MX887017A
TD-SCDMA Uplink
TX Measurement
Operation Manual

Fifth Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided in the MT8870A Universal Wireless Test Set Operation Manual. Please also refer to this document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3652AE-5.0

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

DANGER	This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.
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Safety Symbols Used on Equipment and in Manual

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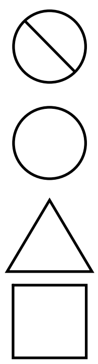
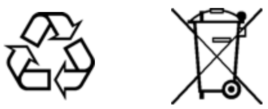


This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

MX887017A
TD-SCDMA Uplink TX Measurement
Operation Manual

18 December 2012 (First Edition)
20 January 2017 (Fifth Edition)

Equipment Certificate

Anritsu Corporation guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.
- The warranty period is 6 months from the purchase date.
- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
- This warranty does not cover damage to this software caused by Acts of God, natural disasters, and misuse or mishandling by the customer.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

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- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument.
  All other required files should be transferred by means of USB or CompactFlash media after undergoing a thorough virus check.
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  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
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Anritsu affixes the CE conformity marking on the following product(s) in accordance with the Decision 768/2008/EC to indicate that they conform to the EMC and LVD directive of the European Union (EU).

CE marking

1. Product Model

Software: MX887017A TD-SCDMA Uplink TX Measurement

2. Applied Directive and Standards

When the MX887017A TD-SCDMA Uplink TX Measurement is installed in the MT8870A, the applied directive and standards of this software conform to that of the MT8870A main frame.

PS: About main frame

Please contact Anritsu for the latest information on the main frame types that MX887017A can be used with.

RCM Conformity Marking

Anritsu affixes the RCM mark on the following product(s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

RCM marking

1. Product Model

Software: MX887017A TD-SCDMA Uplink TX Measurement

2. Applied Directive and Standards

When the MX887017A TD-SCDMA Uplink TX Measurement is installed in the MT8870A, the applied directive and standards of this software conform to that of the MT8870A main frame.

PS: About main frame

Please contact Anritsu for the latest information on the main frame types that MX887017A can be used with.

About This Manual

This manual mainly describes the use, panels, and specifications of the MX887017A TD-SCDMA Uplink TX Measurement.

Products related to the MT8870A Universal Wireless Test Set include:

- MT8870A Universal Wireless Test Set (main unit)
- Modules installed in the MT8870A
- Application software installed in the modules
- Control software installed in a PC controller

These products are referred to as the "Universal Wireless Test Set Series". The operation manuals of the Universal Wireless Test Set Series consist of separate documents for the main unit, module(s), application software, and control software, as shown below. represents this manual.

Main Unit Operation Manual

Describes precautions for safe use, how to connect power and interfaces, and operation and maintenance of the unit.

Module Operation Manual

Describes specifications and operation of the modules. Each module has its own operation manual.

Application Software Operation Manual

Describes how to use the application software installed in the modules and remote commands. Each application software has its own operation manual.

- **MX887017A TD-SCDMA Uplink TX Measurement Operation Manual**

  Describes the functions and remote commands of the TD-SCDMA Uplink Transmit Measurement software.

Control Software Operation Manual

Describes how to install and operate the software for controlling the MT8870A system via a PC. Each control software has its own operation manual.

Table of Contents

Chapter 1 Outline

This chapter outlines the MX887017A TD-SCDMA Uplink Tx Measurement. Refer to Appendix A "Specifications" for the software function and specifications.

1.1 Outline

The MX887017A TD-SCDMA Uplink TX Measurement. (hereafter MX887017A) measures the 3GPP-specified Tx characteristics of mobile stations.

The RF (downlink) signal output from the MU887000A is input to the RF connector of the mobile station and the signal output (uplink) from the mobile station is input to the MU887000A.

Any file pattern can be specified at the MX887017A to send as the downlink TD-SCDMA signal waveform. The downlink signal is sent as a modulation signal pattern read from memory, irrespective of the uplink signal information (non-signalling).

The MX887017A software does not support signalling transmission methods in which the uplink signal information, such mobile call processing, is detected and the downlink signal modulation is changed.

1.2 Features

The MX887000A software features:

(1) High-speed measurement

High-speed measurement is supported by the latest processor and measurement algorithm.

(2) Sequence measurement

Multiple measurements can be executed using pre-programmed sequences to save time and cost at standard mobile tests.

1.3 Composition

The composition of the MX887017A is shown in the Table 1.3-1.

Table 1.3-1 Composition

Item	Model/Code	Name	Qty	Remarks
Software		Storage media (DVD, etc.)	1	
	MX887017A	TD-SCDMA Uplink TX Measurement		On storage media (DVD, etc.)
	W3652AE	MX887017A TD-SCDMA Uplink TX Measurement Operation Manual		English, on storage media (DVD, etc.)

1.4 License Registration

Before the MX887017A software can be used, the software license must be registered in the MU887000A.

Refer to Chapter 8 “Utility Tool” in the *MU887000A TRX Test Module Operation Manual* for the license registration procedure.

1.5 Abbreviations

The abbreviations used in this manual are listed in Table 1.5-1.

Table 1.5-1 Abbreviations

Abbreviations	Name
3GPP	Third Generation Partnership Project
ACK	Acknowledge
ACLR	Adjacent Channel Leakage Power Ratio
AVG	Average
BER	Bit Error Rate
BLER	Block Error Rate
CDE	Code Domain Error
CDP	Code Domain Power
CQI	Channel Quality Indicator
DCCH	Dedicated Control Channel
DL	Downlink
DVT	Deviation
DPCH	Dedicated Physical Channel
ECDP	Effective Code Domain Power
E-DCH	Enhanced Dedicated Channel
E-PUCH	E-DCH Physical Uplink Channel
EVM	Error Vector Magnitude
HSPA	High Speed Packet Access
IQ	In-phase and Quadrature-phase
NACK	Negative Acknowledge
OBW	Occupied Bandwidth
PCDE	Peak Code Domain Error
QPSK	Quadrature Phase Shift Keying
RCDE	Relative Code Domain Error
RRC	Root-Raised Cosine
SCPI	Standard Commands for Programmable Instruments
SEM	Spectrum Emission Mask
TD-SCDMA	Time Division Synchronous Code Division Multiple Access
TFCI	Transport Format Combination Indicator
TPC	Transmit Power Control
TTL	Total
UL	Uplink

Chapter 2 Fundamental Measurement

This chapter describes the fundamental functions and commands of the MX887017A. For details of the commands, refer to Chapter 4 “SCPI Command Reference” and Chapter 5 “Native Command Reference”.

2.1 Common Operations

This section describes operations that are common to the measurements in Chapter 3 “Sequence Measurement”.
Both Native and SCPI commands are described in the introduction to commands.

2.1.1 Selecting application

Switch the MU887000A application software to cellular by using the following command.

```
SYSSEL
:INSTrument[:SELect]
```

Switch the MU887000A measurement standard using the following command.
Set the parameter to TDSCDMA when a function described in sections 2.2 “Transmit Power” to 2.8 “Peak Code Domain Error” is to be used.
Set the parameter to SEQUENCE when a function described in Chapter 3 “Sequence Measurement” is to be used.

```
STDSEL
:CONFigure:CELLular:MEASurement:STANdard
```

2.1.2 Setting ports

Set the MU887000A ports to be used. The following command sets both the port for outputting the downlink signal and the port for receiving the uplink signals.
Set Port1 to Port4 at the parameter.

```
PORT
:ROUTe:PORT:CONNect:DIRection
```

When setting the sequence table in sequence measurement, the sequence commands set only the output port to Port 1 to Port 4.
The above-mentioned command sets the receiving port.

2.1.3 Frequency and level

Frequency

Set the frequency and channel of the measured signal using the following commands.
The signal sent from the MU887000A to the mobile station is the downlink signal and the signal sent from the mobile station to the MU887000A is the uplink signal.

- Channel
  `CHAN`
  `:CONFigure:CELLular:MEASurement:RFSettings:CHANnel`
- Uplink Frequency (mobile station Tx frequency)
  `ULFREQ`
  `TXFREQ`
  `:CONFigure:CELLular:MEASurement:RFSettings:FREQuency`
- Downlink Frequency (mobile station Rx frequency)
  `DLFREQ`
  `RXFREQ`
  `:CONFigure:CELLular:GENerator:RFSettings:FREQuency`

Level

Set the level of the signal sent (Tx) from and received (Rx) by the MU887000A using the following commands, respectively.

- Output Level
  `OLVL`
  `:CONFigure:CELLular:GENerator:RFSettings:LEVel`
- Input Level
  `ILVL`
  `:CONFigure:CELLular:MEASurement:RFSettings:LEVel`

Cable loss correction

The loss of coaxial cables can be corrected for the output, input, and measured levels.
Refer to Chapter 3 "Fundamental Operation" in *the MU887000A TRX Test Module Operation Manual* for an explanation of the commands and loss correction data.

2.1.4 Setting transmission signal

To transmit the waveform pattern from MU887000A by using the Cellular application software, load the waveform file into the waveform memory, and then follow the procedure below:

1. Select the waveform file in the waveform memory.
2. Select the waveform pattern in the waveform file selected in step 1.
3. Set the Modulation On/Off and Output On/Off.

Use the following commands to select waveform file and waveform pattern and to set modulation and output On and Off.

- Output On/Off
  `LVL`
  `:CONFigure:CELLular:GENerator:RFSettings:STATe`
- Modulation On/Off
  `MOD`
  `:CONFigure:CELLular:GENerator:BBMode`
- Waveform File Select
  `PACKAGE`
  `:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`
- Waveform Pattern Select
  `DLPAT`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect`
  `DLPAT_SYNC`
  `:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SEL`
  `ect:SYNC`

Use the following commands to load the waveform file into the waveform memory.
Refer to Chapter 5, "SCPI Command Reference" in the MU887000A "TRX Test Module Operation Manual" for detail descriptions of the commands.

- To load the waveform file into the waveform memory
  `:SOURce:GPRF:GENerator:ARB:FILE:LOAD`
- To query the file name in the waveform memory
  `:SOURce:GPRF:GENerator:ARB:WAVeform:NAME`
- To optimize the waveform memory capacity
  `:SOURce:GPRF:GENerator:ARB:WAVeform:DEFRag`
- To delete the waveform file in the waveform memory
  `:SOURce:GPRF:GENerator:ARB:WAVeform:DELete`
- To query the waveform memory free space
  `:SOURce:GPRF:GENerator:ARB:WAVeform:FREE`

2.1.5 Waveform patterns

To send a TD-SCDMA waveform pattern, specify a file of MV887017A TD-SCDMA Downlink waveform files as the waveform file.

Refer to Chapter 3, “Waveform File Details” in the “Waveform File for Cellular Application Operation Manual” for an explanation of the MV887017A TD-SCDMA Downlink Waveform files.

2.1.6 Setting TD-SCDMA signal

Set the following items to configure the TD-SCDMA signal.

Channel configuration

Select one of the uplink signal channel configurations listed below. The measurement items vary depending on the selected uplink signal channel configuration.

Table 2.1.6-1 Channel Configuration Settings and Measurement Items

Measurement Item	Channel Configuration			
	RMC_SINGLE	RMC_MULTI	HSDPA_RMC	HSUPA_RMC
Tx Power	✓	✓	✓	✓
Power Template	✓	✓	✓	✓
Occupied Bandwidth	✓	✓	✓	✓
Spectrum Emission Mask	✓	✓	✓	✓
Adjacent Channel Leakage Power Ratio	✓	✓	✓	✓
Modulation Analysis				
Carrier Frequency	✓	✓	✓	✓
EVM	✓	✓	✓	✓
Phase Error	✓	✓	✓	✓
Magnitude Error	✓	✓	✓	✓
Origin Offset	✓	✓	✓	✓
IQ Imbalance	✓	✓	✓	✓
Rho	✓	✓	✓	✓
Peak Code Domain Error	✓	✓	✓	✓

✓: Measurement supported

Scrambling code

The scrambling code assigned to each mobile station is a 24-bit spread code. Set the same value as the scrambling code set at the test mobile.

Channels

Set the frequency of the MU887000A TRx signals using the channel numbers specified in 3GPP TS 25.102 5.4 “Channel Arrangement”. Changing the channel number changes the related downlink and uplink frequencies. However, changing the frequencies does not change the channel number.

The relationships between the channel number (N_t) and the uplink frequencies (F_{UL}) = downlink frequencies (F_{DL}) are shown as follows:

$N_t = 5 \times F$ (0.0 MHz≤F≤3276.6 MHz, where F represents the frequency in MHz.)

The following commands are used to set the TD-SCDMA signals.

- Channel Configuration
  `ULCONFIG`
  `:CONFigure:CELLular:TDSCdma:ULConfig`
- Channel
  `CHAN`
  `:CONFigure:CELLular:MEASurement:RFSettings:CHANnel`
- Scrambling Code
  `SCRCODE`
  `:CONFigure:CELLular:TDSCdma:SCODe`
- Midamble Configuration
  `MIDAMBLECONF`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:MIDamble:CONFiguration`
- Uplink DPCH Timeslot
  `UDPCHSLOT`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:UDPChslot`
- Uplink DPCH Channelisation Code (Single Code)
  `UDPCHCODE_SINGLE`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:SINGle`
- Uplink DPCH Channelisation Code (Multi Code_Code1)
  `UDPCHCODE_MULTI1`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi1`
- Uplink DPCH Channelisation Code (Multi Code_Code2)
  `UDPCHCODE_MULTI2`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi2`
- E-PUCH Measurement Slot
  `EPUCH_MEAS_SLOT`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:EPUCH:SLOT`

2.1.7 Setting measurement

Set the following measurement items.

- Trigger Source
  FMEAS_TRGSRC
  :TRIGger:CELLular:TDSCdma:FUNDamental:SOURce
- Trigger level
  FMEAS_TRGLVL
  :TRIGger:CELLular:TDSCdma:FUNDamental:LEVel
- Trigger Timeout
  FMEAS_TRGTOUT
  :TRIGger:CELLular:TDSCdma:FUNDamental:TOUT
- Measurement trigger
  MEASTRG
  :CONFigure:CELLular:TDSCdma:FUNDamental:MEASurement:TRIGger
- Spectrum Emission Mask-Mask Template
  SEM_TEMPLATE
  :CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:TEMPlate
- Spectrum Emission Mask-Mask Template Lower limit
  SEM_LLIMIT
  :CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:LIMit

Use the following command when not measuring.

- Setting all measurements to off
  ALLMEASITEMS_OFF
  :CONFigure:CELLular:TDSCdma:FUNDamental:AMITems:OFF

2.1.8 Starting/stopping measurement

Starting measurement

To start measurement, send the following command.

The status indication lamp 3 of MU887000A is on during the execution of measurement or analysis. For the explanation of the status lamp, refer to Appendix D "Status Indication of lamps" in *the MU887000A TRX Test Module Operation Manual*.

```
SNGLS
:INITiate:CELLular:MEASurement:SINGle
```

Stopping measurement

To stop measurement, send the following command.

```
MEASSTOP
:ABORt:CELLular:MEASurement
```

Checking measurement status

To query the measurement status and errors, send the following command.

```
MSTAT
:FETCh:CELLular:MEASurement:STATe
```

Table 2.1.8-1 Query Responses

Response	Meaning
0	Measurement completed normally
2	Level exceeded The MU887000A receive level is higher than the set input level.
5	Synchronization word not detected
9	Measurement in progress or not executed
12	Tx measurement timeout No trigger occurred before measurement timed out

The measurement status and errors can be queried using the status registers.

Refer to Chapter 3 "Fundamental Operation" in the "MU887000A TRX Test Module Operation Manual" for an explanation of the status registers.

The allocations of MX887017A status registers are described in the following tables.

Native command mode:

Table 2.1.8-2 Bit Definitions of End Event Status Register (Signal Generator)

Bit	Description
7 to 1	Not used and always set to 0
0	Changed to 1 at end of reading waveform file

Table 2.1.8-3 Bit Definitions of End Event Status Register (Measurement)

Bit	Description
7 to 2	Not used and always set to 0
1	Changed to 1 after trigger prepared
0	Changed to 1 when measurement preparation completed

Table 2.1.8-4 Bit Definitions of Error Event Status Register (Signal Generator)

Bit	Description
7 to 1	Not used and always set to 0
0	Changed to 1 at error in read waveform file

Table 2.1.8-5 Bit Definitions of Error Event Status Register (Measurement)

Bit	Description
7 to 3	Not used and always set to 0
2	Changed to 1 at measurement timeout
1	Changed to 1 when measurement result under level
0	Changed to 1 when measurement result over level

SCPI command mode:

Table 2.1.8-6 Bit Definitions of Signal Generator Status Register

Bit	Description
16 to 1	Not used and always set to 0
0	Changed to 1 while reading file

Table 2.1.8-7 Bit Definitions of Measurement Status Register

Bit	Description
16 to 2	Not used and always set to 0
1	Changed to 1 while preparing trigger
0	Changed to 1 during measurement

Table 2.1.8-8 Bit Definitions of Signal Generator Questionable Register

Bit	Description
16 to 1	Not used and always set to 0
0	Changed to 1 at error in read file

Table 2.1.8-9 Bit Definitions of Measurement Questionable Register

Bit	Description
16 to 3	Not used and always set to 0
2	Changed to 1 at measurement timeout
1	Changed to 1 when measurement result under level.
0	Changed to 1 when measurement result over level over

2.2 Transmit Power

Measurement of the Tx power measures the power of the uplink signal sent from the mobile stations as well as the power after passage through an RRC (Root Raised Cosine) filter.

The uplink Tx power measurement settings are:

Channel and frequency of input signals
Set the frequency of the RF signal input to the MU887000A by referring to the command in Section 2.1.3 “Frequency and level”. Set the channel of the RF signal input to the MU887000A by referring to the command in Section 2.1.6 “Setting TD-SCDMA signal”.

Input level
Set the level of the RF signal input to the MU887000A by referring to the command in Section 2.1.3 “Frequency and level”.

Port
Set the input port for the MU887000A by referring to the command in Section 2.1.2 “Setting ports”.

Starting measurement and measurement count
Start Tx power measurement and specify the measurement count. The power for 1 slot (0.675 ms) is measured at single measurement. The measurement count can be set from 1 to 500. Measurement result is obtained from 1-slot measurement excluding GP (Guard Period).

```
PWR_SET
:CONFigure:CELLular:TDSCdma:FUNDamental:POWer:SET
```

Use the following commands to query the Tx power measurement results. The minimum, average, maximum, standard deviation, and unique measurement values can be set as the measurement result type.

- Tx Power
  `TXPWR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:POWer:TXPower`
- Filter Power
  `FILTPWR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:POWer:FLTPower`

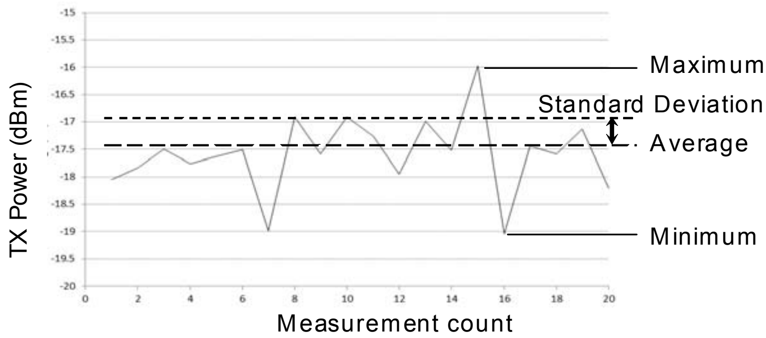

Figure 2.2-1 Types of Measurement Results

2.3 Power Template

Power Template measurement measures the power of the Tx power in the transmission-off section.

Power Template Measurement

Off power (TS s–1):	831-chip section from the first chip in the slot s-1.
–50dBm:	20-chip section after 831-chip offset from the first chip of the slot s-1.
Off power (TS s+1):	864-chip section from the first chip of the slot s+1.

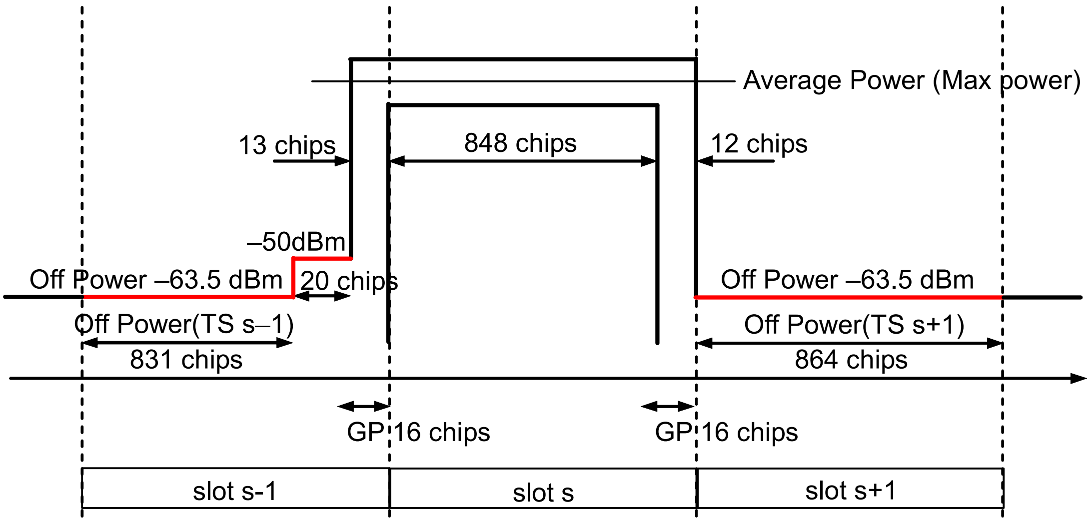

Figure 2.3-1 Power Template Measurement

The uplink Power Template measurement settings are:

Channel and frequency of input signals

Set the channel and frequency of the signal input to the MU870000A using the commands in Section 2.1.3 “Frequency and level”.

Input level

Set the level of the signal input to the MU887000A by referring to the commands in Section 2.1.3 “Frequency and level”.

Port

Set the input port to the MU887000A using the commands in Section 2.1.2 “Setting ports”.

Start measurement at a specified count as follows:
Start Power Template measurement and specify the measurement count within the range from 1 to 500 using the following command. The power for 1 slot (0.675 ms) is measured at single measurement.

```
TEMPLATE_SET
:CONFigure:CELLular:TDSCdma:FUNDamental:TEMPlate:SET
```

Use the following commands to query the measurement results. The minimum, average, maximum, standard deviation, and unique measurement values can be set as the measurement result type.

- Off power (TS s-1)
  OFFPWRM
  :FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:MINus
- Off Power(TS s+1)
  OFFPWRP
  :FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:PLUS
- –50dBm
  M50PWR
  :FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:M50Power
- Template Judgement
  PWR_TEMPLATE
  :FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:JUDGement

2.4 Occupied Bandwidth

The Occupied Bandwidth is the width of the measured spectrum with a specified proportion of the total power.
The following items are measured and displayed at Occupied Bandwidth measurement.

Occupied Bandwidth (OBW)

This is the bandwidth with a specific proportion of the total power of the signal input to the MU887000A.

Upper frequency

The frequency f_{upper}, is found as the power of $\frac{100 - Occupation\_ratio}{2}$ % within the total power from the measured waveform upper limit.
Upper frequency is the difference between this found frequency f_{upper} and the set uplink frequency.

Lower frequency

The frequency f_{lower}, is found as the power of $\frac{100 - Occupation\_ratio}{2}$ % within the total power from the measured waveform lower limit.
Lower frequency is the difference between this found frequency f_{lower} and the set uplink frequency.

Center frequency

The center frequency is found from $\frac{f_{upper} + f_{lower}}{2}$.

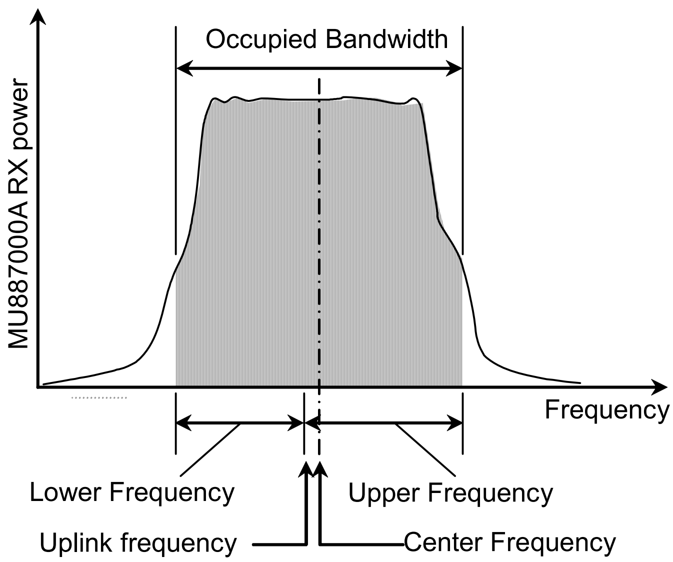

Figure 2.4-1 Occupied Bandwidth

The Occupied Bandwidth measurement settings are:

Channel and frequency of input signals

Specify the channel and frequency of the RF signal input to the MU887000A by referring to the commands in Section 2.1.3 “Frequency and level” and Section 2.1.6 “Setting TD-SCDMA signal”.

Input level

Set the level of the RF signal input to the MU887000A by referring to the command in Section 2.1.3 “Frequency and level”.

Port

Set the input port for the MU887000A by referring to the command in Section 2.1.2 “Setting ports”.

Measurement enable and measurement count

Use the following command to enable Occupied Bandwidth measurement and specify the measurement count. The Occupied Bandwidth for 1 slot (0.675ms) is measured at each measurement count. The measurement count can be set from 1 to 500. Measurement result is obtained from 1-slot measurement.

```
OBW_SET
:CONFigure:CELLular:TDSCdma:FUNDamental:OBW:SET
```

Use the following commands to query Occupied Bandwidth measurement results.
To query a frequency, select one of upper frequency, lower frequency and center frequency.

- Occupied Bandwidth
  ```
  OBW
  :FETCh:CELLular:TDSCdma:FUNDamental:OBW
  ```

- Occupied Bandwidth Frequency
  ```
  OBWFREQ
  :FETCh:CELLular:TDSCdma:FUNDamental:OBW:FREQuency
  ```

2.5 Spectrum Emission Mask

Spectrum Emission Mask measurement measures the peak level and margin at the conditions specified in TS 34.121-1 5.9 Spectrum Emission Mask.

Table 2.5-1 Spectrum Emission Mask Requirement (reprinted from TS 34.122 V11.1.0 Table 5.5.2.1.5.2)

Frequency Difference Δf MHz (Note 1)	Minimum Requirement	Measurement Bandwidth
0.8 – 1.8	$\left\{-33.5-14\cdot\left(\frac{\Delta f}{MHz}-0.8\right)\right\}dBc$	30 kHz (Note 2)
1.8 – 2.4	$\left\{-47.5-17\cdot\left(\frac{\Delta f}{MHz}-1.8\right)\right\}dBc$	30 kHz (Note 2)
2.4 – 4.0	–42.5 dBc	1 MHz (Note 3)

Note 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.
Note 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 0.815 MHz and 2.385 MHz.
Note 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 2.9 MHz and 3.5 MHz .As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.
The lower limit shall be –53.5 dBm/1,28 MHz or the minimum requirement presented in this table which ever is the higher.

The thresholds are shown in the following diagram.

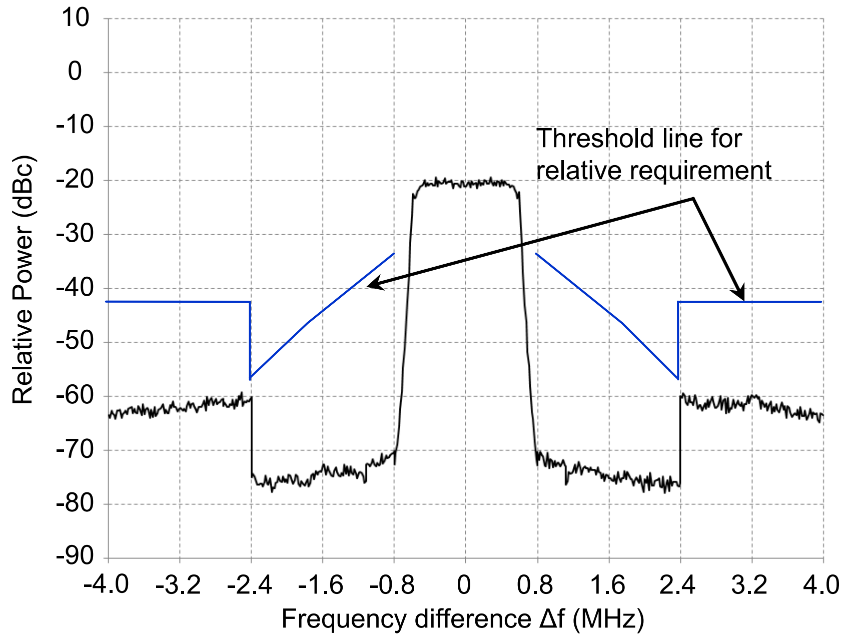

Figure 2.5-1 Thresholds for Spectrum Emission Mask

The Spectrum Emission Mask settings are:

Channel and frequency of input signals

Specify the uplink channel and uplink frequency of the RF signal input to the MU887000A by referring to the commands in Section 2.1.3 “Frequency and level” and in Section 2.1.6 “Setting TD-SCDMA signal”.

Input level

Set the level of the RF signal input to the MU887000A by referring to the command in Section 2.1.3 “Frequency and level”.

Port

Set the input port for the MU887000A by referring to the command in Section 2.1.2 “Setting ports”.

Template

The template is the threshold values for evaluating compliance with the relative standard values of the spectrum emission mask in Figure 2.5-1 “Thresholds for Spectrum Emission Mask”. The levels are set at the five locations shown by the specified numbers on the spectrum emission mask (Figure 2.5-2).

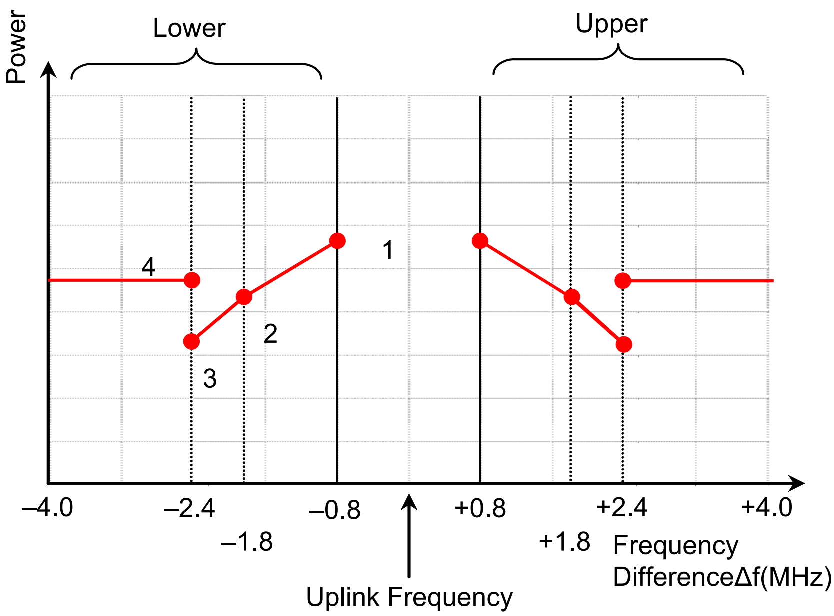

Figure 2.5-2 Setting Points and Levels of Spectrum Emission Mask

Minimum power threshold

The minimum power threshold is the threshold for evaluating compliance with the absolute standard line in Figure 2.5-1 “Thresholds for Spectrum Emission Mask”. The power per 1.28 MHz is set in dBm units. The value at 1.07 dB below the setting value becomes the evaluation level when the resolution is in the 1 MHz frequency range. The value at 16.3 dB below the setting value becomes the evaluation level when the resolution is in the 30 kHz frequency range.

Measurement on/off and measurement count

Enable Spectrum Emission Mask measurement and specify the measurement count. The Spectrum Emission Mask measurement for 1 slot (0.675 ms) is measured at each measurement count. The measurement count can be set from 1 to 500. Measurement result is obtained from 1-slot measurement.

- Measurement Count
  `SEM_SET`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:SET`

Use the following commands to set the spectrum emission mask measurement.

- Template
  `SEM_TEMPLATE`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:TEMPlate`
- Minimum power threshold
  `SEM_LLIMIT`
  `:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:LIMit`

The results of the spectrum emission mask measurement are as follows:

- Evaluation result
  The larger value of either the template threshold or the minimum power threshold is the evaluation threshold value. If the spectrum is below the threshold, it is evaluated as PASS; if it above, it is evaluated as FAIL.
  If the spectrum is entirely within the white part shown in the following diagram, it is evaluated as PASS.

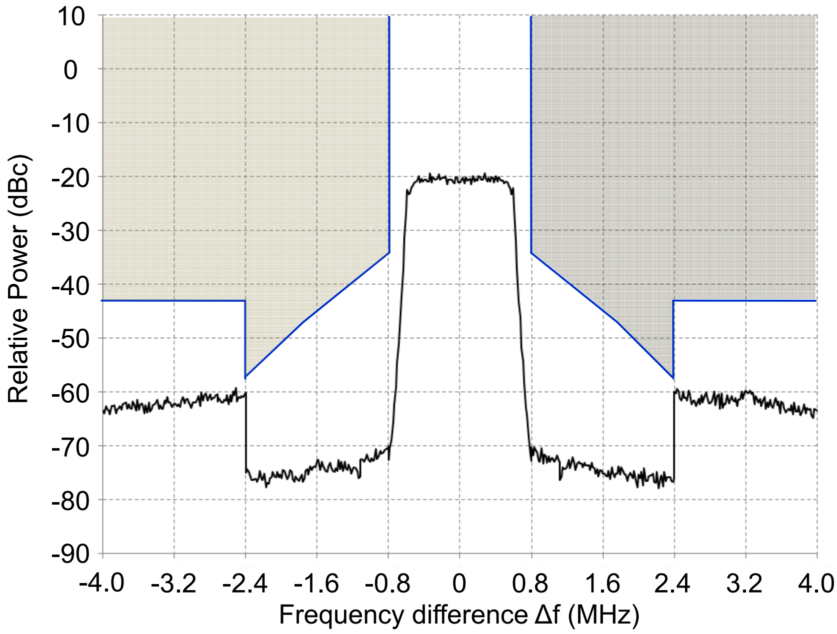

Figure 2.5-3 Spectrum Emission Mask Evaluation Range (at High Signal Level)

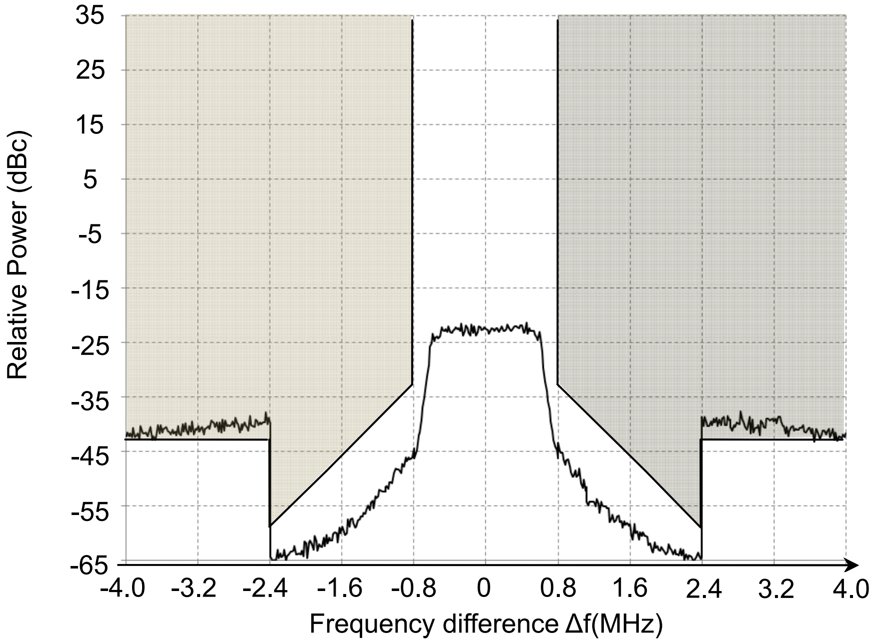

Figure 2.5-4 Spectrum Emission Mask Evaluation Range (at Low Signal Level)

- Peak level and frequency at each range
  Range numbers are shown in Figure 2.5-5 Spectrum Emission Mask Measurement Results.
- Margin
  This is the minimum level difference from the threshold. The applicable threshold depends on the signal level.

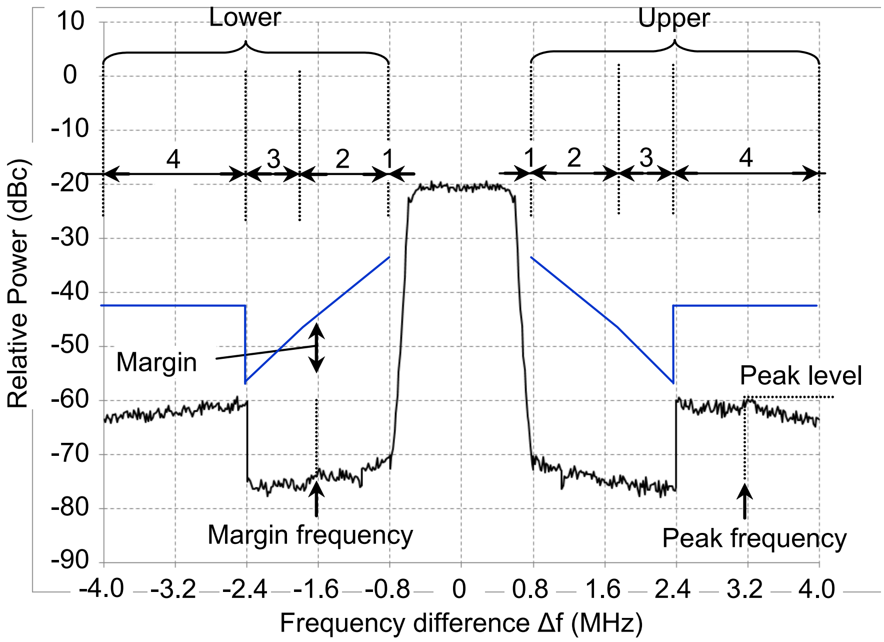

Figure 2.5-5 Spectrum Emission Mask Measurement Results

The commands for querying the spectrum emission mask measurement results are:

- Evaluation Result
  SEM
  :FETCh:CELLular:TDSCdma:FUNDamental:SEMask:JUDGement
- Peak Level and Frequency at Lower Side Frequency Range
  SEMLVL_LOWER
  :FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:LOWer
- Peak Level and Frequency at Upper Side Frequency Range
  SEMLVL_UPPER
  :FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:UPPer
- Margin and Related Point Frequency at Lower Side Frequency Range
  SEMMARGIN_LOWER
  :FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:LOWer
- Margin and Related Point Frequency at Upper Side Frequency Range
  SEMMARGIN_UPPER
  :FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:UPPer

2.6 Adjacent Channel Leakage Power Ratio

Adjacent Channel Leakage Power Ratio is the ratio of in-band power to the power leaking to adjacent channels.

The power leakage to adjacent channels is equivalent to the RRC filtered mean power centered around ±1.6 MHz and ±3.2 MHz from the uplink frequency.

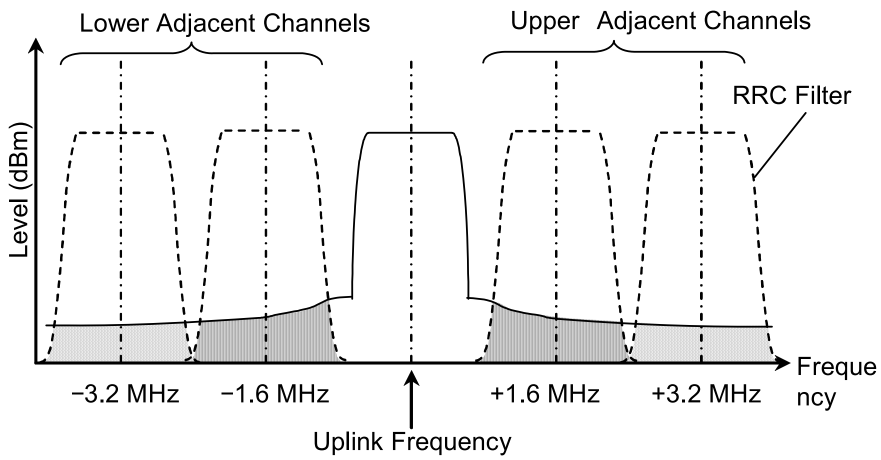

Figure 2.6-1 Measurement Range for Adjacent Channel Leakage Power Ratio

The Adjacent Channel Leakage Power Ratio measurement parameters are:

Measurement on/off and measurement count

Enable Adjacent Channel Leakage Power Ratio measurement and specify the measurement count. The Adjacent Channel Leakage Power Ratio measurement for 1 slot (0.675 ms) is measured at each measurement count. The measurement count can be set from 1 to 500. Measurement result is obtained from 1-slot measurement.

```
ACLR_SET
:CONFigure:CELLular:TDSCdma:FUNDamental:ACLR:SET
```

Use the following command to query the results of the Adjacent Channel Leakage Power Ratio measurement (power ratio at offset frequency, –3.2 MHz, –1.6 MHz, +1.6 MHz, and +3.2 MHz).
Minimum, average, maximum, and standard deviation are available as the type of measurement results.

```
ACLR
:FETCh:CELLular:TDSCdma:FUNDamental:ACLR
```

2.7 Modulation Analysis

Modulation analysis measures:

- Frequency Error
- EVM
- Origin Offset
- IQ Imbalance
- Rho

Use the following command to enable modulation analysis measurement and specify the measurement count. Modulation analysis of 1 slot (0.675 ms) is performed at each measurement count. The measurement count can be set from 1 to 500. Measurement result is obtained from 1-slot measurement excluding GP (Guard Period).

```
MOD_SET
:CONFigure:CELLular:TDSCdma:FUNDamental:MODulation:SET
```

Note:

The MX887017A supports the Modulation Analysis measurement including E-DCH 16QAM only for FRC3.

2.7.1 Frequency error

Frequency error measurement measures the uplink carrier frequency and frequency error.

Set the uplink frequency as the reference frequency for error measurement by referring to Section 2.1.3 “Frequency and level”.

Use the following commands to query the frequency error measurement results:

- Carrier Frequency
  `CFREQ`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:CFRequency`
- Frequency Error
  `CFERR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor`
- Worst Value of Frequency Error
  `CFERR_WORST`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor:WORSt`

The types of frequency error measurement results are minimum, average, maximum, and standard deviation.
The worst value is either the maximum or minimum frequency error, whichever is the larger absolute value.

2.7.2 EVM

Error Vector Magnitude (EVM) is the magnitude ratio of the error vector to the reference vector. The error vector is the difference between the vector of the measured signal and the reference vector.
The difference in phase between the vector of the measured signal and the reference vector is called the phase error while the difference in magnitude is called the magnitude error.

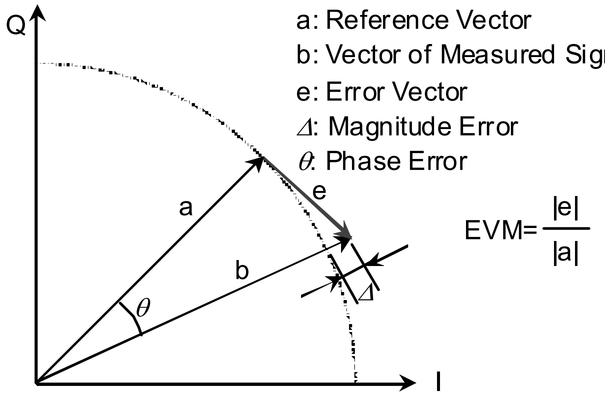

Figure 2.7.2-1 Definition of EVM

EVM, phase error, and magnitude error are measured for each chip for up to 2560 data. The rms of the data is regarded as one measurement result.
The peak EVM is the maximum value among the obtained EVM data.

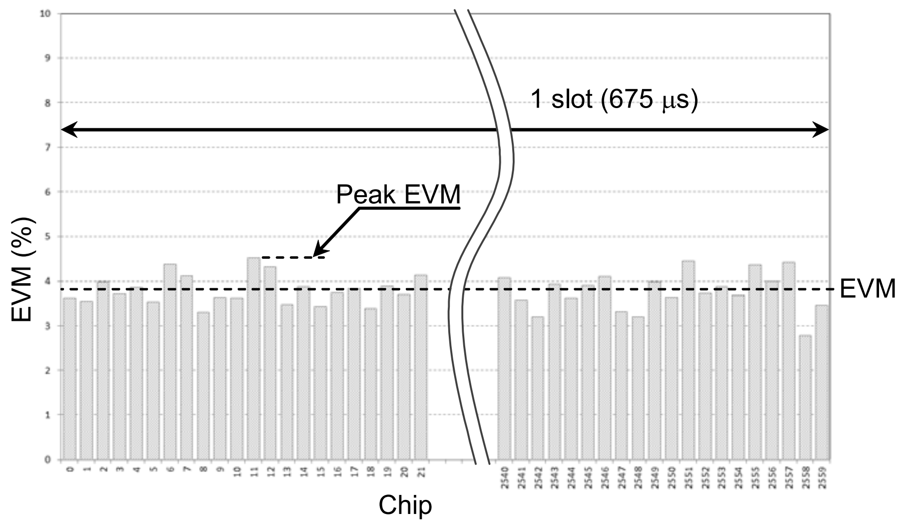

Figure 2.7.2-2 Difference between EVM and Peak EVM

Use the following commands to query the EVM measurement results:
The types of measurement results are minimum, average, maximum, and standard deviation.

