User Manual

Tektronix

WCA230A & WCA280A Option 27
3GPP Release 5 Downlink (HSDPA) Analysis Software

071-1509-02

This document supports firmware version 3.30 and above.

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Preface

This manual provides operating instructions for the WCA230A and WCA280A Portable Wireless Communication Analyzers Option 27 3GPP Release 5 Downlink (HSDPA) analysis software.

About This Manual

This manual is composed of the following sections:

- *Getting Started* describes the overview of the 3GPP Release 5 analysis.
- *Operating Basics* explains the menu functions and measurement procedures.
- *Syntax and Commands* describes GPIB commands for Option 27.
- *Appendix* provides additional information including factory default settings and scale setting range.

Related Manuals

The following related documents are also available:

- The *WCA230A & WCA280A Portable Wireless Communication Analyzers User Manual* (Tektronix part number 071-1253-xx) contains a tutorial to quickly describe how to operate the analyzer. It also includes an in-depth discussion on how to more completely use the analyzer features.
- The *WCA230A & WCA280A Portable Wireless Communication Analyzer Programmer Manual* (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.

Getting Started

Getting Started

The WCA230A and WCA280A Option 27 3GPP Release 5 Downlink (HSDPA) analysis software enables modulation analysis of HSDPA (High Speed Downlink Packet Access) signals defined in 3GPP (3rd Generation Partnership Project) Release 5 ("3GPP-R5"). Measurements may be performed on downlink QPSK and 16QAM or uplink BPSK signals.

Table 1-1 summarizes the functions added in Option 27 by the measurement modes of the analyzer.

Table 1-1: Additional functions in Option 27

Measurement mode	Additional functions
S/A (spectrum analysis)	3GPP-R5 downlink/uplink analysis ■ Channel power ■ ACLR (Adjacent Channel Leakage Power Ratio) ■ MC-ACLR (Multi-Carrier ACLR, downlink analysis only) ■ Spectrum emission Mask ■ OBW (Occupied Bandwidth) ■ EBW (Emission Bandwidth) ■ Carrier frequency
Demod (modulation analysis)	3GPP-R5 downlink/uplink analysis ■ Code domain power ■ Power codogram ■ Code power versus Time slot ■ Code power versus Symbol ■ Symbol constellation ■ Symbol EVM (Error Vector Magnitude) ■ Symbol eye diagram ■ Symbol table ■ Modulation accuracy ■ ACK/NACK analysis (uplink analysis only)
Time (time analysis)	None

NOTE. *The ACK/NACK analysis requires Option 23 W-CDMA Uplink Analysis Software.*

Analysis Definition

The analyzer performs measurements according to 3GPP-R5 specifications.

Downlink Analysis

Table 1-2 shows the 3GPP-R5 downlink transmission parameters for the analyzer.

Table 1-2: 3GPP-R5 downlink transmission parameters

Item	Description
Chip rate	3.84 Mcps
Symbol rate	7.5, 15, 30, 60, 120, 240, 480, and 960 ksps
Maximum number of channels	512
Frame structure	Time slot: 666.7 μs
Scrambling code	Gold code using M series by generator polynomial 18 bits
Channelization code	Hierarchical orthogonal code series based on the combination of chip rate and symbol rate
Modulation method for each channel	QPSK or 16QAM
Baseband filter	Root-cosine with $\alpha = 0.22$ (default) Can be set in the range of $0.0001 \leq \alpha \leq 1$

Measurement Functions. The analyzer has the following measurement functions:

- *Code domain power:* Measures the power relative to the total power for each channel. Multi-rate is supported and up to 512 channels can be measured.
- *Code domain power versus Time:* Measures the relative power at symbol points for each channel in time series.
- *Power codogram:* Measures the code domain power continuously for up to 150 slots (0.1 sec) and displays a spectrogram for each slot.
- *Vector/Constellation:* Measures the vector loci and chip points for all signals as well as constellation at symbol points for each channel.
- *Modulation accuracy:* Measures EVM (Error Vector Magnitude), amplitude and phase errors, waveform quality, and origin offset for each channel. Measures PCDE (Peak Code Domain Error), amplitude, frequency, and phase errors; waveform quality; and origin offset for each time slot.

Measurement Process. The following steps show the internal process for the 3GPP-R5 downlink analysis:

1. Perform flatness correction and filtering.
2. Establish the synchronization with P-SCH.
3. Determine the range of scrambling code numbers with S-SCH.
4. Fix the scrambling code number and the phase.
5. Correct the frequency and the phase.
6. Perform high-speed Hadamard transformation.
7. Calculate the power for each symbol on all channels.

Uplink Analysis

The analyzer supports the following types of 3GPP-R5 uplink signals:

- DPDCH (Dedicated Physical Data Channel)
- DPCCH (Dedicated Physical Control Channel)
- HS-DPCCH (Dedicated Physical Control Channel for High-Speed Downlink Shared Channel (HS-DSCH))

The analyzer covers the 3GPP-R5 uplink transmission parameters listed in Table 1-3.

Table 1-3: 3GPP-R5 uplink transmission parameters

Item	DPDCH	DPCCH	HS-DPCCH
Chip rate	3.84 Mcps		
Symbol rate	15, 30, 60, 120, 240, 480, and 960 ksps	15 ksps	15 ksps
Maximum number of channels	6	1	1
Frame structure	15 time-slots, 10 ms	15 time-slots, 10 ms	5 sub-frames, 10 ms
Time slot	2560 chips, 667 μs		
Scrambling code	Long or short. Number: 0 to 16,777,215		
Modulation method for each channel	BPSK		
Baseband filter	Root-cosine with α = 0.22 (default). Can be set in the range of $0.0001 \leq \alpha \leq 1$		

Measurement Functions. The analyzer has the following measurement functions:

- *ACK/NACK analysis:* Measures the HS-DPCCH to detect and display the ACK/NACK indicator, DTX (Discontinuous Transmission), and CQI (Channel Quality Indicator).
- *Code domain power:* Measures the power relative to the total power for each channel. Multi-rate is supported and up to 512 channels can be measured.
- *Power codogram:* Measures the code domain power continuously for up to 150 slots (0.1 sec) and displays spectrogram for each slot.

