

User Manual



WCA230A & WCA280A Option 24 GSM/EDGE Analysis Software

071-1479-00

This document applies to firmware version 2.0
and above.

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Preface

This manual describes how to use the WCA230A and WCA280A Option 24 GSM/EDGE Analysis Software. For details on the standard functions of the analyzer, refer to the *WCA230A and WCA280A Wireless Communication Analyzers User Manual*.

About This Manual

The manual consists of the following sections:

- *Getting Started* describes the overview of the GSM/EDGE analysis.
- *Operating Basics* explains the menu functions and measurement procedures.
- *Syntax and Commands* presents descriptions of the GPIB commands provided in Option 24.
- *Appendices* provide additional information including factory initialization settings, scale setting ranges, and SCPI conformance information.

Related Documents

The following documents are also available for the analyzer.

- *WCA230A and WCA280A User Manual*
(Standard accessory; Tektronix part number 071-1253-XX)
Describes how to install the analyzer and how to work with the menus, and details the standard functions. Also shows the specifications.
- *WCA230A and WCA280A Programmer Manual*
(Standard accessory; Tektronix part number 071-1255-XX)
Contains an alphabetical listing of the programming commands and other information related to controlling the analyzer over the GPIB interface.

Conventions

This manual uses the following conventions:

- Front-panel button and control labels are printed in the manual in upper case text. For example, SPAN, PEAK, PRINT. If it is part of a procedure, the button or control label is printed in boldface. For example:

Press **SPAN**.

- To easily find buttons on the front panel, the area name label is printed together with the button by concatenating with a colon (:), as in MODE: **DEMODO**, VIEW: **SCALE**, MARKERS: **SELECT**, etc. For example:

Press the MODE: **DEMODO** key.

- Menu and on-screen form titles are printed in the manual in the same case (initial capitals) as they appear on the analyzer screen, such as Span, Source, and Channel Power. If it is part of a procedure, the menu title is shown in boldface. For example:

Press the **Source** side key.

- A list of keys, controls, and/or menu items separated by an arrow symbol (→) indicates the order in which to perform the listed tasks. For example:

Select **RBW/FFT** → **Filter Shape...** → **Gaussian**.

Contacting Tektronix

Phone	1-800-833-9200*
Address	Tektronix, Inc. Department or name (if known) 14200 SW Karl Braun Drive P.O. Box 500 Beaverton, OR 97077 USA
Web site	www.tektronix.com
Sales support	1-800-833-9200, select option 1*
Service support	1-800-833-9200, select option 2*
Technical support	Email: techsupport@tektronix.com 1-800-833-9200, select option 3* 6:00 a.m. – 5:00 p.m. Pacific time

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Getting Started

Getting Started

This section outlines the modulation analysis according to the GSM/EDGE standard using WCA230A and WCA280A Option 24. Table 1-1 summarizes the additional functions in Option 24 by measurement mode.

Table 1-1: Additional functions in Option 24

Measurement mode	Additional functions
S/A (spectrum analysis)	None
Demod (modulation analysis)	Six measurement functions under the GSM/EDGE standard
Time (time analysis)	None

Figure 1-1 shows an example of the GSM/EDGE analysis.

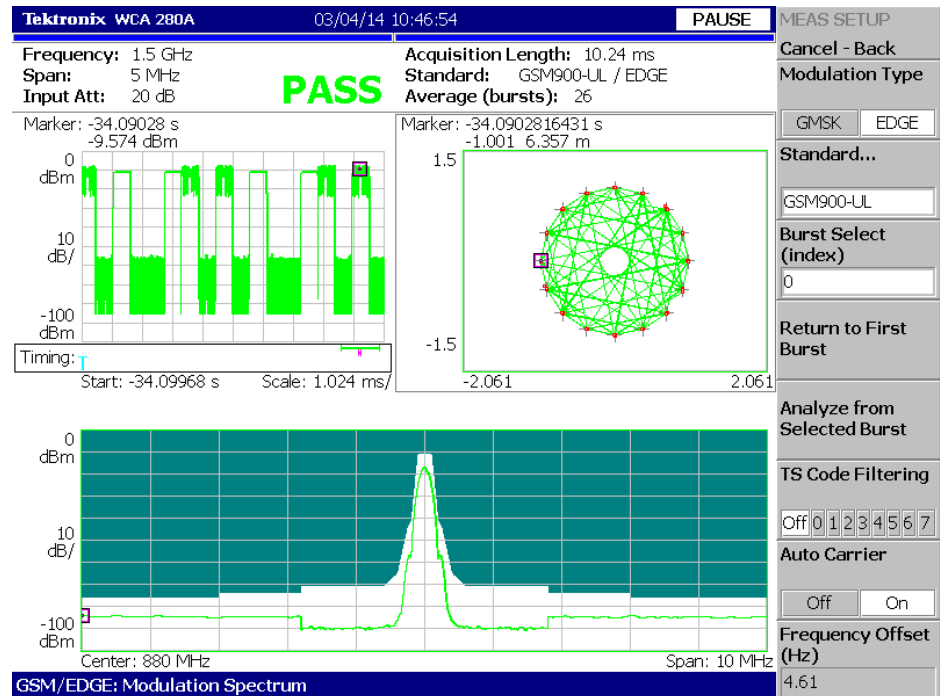


Figure 1-1: An example of the GSM/EDGE analysis display

Definition of the GSM/EDGE Analysis

The analyzer performs GSM/EDGE analysis that conforms to the 3GPP TS45.005 V4.1.0.5 standard.

Channel Frequencies

The analyzer includes GSM/EDGE channel tables as shown in Table 1–2:

Table 1–2: Channel Frequencies

Standard	Link	Channel (N)	Frequency range (MHz)	Frequency calculation formula (MHz)
GSM850	Uplink	128 to 251	824.2 to 848.8	$0.2(N - 128) + 824.2$
	Downlink	128 to 251	869.2 to 893.8	$0.2(N - 128) + 869.2$
GSM900	Uplink	0 to 124	890 to 914.8	$0.2N + 890$
		975 to 1023	880.2 to 889.8	$0.2(N - 1024) + 890$
	Downlink	0 to 124	935 to 959.8	$0.2N + 935$
		975 to 1023	925.2 to 934.8	$0.2(N - 1024) + 935$
DCS1800	Uplink	512 to 885	1710.2 to 1784.8	$0.2(N - 512) + 1710.2$
	Downlink	512 to 885	1805.2 to 1879.8	$0.2(N - 512) + 1805.2$
PCS1900	Uplink	512 to 810	1850.2 to 1908.8	$0.2(N - 512) + 1850.2$
	Downlink	512 to 810	1930.2 to 1989.8	$0.2(N - 512) + 1930.2$

Measurement Functions

The analyzer provides six GSM/EDGE measurement functions as shown in Table 1–3:

Table 1–3: Measurement items

Measurement item	Standard
Modulation accuracy	GSM 11.20 – 2.1.6.2
Mean carrier power	GSM 11.20 – 2.1.6.3
Power versus Time	GSM 11.20 – 2.1.6.4
Modulation spectrum	GSM 11.20 – 2.1.6.5.1
Switching spectrum	GSM 11.20 – 2.1.6.5.2
Spurious signals within transmission band	GSM 5.05 v.8.5.0/4.3.3

Modulation Accuracy

The analyzer measures EVM (Error Vector Magnitude), amplitude error, and phase error in accordance with the GSM standard 11.20 – 2.1.6.2.

The analyzer uses the 147 symbols located at the center of a specified burst to measure EVM, amplitude error, phase error, waveform quality (Q), frequency error, and origin offset. (“Origin offset” is also called “IQ feedthrough”.)

Mean Carrier Power

The analyzer measures mean carrier power in accordance with the GSM standard 11.20 – 2.1.6.3.

Figure 1–2 illustrates the data structure of a slot. The analyzer measures power in the interval E (Data 2) located after TS (Training Sequence) for each burst to calculate the mean value of the power within the measurement range.

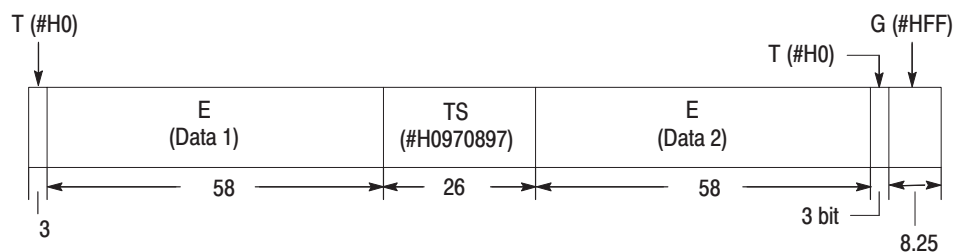


Figure 1–2: Slot data structure

Power versus Time

The analyzer measures Power versus Time in accordance with the GSM standard 11.20 – 2.1.6.4.

The analyzer demodulates a specified burst and synchronizes with the TS (Training Sequence). The analyzer uses the comparison between the spectrum and the GSM/EDGE standard mask (see Figure 1–3), to determine the Pass/Fail status of the test.

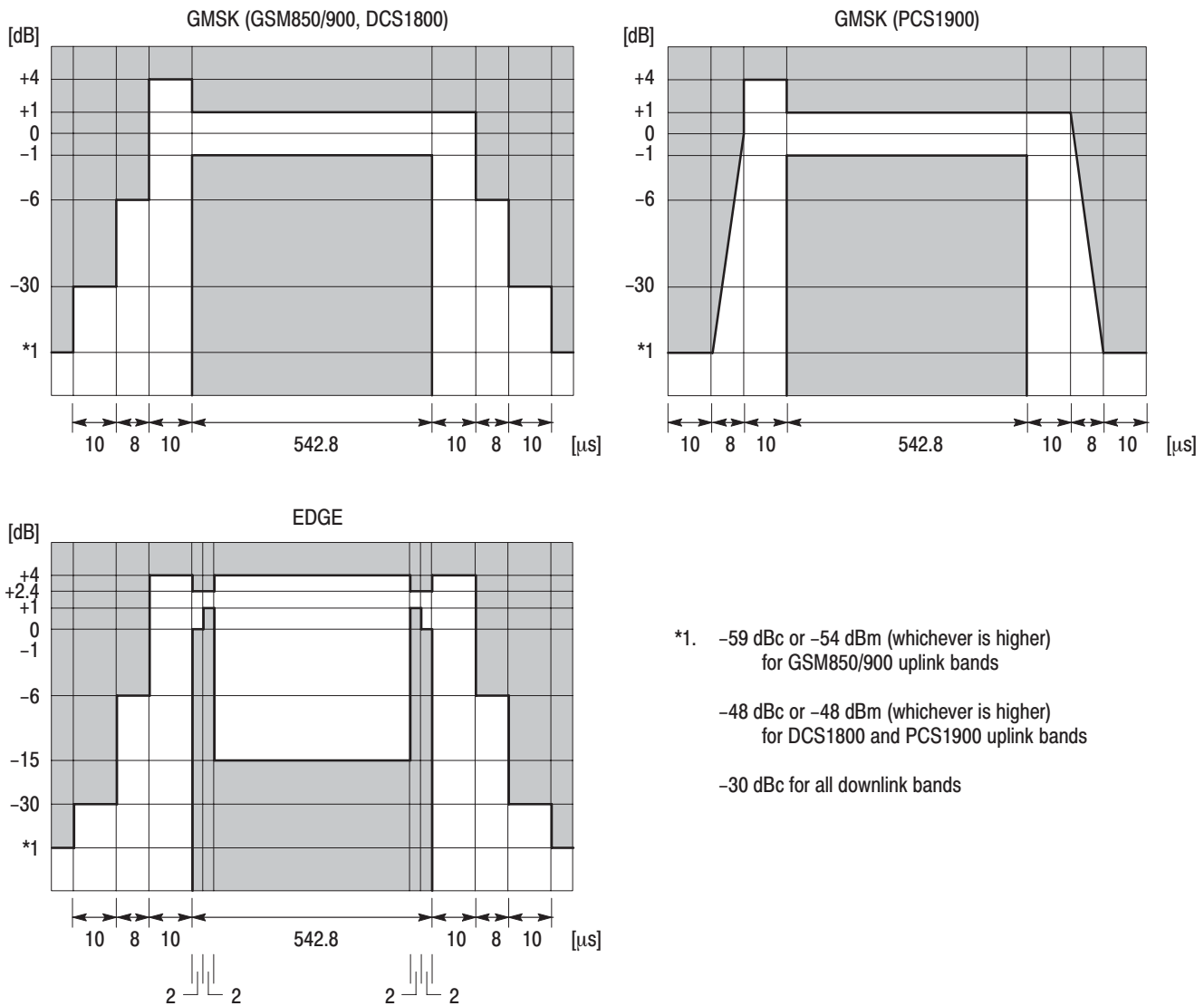


Figure 1-3: GSM/EDGE standard masks for Power versus Time measurement

Modulation Spectrum

The analyzer measures the spectrum generated by the modulation process in accordance with the GSM standard 11.20 – 2.1.6.5.1.

The analyzer acquires the input signal with a span of 15 MHz and demodulates a single burst. The spectrum of the burst is calculated from the center of the training sequence over an interval of 320 μ s. This spectrum is calculated using a 30 kHz RBW up to 1.8 MHz from the carrier, and 100 kHz RBW from 1.8 to 6 MHz from the carrier. Finally, the analyzer compares the spectrum and GSM/EDGE standard masks (see Table 1–4 below) to determine pass/fail status of testing.

Table 1–4: Modulation spectrum standard masks ¹

GSM850/900 uplink								
Offset (MHz)	0.1	0.2	0.25	0.4	≥ 0.6 < 1.8	≥ 1.8 < 3	≥ 3 < 6	≥ 6
Level (dBc)	+0.5	-30	-33	-60 -54	-60	-63	-65	-71
GSM850/900 downlink								
Offset (MHz)	0.1	0.2	0.25	0.4	≥ 0.6 < 1.8	≥ 1.8 < 3	≥ 3 < 6	≥ 6
Level (dBc)	+0.5	-30	-33	-60 -54	-70	-73	-75	-80
DCS1800 uplink								
Offset (MHz)	0.1	0.2	0.25	0.4	≥ 0.6 < 1.8	≥ 1.8 < 6	≥ 6	
Level (dBc)	+0.5	-30	-33	-60 -54	-60	-59	-67	
DCS1800 downlink								
Offset (MHz)	0.1	0.2	0.25	0.4	≥ 0.6 < 1.2	≥ 1.2 < 1.8	≥ 1.8 < 6	≥ 6
Level (dBc)	+0.5	-30	-33	-60 -56	-70	-73	-75	-80

¹ The levels are common for GMSK and EDGE. In cases where two values are indicated in a single column, however, values in the upper line are for GMSK and values in the lower line are for EDGE.

Table 1-4: Modulation spectrum standard masks ¹ (Cont.)

PCS1900 uplink								
Offset (MHz)	0.1	0.2	0.25	0.4	≥0.6 <1.2	≥1.2 <1.8	≥1.8 <6	≥6
Level (dBc)	+0.5	-30	-33	-60 -54	-60	-60	-59	-67
PCS1900 downlink								
Offset (MHz)	0.1	0.2	0.25	0.4	≥0.6 <1.2	≥1.2 <1.8	≥1.8 <6	≥6
Level (dBc)	+0.5	-30	-33	-60 -56	-70	-73	-75	-80

Switching Spectrum

The analyzer measures the spectrum due to switching transients in accordance with the GSM standard 11.20 – 2.1.6.5.2.

The analyzer acquires the input signal with a span of 5 MHz, and calculates the spectrum using a 30 kHz RBW conversion. The analyzer uses peak hold for multiple bursts, and compares the spectrum with GSM/EDGE masks (see Table 1-5) to determine pass/fail status of the test.

Table 1-5: Switching spectrum standard masks ¹

GSM850/900, DCS1800, and PCS1900 uplink				
Offset (MHz)	0.4	0.6	1.2	1.8
Level (dBc)	-23	-26	-32	-36
GSM850/900 downlink				
Offset (MHz)	0.4	0.6	1.2	1.8
Level (dBc)	-57 / -52	-67 / -62	-74	-74
DCS1800 and PCS1900 downlink				
Offset (MHz)	0.4	0.6	1.2	1.8
Level (dBc)	-50	-58	-66	-66

¹ The levels are common for GMSK and EDGE. In cases where two values are indicated in a single column, however, the values to the left are for GMSK and the values to the right are for EDGE.

Inband Spurious Signals

The analyzer detects the spurious signals existing within the transmission band in accordance with the GSM standard 5.05 version 8.5.0/4.3.3.

The analyzer calculates the spectrum of the input signal, using the correct RBW for the frequency offset from the carrier, as shown in Table 1–6. The largest peak in the specified transmission band is assumed to be the carrier and all other peaks are assumed to be spurious responses.