- EVM
  `EVM`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:EVM`
- Peak EVM
  `PEVM`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PEVM`
- Phase Error
  `PHASEERR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PHERrror`
- Magnitude Error
  `MAGERR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:MERRror`

2.7.3 Origin offset

The origin offset is the offset of the IQ vector origin calculated as:

$$offset = 20\log_{10}\left(\frac{|\,offset\_vector\,|}{|\,Reference\_vector\,|}\right) \quad \text{(dB)}$$

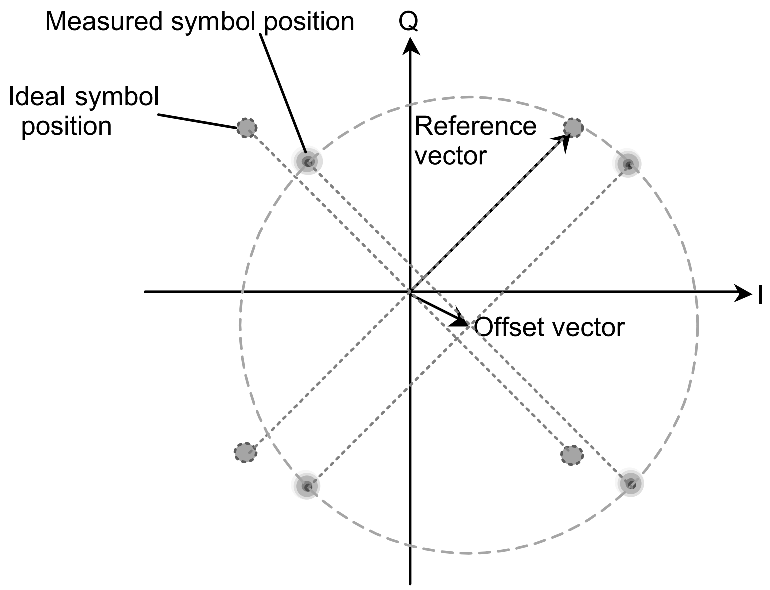

Figure 2.7.3-1 Definition of Origin Offset

Use the following command to query the Origin Offset measurement results.
The types of measurement results are minimum, average, maximum, and standard deviation.

```
ORGNOFS
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:ORGNoffset
```

2.7.4 IQ Imbalance

IQ imbalance is the magnitude ratio of the I component to Q component of the measured signal vector calculated as:

$$IQ\_imbalance = \frac{I}{Q} \times 100 \quad (\%)$$

Use the following command to query the IQ imbalance measurement result:
The types of measurement results are minimum, average, maximum, and standard deviation.

```
IQIMB
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:IQIMbalance
```

2.7.5 Rho

Waveform quality (ρ: Rho) shows the correlation between an ideal noiseless waveform and the measured signal. It is 1 when both signals match each other.
The approximate relationship between Rho and EVM is:

$$\rho \approx \frac{1}{1 + EVM^2}$$

Query the Rho measurement results using the following command:

```
RHO
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:RHO
```

2.8 Peak Code Domain Error

Peak Code Domain Error is the maximum value among code domain errors for channelization codes 0 to 255.

A code domain error is the ratio of an error vector to the reference vector for each channelization code.

$$CDE(code) = 20\log_{10}\left(\frac{|error\_vector(code)|}{|Reference\_vector|}\right) \quad \text{(dB)}$$

code: 0 to 15

The Peak Code Domain Error measurement setting items are:

Measurement execution on/off and measurement count

Turn on Peak Code Domain Error measurement and specify the measurement count. The Peak Code Domain Error of 1 slot (0.675 ms) is measured at each measurement count. The measurement count can be set within the range from 1 to 500.

```
PCDE_SET
:CONFigure:CELLular:TDSCdma:FUNDamental:PCDE:SET
```

Use the following command to query the Peak Code Domain Error measurement results.
The types of measurement results are minimum, average, maximum, and standard deviation.

```
PCDE
:FETCh:CELLular:TDSCdma:FUNDamental:PCDE
```

2.9 Bit Error Rate Measurement

The MX887017A performs the Bit Error Rate (BER) measurement of transport block by loop back communication. In loop back communication, the object to be measured receives the downlink signal from the MU887000A and sends it back as uplink signal.

The Bit Error Rate and Block Error Rate measurements are performed to evaluate the reception performance of the object to be measured. The uplink signal is set to the level where the MU887000A does not have bit errors.

Use the following waveform pattern for Bit Error Rate measurement.
File name : MV887017A_TDSCDMA_0004
Pattern number : 2

The setup for Bit Error Rate measurement is as follows:

Turning On/Off Bit Error Rate measurement

Sets execution of Bit Error Rate measurement

```
BER_MEAS
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:MEASureme
nt
```

Sample bit number

This command sets the bit to be measured. Bit Error Rate measurement ends when the bits specified by sample bit number are measured.

```
BER_SAMPLE
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:SAMPle
```

Upper limit of bit error rate

Sets reference value for pass evaluation of bit error rate. If the measured bit error rate is below the reference, it is judged as pass.

```
BER_LIMIT
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:LIMit
```

DTCH Data Pattern

Sets the data pattern of the signals to be measured. Sets the bit data composed of only 1s (ALL1).

```
DTCHPAT
:CONFigure:CELLular:TDSCdma:FUNDamental:DTCH:PATTern
```

TFCI Detect Mode

Sets TFCI detection to Auto or Manual (fixed value).

```
BER_TFCI
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:TFCI
```

The commands to query the results of Bit Error Rate measurement are as follows.

- Bit error rate
  ```
  BER
  :FETCh:CELLular:TDSCdma:FUNDamental:BERate:ERATe
  ```
- Error bit number
  ```
  BERCNT
  :FETCh:CELLular:TDSCdma:FUNDamental:BERate:ECOunt
  ```
- Transmit bit number
  ```
  BERTRANSMIT
  :FETCh:CELLular:TDSCdma:FUNDamental:BERate:TBIT
  ```
- Judgement results of Bit Error Rate measurement
  ```
  BERPASS
  :FETCh:CELLular:TDSCdma:FUNDamental:BERate:JUDGement
  ```

2.10 Block Error Rate Measurement

The MX887017A performs Block Error Rate measurement by loop back communication. Block errors are checked by CRC (cyclic redundancy checksum) of transport block.

Use the following waveform pattern for Block Error Rate measurement.
File name : MV887017A_TDSCDMA_0004.xml
Pattern number : 2

The setup for Block Error Rate measurement is as follows:

Turning On/Off Block Error Rate measurement

Sets execution of Block Error Rate measurement.

```
BLER_MEAS
:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:MEASureme
nt
```

Sample block number

Sets the block number to be measured. Block Error Rate measurement ends when the blocks specified by sample block number are measured.

```
BLER_SAMPLE
:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:SAMPle
```

The commands to query the results of Block Error Rate measurement are as follows.

- Block error rate
  ```
  BLER
  :FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ERATe
  ```
- Error block number
  ```
  BLERCNT
  :FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ECOunt
  ```
- Transmit block number
  ```
  BLERTRANSMIT
  :FETCh:CELLular:TDSCdma:FUNDamental:BLERate:TBIT
  ```

2.11 Closed Loop Power Control Measurement

In the Closed Loop Power Control measurement, the MU887000A transmits downlink signals that include power control bit. The transmission power of the mobile station is measured under the control of the power control bit.

Note:

The MX887017A supports only Step B and C.

The settings required for the Closed Loop Power Control measurement are as below.

Selecting Closed Loop Power Control (Auto) measurement

Select "CLPC" by the following command to execute the Closed Loop Power Control (Auto) measurement.

```
MEASOBJ
:CONFigure:CELLular:TDSCdma:FUNDamental:MOBJect
```

Control method (interval) of Closed Loop Power Control (Auto) measurement

Select a control method (interval) of Closed Loop Power Control (Auto) measurement.

This measurement is available only for Step B to C.

```
CLPC_MEAS
:CONFigure:CELLular:TDSCdma:FUNDamntal:CLPC:MEASurement
```

Measurement filter for Closed Loop Power Control (Auto) measurement

Select a measurement filter for the Closed Loop Power Control (Auto) measurement.

This measurement is available only for RRC Filter (1.28MHz).

```
CLPC_FLT
:CONFigure:CELLular:TDSCdma:FUNDamntal:CLPC:FILTer
```

Query the measurement results of Closed Loop Power Control (Auto) measurement by the following commands.

- Power by slot

  Queries the measurement result (level) per slot of Step B or Step C.

  ```
  CLPC_PWR
  :FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer
  ```

- Power difference between slots

  Queries the power difference between slots of Step B or Step C.

  ```
  CLPC_PWRDB
  :FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer:DB
  ```

- Maximum power
  Queries the maximum power for the Closed Loop Power Control (Auto) measurement.
  `CLPC_MAXPWR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MAXimum:POWer`
- Minimum power
  Queries the minimum power for the Closed Loop Power Control (Auto) measurement.
  `CLPC_MINPWR`
  `:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MINimum:POWer`
- Judgement result
  Queries the pass/fail results of Closed Loop Power Control (Auto) measurement.
  `CLPC_PASS`
  `:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:JUDGement`

2.12 Capturing Waveform Data

The following command is used to capture the waveform data after measurement has been completed.

```
WAVEFMEAS
:FETCh:CELLular:TDSCdma:FUNDamental:TRACe
```

The query parameter, number of data and data interval for capturing the waveform data for each measurement item are listed in the following table.

Table 2.12-1 Waveform Data Type and Data Interval

Measurement	Query Parameter	Number of Data	Data Interval
Occupied Bandwidth	1	493	9.765625 kHz
Spectrum Emission Mask	2	821	9.765625 kHz
Constellation (I)	3	848	1 chip
Constellation (Q)	4		
EVM (Average)	5	848	1 chip
EVM (Maximum)	6		
Phase Error (Average)	7	848	1 chip
Phase Error (Maximum)	8		
Magnitude Error (Average)	9	848	1 chip
Magnitude Error (Maximum)	10		
Transmit Power	11	2592	1 chip

2.13 Sample Program

This section describes a sample program using free Tera Term software. For the Tera Term communication settings of, refer to Section 2.3.1 “Ethernet” in the MU887000A “TRX Test Module Operation Manual”.

2.13.1 Example of Spectrum emission mask measurement

An example of Spectrum Emission Mask measurement using the Native command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing Flow

1. Set the application software type to the MX887017A.
2. Set the following measurement conditions:

Test Port	Port 1
Input Level	–10 dBm
Uplink Frequency	1940 MHz
Scrambling Code	0
Signal Configuration	RMC 12.2 kbps(Single Code)
Tx Power Measurement	OFF
Power Template	OFF
Occupied Bandwidth Measurement	OFF
Spectrum Emission Mask Measurement	ON, 100 counts
Adjacent Channel Leakage Power Ratio Measurement	OFF
Modulation Analysis	OFF
Peak Code Domain Power Measurement	OFF

3. Set the Spectrum Emission Mask.

Offset 1	–33.5 dBc
Offset 2	–47.5 dBc
Offset 3	–57.7 dBc
Offset 4	–42.5 dBc
Minimum Power	–53.5 dBm

4. Start measurement.
5. Read the measurement status.
6. Query measurement results after measurement is completed.
7. Query the spectrum waveform data.

```
; Sample program for Spectrum Emission Mask
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set application type to "Cellular".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "TD-SCDMA".
sendln 'STDSEL TDSCDMA'
call check_error_code

; Set test port to "Port1".
sendln 'PORT PORT1,PORT1'
call check_error_code

; Set Input Range to "-10 dBm".
sendln 'ILVL -10'
call check_error_code

; Set center frequency to "1940 MHz".
sendln 'ULFREQ 1940MHZ'
call check_error_code

; Set Scrambling Code to "0".
sendln 'SCRCODE 0'
call check_error_code

; Set Uplink Signal Configuration to "RMC 12.2 kbps(Single Code)".
sendln 'ULCONFIG RMC_SINGLE'
call check_error_code

; Set Measurement of Tx Power to "OFF".
sendln 'PWR_SET OFF'
```

```
call check_error_code

; Set Measurement of Power Template to "OFF".
sendln 'TEMPLATE_SET OFF'
call check_error_code

; Set Measurement of Occupied Bandwidth to "OFF".
sendln 'OBW_SET OFF'
call check_error_code

; Set Measurement of Spectrum Emission Mask to "ON","100 times".
sendln 'SEM_SET ON,100'
call check_error_code

; Set Measurement of Adjacent Channel Leakage power Ratio to "OFF".
sendln 'ACLR_SET OFF'
call check_error_code

; Set Measurement of Modulation Analysis to "OFF".
sendln 'MOD_SET OFF'
call check_error_code

; Set Measurement of Peak Code Domain Error to "OFF".
sendln 'PCDE_SET OFF'
call check_error_code

; Set Level Limit of Offset 1 to "-33.5 dBc".
sendln 'SEM_TEMPLATE 1,-33.5'
call check_error_code

; Set Level Limit of Offset 2 to "-47.5 dBc".
sendln 'SEM_TEMPLATE 2,-47.5'
call check_error_code

; Set Level Limit of Offset 3 to "-57.7 dBc".
sendln 'SEM_TEMPLATE 3,-57.7'
call check_error_code

; Set Level Limit of Offset 4 to "-42.5 dBc".
sendln 'SEM_TEMPLATE 4,-42.5'
call check_error_code

; Set Lower Level Limit to "-53.5 dBm".
sendln 'SEM_LLIMIT -53.5'
```

```
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'MSTAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
next

; Query Judgement
sendln 'SEM?'
call check_error_code

; Query Peak level and frequency in each range
sendln 'SEMLVL_LOWER?'
call check_error_code
sendln 'SEMLVL_UPPER?'
call check_error_code

; Query Margin in each range
sendln 'SEMMARGIN_LOWER?'
call check_error_code
sendln 'SEMMARGIN_UPPER?'
call check_error_code

; Query Spectrum data
sendln 'WAVEFMEAS? 2,0,821'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End
```

```
;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

2.13.2 Example of modulation analysis measurement

An example of modulation analysis using the SCPI command mode is described here.

The sample program on the following pages can be executed as a Tera Term macro. Refer to the Tera Term Help file for how to execute the macro.

Processing Flow

1. Set the application software type to the MX887017A.
2. Set the following measurement conditions:

Test Port	Port 2
Input Level	–20 dBm
Uplink Frequency	1940 MHz
Scrambling Code	127
Signal Configuration	RMC 12.2 kbps(Single Code)
Tx Power Measurement	OFF
Power Template	OFF
Occupied Bandwidth Measurement	OFF
Spectrum Emission Mask Measurement	OFF
Adjacent Channel Leakage Power Ratio Measurement	OFF
Modulation Analysis	ON, 200 counts
Peak Code Domain Power Measurement	OFF

3. Start measurement.
4. Read the measurement status
5. After measurement is completed, query the following measurement results:

   Frequency, Frequency Error (Worst), EVM, Peak EVM, Phase Error, Magnitude Error, Origin Offset, and IQ Imbalance
6. Query the following waveform data:

   Constellation (I), Constellation (Q), EVM (Average), Phase Error (Average), and Magnitude Error (Average)

```
; Sample program for Modulation Analysis
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 3 second
timeout=3

; Set language to "SCPI".
sendln 'SYST:LANG SCPI'
call check_error_code

; Set application type to "Cellular".
sendln ':INST CELLULAR'
call check_error_code

; Set standard to "TD-SCDMA".
sendln ':CONF:CELL:MEAS:STAN TDSCDMA'
call check_error_code

; Set test port to "Port2".
sendln ':ROUT:PORT:CONN:DIR PORT2,PORT2'
call check_error_code

; Set Uplink Frequency to "1940 MHz".
sendln ':CONF:CELL:MEAS:RFS:FREQ 1940MHZ '
call check_error_code

; Set Input Level to "-20 dBm".
sendln ':CONF:CELL:MEAS:RFS:LEV -20'

; Set Scrambling Code  to "127".
sendln ':CONF:CELL:TDSC:SCOD 127'
call check_error_code

; Set Uplink Signal Configuration to "RMC 12.2 kbps(Single Code)".
sendln ':CONF:CELL:TDSC:ULC RMC_SINGLE'
call check_error_code

; Set Measurement of Tx Power to "OFF".
sendln ':CONF:CELL:TDSC:FUND:POW:SET OFF '
call check_error_code
```

```
; Set Measurement of Power Template to "OFF".
sendln ':CONF:CELL:TDSC:FUND:TEMP:SET OFF'
call check_error_code

; Set Measurement of Occupied Bandwidth to "OFF".
sendln ':CONF:CELL:TDSC:FUND:OBW:SET OFF'
call check_error_code

; Set Measurement of Spectrum Emission Mask to "OFF".
sendln ':CONF:CELL:TDSC:FUND:SEM:SET OFF'
call check_error_code

; Set Measurement of Adjacent Channel Leakage power Ratio to "OFF".
sendln ':CONF:CELL:TDSC:FUND:ACLR:SET OFF'
call check_error_code

; Set Measurement of Modulation Analysis to "ON","200 times".
sendln ':CONF:CELL:TDSC:FUND:MOD:SET ON,200'
call check_error_code

; Set Measurement of Peak Code Domain Error to "OFF".
sendln ':CONF:CELL:TDSC:FUND:PCDE:SET OFF'
call check_error_code

; ! Note !
; Output the RF power of Device under test.

; Start measurement
sendln ':INIT:CELL:MEAS:SING'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln ':FETC:CELL:MEAS:STAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         break
  endif
  call check_error_code
```

```
next

; Query Frequency
sendln ':FETC:CELL:TDSC:FUND:MOD:CFR?'
call check_error_code

; Query Frequency Error (Worst)
sendln ':FETC:CELL:TDSC:FUND:MOD:FERR:WORS?'
call check_error_code

; Query EVM
sendln ':FETC:CELL:TDSC:FUND:MOD:EVM? TTL'
call check_error_code

; Query Peak EVM
sendln ':FETC:CELL:TDSC:FUND:MOD:PEVM? TTL'
call check_error_code

; Query Phase Error
sendln ':FETC:CELL:TDSC:FUND:MOD:PHER? TTL'
call check_error_code

; Query Magnitude Error
sendln ':FETC:CELL:TDSC:FUND:MOD:MERR? TTL'
call check_error_code

; Query Origin Offset
sendln ':FETC:CELL:TDSC:FUND:MOD:ORGN? TTL'
call check_error_code

; Query IQ Imbalance
sendln ':FETC:CELL:WCDM:FUND:MOD:IQIM? TTL'
call check_error_code

; Query Rho
sendln ':FETC:CELL:TDSC:FUND:MOD:RHO?'
call check_error_code

; Query Waveform Data – Constellation (I)
sendln ':FETC:CELL:TDSC:FUND:TRAC? 3,0,848'
call check_error_code

; Query Waveform Data – Constellation (Q)
sendln ':FETC:CELL:TDSC:FUND:TRAC? 4,0,848'
```

```
call check_error_code

; Query Waveform Data - EVM (Average)
sendln ':FETC:CELL:TDSC:FUND:TRAC? 5,0,848'
call check_error_code

; Query Waveform Data - Phase Error (Average)
sendln ':FETC:CELL:TDSC:FUND:TRAC? 7,0,848'
call check_error_code

; Query Waveform Data - Magnitude Error (Average)
sendln ':FETC:CELL:TDSC:FUND:TRAC? 9,0,848'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------

:check_error_code
  ; query error
  sendln ':SYSTem:ERRor?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return
```

```
:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

Chapter 3 Sequence Measurement

This chapter describes the MX887017A Sequence Measurement function and commands. For a detailed description of the commands, refer to Chapter 4 “SCPI Command Reference” and Chapter 5 “Native Command Reference” in this manual.

A license for the MX887010A Cellular Standards Sequence Measurement is required to execute sequence measurement.

3.1 Outline

The MX887017A TD-SCDMA Uplink Tx Measurement adds the following measurements to the Sequence Measurement mode. Refer to Chapter 2 "Fundamental Measurement" for details of each measurement.

- Tx Power
- Power Template
- Occupied Bandwidth
- Spectrum Emission Mask
- Adjacent Channel Leakage Power Ratio
- Modulation Analysis
  Frequency Error, EVM, Phase Error, Magnitude Error, Origin Offset, IQ Imbalance, and Rho

The Sequence Measurement mode does not support the following measurements.

- Peak Code Domain Error
- Bit Error Rate Measurement
- Block Error Rate Measurement
- Waveform Data

The TD-SCDMA measurement can be allocated to any segment in the sequence table.
The segment duration depends on the measurement count. Each item of TD-SCDMA measurement is measured once in one subframe (5 ms).

Note:

These items are measured only at one slot (675 μs) in one subframe.

When multiple measurements are specified in a segment, the largest measurement count determines the segment measurement duration.

Example:

Transmission power	50 times	50 × 5 ms = 250.0 ms
Power Template	100 times	100 × 5 ms = 500.0 ms
Occupied Bandwidth	100 times	100 × 5 ms = 500.0 ms
Spectrum Emission Mask	150 times	150 × 5 ms = 750.0 ms
Adjacent Channel Leakage Power Ratio	50 times	50 × 5 ms = 250.0 ms
Modulation Analysis	200 times	200 × 5 ms = 1000.0 ms

In this case, the TD-SCDMA signal measurement duration is 1000.0 ms as determined by the Modulation Analysis measurement duration.

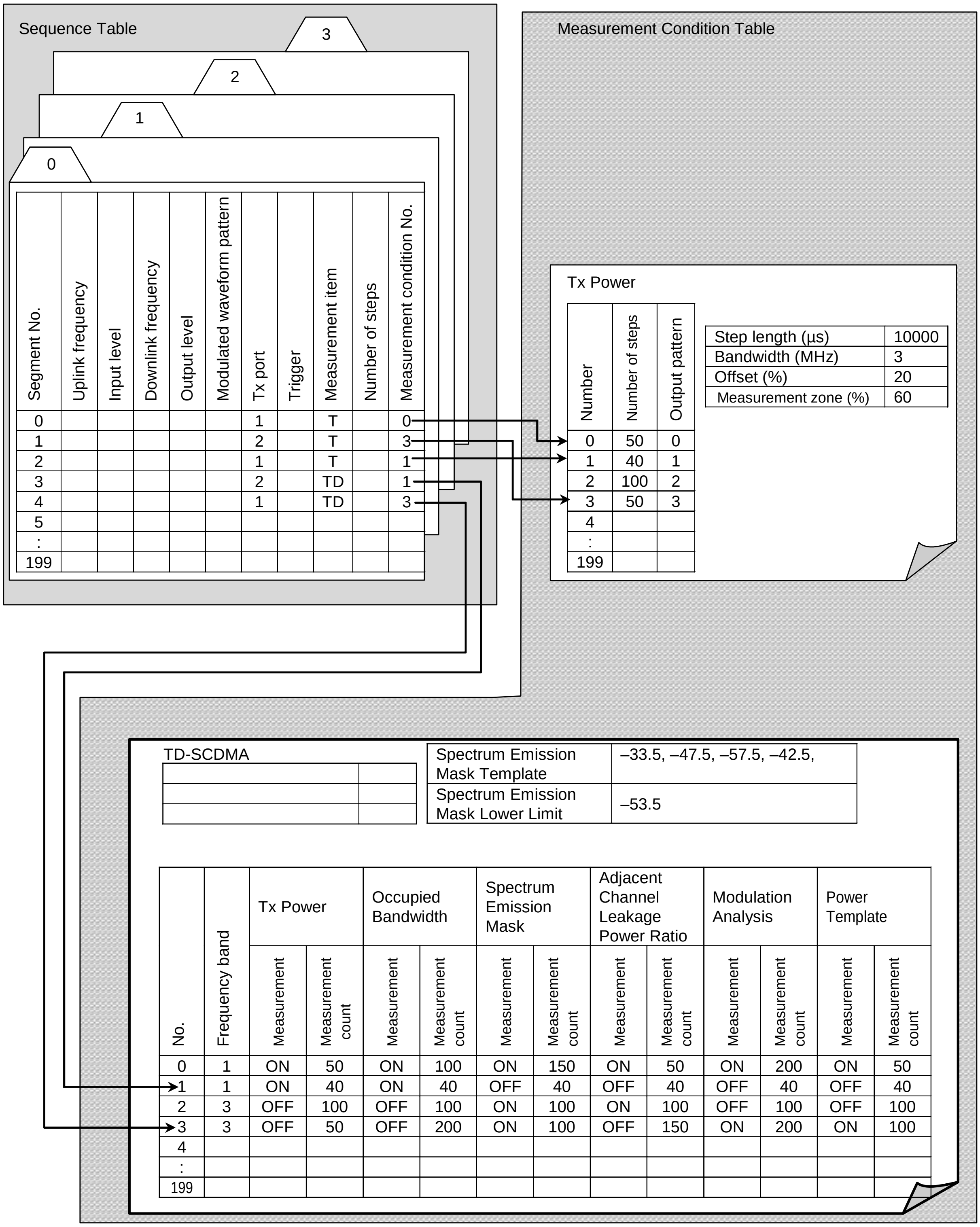

Figure 3.1-1 Data Composition of Sequence Measurement Conditions with MX887017A Installed

To change measurement to the Sequence Measurement mode send the following command to set the parameter to SEQUENCE.

```
STDSEL
:CONFigure:CELLular:MEASurement:STANdard
```

To modify the frequency, level or waveform pattern of a downlink signal at sequence measurement, set the MU887000A vector signal generator to the Sequence Measurement mode. Set the parameter to SEQUENCE using the following command. For detailed descriptions of commands, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

```
:SOURce:GPRF:GENerator:MODE
```

Set the initial sequence measurement conditions to the following items described in Section 2.1 “Common Operations”.
Individual values can be set for each of the following items described in Chapter 2 “Fundamental Measurement” and in this chapter.

- Uplink frequency (Tx frequency of mobile station)
  `ULFREQ`
  `TXFREQ`
  `:CONFigure:CELLular:MEASurement:RFSettings:FREQuency`
- Downlink frequency (Rx frequency of mobile station)
  `DLFREQ`
  `RXFREQ`
  `:CONFigure:CELLular:GENerator:RFSettings:FREQuency`
- Output level
  `OLVL`
  `:CONFigure:CELLular:GENerator:RFSettings:LEVel`
- Input level
  `ILVL`
  `:CONFigure:CELLular:MEASurement:RFSettings:LEVel`
- Output on/off
  `LVL`
  `:CONFigure:CELLular:GENerator:RFSettings:STATe`
- Modulation on/off
  `MOD`
  `:CONFigure:CELLular:GENerator:BBMode`
- Waveform file
  `PACKAGE`
  `:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`

- Waveform pattern
  DLPAT
  :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect
  DLPAT_SYNC
  :CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC
- Ports
  PORT
  :ROUTe:PORT:CONNect:DIRection

3.2 Setting Sequence Table

3.2.1 Sequence table setting items

The sequence table setting items are:

- Table number
- Uplink (Rx) frequency
- Input level
- Downlink (Tx) frequency
- Output level
- Modulated waveform pattern
- Output port
- Trigger condition
- Measurement item
- Step count
- Measurement condition number

Table number

This is the number allocated to the edited sequence table. Four sequence tables are used and each table has a number between 0 and 3.

Rx frequency, Input level, Tx frequency, Output level, Modulated waveform pattern

Each segment of the sequence table is configured with frequencies (MHz) and levels (dBm) and modulated waveform pattern number. The setting ranges are:

Frequency:	400.000000 to 3800.000000 MHz
Input level:	–65.0 to +35.0 dBm (Test Port 1, 2)
	–65.0 to +25.0 dBm (Test Port 3, 4)
Output level:	–130.0 to –10.0 dBm (Test Port 1, 2)
	–120.0 to 0.0 dBm (Test Port 3, 4)
Modulated waveform pattern:	PAT1 to PATn (n: waveform information file group range)

For details of the modulated waveform patterns at TD-SCDMA measurement, refer to Section 2.1.5 “Waveform patterns”.

Output port

This sets the number of the RF signal output port to 1 to 4 in each segment of the sequence table.
When selecting Port 3 or 4, make sure the port number is not the same as the input port.

Trigger conditions

This specifies the trigger condition at each segment of the sequence table. The setting ranges are:

Trigger Source:	Frame: When frame is detected Free run: When measurement start command received Power: When input level above (below) trigger level
Slope:	Rise: When input level exceeds trigger level
Trigger Level:	Level difference from input level Set a value in the range of –40.0 to 0 dB.

Measurement item, step count, and measurement condition

This sets the step count and measurement item for received signals in each segment of the sequence table. To execute the TD-SCDMA measurement described here, set TD-SCDMA as the measurement mode.

Note:

If the license of other cellular application software is installed, the measurement mode supported by the license can be set.

In this case, the measurement mode can be changed up to 15 times during the sequence.

The TD-SCDMA measurement condition is specified in a separate table. A measurement item should be registered in a given segment with its measurement condition number specified in the related table.

Set the step count to the following values or more according to the contents of the TD-SCDMA measurement condition table.

- Measurement Count + 3

Step count setting examples are shown in the following table.

Table 3.2.1-1 Example of Setting the Number of Steps

	Measurement	Example 1		Example 2	
		Measurement Execution	Measurement Count	Measurement Execution	Measurement Count
*1	Tx Power	On	50	On	50
	Occupied Bandwidth	On	100	On	100
	Spectrum Emission Mask	On	60	On	60
	Adjacent Channel Leakage Power Ratio	On	150	On	150
	Modulation Analysis	On	200	On	100
*2	Step Count		203		153

*1: Setup items specified in TD-SCDMA measurement condition table

*2: Setup items specified in sequence table

3.2.2 Sequence table commands

The following commands set and query items in the sequence table.

- Table number
  SEQTBL
  :CONFigure:CELLular:SEQuence:TABLe
- Uplink frequency, Input level, Downlink frequency, Output level, and Modulation pattern
  SEQTRX
  :CONFigure:CELLular:SEQuence:RFSettings:TRX
- Uplink frequency and Input level
  SEQTX
  :CONFigure:CELLular:SEQuence:RFSettings:TX
- Output port
  SEQSGPORT
  :CONFigure:CELLular:SEQuence:RXPort
- Trigger
  SEQTRG
  :TRIGger:CELLular:SEQuence
- Measurement mode, Step count, Measurement condition Number
  SEQMEAS
  :CONFigure:CELLular:SEQuence:SETup

3.2.3 Setting item error check

Setting errors in the following items in the sequence table can be checked.

- Input level
- Output level
- Step count
- Waveform pattern
- Port
- Amount of capture memory
- Output level change count
- Waveform pattern change count
- Measurement mode change count

The following command is used to check for errors.

```
SEQERR
:FETCh:CELLular:SEQuence:ERRor
SEQERR2
:FETCh:CELLular:SEQuence:ERRor2
```

Capture memory is used to save the TD-SCDMA measurement results. One TD-SCDMA measurement uses about 0.01% of the memory, so 1% of the capture memory is required to execute 100 measurements for a specific segment.
The following table shows error causes.

Table 3.2.3-1 Error Cause

Parameter	Cause
Input level*	Input level is out of range.
Output level*	Output level is out of range.
Step count	Fail to satisfy the step count conditions in Section 3.2.1.
Waveform pattern	The specified waveform file is not loaded in the waveform memory. The specified waveform pattern does not exist in the waveform file.
Port	Port 3 is set for both input port and output port. Or Port 4 is set for both input port and output port.
Amount of capture memory	Memory use rate is 100% or above
Output level change count	Output level change count is 3001 or above.
Waveform pattern change count	Waveform pattern change count is 101 or above.
Measurement mode change count	Measurement mode change count is 16 or above.

*: The available level depends on the settings of port number and external loss.

Changing the waveform pattern to CW or NC is not counted as waveform pattern change. Some examples of how to count waveform pattern change are shown below.

Parameter Setting Command	Waveform Pattern Change Count
`SEQTRX 0,1950.00,-10.00,869.20,-60.00,PAT1`	1
`SEQTRX 1,1950.00,-10.00,869.20,-60.00,CW`	1
`SEQTRX 2,1950.00,-10.00,869.20,-60.00,PAT2`	2
`SEQTRX 3,1950.00,-10.00,869.20,-60.00,NC`	2
`SEQTRX 4,1950.00,-10.00,869.20,-60.00,PAT3`	3
`SEQTRX 5,1950.00,-10.00,869.20,-60.00,PAT1`	4

3.3 Setting Measurement Conditions Table

3.3.1 Setting TD-SCDMA measurement items

The items in the TD-SCDMA measurement condition table supporting sequence measurement are listed below. Refer to Figure 3.1-1.

- Spectrum Emission Mask level*1
- Tx Power Measurement on/off and count*2
- Power Template measurement on/off and count*2
- Occupied Bandwidth measurement on/off and count*2
- Spectrum Emission Mask measurement on/off and count*2
- Adjacent Channel Leakage Power Ratio measurement on/off and count*2
- Modulation Analysis measurement on/off and count*2
- All measurement items Off*2

*1: The relative (template) and absolute (minimum threshold power) are set for each frequency offset.

*2: Up to 2000 measurement conditions numbered 0 to 1999 can be set.

3.3.2 TD-SCDMA measurement condition setting commands

The following commands set and query the TD-SCDMA measurement conditions.

- Spectrum Emission Mask level
  Relative value (Template)
  `TDSCDMA_SEM_TEMPLATE`
  `:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:TEMPlate`
  Absolute value (minimum threshold power)
  `TDSCDMA_SEM_LLIMIT`
  `:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:LIMit`

- Tx Power measurement on/off and count
  `TDSCDMA_PWR_SET`
  `:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET`

- Power Template measurement on/off and count
  `TDSCDMA_TEMPLATE_SET`
  `:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET`

- Occupied Bandwidth measurement on/off and count
  `TDSCDMA_OBW_SET`
  `:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET`

- Spectrum Emission Mask measurement on/off and count
  `TDSCDMA_SEM_SET`
  `:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET`

- Adjacent Channel Leakage Power Ratio measurement on/off and count
  `TDSCDMA_ACLR_SET`
  `:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET`

- Modulation Analysis measurement on/off and count
  `TDSCDMA_MOD_SET`
  `:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET`

- All measurement items Off
  `TDSCDMA_MEAS_OFF`
  `:CONFigure:CELLular:SEQuence:TDSCdma:AMITems:OFF`

3.4 Controlling and Monitoring Sequence

3.4.1 Controlling and monitoring items

The following items can be set to control sequence measurement.

- Start and stop segments
- Initialization after completion of sequence measurement

Start and stop segments

Segment numbers from 0 to 1999 can be set in the sequence table. The start and stop segments must be specified if part of a sequence table is executed. If they are not specified, 0 to 199 segments are measured.

Initialization after completion of sequence measurement

Select whether the following items are set to the values described in Section 2.1.3 “Frequency and level”, when sequence measurement is completed.

- Uplink frequency (mobile station Tx frequency)
- Input level
- Downlink frequency (mobile station Rx frequency)
- Output level

Use the commands described in Section 2.1.8 “Starting/stopping measurement” to verify the sequence measurement start, end and status .

In addition, the following items can be queried during sequence measurement.

- Number of measured segments
- Measurement status of each segment
- Measurement status of specified segments
- Progress of sequence measurement

Number of measured segments and measurement status of each segment

The number of completed segment measurements and the status of segments can be monitored during sequence measurement.

The following table lists the response values and status of segments.

Table 3.4.1-1 Segment Status

Response	Status
0	Measurement completed successfully
2	Over level
9	Measuring or no measurement
10	Segment not measured
12	Tx measurement timeout

Measurement status of specified segments

Monitor the status of segments by specifying segment numbers from 0 to 1999.

Progress of sequence measurement

The progress can be measured as a proportion of the total number of segments between the start and stop numbers.

3.4.2 Sequence control and monitor commands

The sequence measurement can be controlled and monitored using the following commands.
The status indication lamp 3 of MU887000A is on during the execution of measurement or analysis. For the explanation of the status lamp, refer to Appendix D "Status Indication of lamps" in *the MU887000A TRX Test Module Operation Manual*.

- Starting measurement and signal output
  This command sets the parameters for both specified measurement and signal transmission and executes measurement.
  `SNGLS`
  `:INITiate:CELLular:MEASurement:SINGle`
- Start segment and stop segment for measurement and signal transmission
  This command sets both start segment and end segment for sequence measurement and sets both measurement and signal transmission parameters.
  `SEQCTRL`
  `:CONFigure:CELLular:SEQuence:CONTrol`
- Start segment and stop segment for measurement
  This command sets both start segment and end segment for sequence measurement and sets the measurement parameters only, without affecting the signal transmission parameters.
  `SEQCTRLTX`
  `:CONFigure:CELLular:SEQuence:CONTrol:TX`
- Starting measurement
  This command sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.
  `SEQEXECTX`
  `:INITiate:CELLular:SEQuence:EXECute:TX`
- Stopping measurement
  `MEASSTOP`
  `:ABORt:CELLular:MEASurement`
- Initialization after completion of sequence measurement
  `SEQREINIT`
  `:CONFigure:CELLular:SEQuence:RFSettings:REINit`

The status of sequence measurement can be queried using the following commands.

- Progress ratio of sequence measurement
  `SEQPROGRESS`
  `:FETCh:CELLular:SEQuence:PROGress`
- Measurement status of specified segment
  `SEQSEGSTAT`
  `:FETCh:CELLular:SEQuence:SEG:STATe`
- Progress status of sequence measurement
  `SEQMSTAT`
  `:FETCh:CELLular:SEQuence:STATe`

3.5 Measurement Results

The TD-SCDMA measurement results are queried using the following commands.

Tx Power

- Tx Power
  `TDSCDMA_TXPWR`
  `:FETCh:CELLular:SEQuence:TDSCdma:POWer:TXPower`
- Filter power
  `TDSCDMA_FILTPWR`
  `:FETCh:CELLular:SEQuence:TDSCdma:POWer:FLTPower`

Power Template

- Off power (TS s–1)
  `TDSCDMA_OFFPWRM`
  `:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:MINus`
- Off power (TS s+1)
  `TDSCDMA_OFFPWRP`
  `:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:PLUS`
- –50 dBm
  `TDSCDMA_M50PWR`
  `:FETCh:CELLular:SEQuence:TDSCdma:POWer:M50Power`
- Template Judgement
  `TDSCDMA_PWR_TEMPLATE`
  `:FETCh:CELLular:SEQuence:TDSCdma:POWer:TEMPlate`

Occupied Bandwidth

- Occupied Bandwidth
  `TDSCDMA_OBW`
  `:FETCh:CELLular:SEQuence:TDSCdma:OBW`
- Occupied Bandwidth frequency
  `TDSCDMA_OBWFREQ`
  `:FETCh:CELLular:SEQuence:TDSCdma:OBW:FREQuency`

Spectrum Emission Mask

- Evaluation result
  `TDSCDMA_SEM`
  `:FETCh:CELLular:SEQuence:TDSCdma:SEMask:JUDGement`
- Max. level and frequency in each range
  Lower side of channel bandwidth
  `TDSCDMA_SEMLVL_LOWER`
  `:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:LOWer`
- Upper side of channel bandwidth
  `TDSCDMA_SEMLVL_UPPER`
  `:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:UPPer`

- Margin in each range
  Lower side of channel bandwidth
  TDSCDMA_SEMMARGIN_LOWER
  :FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:LOWer
  Upper side of channel bandwidth
  TDSCDMA_SEMMARGIN_UPPER
  :FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:UPPer

Adjacent Channel Leakage Power Ratio
  TDSCDMA_ACLR
  :FETCh:CELLular:SEQuence:TDSCdma:ACLR

Modulation Analysis

- Carrier frequency
  TDSCDMA_CFREQ
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:CFRequency
- Frequency error (ppm, Hz)
  TDSCDMA_CFERR
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor
- Frequency error worst value (ppm, Hz)
  TDSCDMA_CFERR_WORST
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor:WORSt
- EVM
  TDSCDMA_EVM
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:EVM
- Peak EVM
  TDSCDMA_PEVM
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:PEVM
- Phase Error
  TDSCDMA_PHASEERR
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:PHERror
- Magnitude Error
  TDSCDMA_MAGERR
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:MERRor
- Origin Offset
  TDSCDMA_ORGNOFS
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:ORGNoffset
- IQ Imbalance
  TDSCDMA_IQIMB
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:IQIMbalance
- Rho
  TDSCDMA_RHO
  :FETCh:CELLular:SEQuence:TDSCdma:MODulation:RHO

3.6 Sample Program

This section describes an example of sequence measurement using the Native command mode.

Processing Flow

1. Set the vector signal generator mode to NORMAL.
2. Load the Tx signal pattern file (MV887017A_TDSCDMA_0002) into memory.
3. Set the application type to CELLULAR.
4. Set the measurement to sequence measurement.
5. Specify MV887017A_TDSCDMA_0002 as the pattern file to use for modulating the Tx signal.
6. Set measurement conditions listed in Table 3.6-1 and Table 3.6-2.
7. Set the following items:

RF Signal output	On
Start segment number	0
Stop segment number	1
Initialization after sequence measurement	On

8. Query the sequence table for errors and abort if errors found.
9. Set the vector signal generator mode to SEQUENCE.
10. Start measurement.
11. Query the status of measurements.
12. When measurement is completed, query:

    Tx Power and Occupied Bandwidth at segment 0
    Spectrum Emission Mask, Adjacent Channel Leakage Power Ratio, Modulation Analysis, and Phase Discontinuity at segment 1

Table 3.6-1 Sequence Table Settings 1

Segment number	0	1	2	....
Uplink frequency (MHz)	1920	1940		
Input level (dBm)	0	0		
Downlink frequency (MHz)	2110	2130		
Output level (dBm)	–50	–55		
Downlink signal pattern	PAT1	PAT2		
Output port	1	2		
Trigger source	Free run	Free run		
Trigger slope	Rise	Rise		
Trigger level	–20	–25		
Trigger delay time (ms)	0	0		

Table 3.6-2 Sequence Table Settings 2

Segment number	0	1	2	....
Measurement item	TDSCDMA	TDSCDMA		
Step count	250	250		
Measurement condition number	0	1		

Table 3.6-3 TD-SCDMA Measurement Condition Settings

Item		Setting			
Spectrum Emission Mask Level	Range 1	–33.5			
	Range 2	–47.5			
	Range 3	–57.7			
	Range 4	–42.5			
	Min. power	–53.5			
Measurement condition number		0	1	2	…
Tx power measurement		ON	OFF		
Tx power measurement count		100	10		
Power Template measurement		ON	OFF		
Power Template measurement count		50	10		
Occupied Bandwidth measurement		ON	OFF		
Occupied Bandwidth measurement count		50	5		
SEM Measurement		OFF	ON		
SEM Measurement count		100	10		
ACLR Measurement		OFF	ON		
ACLR Measurement count		100	10		
Modulation Analysis measurement		OFF	ON		
Modulation Analysis measurement count		200	20		

```
; Sample program for TDSCDMA Sequence Measurement
; Anritsu Corporation March,2012
; Macro for Tera Term Version 4.69
;
; set local echo to on
setecho 1
flushrecv
; time out 10 second
timeout=10

; Set language to "Native".
sendln 'SYST:LANG NAT'
call check_error_code

; Set VSG Mode to "Normal".
sendln 'SOUR:GPRF:GEN:MODE NORMAL'
call check_error_code

; Load ARB File "MV887017A_TDSCDMA_0002".
sendln 'SOUR:GPRF:GEN:ARB:FILE:LOAD "MV887017A_TDSCDMA_0002"'
call check_error_code

; waiting load waveform file.
sendln '*WAI'
call check_error_code

; Set application type to "Cellular".
sendln 'SYSSEL CELLULAR'
call check_error_code

; Set standard to "Sequence".
sendln 'STDSEL SEQUENCE'
call check_error_code

; Set download package to "MV887017A_TDSCDMA_0002".
sendln 'PACKAGE "MV887017A_TDSCDMA_0002"'
call check_error_code

; Set Sequence Table Parameters of "segment 0".
sendln ' SEQTRX 0,1920,0,2110,-50,PAT1'
call check_error_code

sendln 'SEQSGPORT 0,PORT1'
```

```
call check_error_code

sendln 'SEQTRG 0,FREERUN,RISE,-20,0'
call check_error_code

sendln 'SEQMEAS 0,TDSCDMA,250,0'
call check_error_code

; Set Sequence Table Parameters of "segment 1".
sendln ' SEQTRX 1,1940,0,2130,-55,PAT2'
call check_error_code

sendln 'SEQSGPORT 1,PORT2'
call check_error_code

sendln 'SEQTRG 1,FREERUN,RISE,-25,0'
call check_error_code

sendln 'SEQMEAS 1,TDSCDMA,250,1'
call check_error_code

; Set Measurement Condition of "TD-SCDMA".
sendln 'TDSCDMA_SEM_TEMPLATE 1,-33.5'
call check_error_code

sendln 'TDSCDMA_SEM_TEMPLATE 2,-47.5'
call check_error_code

sendln 'TDSCDMA_SEM_TEMPLATE 3,-57.7'
call check_error_code

sendln 'TDSCDMA_SEM_TEMPLATE 4,-42.5'
call check_error_code

sendln 'TDSCDMA_SEM_LLIMIT -53.5'
call check_error_code

sendln 'TDSCDMA_PWR_SET 0,ON,100'
call check_error_code

sendln 'TDSCDMA_PWR_SET 1,OFF,10'
call check_error_code

sendln 'TDSCDMA_TEMPLATE_SET 0,ON,100'
```

```
call check_error_code

sendln 'TDSCDMA_TEMPLATE_SET 1,OFF,50'
call check_error_code

sendln 'TDSCDMA_OBW_SET 0,ON,50'
call check_error_code

sendln 'TDSCDMA_OBW_SET 1,OFF,5'
call check_error_code

sendln 'TDSCDMA_SEM_SET 0,OFF,100'
call check_error_code

sendln 'TDSCDMA_SEM_SET 1,ON,10'
call check_error_code

sendln 'TDSCDMA_ACLR_SET 0,OFF,100'
call check_error_code

sendln 'TDSCDMA_ACLR_SET 1,ON,10'
call check_error_code

sendln 'TDSCDMA_MOD_SET 0,OFF,200'
call check_error_code

sendln 'TDSCDMA_MOD_SET 1,ON,20'
call check_error_code

; Set Output State to "On".
sendln 'LVL ON'
call check_error_code

; Set Start Segment Number to "0",Stop Segment Number to "1".
sendln 'SEQCTRL 0,1'
call check_error_code

; Query error of Sequence table settings.
sendln 'SEQERR?'
  waitln '0,' '1,' '2,' '3,' '4,'
call check_seqerr_response

; Set Initialization to "On" when sequence finished.
sendln 'SEQREINIT ON'
```

```
call check_error_code

; Set VSG Mode to "Sequence".
sendln 'SOUR:GPRF:GEN:MODE SEQUENCE'
call check_error_code

; Start measurement
sendln 'SNGLS'
call check_error_code

; waiting measurement up to 10 second
for i 1 10

  sendln 'MSTAT?'
  pause 1; wait 1 second
  recvln
  recvln
  ;call check_response ; debug
  if result=0 goto _timeout
  if result=1 then
         str2int m_code inputstr
         if m_code=0 break    ;Sequence finish normally.
         call check_error_code
  endif

next

; Query Tx power data of "Segment 0".
sendln 'TDSCDMA_TXPWR? 0,IND'
call check_error_code

; Query Filtered power data of "Segment 0".
sendln 'TDSCDMA_FILTPWR? 0,IND'
call check_error_code

; Query Power Template data of "Segment 0".
sendln 'TDSCDMA_OFFPWRM? 0,AVG'
call check_error_code
sendln 'TDSCDMA_OFFPWRP? 0,AVG'
call check_error_code
sendln 'TDSCDMA_M50PWR? 0,AVG'
call check_error_code
sendln 'TDSCDMA_PWR_TEMPLATE? 0'
call check_error_code
```

```
; Query Occupied Bandwidth of "Segment 0"
sendln 'TDSCDMA_OBW? 0'
call check_error_code

; Query Occupied Bandwidth Frequency of "Segment 0"
sendln 'TDSCDMA_OBWFREQ? 0,UPPER'
call check_error_code
sendln 'TDSCDMA_OBWFREQ? 0,LOWER'
call check_error_code
sendln 'TDSCDMA_OBWFREQ? 0,CENTER'
call check_error_code

; Query Spectrum Emission Mask data of "Segment 1"
sendln 'TDSCDMA_SEM? 1'
call check_error_code
sendln 'TDSCDMA_SEMLVL_LOWER? 1'
call check_error_code
sendln 'TDSCDMA_SEMLVL_UPPER? 1'
call check_error_code
sendln 'TDSCDMA_SEMMARGIN_LOWER? 1'
call check_error_code
sendln 'TDSCDMA_SEMMARGIN_UPPER? 1'
call check_error_code

; Query ACLR data of "Segment 1"
sendln 'TDSCDMA_ACLR? 1,TTL'
call check_error_code

; Query Frequency Error data of "Segment 1".
sendln 'TDSCDMA_CFREQ? 1'
call check_error_code
sendln 'TDSCDMA_CFERR_WORST? 1'
call check_error_code

; Query EVM data of "Segment 1".
sendln 'TDSCDMA_EVM? 1,MAX'
call check_error_code
sendln 'TDSCDMA_PEVM? 1,MAX'
call check_error_code
sendln 'TDSCDMA_PHASEERR? 1,MAX'
call check_error_code
sendln 'TDSCDMA_MAGERR? 1,MAX'
call check_error_code
```

```
; Query Original Offset of "Segment 1".
sendln 'TDSCDMA_ORGNOFS? 1,MAX'
call check_error_code

; Query IQ Imbalance of "Segment 1".
sendln 'TDSCDMA_IQIMB? 1,TTL'
call check_error_code

messagebox  'Macro end successfully' 'Finish'

End

;       ------------ subroutines -----------
:check_error_code
  ; query error
  sendln 'SYSERR?'
  waitln 'No error'

  ; in case of timeout
  if result=0 goto _timeout
  ; in case of error occurring
  if result=2 then
         e_message='Error code = '
         strconcat e_message inputstr
         messagebox  e_message 'Command Error occurred'
         end
  endif

  ; in case of no error

return

:check_seqerr_response

  ;for debug
  strsplit inputstr ','
  err_num=str2int groupmatchstr1
  if err_num then
         ; when error count is not 0.
         messagebox inputstr 'Sequence Table Error'
         End
  endif
```

```
  return

:check_response

  ;for debug
  messagebox inputstr 'debug1'
  int2str result_str result
  messagebox result_str 'debug2'

  return

:_timeout
  messagebox  'No response from MT8870A.' 'Time out!'
  call check_error_code
  End
```

Chapter 4 SCPI Command Reference

This chapter describes the details of SCPI commands.
To switch to the SCPI command mode, send the command SYST:LANG SCPI.