NOTE. *The code domain power and the power codogram can be displayed in the subview only.*

Measurement Process. The following steps show the internal process for the 3GPP-R5 uplink analysis:

1. Perform flatness correction and filtering.
2. Search for a synchronous point by de-spreading DPCCH.
3. Correct the frequency and phase.
4. Obtain symbols for each channel of DPDCH and DPCCH, and calculate power for each symbol.

NOTE. *The analyzer de-spreads DPCCH and the control part of an input signal, using the frequency and phase to establish synchronization. If the level of DPCCH or the control part is much lower than (about 1/10th) the level of the other channels (DPDCH or the data part), the analysis may not be performed accurately.*

Measurement Menu

Figure 1-1 shows the measurement menus related to the 3GPP-R5 analysis.

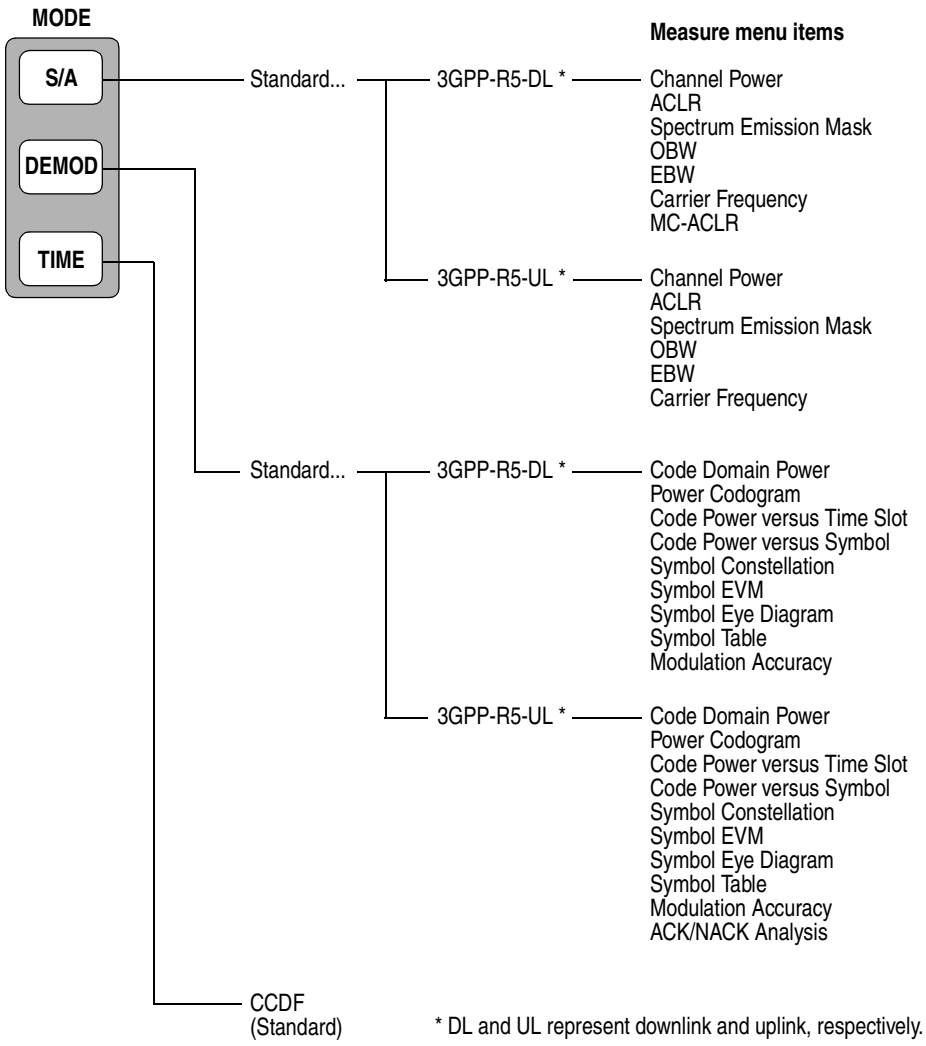


Figure 1-1: Measurement menus for the 3GPP-R5 analysis

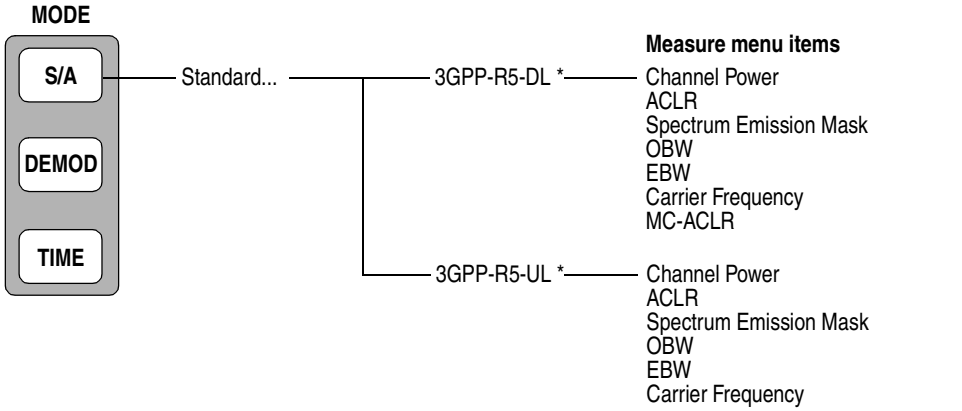
For the CCDF (Complementary Cumulative Distribution Function) analysis in Time mode, refer to the *WCA230A and WCA280A User Manual* (Tektronix part number 071-1253-XX).