Table 1–6: Spurious measurement conditions

Standard	Transmission band	RBW	Threshold ¹
GSM850	824 to 849 MHz (Uplink) 869 to 894 MHz (Downlink)	30 kHz (Offset \geq 1.8 MHz) 100 kHz (Offset \geq 6 MHz)	-36 dBm
GSM900	876 to 915 MHz (Uplink) 921 to 960 MHz (Downlink)		
DCS1800	1710 to 1785 MHz (Uplink) 1805 to 1880 MHz (Downlink)		
PCS1900	1850 to 1910 MHz (Uplink) 1930 to 1960 MHz (Downlink)		

¹ User-definable

Measurement Menu

Figure 1-4 shows the measurement menu items added in Option 24.



Figure 1-4: GSM/EDGE measurement menu

The following sections provide the measurement procedures.

Operating Basics

Burst Analysis

The following five measurements can be performed on one or more GSM/EDGE bursts:

- Modulation accuracy
- Mean carrier power
- Power versus time
- Modulation spectrum
- Switching spectrum

The burst analysis is based on the digital modulation analysis function. For the digital modulation analysis, refer to the *WCA230A and WCA280A User Manual*.

For the spurious signal analysis, refer to page 2–11.

Measurement Procedure

Use the following steps to perform the burst analysis:

1. Select the measurement:
 - a. Press the **DEMODO** key on the front panel.
 - b. Press the **Standard...** side key and then the **GSM/EDGE** side key.
 - c. Press one of the following side keys to select the measurement:

Modulation Accuracy
Mean Carrier Power
Power vs. Time
Modulation Spectrum
Switching Spectrum

2. Acquire the waveform of signal to be measured:

NOTE. *When the input signal is not according to the GSM/EDGE standard, no measurement result may be displayed. However, the waveform of the signal will still be displayed in the overview.*

- a. Press the **FREQUENCY/CHANNEL** key on the front panel to set center frequency.

How to use the channel table:

- Press **Channel Table...** side key.
 - Select one of the GSM/EDGE standards.
 - Use **Channel** side key to select a channel.
- b. Press the **SPAN** key on the front panel to set span. Range: 1 to 15 MHz

NOTE. *It is important to set the span as narrow as possible for the selected modulation type, and to adjust the reference level carefully. Setting these parameters incorrectly can result in incorrect recognition of the signal's modulation type.*

- c. Press the **AMPLITUDE** key on the front panel to set up the amplitude of the signal near the full scale in the overview.
- d. Press the **TRIG** key on the front panel to set up the trigger as necessary.
- e. Press the **TIMING** key on the front panel, and then press the **Acquisition Length** side key to set the number of slots for one acquisition block (see Figure 2–1). Default: 17 slots.
- f. After you have acquired the measurement data, you can stop the acquisition using the **RUN/STOP** key.

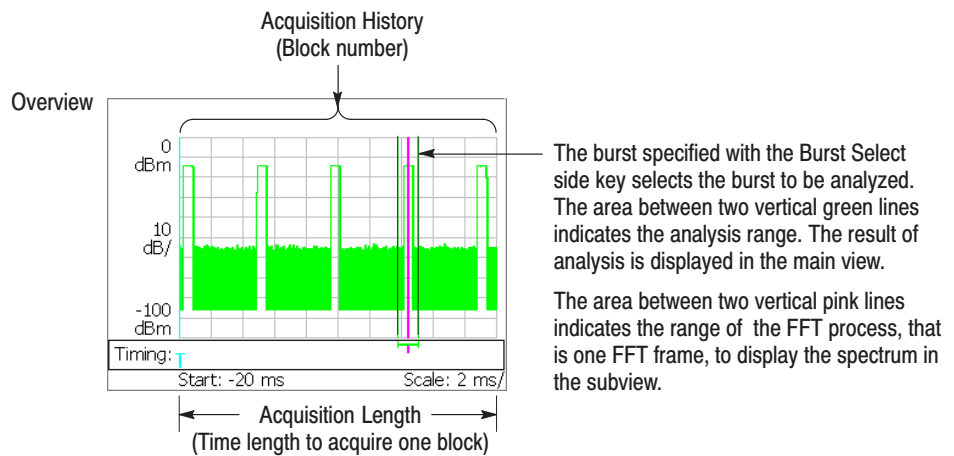


Figure 2-1: Setting analysis range on the overview

3. From the overview, select the burst to be analyzed (see Figure 2–1).
 - a. Press the **TIMING** key on the front panel.
 - b. *If you acquired the signal in continuous trigger repeat:*
Press the **Acquisition History** side key to specify the block number to be analyzed. Block number “0” corresponds to the latest block.
 - c. Press the **Burst Select** side key to specify the burst number to be analyzed. Burst number “0” corresponds to the latest burst.

How to return to the first burst:

To select the first burst of all the data that has been acquired in memory, press the **Return to First Burst** side key.

NOTE. In GSM/EDGE, the analysis length must be at least 1.28 ms.

The specified burst is analyzed and the result of the analysis is displayed on the screen.

4. Press the **MEAS SETUP** key and change the measurement conditions as necessary.

For the Meas Setup menu, refer to page 2–4.

5. In repeating the analysis of waveform data that has been acquired in memory, do the following steps:
 - a. Press the **TIMING** key on the front panel.
 - b. *If you acquired the signal in continuous trigger repeat:*
Press the **Acquisition History** side key to specify the block number to be analyzed.
 - c. Press the **Burst Select** side key to specify the burst number to be analyzed.

How to return to the first burst:

To select the first burst of all the data that has been acquired in memory, press the **Return to First Burst** side key.

- d. Press the **MEAS SETUP** key on the front panel and then press the **Analyze from Selected Burst** side key.

The analyzer performs analysis from the burst specified in step c to the end of the waveform data. To interrupt the analysis, press the **Cancel-Back** (top) side key.

Meas Setup Menu

The Meas Setup menu items for the burst analysis are as follows:

Modulation Type. Selects the modulation type.

- **GMSK.** *Default.* Selects GMSK (Gaussian filtered Minimum Shift Keying).
- **EDGE.** Selects EDGE (Enhanced Data rate for GSM Evolution).

Standard... Selects specification of the mask for comparison with the spectrum waveform:

- GSM850-UL
- GSM850-DL
- GSM900-UL
- GSM900-DL
- DCS1800-UL
- DCS1800-DL
- PCS1900-UL
- PCS1900-DL

UL and DL mean uplink and downlink, respectively.

This menu item is unavailable in the mean carrier power measurement.

Burst Select. Sets the burst number to be analyzed. This menu item is the same as the Burst Index parameter in the Timing menu. Burst number “0” corresponds to the latest burst. The larger the negative values, the older the bursts.

Return to First Burst. Selects the first burst of all the data that has been acquired in memory. This menu item is invalid during acquisition of an input signal.

Analyze from Selected Burst. Press this key for repeated analysis of waveform data that has previously been acquired in memory. The analysis is done from the selected burst. This menu item is invalid during acquisition of an input signal.

TS Code Filtering. Determines whether to perform the analysis while specifying Training Sequence (TS) or not.

- **Off. Default.** No training sequence is specified. The analyzer will perform the analysis for all the training sequences.
- **0 to 7.** Sets the training sequence code number to be analyzed. The analysis result is displayed in the main view only for the bursts containing the specified training sequence, and only results from bursts containing the specified training sequence are included in averaged results.

This menu item is unavailable in the switching spectrum measurement.

Analyze Includes. Sets the number of symbols for EVM calculation in the modulation accuracy measurement.

- **142.** Measures 142 symbols excluding the tail bits for the EDGE signal.
- **147.** Measures 147 symbols specified for the GMSK signal.
- **148.** Measures all symbols in a burst.

Midpoint shift. Defines the center of the mask in the power versus time measurement.

- **Off.** Positions the center of the mask halfway between symbol 13 and 14 in the training sequence.
- **On.** Aligns the center of the mask with symbol 14 in the training sequence.

Auto Carrier. Determines whether to activate the automatic carrier detection.

- **On. Default.** The carrier is automatically detected during data analysis.
- **Off.** No detection of carrier frequency is performed. Set the carrier frequency offset in Frequency Offset below.

This menu item is unavailable in the switching spectrum measurement.

Frequency Offset. When Off is selected in Auto Carrier above, it is necessary to set the carrier frequency offset with reference to the center frequency.

This setup item is unavailable in the switching spectrum measurement.

Modulation Accuracy Measurement

Figure 2–2 shows an example of the modulation accuracy measurement.

- Overview: Power versus Time for the specified block
- Subview: Constellation for the specified burst
- Main view: Measurement results and EVM view

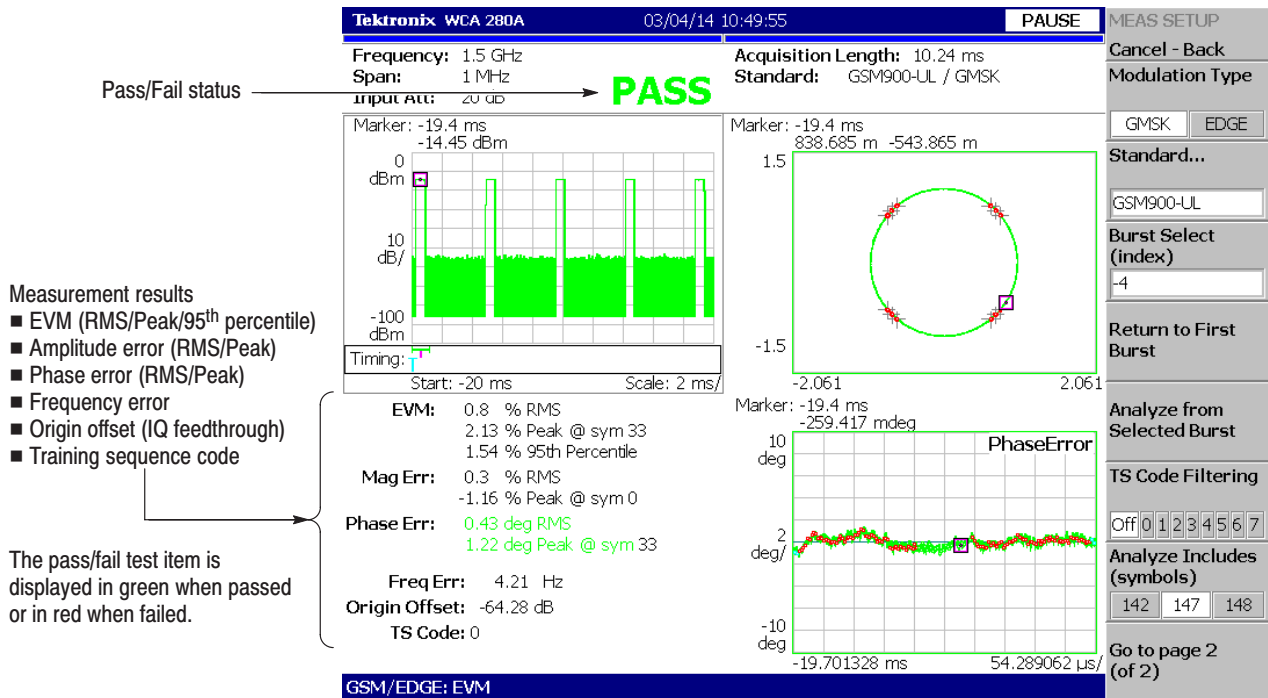


Figure 2–2: Modulation accuracy measurement

Changing Views. You can change the presentation of the overview, the subview and the main view. Procedures to change the presentation of the overview or the subview are common with those for the modulation analysis. Refer to the *WCA230A and WCA280A User Manual* for the details.

To change the presentation of the main view, proceed as follows:

1. Press the VIEW: **DEFINE** key on the front panel.
2. Press the **Mainview Content...** side key and select the main view content:
 - Constellation
 - EVM (Error Vector Magnitude)

Mean Carrier Power Measurement

Figure 2–3 shows an example of the mean carrier power measurement.

- Overview: Power versus Time for the specified block
- Subview: Constellation for the specified burst
- Main view: Power versus Time for the specified burst

The blue domain in the Power versus Time display on the right of the main view shows the range of calculation process. The mean power, maximum power, and minimum power are indicated on the left of the main view for each burst.

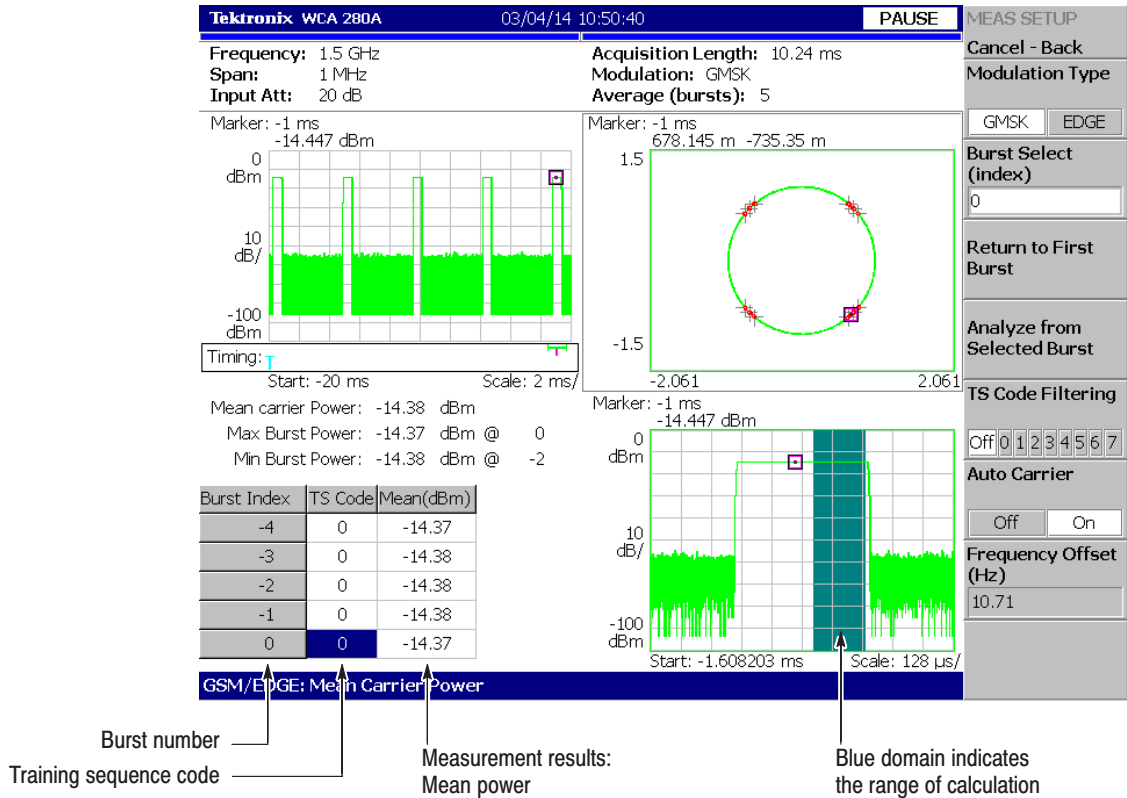


Figure 2–3: Mean carrier power measurement

Changing Views. You can change the presentation of the overview and the subview. The procedures to change the presentation of the overview and the subview are common with those of the modulation analysis. Refer to the *WCA230A and WCA280A User Manual* for the details.

Power versus Time Measurement

Figure 2–4 shows an example of the power versus time measurement.

- Overview: Power versus Time for the specified block
- Subview: Constellation for the specified burst
- Main view: Measurement results and the mask for the specified burst

The Power versus Time waveform and the GSM/EDGE standard mask are shown on the right of the main view. The mean power as well as Pass/Fail status of testing are shown on the left of the main view for each burst.