4.1 List of Commands

The following table shows the rules for describing messages.

[ ]	Messages or parameters in square brackets can be omitted.
|	Choose one of several choices. A|B|C|D indicates a choice of A, B, C, and D.
{}	Choose one of the groups in braces. A|B({C|D}) indicates a choice of A, B(C), or A, B(D).

4.1.1 Common commands

Operation Status Register

Function	Command	Query	Response
Measurement Operation Status Register Query	-----	:STATus:OPERation:MEASure[:EVENt]?	<mosr>

Questionable Register

Function	Command	Query	Response
Measurement Questionable Status Register Query	-----	:STATus:QUEStionable:MEASure[:EVENt]?	<mqsr>

Common

Function	Command	Query	Response
Standard Select	:CONFigure:CELLular:MEASurement:STANdard <std>	:CONFigure:CELLular:MEASurement:STANdard?	<std>
Set Connect Port Direction	:ROUTe:PORT:CONNect:DIRection <input>,<output>	:ROUTe:PORT:CONNect:DIRection?	<input>,<output>

Measurements

Function	Command	Query	Response
Measurement Stop	:ABORt:CELLular:MEASurement	-----	-----
Measurement Status	-----	:FETCh:CELLular:MEASurement:STATe?	<m_status>
Measurement Start	:INITiate:CELLular:MEASurement:SINGle	-----	-----

Common Parameters

Function	Command	Query	Response
Output Level On/Off	:CONFigure:CELLular:GENerator:RFSettings:STATe <on_off>	:CONFigure:CELLular:GENerator:RFSettings:STATe?	<on_off>
Output Signal Modulation	:CONFigure:CELLular:GENerator:BBMode <on_off>	:CONFigure:CELLular:GENerator:BBMode?	<on_off>
Waveform File Select	:CONFigure:CELLular:GENerator:ARB:PACKage:SELect <pac>	:CONFigure:CELLular:GENerator:ARB:PACKage:SELect?	<pac>
Waveform Pattern Select	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect <pat>	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect?	<pat>
Waveform Pattern Select (SYNC)	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC <pat>	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC?	<pat>

System

Function	Command	Query	Response
Application Select	:INSTrument[:SELect] <app>	:INSTrument[:SELect]?	<app>
Language Selection of Remote Command	:SYSTem:LANGuage <mode>	:SYSTem:LANGuage?	<mode>

4.1.2 Fundamental measurement commands

Common Parameters

Function	Command	Query	Response
Input Level	:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>	:CONFigure:CELLular:MEASurement:RFSettings:LEVel?	<level>
Output Level	:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>	:CONFigure:CELLular:GENerator:RFSettings:LEVel?	<level>
Channel	:CONFigure:CELLular:MEASurement:RFSettings:CHANnel <ch>	:CONFigure:CELLular:MEASurement:RFSettings:CHANnel?	<ch>
Downlink Frequency	:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>	:CONFigure:CELLular:GENerator:RFSettings:FREQuency?	<dl_freq>
Uplink Frequency	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?	<ul_freq>
Measurement Select	:CONFigure:CELLular:MEASurement:SELect <meassel>	:CONFigure:CELLular:MEASurement:SELect?	<meassel>
Trigger Source	:TRIGger:CELLular:TDSCdma:FUNDamental:SOURce <source>	:TRIGger:CELLular:TDSCdma:FUNDamental:SOURce?	<source>
Trigger Level	:TRIGger:CELLular:TDSCdma:FUNDamental:LEVel <level>	:TRIGger:CELLular:TDSCdma:FUNDamental:LEVel?	<level>
Trigger Timeout	:TRIGger:CELLular:TDSCdma:FUNDamental:TOUT <time>	:TRIGger:CELLular:TDSCdma:FUNDamental:TOUT?	<time>

Fundamental Measurement Parameters

Function	Command	Query	Response
Turn Off All Measurement Items	:CONFigure:CELLular:TDSCdma :FUNDamental:AMITems:OFF	-----	-----
Uplink DPCH Timeslot	:CONFigure:CELLular:TDSCdma :FUNDamental:UDPChslot <slot>	:CONFigure:CELLular:TDSCdma :FUNDamental:UDPChslot?	<slot>
Midamble Configuration	:CONFigure:CELLular:TDSCdma :FUNDamental:MIDamble:CONFiguration <number>	:CONFigure:CELLular:TDSCdma :FUNDamental:MIDamble:CONFiguration?	<number>
Uplink DPCH Channelisation Code (Single Code)	:CONFigure:CELLular:TDSCdma :FUNDamental:DPCH:SINGle <code>	:CONFigure:CELLular:TDSCdma :FUNDamental:DPCH:SINGle?	<code>
Uplink DPCH Channelisation Code (Multi Code_Code1)	:CONFigure:CELLular:TDSCdma :FUNDamental:DPCH:MULTi1 <code>	:CONFigure:CELLular:TDSCdma :FUNDamental:DPCH:MULTi1?	<code>
Uplink DPCH Channelisation Code (Multi Code_Code2)	:CONFigure:CELLular:TDSCdma :FUNDamental:DPCH:MULTi2 <code>	:CONFigure:CELLular:TDSCdma :FUNDamental:DPCH:MULTi2?	<code>
Measurement Trigger	:CONFigure:CELLular:TDSCdma :FUNDamental:MEASurement:TRIGger <trigger>	:CONFigure:CELLular:TDSCdma :FUNDamental:MEASurement:TRIGger?	<trigger>
E-PUCH Measurement Slot	:CONFigure:CELLular:TDSCdma :FUNDamental:EPUCH:SLOT <slot>	:CONFigure:CELLular:TDSCdma :FUNDamental:EPUCH:SLOT?	<slot>
Spectrum Emission Mask - Mask Template Lower Limit	:CONFigure:CELLular:TDSCdma :FUNDamental:SEMask:LIMit <level>	:CONFigure:CELLular:TDSCdma :FUNDamental:SEMask:LIMit?	<level>
Spectrum Emission Mask - Mask Template	:CONFigure:CELLular:TDSCdma :FUNDamental:SEMask:TEMPlate <offset>,<level>	:CONFigure:CELLular:TDSCdma :FUNDamental:SEMask:TEMPlate? <offset>	<level>

Fundamental Measurement Parameters (Cont'd)

Function	Command	Query	Response
Scrambling Code Number	:CONFigure:CELLular:TDSCdma :SCODe <code>	:CONFigure:CELLular:TDSCdma :SCODe?	<code>
Uplink Configuration	:CONFigure:CELLular:TDSCdma :ULConfig <ulconf>	:CONFigure:CELLular:TDSCdma :ULConfig?	<ulconf>
ACLR Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:ACLR:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:ACLR:SET?	<on_off>,<count>
Modulation Analysis Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:MODulation:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:MODulation:SET ?	<on_off>,<count>
OBW Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:OBW:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:OBW:SET?	<on_off>,<count>
Peak Code Domain Error Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:PCDE:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:PCDE:SET?	<on_off>,<count>
Tx Power Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:POWer:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:POWer:SET?	<on_off>,<count>
Power Template Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:TEMPlate:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:TEMPlate:SET?	<on_off>,<count>
SEM Measurement Enable and Count	:CONFigure:CELLular:TDSCdma :FUNDamental:SEMask:SET <on_off>[,<count>]	:CONFigure:CELLular:TDSCdma :FUNDamental:SEMask:SET?	<on_off>,<count>
Bit Error Rate	:CONFigure:CELLular:TDSCdma:F UNDamental:BERate:MEASurement <on_off>	:CONFigure:CELLular:TDSCdma:F UNDamental:BERate:MEASurement ?	<on_off>

Fundamental Measurement Parameters (Cont'd)

Function	Command	Query	Response
Bit Error Rate - Number of Sample	:CONFigure:CELLular:TDSCdma :FUNDamental:BERate:SAMPle <number>	:CONFigure:CELLular:TDSCdma :FUNDamental:BERate:SAMPle?	<number>
Bit Error Rate - Upper Limit	:CONFigure:CELLular:TDSCdma :FUNDamental:BERate:LIMit <ratio>	:CONFigure:CELLular:TDSCdma :FUNDamental:BERate:LIMit?	<ratio>
Block Error Rate	:CONFigure:CELLular:TDSCdma:FU NDamental:BLERate:MEASurement <on_off>	:CONFigure:CELLular:TDSCdma:FU NDamental:BLERate:MEASurement?	<on_off>
Block Error Rate - Number of Sample	:CONFigure:CELLular:TDSCdma :FUNDamental:BLERate:SAMPle <number>	:CONFigure:CELLular:TDSCdma :FUNDamental:BLERate:SAMPle ?	<number>
DTCH Data Pattern	:CONFigure:CELLular:TDSCdma :FUNDamental:DTCH:PATTern <pattern>	:CONFigure:CELLular:TDSCdma :FUNDamental:DTCH:PATTern?	<pattern>
TFCI Detect Mode	:CONFigure:CELLular:TDSCdma :FUNDamental:BERate:TFCI <mode>	:CONFigure:CELLular:TDSCdma :FUNDamental:BERate:TFCI?	<mode>
Closed Loop Power Control Measurement - Method	:CONFigure:CELLular:TDSCdma :FUNDamental:CLPC:MEASureme nt <method>	:CONFigure:CELLular:TDSCdma :FUNDamental:CLPC:MEASureme nt?	<method>
Closed Loop Power Control Measurement - Filter	:CONFigure:CELLular:TDSCdma :FUNDamental:CLPC:FILTer <type>	:CONFigure:CELLular:TDSCdma :FUNDamental:CLPC:FILTer?	<type>
Measurement Object	:CONFigure:CELLular:TDSCdma :FUNDamental:MOBJect <measobj>	:CONFigure:CELLular:TDSCdma :FUNDamental:MOBJect?	<measobj>

Power Template Results

Function	Command	Query	Response
Result of Power Template Measurement Off power (TS s-1)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:MINus? <mode>	{<avg>,<max>,<min>}|<pwr>
Result of Power Template Measurement Off Power(TS s+1)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:PLUS? <mode>	{<avg>,<max>,<min>}|<pwr>
Result of Power Template Measurement –50dBm	-----	:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:M50Power? <mode>	{<avg>,<max>,<min>}|<pwr>
Result of Power Template Measurement Template Judgement	-----	:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:JUDGement?	<judgement>

Peak Code Domain Error Measurement Results

Function	Command	Query	Response
Result of Peak Code Domain Error	-----	:FETCh:CELLular:TDSCdma:FUNDamental:PCDE? <mode>	{<avg>,<max>,<min>}|<pcde>

Bit Error Rate Results

Function	Command	Query	Response
Bit Error Rate	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BERate:ERATe? [<format>]	<rate>
Bit Error Rate - Error Counts	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BERate:ECOunt?	<number>
Bit Error Rate - Transmitted bits	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BERate:TBIT?	<number>
Bit Error Rate - Judgement	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BERate:JUDGement?	<judgement>
Block Error Rate	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ERATe? [<format>]	<rate>
Block Error Rate - Error Counts	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ECOunt?	<number>
Block Error Rate - Transmitted bits	-----	:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:TBIT?	<number>

Closed Loop Power Control Results

Function	Command	Query	Response
CLPC Measurement - Judgement	-----	:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:JUDGement? <step>	<judgement>
CLPC Measurement – Slot Level	-----	:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer? <step>[,<slot>]	<l[0]>,<l[1]>,..,<l[max_slot_number]>
CLPC Measurement – Power(dB)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer:DB? <step>[,<slot>]	<l[0]>,<l[1]>,..,<l[max_slot_number-1]>
CLPC Measurement – Maximum Power	-----	:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MAXimum:POWer?	<power>
CLPC Measurement – Minimum Power	-----	:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MINimum:POWer?	<power>

Results

Function	Command	Query	Response
Result of Adjacent Channel Leakage Power Ratio	-----	:FETCh:CELLular:TDSCdma:FUNDamental:ACLR? <mode>	{<avg0>,<avg1>,<avg2>,<avg3>,<max0>,<max1>,<max2>,<max3>,<min0>,<min1>,<min2>,<min3>}|{<aclr0>,<aclr1>,<aclr2>,<aclr3>}
Result of Filtered Power Measurement	-----	:FETCh:CELLular:TDSCdma:FUNDamental:POWer:FLTPower? <mode>	{<avg>,<max>,<min>}|<pwr>|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>}
Result of Occupied Bandwidth	-----	:FETCh:CELLular:TDSCdma:FUNDamental:OBW?	<bw>
Result of Occupied Bandwidth Frequency	-----	:FETCh:CELLular:TDSCdma:FUNDamental:OBW:FREQuency? <pos>	<freq>
Judgement of Spectrum Emission Mask	-----	:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:JUDGement?	<judgement>

Results (Cont'd)

Function	Command	Query	Response
Result of Spectrum Emission Mask (Lower)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:LOWer?	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Result of Spectrum Emission Mask (Upper)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:UPPer?	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Margin of Spectrum Emission Mask (Lower)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:LOWer?	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Margin of Spectrum Emission Mask (Upper)	-----	:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:UPPer?	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Result of Tx Power Measurement	-----	:FETCh:CELLular:TDSCdma:FUNDamental:POWer:TXPower? <mode>	{<avg>,<max>,<min>}|<pwr>|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>}
Waveform Data	-----	:FETCh:CELLular:TDSCdma:FUNDamental:TRACe? <format>,<position>,<length>	<data(0)>,<data(1)>,…,<data(length-1)>

Result of Modulation Analysis Measurements

<table>
<tr><th>Function</th><th>Command</th><th>Query</th><th>Response</th></tr>
<tr><td>Carrier Frequency Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:CFRequency?</td><td><freq></td></tr>
<tr><td>Carrier Frequency Error Result of Modulation Analysis (Worst)</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor:WORSt?</td><td><freq_ppm>,<freq_Hz></td></tr>
<tr><td>Carrier Frequency Error Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor? <mode></td><td>{<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>}|{<freq_ppm>,<freq_Hz>}</td></tr>
<tr><td>EVM Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:EVM? <mode></td><td>{<avg>,<max>,<min>}|<evm></td></tr>
<tr><td>IQ Imbalance Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:IQIMbalance? <mode></td><td>{<avg>,<max>,<min>}|<iqimb></td></tr>
<tr><td>Magnitude Error Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:MERRor? <mode></td><td>{<avg>,<max>,<min>}|<merr></td></tr>
<tr><td>Origin Offset Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:ORGNoffset? <mode></td><td>{<avg>,<max>,<min>}|<orgnoffs></td></tr>
<tr><td>Peak EVM Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PEVM? <mode></td><td>{<avg>,<max>,<min>}|<pevm></td></tr>
<tr><td>Phase Error Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PHERror? <mode></td><td>{<avg>,<max>,<min>}|<perr></td></tr>
</table>

Result of Modulation Analysis Measurements (Cont'd)

Function	Command	Query	Response
Rho	-----	:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:RHO? <mode>	{<avg>,<max>,<min>}|<rho>

4.1.3 Sequence measurement commands

Common Parameters

Function	Command	Query	Response
Uplink Frequency	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>	:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?	<ul_freq>
Input Level	:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>	:CONFigure:CELLular:MEASurement:RFSettings:LEVel?	<level>
Downlink Frequency	:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>	:CONFigure:CELLular:GENerator:RFSettings:FREQuency?	<dl_freq>
Output Level	:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>	:CONFigure:CELLular:GENerator:RFSettings:LEVel?	<level>

Sequence Measurements

Function	Command	Query	Response
Sequence Measurement Status	-----	:FETCh:CELLular:SEQuence:STATe?	<m_status>,<n>,<s(n-1)>
Sequence Progress	-----	:FETCh:CELLular:SEQuence:PROGress?	<p>,<cur>,<start>,<stop>
Specified Segment Status	-----	:FETCh:CELLular:SEQuence:SEG:STATe? <seg>	<stat>
Trigger Timeout	:TRIGger:CELLular:MEASurement:TOUT <time>	:TRIGger:CELLular:MEASurement:TOUT?	<time>

Sequence Control Parameters

Function	Command	Query	Response
Sequence Control Parameter - Sequence Control	:CONFigure:CELLular:SEQuence:CONTrol <start>,<end>	:CONFigure:CELLular:SEQuence:CONTrol?	<start>,<end>
Sequence Control Parameter - Sequence Control	:CONFigure:CELLular:SEQuence:CONTrol:TX <start>,<end>	:CONFigure:CELLular:SEQuence:CONTrol:TX?	<start>,<end>
Sequence Control Parameter - Sequence End State Reinitialization	:CONFigure:CELLular:SEQuence:RFSettings:REINit <sw>	:CONFigure:CELLular:SEQuence:RFSettings:REINit?	<sw>
Sequence Control Parameter - Sequence Table	:CONFigure:CELLular:SEQuence:TABLe <table>	:CONFigure:CELLular:SEQuence:TABLe?	<table>
Start Signal Analyzer Measurement Only	:INITiate:CELLular:SEQuence:EXECute:TX	-----	-----

Sequence Parameter Information

Function	Command	Query	Response
Sequence Parameter Information - Error Check	-----	:FETCh:CELLular:SEQuence:ERRor? [<item>]	<n>,<err(n-1)>,<ns>,<seg(ns-1)>,<e>,<mem>,<exe>,<set>
Sequence Parameter Information - Error Check	-----	:FETCh:CELLular:SEQuence:ERRor2? <format>	<n>,<err(n-1)>

Sequence Table Parameters

Function	Command	Query	Response
Sequence Table Parameter - TRX Control	:CONFigure:CELLular:SEQuence:RFSettings:TRX <seg>,<ul_freq>,<ref>,<dl_freq>,<level>,<pat>	:CONFigure:CELLular:SEQuence:RFSettings:TRX? <seg>	<ul_freq>,<ref>,<dl_freq>,<level>,<pat>
Sequence Table Parameter - Uplink Frequency, Input Level	:CONFigure:CELLular:SEQuence:RFSettings:TX <seg>,<ul_freq>,<ref>	:CONFigure:CELLular:SEQuence:RFSettings:TX? <seg>	<ul_freq>,<ref>
Sequence Table Parameter - SG Output Port	:CONFigure:CELLular:SEQuence:RXPort <seg>,<port>	:CONFigure:CELLular:SEQuence:RXPort? <seg>	<port>
Sequence Table Parameter - Measurement	:CONFigure:CELLular:SEQuence:SETup <seg>,<mode>,<step>,<mcond>	:CONFigure:CELLular:SEQuence:SETup? <seg>	<mode>,<step>,<mcond>
Sequence Table Parameter - Trigger	:TRIGger:CELLular:SEQuence <seg>,<src>,<slope>,<level>,<delay>	:TRIGger:CELLular:SEQuence? <seg>	<src>,<slope>,<level>,<delay>

Measurement Parameters

Function	Command	Query	Response
ACLR Measurement Enable and Count	:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET <mcond>,<on_off>[,<count>]	:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET? <mcond>	<on_off>,<count>
Turn Off All Measurement Items	:CONFigure:CELLular:SEQuence:TDSCdma:AMITems:OFF <mcond>	-----	-----
Modulation Analysis Measurement Enable and Count	:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET <mcond>,<on_off>[,<count>]	:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET? <mcond>	<on_off>,<count>

Measurement Parameters (Cont'd)

Function	Command	Query	Response
OBW Measurement Enable and Count	:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET <mcond>,<on_off>[,<count>]	:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET? <mcond>	<on_off>,<count>
Tx Power Measurement Enable and Count	:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET <mcond>,<on_off>[,<count>]	:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET? <mcond>	<on_off>,<count>
Spectrum Emission Mask - Mask Template Lower Limit	:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:LIMit <level>	:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:LIMit?	<level>
SEM Measurement Enable and Count	:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET <mcond>,<on_off>[,<count>]	:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET? <mcond>	<on_off>,<count>
Spectrum Emission Mask - Mask Template	:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:TEMPlate <offset>,<level>	:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:TEMPlate? <offset>	<level>
Power Template Measurement Enable and Count	:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET <mcond>, <on_off>[,<count>]	:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET? <mcond>	<on_off>,<count>

Power Template Results

<table>
<tr><th>Function</th><th>Command</th><th>Query</th><th>Response</th></tr>
<tr><td>Result of Power Template Measurement Off power (TS s-1)</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:MINus? <seg>,<mode></td><td>{<avg>,<max>,<min>}|<pwr></td></tr>
<tr><td>Result of Power Template Measurement Off Power(TS s+1)</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:PLUS? <seg>,<mode></td><td>{<avg>,<max>,<min>}|<pwr></td></tr>
<tr><td>Result of Power Template Measurement –50dBm</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:POWer:M50Power? <seg>,<mode></td><td>{<avg>,<max>,<min>}|<pwr></td></tr>
<tr><td>Result of Power Template Measurement Template Judgement</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:POWer:TEMPlate? <seg></td><td><judgement></td></tr>
</table>

Modulation Analysis Measurement Results

<table>
<tr><th>Function</th><th>Command</th><th>Query</th><th>Response</th></tr>
<tr><td>Carrier Frequency Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:MODulation:CFRequency? <seg></td><td><freq></td></tr>
<tr><td>Carrier Frequency Error Result of Modulation Analysis (Worst)</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor:WORSt? <seg></td><td><freq_ppm>,<freq_Hz></td></tr>
<tr><td>Carrier Frequency Error Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor? <seg>,<mode></td><td>{<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>}|{<freq_ppm>,<freq_Hz>}</td></tr>
<tr><td>EVM Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:MODulation:EVM? <seg>,<mode></td><td>{<avg>,<max>,<min>}|<evm></td></tr>
</table>

Modulation Analysis Measurement Results (Cont'd)

Function	Command	Query	Response
IQ Imbalance Result of Modulation Analysis	-----	:FETCh:CELLular:SEQuence:TDSCdma:MODulation:IQIMbalance? <seg>,<mode>	{<avg>,<max>,<min>}|<iqimb>
Magnitude Error Result of Modulation Analysis	-----	:FETCh:CELLular:SEQuence:TDSCdma:MODulation:MERRor? <seg>,<mode>	{<avg>,<max>,<min>}|<merr>
Origin Offset Result of Modulation Analysis	-----	:FETCh:CELLular:SEQuence:TDSCdma:MODulation:ORGNoffset? <seg>,<mode>	{<avg>,<max>,<min>}|<orgnoffs>
Peak EVM Result of Modulation Analysis	-----	:FETCh:CELLular:SEQuence:TDSCdma:MODulation:PEVM? <seg>,<mode>	{<avg>,<max>,<min>}|<pevm>
Phase Error Result of Modulation Analysis	-----	:FETCh:CELLular:SEQuence:TDSCdma:MODulation:PHERror? <seg>,<mode>	{<avg>,<max>,<min>}|<perr>

Results

<table>
<tr><th>Function</th><th>Command</th><th>Query</th><th>Response</th></tr>
<tr><td>Rho Result of Modulation Analysis</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:MODulation:RHO? <seg>,<mode></td><td>{<avg>,<max>,<min>}|<rho></td></tr>
<tr><td>Result of Adjacent Channel Leakage Power Ratio</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:ACLR? <seg>,<mode></td><td>{<avg0>,<avg1>,<avg2>,<avg3>,<max0>,<max1>,<max2>,<max3>,<min0>,<min1>,<min2>,<min3>}|{<aclr0>,<aclr1>,<aclr2>,<aclr3>}</td></tr>
<tr><td>Result of Filtered Power Measurement</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:POWer:FLTPower? <seg>,<mode></td><td>{<avg>,<max>,<min>}|<pwr>|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>}</td></tr>
<tr><td>Result of Occupied Bandwidth</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:OBW? <seg></td><td><bw></td></tr>
<tr><td>Result of Occupied Bandwidth Frequency</td><td>-----</td><td>:FETCh:CELLular:SEQuence:TDSCdma:OBW:FREQuency? <seg>,<pos></td><td><freq></td></tr>
</table>

Results (Cont'd)

Function	Command	Query	Response
Judgement of Spectrum Emission Mask	-----	:FETCh:CELLular:SEQuence:TDSCdma:SEMask:JUDGement? <seg>	<judgement>
Result of Spectrum Emission Mask (Lower)	-----	:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:LOWer? <seg>	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Result of Spectrum Emission Mask (Upper)	-----	:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:UPPer? <seg>	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Margin of Spectrum Emission Mask (Lower)	-----	:FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:LOWer? <seg>	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Margin of Spectrum Emission Mask (Upper)	-----	:FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:UPPer? <seg>	<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>
Result of Tx Power Measurement	-----	:FETCh:CELLular:SEQuence:TDSCdma:POWer:TXPower? <seg>,<mode>	{<avg>,<max>,<min>}|<pwr>|{<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>}

4.2 Details of Commands

This section describes commands in alphabetic order.

■ Terms in this command list

EX .... Command name (header)

Example .... Command function name

Function .... Command function

Command.................................. Programming command syntax

Query .... Query syntax

Response .... Response syntax

Parameter .... Parameter definition

Details .... Command restrictions and others

Example of Use................................. Command usage example

Related Commands ....Introduction of related commands

■ Suffix code list

Suffix code	Unit	Suffix code	Unit
DB	dB	MHZ	MHz
DBM	dBm	MS	ms
GHZ	GHz	MZ	MHz
GZ	GHz	NS	ns
HZ	Hz	S	s
KHZ	kHz	US	μs
KZ	kHz		

4.2.1 Common commands

:ABORt:CELLular:MEASurement

Measurement Stop

Function

Stops current measurement

Command

```
:ABORt:CELLular:MEASurement
```

Example of Use

To stop measurement:

:ABOR:CELL:MEAS

:CONFigure:CELLular:GENerator:ARB:PACKage:SELect

Waveform File Select

Function

Selects or queries waveform file for arbitrary waveform signal used at downlink signal.

Command

```
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect <pac>
```

Query

```
:CONFigure:CELLular:GENerator:ARB:PACKage:SELect?
```

Response

<pac>

Parameter

<pac>	Waveform file

Details

The name of the file used from the waveform files loaded into waveform memory is set by this command.

Example of Use

To set the waveform file 1 from the waveform files loaded in memory:
:CONF:CELL:GEN:ARB:PACK:SEL “PAC1”
:CONF:CELL:GEN:ARB:PACK:SEL?
> PAC1

Related Command

Use the following command to load the waveform file into waveform memory.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
For details of the command, refer to Chapter 5 "SCPI Command Reference" in the “MU887000A TRX Test Module Operation Manual”.
The following command can be used to query the names waveform files that have been loaded into waveform memory.
:SOURce:GPRF:GENerator:ARB:WAVeform:NAME? <numeric_val>
For details of the command, refer to Chapter 5 "SCPI Command Reference" in the “MU887000A TRX Test Module Operation Manual”.

Use the following commands to select a waveform pattern to use from the waveform patterns included in the waveform file configured using the command described in this section.
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC
:CONFigure:CELLular:SEQuencer:RFSettings:TRX

:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect

Waveform Pattern Select

Function

Selects waveform pattern to use from patterns included in waveform file
When the command received, the signal is immediately switched regardless of the frame cycle of signal, so the frame cycle is not continued.
This command is also used to query the currently selected waveform pattern.

Command

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect <pat>
```

Query

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect?
```

Response

<pat>

Parameter

<pat>	Waveform Pattern
PAT1 to PATn	Waveform pattern number (n: waveform information file group range)
Default	PAT1

Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the "Waveform Files for Cellular Application Operation Manual".

Example of Use

To output waveform 1 signal:
:CONF:CELL:GEN:ARB:WAV:PATT:SEL PAT1
:CONF:CELL:GEN:ARB:WAV:PATT:SEL?
> PAT1

Related command

Waveform file for arbitrary waveform signal selection or query
`:CONFigure:CELLular:GENerator:ARB:WAVeform:PACKage:SELect`

Remarks

The group number depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the "Waveform Files for Cellular Application Operation Manual".

:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC

Waveform Pattern Select (SYNC)

Function

Selects waveform pattern to use from patterns included in waveform file
When the command received, the signal is switched according to the frame cycle of signal so that the frame cycle is continued.
This command is also used to query the currently selected waveform pattern.

Command

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC <pat>
```

Query

```
:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect:SYNC?
```

Response

<pat>

Parameter

<pat>	Waveform Pattern
PAT1 to PATn	Waveform pattern number (n: waveform information file group range)
Default	PAT1

Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the "Waveform Files for Cellular Application Operation Manual".

Example of Use

To output waveform 1 signal:
:CONF:CELL:GEN:ARB:WAV:PATT:SEL:SYNC PAT1
:CONF:CELL:GEN:ARB:WAV:PATT:SEL:SYNC?
> PAT1

Related command

Waveform file for arbitrary waveform signal selection or query
`:CONFigure:CELLular:GENerator:ARB:PACKage:SELect`

Remarks

The group number depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, “Waveform File Details” in the "Waveform Files for Cellular Application Operation Manual".

:CONFigure:CELLular:GENerator:BBMode

Output Signal Modulation

Function

Sets or queries MU887000A RF signal output modulation

Command

```
:CONFigure:CELLular:GENerator:BBMode <on_off>
```

Query

```
:CONFigure:CELLular:GENerator:BBMode?
```

Response

<on_off>

Parameter

<on_off>	Enables/disables modulation
ON	Enables RF output signal modulation
OFF	Disables RF output signal modulation
Default	ON

Example of Use

To modulate the RF signal:

:CONF:CELL:GEN:BBM ON

:CONF:CELL:GEN:BBM?

> ON

:CONFigure:CELLular:GENerator:RFSettings:STATe

Output Level On/Off

Function

Sets or queries RF signal output at MU887000A connector

Command

```
:CONFigure:CELLular:GENerator:RFSettings:STATe <on_off>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:STATe?
```

Response

<on_off>

Parameter

<on_off>	Enables/disables RF signal output
ON	Enables RF signal output
OFF	Disables RF signal output
Default	ON

Example of Use

To output RF signals at MU887000A connector:

:CONF:CELL:GEN:RFS:STAT ON

:CONF:CELL:GEN:RFS:STAT?

> ON

:CONFigure:CELLular:MEASurement:STANdard

Standard Select

Function

Sets or queries measurement standard

Command

```
:CONFigure:CELLular:MEASurement:STANdard <std>
```

Query

```
:CONFigure:CELLular:MEASurement:STANdard?
```

Response

<std>

Parameter

<std>	Measurement standard	
COMMON	Common Measurement	(requires MX887010A)
WCDMA	W-CDMA	(requires MX887011A)
GSM	GSM	(requires MX887012A)
LTE	LTE	(requires MX887013A or MX887014A)
CDMA2000	CDMA2000 1x	(requires MX887015A)
EVDO	CDMA2000 1xEVDO	(requires MX887016A)
TDSCDMA	TD-SCDMA	(requires MX887017A)
SEQUENCE	Sequence	(requires MX887010A)
SEQ	Sequence	(requires MX887010A)
Default	COMMON	

Example of Use

To switch the measurement standard to SEQUENCE:
:CONF:CELLMEAS:STAN SEQUENCE
:CONF:CELL:MEAS:STAN?
> SEQUENCE

Remarks

To execute the measurement described here, set the parameter to TDSCDMA or SEQUENCE.
If this command is sent during measurement, measurement stops to prepare for the new standard.
Common hardware settings, such as Downlink Frequency and Input Level, can be set for each measurement standard.

:FETCh:CELLular:MEASurement:STATe?

Measurement Status

Function

Queries measurement status

Query

```
:FETCh:CELLular:MEASurement:STATe?
```

Response

m_status

Parameter

<m_status>	Measurement status
0	Completed measurement
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
12	Tx measurement timeout
13	Rx measurement failed

Details

This can be used either during measurement or while measurement is stopped.
The value received from MX887017A is 0, 2, 5, 9, or 12.

Example of Use

To query the current measurement status:
:FETC:CELL:MEAS:STAT?
> 0

:INITiate:CELLular:MEASurement:SINGle

Measurement Start

Function

Sets the parameters for both specified measurement and signal transmission and executes measurement.

Command

```
:INITiate:CELLular:MEASurement:SINGle
```

Details

Sending this command executes one measurement execution.
Sending this command during measurement, aborts measurement once and restarts it.
The measurement questionable register must be polled or sync processing via *WAI is required to determine the timing of measurement completion.

Example of Use

To start measurement:
INIT:CELL:MEAS:SING

Related Command

:STATus:QUEStionable:MEASure[:EVENt]
For the details of the questionable register, refer to Chapter 3 “Fundamental Operation” in the “MU887000A TRX Test Module Operation Manual”.

:INSTrument[:SELect]

Application Select

Function

Sets or queries type of application software executing on MU887000A

Command

```
:INSTrument[:SELect] <app>
```

Query

```
:INSTrument[:SELect]?
```

Response

<app>

Parameter

<app>	Type of application software
CELLULAR	When using MX887010A, MX887011A, MX887012A, MX887013A, MX887014A, MX887015A, MX887016A or MX887017A
SRW	When using MX887030A, MX887031A, MX887040A, or MX887050A

Details

Set the parameter to CELLULAR and send the command before using the MX887017A.

Example of Use

To set the application software to CELLULAR:
:INST CELLULAR
:INST?
> CELLULAR

Remarks

When using the MX887017A, set the application to CELLULAR using
`:INSTrument[:SELect]`
and then set the standard to TDSCDMA or SEQUENCE using
`:CONFigure:CELLular:MEASurement:STANdard`.

:ROUTe:PORT:CONNect:DIRection

Set Connect Port Direction

Function

Sets or queries connectors for inputting and outputting RF signals

Command

```
:ROUTe:PORT:CONNect:DIRection <input>,<output>
```

Query

```
:ROUTe:PORT:CONNect:DIRection?
```

Response

<input>,<output>

Parameter

<input>	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1
<output>	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1

Details

Both Test Port1 and Test Port2 can be set to input and output simultaneously.
Test Port3 and Test Port4 can be set to either input or output at one time.

Example of Use

To set Test Port1 as RF signal input connector and Test Port2 as RF signal output connector:
:ROUT:PORT:CONN:DIR PORT1,PORT2
:ROUT:PORT:CONN:DIR?
> PORT1,PORT2

:STATus:OPERation:MEASure[:EVENt]?

Measurement Operation Status Register Query

Function

Queries content of measurement operation status register
The event occurrence can be identified using the retrieved value.

Query

```
:STATus:OPERation:MEASure[:EVENt]?
```

Response

<mosr>

Value = bit0 + bit1 + ... + bit15

bit0 = 2^0 = 1	Measurement in progress
bit1 = 2^1 = 2	Preparing trigger
bit2 = 2^2 = 4	Unused
bit3 = 2^3 = 8	Unused
bit4 = 2^4 = 16	Unused
bit5 = 2^5 = 32	Unused
bit6 = 2^6 = 64	Unused
bit7 = 2^7 = 128	Unused
bit8 = 2^8 = 256	Unused
bit9 = 2^9 = 512	Unused
bit10 = 2^{10} = 1024	Unused
bit11 = 2^{11} = 2048	Unused
bit12 = 2^{12} = 4096	Unused
bit13 = 2^{13} = 8192	Unused
bit14 = 2^{14} = 16384	Unused
bit15 = 2^{15} = 32768	Unused

Parameter

<mosr>	Measurement operation status register
Range	0 to 65535

Details

The sum of the values for bits of the occurring event from the values 2^0 = 1, 2^1 = 2 to 2^{15} = 32768, that correspond to the measurement operation status register bits 0, 1 to 15 becomes the response.

Example of Use

To query content of measurement operation status register:
:STAT:OPER:MEAS?
> 1

:STATus:QUEStionable:MEASure[:EVENt]?

Measurement Questionable Status Register Query

Function

Queries content of measurement questionable status register. The event occurrence can be identified using the retrieved value.

Query

```
:STATus:QUEStionable:MEASure[:EVENt]?
```

Response

<mqsr>

Value = bit0 + bit1 + ... + bit15

bit0 = 2^0 = 1	Over level
bit1 = 2^1 = 2	Under level
bit2 = 2^2 = 4	Timeout
bit3 = 2^3 = 8	Unused
bit4 = 2^4 = 16	Unused
bit5 = 2^5 = 32	Unused
bit6 = 2^6 = 64	Unused
bit7 = 2^7 = 128	Unused
bit8 = 2^8 = 256	Unused
bit9 = 2^9 = 512	Unused
bit10 = 2^{10} = 1024	Unused
bit11 = 2^{11} = 2048	Unused
bit12 = 2^{12} = 4096	Unused
bit13 = 2^{13} = 8192	Unused
bit14 = 2^{14} = 16384	Unused
bit15 = 2^{15} = 32768	Unused

Parameter

<mqsr>	Measurement questionable status register
Range	0 to 65535

Details

The sum of the values for bits of the occurring event from the values $2^0 = 1$, $2^1 = 2$ to $2^{15} = 32768$, that correspond to the measurement questionable status register bits 0, 1 to 15 becomes the response.

Example of Use

To query content of measurement questionable status register:

:STAT:QUES:MEAS?

> 1

:SYSTem:LANGuage

Language Selection of Remote Command

Function

Switches language mode of remote control command

Command

```
:SYSTem:LANGuage <mode>
```

Query

```
:SYSTem:LANGuage?
```

Response

<mode>

Parameters

<mode>	Language mode
NATive	Native
SCPI	SCPI
Default	NATive

Example of Use

To switch the remote control command language mode to Native:

:SYST:LANG NAT

:SYST:LANG?

>NAT

4.2.2 Fundamental measurement commands

:CONFigure:CELLular:GENerator:RFSettings:FREQuency

Downlink Frequency

Function

Sets or queries downlink frequency of MU887000A

Command

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency?
```

Response

<dl_freq>

Parameter

<dl_freq>	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

The Rx frequency for the mobile station is set.
Changing the setting of downlink frequency does not change the setting of the downlink channel.

Example of Use

To set the downlink frequency to 2120 MHz:
:CONF:CELL:GEN:RFS:FREQ 2120MHZ
:CONF:CELL:GEN:RFS:FREQ?
>2120000000

:CONFigure:CELLular:GENerator:RFSettings:LEVel

Output Level

Function

Sets or queries RF signal total output level for all channels

Command

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel?
```

Response

<level>

Unit	dBm

Parameter

<level>	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–66.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Calibration is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Example of Use

To set the output level to –50.0 dBm:
:CONF:CELL:GEN:RFS:LEV -50.0
:CONF:CELL:GEN:RFS:LEV?
> -50.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

:CONFigure:CELLular:MEASurement:RFSettings:CHANnel

Channel

Function

Sets or queries EARFCN (E-UTRA Absolute Radio Frequency Channel Number) to Channel

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:CHANnel <ch>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:CHANnel?
```

Response

<ch>

Parameter

<ch>	Downlink Channel
Range	2000 to 13500
Resolution	1
Default	10054

Details

Changing the Channel parameter, also changes the related Downlink Frequency and Uplink Frequency parameters.
Changing the setting of the Downlink or Uplink Frequency parameter does not change the Channel setting.
The frequency is determined by the equation: F (MHz) = Channel / 5

Example of Use

To set the downlink channel 10054:
:CONF:CELL:MEAS:RFS:CHAN 10054
:CONF:CELL:MEAS:RFS:CHAN?
> 10054

:CONFigure:CELLular:MEASurement:RFSettings:FREQuency

Uplink Frequency

Function

Sets or queries uplink frequency of MU887000A

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?
```

Response

<ul_freq>

Unit	Hz

Parameter

<ul_freq>	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

The Tx frequency is set for the mobile station.
Changing the setting of the Uplink Frequency parameter does not change the Channel setting.

Example of Use

To set the uplink frequency to 1921 MHz:
:CONF:CELL:MEAS:RFS:FREQ 1921MHZ
:CONF:CELL:MEAS:RFS:FREQ?
>1921000000

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

Input Level

Function

Sets or queries input level at MU887000A connector

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel?
```

Response

<level>

Unit	dBm

Parameter

<level>	Input level
Range	–65.0 to +35.0 dBm (Port 1/Port 2)
	–65.0 to +25.0 dBm (Port 3/Port 4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.

When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.

When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Example of Use

To set the input level to 27.0 dBm

:CONF:CELL:MEAS:RFS:LEV 27.0

:CONF:CELL:MEAS:RFS:LEV?

> 27.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch

:CALCulate:EXTLoss:TABLe:SETTing

:CALCulate:EXTLoss:TABLe:VALue

For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

:CONFigure:CELLular:MEASurement:SELect

Measurement Select

Function

Sets or queries measurement function.

Command

```
:CONFigure:CELLular:MEASurement:SELect <meassel>
```

Query

```
:CONFigure:CELLular:MEASurement:SELect?
```

Response

<meassel>

Parameter

<meassel>	Measurement function
FMEAS	Fundamental Measurement
Default	FMEAS

Example of Use

To set the measurement function to Fundamental Measurement:

:CONF:CELL:MEAS:SEL FMEAS

:CONF:CELL:MEAS:SEL?

> FMEAS

:CONFigure:CELLular:TDSCdma:FUNDamental:ACLR:SET

ACLR Measurement Enable and Count

Function

Enables Adjacent Channel Leakage Power Ratio measurement and sets or queries measurement count

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:ACLR:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:ACLR:SET?
```

Response

<on_off>, <count>

Parameters

<on_off>	Executes measurement
ON	Enables measurement
OFF	Disables measurement
<count>	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Adjacent Channel Leakage Power Ratio measurement and set the measurement count to 50:

:CONF:CELL:TDSC:FUND:ACLR:SET ON,50
:CONF:CELL:TDSC:FUND:ACLR:SET?
> ON,50

:CONFigure:CELLular:TDSCdma:FUNDamental:AMITems:OFF

Turn Off All Measurement Items

Function

Turns off all fundamental measurement items

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:AMITems:OFF
```

Details

The operation of this command is similar to turning off all the following command settings.

```
:CONFigure:CELLular:TDSCdma:FUNDamental:POWer:SET
:CONFigure:CELLular:TDSCdma:FUNDamental:OBW:SET
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:SET
:CONFigure:CELLular:TDSCdma:FUNDamental:ACLR:SET
:CONFigure:CELLular:TDSCdma:FUNDamental:MODulation:SET
:CONFigure:CELLular:TDSCdma:FUNDamental:PCDE:SET
:CONFigure:CELLular:TDSCdma:FUNDamental:TEMPlate:SET
```

Example of Use

To set all measurements to off at one time:

:CONF:CELL:TDSC:FUND:AMIT:OFF

:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:LIMit

Bit Error Rate - Upper Limit

Function

Sets or queries upper limit (%) at Bit Error Rate measurement.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:LIMit <ratio>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:LIMit?
```

Response

<ratio>

Unit	%

Parameter

<ratio>	Error Rate
Range	0.0 to 100.0%
Resolution	0.1
Default	10.0

Example of Use

To set upper limit of Bit Error Rate measurement to 10.0%.

:CONF:CELL:TDSC:FUND:BER:LIM 10

:CONF:CELL:TDSC:FUND:BER:LIM?

> 10.0

:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:MEASurement

Bit Error Rate

Function

Enables Bit Error Rate measurement or queries setting.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:MEASurement <on_off>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:MEASurement?
```

Response

<on_off>

Parameter

<on_off>	Enables/disables measurement.
ON	Enables measurement.
OFF	Disables measurement.
Default	OFF

Example of Use

To set Bit Error Rate measurement to On.

:CONF:CELL:TDSC:FUND:BER:MEAS ON

:CONF:CELL:TDSC:FUND:BER:MEAS?

> ON

:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:SAMPle

Bit Error Rate - Number of Sample

Function

Sets or queries sample bit number at Bit Error Rate measurement.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:SAMPle <number>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:SAMPle?
```

Response

<number>

Parameter

<number>	Sample bit number
Range	1 to 73200
Resolution	1
Default	10000

Example of Use

To set sample bit number of Bit Error Rate measurement to 1000.

:CONF:CELL:TDSC:FUND:BER:SAMP 1000

:CONF:CELL:TDSC:FUND:BER:SAMP?

> 1000

:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:TFCI

TFCI Detect Mode

Function

Sets TFCI detection to Auto or Manual (fixed value) or queries setting

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:TFCI <mode>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BERate:TFCI?
```

Response

<mode>

Parameter

<mode>	Detect mode
AUTO	TFCI = 3 or 4 Auto detect
FIX3	TFCI = 3 fixed
FIX4	TFCI = 4 fixed
Default	AUTO

Example of Use

To set TFCI detection to FIX3

:CONF:CELL:TDSC:FUND:BER:TFCI FIX3

:CONF:CELL:TDSC:FUND:BER:TFCI?