NOTE. *If you are not familiar with the operation of the analyzer, refer to the* WCA230A and WCA280A User Manual *(Tektronix part number 071-1253-XX).*

Operating Basics

Uplink/Downlink Analysis in the S/A Mode

This section describes the basic operation of 3GPP-R5 uplink/downlink analysis in the S/A (Spectrum Analysis) mode. You can access the measurement items by pressing **S/A** →**Standard...** →**3GPP-R5-DL** (downlink) or **3GPP-R5-UL** (uplink) as shown in Figure 2-1.



* DL and UL represent downlink and uplink, respectively.

Figure 2-1: Measurement menu in the S/A mode

Measurement Procedure

Use the following procedure to take a spectrum measurement in S/A mode.

NOTE. *For details on setting frequency, span, and amplitude, refer to the* WCA230A and WCA280A User Manual *(Tektronix part number 071-1253-XX).*

1. Press the **S/A** key on the front panel.
2. Press the side key: **Standard...** →**3GPP-R5-DL** (for downlink) or **3GPP-R5-UL** (for uplink).
3. Press the **FREQUENCY/CHANNEL** key on the front panel to set frequency.

   If you use the channel table, do these steps:

   - Press the **Channel Table...** side key and select **W-CDMA-DL** (for downlink) or **W-CDMA-UL** (for uplink).
   - Press the **Channel** side key and select a channel by turning the general purpose knob.

   The center frequency is set to the value corresponding to the channel.
4. Press the **SPAN** key on the front panel and set span.
5. Press the **AMPLITUDE** key on the front panel and set amplitude appropriately.

NOTE. *If the input level is too high, A/D OVERFLOW displays in the red box at the center top of the screen. If this occurs, raise the reference level.*

6. Press the **MEASURE** key on the front panel and select a measurement item:
   - Channel Power
   - ACLR (Adjacent Channel Leakage Power Ratio)
   - Spectrum Emission Mask
   - OBW (Occupied Bandwidth)
   - EBW (Emission Bandwidth)
   - Carrier Frequency
   - MC-ACLR (Multi-Carrier ACLR, downlink analysis only)

NOTE. *Refer to the* WCA230A and WCA280A User Manual *for information on scaling the views.*

The following sections explain each measurement.

Channel Power Measurement

The channel power measurement measures the channel power within a specified bandwidth and the power spectral density in dBm/Hz.

After selecting Channel Power in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the channel power measurement contains the following controls:

Channel Bandwidth. Sets the frequency range for the measurement using the band power marker (see Figure 2-2). Range: 50 kHz to 20 MHz (default: 3.84 MHz).

Measurement Filter Shape... Selects the filter to be used for the measurement:

- Rect (Rectangular, default)
- Gaussian
- Nyquist
- Root Nyquist

Rolloff Ratio. Sets the roll-off ratio when the **Measurement Filter Shape** is Nyquist or Root Nyquist. Range: 0.0001 to 1 (default: 0.5).

Limits... Sets the pass/fail limit for the channel power measurement. When pressing this side key, the measurement limits editor appears. Refer to *Editing the Measurement Limits* on page 2-14 for more information.

Figure 2-2 shows an example of the channel power measurement.

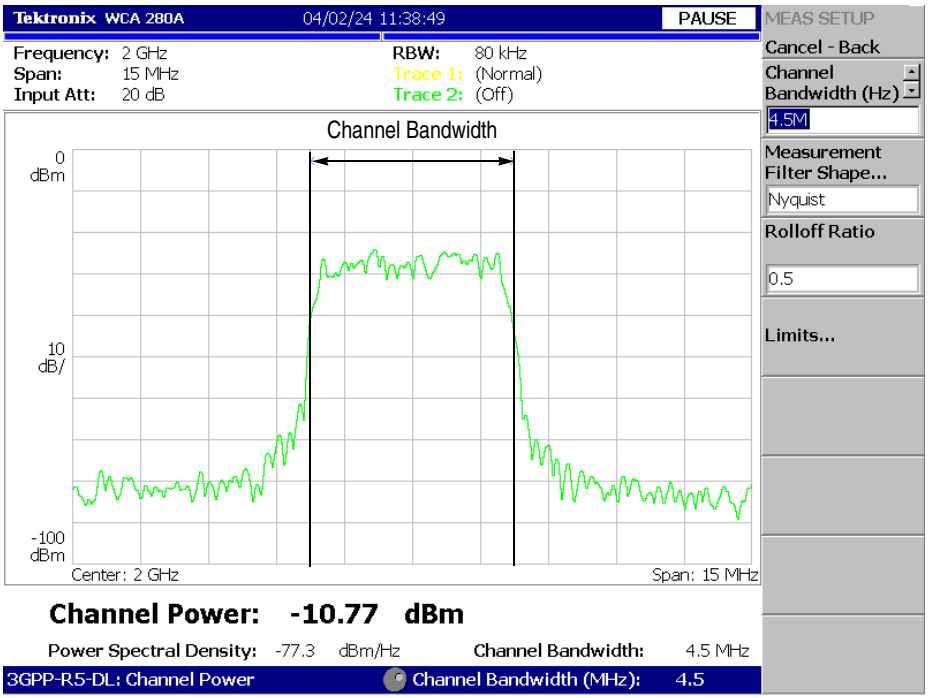


Figure 2-2: Channel power measurement

ACLR Measurement

The ACLR (Adjacent Channel Leakage Power Ratio) measurement according to the 3GPP-R5 standard is based on the ACPR measurement function in the normal spectrum analysis. For the basics, refer to ACPR Measurement in the *WCA230A and WCA280A User Manual*.