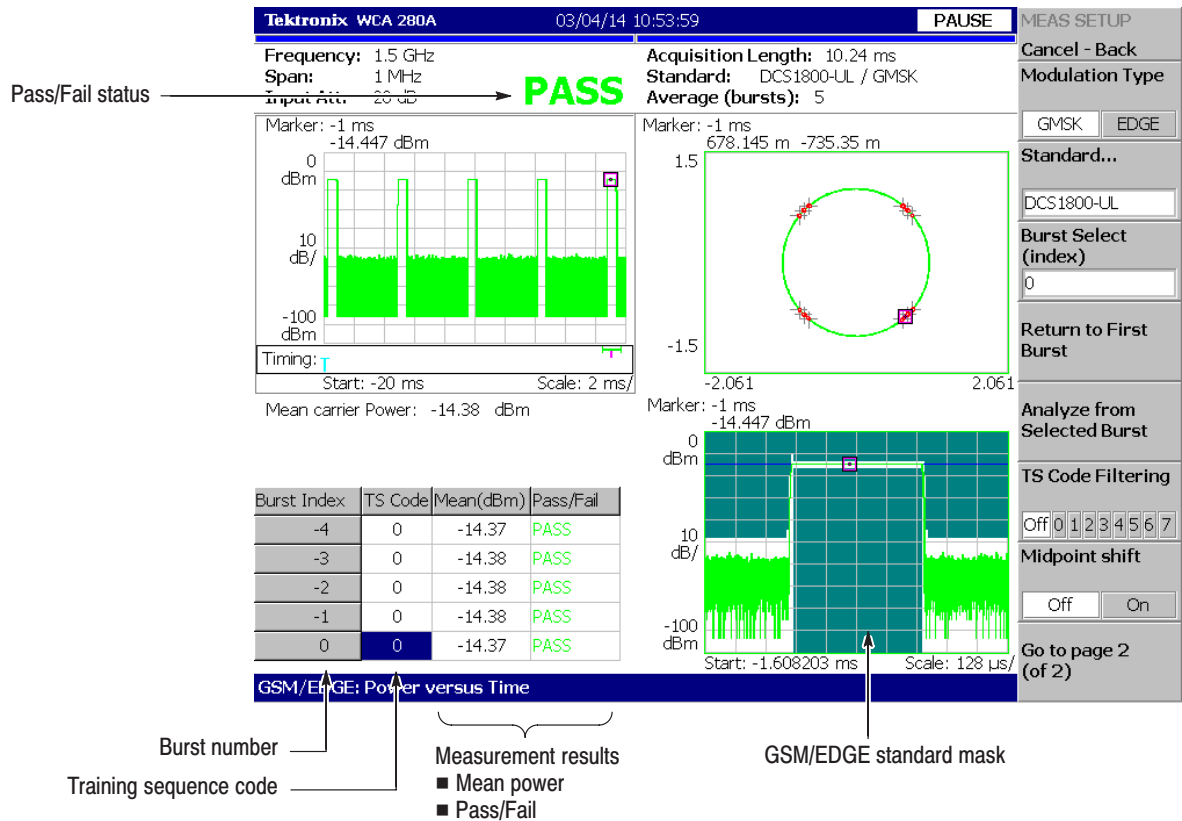


Figure 2–4: Power versus Time measurement

Changing Views. You can change the presentation of the overview and the subview. The procedures to change the presentation of the overview and the subview are common with those of the modulation analysis. Refer to the *WCA230A and WCA280A User Manual* for the details.

Modulation Spectrum Measurement

Figure 2–5 shows an example of the modulation spectrum measurement.

- Overview: Power versus Time for the specified block
- Subview: Constellation for the specified burst
- Main view: Spectrum and the mask for the specified burst

The spectrum waveform and the GSM/EDGE specification mask are displayed in the main view. To select the mask specification, use the **Standard...** side key in the Meas Setup menu.

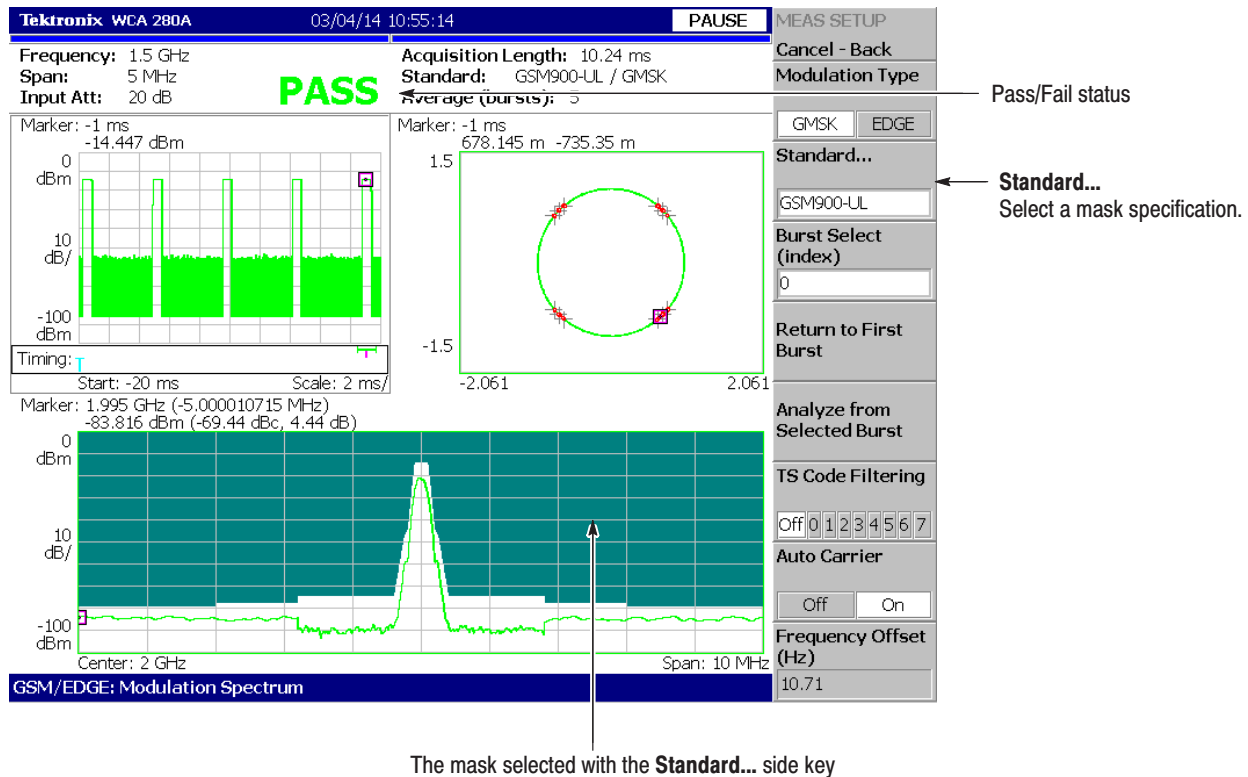


Figure 2–5: Modulation spectrum measurement

Changing Views. You can change the presentation of the overview and the subview. The procedures to change the presentation of the overview and the subview are common with those of the modulation analysis. Refer to the *WCA230A and WCA280A User Manual* for the details.

Switching Spectrum Measurement

Figure 2–6 shows an example of the switching spectrum measurement.

- Overview: Power versus Time for the specified block
- Subview: Constellation for the specified burst
- Main view: Spectrum and the mask for the specified burst

The spectrum waveform and the GSM/EDGE specification mask are shown in the main view. To select the mask specification, use the **Standard...** side key in the Meas Setup menu.

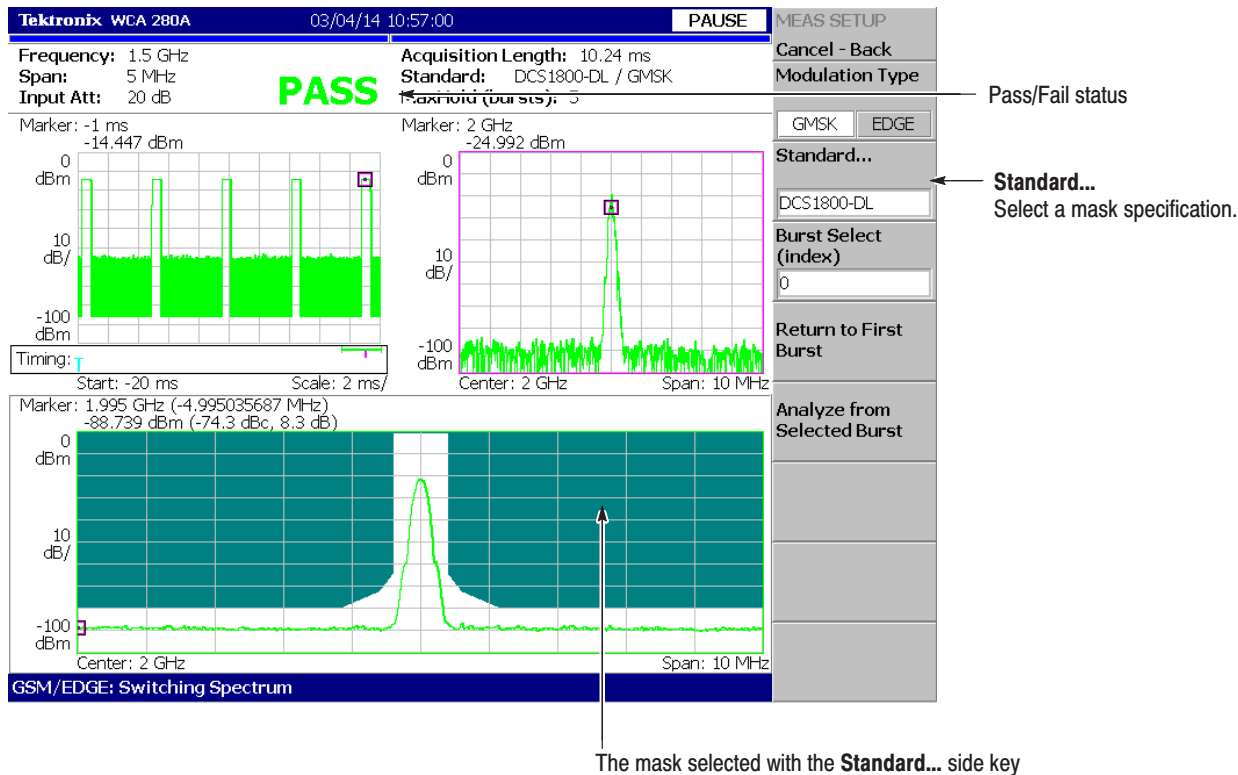


Figure 2–6: Switching spectrum measurement

Changing Views. You can change the presentation of the overview. The procedure to change the presentation of the overview is common with that of the modulation analysis. Refer to the *WCA230A and WCA280A User Manual* for the details.

Spurious Analysis

This section describes operating basics for the measurement of spurious signals within a transmission band. The spurious signal measurement in GSM/EDGE is based on that function in the normal spectrum analysis. For the basics, refer to *Spurious Signal Measurement* in the *WCA230A and WCA280A User Manual*.

Measurement Procedure

The following is the fundamental procedure for the spurious signal measurement.

1. Press the **DEMOD** key on the front panel.
2. Press the side key **GSM/EDGE** → **Inband Spurious**.
3. Display the spectrum waveform of the measurement signal:
 - a. Press the **RUN/STOP** key on the front panel to start data acquisition.

NOTE. For details on setting frequency, span, and amplitude, refer to the *WCA230A and WCA280A User Manual*.

- b. Set the frequency by pressing the **FREQUENCY/CHANNEL** key on the front panel.

How to use the channel table:

 - Press the **Channel Table...** side key.
 - Select one of the GSM/EDGE standards.
 - Use the **Channel** side key to select a channel.
 - c. Set the span by pressing the **SPAN** key on the front panel.
 - d. Set the amplitude by pressing the **AMPLITUDE** key on the front panel.
4. Set the following measurement setup controls by pressing the **MEAS SETUP** key on the front panel.

Meas Setup Menu

The Meas Setup menu for the spurious signal measurement contains the following controls:

Standard... Selects a specification of the mask for comparison with the spectrum waveform:

- GSM850-UL
- GSM850-DL
- GSM900-UL
- GSM900-DL
- DCS1800-UL
- DCS1800-DL
- PCS1900-UL
- PCS1900-DL

UL and DL mean uplink and downlink, respectively.

Signal Threshold. Sets the threshold for detecting the carrier. A signal with the amplitude larger than this threshold is regarded as a carrier.

Range: -100 to +30 dBm (default: -20 dBm)

Spurious Threshold. Sets the threshold for detecting spurious signals. A signal with the amplitude larger than this threshold is regarded as a spurious signal.

Range: -150 to 0 dBm (default: -36 dBm)

Scroll Table. Horizontally scrolls the spurious table displayed in the lower part of the screen. Up to 10 spurious signals are displayed.

Measurement Example

Figure 2–7 shows an example of the spurious measurement. The analyzer compares the spectrum waveform with the standard mask to extract 10 peaks that exceeded the spurious threshold in ascending order. Detected spurious signals are assigned markers, numbered in descending order by amplitude. The frequency and the amplitude are shown in the table at the bottom of the screen.

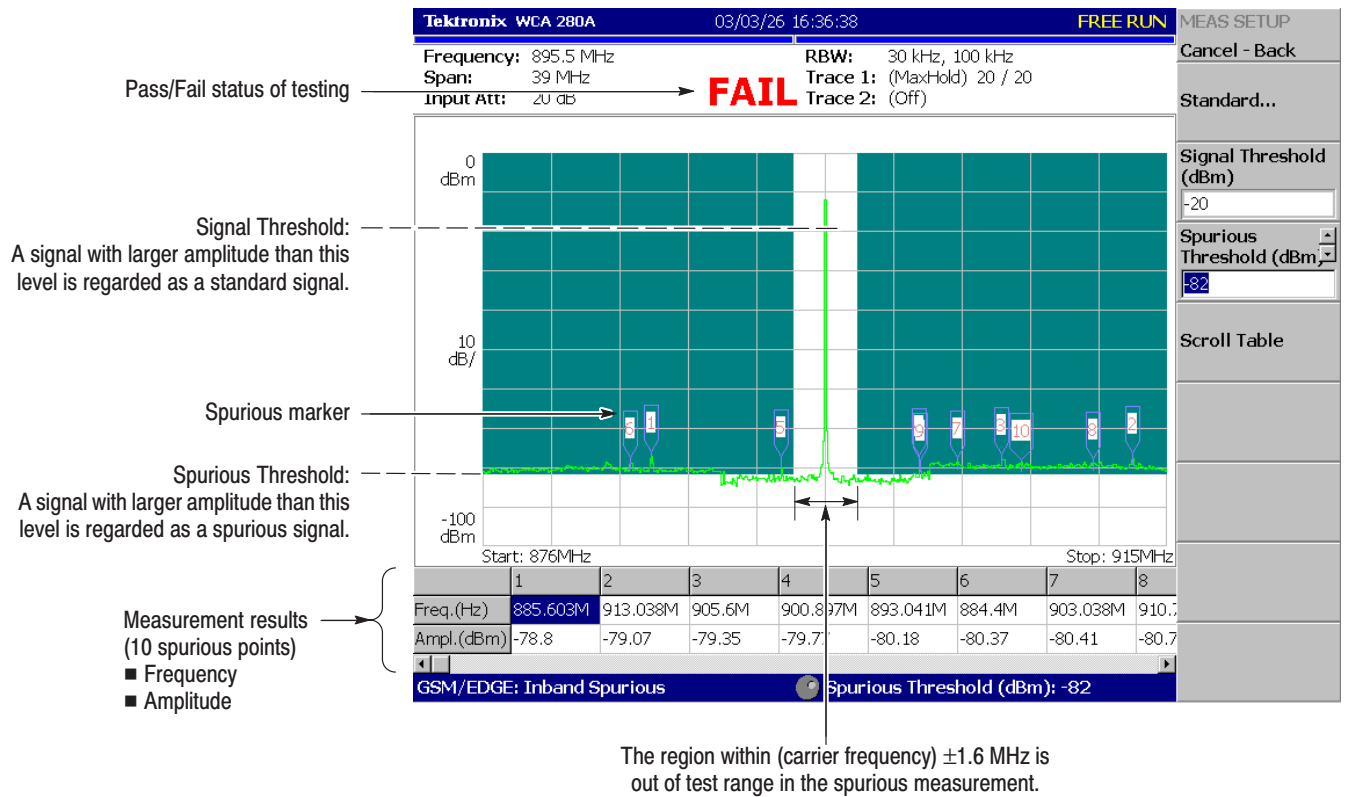


Figure 2–7: Spurious measurement

Scale and Format of View

Setup procedures for the scale and format of views in the GSM/EDGE analysis are the same with those in other measurement modes, except the following views:

- Constellation view
- EVM view
- Power versus Time view (for the Power versus Time measurement only)

This section describes the View: Scale menus for these three views. For details on setup procedures for the other views, refer to *Scale and Format of Views* in the *WCA230A and WCA280A User Manual*.

Constellation View

The View: Scale menu for the constellation view in the GSM/EDGE analysis has the following controls:

Measurement Content. Select vector or constellation display.

- **Vector.** Selects the vector display. The phase and amplitude of the input signal is displayed in a two-dimensional IQ diagram. The red points indicate the symbol positions of the measured signal, and the yellow trace indicates the IQ trajectory between symbols.
- **Constellation.** Selects the constellation display. It is basically the same as the vector display, except that symbols of the measured signal are indicated in red, and the IQ trajectory between the symbols is not shown. The cross marks (+) indicate symbol positions of ideal signal.

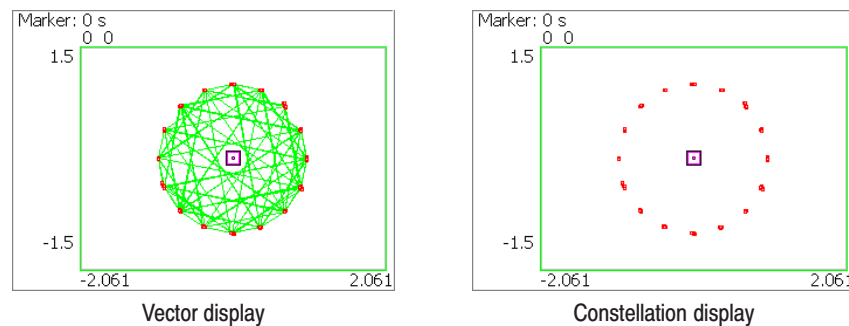


Figure 2-8: Vector and Constellation display

EDGE Inverse Filter. Determines whether or not to apply the inverse filter to the received data for displaying the waveform of an EDGE signal.