> FIX3

:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:MEASurement

Block Error Rate

Function

Enables Block Error Rate measurement or queries setting.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:MEASurement <on_off>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:MEASurement?
```

Response

<on_off>

Parameter

<on_off>	Enables/disables measurement.
ON	Enables measurement.
OFF	Disables measurement.
Default	OFF

Example of Use

To set Block Error Rate measurement to On.

:CONF:CELL:TDSC:FUND:BLER:MEAS ON

:CONF:CELL:TDSC:FUND:BLER:MEAS?

> ON

:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:SAMPle

Block Error Rate - Number of Sample

Function

Sets or queries sample block number at Block Error Rate measurement.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:SAMPle <number>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:BLERate:SAMPle?
```

Response

<number>

Parameter

<number>	Sample block number
Range	1 to 300
Resolution	1
Default	50

Example of Use

To set sample block number of Block Error Rate measurement to 100.

:CONF:CELL:TDSC:FUND:BLER:SAMP 100

:CONF:CELL:TDSC:FUND:BLER:SAMP?

> 100

:CONFigure:CELLular:TDSCdma:FUNDamental:CLPC:FILTer

Closed Loop Power Control Measurement – Filter

Function

Selects a measurement filter for the Closed Loop Power Control (Auto) measurement.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:CLPC:FILTer <type>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:CLPC:FILTer?
```

Response

<type>

Parameter

<type>	Measurement filter
RRC	RRC Filter (1.28 MHz)
Default	RRC

Example of Use

To set a measurement filter for the Closed Loop Power Control measurement to RRC.

:CONF:CELL:TDSC:FUND:CLPC:FILT RRC

:CONF:CELL:TDSC:FUND:CLPC:FILT?

> RRC

:CONFigure:CELLular:TDSCdma:FUNDamental:CLPC:MEASurement

Closed Loop Power Control Measurement – Method

Function

Sets the measurement control method (interval) of the Closed Loop Power Control (Auto) measurement.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:CLPC:MEASurement <method>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:CLPC:MEASurement?
```

Response

<method>

Parameter

<method>	Control method (interval)
AUTO_BC	Auto (Step B to C)
Default	AUTO_BC

Example of Use

To set the control method (interval) of the Closed Loop Power Control measurement to Auto (Step B to C).

:CONF:CELL:TDSC:FUND:CLPC:MEAS AUTO_BC
:CONF:CELL:TDSC:FUND:CLPC:MEAS?
> AUTO_BC

:CONFigure:CELLular:TDSCdma:FUNDamental:DTCH:PATTern

DTCH Data Pattern

Function

Sets or queries DTCH data pattern.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DTCH:PATTern <pattern>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DTCH:PATTern?
```

Response

<pattern>

Parameter

<pattern>	Data Pattern
ALL1	All “1”s

Example of Use

To set DTCH data pattern to ALL1.

:CONF:CELL:TDSC:FUND:DTCH:PATT ALL1

:CONF:CELL:TDSC:FUND:DTCH:PATT?

> ALL1

:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi1

Uplink DPCH Channelisation Code (Multi Code_Code1)

Function

Sets or queries Uplink DPCH Channelisation Code (Multi Code_Code1).

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi1 <code>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi1?
```

Response

```
<code>
```

Parameters

<code>	Channelisation Code
Range	1
Resolution	1
Default	1

Example of Use

To set the Uplink DPCH Channelisation Code (Multi Code_Code1) to 1:

:CONF:CELL:TDSC:FUND:DPCH:MULT1 1

:CONF:CELL:TDSC:FUND:DPCH:MULT1?

> 1

:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi2

Uplink DPCH Channelisation Code (Multi Code_Code2)

Function

Sets or queries Uplink DPCH Channelisation Code (Multi Code_Code2).

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi2 <code>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:MULTi2?
```

Response

<code>

Parameters

<code>	Channelization Code
Range	2
Resolution	1
Default	2

Example of Use

To set the Uplink DPCH Channelization Code (Multi Code_Code2) to 2:

```
:CONF:CELL:TDSC:FUND:DPCH:MULT2 2
:CONF:CELL:TDSC:FUND:DPCH:MULT2?
> 2
```

:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:SINGle

Uplink DPCH Channelization Code (Single Code)

Function

Sets or queries Uplink DPCH Channelization Code (Single Code).

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:SINGle <code>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:DPCH:SINGle?
```

Response

<code>

Parameters

<code>	Channelization Code
Range	1
Resolution	1
Default	1

Example of Use

To set the Uplink DPCH Channelization Code (Single Code) to 1:

:CONF:CELL:TDSC:FUND:DPCH:SING 1

:CONF:CELL:TDSC:FUND:DPCH:SING?

> 1

:CONFigure:CELLular:TDSCdma:FUNDamental:EPUCH:SLOT

E-PUCH Measurement Slot

Function

Sets or queries E-PUCH measurement slot

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:EPUCH:SLOT <slot>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:EPUCH:SLOT?
```

Response

<slot>

Parameter

<slot>	Measurement slot
Range	2 to 5
Resolution	1
Default	2

Example of Use

To set the E-PUCH measurement slot to 3:

:CONF:CELL:TDSC:FUND:EPUCH:SLOT 3

:CONF:CELL:TDSC:FUND:EPUCH:SLOT?

> 3

:CONFigure:CELLular:TDSCdma:FUNDamental:MEASurement:TRIGger

Measurement Trigger

Function

Sets or queries measurement trigger.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MEASurement:TRIGger <trigger>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MEASurement:TRIGger?
```

Response

<trigger>

Parameter

<trigger>	Measurement Trigger
MIDAMBLE	Midamble
VIDEO	Video
Default	MIDAMBLE

Example of Use

To set the measurement trigger to Video:

:CONF:CELL:TDSC:FUND:MEAS:TRIG VIDEO

:CONF:CELL:TDSC:FUND:MEAS:TRIG?

> VIDEO

:CONFigure:CELLular:TDSCdma:FUNDamental:MIDamble:CONFiguration

Midamble Configuration

Function

Sets or queries Midamble configuration.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MIDamble:CONFiguration <number>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MIDamble:CONFiguration?
```

Response

<number>

Parameter

<number>	MidambleConfiguration
Range	16
Resolution	1
Default	16

Example of Use

To set the Midamble configuration to 16:

:CONF:CELL:TDSC:FUND:MID:CONF 16

:CONF:CELL:TDSC:FUND:MID:CONF?

> 16

:CONFigure:CELLular:TDSCdma:FUNDamental:MOBJect

Measurement Object

Function

Sets the measurement target.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MOBJect <measobj>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MOBJect?
```

Response

<measobj>

Parameter

<measobj>	Measurement target
DPCH	DPCH
CLPC	Closed Loop Power Control
Default	DPCH

Example of Use

To set the measurement target to Closed Loop Power Control.

:CONF:CELL:TDSC:FUND:MOBJ CLPC

:CONF:CELL:TDSC:FUND:MOBJ?

> CLPC

:CONFigure:CELLular:TDSCdma:FUNDamental:MODulation:SET

Modulation Analysis Measurement Enable and Count

Function

Enables Modulation Analysis measurement and sets measurement count, or queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MODulation:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:MODulation:SET?
```

Response

<on_off>, <count>

Parameters

<on_off>	Enables/disables measurement
ON	Enables Modulation Analysis measurement
OFF	Disables Modulation Analysis measurement
<count>	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Modulation Analysis measurement and set the measurement count to 120:

```
:CONF:CELL:TDSC:FUND:MOD:SET ON,120
:CONF:CELL:TDSC:FUND:MOD:SET?
> ON,120
```

:CONFigure:CELLular:TDSCdma:FUNDamental:OBW:SET

OBW Measurement Enable and Count

Function

Enables Occupied Bandwidth measurement and sets measurement count, or queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:OBW:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:OBW:SET?
```

Response

<on_off>, <count>

Parameters

<on_off>	Enables measurement
ON	Sets measurement on
OFF	Sets measurement off
<count>	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To turn Occupied Bandwidth measurement on and set the measurement count to 100:

:CONF:CELL:TDSC:FUND:OBW:SET ON,100

:CONF:CELL:TDSC:FUND:OBW:SET?

> ON,100

:CONFigure:CELLular:TDSCdma:FUNDamental:PCDE:SET

Peak Code Domain Error Measurement Enable and Count

Function

Enables Peak Code Domain Error measurement and sets measurement count, or queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:PCDE:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:PCDE:SET?
```

Response

<on_off>, <count>

Parameters

<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
<count>	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To turn the Peak Code Domain Error measurement on and set the measurement count to 150:

:CONF:CELL:TDSC:FUND:PCDE:SET ON,150

:CONF:CELL:TDSC:FUND:PDISC:SET?

> ON,150

:CONFigure:CELLular:TDSCdma:FUNDamental:POWer:SET

Tx Power Measurement Enable and Count

Function

Enables Tx Power measurement and sets measurement count, or queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:POWer:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:POWer:SET?
```

Response

<on_off>, <count>

Parameter

<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
<count>	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To Transmit Power measurement on and set the measurement count to 10:

:CONF:CELL:TDSC:FUND:POW:SET ON,10

:CONF:CELL:TDSC:FUND:RCDE:SET?

> ON,10

:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:LIMit

Spectrum Emission Mask - Mask Template Lower Limit

Function

Sets absolute lower level threshold (minimum threshold power) for Spectrum Emission Mask and queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:LIMit <level>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:LIMit?
```

Response

<level>

Unit	dBm

Parameter

<level>	Template threshold
Range	–100.0 to 0.0
Resolution	0.1 dBm
Suffix code	DBM
Default	–53.5 dBm

Example of Use

To set the absolute lower level threshold (minimum threshold power) for Spectrum Emission Mask measurement to –55.0 dBm:

```
:CONF:CELL:TDSC:FUND:SEM:LIM -55.0
:CONF:CELL:TDSC:FUND:SEM:LIM?
> -55.0
```

:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:SET

SEM Measurement Enable and Count

Function

Enables Spectrum Emission Mask measurement and sets measurement count, or queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:SET?
```

Response

<on_off>, <count>

Parameters

<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Spectrum Emission Mask measurement and set the measurement count to 20:

:CONF:CELL:TDSC:FUND:SEM:SET ON,20

:CONF:CELL:TDSC:FUND:SEM:SET?

> ON,20

:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:TEMPlate

Spectrum Emission Mask - Mask Template

Function

Sets relative level threshold (template) for Spectrum Emission Mask and queries settings

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:TEMPlate <offset>,<level>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:SEMask:TEMPlate? <offset>
```

Response

<level>

Unit	dBm

Parameters

<offset>	Offset frequency point		
Range	1 to 4		
Resolution	1		
<level>	Level at each offset frequency point		
Range	Offset point	Level	Default
	1 (0.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–33.5 dBc
	2 (1.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–47.5 dBc
	3 (2.4 MHz, RBW=1 MHz)	–100.0 to 0.0	–57.7 dBc
	4 (2.4 to 4.0 MHz, RBW=1 MHz)	–100.0 to 0.0	–42.5 dBc
Resolution	0.1 dBc		

Example of Use

To set template value at 2.4 MHz frequency offset to –80.0 dBc:

:CONF:CELL:TDSC:FUND:SEM:TEMP 3,-80.0

:CONF:CELL:TDSC:FUND:SEM:TEMP? 3

> -80.0

:CONFigure:CELLular:TDSCdma:FUNDamental:TEMPlate:SET

Power Template Measurement Enable and Count

Function

Enables Power Template measurement and sets measurement count, or queries settings.

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:TEMPlate:SET <on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:TEMPlate:SET?
```

Response

<on_off>, <count>

Parameters

<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	ON
<count>	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Power Template measurement and set the measurement count to 10:

:CONF:CELL:TDSC:FUND:TEMP:SET ON,10

:CONF:CELL:TDSC:FUND:TEMP:SET?

> ON,10

:CONFigure:CELLular:TDSCdma:FUNDamental:UDPChslot

Uplink DPCH Timeslot

Function

Sets or queries Time Slot of Uplink DPCH

Command

```
:CONFigure:CELLular:TDSCdma:FUNDamental:UDPChslot <slot>
```

Query

```
:CONFigure:CELLular:TDSCdma:FUNDamental:UDPChslot?
```

Response

<slot>

Parameters

<slot>	Time slot
Range	1, 2
Resolution	1
Default	2

Example of Use

To set Time slot of Uplink DPCH to 1:

:CONF:CELL:TDSC:FUND:UDPC 1

:CONF:CELL:TDSC:FUND:UDPC?

> 1

:CONFigure:CELLular:TDSCdma:SCODe

Scrambling Code Number

Function

Sets Scrambling Code Number or queries setting

Command

```
:CONFigure:CELLular:TDSCdma:SCODe <code>
```

Query

```
:CONFigure:CELLular:TDSCdma:SCODe?
```

Response

<code>

Parameter

<code>	Scrambling Code Number
Range	0 to 127
Resolution	1
Default	0

Example of Use

To set Scrambling Code Number to 127:

:CONF:CELL:TDSC:SCOD 127

:CONF:CELL:TDSC:SCOD?

> 127

:CONFigure:CELLular:TDSCdma:ULConfig

Uplink Configuration

Function

Sets uplink signal channel configuration or queries setting

Command

```
:CONFigure:CELLular:TDSCdma:ULConfig <ulconf>
```

Query

```
:CONFigure:CELLular:TDSCdma:ULConfig?
```

Response

<ulconf>

Parameter

<ulconf>	Uplink signal configuration
RMC_SINGLE	Reference measurement channel 12.2 kbps(Single Code)
RMC_MULTI	Reference measurement channel 12.2 kbps(Multi Code)
HSDPA_RMC	HSDPA RMC
HSUPA_RMC	HSUPA RMC
Default	RMC_SINGLE

Example of Use

To set the uplink signal channel configuration to RMC_SINGLE:

:CONF:CELL:TDSC:ULC RMC_SINGLE
:CONF:CELL:TDSC:ULC?
> RMC_SINGLE

:FETCh:CELLular:TDSCdma:FUNDamental:ACLR?

Result of Adjacent Channel Leakage Power Ratio

Function

Queries result of Adjacent Channel Leakage Power Ratio measurement

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:ACLR? <mode>
```

Response

When <mode> = TTL,
<avg(0)>,<avg(1)>,<avg(2)>,<avg3>,<max(0)>,<max(1)>,<max(2)>,<max(3)>,<min(0)>,<min(1)>,<min(2)>,<min(3)>
When <mode> ≠ TTL,
<aclr(0)>,<aclr(1)>,<aclr(2)>,<aclr(3)>

Unit	dB
Resolution	0.01

Parameter number	Frequency offset
0	–3.2 MHz
1	–1.6 MHz
2	+1.6 MHz
3	+3.2 MHz

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<aclr>	Measurement result in specified Storage mode

Example of Use

To query average of ACLR measurement result:
:FETC:CELL:TDSC:FUND:ACLR? AVG
> -20.00,-21.00,-22.00,-23.00

:FETCh:CELLular:TDSCdma:FUNDamental:BERate:ECOunt?

Bit Error Rate - Error Counts

Function

Queries error bit count.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:BERate:ECOunt?
```

Response

<number>

Parameters

<number>	Error Counts
Resolution	1
Unit	bit

Example of Use

To query error bit count:
:FETC:CELL:TDSC:FUND:BER:ECO?
> 25

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is –1.

:FETCh:CELLular:TDSCdma:FUNDamental:BERate:ERATe?

Bit Error Rate

Function

Queries bit error rate.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:BERate:ERATe? [<format>]
```

Response

<rate>

Parameters

<format>	Format	
PER	Percent	
EXP	Exponential	
<rate>	Bit error rate	
When <format> is omitted:		(Error bit number /Transmitted bit number)
Resolution	0.0001	
Unit	None	
When <format> is PER:		(Error bit number/Transmitted bit number×100) [%]
Resolution	0.01	
Unit	%	
When <format> is EXP:		Exponential of (Error bit number/Transmitted bit number)
Resolution	0.01×10^{-08}	
Unit	None	

Example of Use

To query bit error rate:

:FETC:CELL:TDSC:FUND:BER:ERAT?

> 0.0050

:FETC:CELL:TDSC:FUND:BER:ERAT? PER

> 0.50

:FETC:CELL:TDSC:FUND:BER:ERAT? EXP

> 5.00E-3

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is shown as below.

:FETC:CELL:TDSC:FUND:BER:ERAT?	9.9999
:FETC:CELL:TDSC:FUND:BER:ERAT? PER	999.99
:FETC:CELL:TDSC:FUND:BER:ERAT? EXP	9.99E-10

:FETCh:CELLular:TDSCdma:FUNDamental:BERate:JUDGement?

Bit Error Rate - Judgement

Function

Queries judgement results of bit error rate measurement.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:BERate:JUDGement?
```

Response

<judgement>

Parameters

<judgement>	Judgement results
PASS	Passed
FAIL	Failed
–	Not measured

Example of Use

To query judgement results of bit error rate measurement:

:FETC:CELL:TDSC:FUND:BER:JUDG?

> PASS

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is "–".

:FETCh:CELLular:TDSCdma:FUNDamental:BERate:TBIT?

Bit Error Rate - Transmitted bits

Function

Queries transmitted bit number.

Query

`:FETCh:CELLular:TDSCdma:FUNDamental:BERate:TBIT?`

Response

<number>

Parameters

<number>	Transmitted bit number
Resolution	1
Unit	bit

Example of Use

To query transmitted bit number:
:FETC:CELL:TDSC:FUND:BER:TBIT?
> 6000

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is –1.

:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ECOunt?

Block Error Rate - Error Counts

Function

Queries error block number.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ECOunt?
```

Response

<number>

Parameters

<number>	Error block number
Resolution	1
Unit	block

Example of Use

To query error block number:

:FETC:CELL:TDSC:FUND:BLER:ECO?

> 25

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is –1.

:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ERATe?

Block Error Rate

Function

Queries block error rate.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:ERATe? [<format>]
```

Response

<rate>

Parameters

<format>	Format
PER	Percent
EXP	Exponential
<rate>	Block Error Rate

When <format> is omitted: (Error block number / Transmitted block number)

Resolution	0.0001
Unit	None

When <format> is PER: (Error block number / Transmitted block number×100) [%]

Resolution	0.01
Unit	%

When <format> is EXP: Exponential of (Error block number / Transmitted block number)

Resolution	0.01×10^{-08}
Unit	Nine

Example of Use

To query block error rate:

:FETC:CELL:TDSC:FUND:BLER:ERAT?
> 0.0050
:FETC:CELL:TDSC:FUND:BLER:ERAT? PER
> 0.50
:FETC:CELL:TDSC:FUND:BLER:ERAT? EXP
> 5.00E-3

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is shown as below.

:FETC:CELL:TDSC:FUND:BLER:ERAT?	9.9999
:FETC:CELL:TDSC:FUND:BLER:ERAT? PER	999.99
:FETC:CELL:TDSC:FUND:BLER:ERAT? EXP	9.99E-10

:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:TBIT?

Block Error Rate - Transmitted bits

Function

Queries transmitted block number.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:BLERate:TBIT?
```

Response

<number>

Parameters

<number>	Transmitted block number
Resolution	1
Unit	block

Example of Use

To query transmitted block number:
:FETC:CELL:TDSC:FUND:BLER:TBIT?
> 6000

Remarks

When an error has occurred in the measurement (the response of :FETCh:CELLular:MEASurement:STATe? is 5, 9, or 12) or before the measurement starts, the response is –1.

:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:JUDGement?

Closed Loop Power Control (Auto) - Judgement

Function

Queries the judgement result of the Closed Loop Power Control (Auto) measurement.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:JUDGement? <step>
```

Response

<judgement>

Parameters

<step>	Step
ALL	Step B, Step C
B	Step B
C	Step C
<judgement>	Judgement results
PASS	Passed
FAIL	Failed
–	Not measured

Example of Use

To query all judgement result of the Closed Loop Power Control (Auto) measurement.

:FETC:CELL:TDSC:FUND:CLPC:JUDG? ALL

> PASS,PASS

:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MAXimum:POWer?

Closed Loop Power Control (Auto) – Maximum Power

Function

Queries the maximum power of the Closed Loop Power Control (Auto) measurement.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MAXimum:POWer?
```

Response

<power>

Unit	dBm

Parameters

<power>	Maximum power
Resolution	0.01 dB

Example of Use

To query the maximum power of the Closed Loop Power Control (Auto) measurement.

:FETC:CELL:TDSC:FUND:CLPC:MAX:POW?

> -10.00

:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MINimum:POWer?

Closed Loop Power Control (Auto) – Minimum Power

Function

Queries the minimum power of the Closed Loop Power Control (Auto) measurement.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:MINimum:POWer?
```

Response

<power>

Unit	dBm

Parameters

<power>	Minimum power
Resolution	0.01 dB

Example of Use

To query the minimum power of the Closed Loop Power Control (Auto) measurement.

:FETC:CELL:TDSC:FUND:CLPC:MIN:POW?

> -10.00

:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer?

Closed Loop Power Control (Auto) – Slot Level

Function

Queries the measurement result (level) per slot of the step specified for the Closed Loop Power Control (Auto) measurement.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer? <step>[,<slot>]
```

Response

<l[0]>,<l[1]>,..,<l[max_slot_number]>

Unit	dBm

Parameters

<step>	Target step
B	Step B
C	Step C
<slot>	Slot number registered
ALL	ALL
<l[max_slot_number]>	Power
Resolution	0.01 dB

Example of Use

To query the measurement result (level) of all slots of Step B in the Closed Loop Power Control (Auto) measurement.

:FETC:CELL:TDSC:FUND:CLPC:POW? B,ALL

> -10.24,-10.25,-10.26,-10.26,-10.25,,,,

:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer:DB?

Closed Loop Power Control (Auto) – Power (dB)

Function

Queries the power difference among the slots of the step specified for the Closed Loop Power Control (Auto) measurement.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:CLPC:POWer:DB? <step>[,<slot>]
```

Response

<l[0]>,<l[1]>,..,<l[max_slot_number-1]>

Unit	dB

Parameters

<step>	Target step
B	Step B
C	Step C
<slot>	Slot number registered
ALL	ALL
<l[max_slot_number]>	Power
Resolution	0.01 dB

Example of Use

To query the power difference among all the slots of Step B in the Closed Loop Power Control (Auto) measurement.

:FETC:CELL:TDSC:FUND:CLPC:POW:DB? B,ALL

> -0.24,-0.25,-0.26,-0.26,-0.25,,,,

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:CFRequency?

Carrier Frequency Result of Modulation Analysis

Function

Queries Carrier Frequency measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:CFRequency?
```

Response

<freq>

Unit	Hz
Resolution	1

Parameters

<freq>	Carrier frequency
Resolution	1

Example of Use

To query Carrier Frequency measurement result:

:FETC:CELL:TDSC:FUND:MOD:CFR?

> 1951000000

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:EVM?

EVM Result of Modulation Analysis

Function

Queries EVM measurement result

Query

`:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:EVM? <mode>`

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<evm>

Unit	%
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<evm>	Measurement result in the specified Storage mode

Example of Use

To query average of EVM measurement result:

:FETC:CELL:TDSC:FUND:MOD:EVM? AVG

> 1.50

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor?

Carrier Frequency Error Result of Modulation Analysis

Function

Queries frequency error measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor? <mode>
```

Response

When <mode> = TTL,
avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz
When <mode> ≠ TTL,
freq_ppm,freq_Hz

Unit	ppm, Hz
Resolution	0.01, 0.1

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg_ppm>	Average of Frequency Error measurement results in ppm
Resolution	0.01
<avg_Hz>	Average of Frequency Error measurement results in Hz
Resolution	0.1
<max_ppm>	Maximum value in Frequency Error measurement results in ppm
Resolution	0.01
<max_Hz>	Maximum value in Frequency Error measurement results in Hz
Resolution	0.1
<min_ppm>	Minimum value in Frequency Error measurement results in ppm
Resolution	0.01
<min_Hz>	Minimum value in Frequency Error measurement results in Hz
Resolution	0.1
<freq_ppm>	Frequency Error measurement results in specified Storage mode in ppm
Resolution	0.01
<freq_Hz>	Frequency Error measurement results in specified Storage mode of Hz
Resolution	0.1

Example of Use

To query average of Frequency Error measurement results for segment 1 in Sequence Measurement mode:

:FETC:CELL:TDSC:FUND:MOD:FERR? AVG

> 0.03,60.0

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor:WORSt?

Carrier Frequency Error Result of Modulation Analysis (Worst)

Function

Queries worst value in Frequency Error measurement results

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:FERRor:WORSt?
```

Response

<freq_ppm>,<freq_Hz>

Unit	ppm, Hz
Resolution	0.01, 0.1

Parameter

<freq_ppm>	Worst value in Frequency Error measurement results in ppm
Resolution	0.01
<freq_Hz>	Worst value in Frequency Error measurement results in Hz
Resolution	0.1

Example of Use

To query worst value in Frequency Error measurement results:

:FETC:CELL:TDSC:FUND:MOD:FERR:WORS?

> 0.03,60.0

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:IQIMbalance?

IQ Imbalance Result of Modulation Analysis

Function

Queries IQ Imbalance measurement results

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:IQIMbalance? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<iqimb>

Units	%
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<iqimb>	Measurement result in specified Storage mode

Example of Use

To query average of IQ Imbalance measurement result:
:FETC:CELL:TDSC:FUND:MOD:IQIM? AVG
> 0.04

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:MERRor?

Magnitude Error Result of Modulation Analysis

Function

Queries Magnitude Error measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:MERRor? <mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<merr>

Unit	%
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<merr>	Measurement result in specified Storage mode

Example of Use

To query average of Magnitude Error measurement result:

:FETC:CELL:TDSC:FUND:MOD:MERR? AVG

> 1.05

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:ORGNoffset?

Origin Offset Result of Modulation Analysis

Function

Queries Origin Offset measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:ORGNoffset? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<orgnoffs>

Unit	dB
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<orgnoffs>	Measurement result in specified Storage mode

Example of Use

To query average of Origin Offset measurement result:
:FETC:CELL:TDSC:FUND:MOD:ORGN? AVG
> 0.04

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PEVM?

Peak EVM Result of Modulation Analysis

Function

Queries EVM Peak measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PEVM? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<pevm>

Unit	%
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pevm>	Measurement result in specified Storage mode

Example of Use

To query average of EVM Peak measurement result
:FETC:CELL:TDSC:FUND:MOD:PEVM? AVG
> 1.75

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PHERror?

Phase Error Result of Modulation Analysis

Function

Queries Phase Error measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:PHERror? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<perr>

Unit	degree
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Min. value
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<perr>	Measurement result in the specified Storage mode

Example of Use

To query average of Phase Error measurement result:
:FETC:CELL:TDSC:FUND:MOD:PHER? AVG
> 1.55

:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:RHO?

Rho

Function

Queries the Rho measurement result.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:MODulation:RHO? <mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<rho>

Unit	None
Resolution	0.00001

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<rho>	Measurement result in specified Storage mode

Example of Use

To query the Rho measurement result average:

:FETC:CELL:TDSC:FUND:MOD:RHO? AVG

> 0.00122

:FETCh:CELLular:TDSCdma:FUNDamental:OBW?

Result of Occupied Bandwidth

Function

Queries Occupied Bandwidth measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:OBW?
```

Response

<bw>

Unit	MHz
Resolution	0.001

Parameter

<bw>	Occupied Bandwidth [MHz]

Example of Use

To query Occupied Bandwidth measurement result:
:FETC:CELL:TDSC:FUND:OBW?
> 1.280

:FETCh:CELLular:TDSCdma:FUNDamental:OBW:FREQuency?

Result of Occupied Bandwidth Frequency

Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:OBW:FREQuency? <pos>
```

Response

<freq>

Unit	MHz
Resolution	0.001

Parameter

<pos>	Frequency position
UPPER	Upper frequency
LOWER	Lower frequency
CENTER	Center frequency
<freq>	Frequency [MHz]

Example of Use

To query upper frequency of Occupied Bandwidth:

:FETC:CELL:TDSC:FUND:OBW:FREQ? UPPER

> 1951.920

:FETCh:CELLular:TDSCdma:FUNDamental:PCDE?

Result of Peak Code Domain Error

Function

Queries Peak Code Domain Error measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:PCDE? <mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<pcde>

Unit	dB
Resolution	0.01

Parameter

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pcde>	Measurement result in the specified Storage mode

Example of Use

To query average of Peak Code Domain Error measurement result

:FETC:CELL:TDSC:FUND:PCDE? AVG

> 0.08

:FETCh:CELLular:TDSCdma:FUNDamental:POWer:FLTPower?

Result of Filtered Power Measurement

Function

Queries result of RRC Filtered Power measurement

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:POWer:FLTPower? <mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> = AVG, MAX, MIN or DVT

<pwr>

When <mode> = IND,

<s>,<pwr(1)>,<pwr(2)>,...,<pwr(s)>

Unit	dBm
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode
<pwr(s)>	Measurement result at sth slot
s	Measurement count
Range	1 to 500

Example of Use

To query average of RRC Filtered Power measurement result:

:FETC:CELL:TDSC:FUND:POW:FLTP? AVG

> -20.00

:FETCh:CELLular:TDSCdma:FUNDamental:POWer:TXPower?

Result of Tx Power Measurement

Function

Queries Tx Power measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:POWer:TXPower? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> = AVG, MAX, MIN or DVT
<pwr>
When <mode> = IND,
<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>

Unit	dBm
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode
<pwr(s)>	Tx Power of sth measurement
s	Measurement count
Range	1 to 500

Example of Use

To query average of Tx Power measurement results:
:FETC:CELL:TDSC:FUND:POW:TXP? AVG
> -20.00

:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:JUDGement?

Judgement of Spectrum Emission Mask

Function

Queries whether spectrum threshold set at spectrum measurement exceeded or not

Query

`:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:JUDGement?`

Response

<judgement>

Parameter

<judgement>	Judgement result
PASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

To query whether spectrum threshold set at spectrum measurement exceeded or not:

:FETC:CELL:TDSC:FUND:SEM:JUDG?

> PASS

:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:LOWer?

Result of Spectrum Emission Mask (Lower)

Function

Queries peak level and frequency of spectrum in each lower frequency range of Spectrum Emission Mask

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:LOWer?
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency of spectrum peak
Resolution	0.001 MHz
<peak(n)>:	Peak level of spectrum
Resolution	0.01 dB

Parameters

<freq(0)>	Offset frequency –0.8 MHz
<peak(0)>	Peak level of spectrum in offset frequency –0.8 MHz
<freq(1)>	Offset frequency of spectrum peak in offset frequency range from –0.8 to –1.8 MHz
<peak(1)>	Peak level of spectrum in offset frequency range from –0.8 to –1.8 MHz
<freq(2)>	Offset frequency of spectrum peak in offset frequency range from –1.8 to –2.4 MHz
<peak(2)>	Peak level of spectrum in offset frequency range from –1.8 to –2.4 MHz
<freq(3)>	Offset frequency of spectrum peak in offset frequency range from –2.4 to –4.0 MHz
<peak(3)>	Peak level of spectrum in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query spectrum peak level and frequency at lower side of each frequency range:

:FETC:CELL:TDSC:FUND:SEM:LEV:LOW?

> -0.800,-20.00,-1.500,-30.00,-2.200,-40.00,-3.200,-50.00

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SCPI Command Reference

:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:UPPer?

Result of Spectrum Emission Mask (Upper)

Function

Queries peak level and frequency of spectrum in each upper frequency range of Spectrum Emission Mask

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:LEVel:UPPer?
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency of spectrum peak
Resolution	0.001 MHz
<peak(n)>:	Peak level of spectrum
Resolution	0.01 dB

Parameters

freq(0)	Offset frequency +0.8 MHz
peak(0)	Peak level of spectrum in offset frequency +0.8 MHz
freq(1)	Offset frequency of spectrum peak in offset frequency range from +0.8 to +1.8 MHz
peak(1)	Peak level of spectrum in offset frequency range from +0.8 to +1.8 MHz
freq(2)	Offset frequency of the spectrum peak in the offset frequency range from +1.8 to +2.4 MHz
peak(2)	Peak level of spectrum in offset frequency range from +1.8 to +2.4 MHz
freq(3)	Offset frequency of spectrum peak in offset frequency range from +2.4 to +4.0 MHz
peak(3)	Peak level of spectrum in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query spectrum peak level and frequency at upper side of each frequency range:

:FETC:CELL:TDSC:FUND:SEM:LEV:UPP?

> 0.800,-20.00,1.500,-30.00,2.300,-40.00,3.500,-50.00

:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:LOWer?

Margin of Spectrum Emission Mask (Lower)

Function

Queries spectrum margin and offset frequency in each lower frequency range of Spectrum Emission Mask

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:LOWer?
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency at point where margin determined
Resolution	0.001 MHz
<peak(n)>:	Margin from template
Resolution	0.01 dB

Parameters

freq(0)	Offset frequency –0.8 MHz
peak(0)	Margin in offset frequency –0.8 MHz
freq(1)	Offset frequency at point where margin determined offset frequency range from –0.8 to –1.8 MHz
peak(1)	Margin in offset frequency range from –0.8 to –1.8 MHz
freq(2)	Offset frequency at point margin determined in offset frequency range from –1.8 to –2.4 MHz
peak(2)	Margin in offset frequency range from –1.8 to –2.4 MHz
freq(3)	Offset frequency at point where margin determined in offset frequency range from –2.4 to –4.0 MHz
peak(3)	Margin in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query margin from Spectrum Emission Mask template and frequency at lower side of each frequency range:

:FETC:CELL:TDSC:FUND:SEM:MARG:LOW?

> -0.800,3.00,-1.500,3.00,-2.000,3.00,-3.500,3.00

:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:UPPer?

Margin of Spectrum Emission Mask (Upper)

Function

Queries spectrum margin and offset frequency in each upper frequency range of Spectrum Emission Mask

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:SEMask:MARGin:UPPer?
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency at point where margin determined
Resolution	0.001 MHz
<peak(n)>:	Margin from template
Resolution	0.01 dB

Parameters

<freq(0)>	Offset frequency +0.8 MHz
<peak(0)>	Margin in offset frequency +0.8 MHz
<freq(1)>	Offset frequency at point where margin determined in offset frequency range from +0.8 to +1.8 MHz
<peak(1)>	Margin in offset frequency range from +0.8 to +1.8 MHz
<freq(2)>	Offset frequency at point where margin determined in offset frequency range from +1.8 to +2.4 MHz
<peak(2)>	Margin in offset frequency range from +1.8 to +2.4 MHz
<freq(3)>	Offset frequency at point where margin determined in offset frequency range from +2.4 to +4.0 MHz
<peak(3)>	Margin in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query margin from Spectrum Emission Mask template and frequency at upper side of each frequency range:

:FETC:CELL:TDSC:FUND:SEM:MARG:UPP?

> 0.800,3.00,1.600,3.00,2.100,3.00,3.500,3.00

:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:JUDGement?

Result of Power Template Measurement Template Judgement

Function

Queries whether the spectrum in the Power Template measurement is not more than the specified threshold.

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:JUDGement?
```

Response

<judgement>	Judgement result
PASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

To query whether the spectrum is not more than the specified threshold:

:FETC:CELL:TDSC:FUND:TEMP:JUDG?

> PASS

:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:M50Power?

Result of Power Template Measurement –50dBm

Function

Queries the Tx power measurement result in the section where Power Template before burst transmission is restricted to –50 dBm (–50dBm).

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:M50Power? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<pwr>

Unit:	dBm
Resolution:	0.01

Parameter

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the section where Power Template before burst transmission is set to –50 dBm:

:FETC:CELL:TDSC:FUND:TEMP:M50P? AVG
> 1.50

:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:MINus?

Result of Power Template Measurement Off Power (TS s-1)

Function

Queries the Tx power measurement result in the transmission-off section before burst transmission (Off power (TS s-1))

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:MINus? <mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<pwr>

Unit	dB
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section before burst transmission:
:FETC:CELL:TDSC:FUND:TEMP:OFFP:MIN? AVG
> 1.50

:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:PLUS?

Result of Power Template Measurement Off Power(TS s+1)

Function

Queries the Tx power measurement result in the transmission-off section after burst transmission (Off Power(TS s+1)).

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:TEMPlate:OFFPower:PLUS? <mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<pwr>

Unit	dB
Resolution	0.01

Parameters

<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section after burst transmission:

:FETC:CELL:TDSC:FUND:TEMP:OFFP:PLUS? AVG

> 1.50

:FETCh:CELLular:TDSCdma:FUNDamental:TRACe?

Waveform Data

Function

Queries waveform data for each measurement result

Query

```
:FETCh:CELLular:TDSCdma:FUNDamental:TRACe? <format>,<position>,<length>
```

Response

<data(0)>,<data(1)>,<data(2)>,…,<data(length–1)>

<Format>	Unit	Resolution
1, 2, 11	dBm	0.01 dB
3, 4	None	0.0001
5, 6, 9, 10	%	0.01%
7, 8	degree	0.01 degree

Parameters

<format>	Format
1	Measured spectrum for Occupied Bandwidth
2	Measured spectrum for Spectrum Emission Mask
3	Measured waveform for Constellation (I)
4	Measured waveform for Constellation (Q)
5	Measured waveform for EVM (Average)
6	Measured waveform for EVM (Maximum)
7	Measured waveform for Phase Error (Average)
8	Measured waveform for Phase Error (Maximum)
9	Measured waveform for Magnitude Error (Average)
10	Measured waveform for Magnitude Error (Maximum)
11	Measured waveform for Tx Power
<position>	Starting point of waveform data
Range	format1: 0 to 492
	format2: 0 to 820
	format3 to format10: 0 to 847
	format11: 0 to 2591
Resolution	1
<length>	Number of data to be read out
Range	format1: 1 to (493 – position)
	format2: 1 to (821 – position)
	format3 to format10: 1 to (848 – position)
	format11: 1 to (2592 – position)
<data(0)>	Waveform data(0)

<data(1)>	Waveform data(1)
<data(length–1)>	Waveform data(length–1)

Details

Data in the average format are equivalent to results in the Average storage mode.
Data in the maximum format are equivalent to results in the Peak-hold storage mode.

Example of Use

To query 256 points of the measured waveform data for EVM (Average) from 257th point:

```
:FETC:CELL:TDSC:FUND:TRAC? 5,256,256
> 2.00,2.01,2.00,…,2.10
```

:TRIGger:CELLular:TDSCdma:FUNDamental:LEVel

Trigger Level

Function

Sets or queries trigger level.

Command

```
:TRIGger:CELLular:TDSCdma:FUNDamental:LEVel <trglevel>
```

Query

```
:TRIGger:CELLular:TDSCdma:FUNDamental:LEVel?
```

Response

<trglevel>

Unit	dB

Parameter

<trglevel>	Trigger Level
Range	–40 to 0 dB
Resolution	1 dB
Suffix code	DB
Default	–30 dB

Example of Use

To set the trigger level to –10.0 dBm:

:TRIG:CELL:TDSC:FUND:LEV -10.0

:TRIG:CELL:TDSC:FUND:LEV?

> -10.0

:TRIGger:CELLular:TDSCdma:FUNDamental:SOURce

Trigger Source

Function

Sets or queries Trigger Source

Command

```
:TRIGger:CELLular:TDSCdma:FUNDamental:SOURce <source>
```

Query

```
:TRIGger:CELLular:TDSCdma:FUNDamental:SOURce?
```

Response

<source>

Parameter

<source>	Trigger Source
FREERUN	Freerun
PWR	Input signal power
FRAME	Frame
Default	PWR

Example of Use

To set trigger source to Freerun:

:TRIG:CELL:TDSC:FUND:SOUR FREERUN

:TRIG:CELL:TDSC:FUND:SOUR?

> FREERUN

:TRIGger:CELLular:TDSCdma:FUNDamental:TOUT

Trigger Timeout

Function

Sets or queries trigger timeout.

Command

```
:TRIGger:CELLular:TDSCdma:FUNDamental:TOUT <trgtime>
```

Query

```
:TRIGger:CELLular:TDSCdma:FUNDamental:TOUT?
```

Response

<trgtime>

Unit	s

Parameter

<trgtime>	Time Out
Range	1 to 10 s
Resolution	1 s
Suffix code	S
Default	10 s

Example of Use

To set the Trigger timeout time to 5 seconds:

:TRIG:CELL:TDSC:FUND:TOUT 5

:TRIG:CELL:TDSC:FUND:TOUT?

> 5

4.2.3 Sequence measurement commands

:CONFigure:CELLular:GENerator:RFSettings:FREQuency

Downlink Frequency

Function

Sets or queries MU887000A downlink frequency

Command

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency <dl_freq>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:FREQuency?
```

Response

<dl_freq>

Parameter

<dl_freq>	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz omitted)
Default	2010.800000 MHz

Details

The Rx frequency is set for the mobile station.
Changing the setting of the downlink frequency does not change the setting of the downlink channel.

Example of Use

To set the downlink frequency to 2120 MHz:
:CONF:CELL:GEN:RFS:FREQ 2120MHZ
:CONF:CELL:GEN:RFS:FREQ?
>2120000000

:CONFigure:CELLular:GENerator:RFSettings:LEVel

Output Level

Function

Sets or queries RF signal total output level for all channels

Command

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:GENerator:RFSettings:LEVel?
```

Response

<level>

Unit	dBm

Parameter

<level>	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)
	–120.0 to 0.0 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–66.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Correction is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Examples of Use

To set the output level to –50.0 dBm:
:CONF:CELL:GEN:RFS:LEV –50.0
:CONF:CELL:GEN:RFS:LEV?
> -50.0

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

:CONFigure:CELLular:MEASurement:RFSettings:FREQuency

Uplink Frequency

Function

Sets or queries MU887000A Rx frequency (uplink frequency)

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency <ul_freq>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:FREQuency?
```

Response

<ul_freq>

Unit	Hz

Parameter

<ul_freq>	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

This sets the Tx frequency for the mobile station.
Changing the setting of the Uplink Frequency parameter does not change the Uplink Channel setting.

Example of Use

To set the uplink frequency to 1921 MHz:
:CONF:CELL:MEAS:RFS:FREQ 1921MHZ
:CONF:CELL:MEAS:RFS:FREQ?
>1921000000

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel <level>
```

Query

```
:CONFigure:CELLular:MEASurement:RFSettings:LEVel?
```

Response

<level>

Unit	dBm

Parameter

<level>	Input level
Range	–65.0 to +35.0 dBm (Port 1/Port 2)
	–65.0 to +25.0 dBm (Port 3/Port 4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.
When the Cable Loss Correction is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Example of Use

To set input level of MU887000A connector -10 dBm

```
:CONF:CELL:MEAS:RFS:LEV -10
:CONF:CELL:MEAS:RFS:LEV?
> -10.0
```

Related Commands

[:ROUTe]:EXTLoss:TABLe:SWITch
:CALCulate:EXTLoss:TABLe:SETTing
:CALCulate:EXTLoss:TABLe:VALue
For details of the commands, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

:CONFigure:CELLular:SEQuence:CONTrol

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table.

Sets the parameters for both measurement and signal transmission.

Command

```
:CONFigure:CELLular:SEQuence:CONTrol <start>,<end>
```

Query

```
:CONFigure:CELLular:SEQuence:CONTrol?
```

Response

<start>,<end>

Parameters

<start>	Start segment
Range	0 to 1999
Resolution	1
Default	0
<end>	Stop segment
Range	<start> to 1999
Resolution	1
Default	199

Details

<start< = 0 to 1999, <end> = 0 to 1999 where <end> ≥ <start>

Whether the set sequence table can be executed is evaluated.

Use the :FETCh:CELLular:SEQuence:ERRor? command to query the error details.

Example of Use

To set the start and stop segments to 20 and 52, respectively:

:CONF:CELL:SEQ:CONT 20,52

:CONF:CELL:SEQ:CONT?

> 20,52

:CONFigure:CELLular:SEQuence:CONTrol:TX

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table.

Sets the measurement parameters only, without affecting the signal transmission parameters.

Command

```
:CONFigure:CELLular:SEQuence:CONTrol:TX <start>,<end>
```

Query

```
:CONFigure:CELLular:SEQuence:CONTrol:TX?
```

Response

```
<start>,<end>
```

Parameters

<start>	Start segment
Range	0 to 1999
Resolution	1
Default	0
<end>	Stop segment
Range	<start> to 1999
Resolution	1
Default	0

Details

<start> = 0 to 1999, <end> = 0 to 1999 where <end> ≥ <start>

Whether the set sequence table can be executed is evaluated.

Use the :FETCh:CELLular:SEQuence:ERRor? command to query the error details.

Examples of Use

To set the start and stop segments to 20 and 55, respectively:

:CONF:CELL:SEQ:CONT 20,55

:CONF:CELL:SEQ:CONT?

> 20,55

:CONFigure:CELLular:SEQuence:RFSettings:REINit

Sequence Control Parameter - Sequence End State Reinitialization

Function

Enables automatic initialization of following items after completion of sequence measurement mode operation, queries setting

- Downlink frequency
- Output level
- Output signal pattern
- Uplink frequency
- Input level

Command

```
:CONFigure:CELLular:SEQuence:RFSettings:REINit <sw>
```

Query

```
:CONFigure:CELLular:SEQuence:RFSettings:REINit?
```

Response

<sw>

Parameter

<sw>	Automatic initialization after sequence measurement completion
ON	Enables automatic initialization
OFF	Disables automatic initialization
Default	ON

Details

If the parameter is set to ON, the settings are initialized to the values configured by the following commands after sequence measurement completion.

Downlink frequency	:CONFigure:CELLular:GENerator:RFSettings:FREQuency
Output level	:CONFigure:CELLular:GENerator:RFSettings:LEVel
Output signal pattern	:CONFigure:CELLular:GENerator:ARB:WAVeform:PATTern:SELect
Uplink frequency	:CONFigure:CELLular:MEASurementRFSettings:FREQuency
Input level	:CONFigure:CELLular:MEASurement:RFSettings:LEVel

If the parameter is set to OFF, the settings remain those of the sequence measurement stop segment.

Example of Use

To reset target parameters:

:CONF:CELL:SEQ:RFS:REIN ON

:CONF:CELL:SEQ:RFS:REIN?

> ON

:CONFigure:CELLular:SEQuence:RFSettings:TRX

Sequence Table Parameter - TRX control

Function

Sets or queries following items in specific segment of sequence table

- Downlink frequency
- Output Level
- Output signal pattern
- Uplink frequency
- Input level

Command

```
:CONFigure:CELLular:SEQuence:RFSettings:TRX
<seg>,<ul_freq>,<ref>,<dl_freq>,<level>,<pat>
```

Query

```
:CONFigure:CELLular:SEQuence:RFSettings:TRX? <seg>
```

Response

<ul_freq>,<ref>,<dl_freq>,<level>,<pat>

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<ul_freq>	Receive frequency (Uplink)
Range	400.000000 to 3800.000000 MHz
Resolution	0.000001 MHz
Suffix Code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
<ref>	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–10.0 dBm
<dl_freq>	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	0.000001 MHz
Suffix Code	HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ (uses MHz when omitted)
Default	2140.000000 MHz
<level>	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2)

		–120.0 to 0.0 dBm (Port3/Port4)
	Resolution	0.1 dB
	Suffix Code	DBM (used dBm when omitted)
	Default	–60.0 dBm
<pat>		Waveform pattern
	PAT1 to PATn	Pattern number (n: waveform information file group range)
	CW	Modulation turned OFF
	OFF	Output level turned OFF
	NC	Waveform pattern not configured in this segment (holds currently configured waveform pattern)
	Default	CW

Details

The setting range varies with the input/output port setting.
If Cable Loss Correction is ON, the cable loss is added to the range of the input level and subtracted from the range of output level.
If the cable loss is 5 dB, the input and output levels are as follows:

Input level	–60.0 to +40 dBm
Output level	–135.0 to –15.0 dBm

In this case, if the output level is set to –10.0 dBm, an out-of-parameter setting range error occurs. (The response to :SYSTem:ERRor? returns 220, Parameter error).
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
:CONFigure:CELLular:SEQuence:CONTrol,:INITiate:CELLular:MEASurement:SINGle,
:INITiate:CELLular:SEQuence:EXECute:TX
A measurement execution error occurs when an out-of-range error occurs.
:FETCh:CELLular:SEQuence:ERRor? is used to query the error details.