The following settings are fixed according to the 3GPP-R5 standard:

Span: 25 MHz
Main channel measurement bandwidth (Main Chan BW): 3.84 MHz
Adjacent channel measurement bandwidth (Adj Chan BW): 3.84 MHz
Channel spacing (Chan Spacing): 5 MHz

After selecting ACLR in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the ACLR measurement contains the following controls:

Measurement Filter Shape... Selects a filter shape:

- Rect (rectangle)
- RootNyquist (Root Nyquist, default)

Rolloff Ratio. Sets the roll-off value when the filter is Root Nyquist.
Range: 0.0001 to 1 (default: 0.22)

2nd Adj Channel Gain. Because the power of the second adjacent channel is normally much smaller than the main channel, measurement with the same gain causes a larger error. To enhance accuracy, raise the gain of the second adjacent channel inside the analyzer. Set the gain value here.

Range: 3 to 15 dB (default: 5 dB)

NOTE. *The upper limit of the range may be smaller than 15 dB, depending on amplitude settings and/or calibration results. This gain setting does not affect the waveform display.*

Limits... Sets the pass/fail limit for the ACLR measurement. When you press this side key, the measurement limits editor appears. Refer to *Editing the Measurement Limits* on page 2-14 for more information.

NOTE. *The ACLR measurement and the multi-carrier ACLR measurement use the same limits setting.*

Figure 2-3 shows an example of the ACLR measurement. Measured values are displayed in the lower part of the screen.

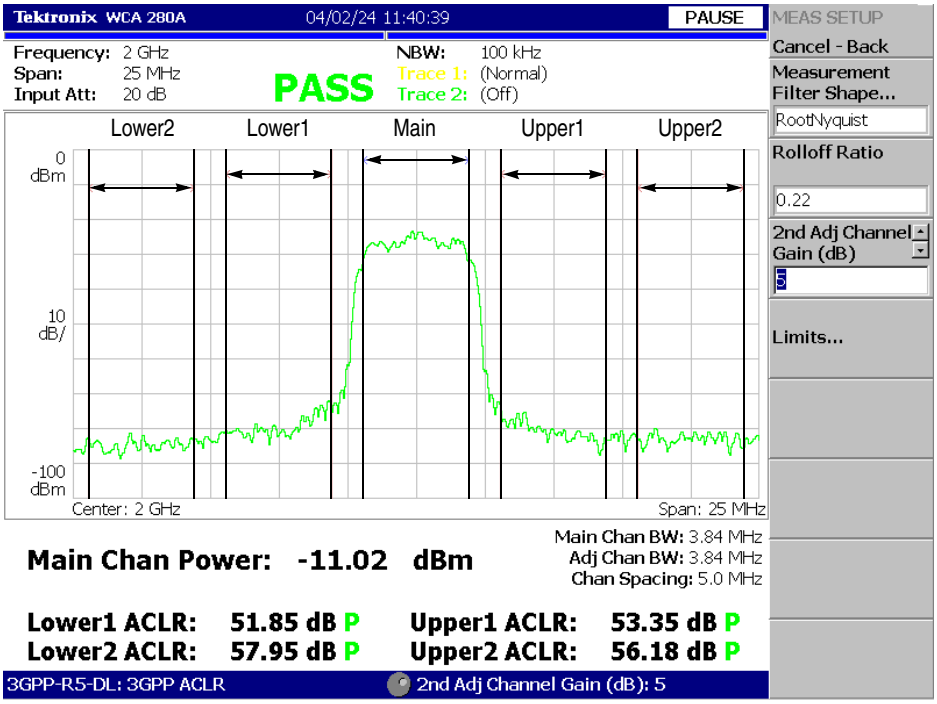


Figure 2-3: 3GPP-R5 ACLR measurement

Multi-Carrier ACLR Measurement

Downlink Analysis Only

The multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement is performed according to the 3GPP-R5 standard. You can measure the power levels of up to four carriers and the ratio of each adjacent channel (a total of four channels) to the power of the main channel. The measurement is based on the ACPR measurement function in the normal spectrum analysis. For the basics, refer to ACPR Measurement in the *WCA230A and WCA280A User Manual*.

The following settings are fixed according to the 3GPP-R5 standard:

Span: 55 MHz
Main channel measurement bandwidth (Main Chan BW): 3.84 MHz
Adjacent channel measurement bandwidth (Adj Chan BW): 3.84 MHz
Channel spacing (Chan Spacing): 5 MHz

After selecting MC-ACLR in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the multi-carrier ACLR measurement contains the following controls:

Carrier Threshold. Sets the threshold level to detect the carrier. The threshold level is indicated by a horizontal line in blue as shown in Figure 2-4.
Range: –30 to –1 dBc relative to the power of the main channel (default: –10 dBc).

Measurement Filter Shape... Selects a filter shape.

- Rect (Rectangular)
- Root Nyquist (default)

Rolloff Ratio. Sets the roll-off value when the filter is Root Nyquist.
Range: 0.0001 to 1 (default: 0.22)

Limits... Sets the pass/fail limit for the multi-carrier ACLR measurement. When you press this side key, the measurement limits editor appears. Refer to *Editing the Measurement Limits* on page 2-14 for more information.