- **Off.** Displays the waveform without applying the inverse filter to the received data.
- **On. Default.** Displays the waveform while applying the inverse filter to the received data.

This menu item is invalid for a GMSK signal. It is available when you select EDGE with Modulation Type in the Meas Setup menu.

Slice Timing. Selects the positions on which the red points are to be located.

- **0.** *Default for GMSK.* The red points are located at the ideal symbol positions.
- **0.5.** *Default for EDGE.* The red points are located at positions halfway between the ideal symbols.

For the EDGE modulation analysis, this menu item is available when you select Off with EDGE Inverse Filter above.

EVM View

The View: Scale menu for the EVM view in the GSM/EDGE analysis has the following controls:

Measurement Content.... Selects one of the following formats for view (see Figure 2–9).

- **EVM. Default.** Displays the temporal response of EVM (Error Vector Magnitude) versus time.
- **Mag Error.** Displays the amplitude error versus time.
- **Phase Error.** Displays the phase error versus time.

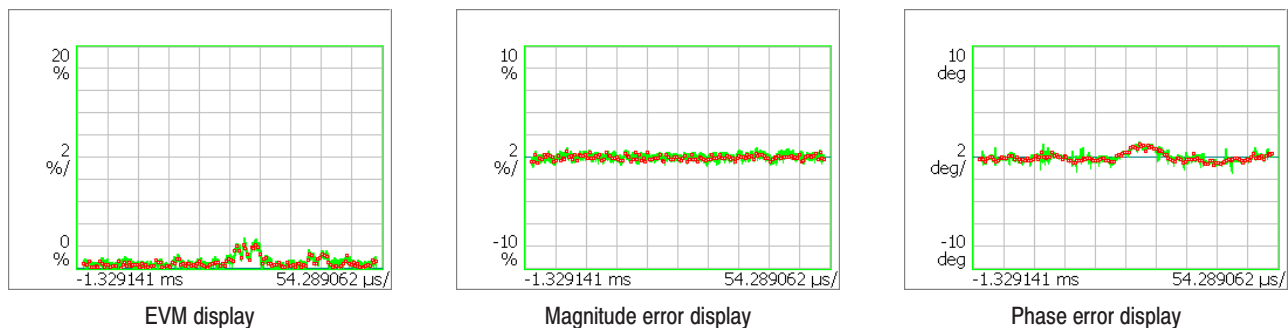


Figure 2-9: EVM, amplitude error, and phase error display

EVM Bandpass Filter. Turns on or off the Raised Cosine Windowed Raised Cosine filter. The default setting is On according to the GSM/EDGE standard.

Auto Scale. Executes the auto scale function. When activated the auto scale, the starting value and the scale of the vertical axis are automatically set so that the waveform will be displayed for optimal viewing.

Horizontal Scale. Sets the scale of the horizontal axis.

Horizontal Start. Sets the starting value of the horizontal axis.

Vertical Scale. Sets the of the scale of the vertical axis scale.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.

Full Scale. Sets the scale of the vertical axis to the default full-scale value.

Power vs. Time View

The View: Scale menu for the power versus time display on the main view in the Power versus Time measurement has the following controls:

View Full Burst. Displays the entire burst (see Figure 2–10).

View Rising Edge. Expands the rising edge horizontally (see Figure 2–10).

View Falling Edge. Expands the falling edge horizontally (see Figure 2–10).

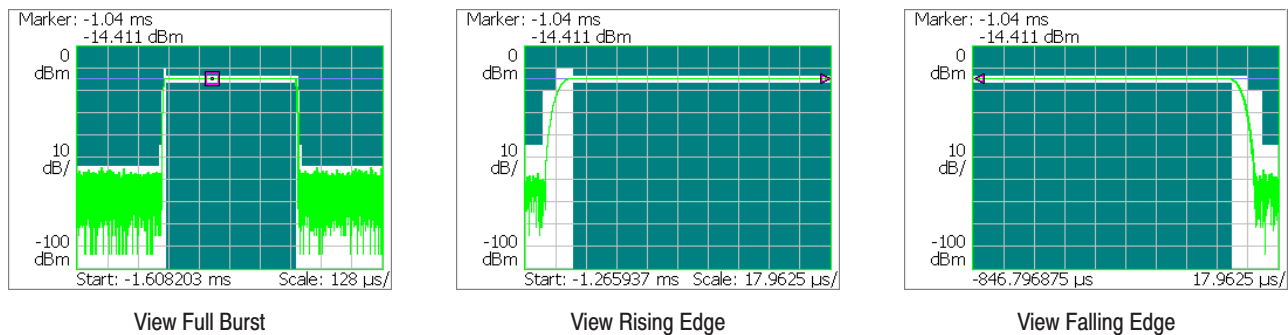


Figure 2–10: Expanding a burst

Auto Scale. Sets the start value and scale of the vertical axis to automatically display the entire waveform.

Horizontal Scale. Sets the scale of the horizontal axis.

Horizontal Start. Sets the minimum value (left edge) of the horizontal axis.

Vertical Scale. Sets the scale of the vertical axis.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.

Full Scale. Sets the scale and start value of the vertical axis to the default full-scale value.

Syntax and Commands

Command Groups

This section lists the commands added in Option 24 in two ways. It first presents them by functional groups. It then lists them alphabetically. The functional group list starts below. The alphabetical list provides more detail on each command and starts on page 3–9.

For details on the standard analyzer commands, refer to the *WCA230A and WCA280A Programmer Manual*.

Items followed by question marks are queries; items without question marks are commands. Some items in this section have a question mark in parentheses (?) in the command header section; this indicates that the item can be both a command and a query.

Each command may be available or unavailable, depending on the current measurement mode. The “Measurement Modes” in each command description shows the measurement mode in which the command is available. To set the measurement mode, use the :INSTRument[:SElect] command (refer to the *WCA230A and WCA280A Programmer Manual*) using one of the mnemonics listed below:

Table 3-1: Measurement mode added in Option 24

Mnemonic	Meaning
DEMGSMEDGE	GSM/EDGE modulation analysis

The WCA200A Series analyzers conform to the Standard Commands for Programmable Instruments (SCPI) 1999.0 and IEEE Std 488.2-1987 except where noted.

Functional Groups

The commands are divided into the groups listed below.

Table 3-2: List of command groups

Command group	Function
:CONFigure	Configure the analyzer for each measurement session.
:DISPlay	Control how to show waveform and measurement result on the screen.
:FETCh	Retrieve the measurements from the data last acquired.
:READ	Obtain the measurement results with acquiring data.
:SENSe	Set up detailed conditions for each measurement.

The following sections list the commands by group.

:CONFigure Commands

Set up the analyzer in order to perform the specified measurement.

Table 3-3: :CONFigure commands

Header	Description
:CONFigure::GSMedge:MACCuracy	Sets up the analyzer to the modulation accuracy measurement default settings.
:CONFigure::GSMedge:MCPower	Sets up the analyzer to the mean carrier power measurement default settings.
:CONFigure::GSMedge:MODulation	Sets up the analyzer to the modulation spectrum measurement default settings.
:CONFigure::GSMedge:PVTime	Sets up the analyzer to the power versus time measurement default settings.
:CONFigure::GSMedge:SPURious	Sets up the analyzer to the spurious measurement default settings.
:CONFigure::GSMedge:SWITching	Sets up the analyzer to the switching spectrum measurement default settings.

:DISPlay Commands

Control how to show measurement data on the screen.

Table 3-4: :DISPlay commands

Header	Description
:DISPlay:GSMedge:DDEMod subgroup	Main view and subview related in the GSM/EDGE analysis.
:DISPlay:GSMedge:DDEMod:MVlew:FILTer:EINVerse (?)	Determines whether to enable the EDGE inverse filter in the main view
:DISPlay:GSMedge:DDEMod:MVlew:FORMat (?)	Selects the main view display format.
:DISPlay:GSMedge:DDEMod:MVlew:STIMe (?)	Sets the slice time on the constellation view
:DISPlay:GSMedge:DDEMod:MVlew:X[:SCALe]:OFFSet (?)	Sets the minimum horizontal value (left end) in the main view.
:DISPlay:GSMedge:DDEMod:MVlew:X[:SCALe]:RANGe (?)	Sets the horizontal full-scale in the main view.
:DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALe]:FIT	Runs auto-scale on the main view.
:DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALe]:FULL	Sets the main view's vertical axis to the default full-scale.
:DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALe]:OFFSet (?)	Sets the minimum vertical value (bottom end) in the main view.
:DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALe]:RANGe (?)	Sets the vertical full-scale in the main view.
:DISPlay:GSMedge:DDEMod:SVlew:FILTer:EINVerse (?)	Determines whether to enable the EDGE inverse filter in the subview
:DISPlay:GSMedge:DDEMod:SVlew:FORMat (?)	Selects the subview display format.
:DISPlay:GSMedge:DDEMod:SVlew:STIMe (?)	Sets the slice time on the constellation view
:DISPlay:GSMedge:DDEMod:SVlew:X[:SCALe]:OFFSet (?)	Sets the minimum horizontal value (left end) in the subview.
:DISPlay:GSMedge:DDEMod:SVlew:X[:SCALe]:RANGe (?)	Sets the horizontal full-scale in the subview.
:DISPlay:GSMedge:DDEMod:SVlew:Y[:SCALe]:FIT	Runs auto-scale on the subview.
:DISPlay:GSMedge:DDEMod:SVlew:Y[:SCALe]:FULL	Sets the vertical axis to the default full-scale in the subview.
:DISPlay:GSMedge:DDEMod:SVlew:Y[:SCALe]:OFFSet (?)	Sets the minimum vertical value (bottom end) in the subview.
:DISPlay:GSMedge:DDEMod:SVlew:Y[:SCALe]:RANGe (?)	Sets the vertical full-scale in the subview.
:DISPlay:GSMedge:SPECTrum subgroup	Spectrum measurement related in the GSM/EDGE analysis.
:DISPlay:GSMedge:SPECTrum:BMARker:STATe (?)	Turns on or off the spurious marker in the spurious measurement.
:DISPlay:GSMedge:SPECTrum:X[:SCALe]:OFFSet (?)	Sets the minimum horizontal value (start frequency).
:DISPlay:GSMedge:SPECTrum:X[:SCALe]:PDIVision (?)	Sets the horizontal scale (span/div).
:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:FIT	Runs auto-scale.
:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:FULL	Sets the vertical axis to the default full-scale.
:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:OFFSet (?)	Sets the minimum vertical, or amplitude, value (bottom end).
:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:PDIVision (?)	Sets the vertical, or amplitude, scale per division.

Table 3-4: :DISPlay commands (Cont.)

Header	Description
:DISPlay:GSMedge:WAVeform subgroup	Time domain display related in the GSM/EDGE analysis.
:DISPlay:GSMedge:WAVeform:BURSt (?)	Selects how to expand waveform in the power versus time measurement
:DISPlay:GSMedge:WAVeform:X[:SCALe]:OFFSet (?)	Sets the minimum horizontal, or time, value (left end).
:DISPlay:GSMedge:WAVeform:X[:SCALe]:PDIVision (?)	Sets the horizontal, or time, scale per division.
:DISPlay:GSMedge:WAVeform:Y[:SCALe]:FIT	Runs auto-scale.
:DISPlay:GSMedge:WAVeform:Y[:SCALe]:FULL	Sets the vertical axis to the default full-scale.
:DISPlay:GSMedge:WAVeform:Y[:SCALe]:OFFSet (?)	Sets the minimum vertical, or amplitude, value (bottom end).
:DISPlay:GSMedge:WAVeform:Y[:SCALe]:PDIVision (?)	Sets the vertical, or amplitude, scale.

:FETCh Commands

The :FETCh commands retrieve the measurements from the data taken by the latest INITiate command.

If you want to perform a FETCh operation on fresh data, use the :READ commands, which acquire a new input signal and fetch the measurement results from that data.

Table 3-5: :FETCh commands

Header	Description
:FETCh:GSMedge:MACCuracy?	Returns the GSM/EDGE modulation accuracy measurement results.
:FETCh:GSMedge:MCPower?	Returns the GSM/EDGE mean carrier power measurement results.
:FETCh:GSMedge:MODulation?	Returns the GSM/EDGE modulation spectrum measurement results.
:FETCh:GSMedge:PVTime?	Returns the GSM/EDGE power versus time measurement results.
:FETCh:GSMedge:SPEctrum:MODulation?	Returns the time amplitude for the modulation spectrum measurement.
:FETCh:GSMedge:SPEctrum:SWITching?	Returns the time amplitude for the switching spectrum measurement.
:FETCh:GSMedge:SPURious?	Returns the GSM/EDGE spurious measurement results.
:FETCh:GSMedge:SWITching?	Returns the GSM/EDGE switching spectrum measurement results.
:FETCh:GSMedge:TAMPlitude:MCPower?	Returns the time amplitude for the mean carrier power measurement.
:FETCh:GSMedge:TAMPlitude:PVTime?	Returns the time amplitude for the power versus time measurement.
:FETCh:GSMedge:TSCode?	Returns the training sequence code in the GSM/EDGE analysis.

:READ Commands

The :READ commands acquire an input signal once in the single mode and obtain the measurement results from that data.

If you want to fetch the measurement results from the data currently residing in the memory without acquiring the input signal, use the :FETCh commands.

Table 3-6: :READ commands

Header	Description
:READ:GSMedge:MACCuracy?	Returns the GSM/EDGE modulation accuracy measurement results.
:READ:GSMedge:MCPower?	Returns the GSM/EDGE mean carrier power measurement results.
:READ:GSMedge:MODulation?	Returns the GSM/EDGE modulation spectrum measurement results.
:READ:GSMedge:PVTime?	Returns the GSM/EDGE power versus time measurement results.
:READ:GSMedge:SPECtrum:MODulation?	Returns the time amplitude for the modulation spectrum measurement.
:READ:GSMedge:SPECtrum:SWITching?	Returns the time amplitude for the switching spectrum measurement.
:READ:GSMedge:SPURious?	Returns the GSM/EDGE spurious measurement results.
:READ:GSMedge:SWITching?	Returns the GSM/EDGE switching spectrum measurement results.
:READ:GSMedge:TAMPlitude:MCPower?	Returns the time amplitude for the mean carrier power measurement.
:READ:GSMedge:TAMPlitude:PVTime?	Returns the time amplitude for the power versus time measurement.

:SENSe Commands

Set the detailed measurement conditions.

Table 3-7: :SENSe commands

Header	Description
[[:SENSe]:GSMedge subgroup	GSM/EDGE analysis related.
[[:SENSe]:GSMedge:ABITs (?)]	Sets the number of symbols for EVM measurement
[[:SENSe]:GSMedge:BLOCK (?)]	Sets the number of the block to be measured.
[[:SENSe]:GSMedge:BURSt:INDex (?)]	Sets the number of the burst to be measured.
[[:SENSe]:GSMedge:BURSt:MPOint (?)]	Defines center of the mask in the power vs. time measurement
[[:SENSe]:GSMedge:BURSt:RTFirst (?)]	Return to the first burst.
[[:SENSe]:GSMedge:CARRier:OFFSet (?)]	Sets the carrier frequency offset.
[[:SENSe]:GSMedge:CARRier:SEARch (?)]	Determines whether to detect the carrier automatically.
[[:SENSe]:GSMedge:FILTer:RCWRcosine (?)]	Determines whether to enable the RCW raised cosine filter.
[[:SENSe]:GSMedge[:IMMediate]	Starts calculation for the GSM/EDGE analysis.
[[:SENSe]:GSMedge:LIMit:SIGNal (?)]	Sets the threshold level to determine the normal signal.
[[:SENSe]:GSMedge:LIMit:SPURious (?)]	Sets the threshold level to determine the spurious signal.
[[:SENSe]:GSMedge:MEASurement (?)]	Selects the GSM/EDGE measurement item.
[[:SENSe]:GSMedge:MODulation (?)]	Selects the modulation system for the GSM/EDGE analysis.
[[:SENSe]:GSMedge:SLOT (?)]	Sets the number of slots for one block
[[:SENSe]:GSMedge:STANdard:BAND (?)]	Selects the standard for the GSM/EDGE analysis.
[[:SENSe]:GSMedge:STANdard:DIRection (?)]	Selects the link direction for the GSM/EDGE analysis.
[[:SENSe]:GSMedge:STINdex (?)]	Sets the column number in the spurious table.
[[:SENSe]:GSMedge:TSCode:AUTO (?)]	Determines whether to set TSC number automatically.
[[:SENSe]:GSMedge:TSCode[:NUMBer] (?)]	Sets the TSC (Training Sequence Code) number.

:CONFigure Commands

The :CONFigure commands set up the analyzer to the default settings for the specified measurement.

Command Tree

Header	Parameter
:CONFigure	
:GSMedge	
:MACCuracy	
:MCPower	
:MODulation	
:PVTime	
:SPURious	
:SWITching	

NOTE. Data acquisition stops on completion of a :CONFigure command. The following each command description shows the front-panel key operation equivalent to running the command except data acquisition control.