The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the "Waveform Files for Cellular Application Operation Manual".

Example of Use

To set segment 0 as follows.
Uplink frequency set to 1950.0 MHz, input level to –10.0 dBm, downlink frequency to 2140.0 MHz, output level to –60.0 dBm, and no modulation:

```
:CONF:CELL:SEQ:RFS:TRX 0,1950.000000,-10.0,2140.000000,-60.0,CW
:CONF:CELL:SEQ:RFS:TRX? 0
> 1950.000000,-10.0,2140.000000,-60.0,CW
```

Remarks

The group range is the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, “Waveform File Details” in the "Waveform Files for Cellular Application Operation Manual".

:CONFigure:CELLular:SEQuence:RFSettings:TX

Sequence Table Parameter - Uplink Frequency, Input Level

Function

Sets or queries uplink frequency and input level of segments in sequence table.

Command

```
:CONFigure:CELLular:SEQuence:RFSettings:TX <seg>,<ul_freq>,<ref>
```

Query

```
:CONFigure:CELLular:SEQuence:RFSettings:TX? <seg>
```

Response

```
<ul_freq>,<ref>
```

Parameter

<seg>	Segment number
Range	0 to 1999
Resolution	1
<ul_freq>	Rx frequency (uplink)
Range	400.000000 to 3800.000000 MHz
Resolution	0.000001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
<ref>	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

This command sets only the uplink frequency and input level among the parameters that are set by :CONFigure:CELLular:SEQuence:RFSettings:TRX.
The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
:CONFigure:CELLular:SEQuence:CONTrol,:INITiate:CELLular:MEASurement:SINGle,
:INITiate:CELLular:SEQuence:EXECute:TX

Example of Use

To set the parameters for segment 1 as follows:
Uplink frequency: 1950 MHz, Input level: –10.0 dBm
:CONF:CELL:SEQ:RFS:TX 1,1950,-10.0
:CONF:CELL:SEQ:RFS:TX? 1
> 1950.000000,-10.0

:CONFigure:CELLular:SEQuence:RXPort

Sequence Table Parameter - SG Output Port

Function

Sets or queries test port to send RF signal in specified segment of sequence table

Command

```
:CONFigure:CELLular:SEQuence:RXPort <seg>,<port>
```

Query

```
:CONFigure:CELLular:SEQuence:RXPort? <seg>
```

Response

<port>

Parameters

<seg>	Segment number
Range	0 to 1999
<port>	Port number
PORT1	PORT 1
PORT2	PORT 2
PORT3	PORT 3
PORT4	PORT 4
Default	PORT1

Details

PORT3 cannot be set when PORT3 is selected for RF signal input port.
PORT4 cannot be set when PORT4 is selected for RF signal input port.

Example of Use

To set the port number in segment 5 to 2
:CONF:CELL:SEQ:RXP 5,PORT2
:CONF:CELL:SEQ:RXP? 5
> PORT2

:CONFigure:CELLular:SEQuence:SETup

Sequence Table Parameter - Measurement

Function

Sets or queries measurement conditions of specified segment

Command

```
:CONFigure:CELLular:SEQuence:SETup <seg>,<mode>,<step>,<mcond>
```

Query

```
:CONFigure:CELLular:SEQuence:SETup? <seg>
```

Response

<mode>,<step>,<mcond>

Parameters

<seg>	Segment number	
Range	0 to 1999	
Resolution	1	
<mode>	Measurement mode	Required software license
TXP	Tx power measurement mode	MX887010A
WCDMA	W-CDMA measurement mode	MX887010A and MX887011A
GSM	GSM measurement mode	MX887010A and MX887012A
CDMA2K	CDMA2000 1x measurement mode	MX887010A and MX887015A
EVDO	CDMA2000 1xEVDO measurement mode	MX887010A and MX887016A
TDSCDMA	TD-SCDMA measurement mode	MX887010A and MX887017A
LTE	LTE measurement mode	MX887010A and MX887013A, or MX887010A and MX887014A
Default	TXP	
<step>	Step count	
Range	2 to 3000	
Resolution	1	
Default	2	
<mcond>	Measurement condition number	
Range	0 to 1999	
Resolution	1	
Default	0	

Example of Use

To set settings for segment 2 as follows:

Measurement mode: TD-SCDMA, Step count: 1000, Measurement condition number: 3

:CONF:CELL:SEQ:SET 2, TDSCDMA,1000,3

:CONF:CELL:SEQ:SET? 2

> TDSCDMA,1000,3

:CONFigure:CELLular:SEQuence:TABLe

Sequence Control Parameter - Sequence Table

Function

Sets or queries number of sequence table to execute

Command

```
:CONFigure:CELLular:SEQuence:TABLe <table>
```

Query

```
:CONFigure:CELLular:SEQuence:TABLe?
```

Response

<table>

Parameters

<table>	Sequence table number
Range	0 to 3
Resolution	1
Default	0

Example of Use

To select sequence table 1:

:CONF:CELL:SEQ:TABL 1

:CONF:CELL:SEQ:TABL?

> 1

:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET

ACLR Measurement Enable and Count

Function

Enables Adjacent Channel Leakage Power Ratio measurement and sets measurement count in Sequence Measurement mode, or queries settings

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET <mcond>,<on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET? <mcond>
```

Response

<on_off>,<count>

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<on_off>	Enables/disables measurement
ON	Turns measurement on
OFF	Disables measurement
Default	OFF
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Adjacent Channel Leakage Power Ratio measurement and set the measurement count to 80 at measurement condition number 3:

```
:CONF:CELL:SEQ:TDSC:ACLR:SET 3,ON,80
:CONF:CELL:SEQ:TDSC:ACLR:SET? 3
> ON,80
```

4

SCPI Command Reference

:CONFigure:CELLular:SEQuence:TDSCdma:AMITems:OFF

Turn Off All Measurement Items

Function

Sets all measurement items to Off collectively.

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:AMITems:OFF <mcond>
```

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1

Example of Use

To set all measurement items of condition number 0 in the TDSCDMA measurement condition table to Off collectively.

:CONF:CELL:SEQ:TDSC:AMIT:OFF 0

Remarks

This is equivalent to setting all the commands below to Off.

:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET
:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET
:CONFigure:CELLular:SEQuence:TDSCdma:ACLR:SET
:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET
:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET

:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET

Modulation Analysis Measurement Enable and Count

Function

Enables Modulation Analysis Measurement and sets measurement count in Sequence Measurement mode, or queries set values

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET
<mcond>,<on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:MODulation:SET? <mcond>
```

Response

<on_off>,<count>

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Modulation Analysis measurement and set the measurement count to 120 for measurement condition number 25:

:CONF:CELL:SEQ:TDSC:MOD:SET 25,ON,120

:CONF:CELL:SEQ:TDSC:MOD:SET? 25

> ON,120

:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET

OBW Measurement Enable and Count

Function

Enables Occupied Bandwidth measurement and sets measurement count in Sequence Measurement mode, or queries settings

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET <mcond>,<on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:OBW:SET? <mcond>
```

Response

<on_off>,<count>

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Occupied Bandwidth measurement and set the measurement count to 100 for the measurement condition number 2 in Sequence Measurement mode:

:CONF:CELL:SEQ:TDSC:OBW:SET 2,ON,100

:CONF:CELL:SEQ:TDSC:OBW:SET? 2

> ON,100

:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET

Tx Power Measurement Enable and Count

Function

Enables Tx Power measurement and sets measurement count in Sequence Measurement mode, or queries settings

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET <mcond>,<on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:POWer:SET? <mcond>
```

Response

<on_off>,<count>

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Transmit Power measurement and set the measurement count to 10 for measurement condition number 5 in Sequence Measurement mode:

```
:CONF:CELL:SEQ:TDSC:POW:SET 5,ON,10
:CONF:CELL:SEQ:TDSC:POW:SET? 5
> ON,10
```

:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:LIMit

Spectrum Emission Mask - Mask Template Lower Limit

Function

Sets absolute lower level threshold (minimum threshold power) for Spectrum Emission Mask measurement in Sequence Measurement mode, queries setting

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:LIMit <level>
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:LIMit?
```

Response

<level>

Unit	dBm

Parameter

<level>	Template threshold
Range	–100.0 to 0.0
Resolution	0.1 dBm
Default	–50.0 dBm

Example of Use

To set the absolute lower level threshold (minimum threshold power) for the Spectrum Emission Mask measurement to –100.0 dBm:

:CONF:CELL:SEQ:TDSC:SEM:LIM -100.0

:CONF:CELL:SEQ:TDSC:SEM:LIM?

> -100.0

:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET

SEM Measurement Enable and Count

Function

Enables Spectrum Emission Mask Measurement and sets measurement count in Sequence Measurement mode, and queries settings

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET
<mcond>,<on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:SET? <mcond>
```

Response

<on_off>,<count>

Parameters

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Spectrum Emission Mask measurement and set the measurement count to 20 for the measurement condition number 8 in Sequence Measurement mode:

```
:CONF:CELL:SEQ:TDSC:SEM:SET 8,ON,20
:CONF:CELL:SEQ:TDSC:SEM:SET? 8
> ON,20
```

:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:TEMPlate

Spectrum Emission Mask - Mask Template

Function

Sets relative threshold for the Spectrum Emission Mask measurement in Sequence Measurement mode, and queries setting

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:TEMPlate <offset>,<level>
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:SEMask:TEMPlate? <offset>
```

Response

<level>

Parameters

<offset>	Offset frequency point		
Range	1 to 4		
Resolution	1		
<level>	Level at each offset frequency point		
Range	Offset point	Level	Default
	1 (0.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–33.5 dBc
	2 (1.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–47.5 dBc
	3 (2.4 MHz, RBW=1 MHz)	–100.0 to 0.0	–57.7 dBc
	4 (2.4 to 4.0 MHz, RBW=1 MHz)	–100.0 to 0.0	–42.5 dBc
Resolution	0.1 dBc		

Example of Use

To set the relative threshold at Point3 (2.4 MHz frequency offset) for the Spectrum Emission Mask measurement to –60.0 dBc in Sequence Measurement mode:

```
:CONF:CELL:SEQ:TDSC:SEM:TEMP 3,-60.0
:CONF:CELL:SEQ:TDSC:SEM:TEMP? 3
> -60.0
```

:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET

Power Template Measurement Enable and Count

Function

Enables Power Template measurement and sets measurement count in Sequence Measurement mode, or queries settings

Command

```
:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET
<mcond>,<on_off>[,<count>]
```

Query

```
:CONFigure:CELLular:SEQuence:TDSCdma:TEMPlate:SET? <mcond>
```

Response

<on_off>,<count>

Parameter

<mcond>	Measurement condition number
Range	0 to 1999
Resolution	1
<on_off>	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	ON
<count>	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Power Template measurement and set the measurement count to 10 for the measurement condition number 8 :

```
:CONF:CELL:SEQ:TDSC:TEMP:SET 8,ON,10
:CONF:CELL:SEQ:TDSC:TEMP:SET? 8
> ON,10
```

:FETCh:CELLular:SEQuence:ERRor?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
:FETCh:CELLular:SEQuence:ERRor? [<item>]
```

Response

Query parameter	Response
None:	<n>,<err(0)>,..,<err(n–1)>
ILVL, OLVL, STEP, DLPAT, PORT:	<ns>,<seg(0)>,..,<seg(ns–1)>
LEN:	<e>,<mem>,<exe>,<set>
OLVLNUM, PATNUM, STDNUM:	<e>,<exe>,<set>

If no error is found in the sequence table, the response returns 0.

Parameters

<item>	Parameter of sequence table	
ILVL	Input level	
OLVL	Output level	
STEP	Step count	
DLPAT	Waveform pattern	
PORT	Port	
LEN	Capture memory length	
OLVLNUM	Output level change count	
PATNUM	Waveform pattern change count	
STDNUM	Measurement mode change count	
<n>	Number of errors	
Range	0 to 4	
<err(n–1)>	Parameter with error	
ILVL	Input level	
OLVL	Output level	
STEP	Number of steps	
LEN	Capture memory length	
<ns>	Number of segments with errors	
Range	0 to 200	
<seg(ns–1)>	Segment number with errors	
Range	0 to 1999	
<e>	Presence of errors	
Range	0	No error, executable
	1	Errors found, not executable
<mem>	Memory utilization	

Range	0.0 to 100.0%
Resolution	0.1%
<exe>	Number of capture capable of executing capture out of number of configured segments
Range	0 to 200
<set>	Number of segments with capture configured
Range	0 to 200

Details

This command can check error presence of input level, output level, step count, and capture memory length.
To query error presence of the following parameters,
use :FETCh:CELLular:SEQuence:ERRor2? command.
Waveform pattern, port, output level change count, waveform pattern change count, measurement mode change count.

To set parameters for sequence table using the following commands, errors are not checked.
:CONFigure:CELLular:SEQuence:RFSettings:TRX
:CONFigure:CELLular:SEQuence:RFSettings:TX
:CONFigure:CELLular:SEQuence:SETup

Examples of Use

To query presence of error:
:FETC:CELL:SEQ:ERR?
>1,ILVL

To query the input level setting error information:
:FETC:CELL:SEQ:ERR? ILVL
>2,3,12

To query capture memory error information:
:FETC:CELL:SEQ:ERR? LEN
>0,25.0,20,20
Here, the capture memory utilization is 25.0%, so all captures configured in 20 segments are executable.

Remarks

The Sequence Measurement mode cannot be started if there is an error.
However, the sequence can be started by using the :CONFigure:CELLular:SEQuence:CONTrol command to detect any segment with an error and exclude it from the executable range.

:FETCh:CELLular:SEQuence:ERRor2?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
:FETCh:CELLular:SEQuence:ERRor2? <format>
```

Response

<n>,<err(0)>,..,<err(n-1)>

If no error is found in the sequence table, the response returns 0.

Parameters

<format>	Format
1	Error Check 1
<n>	Number of errors
Range	0 to 7
<err(n-1)>	Parameter with errors
ILVL	Input level
OLVL	Output level
STEP	Step count
DLPAT	Waveform pattern
PORT	Port
LEN	Capture memory length
OLVLNUM	Output level change count
PATNUM	Waveform pattern change count
STDNUM	Measurement mode change count

Details

Parameter setting errors can be checked up to seven types.
Only one of output level change count, waveform pattern change count, or measurement mode change count has an error.
Two or three of them cannot have an error simultaneously.

To set parameters for sequence table using the following commands, errors are not checked.

:CONFigure:CELLular:SEQuence:RXPort
:CONFigure:CELLular:SEQuence:RFSettings:TRX
:CONFigure:CELLular:SEQuence:RFSettings:TX
:CONFigure:CELLular:SEQuence:SETup

To query error details per parameter, use :FETCh:CELLular:SEQuence:ERRor command.

Example of Use

To query the presence of errors:
:FETC:CELL:SEQ:ERR2? 1
>2,ILVL,DLPAT

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the :CONFigure:CELLular:SEQuence:CONTrol command.

:FETCh:CELLular:SEQuence:PROGress?

Sequence progress

Function

Queries progress rate of sequence measurement and currently operating sequence number

Query

```
:FETCh:CELLular:SEQuence:PROGress?
```

Response

<p>,<cur>,<start>,<stop>

Parameters

<p>	Progress rate of sequence measurement
Range	0% to 100 %
<cur>	Segment number currently executing
Range	0 to 1999
<start>	Segment number executed first
Range	0 to 1999
<stop>	Segment number executed last
Range	0 to 1999

Example of Use

To query sequence measurement progress and currently executing sequence number:
:FETC:CELL:SEQ:PROG?
>65,23,11,30

Remarks

The segment number where measurement is executed first and the segment number where measurement is executed last are same as the start and stop segment numbers configured using the :CONFigure:CELLular:SEQuence:CONTrol command.

:FETCh:CELLular:SEQuence:SEG:STATe?

Specified Segment Status

Function

Queries measurement status of specified segment

Query

```
:FETCh:CELLular:SEQuence:SEG:STATe? <seg>
```

Response

<stat>

Parameters

<seg>	Segment number
Range	0 to 1999
<stat>	Segment status
0	Measurement completed successfully
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
10	Segment not measured
12	Tx measurement timeout

The value received from MX887017A is 0, 2, 5, 9, 10, or 12.

Example of Use

To query the measurement status of segment 16:

:FETC:CELL:SEQ:SEG:STAT? 16

> 0

:FETCh:CELLular:SEQuence:STATe?

Sequence measurement status

Function

Queries status of sequence measurement

Query

```
:FETCh:CELLular:SEQuence:STATe?
```

Response

<m_status>,<n>,<s(0)>,<s(1)>,..,<s(n–1)>

Parameters

<m_status>	Measurement execution status
0	Measurement completed successfully
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
12	Tx measurement timeout

The value received from MX887017A is 0, 2, 5, 9, or 12.

<n>	Number of measured segments
Range	0 to 200
<s(n–1)>	Measurement status of specified segment
0	Measurement completed successfully
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
10	Segment not measured
12	Tx measurement timeout

The value received from MX887017A is 0, 2, 5, 9, 10, or 12.

Example of Use

To query status of sequence measurement:

```
:FETC:CELL:SEQ:STAT?
>2,6,0,0,0,0,2,0
```

The results shows that six segments are measured segments and the fifth segment is over level.

Related commands

```
:FETCh:CELLular:MEASurement:STATe
:FETCh:CELLular:SEQuence:SEG:STATe
```

:FETCh:CELLular:SEQuence:TDSCdma:ACLR?

Result of Adjacent Channel Leakage Power Ratio

Function

Queries Adjacent Channel Leakage Power Ratio measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:ACLR? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg(0)>,<avg(1)>,<avg(2)>,<avg(3)>,<max(0)>,<max(1)>,<max(2)>,<max(3)>,<min(0)>,<min(1)>,<min(2)>,<min(3)>
When <mode> ≠ TTL,
<aclr(0)>,<aclr(1)>,<aclr(2)>,<aclr(3)>

Unit	dB
Resolution	0.01

Parameter number	Frequency offset
0	–3.2 MHz
1	–1.6 MHz
2	+1.6 MHz
3	+3.2 MHz

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<aclr>	Measurement result in specified Storage mode

Example of Use

To query average value of ACLR measurement results for segment 1 in the Sequence

Measurement mode:
:FETC:CELL:SEQ:TDSC:ACLR? 1,AVG
> -20.00,-21.00,-22.00,-23.00

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:CFRequency?

Carrier Frequency Result of Modulation Analysis

Function

Queries Carrier Frequency measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:CFRequency? <seg>
```

Response

<freq>

Unit	Hz
Resolution	1

Parameter

<seg>	Segment number
Range	0 to 1999
Resolution	1
<freq>	Carrier frequency

Example of Use

To query the carrier frequency measurement result for segment 1 in the Sequence Measurement mode:
:FETC:CELL:SEQ:TDSC:MOD:CFR? 1
> 1951000000

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:EVM?

EVM Result of Modulation Analysis

Function

Queries EVM measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:EVM? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<evm>

Unit	%
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<evm>	Measurement result in specified Storage mode

Example of Use

To query average of EVM Measurement results for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:MOD:EVM? 1,AVG
> 1.50

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor?

Carrier Frequency Error Result of Modulation Analysis

Function

Queries Carrier Frequency Error measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg_ppm>,<avg_Hz>,<max_ppm>,<max_Hz>,<min_ppm>,<min_Hz>
When <mode> ≠ TTL,
<freq_ppm>,<freq_Hz>

Unit	ppm, Hz
Resolution	0.01,0.1

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg_ppm>	Average of Frequency Error measurement results in ppm
<avg_Hz>	Average of Frequency Error measurement results in Hz
<max_ppm>	Maximum value in Frequency Error measurement results in ppm
<max_Hz>	Maximum value in Frequency Error measurement results in Hz
<min_ppm>	Minimum value in Frequency Error measurement results in ppm
<min_Hz>	Minimum value in Frequency Error measurement results in Hz
<freq_ppm>	Frequency Error measurement results in specified Storage mode in ppm
<freq_Hz>	Frequency Error measurement results in specified Storage mode in Hz

Example of Use

To query average of Frequency Error measurement results for segment 1 in Sequence Measurement mode:
:FETC:CELL:SEQ:TDSC:MOD:FERR? 1,AVG
> 0.03,60.0

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor:WORSt?

Carrier Frequency Error Result of Modulation Analysis (Worst)

Function

Queries worst value in Carrier Frequency Error measurement results in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:FERRor:WORSt? <seg>
```

Response

<freq_ppm>,<freq_Hz>

Unit	ppm, Hz
Resolution	0.01, 0.1

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<freq_ppm>	Worst value in Frequency Error measurement results in ppm
<freq_Hz>	Worst value in Frequency Error measurement results in Hz

Example of Use

To query worst value in Frequency Error measurement results for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:MOD:FERR:WORS? 1

> 0.03,60.0

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:IQIMbalance?

IQ Imbalance Result of Modulation Analysis

Function

Queries IQ Imbalance measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:IQIMbalance? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<iqimb>

Unit	%
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<iqimb>	Measurement result in specified Storage mode

Example of Use

To query average of IQ Imbalance Measurement results for segment 1 in Sequence Measurement mode:

```
:FETC:CELL:SEQ:TDSC:MOD:IQIM? 1,AVG
> 0.04
```

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SCPI Command Reference

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:MERRor?

Magnitude Error Result of Modulation Analysis

Function

Queries Magnitude Error measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:MERRor? <seg>,<mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<merr>

Unit	%
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<merr>	Measurement result in specified Storage mode

Example of Use

To query average of Magnitude Error measurement result for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:MOD:MERR? 1,AVG

> 1.05

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:ORGNoffset?

Origin Offset Result of Modulation Analysis

Function

Queries Origin Offset measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:ORGNoffset? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<orgnoffs>

Unit	dB
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<orgnoffs>	Measurement result in specified Storage mode

Example of Use

To query average of Origin Offset measurement result for segment 1 in Sequence Measurement mode

:FETC:CELL:SEQ:TDSC:MOD:ORGN? 1,AVG

> 0.04

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:PEVM?

Peak EVM Result of Modulation Analysis

Function

Queries Peak EVM measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:PEVM? <seg>,<mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<pevm>

Unit	%
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pevm>	Measurement result in specified Storage mode

Example of Use

To query average of peak EVM measurement results for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:MOD:PEVM? 1,AVG

> 1.75

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:PHERror?

Phase Error Result of Modulation Analysis

Function

Queries Phase Error measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:PHERror? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<perr>

Unit	degree
Resolution	0.01

Parameter

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<perr>	Measurement result in specified Storage mode

Example of Use

To query average of Phase Error measurement results for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:MOD:PHER? 1,AVG
> 1.55

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SCPI Command Reference

:FETCh:CELLular:SEQuence:TDSCdma:MODulation:RHO?

Rho Result of Modulation Analysis

Function

Queries the Rho measurement results in the sequence measurement.

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:MODulation:RHO? <seg>,<mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<rho>

Unit	None
Resolution	0.00001

Parameter

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<rho>	Measurement result in specified Storage mode

Example of Use

To query the average value of the Rho measurement results of segment number 1 in the sequence measurement.

:FETC:CELL:SEQ:TDSC:MOD:RHO? 1,AVG

> 0.00122

:FETCh:CELLular:SEQuence:TDSCdma:OBW?

Result of Occupied Bandwidth

Function

Queries Occupied Bandwidth measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:OBW? <seg>
```

Response

<bw>

Unit	MHz
Resolution	0.001

Parameter

<seg>	Segment number
Range	0 to 1999
Resolution	1
<bw>	Occupied Bandwidth [MHz]

Example of Use

To query Occupied Bandwidth measurement result for segment 0 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:OBW? 0

> 3.840

:FETCh:CELLular:SEQuence:TDSCdma:OBW:FREQuency?

Result of Occupied Bandwidth Frequency

Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:OBW:FREQuency? <seg>,<pos>
```

Response

<freq>

Unit	MHz
Resolution	0.001

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<pos>	Frequency position
UPPER	Upper frequency
LOWER	Lower frequency
CENTER	Center frequency
<freq>	Frequency (MHz)

Example of Use

To query the upper frequency of the Occupied Bandwidth for segment 1 in the Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:OBW:FREQ? 1,UPPER

> 1951.920

:FETCh:CELLular:SEQuence:TDSCdma:POWer:FLTPower?

Result of Filtered Power Measurement

Function

Queries Filtered Power measurement result in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:POWer:FLTPower? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> = AVG, MAX, MIN or DVT
<pwr>
When <mode> = IND,
<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>

Unit	dB
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode
<pwr(s)>	Measurement result at sth slot
s	Measurement count
Range	1 to 200

Example of Use

To query average of RRC Filtered Power Measurement result for segment 0 in Sequence Measurement mode:
:FETC:CELL:SEQ:TDSC:POW:FLTP? 0,AVG

> -20.00

:FETCh:CELLular:SEQuence:TDSCdma:POWer:M50Power?

Result of Power Template Measurement –50dBm

Function

Queries the Tx power measurement result in the section where Power Template before burst transmission is restricted to –50 dBm (–50dBm) in Sequence Measurement mode.

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:POWer:M50Power? <seg>,<mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> ≠ TTL,

<pwr>

Unit	dBm
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the section where Power Template before burst transmission is set to –50 dBm for segment 0 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:POW:M50P? 0,AVG

> 1.50

:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:MINus?

Result of Power Template Measurement Off Power (TS s-1)

Function

Queries the Tx power measurement result in the transmission-off section before burst transmission (Off power (TS s-1)) in Sequence Measurement mode.

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:MINus? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<pwr>

Unit	dB
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section before burst transmission for segment 0 in Sequence Measurement mode:
:FETC:CELL:SEQ:TDSC:POW:OFFP:MIN? 0,AVG
> 1.50

:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:PLUS?

Result of Power Template Measurement Off Power(TS s+1)

Function

Queries the Tx power measurement result in the transmission-off section after burst transmission (Off Power(TS s+1)) in Sequence Measurement mode.

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:POWer:OFFPower:PLUS? <seg>,<mode>
```

Response

When <mode> = TTL,
<avg>,<max>,<min>
When <mode> ≠ TTL,
<pwr>

Unit	dB
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section after burst transmission for segment 0 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:POW:OFFP:PLUS? 0,AVG
> 1.50

:FETCh:CELLular:SEQuence:TDSCdma:POWer:TEMPlate?

Result of Power Template Measurement Template Judgement

Function

Queries whether the spectrum in the Power Template measurement is not more than the specified threshold in Sequence Measurement mode.

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:POWer:TEMPlate? <seg>
```

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<judgement>	Judgement result
PPASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

Queries whether the spectrum is not more than the specified threshold for segment 0 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:POW:TEMP? 0

> PASS

:FETCh:CELLular:SEQuence:TDSCdma:POWer:TXPower?

Result of Tx Power Measurement

Function

Queries Tx Power measurement results in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:POWer:TXPower? <seg>,<mode>
```

Response

When <mode> = TTL,

<avg>,<max>,<min>

When <mode> = AVG, MAX, MIN or DVT

<pwr>

When <mode> = IND,

<s>,<pwr(1)>,<pwr(2)>,…,<pwr(s)>

Unit	dBm
Resolution	0.01

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<mode>	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
<avg>	Measurement result (Average)
<max>	Measurement result (Maximum)
<min>	Measurement result (Minimum)
<pwr>	Measurement result in specified Storage mode
<pwr(s)>	Tx Power of sth measurement
s	Measurement count
Range	1 to 200

Example of Use

To query average of Tx Power measurement result for segment 0 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:POW:TXP? 0,AVG

> -20.00

:FETCh:CELLular:SEQuence:TDSCdma:SEMask:JUDGement?

Judgement of Spectrum Emission Mask

Function

Queries whether spectrum threshold set at spectrum measurement exceeded or not

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:SEMask:JUDGement? <seg>
```

Response

<judgement>

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<judgement>	Judgement result
PASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

To query whether spectrum threshold set for segment 1 in Sequence Measurement mode exceeded or not:

:FETC:CELL:SEQ:TDSC:SEM:JUDG? 1

> PASS

:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:LOWer?

Result of Spectrum Emission Mask (Lower)

Function

Queries peak level and frequency of spectrum in each lower frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:LOWer? <seg>
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency of spectrum peak
Resolution	0.001 MHz
<peak(n)>:	Peak level of spectrum
Resolution	0.01 dB

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<freq(0)>	Offset frequency –0.8 MHz
<peak(0)>	Peak level of spectrum in offset frequency –0.8 MHz
<freq(1)>	Offset frequency of spectrum peak in offset frequency range from –0.8 to –1.8 MHz
<peak(1)>	Peak level of spectrum in offset frequency range from –0.8 to –1.8 MHz
<freq(2)>	Offset frequency of spectrum peak in offset frequency range from –1.8 to –2.4 MHz
<peak(2)>	Peak level of spectrum in offset frequency range from –1.8 to –2.4 MHz
<freq(3)>	Offset frequency of spectrum peak in offset frequency range from –2.4 to –4.0 MHz
<peak(3)>	Peak level of spectrum in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query peak level and frequency of spectrum in each lower frequency range for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:SEM:LEV:LOW? 1

> -0.800,-20.00,-1.500,-30.00,-2.200,-40.00,-3.200,-50.00

:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:UPPer?

Result of Spectrum Emission Mask (Upper)

Function

Queries peak level and frequency of spectrum in each upper frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:SEMask:LEVel:UPPer? <seg>
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency of spectrum peak
Resolution	0.001 MHz
<peak(n)>:	Peak level of spectrum
Resolution	0.01 dB

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<freq(0)>	Offset frequency +0.8 MHz
<peak(0)>	Peak level of spectrum in offset frequency +0.8 MHz
<freq(1)>	Offset frequency of spectrum peak in offset frequency range from +0.8 to +1.8 MHz
<peak(1)>	Peak level of spectrum in offset frequency range from +0.8 to +1.8 MHz
<freq(2)>	Offset frequency of the spectrum peak in offset frequency range from +1.8 to +2.4 MHz
<peak(2)>	Peak level of spectrum in offset frequency range from +1.8 to +2.4 MHz
<freq(3)>	Offset frequency of spectrum peak in offset frequency range from +2.4 to +4.0 MHz
<peak(3)>	Peak level of spectrum in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query peak level and frequency of spectrum in each upper frequency range for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:SEM:LEV:UPP? 1

> 0.800,-20.00,1.500,-30.00,2.300,-40.00,3.500,-50.00

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SCPI Command Reference

:FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:LOWer?

Margin of Spectrum Emission Mask (Lower)

Function

Queries spectrum margin and offset frequency in each lower frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:LOWer? <seg>
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency at point where margin determined
Resolution	0.001 MHz
<peak(n)>:	Margin from template
Resolution	0.01 dB

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<freq(0)>	Offset frequency –0.8 MHz
<peak(0)>	Margin in offset frequency –0.8 MHz
<freq(1)>	Offset frequency at point where margin determined in offset frequency range from –0.8 to –1.8 MHz
<peak(1)>	Margin in offset frequency range from –0.8 to –1.8 MHz
<freq(2)>	Offset frequency at point where margin determined in offset frequency range from –1.8 to –2.4 MHz
<peak(2)>	Margin in offset frequency range from –1.8 to –2.4 MHz
<freq(3)>	Offset frequency at point where margin determined in offset frequency range from –2.4 to –4.0 MHz
<peak(3)>	Margin in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query margin and frequency from Spectrum Emission Mask template spectrum in each lower frequency range for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:SEM:MARG:LOW? 1

> -3.000,3.00,-5.000,3.00,-8.000,3.00,-9.500,3.00

:FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:UPPer?

Margin of Spectrum Emission Mask (Upper)

Function

Queries spectrum margin and offset frequency in each upper frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
:FETCh:CELLular:SEQuence:TDSCdma:SEMask:MARGin:UPPer? <seg>
```

Response

<freq(0)>,<peak(0)>,<freq(1)>,<peak(1)>,<freq(2)>,<peak(2)>,<freq(3)>,<peak(3)>

<freq(n)>:	Offset frequency at point where margin determined
Resolution	0.001 MHz
<peak(n)>:	Margin from template
Resolution	0.01 dB

Parameters

<seg>	Segment number
Range	0 to 1999
Resolution	1
<freq(0)>	Offset frequency +0.8 MHz
<peak(0)>	Margin in offset frequency +0.8 MHz
<freq(1)>	Offset frequency at point where margin determined in offset frequency range from +0.8 to +1.8 MHz
<peak(1)>	Margin in offset frequency range from +0.8 to +1.8 MHz
<freq(2)>	Offset frequency at point where margin determined in offset frequency range from +1.8 to +2.4 MHz
<peak(2)>	Margin in the offset frequency range from +1.8 to +2.4 MHz
<freq(3)>	Offset frequency at point where margin determined in offset frequency range from +2.4 to +4.0 MHz
<peak(3)>	Margin in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query margin and frequency from Spectrum Emission Mask template spectrum in each upper frequency range for segment 1 in Sequence Measurement mode:

:FETC:CELL:SEQ:TDSC:SEM:MARG:UPP? 1

> 3.000,3.00,5.000,3.00,8.000,3.00,9.500,3.00

:INITiate:CELLular:SEQuence:EXECute:TX

Start Signal Analyzer Measurement Only

Function

Sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.

Command

```
:INITiate:CELLular:SEQuence:EXECute:TX
```

:TRIGger:CELLular:MEASurement:TOUT

Trigger Timeout

Function

Sets or queries trigger timeout

Command

```
:TRIGger:CELLular:MEASurement:TOUT <time>
```

Query

```
:TRIGger:CELLular:MEASurement:TOUT?
```

Response

<time>

Unit	s

Parameters

<time>	Timeout time
Range	1 to 60 s
Resolution	1 s
Suffix code	NS,US,MS,S (uses s when omitted)
Default	10 s

Example of Use

To set the Trigger timeout to 10 seconds:

:TRIG:CELL:MEAS:TOUT 10

:TRIG:CELL:MEAS:TOUT?

> 10

:TRIGger:CELLular:SEQuence

Sequence Table Parameter - Trigger

Function

Sets or queries trigger condition for starting Sequence Measurement

Command

```
:TRIGger:CELLular:SEQuence <seg>,<src>,<slope>,<level>,<delay>
```

Query

```
:TRIGger:CELLular:SEQuence? <seg>
```

Response

<src>,<slope>,<level>,<delay>

Parameters

<seg>	Segment number
Range	0 to 1999
<src>	Trigger source
FRAME	Frame
FREERUN	Free run
PWR	Input signal power
Default	FREERUN
<slope>	Trigger slope
RISE	Rising edge trigger
Default	RISE
<level>	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30 dB
<delay>	Delay time
Range	0 to 1000.000 ms
Resolution	0.001 ms
Suffix Code	NS, US, MS, S (uses ms when omitted)
Default	0.000 ms

Details

The trigger slope and trigger level are enabled when trigger source is set to PWR.

Example of Use

To set the trigger condition of segment 2 as follows:

Trigger source: PWR, Trigger slope: RISE, Trigger level: –30 dB, Delay time: 0

:TRIG:CELL:SEQ 2,PWR,RISE,-30,0

:TRIG:CELL:SEQ? 2

> PWR,RISE,-30,0.000

Remarks

Trigger level is defined as the level difference from the input level specified by the following commands:

:CONFigure:CELLular:MEASurement:RFSettings:LEVel

:CONFigure:CELLular:SEQuence:RFSettings:TRX

Chapter 5 Native Command Reference

This chapter describes the details of Native commands.
To switch to the Native command mode, send the command SYST:LANG NAT.

5

Native Command Reference

5.1 List of Commands

The following table shows the rules for describing messages.

[ ]	Messages or parameters in square brackets can be omitted.
|	Choose one of several choices. A | B | C | D indicates a choice of A, B, C, and D.
{}	Choose one of the groups in braces. A | B({C | D}) indicates a choice of A, B(C), or A, B(D).

5.1.1 Common commands

Common

Function	Command	Query	Response
Standard Select	STDSEL std	STDSEL?	std
Set Connect Port Direction	PORT input,output	PORT?	input,output

Measurements

Function	Command	Query	Response
Measurement Stop	MEASSTOP	-----	-----
Measurement Status	-----	MSTAT	m_status
Measurement Start	SNGLS	-----	-----
End Event Status (Measurement) Register Query	-----	ESR2?	register
Error Event Status (Measurement) Register Query	-----	ESR3?	register

Common Parameters

Function	Command	Query	Response
Output Level On/Off	LVL on_off	LVL?	on_off
Output Signal Modulation	MOD on_off	MOD?	on_off
Waveform File Select	PACKAGE pac	PACKAGE?	pac
Waveform Pattern Select	DLPAT pat	DLPAT?	pat
Waveform Pattern Select (SYNC)	DLPAT_SYNC pat	DLPAT_SYNC?	pat

System

Function	Command	Query	Response
Application Select	SYSSEL app	SYSSEL?	App
Language Selection of Remote Command	SYST:LANG mode	SYST:LANG?	mode

5.1.2 Fundamental measurement commands

Common Parameters

Function	Command	Query	Response
Input Level	ILVL level	ILVL?	level
Output Level	OLVL level	OLVL?	level
Channel	CHAN ch	CHAN?	ch
Downlink Frequency	RXFREQ dl_freq	RXFREQ?	dl_freq
	DLFREQ dl_freq	DLFREQ?	dl_freq
Uplink Frequency	TXFREQ ul_freq	TXFREQ?	ul_freq
	ULFREQ ul_freq	ULFREQ?	ul_freq
Measurement Select	MEASSEL meassel	MEASSEL?	meassel
Trigger Source	FMEAS_TRGSRC source	FMEAS_TRGSRC?	source
Trigger Level	FMEAS_TRGLVL level	FMEAS_TRGLVL?	level
Trigger Timeout	FMEAS_TRGTOUT time	FMEAS_TRGTOUT?	time

Fundamental Measurement Parameters

Function	Command	Query	Response
Turn Off All Measurement Items	ALLMEASITEMS_OFF	-----	-----
Uplink DPCH Timeslot	UDPCHSLOT slot	UDPCHSLOT?	slot
Midamble Configuration	MIDAMBLECONF number	MIDAMBLECONF?	number
Uplink DPCH Channelization Code (Single Code)	UDPCHCODE_SINGLE code	UDPCHCODE_SINGLE?	code
Uplink DPCH Channelization Code (Multi Code_Code1)	UDPCHCODE_MULTI1 code	UDPCHCODE_MULTI1?	code
Uplink DPCH Channelization Code (Multi Code_Code2)	UDPCHCODE_MULTI2 code	UDPCHCODE_MULTI2?	code
Measurement Trigger	MEASTRG trigger	MEASTRG?	trigger
E-PUCH Measurement Slot	EPUCH_MEAS_SLOT slot	EPUCH_MEAS_SLOT?	slot
Spectrum Emission Mask - Mask Template Lower Limit	SEM_LLIMIT level	SEM_LLIMIT?	level
Spectrum Emission Mask - Mask Template	SEM_TEMPLATE offset,level	SEM_TEMPLATE? offset	level
Scrambling Code Number	SCRCODE code	SCRCODE?	code
Uplink Configuration	ULCONFIG ulconf	ULCONFIG?	ulconf
ACLR Measurement Enable and Count	ACLR_SET on_off[,count]	ACLR_SET?	on_off,count
Modulation Analysis Measurement Enable and Count	MOD_SET on_off[,count]	MOD_SET?	on_off,count

Fundamental Measurement Parameters (Cont'd)

Function	Command	Query	Response
OBW Measurement Enable and Count	OBW_SET on_off[,count]	OBW_SET?	on_off,count
Peak Code Domain Error Measurement Enable and Count	PCDE_SET on_off[,count]	PCDE_SET?	on_off,count
Tx Power Measurement Enable and Count	PWR_SET on_off[,count]	PWR_SET?	on_off,count
Power Template Measurement Enable and Count	TEMPLATE_SET on_off[,count]	TEMPLATE_SET?	on_off,count
SEM Measurement Enable and Count	SEM_SET on_off[,count]	SEM_SET?	on_off,count
Bit Error Rate	BER_MEAS on_off	BER_MEAS?	on_off
Bit Error Rate - Number of Sample	BER_SAMPLE number	BER_SAMPLE?	number
Bit Error Rate - Upper Limit	BER_LIMIT ratio	BER_LIMIT?	ratio
Block Error Rate	BLER_MEAS on_off	BLER_MEAS?	on_off
Block Error Rate - Number of Sample	BLER_SAMPLE number	BLER_SAMPLE?	number
DTCH Data Pattern	DTCHPAT pattern	DTCHPAT?	pattern
TFCI Detect Mode	BER_TFCI mode	BER_TFCI?	mode
Closed Loop Power Control Measurement - Method	CLPC_MEAS method	CLPC_MEAS?	method
Closed Loop Power Control Measurement - Filter	CLPC_FLT type	CLPC_FLT?	type
Measurement Object	MEASOBJ measobj	MEASOBJ?	measobj

Power Template Results

Function	Command	Query	Response
Result of Power Template Measurement Off Power (TS s-1)	-----	`OFFPWRM? mode`	`{avg,max,min}|pwr`
Result of Power Template Measurement Off Power(TS s+1)	-----	`OFFPWRP? mode`	`{avg,max,min}|pwr`
Result of Power Template Measurement –50dBm	-----	`M50PWR? mode`	`{avg,max,min}|pwr`
Result of Power Template Measurement Template Judgement	-----	`PWR_TEMPLATE?`	`judgement`

Peak Code Domain Error Results

Function	Command	Query	Response
Result of Peak Code Domain Error	-----	`PCDE? mode`	`{avg,max,min}|pcde`

Bit Error Rate Results

Function	Command	Query	Response
Bit Error Rate	-----	BER? [format]	rate
Bit Error Rate - Error Counts	-----	BERCNT?	number
Bit Error Rate - Transmitted bits	-----	BERTRANSMIT?	number
Bit Error Rate - Judgement	-----	BERPASS?	judgement
Block Error Rate	-----	BLER? [format]	rate
Block Error Rate - Error Counts	-----	BLERCNT?	number
Block Error Rate - Transmitted bits	-----	BLERTRANSMIT?	number

Closed Loop Power Control Results

Function	Command	Query	Response
CLPC Measurement - Judgement	-----	CLPC_PASS? step	judgement
CLPC Measurement – Slot Level	-----	CLPC_PWR? step[,slot]	l[0],l[1],..,l[max_slot_number]
CLPC Measurement – Power (dB)	-----	CLPC_PWRDB? step[,slot]	l[0],l[1],..,l[max_slot_number-1]
CLPC Measurement – Maximum Power	-----	CLPC_MAXPWR?	power
CLPC Measurement – Minimum Power	-----	CLPC_MINPWR?	power

Results

Function	Command	Query	Response
Result of Adjacent Channel Leakage Power Ratio	-----	`ACLR? mode`	`{avg(0),avg(1),avg(2),avg(3),max(0),max(1),max(2),max(3),min(0),min(1),min(2),min(3)}|{ aclr(0),aclr(1),aclr(2),aclr(3)}`
Result of Filtered Power Measurement	-----	`FILTPWR? mode`	`{avg,max,min}|pwr|{s,pwr(1),pwr(2),…,pwr(s)}`
Result of Occupied Bandwidth	-----	`OBW?`	`bw`
Result of Occupied Bandwidth Frequency	-----	`OBWFREQ? pos`	`freq`
Judgement of Spectrum Emission Mask	-----	`SEM?`	`judgement`
Result of Spectrum Emission Mask (Lower)	-----	`SEMLVL_LOWER?`	`freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)`
Result of Spectrum Emission Mask (Upper)	-----	`SEMLVL_UPPER?`	`freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)`

Results (Cont'd)

Function	Command	Query	Response
Margin of Spectrum Emission Mask (Lower)	-----	`SEMMARGIN_LOWER?`	`freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)`
Margin of Spectrum Emission Mask (Upper)	-----	`SEMMARGIN_UPPER?`	`freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)`
Result of Tx Power Measurement	-----	`TXPWR? mode`	`{avg,max,min}|pwr|{s,pwr(1),pwr(2),…,pwr(s)}`
Waveform Data	-----	`WAVEFMEAS? format,position,length`	`data(0),data(1),…,data(length-1)`

Results of Modulation Analysis Measurements

Function	Command	Query	Response
Carrier Frequency Error Result of Modulation Analysis	-----	`CFERR? mode`	`{avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz}|{freq_ppm,freq_Hz}`
Carrier Frequency Error Result of Modulation Analysis (Worst)	-----	`CFERR_WORST?`	`freq_ppm,freq_Hz`
Carrier Frequency Result of Modulation Analysis	-----	`CFREQ?`	`freq`
EVM Result of Modulation Analysis	-----	`EVM? mode`	`{avg,max,min}|evm`
IQ Imbalance Result of Modulation Analysis	-----	`IQIMB? mode`	`{avg,max,min}|iqimb`
Magnitude Error Result of Modulation Analysis	-----	`MAGERR? mode`	`{avg,max,min}|merr`
Origin Offset Result of Modulation Analysis	-----	`ORGNOFS? mode`	`{avg,max,min}|orgnoffs`
Peak EVM Result of Modulation Analysis	-----	`PEVM? mode`	`{avg,max,min}|pevm`
Phase Error Result of Modulation Analysis	-----	`PHASEERR? mode`	`{avg,max,min}|perr`
Rho	-----	`RHO? mode`	`{avg,max,min}|rho`

5.1.3 Sequence measurement commands

Common Parameters

Function	Command	Query	Response
Level - Input Level	ILVL level	ILVL?	level
Output Level	OLVL level	OLVL?	level
DL Frequency	RXFREQ dl_freq	RXFREQ?	dl_freq
	DLFREQ dl_freq	DLFREQ?	dl_freq
UL Frequency	TXFREQ ul_freq	TXFREQ?	ul_freq
	ULFREQ ul_freq	ULFREQ?	ul_freq

Sequence Measurements

Function	Command	Query	Response
Sequence Measurement Status	-----	SEQMSTAT?	m_status,n,s(0),s(1),…,s(n-1)
Sequence Progress	-----	SEQPROGRESS?	p,cur,start,end
Specified Segment Status	-----	SEQSEGSTAT? seg	stat
Trigger Timeout	TRGTOUT time	TRGTOUT?	time

Sequence Control Parameters

Function	Command	Query	Response
Sequence Control Parameter - Sequence Control	SEQCTRL start,end	SEQCTRL?	start,end
Sequence Control Parameter - Sequence Control	SEQCTRLTX start,end	SEQCTRLTX?	start,end
Start Signal Analyzer Measurement Only	SEQEXECTX	-----	-----
Sequence Control Parameter - Sequence End State Reinitialization	SEQREINIT sw	SEQREINIT?	sw
Sequence Control Parameter - Sequence Table	SEQTBL table	SEQTBL?	table

Sequence Parameter Information

Function	Command	Query	Response
Sequence Parameter Information - Error Check	-----	SEQERR? [item]	n,err(0),err(1),…,err(n-1) ns,seg(0),seg(1),…,seg(ns-1) e,mem,exe,set
Sequence Parameter Information - Error Check	-----	SEQERR2? format	n,err(n-1)

Sequence Table Parameters

Function	Command	Query	Response
Sequence Table Parameter - SG Output Port	`SEQSGPORT seg,port`	`SEQSGPORT? seg`	`port`
Sequence Table Parameter - Measurement	`SEQMEAS seg,mode,step,mcond`	`SEQMEAS? seg`	`mode,step,mcond`
Sequence Table Parameter - Trigger	`SEQTRG seg,src,slope,level,delay`	`SEQTRG? seg`	`src,slope,level,delay`
Sequence Table Parameter - TRX control	`SEQTRX seg,ul_freq,ref,dl_freq,level,pat`	`SEQTRX? seg`	`ul_freq,ref,dl_freq,level,pat`
Sequence Table Parameter - Uplink Frequency, Input Level	`SEQTX seg,ul_freq,ref`	`SEQTX? seg`	`ul_freq,ref`

Measurement Parameters

Function	Command	Query	Response
ACLR Measurement Enable and Count	TDSCDMA_ACLR_SET mcond,on_off[,count]	TDSCDMA_ACLR_SET? mcond	on_off,count
Turn Off All Measurement Items	TDSCDMA_MEAS_OFF mcond	-----	-----
Modulation Analysis Measurement Enable and Count	TDSCDMA_MOD_SET mcond,on_off[,count]	TDSCDMA_MOD_SET? mcond	on_off,count
OBW Measurement Enable and Count	TDSCDMA_OBW_SET mcond,on_off[,count]	TDSCDMA_OBW_SET? mcond	on_off,count
Tx Power Measurement Enable and Count	TDSCDMA_PWR_SET mcond,on_off[,count]	TDSCDMA_PWR_SET? mcond	on_off,count
Spectrum Emission Mask - Mask Template Lower Limit	TDSCDMA_SEM_LLIMIT level	TDSCDMA_SEM_LLIMIT?	level
SEM Measurement Enable and Count	TDSCDMA_SEM_SET mcond,on_off[,count]	TDSCDMA_SEM_SET? mcond	on_off,count
Spectrum Emission Mask - Mask Template	TDSCDMA_SEM_TEMPLATE offset,level	TDSCDMA_SEM_TEMPLATE? offset	level
Power Template Measurement Enable and Count	TDSCDMA_TEMPLATE_SET mcond,on_off[,count]	TDSCDMA_TEMPLATE_SET? mcond	on_off,count

Power Template Results

Function	Command	Query	Response
Result of Power Template Measurement Off Power (TS s-1)	-----	TDSCDMA_OFFPWRM? seg,mode	{avg,max,min}|pwr
Result of Power Template Measurement Off Power(TS s+1)	-----	TDSCDMA_OFFPWRP? seg,mode	{avg,max,min}|pwr
Result of Power Template Measurement –50dBm	-----	TDSCDMA_M50PWR? seg,mode	{avg,max,min}|pwr
Result of Power Template Measurement Template Judgement	-----	TDSCDMA_PWR_TEMPLATE? seg	judgement

Modulation Analysis Measurement Results

Function	Command	Query	Response
Carrier Frequency Error Result of Modulation Analysis	-----	TDSCDMA_CFERR? seg,mode	{avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz}|{freq_ppm,freq_Hz}
Carrier Frequency Error Result of Modulation Analysis (Worst)	-----	TDSCDMA_CFERR_WORST? seg	freq_ppm,freq_Hz
Carrier Frequency Result of Modulation Analysis	-----	TDSCDMA_CFREQ? seg	freq
EVM Result of Modulation Analysis	-----	TDSCDMA_EVM? seg,mode	{avg,max,min}|evm
IQ Imbalance Result of Modulation Analysis	-----	TDSCDMA_IQIMB? seg,mode	{avg,max,min}|iqimb
Magnitude Error Result of Modulation Analysis	-----	TDSCDMA_MAGERR? seg,mode	{avg,max,min}|merr
Origin Offset Result of Modulation Analysis	-----	TDSCDMA_ORGNOFS? seg,mode	{avg,max,min}|orgnoffs
Peak EVM Result of Modulation Analysis	-----	TDSCDMA_PEVM? seg,mode	{avg,max,min}|pevm
Phase Error Result of Modulation Analysis	-----	TDSCDMA_PHASEERR? seg,mode	{avg,max,min}|perr
Rho Result of Modulation Analysis	-----	TDSCDMA_RHO? seg,mode	{avg,max,min}|rho

Results

Function	Command	Query	Response
Result of Adjacent Channel Leakage Power Ratio	-----	TDSCDMA_ACLR? seg,mode	{avg(0),avg(1),avg(2),avg(3),max(0),max(1),max(2),max(3),min(0),min(1),min(2),min(3)}|{ aclr(0),aclr(1),aclr(2),aclr(3)}
Result of Filtered Power Measurement	-----	TDSCDMA_FILTPWR? seg,mode	{avg,max,min}|pwr|{s,pwr(1),pwr(2),…,pwr(s)}
Result of Occupied Bandwidth	-----	TDSCDMA_OBW? seg	bw
Result of Occupied Bandwidth Frequency	-----	TDSCDMA_OBWFREQ? seg,pos	freq
Judgment of Spectrum Emission Mask	-----	TDSCDMA_SEM? seg	judgement
Result of Spectrum Emission Mask (Lower)	-----	TDSCDMA_SEMLVL_LOWER? seg	freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)
Result of Spectrum Emission Mask (Upper)	-----	TDSCDMA_SEMLVL_UPPER? seg	freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)

Results (Cont'd)

Function	Command	Query	Response
Margin of Spectrum Emission Mask (Lower)	-----	TDSCDMA_SEMMARGIN_LOWER? seg	freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)
Margin of Spectrum Emission Mask (Upper)	-----	TDSCDMA_SEMMARGIN_UPPER? seg	freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)
Result of Tx Power Measurement	-----	TDSCDMA_TXPWR? seg,mode	{avg,max,min}|pwr|{s,pwr(1),pwr(2),…,pwr(s)}

5.2 Details of Commands

Commands are detailed below in alphabetic order.

■ Terms in this command list

EX .... Command name (header)

Example .... Command function name

Function .... Command function

Command................................. Programming command syntax

Query .... Query syntax

Response .... Response syntax

Parameter .... Parameter definition

Details .... Command restrictions and others

Example of Use................................. Command usage example

Related Commands ....Introduction of related commands

■ Suffix code list

Suffix code	Unit	Suffix code	Unit
DB	dB	MHZ	MHz
DBM	dBm	MS	ms
GHZ	GHz	MZ	MHz
GZ	GHz	NS	ns
HZ	Hz	S	s
KHZ	kHz	US	μs
KZ	kHz		

5.2.1 Common commands

DLPAT

Waveform Pattern Select

Function

Selects waveform pattern to use from patterns included in waveform file
When the command received, the signal is immediately switched regardless of the frame cycle of signal, so the frame cycle is not continued.
This command is also used to query the currently selected waveform pattern.

Command