NOTE. *The ACLR measurement and the multi-carrier ACLR measurement use the same limits setting.*

Figure 2-4 shows an example of the multi-carrier ACLR measurement. There are four carriers. On the bottom of the screen, the measurement results of the channel power and ACLR are displayed. The channel at the center frequency (Ch 2 in this case) is the main channel, which is indicated as “Main” in green in the measurement results. The all channels are located at 5 MHz intervals according to the standard.

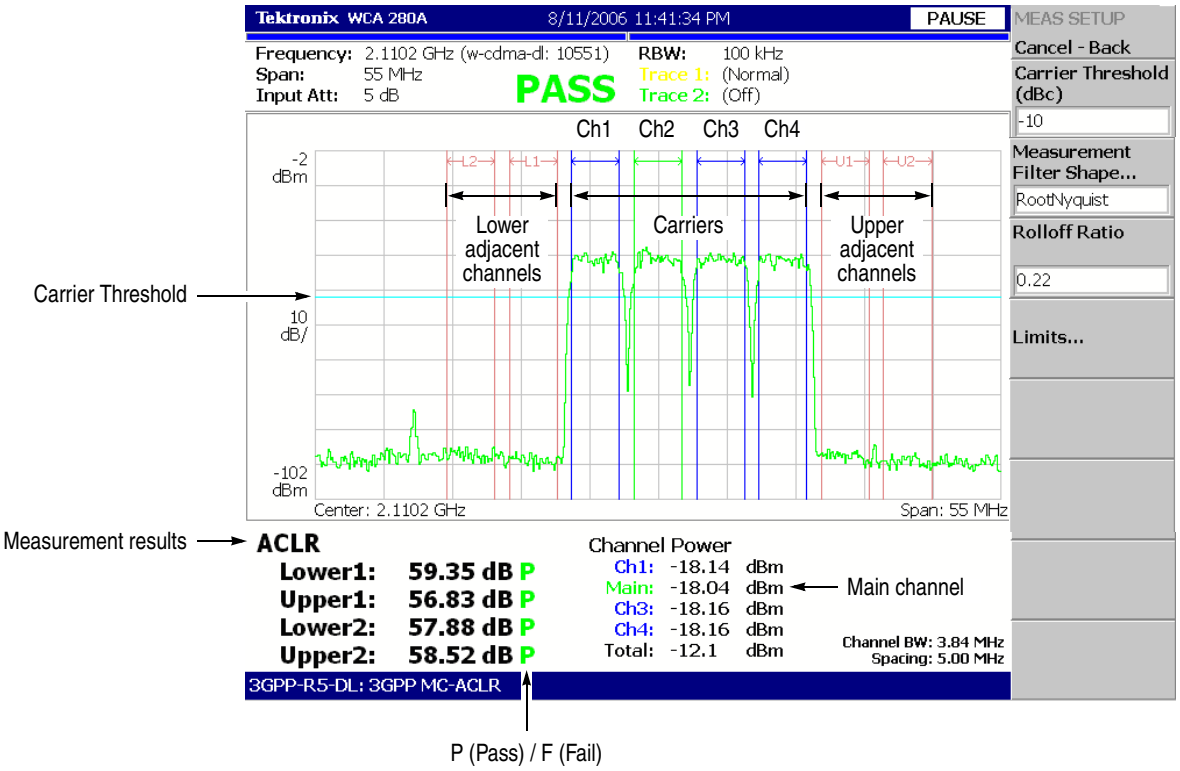


Figure 2-4: 3GPP-R5 ACLR measurement

NOTE. *If there is no carrier in the main channel, the error message “No carrier” will appear.*

If there are more than four carriers in the span, the error message “Too many carriers” will appear.

Spectrum Emission Mask Measurement

The spectrum emission mask measurement verifies that the base station is not transmitting excessive power outside of its designated channel.

NOTE. *When performing this measurement, be sure to apply a continuous active slot signal or a continuous idle slot signal.*

After selecting Spectrum Emission Mask in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the spectrum emission mask measurement contains the following controls:

Ref. Channel Select. Selects how to determine the reference channel level.

- **Auto.** The level is determined automatically by evaluating the spectrum trace.
- **Man.** The level is set by the **Ref. Channel Level** just below.

Ref. Channel Level. Sets the reference channel level to be used by the measurement when **Ref. Channel Select** is set to Man. Range: −150 to 30 dBm (default: 0 dBm).

Channel Bandwidth. Defines the frequency window occupied by the reference channel. Range: 1 to 10 MHz (default: 3.84 MHz).

Measurement Filter Shape... Selects the filter shape to be used when measuring the reference channel when **Ref. Channel Select** is set to Auto.