:CONFigure:GSMedge:MACCuracy (No Query Form)

Sets up the analyzer to the default settings for the modulation accuracy measurement under the GSM/EDGE standard. Running this command is equivalent to pressing the following front panel keys:

DEMOD key → **Standard...** side key → **GSM/EDGE** side key
→ **PRESET** key → **Modulation Accuracy** side key

Syntax :CONFigure:GSMedge:MACCuracy

Arguments None

Measurement Modes DEMGSMEDGE

Examples :CONFigure:GSMedge:MACCuracy
sets up the analyzer to the default settings for the modulation accuracy measurement under the GSM/EDGE standard.

Related Commands :INSTrument[:SElect]

:CONFigure:GSMedge:MCPower (No Query Form)

Sets up the analyzer to the default settings for the mean carrier power measurement under the GSM/EDGE standard. Running this command is equivalent to pressing the following front panel keys:

DEM key → **Standard...** side key → **GSM/EDGE** side key
→ **PRESET** key → **Mean Carrier Power** side key

Syntax :CONFigure:GSMedge:MCPower

Arguments None

Measurement Modes DEMGSMEDGE

Examples :CONFigure:GSMedge:MCPower
sets up the analyzer to the default settings for the mean carrier power measurement under the GSM/EDGE standard.

Related Commands :INSTrument[:SElect]

:CONFigure:GSMedge:MODulation (No Query Form)

Sets up the analyzer to the default settings for the modulation spectrum measurement under the GSM/EDGE standard. Running this command is equivalent to pressing the following front panel keys:

DEMOD key → **Standard...** side key → **GSM/EDGE** side key
→ **PRESET** key → **Modulation Spectrum** side key

Syntax :CONFigure:GSMedge:MODulation

Arguments None

Measurement Modes DEMGSMEDGE

Examples :CONFigure:GSMedge:MODulation
sets up the analyzer to the default settings for the modulation spectrum measurement under the GSM/EDGE standard.

Related Commands :INSTrument[:SElect]

:CONFigure:GSMedge:PVTime (No Query Form)

Sets up the analyzer to the default settings for the power versus time measurement under the GSM/EDGE standard. Running this command is equivalent to pressing the following front panel keys:

DEMMOD key → **Standard...** side key → **GSM/EDGE** side key
→ **PRESET** key → **Power versus Time** side key

Syntax :CONFigure:GSMedge:PVTime

Arguments None

Measurement Modes DEMGSMEDGE

Examples :CONFigure:GSMedge:PVTime
sets up the analyzer to the default settings for the power versus time measurement under the GSM/EDGE standard.

Related Commands :INSTrument[:SElect]

:CONFigure:GSMedge:SPURious (No Query Form)

Sets up the analyzer to the default settings for the spurious measurement under the GSM/EDGE standard. Running this command is equivalent to pressing the following front panel keys:

DEMOD key → **Standard...** side key → **GSM/EDGE** side key
→ **PRESET** key → **Inband Spurious** side key

Syntax :CONFigure:GSMedge:SPURious

Arguments None

Measurement Modes DEMGSMEDGE

Examples :CONFigure:GSMedge:SPURious
sets up the analyzer to the default settings for the spurious measurement under the GSM/EDGE standard.

Related Commands :INSTrument[:SElect]

:CONFigure:GSMedge:SWITching (No Query Form)

Sets up the analyzer to the default settings for the switching spectrum measurement under the GSM/EDGE standard. Running this command is equivalent to pressing the following front panel keys:

DEMOD key → **Standard...** side key → **GSM/EDGE** side key
→ **PRESET** key → **Switching Spectrum** side key

Syntax :CONFigure:GSMedge:SWITching

Arguments None

Measurement Modes DEMGSMEDGE

Examples :CONFigure:GSMedge:SWITching
sets up the analyzer to the default settings for the switching spectrum measurement under the GSM/EDGE standard.

Related Commands :INSTrument[:SElect]

:DISPlay Commands

The :DISPlay commands control how to show measurement data on the screen. These commands are divided into the following subgroups:

Table 3-8: :DISPlay command subgroups

Command header	Function	Refer to:
:DISPlay:GSMedge:DDEMod	Control display of the GSM/EDGE analysis.	p. 3-18
:DISPlay:GSMedge:SPECTrum	Control spectrum view in the GSM/EDGE analysis.	p. 3-33
:DISPlay:GSMedge:WAVeform	Control time domain view in the GSM/EDGE analysis.	p. 3-39

NOTE. The :DISPlay commands concern the measurement display only, and do not affect the hardware settings.

:DISPlay:GSMedge:DDEMod Subgroup

The :DISPlay:GSMedge:DDEMod commands control display of the main view and subview for the GSM/EDGE analysis.

NOTE. To use a command of this group, you must have selected DEMGSMEDGE (GSM/EDGE analysis) in the :INSTRument[:SElect] command.

Command Tree	Header	Parameter
	:DISPlay	
	:GSMedge	
	:DDEMod	
	:MView	
	:FILTER	
	:EINverse	<boolean>
	:FORMat	CONStE VECTor EVM MERRor PERRor OFF
	:STIME	SYMBol ISYMBol
	:X	
	[:SCALE]	
	:OFFSet	<numeric_value>
	:RANGe	<numeric_value>
	:Y	
	[:SCALE]	
	:FIT	
	:FULL	
	:OFFSet	<numeric_value>
	:RANGe	<numeric_value>
	:SView	
	:FILTER	
	:EINverse	<boolean>
	:FORMat	IQVTime SPECTrum CONStE VECTor EVM MERRor PERRor IEYE QEYE TEYE STABle
	:STIME	SYMBol ISYMBol
	:X	
	[:SCALE]	
	:OFFSet	<numeric_value>
	:RANGe	<numeric_value>
	:Y	
	[:SCALE]	
	:FIT	
	:FULL	
	:OFFSet	<numeric_value>
	:RANGe	<numeric_value>

:DISPlay:GSMedge:DDEMod:MVIew:FILTer:EINVerse (?)

Determines whether to enable or disable the inverse filter for the EDGE signal on the main view set to constellation in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:MVIew:FORMat is CONStE and [:SENSe]:GSMedge:MODulation is EDGE.

Syntax :DISPlay:GSMedge:DDEMod:MVIew:FILTer:EINVerse { OFF | ON | 0
| 1 }

:DISPlay:GSMedge:DDEMod:MVIew:FILTer:EINVerse?

Arguments OFF or 0 disables the inverse filter for the EDGE signal.

ON or 1 enables the inverse filter for the EDGE signal.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MVIew:FILTer:EINVerse ON
enables the inverse filter for the EDGE signal.

Related Commands :DISPlay:GSMedge:DDEMod:MVIew:FORMat, [:SENSe]:GSMedge:MODulation

:DISPlay:GSMedge:DDEMod:MView:FORMat (?)

Selects or queries the display format of the main view in the GSM/EDGE analysis.

Syntax :DISPlay:GSMedge:DDEMod:MView:FORMat { CONSTe | VECTor | EVM
| MERRor | PERRor | OFF }
:DISPlay:GSMedge:DDEMod:MView:FORMat?

Arguments Table 3–9 shows the arguments and the display formats.

Table 3–9: Main view display formats

Argument	Display format
CONSTe	Constellation
VECTor	Vector
EVM	Error vector magnitude (EVM)
MERRor	Magnitude error
PERRor	Phase error
OFF	Hides all measurement results.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:FORMat CONSTe
selects constellation for the main view.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:DDEMod:MView:STIME (?)

Sets or queries the slice timing on the main view set to constellation in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:MView:EINVerse is OFF, :DISPlay:GSMedge:DDEMod:MView:FORMat is CONSTe and [:SENSe]:GSMedge:MODulation is EDGE.

Syntax :DISPlay:GSMedge:DDEMod:MView:STIME { SYMBo1 | ISYMbo1 }
:DISPlay:GSMedge:DDEMod:MView:STIME?

Arguments SYMBo1 displays a red point at the symbol position.
ISYMbo1 displays a red point halfway between two symbols.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:STIME SYMBo1
displays a red point at the symbol position.

Related Commands :DISPlay:GSMedge:DDEMod:MView:EINVerse,
:DISPlay:GSMedge:DDEMod:MView:FORMat, [:SENSe]:GSMedge:MODulation

:DISPlay:GSMedge:DDEMod:MView:X[:SCALE]:OFFSet (?)

Sets or queries the minimum horizontal value (left end) in the main view in the GSM/EDGE analysis.

Syntax :DISPlay:GSMedge:DDEMod:MView:X[:SCALE]:OFFSet <value>

:DISPlay:GSMedge:DDEMod:MView:X[:SCALE]:OFFSet?

Arguments <value>::=<NRf> specifies the minimum horizontal value in the main view. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:X:SCALE:OFFSet -20ms
sets the minimum horizontal value to -20 ms when the main view displays EVM.

Related Commands :DISPlay:GSMedge:DDEMod:MView:FORMat

:DISPlay:GSMedge:DDEMod:MView:X[:SCALE]:RANGe (?)

Sets or queries the full-scale of the horizontal axis in the main view in the GSM/EDGE analysis.

Syntax :DISPlay:GSMedge:DDEMod:MView:X[:SCALE]:RANGe <value>

:DISPlay:GSMedge:DDEMod:MView:X[:SCALE]:RANGe?

Arguments <value>::=<NRf> specifies the full-scale of the horizontal axis in the main view. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:X:SCALE:RANGe 50us
sets the full-scale of the horizontal axis to 50 μ s when the main view displays EVM.

Related Commands :DISPlay:GSMedge:DDEMod:MView:FORMat

:DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:FIT (No Query Form)

Runs the auto-scale on the main view in the GSM/EDGE analysis. The auto-scale automatically sets the start value and scale of the vertical axis to display the whole waveform.

This command is valid when :DISPlay:GSMedge:DDEMod:MView:FORMat is set to EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:FIT

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:Y:SCALE:FIT
runs the auto-scale on the main view.

Related Commands :DISPlay:GSMedge:DDEMod:MView:FORMat

:DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:FULL (No Query Form)

Sets the vertical axis in the main view to the default full-scale in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:MView:FORMat is set to EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:FULL

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:Y:SCALE:FULL
sets the main view's vertical axis to the default full-scale:

Related Commands :DISPlay:GSMedge:DDEMod:MView:FORMat

:DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALE]:OFFSet (?)

Sets or queries the minimum vertical value in the main view (bottom edge) in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:MVlew:FORMat is set to EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALE]:OFFSet <value>

:DISPlay:GSMedge:DDEMod:MVlew:Y[:SCALE]:OFFSet?

Arguments <value>::=<NRf> specifies the minimum vertical value in the main view. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MVlew:Y:SCALE:OFFSet 10pct
sets the minimum vertical value to 10% when the main view displays EVM.

Related Commands :DISPlay:GSMedge:DDEMod:MVlew:FORMat

:DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:RANGE (?)

Sets or queries full-scale of the vertical axis in the main view in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:MView:FORMat is set to EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:RANGE <value>
:DISPlay:GSMedge:DDEMod:MView:Y[:SCALE]:RANGE?

Arguments <value>::=<NRf> specifies full-scale of the vertical axis in the main view. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:MView:Y:SCALE:RANGE 50pct
sets full-scale of the vertical axis to 50% when the the main view displays EVM.

Related Commands :DISPlay:GSMedge:DDEMod:MView:FORMat

:DISPlay:GSMedge:DDEMod:SVIew:FILTer:EIINVerse (?)

Determines whether to enable or disable the inverse filter for the EDGE signal on the subview set to constellation in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:SVIew:FORMat is CONSTe and [:SENSe]:GSMedge:MODulation is EDGE.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:FILTer:EIINVerse { OFF | ON | 0
| 1 }

:DISPlay:GSMedge:DDEMod:SVIew:FILTer:EIINVerse?

Arguments OFF or 0 disables the inverse filter for the EDGE signal.

ON or 1 enables the inverse filter for the EDGE signal.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:FILTer:EIINVerse ON
enables the inverse filter for the EDGE signal in the subview.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat, [:SENSe]:GSMedge:MODulation

:DISPlay:GSMedge:DDEMod:SVIew:FORMat (?)

Selects or queries the display format of the subview in the GSM/EDGE analysis.

This command is valid when the measurement item is modulation accuracy (MACCuracy), mean carrier power (MCPower), modulation spectrum (MODulation), or power versus time (PVTime).

Syntax :DISPlay:GSMedge:DDEMod:SVIew:FORMat { IQVTime | FVTime | CONSTe
| VECTor | EVM | MERRor | PERRor | IEYE | QEYE | TEYE | STABle }

:DISPlay:GSMedge:DDEMod:SVIew:FORMat?

Arguments The arguments and display formats are listed below:

Table 3-10: Subview display formats

Argument	Display format
IQVTime	IQ level vs. Time
SPECTrum	Spectrum
CONSte	Constellation
VECTor	Vector
EVM	Error vector magnitude (EVM)
MERRor	Amplitude error
PERRor	Phase error
IEYE	Eye diagram (vertical axis: I data)
QEYE	Eye diagram (vertical axis: Q data)
TEYE	Eye diagram (vertical axis: Phase)
STABLE	Symbol table

NOTE. The display format is fixed to spectrum when the measurement item is switching spectrum (SWITChing).

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:FORMat CONSte
displays the constellation in the subview.

Related Commands :DISPlay:GSMedge:DDEMod:MVIew:FORMat, [:SENSe]:GSMedge:MEASurement

:DISPlay:GSMedge:DDEMod:SVIew:STIME (?)

Sets or queries the slice timing on the subview set to constellation in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:SVIew:EINVerse is OFF, :DISPlay:GSMedge:DDEMod:SVIew:FORMat is CONStE and [:SENSe]:GSMedge:MODulation is EDGE.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:STIME { SYMBo1 | ISYMbo1 }
 :DISPlay:GSMedge:DDEMod:SVIew:STIME?

Arguments SYMBo1 displays a red point at the symbol position.
 ISYMbo1 displays a red point halfway between two symbols.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:STIME SYMBo1
 displays a red point at the symbol position.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:EINVerse,
 :DISPlay:GSMedge:DDEMod:SVIew:FORMat, [:SENSe]:GSMedge:MODulation

:DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:OFFSet (?)

Sets or queries the minimum horizontal value (left end) in the subview in the GSM/EDGE analysis.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:OFFSet <value>
:DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:OFFSet?

Arguments <value>::=<Nrf> specifies the minimum horizontal value in the subview. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:X:SCALe:OFFSet -2.5
sets the minimum horizontal value to -2.5 when the subview displays the constellation.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:RANGe (?)

Sets or queries full-scale of the horizontal axis in the subview in the GSM/EDGE analysis.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:RANGe <value>
:DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:RANGe?

Arguments <value>::=<Nrf> specifies full-scale of the horizontal axis in the subview. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:X:SCALe:RANGe 2.5
sets full-scale of the horizontal axis to 2.5 when the subview displays the constellation.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:FIT (No Query Form)

Runs the auto-scale on the subview in the GSM/EDGE analysis. The auto-scale automatically sets the start value and scale of the vertical axis to display the whole waveform.

This command is valid when :DISPlay:GSMedge:DDEMod:SVIew:FORMat is set to IQVTime, FVTime, EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:FIT

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:Y:SCALE:FIT
runs the auto-scale on the subview.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:FULL (No Query Form)

Sets the vertical axis in the subview to the default full-scale in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:SVIew:FORMat is set to IQVTime, FVTime, EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:FULL

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:Y:SCALE:FULL
sets the vertical axis in the subview to the default full-scale.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALe]:OFFSet (?)

Sets or queries the minimum vertical value (bottom edge) in the subview in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:SVIew:FORMat is set to IQVTime, FVTime, EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALe]:OFFSet <value>

Arguments <value>::=<NRf> specifies the minimum vertical value in the subview. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:Y:SCALe:OFFSet 10pct
sets the minimum vertical value to 10% when the subview displays EVM.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:RANGe (?)

Sets or queries full-scale of the vertical axis in the subview in the GSM/EDGE analysis.

This command is valid when :DISPlay:GSMedge:DDEMod:SVIew:FORMat is set to IQVTime, FVTime, EVM, MERRor, or PERRor.

Syntax :DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:RANGe <value>
 :DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALE]:RANGe?

Arguments <value> ::= <NRf> specifies full-scale of the vertical axis in the subview. The valid range depends on the display format. Refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:DDEMod:SVIew:Y:SCALE:RANGe 50pct
 sets full-scale of the vertical axis to 50% when the subview displays EVM.

Related Commands :DISPlay:GSMedge:DDEMod:SVIew:FORMat

:DISPlay:GSMedge:SPECTrum Subgroup

The :DISPlay:GSMedge:SPECTrum commands control the spectrum display in the modulation spectrum, the switching spectrum, and the spurious measurements under the GSM/EDGE standard.