```
DLPAT pat
```

Query

```
DLPAT?
```

Response

pat

Parameter

pat	Waveform Pattern
PAT1 to PATn	Pattern number (n: Waveform information file group range)
Default	PAT1

Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, "Waveform File Details" in the "Waveform Files for Cellular Application Operation Manual".

Example of Use

To set waveform pattern 1:
DLPAT PAT1
DLPAT?
> PAT1

Related command

Waveform file for arbitrary waveform signal selection or query
PACKAGE

Remarks

The group number depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, "Waveform File Details" in the "Waveform Files for Cellular Application Operation Manual".

DLPAT_SYNC

Waveform Pattern Select (SYNC)

Function

Selects waveform pattern to use from patterns included in waveform file
When the command received, the signal is switched according to the frame cycle of signal so that the frame cycle is continued.
This command is also used to query the currently selected waveform pattern.

Command

```
DLPAT_SYNC pat
```

Query

```
DLPAT_SYNC?
```

Response

pat

Parameter

pat	Waveform Pattern
PAT1 to PATn	Pattern number (n: Waveform information file group range)
Default	PAT1

Details

Select the waveform pattern for RF output signal in waveform file.
The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the “Waveform Files for Cellular Application Operation Manual”.

Example of Use

To set waveform pattern 1:
DLPAT_SYNC PAT1
DLPAT_SYNC?
> PAT1

Related command

Waveform file for arbitrary waveform signal selection or query
PACKAGE

Remarks

The group number depends on the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, “Waveform File Details” in the “Waveform Files for Cellular Application Operation Manual”.

ESR2?

End Event Status (Measurement) Register Query

Function

Queries end event status register (measurement)
The event occurrence can be identified using the retrieved value.

Query

ESR2?

Response

register	Value = bit0 + bit1 + ... + bit7
bit0 = 2^0 = 1	End of measurement
bit1 = 2^1 = 2	Trigger preparation completed
bit2 = 2^2 = 4	Unused (reserved for application use)
bit3 = 2^3 = 8	Unused (reserved for application use)
bit4 = 2^4 = 16	Unused (reserved for application use)
bit5 = 2^5 = 32	Unused (reserved for application use)
bit6 = 2^6 = 64	Unused (reserved for application use)
bit7 = 2^7 = 128	Unused (reserved for application use)

Parameter

register	End event status register (measurement)
Range	0 to 255

Details

The sum of the values for bits of the occurring event from the values 2^0 = 1, 2^1 = 2, 2^2 = 4, 2^3 = 8, 2^4 = 16, 2^5 = 32, 2^6 = 64, and 2^7 = 128, that correspond to the end event status register (measurement) bits 0, 1, 2, 3, 4, 5, 6, and 7 becomes the response.

Example of Use

To query the end event status register (measurement) value:
ESR2?
> 0

5

Native Command Reference

ESR3?

Error Event Status (Measurement) Register Query

Function

Queries error event status register (measurement)
The event occurrence can be identified using the retrieved value.

Query

ESR3?

Response

register	Value = bit0 + bit1 + ... + bit7
bit0 = 2^0 = 1	Level over
bit1 = 2^1 = 2	Level under
bit2 = 2^2 = 4	Timeout
bit3 = 2^3 = 8	Unused (reserved for application use)
bit4 = 2^4 = 16	Unused (reserved for application use)
bit5 = 2^5 = 32	Unused (reserved for application use)
bit6 = 2^6 = 64	Unused (reserved for application use)
bit7 = 2^7 = 128	Unused (reserved for application use)

Parameter

register	Error event status register (measurement)
Range	0 to 255

Details

The sum of the values for bits of the occurring event from the values $2^0 = 1$, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$, $2^5 = 32$, $2^6 = 64$, and $2^7 = 128$, that correspond to the error event status register (measurement) bits 0, 1, 2, 3, 4, 5, 6, and 7 becomes the response.

Example of Use

To query the error event status register (measurement) value:
ESR3?
> 4

LVL

Output Level On/Off

Function

Enables the MU887000A RF signal output or queries the set status

Command

```
LVL on_off
```

Query

```
LVL?
```

Response

on_off

Parameter

on_off	Enabled the RF signal output
ON	Outputs the RF signal
OFF	Does not output the RF signal
Default	ON

Example of Use

To output RF signal at MU887000A connector:

LVL ON

LVL?

> ON

MEASSTOP

Measurement Stop

Function

Stops current measurement

Command

```
MEASSTOP
```

Example of Use

To stop current measurement:

MEASSTOP

MOD

Output Signal Modulation

Function

Enables modulation of MU887000A RF signal output or queries set status

Command

```
MOD on_off
```

Query

```
MOD?
```

Response

on_off

Parameter

on_off	Enables RF signal modulation
ON	Turns modulation off
OFF	Turns modulation on
Default	ON

Example of Use

To turn modulation on:

MOD ON

MOD?

> ON

MSTAT?

Measurement Status

Function

Queries status of current measurement

Query

```
MSTAT?
```

Response

m_status

Parameter

m_status	Measurement status
0	Measurement completed normally
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not executed
12	Tx measurement timeout
13	Rx measurement failed

Details

This can be used either during measurement or while measurement is stopped.
The value received from MX887017A is 0, 2, 5, 9, or 12.

Example of Use

To query current measurement status:
MSTAT?
> 0

PACKAGE

Waveform File Select

Function

Selects or queries waveform file for arbitrary waveform signal used at downlink signal.

Command

```
PACKAGE package
```

Query

```
PACKAGE?
```

Response

package

Parameter

package	Waveform File

Details

The name of the file used from the waveform files loaded into waveform memory is set by this command.

Example of Use

To set the waveform file1 from the waveform file loaded in waveform memory:
PACKAGE “PAC1”
PACKAGE?
> PAC1

Related command

Use the following command to load the waveform file into waveform memory.
SOUR:GPRF:GEN:ARB:FILE:LOAD
For the details of the command, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
The following command can be used to query the names of waveform files that have been loaded into waveform memory.
SOUR:GPRF:GEN:ARB:WAV:NAME?
For the details of the command, refer to Chapter 5 “SCPI Command Reference” in the “MU887000A TRX Test Module Operation Manual”.
:SOURce:GPRF:GENerator:ARB:WAVeform:NAME?

Use the following commands to select a waveform pattern to use from the waveform patterns included in the waveform file configured using the command described in this section.
DLPAT, DLPAT_SYNC, SEQTRX

PORT

Set Connect Port Direction

Function

Sets or queries connector settings for inputting and outputting RF signals

Command

```
PORT input,output
```

Query

Response

input,output

Parameters

input	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1
output	Test Port No.
PORT1	Test Port1
PORT2	Test Port2
PORT3	Test Port3
PORT4	Test Port4
Default	PORT1

Details

Both Test Port1 and Test Port2 can be set to input and output simultaneously.
Test Port3 and Test Port4 can be set to either input or output at one time.

Example of Use

To set Test Port1 as RF signal input connector and Test Port2 as RF signal output connector:

PORT PORT1,PORT2
PORT?
> PORT1,PORT2

SNGLS

Measurement Start

Function

Sets the parameters for both specified measurement and signal transmission and executes measurement.

Command

```
SNGLS
```

Details

Sending this command executes one measurement execution.
Sending this command during measurement, aborts measurement once and restarts it.
ESR2 be polled or sync processing via *WAI is required to determine the timing of measurement completion.

Example of Use

To start measurement:
SNGLS

Related command

ESR2
For the details of the event status register, refer to Chapter 3 “Fundamental Operation” in the “MU887000A TRX Test Module Operation Manual”.

STDSEL

Standard Select

Function

Sets or queries measurement standard

Command

```
STDSEL std
```

Query

```
STDSEL?
```

Response

std

Parameter

std	Measurement standard	
COMMON	Common Measurement	(requires MX887010A)
WCDMA	W-CDMA	(requires MX887011A)
GSM	GSM	(requires MX887012A)
LTE	LTE	(requires MX887013A or MX887014A)
CDMA2000	CDMA2000 1x	(requires MX887015A)
EVDO	CDMA2000 1xEVDO	(requires MX887016A)
TDSCDMA	TD-SCDMA	(requires MX887017A)
SEQUENCE	Sequence	(requires MX887010A)
SEQ	Sequence	(requires MX887010A)
Default	COMMON	

Example of Use

To switch the measurement standard to SEQUENCE:

STDSEL SEQUENCE

STDSEL?

> SEQUENCE

Remarks

To execute the measurement described here, set the parameter to TDSCDMA or SEQUENCE.
If this command is sent during measurement, measurement stops to prepare for the new standard.
Common hardware settings, such as Downlink Frequency and Input Level, can be set for each measurement standard.

SYSSEL

Application Select

Function

Sets or queries type of application software executing on MU887000A

Command

```
SYSSEL app
```

Query

```
SYSSEL?
```

Response

app

Parameter

app	Application software
CELLULAR	Cellular Application
SRW	SRW Application

Details

Set the parameter to CELLULAR and send the command before using the MX887017A.

Example of Use

To set the application software to CELLULAR:
SYSSEL CELLULAR
SYSSEL?
> CELLULAR

Remarks

When using the MX887017A, set the application to CELLULAR using the SYSSEL command, and then set the standard to measure using the STDSEL command.

SYST:LANG

Language Selection of Remote Command

Function

Switches language mode of remote control command

Command

```
SYST:LANG mode
```

Query

```
SYST:LANG?
```

Response

mode

Parameter

mode	Language mode
NAT	Native
SCPI	SCPI
Default	NAT

Example of Use

To switch the remote control command language mode to Native:

SYST:LANG NAT

SYST:LANG?

>NAT

5.2.2 Fundamental measurement commands

ACLR?

Result of Adjacent Channel Leakage Power Ratio

Function

Queries Adjacent Channel Leakage Power Ratio measurement result

Query

`ACLR? mode`

Response

When mode = TTL,
avg(0),avg(1),avg(2),avg(3),max(0),max(1),max(2),max(3),min(0),min(1),min(2),min(3)
When mode ≠ TTL,
aclr(0),aclr(1),aclr(2),aclr(3)

Unit	dB
Resolution	0.01

Parameter number	Frequency offset
0	–3.2 MHz
1	–1.6 MHz
2	+1.6 MHz
3	+3.2 MHz

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average･Maximum･Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
aclr	Measurement result in specified Storage mode

Example of Use

To query average of ACLR measurement result:
ACLR? AVG
> -20.00,-21.00,-22.00,-23.00

ACLR_SET

ACLR Measurement Enable and Count

Function

Enables Adjacent Channel Leakage Power Ratio measurement and sets average number, or queries settings

Command

```
ACLR_SET on_off[,count]
```

Query

```
ACLR_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Executes the measurement
OFF	Does not execute the measurement
Default	OFF
count	Number of measurement
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Adjacent Channel Leakage Power Ratio measurement and set the measurement count to 50:

ACLR_SET ON,50
ACLR_SET?
> ON,50

ALLMEASITEMS_OFF

Turn Off All Measurement Items

Function

Turns off all of fundamental measurement items

Command

```
ALLMEASITEMS_OFF
```

Details

The operation of this command is similar to turning off all the following command settings.

PWR_SET, OBW_SET, SEM_SET, ACLR_SET, MOD_SET, PCDE_SET, TEMPLATE_SET

Example of Use

To set all measurements to off at one time:

ALLMEASITEMS_OFF

BER?

Bit Error Rate

Function

Queries bit error rate.

Query

```
BER? [format]
```

Response

rate

Parameters

format	Format	
PER	Percent	
EXP	Exponential	
rate	Bit error rate	
When <format> is omitted:		(Error bit number / Transmitted bit number)
Resolution	0.0001	
Unit	None	
When <format> is PER:		(Error bit number / Transmitted bit number×100) [%]
Resolution	0.01	
Unit	%	
When <format> is EXP:		Exponential of (Error bit number / Transmitted bit number)
Resolution	0.01×10^{-08}	
Unit	None	

Example of Use

To query bit error rate:

BER?

> 0.0050

BER? PER

> 0.50

BER? EXP

> 5.00E-3

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is shown as below.

BER?	9.9999
BER? PER	999.99
BER? EXP	9.99E-10

BERCNT?

Bit Error Rate - Error Counts

Function

Queries error bit count.

Query

`BERCNT?`

Response

number

Parameters

number	Error Counts
Resolution	1
Default	bit

Example of Use

To query error bit count:

BERCNT?

> 25

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is –1.

BER_LIMIT

Bit Error Rate - Upper Limit

Function

Sets or queries upper limit (%) at Bit Error Rate measurement.

Command

```
BER_LIMIT ratio
```

Query

```
BER_LIMIT?
```

Response

ratio

Unit	%

Parameters

ratio	Error Rate
Range	0.0 to 100.0%
Resolution	0.1
Default	10.0

Example of Use

To set upper limit of Bit Error Rate measurement to 5.0%.

BER_LIMIT 5

BER_LIMIT?

> 5.0

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Native Command Reference

BER_MEAS

Bit Error Rate

Function

Enables Bit Error Rate measurement or queries setting.

Command

```
BER_MEAS on_off
```

Query

```
BER_MEAS?
```

Response

on_off

Parameters

on_off	Enables/disables measurement.
ON	Enables measurement.
OFF	Disables measurement.
Default	OFF

Example of Use

To set Bit Error Rate measurement to On.

BER_MEAS ON

BER_MEAS?

> ON

BERPASS?

Bit Error Rate - Judgement

Function

Queries judgement results of bit error rate measurement.

Query

BERPASS?

Response

judgement

Parameter

judgement	Judgement results
PASS	Passed
FAIL	Failed
–	Not measured

Example of Use

To query judgement results of bit error rate measurement:

BERPASS?

> PASS

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is "–".

BER_SAMPLE

Bit Error Rate - Number of Sample

Function

Sets or queries sample bit number at Bit Error Rate measurement.

Command

```
BER_SAMPLE number
```

Query

```
BER_SAMPLE?
```

Response

number

Parameter

number	Sample bit number
Range	1 to 73200
Resolution	1
Default	10000

Example of Use

To set sample bit number of Bit Error Rate measurement to 1000.

BER_SAMPLE 1000

BER_SAMPLE?

> 1000

BER_TFCI

TFCI Detect Mode

Function

Sets TFCI detection to Auto or Manual (fixed value) or queries setting

Command

```
BER_TFCI mode
```

Query

```
BER_TFCI?
```

Response

mode

Parameter

mode	Detect mode
AUTO	TFCI = 3 or 4 Auto detect
FIX3	TFCI = 3 fixed
FIX4	TFCI = 4 fixed
Default	AUTO

Example of Use

To set TFCI detection to FIX3

BER_TFCI FIX3

BER_TFCI?

> FIX3

BERTRANSMIT?

Bit Error Rate - Transmitted bits

Function

Queries transmitted bit number.

Query

```
BERTRANSMIT?
```

Response

number

Parameter

number	Transmitted bit number
Resolution	1
Unit	bit

Example of Use

To query transmitted bit number:

BERTRANSMIT?

> 6000

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is –1.

BLER?

Block Error Rate

Function

Queries block error rate.

Query

```
BLER? [format]
```

Response

rate

Parameter

format	Format
PER	Percent
EXP	Exponential
rate	Block Error Rate

When <format> is omitted: (Error block number / Transmitted block number)

Resolution	0.0001
Unit	None

When <format> is PER: (Error block number / Transmitted block number×100) [%]

Resolution	0.01
Unit	%

When <format> is EXP: Exponential of (Error block number / Transmitted block number)

Resolution	0.01×10^{-08}
Unit	None

Example of Use

To query block error rate:

BLER?

> 0.0050

BLER? PER

> 0.50

BLER? EXP

> 5.00E-3

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is shown as below.

BLER?	9.9999
BLER? PER	999.99
BLER? EXP	9.99E-10

BLERCNT?

Block Error Rate - Error Counts

Function

Queries error block number.

Query

```
BLERCNT?
```

Response

number

Parameter

number		Error block number
	Resolution	1
	Unit	block

Example of Use

To query error block number:

BLERCNT?

> 25

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is –1.

BLER_MEAS

Block Error Rate

Function

Enables Block Error Rate measurement or queries setting.

Command

```
BLER_MEAS on_off
```

Query

```
BLER_MEAS?
```

Response

on_off

Parameter

on_off	Enables/disables measurement.
ON	Enables measurement.
OFF	Disables measurement.
Default	OFF

Example of Use

To set Block Error Rate measurement to On.

BLER_MEAS ON

BLER_MEAS?

> ON

BLER_SAMPLE

Block Error Rate - Number of Sample

Function

Sets or queries sample block number at Block Error Rate measurement.

Command

```
BLER_SAMPLE number
```

Query

```
BLER_SAMPLE?
```

Response

number

Parameter

number	Sample block number
Range	1 to 300
Resolution	1
Default	50

Example of Use

To set sample block number of Block Error Rate measurement to 100.

BLER_SAMPLE 100

BLER_SAMPLE?

> 100

BLERTRANSMIT?

Block Error Rate - Transmitted bits

Function

Queries transmitted block number.

Query

```
BLERTRANSMIT?
```

Response

number

Parameter

number	Transmitted block number
Resolution	1
Unit	block

Example of Use

To query transmitted block number:

BLERTRANSMIT?

> 6000

Remarks

When an error has occurred in the measurement (the response of MSTAT? is 5, 9, or 12) or before the measurement starts, the response is –1.

CFERR?

Carrier Frequency Error Result of Modulation Analysis

Function

Queries Carrier Frequency Error measurement result

Query

`CFERR? mode`

Response

When mode = TTL,

avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz

When mode ≠ TTL,

freq_ppm,freq_Hz

Unit	ppm, Hz
Resolution	0.01, 0.1

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg_ppm	Average of Frequency Error measurement results ppm
Resolution	0.01
avg_Hz	Average of Frequency Error measurement results Hz
Resolution	0.1
max_ppm	Maximum value in Frequency Error measurement result in ppm
Resolution	0.01
max_Hz	Maximum value in Frequency Error measurement results in Hz
Resolution	0.1
min_ppm	Minimum value in Frequency Error measurement results in ppm
Resolution	0.01
min_Hz	Minimum value in Frequency Error measurement results in Hz
Resolution	0.1
freq_ppm	Frequency Error measurement results in specified Storage mode in ppm
Resolution	0.01
freq_Hz	Frequency Error measurement results in specified Storage mode in Hz
Resolution	0.1

Example of Use

To query average of Frequency Error measurement results:

CFERR? AVG

> 0.03,60.0

CFERR_WORST?

Carrier Frequency Error Result of Modulation Analysis (Worst)

Function

Queries worst value in Carrier Frequency Error measurement results

Query

```
CFERR_WORST?
```

Response

freq_ppm,freq_Hz

Unit	ppm, Hz
Resolution	0.01, 0.1

Parameters

freq_ppm	Worst value in Frequency Error measurement results in ppm
Resolution	0.01
freq_Hz	Worst value in Frequency Error measurement results in Hz
Resolution	0.1

Example of Use

To query worst value in Frequency Error measurement results:

CFERR_WORST?

> 0.03,60.0

CFREQ?

Carrier Frequency Result of Modulation Analysis

Function

Queries Carrier Frequency measurement result

Query

```
CFREQ?
```

Response

freq

Unit	Hz
Resolution	1

Parameter

freq	Carrier frequency
Resolution	1

Example of Use

To query Carrier Frequency measurement result:

CFREQ?

> 1951000000

CHAN

Channel

Function

Sets or queries EARFCN (E-UTRA Absolute Radio Frequency Channel Number) to Channel

Command

```
CHAN ch
```

Query

```
CHAN?
```

Response

ch

Parameter

ch		Downlink Channel
	Range	2000 to 13500
	Resolution	1
	Default	10054

Details

Changing the Channel parameter, also changes the related Downlink Frequency and Uplink Frequency parameters.

Changing the setting of the Downlink or Uplink Frequency parameter does not change the Channel setting.

The frequency is determined by the equation: F(MHz) = Channel / 5

Example of Use

To set the channel 10054:

CHAN 10054

CHAN?

> 10054

CLPC_FLT

Closed Loop Power Control Measurement – Filter

Function

Selects a measurement filter for the Closed Loop Power Control (Auto) measurement.

Command

```
CLPC_FLT type
```

Query

```
CLPC_FLT?
```

Response

type

Parameters

type	Measurement filter
RRC	RRC Filter (1.28 MHz)
Default	RRC

Example of Use

Sets a measurement filter for the Closed Loop Power Control measurement to RRC.

CLPC_FLT RRC

CLPC_FLT?

> RRC

CLPC_MAXPWR?

Closed Loop Power Control (Auto) – Maximum Power

Function

Queries the maximum power of the Closed Loop Power Control (Auto) measurement.

Query

```
CLPC_MAXPWR?
```

Response

power

Unit	dBm

Parameters

power	Maximum power
Resolution	0.01 dB

Example of Use

To query the maximum power of the Closed Loop Power Control (Auto) measurement.

CLPC_MAXPWR?

> -10.00

CLPC_MEAS

Closed Loop Power Control Measurement – Method

Function

Sets the measurement control method (interval) of the Closed Loop Power Control (Auto) measurement.

Command

```
CLPC_MEAS method
```

Query

```
CLPC_MEAS?
```

Response

method

Parameters

method	Control method (interval)
AUTO_BC	Auto (Step B to C)
Default	AUTO_BC

Example of Use

To set the control method (interval) of the Closed Loop Power Control measurement to Auto (Step B to C).

CLPC_MEAS AUTO_BC

CLPC_MEAS?

> AUTO_BC

CLPC_MINPWR?

Closed Loop Power Control (Auto) – Minimum Power

Function

Queries the minimum power of the Closed Loop Power Control (Auto) measurement.

Query

```
CLPC_MINPWR?
```

Response

power

Unit	dBm

Parameters

power	Minimum power
Resolution	0.01 dB

Example of Use

To query the minimum power of the Closed Loop Power Control (Auto) measurement.

CLPC_MINPWR?

> -10.00

CLPC_PASS?

Closed Loop Power Control (Auto) - Judgement

Function

Queries the judgement result of the Closed Loop Power Control (Auto) measurement.

Query

```
CLPC_PASS? step
```

Response

judgement

Parameters

<step>	Step
ALL	Step B, Step C
B	Step B
C	Step C
judgement	Judgement results
PASS	Passed
FAIL	Failed
–	Not measured

Example of Use

To query all judgement results of the Closed Loop Power Control (Auto) measurement.

CLPC_PASS? ALL

> PASS,PASS

CLPC_PWR?

Closed Loop Power Control (Auto) – Slot Level

Function

Queries the measurement result (level) per slot of the step specified for the Closed Loop Power Control (Auto) measurement.

Query

```
CLPC_PWR? step[,slot]
```

Response

l[0],l[1],..,l[max_slot_number]

Unit	dBm

Parameters

step	Target step
B	Step B
C	Step C
slot	Slot number registered
ALL	ALL
l[max_slot_number]	Power
Resolution	0.01 dB

Example of Use

To query the measurement result (level) of all slots of Step B in the Closed Loop Power Control (Auto) measurement.

CLPC_PWR? B,ALL

> -10.24,-10.25,-10.26,-10.26,-10.25,,,,

CLPC_PWRDB?

Closed Loop Power Control (Auto) – Power (dB)

Function

Queries the power difference among the slots of the step specified for the Closed Loop Power Control (Auto) measurement.

Query

```
CLPC_PWRDB? step[,slot]
```

Response

l[0],l[1],..,l[max_slot_number-1]

Unit	dB

Parameters

step	Target step
B	Step B
C	Step C
slot	Slot number registered
ALL	ALL
l[max_slot_number]	Power
Resolution	0.01 dB

Example of Use

To query the power difference among all the slots of Step B in the Closed Loop Power Control (Auto) measurement.

CLPC_PWRDB? B,ALL

> -0.24,-0.25,-0.26,-0.26,-0.25,,,,

DLFREQ

Downlink Frequency

Function

Sets or queries MU887000A downlink frequency

Command

```
DLFREQ dl_freq
```

Query

```
DLFREQ?
```

Response

dl_freq

Unit	Hz

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz omitted)
Default	2010.80000 MHz

Details

The Rx frequency is set for the mobile station.
Changing the setting of the downlink frequency does not change the setting of the channel.

Example of Use

To set the Downlink Frequency to 2120 MHz:
DLFREQ 2120 MHZ
DLFREQ?
> 2120000000

DTCHPAT

DTCH Data Pattern

Function

Sets or queries DTCH data pattern.

Command

```
DTCHPAT pattern
```

Query

```
DTCHPAT?
```

Response

pattern

Parameter

pattern	Data Pattern
ALL1	All “1”s

Example of Use

To set DTCH data pattern to ALL1.

DTCHPAT ALL1

DTCHPAT?

> ALL1

EPUCH_MEAS_SLOT

E-PUCH Measurement Slot

Function

Sets or queries E-PUCH measurement slot

Command

```
EPUCH_MEAS_SLOT slot
```

Query

```
EPUCH_MEAS_SLOT?
```

Response

slot

Parameter

slot	Measurement slot
Range	2 to 5
Resolution	1
Default	2

Example of Use

To set the E-PUCH measurement slot to 3:

EPUCH_MEAS_SLOT 3

EPUCH_MEAS_SLOT?

> 3

EVM?

EVM Result of Modulation Analysis

Function

Queries EVM measurement result

Query

```
EVM? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
evm

Unit	%
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
evm	Measurement result in specified Storage mode

Example of Use

To query average of EVM measurement result:
EVM? AVG
> 1.50

FILTPWR?

Result of Filtered Power Measurement

Function

Queries RRC Filtered Power measurement result

Query

```
FILTPWR? mode
```

Response

When mode = TTL,
avg,max,min
When mode = AVG, MAX, MIN or DVT
pwr
When mode = IND,
s,pwr(1),pwr(2),...,pwr(s)

Unit	dBm
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode
pwr(s)	Measurement result at sth slot
s	Measurement count
Range	1 to 500

Example of Use

To query average of RRC Filtered Power measurement result:
FILTPWR? AVG
> -20.00

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Native Command Reference

FMEAS_TRGLVL

Trigger Level

Function

Sets or queries trigger level.

Command

```
FMEAS_TRGLVL trglevel
```

Query

```
FMEAS_TRGLVL?
```

Response

trglevel

Unit	dB

Parameter

trglevel	Trigger Level
Range	–40 to 0 dB
Resolution	1 dB
Suffix code	DB
Default	–30 dB

Example of Use

To set the trigger level to –10.0 dBm:

FMEAS_TRGLVL -10.0

FMEAS_TRGLVL?

> -10.0

FMEAS_TRGSRC

Trigger Source

Function

Sets or queries Trigger Source

Command

```
FMEAS_TRGSRC source
```

Query

```
FMEAS_TRGSRC?
```

Response

source

Parameter

source	Trigger Source
FREERUN	Freerun
PWR	Input signal power
FRAME	Frame
Default	PWR

Example of Use

To set trigger source to Freerun:
FMEAS_TRGSRC FREERUN
FMEAS_TRGSRC?
> FREERUN

FMEAS_TRGTOUT

Trigger Timeout

Function

Sets or queries trigger timeout.

Command

```
FMEAS_TRGTOUT trgtime
```

Query

```
FMEAS_TRGTOUT?
```

Response

trgtime

Unit	s

Parameter

trgtime	Time Out
Range	1 to 10 s
Resolution	1 s
Suffix code	S
Default	10 s

Example of Use

To set the Trigger timeout time to 5 seconds:

FMEAS_TRGTOUT 5

FMEAS_TRGTOUT?

> 5

ILVL

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
ILVL level
```

Query

```
ILVL?
```

Response

level

Unit	dBm

Parameter

level	Input level
Range	–65.0 to +35.0 dBm (Port 1/Port 2)
	–65.0 to +25.0 dBm (Port 3/Port 4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Example of Use

To set the output level to –10.0 dBm:
ILVL -10.0
ILVL?
>-10.0

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 "Native Command Reference" in the "MU887000A TRX Test Module Operation Manual".

IQIMB?

IQ Imbalance Result of Modulation Analysis

Function

Queries IQ Imbalance measurement result

Query

```
IQIMB? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
iqimb

Unit	%
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
iqimb	Measurement result in specified Storage mode

Example of Use

To query average of IQ Imbalance measurement result:
IQIMB? AVG
> 0.04

M50PWR?

Result of Power Template measurement –50dBm

Function

Queries the Tx power measurement result in the section where Power Template before burst transmission is restricted to –50 dBm (–50dBm).

Query

```
M50PWR? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pwr

Unit:	dBm
Resolution:	0.01

Parameter

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the section where Power Template before burst transmission is set to –50 dBm:
M50PWR? AVG
> 1.50

MAGERR?

Magnitude Error Result of Modulation Analysis

Function

Queries Magnitude Error measurement result

Query

`MAGERR? mode`

Response

When mode = TTL,

avg,max,min

When mode ≠ TTL,

mevm

Unit	%
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
merr	Measurement result in specified Storage mode

Example of Use

To query average of Magnitude Error measurement result:

MAGERR? AVG

> 1.05

MEASOBJ

Measurement Object

Function

Sets the measurement target.

Command

```
MEASOBJ measobj
```

Query

```
MEASOBJ?
```

Response

measobj

Parameters

measobj	Measurement target
DPCH	DPCH
CLPC	Closed Loop Power Control
Default	DPCH

Example of Use

To set the measurement target to Closed Loop Power Control.

MEASOBJ CLPC

MEASOBJ?

> CLPC

MEASSEL

Measurement Select

Function

Sets or queries measurement function.

Command

`MEASSEL meassel`

Query

`MEASSEL?`

Response

meassel

Parameter

meassel	Measurement function
FMEAS	Fundamental Measurement
Default	FMEAS

Example of Use

To set the measurement function to Fundamental Measurement:

MEASSEL FMEAS

MEASSEL?

> FMEAS

MEASTRG

Measurement Trigger

Function

Sets or queries measurement trigger.

Command

```
MEASTRG trigger
```

Query

```
MEASTRG?
```

Response

trigger

Parameter

trigger	Measurement Trigger
MIDAMBLE	Midamble
VIDEO	Video
Default	MIDAMBLE

Example of Use

To set the measurement trigger to Video:

MEASTRG VIDEO

MEASTRG?

> VIDEO

MIDAMBLECONF

Midamble Configuration

Function

Sets or queries Midamble configuration.

Command

```
MIDAMBLECONF number
```

Query

```
MIDAMBLECONF?
```

Response

number

Parameter

number	MidambleConfiguration
Range	16
Resolution	1
Default	16

Example of Use

To set the Midamble configuration to 16:

MIDAMBLECONF 16

MIDAMBLECONF?

> 16

MOD_SET

Modulation Analysis Measurement Enable and Count

Function

Enables Modulation Analysis measurement and sets measurement count, or queries settings

Command

```
MOD_SET on_off[,count]
```

Query

```
MOD_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Enables Modulation Analysis measurement
OFF	Disables Modulation Analysis measurement
Default	OFF
count	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Modulation Analysis measurement and set average number to 120:

MOD_SET ON,120
MOD_SET?
> ON,120

OBW?

Result of Occupied Bandwidth

Function

Queries Occupied Bandwidth measurement result

Query

```
OBW?
```

Response

bw

Unit	MHz
Resolution	0.001

Parameter

bw	Occupied Bandwidth [MHz]

Example of Use

To query Occupied Bandwidth measurement result:

OBW?

> 1.280

OBWFREQ?

Result of Occupied Bandwidth Frequency

Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement

Query

```
OBWFREQ? pos
```

Response

freq

Unit	MHz
Resolution	0.001

Parameters

pos	Frequency position
UPPER	Upper frequency
LOWER	Lower frequency
CENTER	Center frequency
freq	Frequency [MHz]

Example of Use

To query upper frequency of Occupied Bandwidth:

OBWFREQ? UPPER

> 1951.920

OBW_SET

OBW Measurement Enable and Count

Function

Enables Occupied Bandwidth measurement and sets measurement count, or queries settings

Command

```
OBW_SET on_off[,count]
```

Query

```
OBW_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
count	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Occupied Bandwidth measurement and set the measurement count to 100:

OBW_SET ON,100

OBW_SET?

> ON,100

OFFPWRM?

Result of Power Template measurement Off power (TS s-1)

Function

Queries the Tx power measurement result in the transmission-off section before burst transmission (Off power (TS s-1)).

Query

```
OFFPWRM? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pwr

Unit	dB
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section before burst transmission:
OFFPWRM? AVG
> 1.50

OFFPWRP?

Result of Power Template measurement Off Power(TS s+1)

Function

Queries the Tx power measurement result in the transmission-off section after burst transmission (Off Power(TS s+1)).

Query

```
OFFPWRP? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pwr

Unit	dB
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section after burst transmission:

OFFPWRP? AVG
> 1.50

OLVL

Output Level

Function

Sets or queries RF signal total output level for all channels

Command

```
OLVL level
```

Query

```
OLVL?
```

Response

level

Unit	dBm

Parameter

level	Output level
Range	–130.0 to –10.0 dBm (Port 1/Port 2)
	–120.0 to 0.0 dBm (Port 3/Port 4)
Resolution	0.1
Suffix code	DBM (assumes dBm when omitted)
Default	–66.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Calibration is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Example of Use

To set the output level to –50.0 dBm:

```
OLVL -50.0
OLVL?
>-50.0
```

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL
For details of the commands, refer to Chapter 6 “Native Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

ORGNOFS?

Origin Offset Result of Modulation Analysis

Function

Queries Origin Offset measurement result

Query

```
ORGNOFS? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
orgnoffs

Unit	dB
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
orgnoffs	Measurement result in specified Storage mode

Example of Use

To query average of Origin Offset measurement result:
ORGNOFS? AVG
> 0.04

PCDE?

Result of Peak Code Domain Error

Function

Queries Peak Code Domain Error measurement result

Query

```
PCDE? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pcde

Unit	dB
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Min. value
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pcde	Measurement result in specified Storage mode

Example of Use

To query average of Peak Code Domain Error measurement result:
PCDE? AVG
> 0.08

PCDE_SET

Peak Code Domain Error Measurement Enable and Count

Function

Enables Peak Code Domain Error measurement and sets measurement count, or queries settings

Command

```
PCDE_SET on_off[,count]
```

Query

```
PCDE_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Turns measurement on
OFF	Turns measurement off
count	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To turn the Peak Code Domain Error measurement on and set the measurement count to 150:

PCDE_SET ON,150

PCDE_SET?

> ON,150

PEVM?

Peak EVM Result of Modulation Analysis

Function

Queries EVM Peak measurement result

Query

```
PEVM? mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pevm

Unit	%
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pevm	Measurement result in specified Storage mode

Example of Use

To query average of EVM Peak measurement result:
PEVM? AVG
> 1.75

PHASEERR?

Phase Error Result of Modulation Analysis

Function

Queries Phase Error measurement result

Query

```
PHASEERR? mode
```

Response

When mode = TTL,

avg,max,min

When mode ≠ TTL,

perr

Unit	degree
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Min. value
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
perr	Measurement result in specified Storage mode

Example of Use

To query average of Phase Error measurement result:

PHASEERR? AVG

> 1.55

PWR_SET

Tx Power Measurement Enable and Count

Function

Enables Tx Power measurement and sets measurement count, or queries settings

Command

```
PWR_SET on_off[,count]
```

Query

```
PWR_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
count	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Transmit Power measurement and set the average number to 10:

PWR_SET ON,10

PWR_SET?

> ON,10

PWR_TEMPLATE?

Result of Power Template measurement Template Judgement

Function

Queries whether the spectrum in the Power Template measurement is not more than the specified threshold.

Query

```
PWR_TEMPLATE?
```

Response

judgement

Parameter

judgement	Judgement result
PASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

To query whether the spectrum is not more than the specified threshold:

PWR_TEMPLATE?

> PASS

RHO

Rho

Function

Queries the Rho measurement result.

Query

`RHO? mode`

Response

When mode = TTL,

avg,max,min

When mode ≠ TTL,

rho

Unit	None
Resolution	0.00001

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
rho	Measurement result in specified Storage mode

Example of Use

To query the Rho measurement result average:

RHO? AVG

> 0.00122

RXFREQ

Downlink Frequency

Function

Sets or queries MU887000A downlink frequency

Command

```
RXFREQ dl_freq
```

Query

```
RXFREQ?
```

Response

dl_freq

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz omitted)
Default	2010.800000 MHz

Details

The Rx frequency is set for the mobile station.
Changing the setting of the downlink frequency does not change the setting of the channel.

Example of Use

To set the downlink frequency to 2120 MHz:
RXFREQ 2120MHZ
RXFREQ?
>2120000000

SCRCODE

Scrambling Code Number

Function

Sets Scrambling Code Number or queries setting

Command

```
SCRCODE code
```

Query

```
SCRCODE?
```

Response

code

Parameter

code	Scrambling Code Number
Range	0 to 127
Resolution	1
Default	0

Example of Use

To set Scrambling Code Number to 127:

SCRCODE 127

SCRCODE?

> 127

SEM?

Judgement of Spectrum Emission Mask

Function

Queries whether spectrum threshold set at spectrum measurement exceeded or not

Query

`SEM?`

Response

judgement

Parameter

judgement	Judgement result
PASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

To query whether spectrum threshold set at spectrum measurement exceeded or not:

SEM?

> PASS

SEM_LLIMIT

Spectrum Emission Mask - Mask Template Lower Limit

Function

Sets absolute level threshold (minimum threshold power) for Spectrum Emission Mask and queries settings

Command

```
SEM_LLIMIT level
```

Query

```
SEM_LLIMIT?
```

Response

Level

Unit	dBm

Parameter

level	Template threshold
Range	–100.0 to 0.0
Resolution	0.1 dBm
Suffix code	DBM
Default	–53.5 dBm

Example of Use

To set the absolute level threshold (minimum threshold power) for Spectrum Emission Mask measurement to –55.0 dBm:

SEM_LLIMIT -55.0

SEM_LLIMIT?

> -55.0

SEMLVL_LOWER?

Result of Spectrum Emission Mask (Lower)

Function

Queries peak level and frequency of spectrum in each lower frequency range of Spectrum Emission Mask

Query

```
SEMLVL_LOWER?
```

Response

freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)

freq(n):	Offset frequency of spectrum peak
Resolution	0.001 MHz
peak(n):	Peak level of spectrum
Resolution	0.01 dB

Parameters

freq(0)	Offset frequency –0.8 MHz
peak(0)	Peak level of spectrum in offset frequency –0.8 MHz
freq(1)	Offset frequency of spectrum peak in offset frequency range from –0.8 to –1.8 MHz
peak(1)	Peak level of spectrum in offset frequency range from –0.8 to –1.8 MHz
freq(2)	Offset frequency of spectrum peak in offset frequency range from –1.8 to –2.4 MHz
peak(2)	Peak level of spectrum in offset frequency range from –1.8 to –2.4 MHz
freq(3)	Offset frequency of spectrum peak in offset frequency range from –2.4 to –4.0 MHz
peak(3)	Peak level of spectrum in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query spectrum peak level and frequency at lower side of each frequency range:

SEMLVL_LOWER?

> -0.800,-20.00,-1.500,-30.00,-2.200,-40.00,-3.200,-50.00

SEMLVL_UPPER?

Result of Spectrum Emission Mask (Upper)

Function

Queries peak level and frequency of spectrum in each upper frequency range of Spectrum Emission Mask

Query

```
SEMLVL_UPPER?
```

Response

freq(0),peak(0),freq(1),peak(1),freq(2),peak(2),freq(3),peak(3)

freq(n):	Offset frequency of spectrum peak
Resolution	0.001 MHz
peak(n):	Peak level of spectrum
Resolution	0.01 dB

Parameters

freq(0)	Offset frequency +0.8 MHz
peak(0)	Peak level of spectrum in offset frequency +0.8 MHz
freq(1)	Offset frequency of spectrum peak in offset frequency range from +0.8 to +1.8 MHz
peak(1)	Peak level of spectrum in offset frequency range from +0.8 to +1.8 MHz
freq(2)	Offset frequency of the spectrum peak in the offset frequency range from +1.8 to +2.4 MHz
peak(2)	Peak level of spectrum in offset frequency range from +1.8 to +2.4 MHz
freq(3)	Offset frequency of spectrum peak in offset frequency range from +2.4 to +4.0 MHz
peak(3)	Peak level of spectrum in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query spectrum peak level and frequency at upper side of each frequency range:

SEMLVL_UPPER?

> 0.800,-20.00,1.500,-30.00,2.300,-40.00,3.500,-50.00

SEMMARGIN_LOWER?

Margin of Spectrum Emission Mask (Lower)

Function

Queries spectrum margin and offset frequency in each lower frequency range of Spectrum Emission Mask

Query

```
SEMMARGIN_LOWER?
```

Response

freq(0), peak(0), freq(1), peak(1), freq(2), peak(2), freq(3), peak(3)

freq(n):	Offset frequency at point where margin determined
Resolution	0.001 MHz
peak(n):	Margin from template
Resolution	0.01 dB

Parameters

freq(0)	Offset frequency –0.8 MHz
peak(0)	Margin in offset frequency –0.8 MHz
freq(1)	Offset frequency at point where margin determined offset frequency range from –0.8 to –1.8 MHz
peak(1)	Margin in offset frequency range from –0.8 to –1.8 MHz
freq(2)	Offset frequency at point margin determined in offset frequency range from –1.8 to –2.4 MHz
peak(2)	Margin in offset frequency range from –1.8 to –2.4 MHz
freq(3)	Offset frequency at point where margin determined in offset frequency range from –2.4 to –4.0 MHz
peak(3)	Margin in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query margin from Spectrum Emission Mask template and frequency at lower side of each frequency range:

SEMMARGIN_LOWER?

> -0.800,3.00,-1.500,3.00,-2.000,3.00,-3.500,3.00

SEMMARGIN_UPPER?

Margin of Spectrum Emission Mask (Upper)

Function

Queries spectrum margin and offset frequency in each upper frequency range of Spectrum Emission Mask

Query

```
SEMMARGIN_UPPER?
```

Response

freq(0), peak(0), freq(1), peak(1), freq(2), peak(2), freq(3), peak(3)

freq(n):	Offset frequency at the point on which the margin is determined
Resolution	0.001 MHz
peak(n):	Margin from the template
Resolution	0.01 dB

Parameter

<freq(0)>	Offset frequency +0.8 MHz
<peak(0)>	Margin in offset frequency +0.8 MHz
<freq(1)>	Offset frequency at point where margin determined in offset frequency range from +0.8 to +1.8 MHz
<peak(1)>	Margin in offset frequency range from +0.8 to +1.8 MHz
<freq(2)>	Offset frequency at point where margin determined in offset frequency range from +1.8 to +2.4 MHz
<peak(2)>	Margin in offset frequency range from +1.8 to +2.4 MHz
<freq(3)>	Offset frequency at point where margin determined in offset frequency range from +2.4 to +4.0 MHz
<peak(3)>	Margin in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query margin from Spectrum Emission Mask template and frequency at upper side of each frequency range:

SEMMARGIN_UPPER?

> 0.800,3.00,1.600,3.00,2.100,3.00,3.500,3.00

SEM_SET

SEM Measurement Enable and Count

Function

Enables Spectrum Emission Mask Measurement and sets measurement count, and queries settings

Command

```
SEM_SET on_off[,count]
```

Query

```
SEM_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
count	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Spectrum Emission Mask measurement and set the measurement count to 20:

SEM_SET ON,20

SEM_SET?