- Rect (Rectangular, default)
- Gaussian
- Nyquist
- Root Nyquist

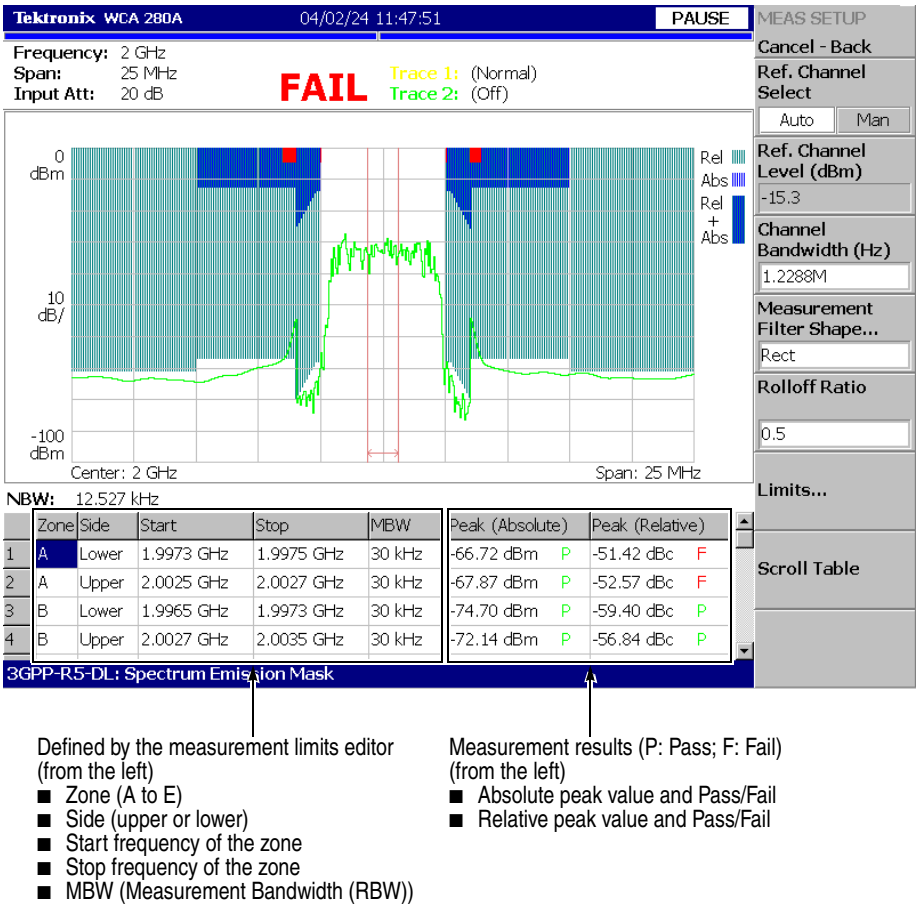
Rolloff Ratio. Sets the rolloff ratio when **Measurement Filter Shape** is set to Nyquist or Root Nyquist. Range: 0.0001 to 1 (default: 0.5).

Limits... Sets the pass/fail limit for the spectrum emission mask measurement. When pressing this side key, the measurement limits editor appears. Refer to *Editing the Measurement Limits* on page 2-14 for more information.

Scroll Table. Scrolls the results table on screen using the general purpose knob.

Step Size. Sets the step size for the **Channel Bandwidth** setting.

Figure 2-5 shows an example of the spectrum emission mask measurement.



Defined by the measurement limits editor (from the left)
- Zone (A to E)
- Side (upper or lower)
- Start frequency of the zone
- Stop frequency of the zone
- MBW (Measurement Bandwidth (RBW))

Measurement results (P: Pass; F: Fail) (from the left)
- Absolute peak value and Pass/Fail
- Relative peak value and Pass/Fail

Figure 2-5: Spectrum emission mask measurement

OBW Measurement

The OBW (Occupied Bandwidth) measurement measures the frequency bandwidth using the ratio you specify for carrier signal power over power within the set span.

After selecting OBW in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the OBW measurement contains the following controls:

Power Ratio. Specifies the power ratio of the carrier and span regions for calculating OBW. Range: 80 to 99.99% (default: 99%).

Limits... Sets the pass/fail limits for the OBW measurement.
When pressing this side key, the measurement limits editor appears. Refer to *Editing the Measurement Limits* on page 2-14 for more information.

Figure 2-6 shows an example of the OBW measurement.

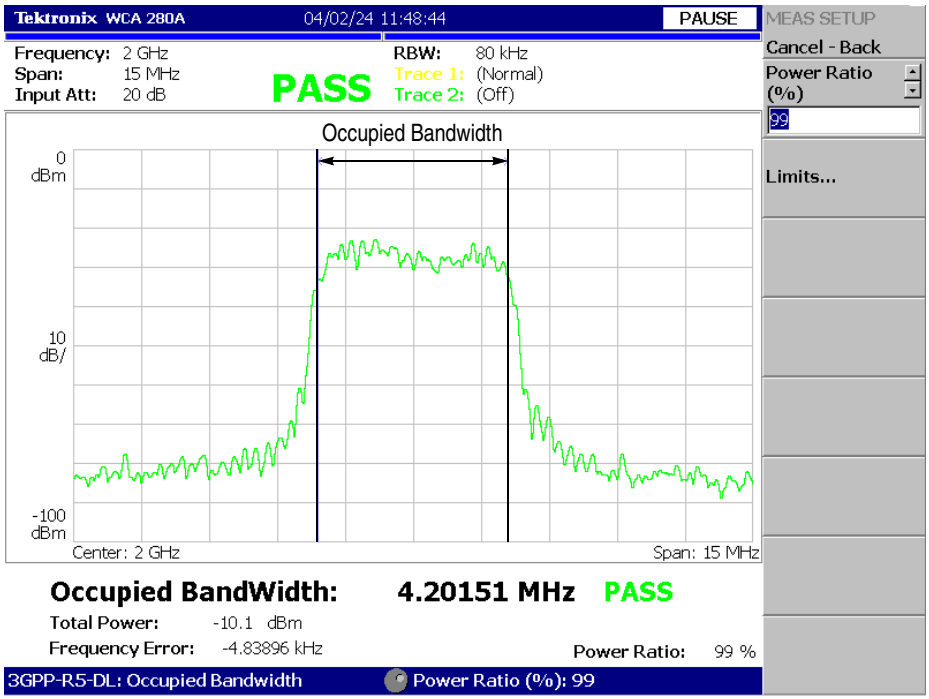


Figure 2-6: OBW measurement

EBW Measurement

The frequency bandwidth between the maximum peak of spectrum and the specified dB value is measured in EBW (Emission Bandwidth).