Command Tree	Header	Parameter
	:DISPlay	
	:GSMedge	
	:SPECTrum	
	:BMARker	
	:STATe	<boolean>
	:X	
	[:SCALe]	
	:OFFSet	<frequency>
	:PDIVsion	<frequency>
	:Y	
	[:SCALe]	
	:FIT	
	:FULL	
	:OFFSet	<amplitude>
	:PDIVsion	<amplitude>

Prerequisites for Use

To use a command of this group, you must have run at least the following two commands:

1. Run the following command to set the measurement mode to GSM/EDGE:

```
:INSTrument[:SElect] "DEMGSMEDGE"
```

2. Run one of the following commands to start the modulation spectrum, the switching spectrum, or the spurious measurement.

- To start the measurement with the default settings:

```
:CONFIgure:GSMedge:MODulation
:CONFIgure:GSMedge:SWITChing or
:CONFIgure:GSMedge:SPURious
```

- To start the measurement without modifying the current settings:

```
[:SENSe]:GSMedge:MEASurement { MODulation | SWITChing
| SPURious }
```

:DISPlay:GSMedge:SPECTrum:BMARker:STATe (?)

Determines whether to show the spurious marker in the spurious (SPURious) measurement.

Syntax :DISPlay:GSMedge:SPECTrum:BMARker:STATe { OFF | ON | 0 | 1 }
 :DISPlay:GSMedge:SPECTrum:BMARker:STATe?

Arguments OFF or 0 hides the spurious marker.
 ON or 1 shows the spurious marker.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:BMARker:STATe ON
 shows the spurious marker in the spurious measurement.

:DISPlay:GSMedge:SPECTrum:X[:SCALE]:OFFSet (?)

Sets or queries the minimum value (left edge) of the horizontal axis (frequency) in the spectrum view.

Syntax :DISPlay:GSMedge:SPECTrum::X[:SCALE]:OFFSet <freq>
 :DISPlay:GSMedge:SPECTrum::X[:SCALE]:OFFSet?

Arguments <freq>::=<NRf> specifies the minimum horizontal value in the spectrum view. The valid range depends on the measurement frequency band, which can be queried with the [:SENSe]:FREQUency:BAND? command. Refer to Table 3–11.

Table 3–11: X offset setting range

Argument	Frequency range
BAS	DC to 20 MHz
RF1B	15 MHz to 3 GHz (WCA230A) 15 MHz to 3.5 GHz (WCA280A)
RF2B	3.5 to 6.5 GHz (WCA280A)
RF3B	5 to 8 GHz (WCA280A)

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:X:SCALE:OFFSet 100MHz
 sets the minimum horizontal value to 100 MHz.

Related Commands [:SENSe]:FREQUency:BAND?

:DISPlay:GSMedge:SPECTrum:X[:SCALE]:PDIVision (?)

Sets or queries the horizontal scale (frequency per division) in the spectrum view.

Syntax :DISPlay:GSMedge:SPECTrum:X[:SCALE]:PDIVision <freq>
 :DISPlay:GSMedge:SPECTrum:X[:SCALE]:PDIVision?

Arguments <freq> ::= <NRf> sets the horizontal scale (frequency per division).
Range: 5 Hz to 2 MHz (Baseband), 5 Hz to 300 MHz (RF)

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:X:SCALE:PDIVision 100.0E+3
sets the horizontal scale to 100 kHz/div.

:DISPlay:GSMedge:SPECTrum:Y[:SCALE]:FIT (No Query Form)

Runs the auto-scale on the spectrum view. The auto-scale automatically sets the start value and scale of the vertical axis to display the whole waveform.

Syntax :DISPlay:GSMedge:SPECTrum:Y[:SCALE]:FIT

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:Y:SCALE:FIT
runs the auto-scale on the spectrum view.

:DISPlay:GSMedge:SPECTrum:Y[:SCALE]:FULL (No Query Form)

Sets the vertical axis to the default full-scale in the spectrum view.

Syntax :DISPlay:GSMedge:SPECTrum:Y[:SCALE]:FULL

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:Y:SCALE:FULL
sets the vertical axis to the default full-scale in the spectrum view.

:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:OFFSet (?)

Sets or queries the minimum vertical, or amplitude, value (bottom end) in the spectrum view.

Syntax :DISPlay:GSMedge:SPECTrum:Y[:SCALe]:OFFSet <amp1>
 :DISPlay:GSMedge:SPECTrum:Y[:SCALe]:OFFSet?

Arguments <amp1>::=<NRf> sets the minimum vertical value. Range: -200 to +100 dBm.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:Y:SCALe:OFFSet -100
 sets the minimum vertical value to -100 dBm.

:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:PDIVision (?)

Sets or queries the vertical, or amplitude, scale (per division) in the spectrum view.

Syntax :DISPlay:GSMedge:SPECTrum:Y[:SCALe]:PDIVision <amp1>
 :DISPlay:GSMedge:SPECTrum:Y[:SCALe]:PDIVision?

Arguments <freq>::=<NRf> specifies the horizontal scale in the spectrum view.
Range: 0 to 10 dB/div.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:SPECTrum:Y:SCALe:PDIVision 10
 sets the vertical scale to 10 dB/div.

:DISPlay:GSMedge:WAVeform Subgroup

The :DISPlay:GSMedge:WAVeform commands control the time domain display in the main view of the mean carrier power and the power versus time measurements under the GSM/EDGE standard.

Command Tree	Header	Parameter
	:DISPlay	
	:GSMedge	
	:WAVeform	
	:BURSt	FULL REDGe FEDGe
	:X	
	[:SCALe]	
	:OFFSet	<time>
	:PDIvSion	<time>
	:Y	
	[:SCALe]	
	:FIT	
	:FULL	
	:OFFSet	<amplitude>
	:PDIvSion	<amplitude>

Prerequisites for Use

To use a command of this group, you must have run at least the following two commands:

1. Run the following command to set the measurement mode to GSM/EDGE:


```
:INSTrument[:SElect] "DEMGSMEDGE"
```
2. Run one of the following commands to start the mean carrier power or the power versus time measurement:
 - To start the measurement with the default settings:


```
:CONFIgure:GSMedge:MCPower or  
:CONFIgure:GSMedge:PVTime
```
 - To start the measurement without modifying the current settings:


```
[:SENSe]:GSMedge:MEASurement { MCPower | PVTime }
```

:DISPlay:GSMedge:WAVeform:BURSt (?)

Selects or queries how to expand a burst in the power versus time (PVTime) measurement.

This command is executed only when display data exists.

Syntax :DISPlay:GSMedge:WAVeform:BURSt { FULL | REDGe | FEDGe }
 :DISPlay:GSMedge:WAVeform:BURSt?

Arguments FULL displays the entire burst.
 REDGe expands the rising edge horizontally.
 FEDGe expands the falling edge horizontally.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:BURSt REDGe
 expands the rising edge horizontally.

:DISPlay:GSMedge:WAVeform:X[:SCALE]:OFFSet (?)

Sets or queries the minimum value of the horizontal axis (left end) in the time domain display.

Syntax :DISPlay:GSMedge:WAVeform:X[:SCALE]:OFFSet <time>
 :DISPlay:GSMedge:WAVeform:X[:SCALE]:OFFSet?

Arguments <time>::=<Nrf> sets the minimum horizontal value.
 For the setting range, refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:X:SCALE:OFFSet -100us
 sets the minimum horizontal value to -100 μ s.

:DISPlay:GSMedge:WAVeform:X[:SCALE]:PDIVision (?)

Sets or queries the horizontal, or time, scale (per division) in the time domain display.

Syntax :DISPlay:GSMedge:WAVeform:X[:SCALE]:PDIVision <time>
 :DISPlay:GSMedge:WAVeform:X[:SCALE]:PDIVision?

Arguments <time>::=<Nrf> specifies the horizontal scale.
 For the setting range, refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:X:SCALE:PDIVision 10us
 sets the horizontal scale to 10 μ s/div.

:DISPlay:GSMedge:WAVeform:Y[:SCALE]:FIT (No Query Form)

Runs the auto-scale on the time domain display. The auto-scale automatically sets the start value and scale of the vertical axis to display the whole waveform.

Syntax :DISPlay:GSMedge:WAVeform:Y[:SCALE]:FIT

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:Y:SCALE:FIT
runs the auto-scale.

:DISPlay:GSMedge:WAVeform:Y[:SCALE]:FULL (No Query Form)

Sets the vertical axis in the time domain display to the default full-scale.

Syntax :DISPlay:GSMedge:WAVeform:Y[:SCALE]:FULL

Arguments None

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:Y:SCALE:FULL
sets the vertical axis in the time domain display to the default full-scale.

:DISPlay:GSMedge:WAVeform:Y[:SCALe]:OFFSet (?)

Sets or queries the minimum value of the vertical axis (bottom end) in the time domain display.

Syntax :DISPlay:GSMedge:WAVeform:Y[:SCALe]:OFFSet <amp1>

:DISPlay:GSMedge:WAVeform:Y[:SCALe]:OFFSet?

Arguments <amp1>: :=<Nrf> specifies the minimum value of the vertical axis. For the setting range, refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:Y:SCALe:OFFSet -100
sets the minimum vertical value to -100 dBm.

:DISPlay:GSMedge:WAVeform:Y[:SCALe]:PDIVision (?)

Sets the vertical axis scale (per division) in the time domain display.

Syntax :DISPlay:GSMedge:WAVeform:Y[:SCALe]:PDIVision <amp1>

:DISPlay:GSMedge:WAVeform:Y[:SCALe]:PDIVision?

Arguments <amp1>: :=<Nrf> specifies the vertical scale. For the setting range, refer to Table C-1 in *Appendix C*.

Measurement Modes DEMGSMEDGE

Examples :DISPlay:GSMedge:WAVeform:Y:SCALe:PDIVision 10
sets the vertical scale to 10 dB/div.

:FETCh Commands

The :FETCh commands retrieve the measurements from the data taken by the latest INITiate command.

If you want to perform a FETCh operation on fresh data, use the :READ commands on page 3–57. The :READ commands acquire a new input signal and fetch the measurement results from that data.

NOTE. To use a :FETCh command, you must have set a measurement mode for the FETCh operation using the :INSTRument[:SELEct] command (refer to the WCA230A and WCA280A Programmer Manual).

Command Tree

Header	Parameter
:FETCh	
:GSMedge	
:MACCuracy?	
:MCPower?	
:MODulation?	
:PVTime?	
:SPECTrum	
:MODulation?	
:SWITching?	
:SPURious?	
:SWITching?	
:TAMPplitude	
:MCPower?	
:PVTime?	
:TSCode?	

:FETCh:GSMedge:MACCuracy? (Query Only)

Fetches the results of the GSM/EDGE modulation accuracy measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDEx command.

Syntax :FETCh:GSMedge:MACCuracy?

Arguments None

Returns <pass_fail>,<phase_error>,<peak_phase_error>,<evm>,<evm95>,<peak_evm>,<freq_error>,<o_off>

Where

<pass_fail>::=<NR1> = 0 represents Fail; = 1 represents Pass.

<phase_error>::=<NRf> is the phase error in degree.

<peak_phase_error>::=<NRf> is the peak phase error in degree.

<evm>::=<NRf> is the EVM (Error Vector Magnitude) in percent (%).

<evm95>::=<NRf> is the EVM 95% tile in percent (%).

<peak_evm>::=<NRf> is the peak EVM in percent (%).

<freq_error>::=<NRf> is the frequency error in Hz.

<o_off>::=<NRf> is the origin offset in dB.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:MACCuracy?
might return 1,0.47,0.86,0.93,0.75,2.15,4.209,-64.31 for the modulation accuracy measurement results.

Related Commands :INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDEx

:FETCh:GSMedge:MCPower? (Query Only)

Fetches the results of the GSM/EDGE mean carrier power measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :FETCh:GSMedge:MCPower?

Arguments None

Returns <mean_power>,<max_power>,<max_bi>,<min_power>,<min_bi>

Where

<mean_power>::=<NRf> is the mean power value in dBm.

<max_power>::=<NRf> is the maximum power value in dBm.

<max_bi>::=<NR1> is the burst index for the maximum power.

<min_power>::=<NRf> is the minimum power value in dBm.

<min_bi>::=<NR1> is the burst index for the minimum power.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:MCPower?
might return 68.081,72.4203,-3,58.229,-7 as the mean carrier power measurement results.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:FETCh:GSMedge:MODulation? (Query Only)

Queries the pass/fail result of the GSM/EDGE modulation spectrum measurement for the standard specified with the [:SENSe]:GSMedge:STANdard commands.

Syntax :FETCh:GSMedge:MODulation?

Arguments None

Returns <NR1> = 0 indicates Fail.
<NR1> = 1 indicates Pass.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:MODulation?
might return 1, indicating that the modulation spectrum measurement has passed.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:STANdard

:FETCh:GSMedge:PVTime? (Query Only)

Queries the pass/fail result of the GSM/EDGE power versus time measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :FETCh:GSMedge:PVTime?

Arguments None

Returns <NR1> = 0 indicates Fail.
<NR1> = 1 indicates Pass.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:PVTime?
might return 1, indicating that the power versus time measurement has passed.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:FETCh:GSMedge:SPECTrum:MODulation? (Query Only)

Fetches the time domain amplitude data of the GSM/EDGE modulation spectrum measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :FETCh:GSMedge:SPECTrum:MODulation?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the modulation spectrum power data in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:SPECTrum:MODulation?
might return #510240xxx... (10240-byte data) as the results of the modulation spectrum measurement.

Related Commands :INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:FETCh:GSMedge:SPECTrum:SWITChing? (Query Only)

Fetches the time domain amplitude data of the GSM/EDGE switching spectrum measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :FETCh:GSMedge:SPECTrum:SWITChing?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the switching spectrum power data in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:SPECTrum:SWITChing?
might return #510240xxx... (10240-byte data) as the results of the switching spectrum measurement.

Related Commands :INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:FETCh:GSMedge:SPURious? (Query Only)

Fetches the results of the GSM/EDGE spurious measurement for the standard specified with the [:SENSe]:GSMedge:STANdard commands. The values of frequency and level are returned for maximum 10 peaks that exceeded the standard level in ascending order.

Syntax : FETCh:GSMedge:SPURious?

Arguments None

Returns <num>{,<freq>,<rdb>}

Where

<num>::=<NR1> is the number of detected spurious signals, up to 10.

<freq>::=<NRf> is the frequency of spurious in Hz.

<rdb>::=<NRf> is the level of spurious in dBm.

Measurement Modes DEMGSMEDGE

Examples : FETCh:GSMedge:SPURious?
might return 3,1.2E6,-79,2.4E6,-79.59,1E6,-80.38.

Related Commands : INSTRument[:SElect], [:SENSe]:GSMedge:STANdard

:FETCh:GSMedge:SWITChing? (Query Only)

Queries the pass/fail result of the GSM/EDGE switching spectrum measurement for the standard specified with the [:SENSe]:GSMedge:STANdard commands.

Syntax :FETCh:GSMedge:SWITChing?

Arguments None

Returns <NR1> = 0 indicates Fail.
<NR1> = 1 indicates Pass.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:SWITChing?
might return 1, indicating that the switching spectrum measurement has passed.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:STANdard

:FETCh:GSMedge:TAMplitude:MCPower? (Query Only)

Fetches the time domain amplitude data of the GSM/EDGE mean carrier power measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :FETCh:GSMedge:TAMplitude:MCPower?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the absolute power for each symbol in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Invalid data is returned as -1000.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:TAMplitude:MCPower?
might return #510240xxx... (10240-byte data) as the results of the mean carrier power measurement.

Related Commands :INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:FETCh:GSMedge:TAMplitude:PVTime? (Query Only)

Fetches the time domain amplitude data of the GSM/EDGE power versus time measurement for the time slot specified with the [:SENSe]:GSMedge:BURSt:IN-Dex command.

Syntax :FETCh:GSMedge:TAMplitude:PVTime?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the absolute power for each symbol in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Invalid data is returned as -1000.

Measurement Modes DEMGSMEDGE

Examples :FETCh:GSMedge:TAMplitude:PVTime?
might return #510240xxx... (10240-byte data) as the results of the power versus time measurement.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:BURSt:INDEX

:FETCh:GSMedge:TSCode? (Query Only)

Queries the Training Sequence Code (TSC) number of the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax : FETCh:GSMedge:TSCode?

Returns <tsc>::=<NR1> is the TSC number (0 to 7).

NOTE. This command is valid when one of the following measurements is done: *MCPower* (mean carrier power), *PVTime* (power versus time), *MACCuracy* (modulation accuracy), *MODulation* (modulation spectrum), and *SWITChing* (switching spectrum). Unless it is done, the error message “-200, Execution Error” is returned.

Measurement Modes DEMGSMEDGE

Examples : FETCh:GSMedge:TSCode?
 might return 5 of the TSC number.

Related Commands : INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:READ Commands

The :READ commands acquire an input signal once in the single mode and obtain the measurement results from that data.

If you want to fetch the measurement results from the data currently residing in the memory without acquiring the input signal, use the :FETCh commands.