> ON,20

SEM_TEMPLATE

Spectrum Emission Mask - Mask Template

Function

Sets relative threshold for the Spectrum Emission Mask measurement, and queries setting

Command

```
SEM_TEMPLATE offset,level
```

Query

```
SEM_TEMPLATE? offset
```

Response

level

Unit	dBm

Parameters

offset	Offset frequency point		
Range	1 to 4		
Resolution	1		
level	Level at each offset frequency point		
Range	offset point	Level	Default
	1 (0.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–33.5 dBc
	2 (1.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–47.5 dBc
	3 (2.4 MHz, RBW=1 MHz)	–100.0 to 0.0	–57.7 dBc
	4 (2.4 to 4.0 MHz, RBW=1 MHz)	–100.0 to 0.0	–42.5 dBc
Resolution	0.1 dBc		

Example of Use

To set template at Point3 (2.4 MHz frequency offset) to –80.0 dBc:

SEM_TEMPLATE 3,-80.0

SEM_TEMPLATE? 3

> -80.0

TEMPLATE_SET

Power Template Measurement Enable and Count

Function

Enables Power Template measurement and sets measurement count, or queries settings.

Command

```
TEMPLATE_SET on_off[,count]
```

Query

```
TEMPLATE_SET?
```

Response

on_off, count

Parameters

on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	ON
count	Measurement count
Range	1 to 500
Resolution	1
Default	1

Example of Use

To enable Power Template measurement and set the measurement count to 10:

TEMPLATE_SET ON,10

TEMPLATE_SET?

> ON,10

TXFREQ

Uplink Frequency

Function

Sets or queries MU887000A Rx frequency (uplink frequency)

Command

```
TXFREQ ul_freq
```

Query

```
TXFREQ?
```

Response

ul_freq

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

This sets the Tx frequency for the mobile station.

Changing the setting of the uplink frequency does not change the setting of the channel.

Example of Use

To set the Uplink frequency to 1950 MHz:

TXFREQ 1950MHZ

TXFREQ?

>1950000000

TXPWR?

Result of Tx Power Measurement

Function

Queries Tx Power measurement results

Query

```
TXPWR? mode
```

Response

When mode = TTL,

avg,max,min

When mode = AVG, MAX, MIN or DVT

pwr

When mode = IND,

s,pwr(1),pwr(2),...,pwr(s)

Unit	dBm
Resolution	0.01

Parameters

mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode
pwr(s)	Tx Power of sth measurement
s	Measurement count
Range	1 to 500

Example of Use

To query average of Tx Power measurement results:

TXPWR? AVG

> -20.00

UDPCHCODE_MULTI1

Uplink DPCH Channelization Code (Multi Code_Code1)

Function

Sets or queries Uplink DPCH Channelisation Code (Multi Code_Code1).

Command

```
UDPCHCODE_MULTI1 code
```

Query

```
UDPCHCODE_MULTI1?
```

Response

```
code
```

Parameters

code	Channelization Code
Range	1
Resolution	1
Default	1

Example of Use

To set the Uplink DPCH Channelization Code (Multi Code_Code1) to 1:

UDPCHCODE_MULTI1 1

UDPCHCODE_MULTI1?

> 1

UDPCHCODE_MULTI2

Uplink DPCH Channelization Code (Multi Code_Code2)

Function

Sets or queries Uplink DPCH Channelization Code (Multi Code_Code2).

Command

```
UDPCHCODE_MULTI2 code
```

Query

```
UDPCHCODE_MULTI2?
```

Response

code

Parameters

code	Channelization Code
Range	2
Resolution	1
Default	2

Example of Use

To set the Uplink DPCH Channelization Code (Multi Code_Code2) to 2:

UDPCHCODE_MULTI2 2

UDPCHCODE_MULTI2?

> 2

UDPCHCODE_SINGLE

Uplink DPCH Channelization Code (Single Code)

Function

Sets or queries Uplink DPCH Channelization Code (Single Code).

Command

```
UDPCHCODE_SINGLE code
```

Query

```
UDPCHCODE_SINGLE?
```

Response

code

Parameters

code	Channelization Code
Range	1
Resolution	1
Default	1

Example of Use

To set the Uplink DPCH Channelization Code (Single Code) to 1:

UDPCHCODE_SINGLE 1

UDPCHCODE_SINGLE?

> 1

UDPCHSLOT

Uplink DPCH Timeslot

Function

Sets or queries Time Slot of Uplink DPCH

Command

`UDPCHSLOT slot`

Query

`UDPCHSLOT?`

Response

slot

Parameter

slot	Time slot
Range	1, 2
Resolution	1
Default	2

Example of Use

To set Time slot of Uplink DPCH to 1:

UDPCHSLOT 1

UDPCHSLOT?

> 1

ULCONFIG

Uplink Configuration

Function

Sets uplink signal channel configuration or queries setting

Command

```
ULCONFIG ulconf
```

Query

```
ULCONFIG?
```

Response

ulconf

Parameter

ulconf — Uplink signal channel configuration

RMC_SINGLE	Reference measurement channel 12.2 kbps(Single Code)
RMC_MULTI	Reference measurement channel 12.2 kbps(Multi Code)
HSDPA_RMC	HSDPA RMC
HSUPA_RMC	HSUPA RMC
Default	RMC_SINGLE

Example of Use

To set the uplink signal channel configuration to RMC_SINGLE:

ULCONFIG RMC_SINGLE

ULCONFIG?

> RMC_SINGLE

ULFREQ

Uplink Frequency

Function

Sets or queries MU887000A Rx frequency (uplink frequency)

Command

```
ULFREQ ul_freq
```

Query

```
ULFREQ?
```

Response

ul_freq

Unit	Hz

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

This sets the Tx frequency for the mobile station.
Changing the setting of the Uplink Frequency parameter does not change the Channel setting.

Example of Use

To set the uplink frequency to 1921 MHz:
ULFREQ 1921MHZ
ULFREQ?
>1921000000

WAVEFMEAS?

Waveform Data

Function

Queries waveform data for each measurement result

Query

```
WAVEFMEAS? format,position,length
```

Response

data(0),data(1),data(2),...,data(length–1)

<Format>	Unit	Resolution
1, 2, 11	dBm	0.01 dB
3, 4	None	0.0001
5, 6, 9, 10	%	0.01%
7, 8	degree	0.01 degree

Parameters

format	Format
1	Measured spectrum for Occupied Bandwidth
2	Measured spectrum for Spectrum Emission Mask
3	Measured waveform for Constellation (I)
4	Measured waveform for Constellation (Q)
5	Measured waveform for EVM (Average)
6	Measured waveform for EVM (Maximum)
7	Measured waveform for Phase Error (Average)
8	Measured waveform for Phase Error (Maximum)
9	Measured waveform for Magnitude Error (Average)
10	Measured waveform for Magnitude Error (Maximum)
11	Measured waveform for Tx Power
position	Starting point of the waveform data
Range	format1: 0 to 492
	format2: 0 to 820
	format3 to format10: 0 to 847
	format11: 0 to 2591
Resolution	1
length	Number of data to be read out
Range	format1: 1 to (493 – position)
	format2: 1 to (821 – position)
	format3 to format10: 1 to (848 – position)
	format11: 1 to (2592 – position)
data(0)	Waveform data(0)

5

Native Command Reference

data(1)	Waveform data(1)
data(length–1)	Waveform data(length–1)

Details

Data in the average format are equivalent to results in the Average storage mode.
Data in the maximum format are equivalent to results in the Peak-hold storage mode.

Example of Use

To query 256 points of the measured waveform data for EVM (Average) from 257th point:
WAVEFMEAS? 5,256,256
> 2.00,2.01,2.00,...,2.10

5.2.3 Sequence measurement commands

DLFREQ

Downlink Frequency

Function

Sets or queries downlink frequency of MU887000A

Command

```
DLFREQ dl_freq
```

Query

```
DLFREQ?
```

Response

dl_freq

Unit	Hz

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

The Rx frequency is set for the mobile station.
Changing the setting of the downlink frequency does not change the setting of the channel.

Example of Use

To set the downlink frequency to 2120 MHz:
DLFREQ 2120MHZ
DLFREQ?
> 2120000000

ILVL

Input Level

Function

Sets or queries input level of MU887000A connector

Command

```
ILVL level
```

Query

```
ILVL?
```

Response

level

Unit	dBm

Parameter

level	Input level
Range	–65.0 to +35.0 dBm (Port 1/Port 2)
	–65.0 to +25.0 dBm (Port 3/Port 4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

The setting range varies with the input port setting.
When the Cable Loss Correction is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.

Example of Use

To set the output level to –10.0 dBm:

ILVL -10.0
ILVL?
>-10.0

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL

For details of the commands, refer to Chapter 6 “Native Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

OLVL

Output Level

Function

Sets or queries RF signal total output level for all channels.

Command

`OLVL level`

Query

`OLVL?`

Response

level

Unit	dBm

Parameter

level	Output level
Range	–130.0 to –10.0 dBm (Port 1/Port 2)
	–120.0 to 0.0 dBm (Port 3/Port 4)
Resolution	0.1
Suffix code	DBM (uses dBm when omitted)
Default	–66.0 dBm

Details

The setting range varies with the output port setting.
When the Cable Loss Correction is ON, the cable loss is subtracted from the output level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –135.0 to –15.0 dBm.

Example of Use

To set the output level to –50.0 dBm:

OLVL -50.0
OLVL?
> -50.0

Related Commands

EXTLOSSW
LOSSTBL
LOSSTBLVAL

For details of the commands, refer to Chapter 6 “Native Command Reference” in the “MU887000A TRX Test Module Operation Manual”.

RXFREQ

Downlink Frequency

Function

Sets or queries MU887000A downlink frequency

Command

```
RXFREQ dl_freq
```

Query

```
RXFREQ?
```

Response

dl_freq

Parameter

dl_freq	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz omitted)
Default	2010.800000 MHz

Details

This Rx frequency is set for the mobile station.

Changing the setting of the downlink frequency does not change the setting of the channel.

Example of Use

To set the downlink Frequency to 2120 MHz:

RXFREQ 2120MHZ

RXFREQ?

>2120000000

SEQCTRL

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table
Sets the parameters for both measurement and signal transmission.

Command

```
SEQCTRL start,end
```

Query

```
SEQCTRL?
```

Response

start,end

Parameters

start	Start segment
Range	0 to 1999
Resolution	1
Default	0
end	Stop segment
Range	start to 1999
Resolution	1
Default	199

Details

Start=0 to 1999, end=0 to 1999 where end ≥ start
Whether the set sequence table can be executed is evaluated. Use the SEQERR? command to query the error details.

Example of Use

To set the start and stop segments to 20 and 52, respectively.
SEQCTRL 20,52
SEQCTRL?
> 20,52

SEQCTRLTX

Sequence Control Parameter - Sequence Control

Function

Sets or queries start and stop segments in sequence table.

Sets the measurement parameters only, without affecting the signal transmission parameters.

Command

```
SEQCTRLTX start,end
```

Query

```
SEQCTRLTX?
```

Response

```
start,end
```

Parameters

start	Start segment
Range	0 to 1999
Resolution	1
Default	0
end	Stop segment
Range	start to 1999
Resolution	1
Default	0

Details

Start = to 1999, end = 0 to 1999 where end ≥ start

Whether the set sequence table can be executed is evaluated. Use the SEQERR? command to query the error details.

Examples of Use

To set the start and stop segments to 20 and 55, respectively:

SEQCTRLTX 20,55

SEQCTRLTX?

> 20,55

SEQERR?

Sequence Parameter Information - Error check

Function

Queries setting error information of sequence table

Query

```
SEQERR? [item]
```

Response

Query parameter	Response
None:	n,err(0),..,err(n–1)
ILVL, OLVL, STEP, DLPAT, PORT:	ns,seg(0),..,seg(ns–1)
LEN:	e,mem,exe,set
OLVLNUM, PATNUM, STDNUM:	e,exe,set

If no error is found in the sequence table, the response returns 0.

Parameters

item	Parameter of sequence table	
ILVL	Input level	
OLVL	Output level	
STEP	Step count	
DLPAT	Waveform pattern	
PORT	Port	
LEN	Capture memory length	
OLVLNUM	Output level change count	
PATNUM	Waveform pattern change count	
STDNUM	Measurement mode change count	
n	Number of errors	
Range	0 to 4	
err	Parameter with error	
ILVL	Input level	
OLVL	Output level	
STEP	Number of steps	
LEN	Capture memory length	
ns	Number of segments that contain errors	
Range	0 to 200	
seg	Segment number that contains errors	
Range	0 to 1999	
e	Presence of errors	
Range	0	No error, executable
	1	Errors found, not executable
mem	Memory utilization	

Range	0. to 100.0%
Resolution	0.1%
exe	Number of capture capable of executing capture out of number of configured segments
Range	0 to 200
set	Number of segments with capture configured
Range	0 to 200

Details

This command can check error presence of input level, output level, step count, and capture memory length.

To query error presence of the following parameters, use SEQERR2? command.

Waveform pattern. Port, Output level change count, Waveform pattern change count, Measurement mode change count

To set parameters for sequence table using the following commands, errors are not checked.

SEQTRX, SEQTX, SEQMEAS

Examples of Use

To query presence or error:

SEQERR?

>1,ILVL

To query the input level setting error information:

SEQERR? ILVL

>2,3,12

To query capture memory error information:

SEQERR? LEN

>0,25.0,20,20

Here, the capture memory utilization is 25.0%, so all captures configured in 20 segments are executable.

Remarks

Sequence measurement cannot be started if there are errors.

However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the SEQCTRL command.

SEQERR2?

Sequence Parameter Information - Error Check

Function

Queries setting error information of sequence table

Query

```
SEQERR2? format
```

Response

n,err(0),..,err(n-1)

If no error is found in the sequence table, the response returns 0.

Parameters

format	Format
1	Error check 1
n	Number of errors
Range	0 to 7
err(n-1)	Parameter with errors
ILVL	Input level
OLVL	Output level
STEP	Step count
DLPAT	Waveform Pattern
PORT	Port
LEN	Capture memory length
OLVLNUM	Output level change count
PATNUM	Waveform pattern change count
STDNUM	Measurement mode change count

Details

Parameter setting errors can be checked up to seven types.

Only one of output level change count, waveform pattern change count, or measurement mode change count has an error.

Two or three of them cannot have an error simultaneously.

To set parameters for sequence table using the following commands, errors are not checked.

SEQTRX, SEQTX, SEQMEAS, SEQSGPORT

To query error details of each parameter, use SEQERR command.

Examples of Use

To query the presence of errors:

SEQERR2? 1

>2,ILVL,DLPAT

Remarks

Sequence measurement cannot be started if there are errors.
However, sequence measurement can be started if segment numbers with errors are excluded from the execution range using the SEQCTRL command.

SEQEXECTX

Start Signal Analyzer Measurement Only

Function

Sets only the parameters for the specified measurement and executes measurement, without affecting the signal transmission parameters.

Command

```
SEQEXECTX
```

SEQMEAS

Sequence Table Parameter - Measurement

Function

Sets or queries measurement conditions of specified segment

Command

```
SEQMEAS seg,mode,step,mcond
```

Query

```
SEQMEAS? seg
```

Response

mode,step,mcond

Parameters

seg	Segment number	
Range	0 to 1999	
Resolution	1	
mode	Measurement mode	Required software license
TXP	Transmit power measurement mode	MX887010A
WCDMA	W-CDMA measurement mode	MX887010A and MX887011A
GSM	GSM measurement mode	MX887010A and MX887012A
CDMA2K	CDMA2000 1x measurement mode	MX887010A and MX887015A
EVDO	CDMA2000 1xEVDO measurement mode	MX887010A and MX887016A
TDSCDMA	TD-SCDMA measurement mode	MX887010A and MX887017A

LTE	LTE measurement mode	MX887010A and MX887013A, or MX887010A and MX887014A
Default	TXP	
step	Step count	
Range	2 to 3000	
Resolution	1	
Default	2	
mcond	Measurement condition number	
Range	0 to 1999	
Resolution	1	
Default	0	

Example of Use

To set settings for segment 2 as follows:
Measurement mode: TDSCDMA, Step count: 1000, Measurement condition number: 3
SEQMEAS 2,TDSCDMA,1000,3
SEQMEAS? 2
> TDSCDMA,1000,3

SEQMSTAT?

Sequence Measurement Status

Function

Queries status of sequence measurement

Query

```
SEQMSTAT?
```

Response

m_status,n,s(0),s(1),..,s(n–1)

Parameters

m_status	Measurement execution status
0	Measurement completed successfully
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
12	Tx measurement timeout

The value received from MX887017A is 0, 2, 5, 9, or 12.

n	Number of measured segments
Range	0 to 200
s	Measurement status of specified segment
0	Measurement completed successfully
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
10	Segment not measured
12	Tx measurement timeout

The value received from MX887017A is 0, 2, 5, 9, 10, or 12.

Example of Use

To query sequence measurement execution status:

SEQMSTAT?

>2,6,0,0,0,0,2,0

The result shows that six segments are measured segments and the fifth segment is over level.

Related command

```
MSTAT
```

SEQSEGSTAT

SEQPROGRESS?

Sequence Progress

Function

Queries progress rate of sequence measurement and currently operating sequence number

Query

SEQPROGRESS?

Response

p,cur,start,end

Parameters

p	Progress rate of sequence measurement
Range	0% to 100 %
cur	Segment number currently executing
Range	0 to 1999
start	Segment number executed first
Range	0 to 1999
end	Segment number executed last
Range	0 to 1999

Example of Use

To query sequence measurement progress and currently executing sequence number:
SEQPROGRESS?
>65,23,11,30

Remarks

The segment number where measurement is executed first and the segment number where measurement is executed last are same as the start and stop segment numbers configured using the SEQCTRL command.

SEQREINIT

Sequence Control Parameter - Sequence End State Reinitialization

Function

Enables automatic initialization of following items after completion of sequence measurement mode operation, queries setting

- Downlink frequency
- Output level
- Output signal pattern
- Uplink frequency
- Input level

Command

```
SEQREINIT sw
```

Query

```
SEQREINIT?
```

Response

sw

Parameter

sw	Automatic initialization after sequence measurement completion
ON	Enables automatic initialization
OFF	Disables automatic initialization
Default	ON

Details

If the parameter is set to ON, the settings are initialized to the values configured by the following commands after sequence measurement completion.

Downlink frequency	DLFREQ
Output level	OLVL
Output signal pattern	DLPAT
Uplink frequency	ULFREQ
Input level	ILVL

If the parameter is set to OFF, the settings remain those of the sequence measurement stop segment.

Example of Use

To reset target parameters:

SEQREINIT ON

SEQREINIT?
> ON

SEQSEGSTAT?

Specified Segment Status

Function

Queries measurement status of specified segment

Query

```
SEQSEGSTAT? seg
```

Response

```
stat
```

Parameters

seg	Segment number
Range	0 to 1999
stat	Segment status
0	Measurement completed successfully
2	Over level
3	Under level
4	Measurement failed
5	Synchronization word not detected
9	Measurement in progress or not measured
10	Segment not measured
12	Tx measurement timeout

The value received from MX887017A is 0, 2, 5, 9, 10, or 12.

Example of Use

To query the measurement status of segment 16:
SEQSEGSTAT? 16
> 0

SEQSGPORT

Sequence Table Parameter - SG Output Port

Function

Sets or queries test port to send RF signal in specified segment of sequence table

Command

```
SEQSGPORT seg,port
```

Query

```
SEQSGPORT? seg
```

Response

port

Parameters

seg	Segment number
Range	0 to 1999
port	Port number
PORT1	PORT 1
PORT2	PORT 2
PORT3	PORT 3
PORT4	PORT 4
Default	PORT1

Details

PORT3 cannot be set when PORT3 is selected for RF signal input port.
PORT4 cannot be set when PORT4 is selected for RF signal input port.

Example of Use

To set the port number in segment 5 to 2:
SEQSGPORT 5, PORT2
SEQSGPORT? 5
> PORT2

SEQTBL

Sequence Control Parameter - Sequence Table

Function

Sets or queries number of sequence table to execute

Command

```
SEQTBL table
```

Query

```
SEQTBL?
```

Response

table

Parameter

table	Sequence table number
Range	0 to 3
Resolution	1
Default	0

Example of Use

To select sequence table 1:

SEQTBL 1

SEQTBL?

> 1

SEQTRG

Sequence Table Parameter - Trigger

Function

Sets or queries trigger condition for starting Sequence Measurement mode

Command

```
SEQTRG seg,src,slope,level,delay
```

Query

```
SEQTRG? seg
```

Response

src,slope,level,delay

Parameters

seg	Segment number
Range	0 to 1999
src	Trigger source
FRAME	Frame
FREERUN	Free run
PWR	Input signal power
Default	FREERUN
slope	Trigger slope
RISE	Rising edge trigger
Default	RISE
level	Trigger level
Range	–40 to 0 dB
Resolution	1 dB
Suffix Code	DB (uses dB when omitted)
Default	–30 dB
delay	Delay time
Range	0 to 1000.000 ms
Resolution	0.001 ms
Suffix Code	NS, US, MS, S (uses ms when omitted)
Default	0.000 ms

Details

The trigger slope and trigger level are enabled when trigger source is set to PWR.

Example of Use

To set the trigger condition of segment 2 as follows:

Trigger source: PWR, Trigger slope: RISE, Trigger level: –30 dB, Delay time: 0

SEQTRG 2,PWR,RISE,-30,0
SEQTRG? 2
> PWR,RISE,-30,0.000

Remarks

Trigger level is defined as the level difference from the input level specified by the following command:
ILVL, SEQTRX

SEQTRX

Sequence Table Parameter - TRX Control

Function

Sets or queries following items in specific segment of sequence table

- Downlink frequency
- Output Level
- Output signal pattern
- Uplink frequency
- Input level

Command

```
SEQTRX seg,ul_freq,ref,dl_freq,level,pat
```

Query

```
SEQTRX? seg
```

Response

ul_freq,ref,dl_freq,level,pat

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
ul_freq	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	0.000001 MHz
Suffix Code	HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ (uses MHz when omitted)
Default	1950.000000 MHz
ref	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix Code	DBM (uses dBm when omitted)
Default	–10.0 dBm
dl_freq	Downlink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	0.000001 MHz
Suffix Code	HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ (uses MHz when omitted)
Default	2140.000000 MHz
level	Output level
Range	–130.0 to –10.0 dBm (Port1/Port2) –120.0 to 0.0 dBm (Port3/Port4)

Resolution	0.1 dB
Suffix Code	DBM (used dBm when omitted)
Default	–60.0 dBm
pat	Waveform pattern
PAT1 to PATn	Pattern number (n: waveform information file group range)
CW	Modulation turned OFF
OFF	Output level turned OFF
NC	Waveform pattern not configured in this segment (holds currently configured waveform pattern)
Default	CW

Details

The setting range varies with the input/output port setting.
If Cable Loss Correction is ON, the cable loss is added to the range of the input level and subtracted from the range of output level.
If the cable loss is 5 dB, the input and output levels are as follows:

Input level	–60.0 to +40 dBm
Output level	–135.0 to –15.0 dBm

In this case, if the output level is set to –10.0 dBm, an out-of-parameter setting range error occurs. (The response to SYSERR? returns 220, Parameter error).
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS, SEQEXECTX
A measurement execution error occurs when an out-of-range error occurs.
SEQERR? is used to query the details of errors.

The pattern number is the same as the group number. Refer to Chapter 3, “Waveform File Details” in the "Waveform Files for Cellular Application Operation Manual".

Examples of Use

To set segment 0 as follows.
Uplink frequency set to 1950.0 MHz, input level to –10.0 dBm, downlink frequency to 2140.0 MHz, output level to –60.0 dBm, and no modulation:
SEQTRX 0,1950.000000, -10.0,2140.000000,-60.0,CW
SEQTRX? 0
> 1950.000000,-10.0,2140.000000,-60.0,CW

Remarks

The group range is the selected waveform file.
For details of the waveform pattern, refer to Chapter 3, “Waveform File Details” in the “Waveform Files for Cellular Application Operation Manual”.

SEQTX

Sequence Table Parameter - Uplink Frequency, Input Level

Function

Sets or queries uplink frequency and input level of segments in sequence table.

Command

```
SEQTX seg,ul_freq,ref
```

Query

```
SEQTX? seg
```

Response

```
ul_freq,ref
```

Parameter

seg	Segment number
Range	0 to 1999
Resolution	1
ul_freq	Rx frequency (uplink)
Range	400.000000 to 3800.000000 MHz
Resolution	0.000001 MHz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses MHz when omitted)
Default	1950.000000 MHz
ref	Input level
Range	–65.0 to +35 dBm (Port1/Port2) –65.0 to +25 dBm (Port3/Port4)
Resolution	0.1 dB
Suffix code	DBM (uses dBm when omitted)
Default	–10.0 dBm

Details

This command sets only the uplink frequency and input level among the parameters that are set by SEQTRX.
The setting range varies with the input port setting.
When the Cable Loss Calibration is ON, the cable loss is added to the input level setting range.
When the cable loss is 5 dB, the Port1/Port2 setting range is –60.0 to +40.0 dBm.
Whether an out-of-parameter setting range error has occurred is determined during execution of the following commands:
SEQCTRL, SNGLS, SEQEXECTX

Example of Use

To set the parameters for segment 1 as follows:
Uplink frequency: 1950 MHz, Input level: –10.0 dBm
SEQTX 1,1950,-10.0
SEQTX? 1
> 1950.000000,-10.0

TRGTOUT

Trigger Timeout

Function

Sets or queries trigger timeout

Command

```
TRGTOUT time
```

Query

```
TRGTOUT?
```

Response

time

Unit	s

Parameter

time	Timeout time
Range	1 to 60 s
Resolution	1 s
Suffix code	NS, US, MS, S (uses s when omitted)
Default	10 s

Example of Use

To set the Trigger timeout time to 10 seconds:
TRGTOUT 10
TRGTOUT?
> 10

TXFREQ

Uplink Frequency

Function

Sets or queries uplink frequency of MU887000A

Command

```
TXFREQ ul_freq
```

Query

```
TXFREQ?
```

Response

ul_freq

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

The Tx frequency is set for the mobile station.

Changing the setting of the Uplink Frequency parameter does not change the Channel setting.

Example of Use

To set the uplink frequency to 1950 MHz:

TXFREQ 1950MHZ

TXFREQ?

>1950000000

ULFREQ

Uplink Frequency

Function

Sets or queries MU887000A Rx frequency (uplink frequency)

Command

```
ULFREQ ul_freq
```

Query

```
ULFREQ?
```

Response

ul_freq

Unit	Hz

Parameter

ul_freq	Uplink frequency
Range	400.000000 to 3800.000000 MHz
Resolution	1 Hz
Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ (uses Hz when omitted)
Default	2010.800000 MHz

Details

This sets the Tx frequency for the mobile station.
Changing the setting of the Uplink Frequency parameter does not change the Channel setting.

Example of Use

To set the uplink frequency to 1921 MHz:
ULFREQ 1921MHZ
ULFREQ?
>1921000000

TDSCDMA_ACLR?

Result of Adjacent Channel Leakage Power Ratio

Function

Queries Adjacent Channel Leakage Power Ratio measurement result in Sequence Measurement mode

Query

```
TDSCDMA_ACLR? seg,mode
```

Response

When mode = TTL,
avg(0),avg(1),avg(2),avg(3),max(0),max(1),max(2),max(3),min(0),min(1),min(2),min(3)
When mode ≠ TTL,
aclr(0),aclr(1),aclr(2),aclr(3)

Unit	dB
Resolution	0.01

Parameter number	Frequency offset
0	–3.2 MHz
1	–1.6 MHz
2	+1.6 MHz
3	+3.2 MHz

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
aclr	Measurement result in specified Storage mode

Example of Use

To query average value of ACLR measurement results for segment 20 in the Sequence Measurement mode:

TDSCDMA_ACLR? 20 AVG
> -20.00,-21.00,-22.00,-23.00

TDSCDMA_ACLR_SET

ACLR Measurement Enable and Count

Function

Enables Adjacent Channel Leakage Power Ratio measurement and sets or queries measurement count

Command

```
TDSCDMA_ACLR_SET mcond,on_off[,count]
```

Query

```
TDSCDMA_ACLR_SET? mcond
```

Response

on_off,count

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
count	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Adjacent Channel Leakage Power Ratio measurement and set the measurement count to 80 in measurement condition number 3:

TDSCDMA_ACLR_SET 3,ON,80
TDSCDMA_ACLR_SET? 3
> ON,80

TDSCDMA_CFREQ?

Carrier Frequency Result of Modulation Analysis

Function

Queries Carrier Frequency measurement result

Query

`TDSCDMA_CFREQ? seg`

Response

freq

Unit	Hz
Resolution	1

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
freq	Carrier frequency

Example of Use

To query the carrier frequency measurement result for segment 1 in the Sequence Measurement mode:

TDSCDMA_CFREQ? 1

> 1951000000

TDSCDMA_CFERR?

Carrier Frequency Error Result of Modulation Analysis

Function

Queries Carrier Frequency measurement result in Sequence Measurement mode

Query

```
TDSCDMA_CFERR? seg,mode
```

Response

When mode = TTL,
avg_ppm,avg_Hz,max_ppm,max_Hz,min_ppm,min_Hz
When mode ≠ TTL,
freq_ppm,freq_Hz

Unit	ppm, Hz
Resolution	0.01,0.1

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg_ppm	Average of Frequency Error measurement results in ppm
avg_Hz	Average of Frequency Error measurement results in Hz
max_ppm	Maximum value in Frequency Error measurement results in ppm
max_Hz	Maximum value in Frequency Error measurement results in Hz
min_ppm	Minimum value in Frequency Error measurement results in ppm
min_Hz	Minimum value in Frequency Error measurement results in Hz
freq_ppm	Frequency Error measurement results in specified Storage mode in ppm
freq_Hz	Frequency Error measurement results in specified Storage mode in Hz

Example of Use

To query average of Frequency Error measurement results for segment 1 in Sequence Measurement mode:
TDSCDMA_CFERR? 1,AVG
> 0.03,60.0

TDSCDMA_CFERR_WORST?

Carrier Frequency Error Result of Modulation Analysis (Worst)

Function

Queries worst value in Carrier Frequency Error measurement results in Sequence Measurement mode

Query

`TDSCDMA_CFERR_WORST? seg`

Response

<freq_ppm>,<freq_Hz>

Unit	ppm, Hz
Resolution	0.01,0.1

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
freq_ppm	Worst value in Frequency Error measurement results in ppm
freq_Hz	Worst value in Frequency Error measurement results in Hz

Example of Use

To query worst value in Frequency Error measurement results for segment 1 in Sequence Measurement mode:

TDSCDMA_CFERR_WORST? 1

> 0.03,60.0

TDSCDMA_EVM?

EVM Result of Modulation Analysis

Function

Queries EVM measurement in Sequence Measurement mode

Query

```
TDSCDMA_EVM? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
evm

Unit	%
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
evm	Measurement result in specified Storage mode

Example of Use

To query average of EVM Measurement results for segment 1 in Sequence Measurement mode:
TDSCDMA_EVM? 1,AVG
> 1.50

TDSCDMA_FILTPWR?

Result of Filtered Power Measurement

Function

Queries result of RRC Filtered Power measurement in Sequence Measurement mode

Query

```
TDSCDMA_FILTPWR? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode = AVG, MAX, MIN or DVT
pwr
When mode = IND,
s,pwr(1),pwr(2),…,pwr(s)

Unit	dBm
Resolution	0.01

Parameter

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode
pwr(s)	Filtered Power of sth measurement
s	Measurement count
Range	1 to 200

Example of Use

To query average of RRC Filtered Power Measurement result for segment 0 in Sequence Measurement mode:
TDSCDMA_FILTPWR? 0,AVG

> -20.00

TDSCDMA_IQIMB?

IQ Imbalance Result of Modulation Analysis

Function

Queries IQ Imbalance measurement result in Sequence Measurement mode

Query

```
TDSCDMA_IQIMB? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
iqimb

Unit	%
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
iqimb	Measurement result in specified Storage mode

Example of Use

To query average of IQ Imbalance Measurement results for segment 1 in Sequence Measurement mode:
TDSCDMA_IQIMB? 1,AVG
> 0.04

TDSCDMA_M50PWR?

Result of Power Template Measurement –50dBm

Function

Queries the Tx power measurement result in the section where Power Template before burst transmission is restricted to –50 dBm (–50dBm) in Sequence Measurement mode.

Query

`TDSCDMA_M50PWR? seg,mode`

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pwr

Unit	dBm
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the section where Power Template before burst transmission is set to –50 dBm for segment 0 in Sequence Measurement mode:

TDSCDMA_M50PWR? 0,AVG
> 1.50

TDSCDMA_MAGERR?

Magnitude Error Result of Modulation Analysis

Function

Queries result of Magnitude Error measurement in Sequence Measurement mode

Query

```
TDSCDMA_MAGERR? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
merr

Unit	%
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
merr	Measurement result in specified Storage mode

Example of Use

To query average of Magnitude Error measurement result for segment 1 in Sequence Measurement mode:
TDSCDMA_MAGERR? 1,AVG
> 1.05

5
Native Command Reference

TDSCDMA_MEAS_OFF

Turn Off All Measurement Items

Function

Sets all measurement items to Off collectively.

Command

```
TDSCDMA_MEAS_OFF mcond
```

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1

Example of Use

To set all measurement items of condition number 0 in the TDSCDMA measurement condition table to Off collectively.

TDSCDMA_MEAS_OFF 0

Remarks

This is equivalent to setting all the commands below to Off.

TDSCDMA_PWR_SET
TDSCDMA_OBW_SET
TDSCDMA_SEM_SET
TDSCDMA_ACLR_SET
TDSCDMA_MOD_SET
TDSCDMA_TEMPLATE_SET

TDSCDMA_MOD_SET

Modulation Analysis Measurement Enable and Count

Function

Enables Modulation Analysis measurement and sets measurement count, or queries settings

Command

```
TDSCDMA_MOD_SET mcond,on_off[,count]
```

Query

```
TDSCDMA_MOD_SET? mcond
```

Response

on_off,count

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
on_off	Enables/disables measurement
ON	Enables Modulation Analysis measurement
OFF	Disables Modulation Analysis measurement
Default	OFF
count	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Modulation Analysis measurement and set the measurement count to 120 in measurement condition number 25:

TDSCDMA_MOD_SET 25,ON,120

TDSCDMA_MOD_SET? 25

> ON,120

TDSCDMA_OBW?

Result of Occupied Bandwidth

Function

Queries Occupied Bandwidth measurement result in Sequence Measurement mode

Query

`TDSCDMA_OBW? seg`

Response

bw

Unit	MHz
Resolution	0.001

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
bw	Occupied Bandwidth [MHz]

Example of Use

To query Occupied Bandwidth measurement result for segment 0 in Sequence Measurement mode:

TDSCDMA_OBW? 0

> 3.840

TDSCDMA_OBWFREQ?

Result of Occupied Bandwidth Frequency

Function

Queries upper, lower and center frequency of Occupied Bandwidth measurement in Sequence Measurement mode

Query

```
TDSCDMA_OBWFREQ? seg,pos
```

Response

freq	
Unit	MHz
Resolution	0.001

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
pos	Frequency position
UPPER	Upper frequency
LOWER	Lower frequency
CENTER	Center frequency
freq	Frequency (MHz)

Example of Use

To query the upper frequency of the Occupied Bandwidth for segment 1 in the Sequence Measurement mode:

TDSCDMA_OBWFREQ? 1,UPPER

> 1951.920

TDSCDMA_OBW_SET

OBW Measurement Enable and Count

Function

Enables Occupied Bandwidth measurement and sets measurement count in Sequence Measurement mode, or queries settings

Command

```
TDSCDMA_OBW_SET mcond,on_off[,count]
```

Query

```
TDSCDMA_OBW_SET? mcond
```

Response

on_off,count

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
count	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Occupied Bandwidth measurement and set the measurement count to 100 for the measurement condition number 2 in Sequence Measurement mode:

TDSCDMA_OBW_SET 2,ON,100

TDSCDMA_OBW_SET? 2

> ON,100

TDSCDMA_OFFPWRM?

Result of Power Template Measurement Off power (TS s-1)

Function

Queries the Tx power measurement result in the transmission-off section before burst transmission (Off power (TS s-1)) in Sequence Measurement mode.

Query

```
TDSCDMA_OFFPWRM? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pwr

Unit	dB
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section before burst transmission for segment 0 in Sequence Measurement mode:
TDSCDMA_OFFPWRM? 0,AVG
> 1.50

TDSCDMA_OFFPWRP?

Result of Power Template Measurement Off Power(TS s+1)

Function

Queries the Tx power measurement result in the transmission-off section after burst transmission (Off Power(TS s+1)) in Sequence Measurement mode.

Query

```
TDSCDMA_OFFPWRP? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pwr

Unit	dB
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode

Example of Use

To query the average of the Tx power measurement result in the transmission-off section after burst transmission for segment 0 in Sequence Measurement mode:
TDSCDMA_OFFPWRP? 0,AVG
> 1.50

TDSCDMA_ORGNOFS?

Origin Offset Result of Modulation Analysis

Function

Queries Origin Offset measurement result in Sequence Measurement mode

Query

```
TDSCDMA_ORGNOFS? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
orgnoffs

Unit	dB
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
orgnoffs	Measurement result in the specified Storage mode

Example of Use

To query average of Origin Offset measurement result for segment 1 in Sequence Measurement mode

TDSCDMA_ORGNOFS? 1,AVG
> 0.04

TDSCDMA_PEVM?

Peak EVM Result of Modulation Analysis

Function

Queries EVM Peak measurement result in Sequence Measurement mode

Query

```
TDSCDMA_PEVM? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
pevm

Unit	%
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pevm	Measurement result in specified Storage mode

Example of Use

To query average of peak EVM measurement results for segment 1 in Sequence Measurement mode:

TDSCDMA_PEVM? 1,AVG
> 1.75

TDSCDMA_PHASEERR?

Phase Error Result of Modulation Analysis

Function

Queries result of Phase Error measurement in Sequence Measurement mode

Query

```
TDSCDMA_PHASEERR? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
perr

Unit	degree
Resolution	0.01

Parameter

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
perr	Measurement result in the specified Storage mode

Example of Use

To query average of Phase Error measurement results for segment 1 in Sequence Measurement mode:

TDSCDMA_PHASEERR? 1,AVG
> 1.55

5
Native Command Reference

TDSCDMA_PWR_SET

Tx Power Measurement Enable and Count

Function

Enables Tx Power measurement and sets measurement count in Sequence Measurement mode, or queries settings

Command

```
TDSCDMA_PWR_SET mcond,on_off[,count]
```

Query

```
TDSCDMA_PWR_SET? mcond
```

Response

on_off,count

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
count	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Transmit Power measurement and set the measurement count to 10 for the measurement condition number 5 in Sequence Measurement mode:

TDSCDMA_PWR_SET 5,ON,10

TDSCDMA_PWR_SET? 5

> ON,10

TDSCDMA_PWR_TEMPLATE?

Result of Power Template Measurement Template Judgement

Function

Queries whether the spectrum in the Power Template measurement is not more than the specified threshold in Sequence Measurement mode.

Query

```
TDSCDMA_PWR_TEMPLATE? seg
```

Response

judgement

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
judgement	Judgement result
PASS	Passed (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

Queries whether the spectrum is not more than the specified threshold for segment 0 in Sequence Measurement mode:

TDSCDMA_PWR_TEMPLATE? 0

> PASS

TDSCDMA_RHO?

Rho Result of Modulation Analysis

Function

Queries the Rho measurement results in the sequence measurement.

Query

```
TDSCDMA_RHO? seg,mode
```

Response

When mode = TTL,
avg,max,min
When mode ≠ TTL,
rho

Unit	None
Resolution	0.00001

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
rho	Measurement result in the specified Storage mode

Example of Use

To query the average value of the Rho measurement results of segment number 1 in the sequence measurement.
TDSCDMA_RHO? 1,AVG
> 0.00122

TDSCDMA_SEM?

Judgement of Spectrum Emission Mask

Function

Queries whether spectrum threshold set at Spectrum measurement in Sequence Measurement mode exceeded or not

Query

```
TDSCDMA_SEM? seg
```

Response

judgement

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
judgement	Judgement result
PASS	Pass (below threshold)
FAIL	Failed (above threshold)
–	No measurement

Example of Use

To query whether spectrum threshold set for segment 1 in Sequence Measurement mode exceeded or not:

TDSCDMA_SEM? 1

> PASS

TDSCDMA_SEM_LLIMIT

Spectrum Emission Mask - Mask Template Lower Limit

Function

Sets absolute lower level threshold (minimum threshold power) for Spectrum Emission Mask in Sequence Measurement mode and queries settings

Command

```
TDSCDMA_SEM_LLIMIT level
```

Query

```
TDSCDMA_SEM_LLIMIT?
```

Response

level

Unit	dBm

Parameter

level	Template threshold
Range	–100.0 to 0.0
Resolution	0.1 dBm
Default	–53.5 dBm

Example of Use

To set the absolute level threshold (minimum threshold power) for Spectrum Emission Mask measurement to –100.0 dBm:

TDSCDMA_SEM_LLIMIT -100.0

TDSCDMA_SEM_LLIMIT?

> -100.0

TDSCDMA_SEMLVL_LOWER?

Result of Spectrum Emission Mask (Lower)

Function

Queries peak level and frequency of spectrum in each lower frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
TDSCDMA_SEMLVL_LOWER? seg
```

Response

freq(0), peak(0), freq(1), peak(1), freq(2), peak(2), freq(3), peak(3)

freq(n):	Offset frequency of spectrum peak
Resolution	0.001 MHz
peak(n):	Peak level of spectrum
Resolution	0.01 dB

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
freq(0)	Offset frequency –0.8 MHz
peak(0)	Peak level of spectrum in offset frequency –0.8 MHz
freq(1)	Offset frequency of spectrum peak in offset frequency range from –0.8 to –1.8 MHz
peak(1)	Peak level of spectrum in offset frequency range from –0.8 to –1.8 MHz
freq(2)	Offset frequency of spectrum peak in offset frequency range from –1.8 to –2.4 MHz
peak(2)	Peak level of spectrum in offset frequency range from –1.8 to –2.4 MHz
freq(3)	Offset frequency of spectrum peak in offset frequency range from –2.4 to –4.0 MHz
peak(3)	Peak level of spectrum in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query peak level and frequency of spectrum in each lower frequency range for segment 1 in Sequence Measurement mode:

TDSCDMA_SEMLVL_LOWER? 1

> ,-0.800,-20.00,-1.500,-30.00,-2.200,-40.00,-3.200,-50.00

TDSCDMA_SEMLVL_UPPER?