After selecting EBW in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the EBW measurement contains the following controls:

Measurement Level. Specifies how far down from the peak level the bandwidth is measured (see Figure 2-7). Range: −100 to −1 dB (default: −30 dB).

Figure 2-7 shows an example of the EBW measurement.

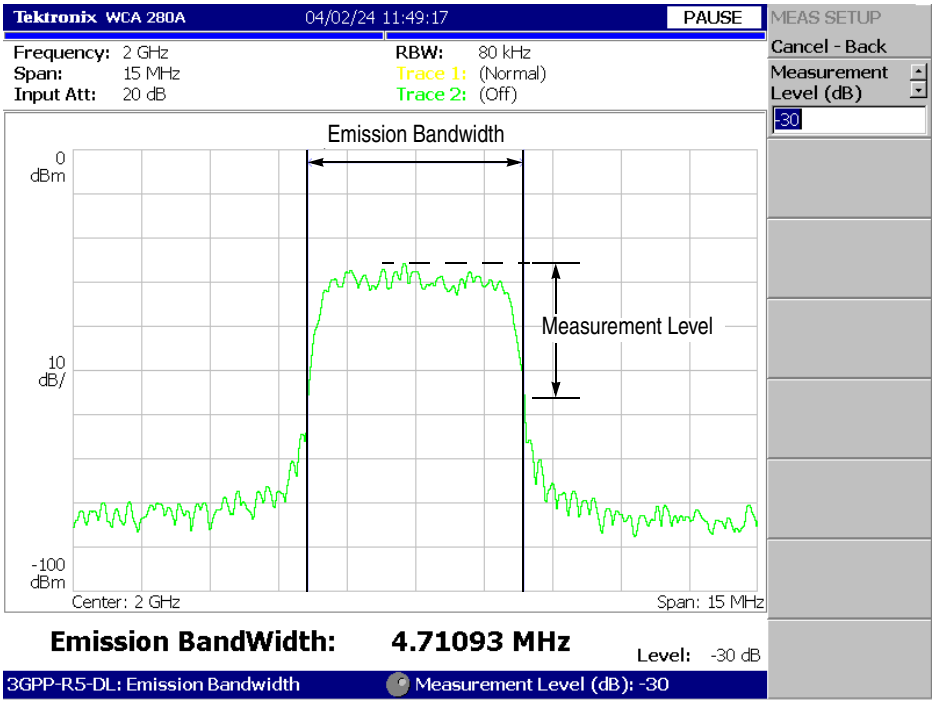


Figure 2-7: EBW measurement

Carrier Frequency Measurement

Carrier frequency is accurately measured using the counter function.

NOTE. *The carrier frequency measurement function should be used to estimate roughly the frequency of a 3GPP signal. Use the modulation analysis function (Demod mode) to measure accurately the 3GPP signal.*

After selecting Carrier Frequency in the procedure described on page 2-2, set the parameters in the Meas Setup menu as follows.

Measurement Setup Menu

The Meas Setup menu for the carrier frequency measurement contains the following controls:

Counter Resolution. Sets the counter resolution. The measurement result is displayed on the bottom of the view with this resolution.
Range: 1 mHz to 1 MHz in a tenfold sequence (default: 1 Hz).

Figure 2-8 shows an example of the carrier frequency measurement.

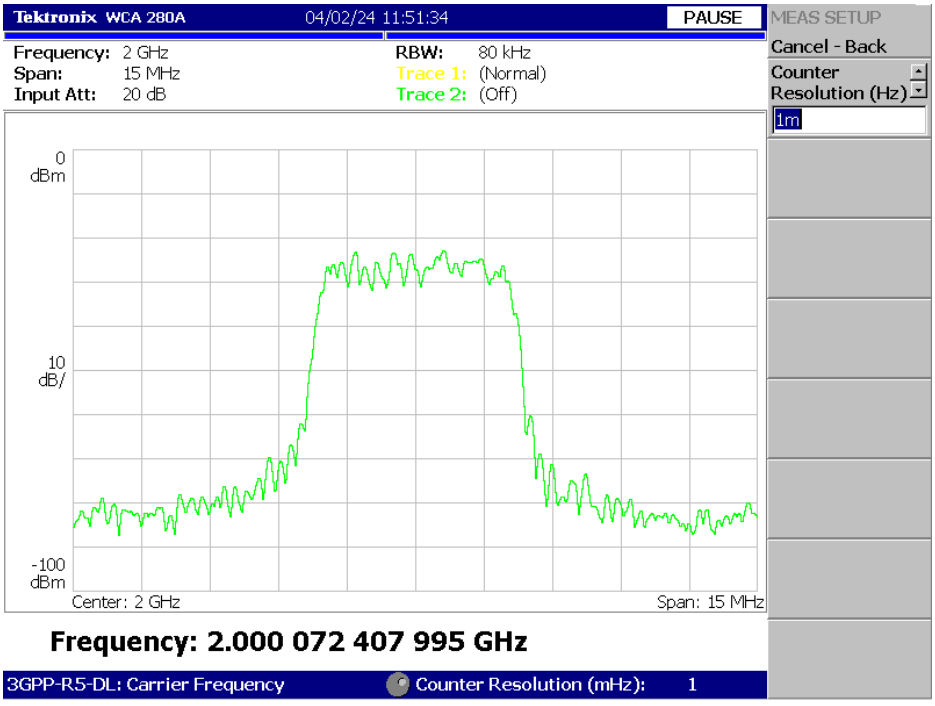


Figure 2-8: Carrier frequency measurement

Editing the Measurement Limits

This section describes how to set measurement limits that can be used to perform pass/fail testing for the following measurements in the S/A mode:

- Channel power
- ACLR
- Spectrum emission mask
- OBW

Refer to *Appendix A: Measurement Limit Defaults* for information about the default settings of each measurement limit.