Prerequisites for Use

To use a command of this group, you must have run at least the following two commands:

1. Select a measurement mode with the :INSTRument[:SElect] command. For example, use the following command to select DEMGSMEDGE (GSM/EDGE modulation analysis mode).

```
:INSTRument[:SElect] "DEMGSMEDGE"
```

2. Set the acquisition mode to single with the following command:

```
:INITiate:CONTinuous OFF
```

NOTE. If a :READ command is run in the continuous mode, the acquisition mode is changed to single.

Command Tree

Header	Parameter
:READ	
:GSMEdge	
:MACCuracy?	
:MCPower?	
:MODulation?	
:PVTime?	
:SPECTrum	
:MODulation?	
:SWITching?	
:SPURious?	
:SWITching?	
:TAMPLitude	
:MCPower?	
:PVTime?	

:READ:GSMedge:MACCuracy? (Query Only)

Obtains the results of the GSM/EDGE modulation accuracy measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :READ:GSMedge:MACCuracy?

Arguments None

Returns <pass_fail>,<phase_error>,<peak_phase_error>,<evm>,<evm95>,<peak_evm>,<freq_error>,<o_off>

Where

<pass_fail>::=<NR1> = 0 represents Fail; = 1 represents Pass.

<phase_error>::=<NRf> is the phase error in degree.

<peak_phase_error>::=<NRf> is the peak phase error in degree.

<evm>::=<NRf> is the EVM (Error Vector Magnitude) in percent (%).

<evm95>::=<NRf> is the EVM 95% tile in percent (%).

<peak_evm>::=<NRf> is the peak EVM in percent (%).

<freq_error>::=<NRf> is the frequency error in Hz.

<o_off>::=<NRf> is the origin offset in dB.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:MACCuracy?
might return 1,0.47,0.86,0.93,0.75,2.15,4.209,-64.31 as the modulation accuracy measurement results.

Related Commands :INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:READ:GSMedge:MCPower? (Query Only)

Obtains the results of the GSM/EDGE mean carrier power measurement for the burst specified with the [:SENSE]:GSMedge:BURSt:INDEx command.

Syntax :READ:GSMedge:MCPower?

Arguments None

Returns <mean_power>,<max_power>,<max_bi>,<min_power>,<min_bi>

Where

<mean_power>::=<NRf> is the mean power value in dBm.

<max_power>::=<NRf> is the maximum power value in dBm.

<max_bi>::=<NR1> is the burst index for the maximum power.

<min_power>::=<NRf> is the minimum power value in dBm.

<min_bi>::=<NR1> is the burst index for the minimum power.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:MCPower?
might return 68.081,72.4203,3,58.229,7 as the mean carrier power measurement results.

Related Commands :INSTRument[:SElect], [:SENSE]:GSMedge:BURSt:INDEx

:READ:GSMedge:MODulation? (Query Only)

Queries the pass/fail result of the GSM/EDGE modulation spectrum measurement for the standard specified with the [:SENSe]:GSMedge:STANdard commands.

Syntax :READ:GSMedge:MODulation?

Arguments None

Returns <NR1> = 0 indicates Fail.
<NR1> = 1 indicates Pass.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:MODulation?
might return 1, indicating that the modulation spectrum measurement has passed.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:STANdard

:READ:GSMedge:PVTime? (Query Only)

Queries the pass/fail result of the GSM/EDGE power versus time measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :READ:GSMedge:PVTime?

Arguments None

Returns <NR1> = 0 indicates Fail.
 <NR1> = 1 indicates Pass.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:PVTime?
 might return 1, indicating that the power versus time measurement has passed.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:READ:GSMedge:SPECTrum:MODulation? (Query Only)

Obtains the time domain amplitude data of the GSM/EDGE modulation spectrum measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDEx command.

Syntax :READ:GSMedge:SPECTrum:MODulation?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the modulation spectrum power data in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:SPECTrum:MODulation?
might return #510240xxx... (10240-byte data) as the results of the modulation spectrum measurement.

Related Commands :INSTrument[:SELEct], [:SENSe]:GSMedge:BURSt:INDEx

:READ:GSMedge:SPECTrum:SWITching? (Query Only)

Obtains the time domain amplitude data of the GSM/EDGE switching spectrum measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INDeX command.

Syntax :READ:GSMedge:SPECTrum:SWITching?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the switching spectrum power data in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:SPECTrum:SWITching?
might return #510240xxx... (10240-byte data) as the results of the switching spectrum measurement.

Related Commands :INSTRument[:SElect], [:SENSe]:GSMedge:BURSt:INDeX

:READ:GSMedge:SPURious? (Query Only)

Fetches the results of the GSM/EDGE spurious measurement for the standard specified with the [:SENSe]:GSMedge:STANdard commands. The values of frequency and level are returned for maximum 10 peaks that exceeded the standard level in ascending order.

Syntax :READ:GSMedge:SPURious?

Arguments None

Returns <snum>{,<freq>,<rdb>}

Where

<snum>::=<NR1> is the number of detected spurious signals, up to 10.

<freq>::=<NRf> is the frequency of spurious in Hz.

<rdb>::=<NRf> is the level of spurious in dBm.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:SPURious?
might return 3,1.2E6,-79,2.4E6,-79.59,1E6,-80.38.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:STANdard

:READ:GSMedge:SWITching? (Query Only)

Queries the pass/fail result of the GSM/EDGE switching spectrum measurement for the standard specified with the [:SENSe]:GSMedge:STANdard commands.

Syntax :READ:GSMedge:SWITching?

Arguments None

Returns <NR1> = 0 indicates Fail.
 <NR1> = 1 indicates Pass.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:SWITching?
 might return 1, indicating that the switching spectrum measurement has passed.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:STANdard

:READ:GSMedge:TAMplitude:MCPower? (Query Only)

Obtains the time domain amplitude data of the GSM/EDGE mean carrier power measurement for the burst specified with the [:SENSe]:GSMedge:BURSt:INdEx command.

Syntax :READ:GSMedge:TAMplitude:MCPower?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the absolute power for each symbol in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Invalid data is returned as -1000.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:TAMplitude:MCPower?
might return #510240xxx... (10240-byte data) for the results of the mean carrier power measurement.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:BURSt:INdEx

:READ:GSMedge:TAMPlitude:PVTime? (Query Only)

Obtains the time domain amplitude data of the GSM/EDGE power versus time measurement for the time slot specified with the [:SENSe]:GSMedge:BURSt:IN-Dex command.

Syntax :READ:GSMedge:TAMPlitude:PVTime?

Returns #<Num_digit><Num_byte><Data(1)><Data(2)>...<Data(n)>

Where

<Num_digit> is the number of digits in <Num_byte>.

<Num_byte> is the number of bytes of the data that follow.

<Data(n)> is the absolute power for each symbol in dBm.

4-byte little endian floating-point format specified in IEEE 488.2

n: Max 512000 (= 1024 points × 500 frames)

Invalid data is returned as -1000.

Measurement Modes DEMGSMEDGE

Examples :READ:GSMedge:TAMPlitude:PVTime?
might return #510240xxx... (10240-byte data) as the results of the power versus time measurement.

Related Commands :INSTrument[:SElect], [:SENSe]:GSMedge:BURSt:INdEx

:SENSE Commands

The :SENSE commands set the details for each of the measurement sessions. They are divided into the following subgroups:

Table 3-12: :SENSE command subgroups

Command header	Function	Refer to:
[:SENSE]:GSMedge	Set up GSM/EDGE analysis	p. 3-70

[:SENSe]:GSMedge Subgroup

The [:SENSe]:GSMedge commands set up the conditions related to the GSM/EDGE analysis.

NOTE. To use a command of this group, you must have selected DEMGSMEDGE (GSM/EDGE analysis) in the :INSTRument[:SElect] command.

Command Tree	Header	Parameter
	[:SENSe]	
	:GSMedge	
	:ABITs	142 147 148
	:BLOCk	<numeric_value>
	:BURSt	
	:INDex	<numeric_value>
	:MPOint	HWAY S14
	:RTFirst	
	:CARRier	
	:OFFSet	<numeric_value>
	:SEARCh	<boolean>
	:FILTer	
	:RCWRcosine	<boolean>
	[:IMMediate]	
	:LIMit	
	:SIGNal	<numeric_value>
	:SPURious	<numeric_value>
	:MEASurement	MCPower PVTime MACCuracy MODulation SWITChing SPURious
	:MODulation	GMSK EDGE
	:SLOT	<numeric_value>
	:STANDard	
	:BAND	GSM900 GSM1800 GSM1900
	:DIRection	UPLink DOWNlink
	:STINDex	<numeric_value>
	:TSCode	
	:AUTO	<boolean>
	[:NUMBer]	<numeric_value>

[:SENSe]:GSMedge:ABITs (?)

Sets or queries the number of symbols for EVM calculation in the modulation accuracy measurement.

This command is valid when the measurement item is modulation accuracy (MACCuracy).

Syntax [:SENSe]:GSMedge:ABITs { 142 | 147 | 148 }
[:SENSe]:GSMedge:ABITs?

Arguments 142 measures 142 symbols excluding the tail bits for the EDGE signal.
147 measures 147 symbols specified for the GMSK signal.
148 measures all symbols in a burst.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:ABITs 147
measures 147 symbols specified for the GMSK signal.

Related Commands :CONFigure:GSMedge:MACCuracy, [:SENSe]:GSMedge:MEASurement

[:SENSe]:GSMedge:BLOCK (?)

Sets or queries the number of the block to measure in the GSM/EDGE analysis.

This command is invalid when the measurement item is spurious (SPURious).

Syntax [:SENSe]:GSMedge:BLOCK <number>

[:SENSe]:GSMedge:BLOCK?

Arguments <number>::=<NR1> specifies the block number. Zero represents the latest block.
Range: -M to 0 (M: Number of acquired blocks)

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:BLOCK -5
sets the block number to -5.

Related Commands :CONFIgure:GSMedge commands, [:SENSe]:GSMedge:MEASurement

[:SENSe]:GSMedge:BURSt:INDeX (?)

Sets or queries the number of the burst to measure in the GSM/EDGE analysis.

This command is invalid when the measurement item is spurious (SPURious).

Syntax [:SENSe]:GSMedge:BURSt:INDeX <number>

[:SENSe]:GSMedge:BURSt:INDeX?

Arguments <number>::=<NR1> specifies the burst number. Range: -999 to 0.
Zero (0) represents the latest burst.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:BURSt:INDeX -5
sets the burst number for measurement to -5.

Related Commands :CONFIgure:GSMedge commands, [:SENSe]:GSMedge:MEASurement

[[:SENSe]:GSMedge:BURSt:MP0int (?)]

Defines or queries the center of the mask in the power versus time measurement.

This command is valid when the measurement item is power versus time (PVTime).

Syntax [:SENSe]:GSMedge:BURSt:MP0int { HWAY | S14 }
 [:SENSe]:GSMedge:BURSt:MP0int?

Arguments HWAY aligns the center of the mask with halfway between symbol 13 and 14 in the training sequence.

S14 aligns the center of the mask with symbol 14 in the training sequence.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:BURSt:MP0int S14
 aligns the center of the mask with symbol 14 in the training sequence.

Related Commands :CONFigure:GSMedge:PVTime, [:SENSe]:GSMedge:MEASurement

[[:SENSe]:GSMedge:BURSt:RTFirst (No Query Form)]

Selects the first burst of all the acquired data in the GSM/EDGE analysis.

This command is invalid when the measurement item is spurious (SPURious).

Syntax [:SENSe]:GSMedge:BURSt:RTFirst

Arguments None

Measurement Modes DEMGSMEDGE

Examples :SENSe]:GSMedge:BURSt:RTFirst
 selects the first burst of all the acquired data in the GSM/EDGE analysis.

Related Commands :CONFigure:GSMedge commands, [:SENSe]:GSMedge:MEASurement

[[:SENSe]:GSMedge:CARRier:OFFSet (?)]

Sets or queries the carrier frequency offset in the GSM/EDGE analysis.

This command is valid when [[:SENSe]:GSMedge:CARRier:SEARch] is OFF.

Syntax [[:SENSe]:GSMedge:CARRier:OFFSet <freq>

[[:SENSe]:GSMedge:CARRier:OFFSet?

Arguments <frequency>::=<NR1> specifies the carrier frequency offset relative to the center frequency. Range: -(span) to +(span).

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:CARRier:OFFSet 10MHz
sets the carrier frequency offset to 10 MHz.

Related Commands [[:SENSe]:GSMedge:CARRier:SEARch

[[:SENSe]:GSMedge:CARRier:SEARch (?)]

Selects or queries whether to detect the carrier automatically in the GSM/EDGE analysis.

This command is invalid when the measurement item is switching spectrum (SWITching) and spurious (SPURious).

Syntax [:SENSe]:GSMedge:CARRier:SEARch { OFF | ON | 0 | 1 }

[:SENSe]:GSMedge:CARRier:SEARch?

Arguments OFF or 0 specifies that the carrier is not detected automatically. To set it, use the [:SENSe]:GSMedge:CARRier:OFFSet command.

ON or 1 specifies that the carrier is detected automatically.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:CARRier:SEARch ON
specifies that the carrier is detected automatically.

Related Commands :CONFIgure:GSMedge commands, [:SENSe]:GSMedge:CARRier:OFFSet,
[:SENSe]:GSMedge:MEASurement

[[:SENSe]:GSMedge:FILTer:RCWRcosine (?)]

Determines whether to enable or disable the RCW (Raised Cosine Windowed) Raised Cosine filter in the modulation accuracy measurement.

This command is valid when the measurement item is modulation accuracy (MACCuracy).

Syntax [:SENSe]:GSMedge:FILTer:RCWRcosine { OFF | ON | 0 | 1 }
[:SENSe]:GSMedge:FILTer:RCWRcosine?

Arguments OFF or 0 disables the RCW Raised Cosine filter.
ON or 1 enables the RCW Raised Cosine filter.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:FILTer:RCWRcosine ON
enables the RCW Raised Cosine filter.

Related Commands :CONFIgure:GSMedge:MACCuracy, [:SENSe]:GSMedge:MEASurement

[[:SENSe]:GSMedge[:IMMEDIATE] (No Query Form)]

Performs calculation for the acquired data in the GSM/EDGE analysis.

Syntax [:SENSe]:GSMedge[:IMMEDIATE]

Arguments None

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:IMMEDIATE
performs calculation for the acquired data.

Related Commands :INITiate

[:SENSe] :GSMedge :LIMit :SIGNa1 (?)

Sets or queries a threshold to determine a normal signal in the GSM/EDGE spurious measurement.

This command is valid when the measurement item is spurious (SPURious).

Syntax [:SENSe] :GSMedge :LIMit :SIGNa1 <value>

[:SENSe] :GSMedge :LIMit :SIGNa1 ?

Arguments <value>::=<Nrf> specifies the threshold to determine a normal signal. The signal that exceeds the threshold is regarded as the normal signal.
Range: -100 to +30 dBm.

Measurement Modes DEMGSMEDGE

Examples :SENSe :GSMedge :LIMit :SIGNa1 -20
sets the threshold to -20 dBm.

Related Commands :CONFiGure :GSMedge :SPURious, [:SENSe] :GSMedge :MEASurement

[:SENSe] :GSMedge:LIMit:SPURious (?)

Sets or queries a threshold to determine a spurious signal in the GSM/EDGE spurious measurement.

This command is valid when the measurement item is spurious (SPURious).

Syntax [:SENSe] :GSMedge:LIMit:SPURious <value>

[:SENSe] :GSMedge:LIMit:SPURious?

Arguments <value> ::= <NRf> specifies the threshold to determine a spurious signal. The signal that exceeds the threshold is regarded as the spurious signal.
Range: -150 to 0 dBm.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:LIMit:SPURious -30
sets the threshold to -30 dBm.

Related Commands :CONFigure:GSMedge:SPURious, [:SENSe] :GSMedge:MEASurement

[:SENSe]:GSMedge:MEASurement (?)

Selects or queries the measurement item in the GSM/EDGE analysis.

Syntax [:SENSe]:GSMedge:MEASurement { MCPower | PVTime | MACCuracy
| MODulation | SWITching | SPURious }

[:SENSe]:GSMedge:MEASurement?

Arguments Table 3–13 shows the arguments and their meanings.

Table 3–13: GSM/EDGE measurement items

Argument	Measurement item
MCPower	Mean carrier power
PVTime	Power versus Time
MACCuracy	Modulation accuracy
MODulation	Modulation spectrum
SWITching	Switching spectrum
SPURious	Inband spurious

Measurement Modes DEMGSMEDGE

Examples SENSe:GSMedge:MEASurement MCPower
selects the mean carrier power measurement.

[:SENSe] :GSMedge:MODulation (?)

Selects or queries the modulation system in the GSM/EDGE analysis.

This command is invalid when the measurement item is spurious (SPURious).

Syntax [:SENSe] :GSMedge:MODulation { GMSK | EDGE }
 [:SENSe] :GSMedge:MODulation?

Arguments GMSK selects GMSK (Gaussian Minimum Shift Keying).
 EDGE selects EDGE (Enhanced Data rates for GSM Evolution).

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:MODulation EDGE
 selects the EDGE modulation.

Related Commands :CONFigure:GSMedge commands, [:SENSe] :GSMedge:MEASurement

[:SENSe] :GSMedge:SLOT (?)