Result of Spectrum Emission Mask (Upper)

Function

Queries peak level and frequency of spectrum in each upper frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
TDSCDMA_SEMLVL_UPPER? seg
```

Response

freq(0), peak(0), freq(1), peak(1), freq(2), peak(2), freq(3), peak(3)

freq(n):	Offset frequency of spectrum peak
Resolution	0.001 MHz
peak(n):	Peak level of spectrum
Resolution	0.01 dB

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
freq(0)	Offset frequency +0.8 MHz
peak(0)	Peak level of spectrum in offset frequency +0.8 MHz
freq(1)	Offset frequency of spectrum peak in offset frequency range from +0.8 to +1.8 MHz
peak(1)	Peak level of spectrum in offset frequency range from +0.8 to +1.8 MHz
freq(2)	Offset frequency of the spectrum peak in offset frequency range from +1.8 to +2.4 MHz
peak(2)	Peak level of spectrum in offset frequency range from +1.8 to +2.4 MHz
freq(3)	Offset frequency of spectrum peak in offset frequency range from +2.4 to +4.0 MHz
peak(3)	Peak level of spectrum in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query peak level and frequency of spectrum in each upper frequency range for segment 1 in Sequence Measurement mode:

TDSCDMA_SEMLVL_UPPER? 1

> 0.800,-20.00,1.500,-30.00,2.300,-40.00,3.500,-50.00

TDSCDMA_SEMMARGIN_LOWER?

Margin of Spectrum Emission Mask (Lower)

Function

Queries spectrum margin and offset frequency in each lower frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
TDSCDMA_SEMMARGIN_LOWER? seg
```

Response

freq(0), peak(0), freq(1), peak(1), freq(2), peak(2), freq(3), peak(3)

freq(n):	Offset frequency at point where margin determined
Resolution	0.001 MHz
peak(n):	Margin from template
Resolution	0.01 dB

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
freq(0)	Offset frequency –0.8 MHz
peak(0)	Margin in offset frequency –0.8 MHz
freq(1)	Offset frequency at point where margin determined in offset frequency range from –0.8 to –1.8 MHz
peak(1)	Margin in offset frequency range from –0.8 to –1.8 MHz
freq(2)	Offset frequency at point where margin determined in offset frequency range from –1.8 to –2.4 MHz
peak(2)	Margin in offset frequency range from –1.8 to –2.4 MHz
freq(3)	Offset frequency at point where margin determined in offset frequency range from –2.4 to –4.0 MHz
peak(3)	Margin in offset frequency range from –2.4 to –4.0 MHz

Example of Use

To query margin and frequency from Spectrum Emission Mask template spectrum in each lower frequency range for segment 1 in Sequence Measurement mode:

TDSCDMA_SEMMARGIN_LOWER? 1

> -0.800,3.00,-1.500,3.00,-2.000,3.00,-3.500,3.00

TDSCDMA_SEMMARGIN_UPPER?

Margin of Spectrum Emission Mask (Upper)

Function

Queries spectrum margin and offset frequency in each upper frequency range of Spectrum Emission Mask in Sequence Measurement mode

Query

```
TDSCDMA_SEMMARGIN_UPPER? seg
```

Response

freq(0), peak(0), freq(1), peak(1), freq(2), peak(2), freq(3), peak(3)

freq(n):	Offset frequency at point where margin determined
Resolution	0.001 MHz
peak(n):	Margin from template
Resolution	0.01 dB

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
freq(0)	Offset frequency +0.8 MHz
peak(0)	Margin in offset frequency +0.8 MHz
freq(1)	Offset frequency at point where margin determined in offset frequency range from +0.8 to +1.8 MHz
peak(1)	Margin in offset frequency range from +0.8 to +1.8 MHz
freq(2)	Offset frequency at point where margin determined in offset frequency range from +1.8 to +2.4 MHz
peak(2)	Margin in the offset frequency range from +1.8 to +2.4 MHz
freq(3)	Offset frequency at point where margin determined in offset frequency range from +2.4 to +4.0 MHz
peak(3)	Margin in offset frequency range from +2.4 to +4.0 MHz

Example of Use

To query margin and frequency from Spectrum Emission Mask template spectrum in each upper frequency range for segment 1 in Sequence Measurement mode:

TDSCDMA_SEMMARGIN_UPPER? 1

> 0.800,3.00,1.600,3.00,2.100,3.00,3.500,3.00

TDSCDMA_SEM_SET

SEM Measurement Enable and Count

Function

Enables Spectrum Emission Mask measurement and sets measurement count, or queries settings

Command

```
TDSCDMA_SEM_SET mcond,on_off[,count]
```

Query

```
TDSCDMA_SEM_SET? mcond
```

Response

on_off, count

Parameters

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	OFF
count	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Spectrum Emission Mask measurement and set the measurement count to 20 for the measurement condition number 8

TDSCDMA_SEM_SET 8,ON,20

TDSCDMA_SEM_SET? 8

> ON,20

TDSCDMA_SEM_TEMPLATE

Spectrum Emission Mask - Mask Template

Function

Sets relative level threshold (template) for Spectrum Emission Mask in Sequence Measurement mode and queries settings

Command

```
TDSCDMA_SEM_TEMPLATE offset,level
```

Query

```
TDSCDMA_SEM_TEMPLATE? offset
```

Response

level

Parameters

offset	Offset frequency point		
Range	1 to 4		
Resolution	1		
level	Level at each offset frequency point		
Range	offset point	Level	Default
	1 (0.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–33.5 dBc
	2 (1.8 MHz, RBW=30 kHz)	–100.0 to 0.0	–47.5 dBc
	3 (2.4 MHz, RBW=1 MHz)	–100.0 to 0.0	–57.7 dBc
	4 (2.4 to 4.0 MHz, RBW=1 MHz)	–100.0 to 0.0	–42.5 dBc
Resolution	0.1 dBc		

Example of Use

To set the template at Point3 (2.4 MHz frequency offset) for the Spectrum Emission Mask measurement to –60.0 dBc in Sequence Measurement mode:

TDSCDMA_SEM_TEMPLATE 3,-60.0

TDSCDMA_SEM_TEMPLATE? 3

> -60.0

TDSCDMA_TEMPLATE_SET

Power Template Measurement Enable and Count

Function

Enables Power Template measurement and sets measurement count in Sequence Measurement mode, or queries settings.

Command

```
TDSCDMA_TEMPLATE_SET mcond,on_off[,count]
```

Query

```
TDSCDMA_TEMPLATE_SET? mcond
```

Response

on_off, count

Parameter

mcond	Measurement condition number
Range	0 to 1999
Resolution	1
on_off	Enables/disables measurement
ON	Enables measurement
OFF	Disables measurement
Default	ON
count	Measurement count
Range	1 to 200
Resolution	1
Default	1

Example of Use

To enable Power Template measurement and set the measurement count to 10 for the measurement condition number 8：

TDSCDMA_TEMPLATE_SET 8,ON,10

TDSCDMA_TEMPLATE_SET? 8

> ON,10

TDSCDMA_TXPWR?

Result of Tx Power Measurement

Function

Queries Tx Power measurement result in Sequence Measurement mode

Query

```
TDSCDMA_TXPWR? seg,mode
```

Response

When mode = TTL,

avg,max,min

When mode = AVG, MAX, MIN or DVT

pwr

When mode = IND,

s,pwr(1),pwr(2),…,pwr(s)

Unit	dBm
Resolution	0.01

Parameters

seg	Segment number
Range	0 to 1999
Resolution	1
mode	Storage mode
AVG	Average
MAX	Maximum
MIN	Minimum
TTL	Average・Maximum・Minimum
DVT	Standard deviation
IND	Individual measurement result
avg	Measurement result (Average)
max	Measurement result (Maximum)
min	Measurement result (Minimum)
pwr	Measurement result in specified Storage mode
pwr(s)	Tx Power of sth measurement
s	Measurement count
Range	1 to 200

Example of Use

To query average of Tx Power measurement result for segment 0 in Sequence Measurement mode:

TDSCDMA_TXPWR? 0,AVG

> -20.00

Chapter 6 Performance Test

This chapter explains how to setup the measuring instruments required for the MX887017A TD-SCDMA performance tests as well as the test procedures.

6.1 Outline

The performance tests are performed to assure that the MU887000A performance does not deteriorate. Test the performance of the MU887000A at the initial acceptance inspection, at periodic inspections, and after repairs. Test important items periodically to assure the performance. This chapter explains the following test items.

- Output EVM
- Tx Power measurement accuracy (CW)
- Tx Power measurement linearity
- Frequency/Modulation measurement   Carrier frequency accuracy
  Residual EVM
- Adjacent Channel Leakage Power Ratio measurement

We recommend testing the performance periodically once or twice a year. If the test results do not meet the specifications, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

CAUTION

Warm-up the MU887000A and the required measuring instruments for at least 30 minutes (except when specified otherwise) to stabilize them. To achieve the highest accuracy, the test should be performed at room temperature using a power supply with as little voltage fluctuation as possible in an environment free from noise, vibration, dust and humidity.

6.2 Instruments for Testing Performance

The following table lists the measuring instruments required for testing the MU887000A performance and the specifications for each instrument.

Table 6.2-1 Measuring Instruments for Performance Test

<table>
<tr><th>Performance Test Item</th><th>Instrument Required Specifications*1</th><th>Recommended Instrument (Anritsu Model)</th></tr>
<tr><td>Output EVM</td><td>Signal Analyzer
• Frequency Range: 400 to 2700 MHz
• Resolution: 1 Hz
• Measured Power Range: –140 to +20 dBm
• Measurement Accuracy: ±0.05 dB
• External Reference Input: (10 MHz)</td><td>Signal Analyzer (MS2690A or MS2830A)
TD-SCDMA Measurement Software(MX269015A)</td></tr>
<tr><td rowspan="4">Tx Power Measurements
• Measurement Accuracy
• Linearity</td><td>Signal Generator
• Frequency Range: 400 to 2700 MHz
• Resolution: 1 Hz
• Output Level Range
Unmodulated: –143 to +13 dBm
Resolution: 0.01 dB</td><td>Vector Signal Generator (MG3700A)
Mechanical Attenuator (MG3700A-002)
High Frequency 6 GHz (MG3700A-011)</td></tr>
<tr><td>Signal Analyzer
Same as above</td><td>Signal Analyzer (MS2690A or MS2830A)</td></tr>
<tr><td>Power Meter
• Main Frame Accuracy: ±0.02 dB
• Frequency Range: 400 to 2700 MHz
• Resolution: 0.01 dB</td><td>Power Meter (ML2437A)</td></tr>
<tr><td>Power sensor
• Frequency Range: 400 to 2700 MHz
• Measured Power Range: –40 to +20 dBm
• Input Connector: N type</td><td>Power Sensor (MA2442D)</td></tr>
<tr><td rowspan="3">Frequency/Modulation Measurements
• Carrier Frequency Accuracy
• Residual EVM
Adjacent Channel Leakage Power Ratio</td><td>Signal generator supporting output of 3GPP TD-SCDMA modulation signals
Same as above</td><td>Same as above</td></tr>
<tr><td>Power Meter
Same as above</td><td>Same as above</td></tr>
<tr><td>Power sensor
• Frequency Range: 400 to 2700 MHz
• Measured Power Range: –30 to +20 dBm
• Input Connector: N type</td><td>Power Sensor (MA24002A)</td></tr>
<tr><td>Common</td><td>3-dB Attenuator</td><td>3-dB Attenuator (AT-103)</td></tr>
</table>

*1: The performance covers the test item measurement range.

6.3 Performance Test for Each Measurement

Common test items

The following list shows the common settings for each measurement at the MU887000A.

Application:	Cellular
Standard:	TD-SCDMA
Uplink Configuration:	RMC_SINGLE
Scrambling Code:	0
Trigger Level	–30
Trigger Timeout	10
Measurement Trigger	Video

6.3.1 Calibrating signal generator (CW)

This procedure captures the calibration value for measurements using an unmodulated waveform (CW).

(1) Measuring instruments

- Vector signal generator: MG3700A
- Power meter: ML2437A
- Power sensor: MA2442D
- 3-dB Attenuator: AT-103 (2 sets)

(2) Setup

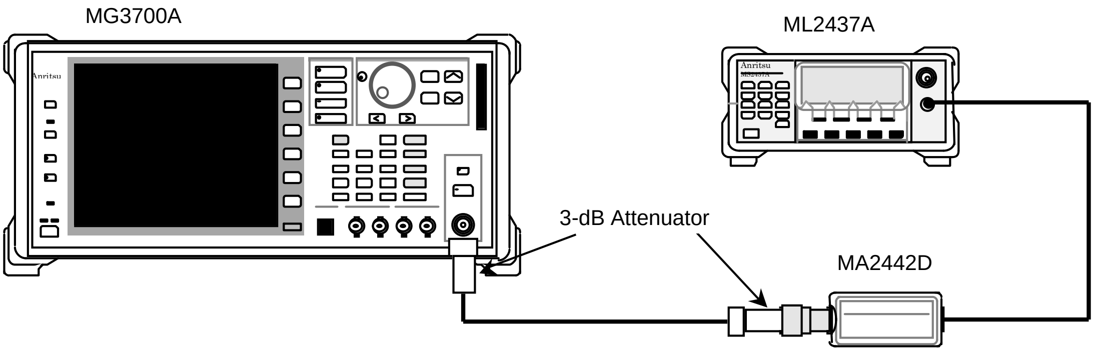

Figure 6.3.1-1 Signal Generator Calibration Setup (CW)

(3) Procedure

1. Setup the instruments as shown in Figure 6.3.1-1.
2. Output a CW 399.99 MHz signals from the Vector signal generator (SG) at a level of +6 dBm
3. Measure the level with the ML2437A power meter and adjust the SG so that the output level is 0 dBm.
4. Change the frequency as shown in Table 6.3.1-1 “Measurement Points and Frequency” and perform the same measurement to obtain the calibration value.
5. Repeat steps 3 and 4 over while changing the output level (value measured with power meter) to –10,–25 dBm, successively to measure and obtain the calibration value.

Table 6.3.1-1 Measurement Point and Frequency

Meas. Point	Frequency (MHz)	Meas. Point	Frequency (MHz)
1	400	7	2000
2	480	8	2200
3	880	9	2700
4	940		
5	1000		
6	1800		

Note:

Add an offset of −10 kHz to the frequency in the above table and set the frequency as SG output frequency, except for the measurement described in section 6.3.7 and 6.3.8.

6.3.2 Calibrating signal generator (MOD)

This procedure captures the calibration value for measurement using a modulated waveform.

(1) Measuring instruments

- Vector signal generator: MG3700A
- Power meter: ML2437A
- Power sensor: MA24002A
- 3-dB Attenuator: AT-103 (2 sets)

(2) Setup

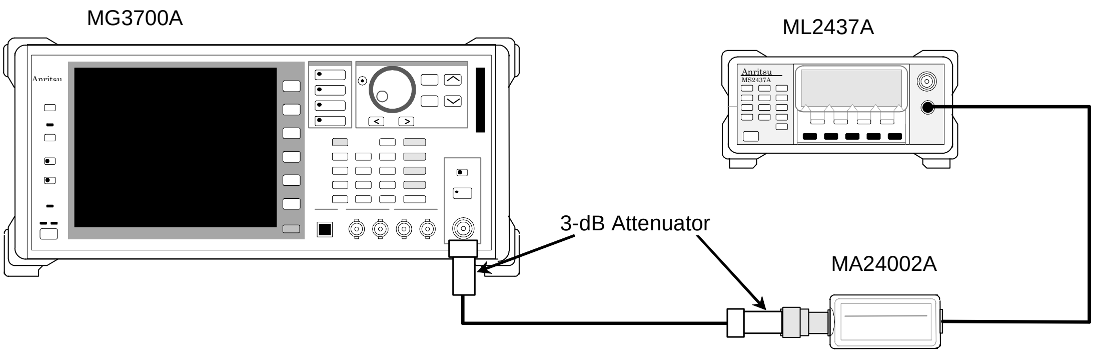

Figure 6.3.2-1 Signal Generator Calibration Setup (MOD)

(3) Procedure

1. Setup the instruments as shown in Figure 6.3.2-1.
2. Output a modulated 399.99 MHz signal from the Vector signal generator (SG) at a level of –4 dBm with Waveform pattern rmc_12_2k_bs_ul.
3. Measure the level with the ML2437A Power Meter and adjust the SG so that the output level is –10 dBm.
4. Change the frequency as shown in Table 6.3.1-1 "Measurement Points and Frequency" and perform the same measurements to obtain the calibration value.

6.3.3 Calibrating linearity

This procedure captures the calibration value for measurements related to linearity.

(1) Measuring instruments

- Vector Signal Generator: MG3700A
- Signal Analyzer: MS269XA or MS2830A
- 3-dB Attenuator: AT-103 (2 sets)

(2) Setup

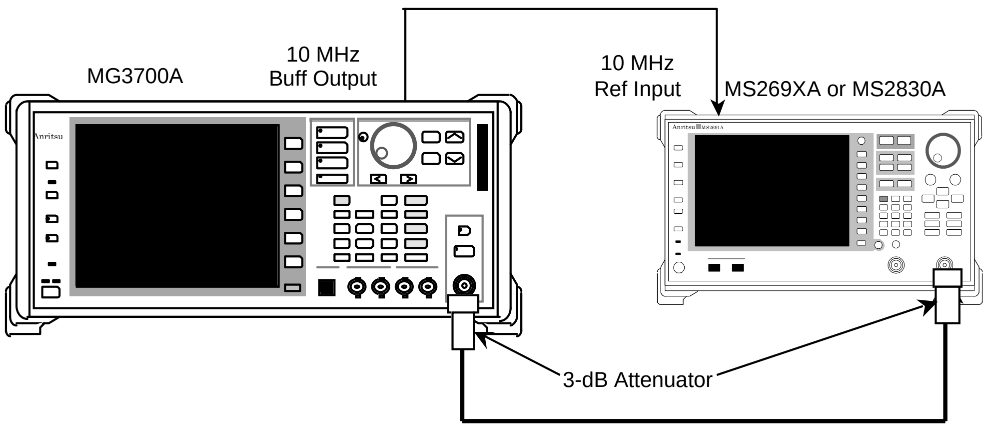

Figure 6.3.3-1 Linearity Calibration Setup

(3) Procedure

1. Setup the instruments as shown in Figure 6.3.3-1.
2. Set the signal analyzer (SA) as shown in #1 of Table 6.3.3-1 “Signal Analyzer Settings”.
3. Output a 399.99 MHz signal from the Vector signal generator (SG) at a level of 0 dBm (output level reference). This output level reflects the calibration value for item 6.3.1.
4. Connect the output of the SG to the SA and measure the SG output level with the SA (A dBm).
5. Decrease the SG output level in 10-dB steps down to 40 dB and measure the level at each step (B dBm). (The calibration value is B – A.)
6. Change the frequency as shown in Table 6.3.1-1 “Measurement Points and Frequency” and perform the same measurements to obtain the calibration value.
7. Set the SA as shown in #2 of Table 6.3.3-1 “Signal Analyzer Settings”.

8. Change the SG output reference level to –25 dBm and repeat the measurements over in the same way down to a level of –40 dBm. Use the same frequency range/steps. (This output level reflects the calibration value for item 6.3.1.)

Table 6.3.3-1 Signal Analyzer Settings

	MS269xA or MS2830A						
	Application Switch	**RBW**	**Zone Width**	**Time Length**	**ATT**	**Preamp**	**Ref Level**
#1	Signal Analyzer	100 Hz	781.3 Hz	AUTO	20 dB	OFF	0 dBm
#2	Signal Analyzer	100 Hz	781.3 Hz	AUTO	0 dB	OFF	–20 dBm

6.3.4 Output EVM

This test measures the output signal EVM.

(1) Test specifications

EVM	Remarks
≤3%rms	400 to 2700 MHz (TD-SCDMA)

(2) Measuring instruments

- Signal Analyzer: MS269XA or MS2830A

(3) Setup

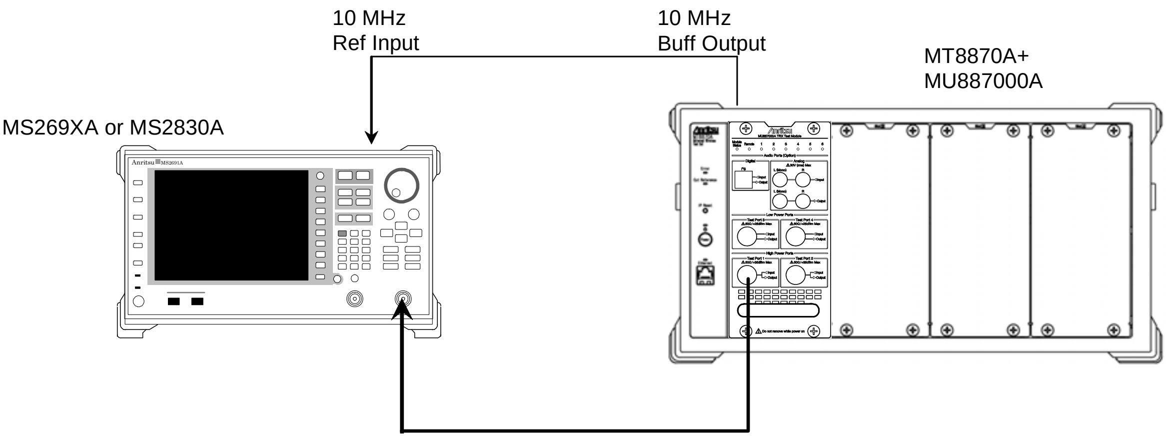

Figure 6.3.4-1 Output EVM Measurement Setup

(4) Procedure

1. Setup the instruments as shown in Figure 6.3.4-1.
2. Select the signal analyzer (SA) measurement software and set the following:

Measurement software:	MX269015A
Input level:	Output level of step 4
Level offset:	0 dB
Trigger:	Free run

3. Select the MU887000A application software.
4. Set the MU887000A input and output levels.

Test Port1

Output level:	–10.9 dBm
Input level:	+35 dBm
Uplink frequency:	10 MHz

Test Port3

Output level:	–0.9 dBm
Input level:	+25 dBm
Uplink frequency:	10 MHz

5. Set the MU887000A output frequency to 400 MHz and output the test pattern.

Download Package Select:	MV887017A_TDSCDMA_0002
Downlink pattern name:	Group No. 1
Connect port:	Test Port1 or Test Port3
Output level ON/OFF:	ON
Downlink frequency:	400 MHz

6. Measure the EVM at the SA.
7. In the same manner, change the MU887000A output frequency sequentially from 900, 2000, 2700 MHz and measure the EVM at each frequency.
8. Change the Test Port in steps 4 and 5 and repeat steps 4 to 7 over.

6.3.5 Tx Power measurement accuracy (CW)

This test is related to the accuracy of Tx power measurements.

(1) Test specifications

Test Port1/2

Measurement Accuracy	Input Level	Temperature
±0.5 dB	–25 dBm ≤, ≤+35 dBm	10° to 40°C
±0.7 dB	–55 dBm ≤, <–25 dBm	10° to 40°C
±0.9 dB	–70 dBm ≤, <–55 dBm	10° to 40°C

Test Port3/4

Measurement Accuracy	Input Level	Temperature
±0.7 dB	–25 dBm ≤, ≤+25 dBm	10° to 40°C
±0.9 dB	–55 dBm ≤, <–25 dBm	10° to 40°C
±1.1 dB	–70 dBm ≤, <–55 dBm	10° to 40°C

(2) Measuring instruments

- Vector signal generator: MG3700A
- 3-dB Attenuator: AT-103 (2 sets)

(3) Setup

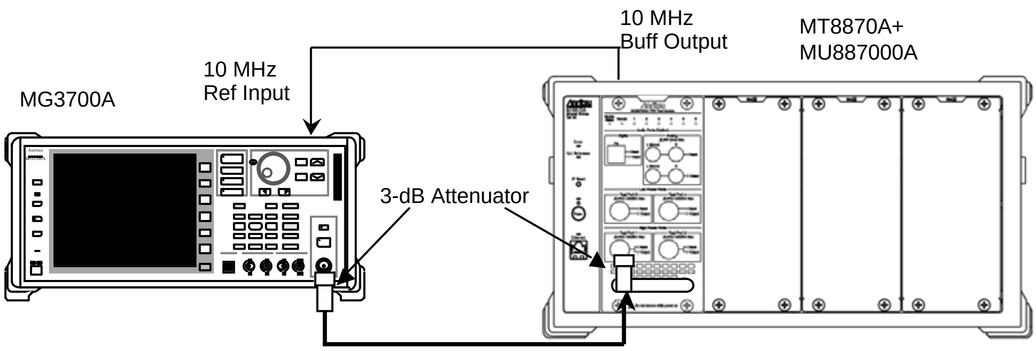

Figure 6.3.5-1 Setup for Measuring Amplitude Measurement Accuracy

6

Performance Test

(4) Test procedure

1. Setup the instruments as shown in Figure 6.3.5-1.
2. Set the MU887000A as follows:

Connect port:	Test Port1
Output level ON/OFF :	OFF
Input level:	–10 dBm
Uplink frequency:	400 MHz
Turn Off All measurement:	OFF
Tx Power measurement:	ON,1 time

3. Set the Vector signal generator (SG) as follows:

Modulation:	OFF
Output frequency:	399.99 MHz
Output level:	–10 dBm (This output level reflects the calibration value for item 6.3.1.)

4. Change the frequency of the MU887000A and SG according to Table 6.3.1-1 “Measurement Point and Frequency” and measure the Tx power.

   Result of Tx Power Measurement: Average value
5. Change the SG output level and MU887000A input level each to –55, and –70 dBm and repeat steps 2 to 4 over and measure the Tx power. (This output level reflects the calibration value for item 6.3.1.)
6. Change the Connect Port setting for the connection with the MU887000A to Test Port2/3/4,successively, and repeat steps 2 to 5 over.

6.3.6 Tx power measurement linearity

This test is related to the linearity of Tx power measurements.

(1) Test specifications

Linearity	Input Level, Range
±0.2 dB	–55 dBm ≤, –40 to 0 dB
±0.4 dB	–65 dBm ≤, –40 to 0 dB

(2) Measuring instruments

- Vector signal generator: MG3700A
- 3-dB Attenuator: AT-103 (2 sets)

(3) Setup

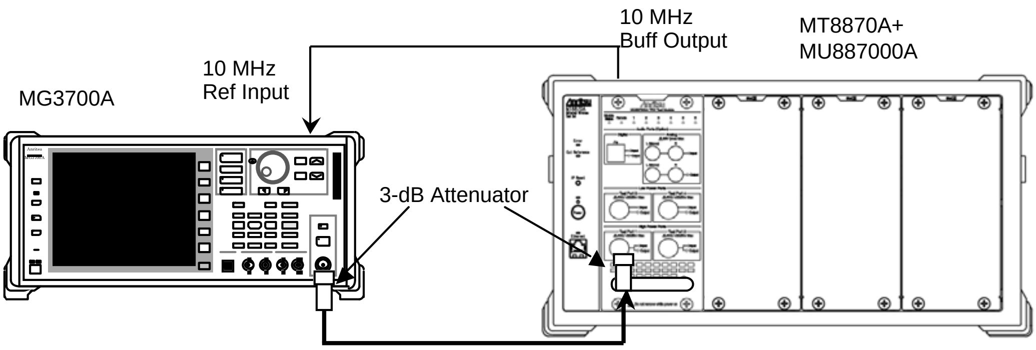

Figure 6.3.6-1 Setup for Measuring Tx Power Measurement Linearity

(4) Procedure

1. Setup the instruments as shown in Figure 6.3.6-1.
2. Set the MU887000A as follows:

Connect port:	Test Port1
Output level ON/OFF :	OFF
Input level:	0 dBm
Uplink frequency:	400 MHz
Turn Off All measurement:	OFF
Tx Power measurement:	ON,1 time

3. Set the Vector signal generator (SG) as follows:

Modulation:	OFF
Output frequency:	399.99 MHz
Output level:	0 dBm (This output level reflects the calibration value for item 6.3.1.)

4. Measure the Tx Power and make this value the reference level (REF dBm).

   Tx Power Measurement Results: Average value
5. Set the SG output level to –10 dB and measure the Tx power, making this value D dBm.
6. Calculate the difference between REF dBm and D dBm using the following equation.

   Linearity error = D – REF – (calibration value of section 6.3.3)
7. Similarly, change the SG output level successively from –20 dB to –40 dB in –10 dB steps and measure the Tx power. Calculate the linearity as described in step 6 and check that the results meet the specifications.
8. Change the MU887000A and SG frequencies according to Table 6.3.1-1 “Measurement Point and Frequency” and repeat steps 2 to 7 over.
9. Change the SG output level and the MU887000A input level to –25 dBm and repeat steps 2 to 8 over to measure the Tx Power. (This output level reflects the calibration value for item 6.3.1.)
10. Change the Connect port setting for the connection with the MU887000A to Test Port2/3/4 successively, and repeat steps 2 to 9 over.

6.3.7 Frequency/Modulation measurement

This test is related to the following modulation analyses.

- Carrier frequency accuracy
- Residual EVM

(1) Test specifications

Test Port1/2

Carrier frequency accuracy	±(Set frequency × Reference oscillator accuracy + 10 Hz)
Residual EVM	≤2.5% (rms)

Input level: –30 dBm ≤, ≤+35 dBm

Test Port3/4

Carrier frequency accuracy	±(Set frequency × Reference oscillator accuracy + 10 Hz)
Residual EVM	≤2.5% (rms)

Input level: –30 dBm ≤, ≤+25 dBm

(2) Measuring instruments

- Vector signal generator: MG3700A
- 3-dB Attenuator: AT-103 (2 sets)

(3) Setup

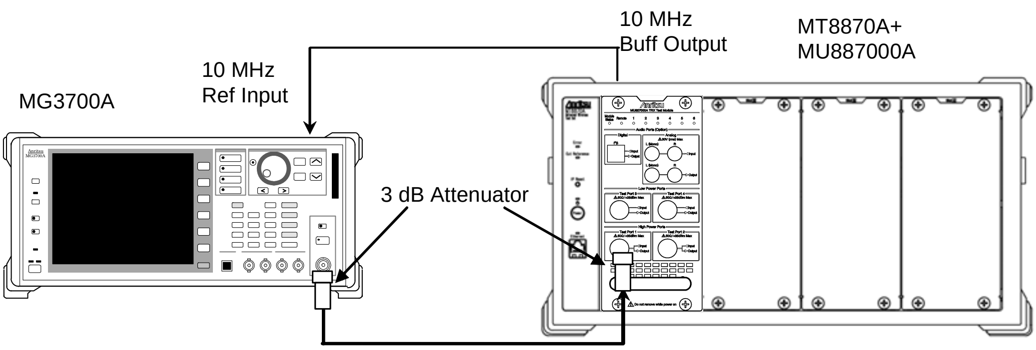

Figure 6.3.7-1 Setup for Measuring Frequency/Modulation

(4) Test procedure

1. Setup the instruments as shown in Figure 6.3.7-1.
2. Set the MU887000A as follows:

Connect port:	Test Port1
Output level ON/OFF :	OFF
Input level:	–10 dBm
Uplink frequency:	400 MHz
Turn Off All measurement:	OFF
Modulation Analysis measurement:	ON,1 time

3. Set the Vector signal generator (SG) as follows:

Modulation:	ON
Waveform pattern:	rmc_12_2k_bs_ul
Output frequency:	400 MHz
Output level:	–10 dBm (This output level reflects the calibration value for item 6.3.2.)

4. Measure the frequency error and EVM.

Carrier Frequency Error Result:	Average value
EVM Result:	Average value

5. Change the MU887000A and SG frequencies according to Table 6.3.1-1 “Measurement Point and Frequency” and repeat steps 2 to 4 over.
6. Change the SG output level and the MU887000A input level to –30 dBm and measure by repeating steps 2 to 5 over. (This output level reflects the calibration value for item 6.3.2.)
7. Change the Connect Port setting for the connection with the MU887000A to Test Port2/3/4 successively, and repeat steps 2 to 6 over.

6.3.8 Adjacent Channel Leakage Power Ratio

This test is related to Adjacent Channel Leakage Power Ratio measurements.

(1) Testing specifications

Test Port 1/2

Adjacent Channel Leakage Power Ratio	Measurement Point
≥50 dB	1.6 MHz detuning
≥55 dB	3.2 MHz detuning

Input level range: –10 dBm ≤,≤+35 dBm

Test Port 3/4

Adjacent Channel Leakage Power Ratio	Measurement Point
≥50 dB	1.6 MHz detuning
≥55 dB	3.2 MHz detuning

Input level range: –10 dBm ≤, ≤+25 dBm

(2) Measuring instruments

- Vector signal Generator: MG3700A
- 3-dB Attenuator: AT-103 (2 sets)

(3) Setup

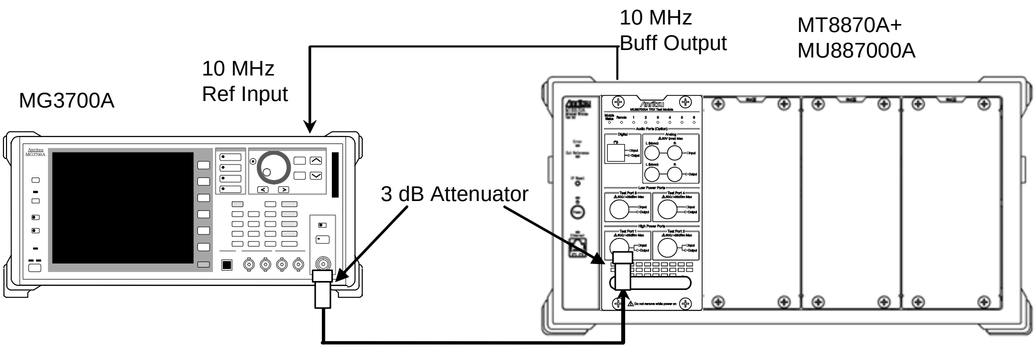

Figure 6.3.8-1 Setup for Measuring Adjacent Channel Leakage Power Ratio

(4) Test procedure

1. Setup the instruments as shown in Figure 6.3.8-1.
2. Set the MU887000A as follows:

Connect port:	Test Port1
Output level ON/OFF :	OFF
Input level:	–10 dBm
Uplink frequency:	400 MHz
Turn Off All measurement:	OFF
ACLR measurement:	ON,1 time

3. Set the Vector signal generator (SG) as follows:

Modulation:	ON
Waveform pattern:	rmc_12_2k_bs_ul
Output frequency:	400 MHz
Output level:	–10 dBm (This output level reflects the calibration value for item 6.3.2.)

4. Measure the Adjacent Channel Leakage Power Ratio for ±1.6 MHz and ±3.2 MHz.

   ACLR result: Average value

5. Change the MU887000A and SG frequencies according to Table 6.3.1-1 “Measurement Point and Frequency” and repeat steps 2 to 4 over.
6. Change the Connect Port setting for the connection with the MU887000A to Test Port2/3/4 successively, and repeat steps 2 to 5 over.

6.3.9 About evaluation signals

The evaluation signals (Waveform pattern) described in the performance test items 6.3.2, 6.3.7, 6.3.8 are set as follows. When the user is executing performance tests, set the SG actually used based on the following setting contents.

Install the MG3700A-002 Mechanical Attenuator option in the MG3700A. In addition, the MG3700A-011 High Frequency 6 GHz option is required to support Opt-015/016.

Summary of the evaluation signal

UL reference measurement channel described by 3GPP TS 34.122 Annex C.2.1 (12.2 kbps).

To transmit UL reference measurement channel (12.2 kbps) by using Vector Signal Generator MG3700A, select [rmc12_2k_bs_ul] in Pattern Select.

Table 6.3.9-1 Parameters of the evaluation signal

Parameter	Value
Channel Coding	UL reference measurement channel (12,2 kbps) 1.28 TDD Option
Scrambling Code ID	0
Midamble Allocation Mode	Default Midamble
Midamble Configuration	8
Channelization Code	(8/1)

6.3.10 Sample format for performance test result sheets

Use the following test result sheets when testing the MX887017A performance. Duplicate these sheets as necessary for tests.

Test location ______________________

____

____

Report No. ______________________

Date ______________________

Person-in-charge ______________________

Model:

Serial No. ______________________

Ambient temperature ______________________ °C

Power source frequency ______________________ Hz

Relative humidity ______________________ %

Remarks ______________________

____

____

SG Calibration (CW)

SG Calibration Value (CW)

MG3700A Unmodulated Wave

Frequency (MHz)	SG Setting (dBm)		
	0 dBm	–10 dBm	–25 dBm
400			
480			
880			
940			
1000			
1800			
2000			
2200			
2700			

SG Calibration (MOD)

SG Calibration (MOD)

MG3700A Modulation Wave

Frequency (MHz)	SG Setting (dBm)
	–10 dBm
400	
480	
880	
940	
1000	
1800	
2000	
2200	
2700	

Linearity Calibration

Linearity Calibration

Frequency (MHz)	SG Level (dBm)	SA Measured Value (dBm)	Calibration Value (C) (B) – (A) (dB)	SG Level (dBm)	SA Measured Value (dBm)	Calibration Value (C) (B) – (A) (dB)
400	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
480	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	
880	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	
940	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	
1000	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	
1800	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	

Linearity Calibration (continued)

Linearity Calibration (continued)

Frequency (MHz)	SG Level (dBm)	SA Measured Value (dBm)	Calibration Value (C) (B) – (A) (dB)	SG Level (dBm)	SA Measured Value (dBm)	Calibration Value (C) (B) – (A) (dB)
2000	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	
2200	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	
2700	0	(A)		–25	(A)	
	–10	(B)		–35	(B)	
	–20	(B)		–45	(B)	
	–30	(B)		–55	(B)	
	–40	(B)		–65	(B)	
				–70	(B)	

Output EVM

Output EVM

Frequency (MHz)	EVM (%) Test Port1 MU887000A Output Level: –10.9 dBm			EVM (%) Test Port3 MU887000A Output Level: –0.9 dBm		
	Measured Value	Spec.	Measurement uncertainty	Measured Value	Spec.	Measurement uncertainty
400		≤3.0	0.2		≤3.0	0.2
900						
2000						
2700						

Tx Power Measurement Accuracy (CW)

Tx Power Measurement Accuracy Port1/2

MU887000A Input Level: –10 dBm (Item 6.3.1 Calibration Value)

Frequency (MHz)	MX887017A Measured Value (P) (dBm)	Measurement Accuracy (dB) Lo Limit	Measurement Accuracy –10 – (P)	Hi Limit	Measurement uncertainty
400		–0.5		+0.5	±0.15
480					
880					
940					
1000					
1800					
2000					
2200					
2700					

Tx Power Measurement Accuracy Port1/2

MU887000A Input Level: –55 dBm (Item 6.3.3 Calibration Value)

Frequency (MHz)	Item 6.3.3 –55 dBm Calibration Value (C) (dB)	MX887017A Measured Value (P) (dBm)	Measurement Accuracy (dB) Lo Limit	Measurement Accuracy –25 + (C) – (P)	Hi Limit	Measurement uncertainty
400			–0.7		+0.7	±0.13
480						
880						
940						
1000						
1800						
2000						
2200						
2700						

Tx Power Measurement Accuracy (CW) (continued)

Tx Power Measurement Accuracy Port1/2

MU887000A Input Level: –70 dBm (Item 6.3.3 Calibration Value)

Frequency (MHz)	Item 6.3.3 –70 dBm Calibration Value (C) (dB)	MX887017A Measured Value (P) (dBm)	Measurement Accuracy (dB)			
			Lo Limit	Measurement Accuracy –25 + (C) – (P)	Hi Limit	Measurement uncertainty
400			–0.9		+0.9	±0.13
480						
880						
940						
1000						
1800						
2000						
2200						
2700						

Tx Power Measurement Accuracy (CW) (continued)

Tx Power Measurement Accuracy Port3/4

MU887000A Input Level: –10 dBm (Item 6.3.3 Calibration Value)

Frequency (MHz)	MX887017A Measured Value (P) (dBm)	Measurement Accuracy (dB)			
		Lo Limit	Measurement Accuracy –10 – (P)	Hi Limit	Measurement uncertainty
400		–0.7		+0.7	±0.17
480					
880					
940					
1000					
1800					
2000					
2200					
2700					

Tx Power Measurement Accuracy Port3/4

MU887000A Input Level: –55 dBm (Item 6.3.3 Calibration Value)

Frequency (MHz)	Item 6.3.3 –55 dBm Calibration Value (C) (dB)	MX887017A Measured Value (P) (dBm)	Measurement Accuracy (dB)			
			Lo Limit	Measurement Accuracy –25 + (C) – (P)	Hi Limit	Measurement uncertainty
400			–0.9		+0.9	±0.14
480						
880						
940						
1000						
1800						
2000						
2200						
2700						

Tx Power Measurement Accuracy (CW) (continued)

Tx Power Measurement Accuracy Port3/4

MU887000A Input Level: –70 dBm (Item 6.3.3 Calibration Value)

Frequency (MHz)	Item 6.3.3 –70 dBm Calibration Value (C) (dB)	MX887017A Measured Value (P) (dBm)	Measurement Accuracy (dB)			
			Lo Limit	Measurement Accuracy –25 + (C) – (P)	Hi Limit	Measurement uncertainty
400			–1.1		+1.1	±0.14
480						
880						
940						
1000						
1800						
2000						
2200						
2700						

Tx Power Measurement Linearity

Linearity (Reference Level 0 dBm)

Frequency (MHz)	SG Level (dBm)	Item 6.3.3 Calibration Value (dB)	MX887017A Measured Value (dBm)	Linearity (D) – (REF) – (C) (dB)	Spec. (dB)	Measurement uncertainty
400	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
480	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
880	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
940	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
1000	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
1800	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			

Tx Power Measurement Linearity (continued)

Linearity (Reference Level 0 dBm)

Frequency (MHz)	SG Level (dBm)	Item 6.3.3 Calibration Value (dB)	MX887017A Measured Value (dBm)	Linearity (D) – (REF) – (C) (dB)	Spec. (dB)	Measurement uncertainty
2000	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
2200	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			
2700	0		(REF)			
	–10	(C)	(D)		±0.2	±0.05
	–20	(C)	(D)			
	–30	(C)	(D)			
	–40	(C)	(D)			

Tx Power Measurement Linearity (continued)

Linearity (Reference Level – 25 dBm)

Frequency (MHz)	SG Level (dBm)	Item 6.3.3 Calibration Value (dB)	MX887017A Measured Value (dBm)	Linearity (D) – (REF) – (C) (dB)	Spec. (dB)	Measurement uncertainty
400	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
480	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
880	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
940	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
1000	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
1800	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05

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Performance Test

Tx Power Measurement Linearity (continued)

Linearity (Reference Level – 25 dBm) (continued)

Frequency (MHz)	SG Level (dBm)	Item 6.3.3 Calibration Value (dB)	MX887017A Measured Value (dBm)	Linearity (D) – (REF) – (C) (dB)	Spec. (dB)	Measurement uncertainty
2000	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
2200	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05
2700	–25		(REF)			
	–35	(C)	(D)		±0.2	±0.05
	–45	(C)	(D)			
	–55	(C)	(D)			
	–65	(C)	(D)		±0.4	±0.05

Frequency/Modulation Measurement

Residual EVM/Carrier Frequency Accuracy

MU887000A Input Level: –10 dBm

Frequency (MHz)	Residual EVM (%)			Carrier Frequency Accuracy (Hz)		
	Measured Value	Spec.	Measurement uncertainty	Measured Value	Spec.	Measurement uncertainty
400						
480						
880						
940						
1000		≤2.5	±0.1		±10.0	±2.0
1800						
2000						
2200						
2700						

MU887000A Input Level: –30 dBm

Frequency (MHz)	Residual EVM (%)			Carrier Frequency Accuracy (Hz)		
	Measured Value	Spec.	Measurement uncertainty	Measured Value	Spec.	Measurement uncertainty
400						
480						
880						
940						
1000		≤2.5	±0.1		±10.0	±2.0
1800						
2000						
2200						
2700						

Adjacent Channel Leakage Power Ratio Measurement

Adjacent Channel Leakage Power Ratio

	Adjacent Channel Leakage Power Ratio (dB)			
	MU887000A Input Level: –10 dBm			
Frequency (MHz)	Detuning Frequency (MHz)			
	–10	–5	+5	+10
400				
480				
880				
940				
1000				
1800				
2000				
2200				
2700				
Spec. (dB)	≥55	≥50	≥50	≥55
Measurement uncertainty	1 dB			

6.4 Servicing

If any unit is found to be broken or does not operate as described in the specifications, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

When requesting repair, supply the following information:

(a) Model name and serial number marked on rear panel

(b) Failure symptoms

(c) Person to contact about nature of failure and repair completion notification

(d) Software version

Appendix A　Specifications

This appendix lists the specifications of the MX887017A TD-SCDMA Uplink TX Measurement. Refer to section 1.3 Composition for details of the product configuration.

These specifications assume use of the system at a constant temperature after warming-up the instruments for 30 minutes. The abbreviation (typ.) indicates the reference data at 20 to 30°C and is not a guaranteed value.

Table A-1　MX887017A Specifications

<table>
<tr><th>Item</th><th>Specification</th></tr>
<tr><td>Common Items</td><td></td></tr>
<tr><td>Frequency</td><td>400 to 2700 MHz</td></tr>
<tr><td>Measurement Target</td><td>TD-SCDMA Uplink signals</td></tr>
<tr><td>Tx Power Measurement</td><td></td></tr>
<tr><td>Input Level Range</td><td>Port1, Port2: –65.0 to +35.0 dBm
Port3, Port4: –65.0 to +25.0 dBm</td></tr>
<tr><td>Measurement Accuracy</td><td>Port1, Port2: After calibration, 10 to 40°C
<table>
<tr><th>Input Level</th><th>Measurement Accuracy</th></tr>
<tr><td>–25 to +35 dBm</td><td>±0.3 dB (typ.)
±0.5 dB</td></tr>
<tr><td>–55 to –25 dBm</td><td>±0.7 dB</td></tr>
<tr><td>–70 to –55 dBm</td><td>±0.9 dB</td></tr>
</table>
Port3, Port4: After calibration, 10 to 40°C
<table>
<tr><th>Input Level</th><th>Measurement Accuracy</th></tr>
<tr><td>–25 to +25 dBm</td><td>±0.7 dB</td></tr>
<tr><td>–55 to –25 dBm</td><td>±0.9 dB</td></tr>
<tr><td>–70 to –55 dBm</td><td>±1.1 dB</td></tr>
</table>
</td></tr>
<tr><td>Linearity</td><td>
<table>
<tr><th>Input Level</th><th>Linearity</th></tr>
<tr><td>≥–55 dBm (0 to 40 dB)</td><td>±0.2 dB</td></tr>
<tr><td>≥–65 dBm (0 to 40 dB)</td><td>±0.4 dB</td></tr>
</table>
</td></tr>
</table>

Table A-1 MX887017A Specifications (continued)

<table>
<tr><th>Item</th><th>Specification</th></tr>
<tr><td>Modulation Analysis
Input Level Range
Carrier Frequency Accuracy
Modulation Accuracy</td><td>Port1, Port2: –30.0 to +35.0 dBm
Port3, Port4: –30.0 to +25.0 dBm
±(Set frequency × Reference oscillator accuracy + 10 Hz)
Residual Vector Error: ≤2.5%
(At Single Code input)</td></tr>
<tr><td>Occupied Bandwidth
Input Level Range
Occupation Ratio</td><td>Port1, Port2: –10.0 to +35.0 dBm
Port3, Port4: –10.0 to +25.0 dBm
99.0 %</td></tr>
<tr><td>Adjacent Channel Leakage Power Ratio
Input Level Range
Measurement Point
Measurement Range</td><td>Port1, Port2: –10.0 to +35.0 dBm
Port3, Port4: –10.0 to +25.0 dBm
±1.6 MHz, ±3.2 MHz
<table><tr><th>Measurement Point</th><th>Measurement Range</th></tr><tr><td>±1.6 MHz</td><td>≥ 50 dB</td></tr><tr><td>±3.2MHz</td><td>≥ 55 dB</td></tr></table></td></tr>
</table>

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References are page numbers.

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