Sets or queries the number of slots per block. Waveform data is acquired in the block unit.

This command is invalid when the measurement item is spurious (SPURious).

Syntax [:SENSe] :GSMedge:SLOT <value>
 [:SENSe] :GSMedge:SLOT?

Arguments <value>::=<NRF> specifies the number of slots per block. Range: 1 to 65535

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:SLOT 100
 sets one block to 100 slots.

Related Commands :CONFigure:GSMedge commands, [:SENSe] :BSIZE,
 [:SENSe] :GSMedge:MEASurement

[:SENSe] :GSMedge :STANdard :BAND (?)

Selects or queries the GSM/EDGE standard.

NOTE. *No query in the GSM/EDGE spurious measurement.*

Syntax [:SENSe] :GSMedge :STANdard :BAND { GSM850 | GSM900 | GSM1800
| GSM1900 }

[:SENSe] :GSMedge :STANdard :BAND ?

Arguments GSM850 selects the GSM850 standard.
GSM900 selects the GSM900 standard.
DCS1800 selects the DCS1800 standard.
PCS1900 selects the PCS1900 standard.

Measurement Modes DEMGSMEDGE

Examples :SENSe :GSMedge :STANdard :BAND PCS1900
selects the PCS1900 standard.

[:SENSe]:GSMedge:STANdard:DIRectiOn (?)

Selects or queries the link direction in the GSM/EDGE analysis.

NOTE. *No query in the GSM/EDGE spurious measurement.*

Syntax [:SENSe]:GSMedge:STANdard:DIRectiOn { UPLink | DOWNlink }
[:SENSe]:GSMedge:STANdard:DIRectiOn?

Arguments UPLink selects uplink.
DOWNlink selects downlink.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:STANdard:DIRectiOn DOWNlink
selects downlink in the GSM/EDGE analysis.

[:SENSe]:GSMedge:STINdex (?)

Sets or queries the column number of the spurious table in the spurious measurement. The specified column is highlighted.

This command is valid when the measurement item is spurious (SPURious).

Syntax [:SENSe]:GSMedge:STINdex <number>
[:SENSe]:GSMedge:STINdex?

Arguments <number>::=<Nrf> specifies the column number of the spurious table.
Range: 1 to 10.

Measurement Modes DEMGSMEDGE

Examples :SENSe:GSMedge:STINdex 3
specifies column 3 in the spurious table.

Related Commands :CONFIgure:GSMedge:SPURious, [:SENSe]:GSMedge:MEASurement

[:SENSe] :GSMedge :TSCode :AUTO (?)

Determines whether to set the training sequence code (TSC) automatically in the GSM/EDGE analysis.

Syntax [:SENSe] :GSMedge :TSCode :AUTO { OFF | ON | 0 | 1 }
[:SENSe] :GSMedge :TSCode :AUTO?

Arguments OFF or 0 specifies that TSC is not set automatically. To set it, use the [:SENSe] :GSMedge :TSCode [:NUMBer] command.
ON or 1 specifies that TSC is set automatically.

Measurement Modes DEMGSMEDGE

Examples :SENSe :GSMedge :TSCode :AUTO ON
sets TSC automatically.

Related Commands [:SENSe] :GSMedge :TSCode [:NUMBer]

[:SENSe] :GSMedge :TSCode [:NUMBer] (?)

Sets or queries the training sequence code (TSC) number in the GSM/EDGE analysis.

This command is valid when [:SENSe] :GSMedge :TSCode :AUTO is OFF.

Syntax [:SENSe] :GSMedge :TSCode [:NUMBer] <number>
[:SENSe] :GSMedge :TSCode [:NUMBer] ?

Arguments <number> ::= <NR1> specifies the TSC number. Range: 0 to 7

Measurement Modes DEMGSMEDGE

Examples :SENSe :GSMedge :TSCode :NUMBer 7
sets the TSC number to 7.

Related Commands [:SENSe] :GSMedge :TSCode :AUTO

Appendices

Appendix A: Specifications

This appendix lists the electrical, physical, and environmental characteristics of the analyzer, and specifies the performance requirements for those characteristics. The specifications are common to WCA230A and WCA280A, unless otherwise noted.

Unless otherwise stated, the following tables of electrical characteristics and features apply to the analyzer after a 20 minute warm-up period (within the environmental limits) and after all calibration procedures have been carried out.

Electrical Characteristics

Table A-1: GSM/EDGE (Option 24)

Characteristics	Description
Mean power measurement	
RF input range	-50 to +30 dBm
Absolute power measurement accuracy at 20° to 30° C excluding mismatch error	
GSM900 (typical)	±0.5 dB (signal frequency: 880 to 960 MHz, signal power: +10 to -30 dBm, RF attenuation: 0 to 20 dB, after auto level is performed at 5 MHz span)
DCS1800 and PCS1900 (typical)	±0.6 dB (signal frequency: 1710 to 1990 MHz, signal power: +10 to -30 dBm, RF Attenuation: 0 to 20 dB, after auto level is performed at 5 MHz span)
Resolution	0.01 dB
Burst count	1000 maximum
Power versus Time measurement	
RF input range	-50 to +30 dBm
Power ramp relative accuracy (typical)	±0.2 dB at 0 to -40 dB fs
Time resolution (typical)	0.15625 μs at 5 MHz span
Marker amplitude resolution	0.001 dB
Burst count	1000 maximum

Table A-1: GSM/EDGE (Option 24) (Cont.)

Characteristics	Description
Modulation accuracy measurement	
Carrier power range	-30 to +30 dBm
Phase error measurement accuracy for GMSK modulation (typical)	≤0.8° (RMS) ≤1.8° (Peak)
Phase error resolution	0.01°
EVM measurement accuracy for 8-PSK modulation (typical)	≤0.9% (RMS)
EVM resolution	0.01%
Time resolution	0.15625 μs at 5 MHz span
Burst count	1000 maximum
Modulation spectrum measurement	
Carrier power range	-5 to +30 dBm
Dynamic range for GMSK modulation (typical)	82 dB at 600 kHz offset (30 kHz RBW) 86 dB at 1.2 MHz offset (30 kHz RBW) 83 dB at 1.8 MHz offset (100 kHz RBW) 85 dB at 6 MHz offset (100 kHz RBW)
Dynamic range for 8-PSK modulation (typical)	82 dB at 600 kHz offset (30 kHz RBW) 85 dB at 1.2 MHz offset (30 kHz RBW) 83 dB at 1.8 MHz offset (100 kHz RBW) 83 dB at 6 MHz offset (100 kHz RBW)
Burst count	1000 maximum
Switching spectrum measurement	
Carrier power range	-5 to +30 dBm
Dynamic range for GMSK modulation (typical)	75 dB at 400 kHz offset (30 kHz RBW) 80 dB at 600 kHz offset (30 kHz RBW) 84 dB at 1.2 MHz offset (30 kHz RBW) 88 dB at 1.8 MHz offset (30 kHz RBW)
Dynamic range for 8-PSK modulation (typical)	75 dB at 400 kHz offset (30 kHz RBW) 80 dB at 600 kHz offset (30 kHz RBW) 84 dB at 1.2 MHz offset (30 kHz RBW) 88 dB at 1.8 MHz offset (30 kHz RBW)
Burst count	1000 maximum

Appendix B: Factory Initialization Settings

The factory initialization settings provide you a known state for the analyzer. The *RST command returns the instrument settings to the factory defaults for the measurement mode specified with :INSTRument[:SELEct]. Factory initialization sets values as shown in the following tables. The column to the far right shows the measurement modes in which the command is available.

Table B-1: Factory initialization settings — :DISPlay commands

Header	Default value	Meas. mode
:DISPlay:GSMedge:DDEMod subgroup		
:DISPlay:GSMedge:DDEMod:MView:FILTer:EINVerse	OFF	DEMGSMEDGE
:DISPlay:GSMedge:DDEMod:MView:FORMat	EVM	
:DISPlay:GSMedge:DDEMod:MView:STIMe	SYMBol	
:DISPlay:GSMedge:DDEMod:MView:X[:SCALe]:OFFSet	0	
:DISPlay:GSMedge:DDEMod:MView:X[:SCALe]:RANGe	0	
:DISPlay:GSMedge:DDEMod:MView:Y[:SCALe]:OFFSet	0	
:DISPlay:GSMedge:DDEMod:MView:Y[:SCALe]:RANGe	0	
:DISPlay:GSMedge:DDEMod:SVIew:FILTer:EINVerse	OFF	
:DISPlay:GSMedge:DDEMod:SVIew:FORMat	VECTor	
:DISPlay:GSMedge:DDEMod:SVIew:STIMe	SYMBol	
:DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:OFFSet	0	
:DISPlay:GSMedge:DDEMod:SVIew:X[:SCALe]:RANGe	0	
:DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALe]:OFFSet	0	
:DISPlay:GSMedge:DDEMod:SVIew:Y[:SCALe]:RANGe	0	
:DISPlay:GSMedge:SPECTrum subgroup		
:DISPlay:GSMedge:SPECTrum:BMARker:STATe	OFF	DEMGSMEDGE
:DISPlay:GSMedge:SPECTrum:X[:SCALe]:OFFSet	0	
:DISPlay:GSMedge:SPECTrum:X[:SCALe]:PDIVsion	0	
:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:OFFSet	0	
:DISPlay:GSMedge:SPECTrum:Y[:SCALe]:PDIVsion	0	

Table B-1: Factory initialization settings — :DISPlay commands (Cont.)

Header	Default value	Meas. mode
:DISPlay:GSMedg:WAVeform subgroup		
:DISPlay:GSMedg:WAVeform:BURSt	FULL	DEMGSMEDGE
:DISPlay:GSMedg:WAVeform:X[:SCALe]:OFFSet	0	
:DISPlay:GSMedg:WAVeform:X[:SCALe]:PDIVision	0	
:DISPlay:GSMedg:WAVeform:Y[:SCALe]:OFFSet	0	
:DISPlay:GSMedg:WAVeform:Y[:SCALe]:PDIVision	0	

Table B-2: Factory initialization settings — :SENSe commands

Header	Default value	Meas. mode
[:SENSe]:GSMedg subgroup		
[:SENSe]:GSMedg:ABITs	147	DEMGSMEDGE
[:SENSe]:GSMedg:BLOCK	0	
[:SENSe]:GSMedg:BURSt:INDex	0	
[:SENSe]:GSMedg:BURSt:MPOint	HWAY	
[:SENSe]:GSMedg:CARRier:OFFSet	0	
[:SENSe]:GSMedg:CARRier:SEARch	ON	
[:SENSe]:GSMedg:FILTer:RCWRcosine	ON	
[:SENSe]:GSMedg:LIMit:SIGNal	-20	
[:SENSe]:GSMedg:LIMit:SPURious	-36	
[:SENSe]:GSMedg:MEASurement	MACCuracy	
[:SENSe]:GSMedg:MODulation	GMSK	
[:SENSe]:GSMedg:SLOT	17	
[:SENSe]:GSMedg:STANDard:BAND	GSM900	
[:SENSe]:GSMedg:STANDard:DIRection	UPLink	
[:SENSe]:GSMedg:STINDex	1	
[:SENSe]:GSMedg:TSCode:AUTO	OFF	
[:SENSe]:GSMedg:TSCode[:NUMBer]	0	

Appendix C: Scale Setting Range

This section lists the setting ranges of the horizontal and the vertical scales for the views used in the GSM/EDGE analysis.

Table C-1: Display format and scale

Display format	Horizontal range	Vertical range
Spectrum	0 Hz to 3 GHz (WCA230A) 0 Hz to 8 GHz (WCA280A)	-200 to +100 dBm
Spectrogram	0 Hz to 3 GHz (WCA230A) 0 Hz to 8 GHz (WCA280A)	Frame -15999 to 0 Frame -63999 to 0 (Option 02)
Time domain view	$-(T_f \times N_f)$ to 0 s *	-200 to +100 dBm (Amplitude) -30 to +30 V (I/Q level) -300 to +300% (AM) -38.4 to +38.4 MHz (FM/FVT) -675 to +675 deg. (PM)
Constellation	$-(T_f \times N_f)$ to 0 s *	fixed
EVM	$-(T_f \times N_f)$ to 0 s *	-100 to +200% (EVM) -300 to +300% (amplitude error) -675 to +675 deg. (phase error)
Eye diagram	$-(T_f \times N_f)$ to 0 s *	fixed
Symbol table	0 to $(1024 \times N_f)$ symbols	NA

* T_f : Frame time; N_f : Frame number

Appendix D: SCPI Conformance Information

All commands in the WCA200A Series analyzers are based on SCPI Version 1999.0. The following tables list all commands supported by the analyzer. The columns to the right show whether a command is defined in the SCPI 1999.0 Standard or not.

Table D-1: SCPI conformance information — :CONFigure commands

Command	Defined in SCPI 1999.0	Not Defined in SCPI 1999.0
:CONFigure :GSMedge :MACCuracy		✓
:CONFigure :GSMedge :MCPower		✓
:CONFigure :GSMedge :MODulation		✓
:CONFigure :GSMedge :PVTime		✓
:CONFigure :GSMedge :SPURious		✓
:CONFigure :GSMedge :SWITching		✓

Table D-2: SCPI conformance information — :DISPlay commands

Command	Defined in SCPI 1999.0	Not Defined in SCPI 1999.0
:DISPlay :GSMedge :DDEMod :MView :FILTer :EINVerse		✓
:DISPlay :GSMedge :DDEMod :MView :FORMat		✓
:DISPlay :GSMedge :DDEMod :MView :STIME		✓
:DISPlay :GSMedge :DDEMod :MView :X [:SCALE] :OFFSet		✓
:DISPlay :GSMedge :DDEMod :MView :X [:SCALE] :RANGe		✓
:DISPlay :GSMedge :DDEMod :MView :Y [:SCALE] :FIT		✓
:DISPlay :GSMedge :DDEMod :MView :Y [:SCALE] :FULL		✓
:DISPlay :GSMedge :DDEMod :MView :Y [:SCALE] :OFFSet		✓
:DISPlay :GSMedge :DDEMod :MView :Y [:SCALE] :RANGe		✓
:DISPlay :GSMedge :DDEMod :SVIew :FILTer :EINVerse		✓
:DISPlay :GSMedge :DDEMod :SVIew :FORMat		✓
:DISPlay :GSMedge :DDEMod :SVIew :STIME		✓

Table D-2: SCPI conformance information — :DISPlay commands (Cont.)

Command			Defined in SCPI 1999.0	Not Defined in SCPI 1999.0	
	:X	[:SCALE]	:OFFSet	✓	
			:RANGe	✓	
	:Y	[:SCALE]	:FIT	✓	
			:FULL	✓	
			:OFFSet	✓	
			:RANGe	✓	
			:SPEctrum	:BMArker	:STATe
		:X	[:SCALE]	:OFFSet	✓
				:PDIvSion	✓
		:Y	[:SCALE]	:FIT	✓
				:FULL	✓
				:OFFSet	✓
:PDIvSion				✓	
:WAVEform	:BURSt			✓	
			:X	[:SCALE]	:OFFSet
		:Y	[:SCALE]	:FIT	✓
				:FULL	✓
				:OFFSet	✓
				:PDIvSion	✓

Table D-3: SCPI conformance information — :FETCh commands

Command			Defined in SCPI 1999.0	Not Defined in SCPI 1999.0	
:FETCh	:GSMedge	:MACCuracy?		✓	
		:MCPower?		✓	
		:MODulation?		✓	
		:PVTTime?		✓	
		:SPEctrum	:MODulation?		✓
			:SWITChing?		✓

Table D-3: SCPI conformance information — :FETCh commands (Cont.)

Command	Defined in SCPI 1999.0	Not Defined in SCPI 1999.0
:SPURious?		✓
:SWITching?		✓
:TAMPlitude :MCPower?		✓
:PVTTime?		✓
:TSCode?		✓

Table D-4: SCPI conformance information — :READ commands

Command	Defined in SCPI 1999.0	Not Defined in SCPI 1999.0
:READ :GSMedge :MACCuracy?		✓
:MCPower?		✓
:MODulation?		✓
:PVTTime?		✓
:SPECTrum :MODulation?		✓
:SWITching?		✓
:SPURious?		✓
:SWITching?		✓
:TAMPlitude :MCPower?		✓
:PVTTime?		✓

Table D-5: SCPI conformance information — :SENSe commands

Command			Defined in SCPI 1999.0	Not Defined in SCPI 1999.0	
[:SENSe]	:GSMedge	:ABITs		✓	
		:BLOCk		✓	
		:BURSt	:INDex		✓
			:MPOint		✓
			:RTFirst		✓
		:CARRier	:OFFSet		✓
			:SEARch		✓
		:FILTer	:RCWRcosine		✓
		[:IMMEDIATE]			✓
		:LIMit	:SIGNal		✓
			:SPURious		✓
		:MEASurement			✓
		:MODulation			✓
		:SLOT			✓
		:STANdard	:BAND		✓
			:DIRection		✓
		:STINDEX			✓
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			:NUMBer		✓

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