Using the Measurement Limits Editor

All of the measurement limits are set in the measurement limits editor. You can access it from the **Limits...** side key on the Meas Setup menu. Figure 2-9 shows the measurement limits editor for the 3GPP-R5 downlink analysis in the S/A mode.

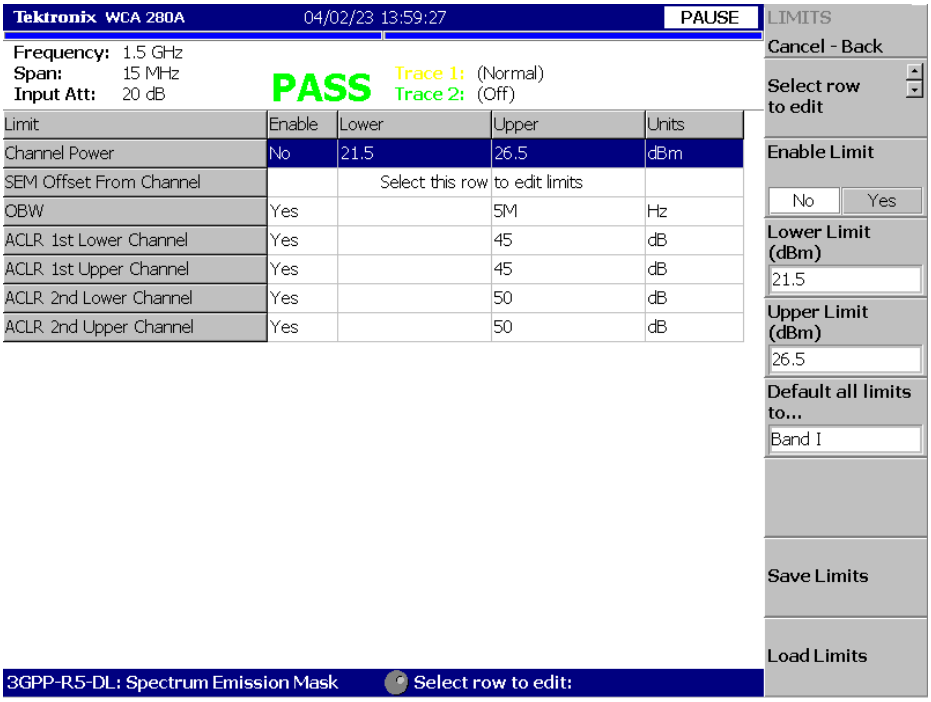


Figure 2-9: Measurement limits editor

Table 2-1 describes all of the measurement limit items available in the measurement limits editor.

Table 2-1: Measurement limits settings

Limit item	Description	Lower limit range	Upper limit range
Channel Power	Sets the lower and upper limits for the Channel Power measurement.	–200 to +200 dBm	–200 to +200 dBm
SEM Offset From Channel	Select this item to access another measurement limits editor to edit SEM offset from channel limits.	Refer to page 2-16 for the details.	
OBW	Sets the upper and lower limits for the OBW measurement.	0 to 30 MHz	0 to 30 MHz
ACLR 1st Lower Channel	Sets the upper limit for the first lower channel in the ACLR measurement.	-	0 to 70 dB
ACLR 1st Upper Channel	Sets the upper limit for the first upper channel in the ACLR measurement.	-	0 to 70 dB
ACLR 2nd Lower Channel	Sets the upper limit for the second lower channel in the ACLR measurement.	-	0 to 70 dB
ACLR 2nd Upper Channel	Sets the upper limit for the second upper channel in the ACLR measurement.	-	0 to 70 dB

Setting Measurement Limits

Perform the following procedure to set measurement limits:

1. Press the **MEAS SETUP** menu key to open the Meas Setup menu.
2. Press the **Limits...** side key to open the measurement limits editor with the LIMITS menu.
3. Press the **Select row to edit** side key.
4. Turn the general purpose knob (or press the arrow keys just above the knob) to select the row that you want to edit.
5. Press the **Enable Limit** side key to enable or disable the Pass/Fail testing for the specified limit(s).
6. Press the **Lower Limit** side key and set the lower limit for the selected measurement item, if applicable.
7. Press the **Upper Limit** side key and set the upper limit for the selected measurement item.
8. If you want to use a given measurement limit set for the frequency band of Band I, II, or III defined in 3GPP-R5, press the **Default all limits to...** side key and then select the band. Refer to *Appendix A: Measurement Limit Defaults* for information about the default settings of each measurement limit.

When you set limits for the spectrum emission mask measurement, perform the following steps to open another limits editor:

1. Press the **Select row to edit** side key.
2. Turn the general purpose knob (or press the arrow keys just above the knob) to select the **SEM Offset From Channel** row in the table.
3. Press the **Edit SEM Offset Limits...** side key.

This opens the measurement limits editor to specify the detail of the limits for the spectrum emission mask measurement. For more information, refer to the following section, *Setting the Spectrum Emission Mask Limits*.

Setting the Spectrum Emission Mask Limits

When you select the SEM Offset From Channel row in the measurement limits editor and then press the **Edit SEM Offset Limits...** side key, another limits editor for the spectrum emission mask measurement is displayed as shown in Figure 2-10.

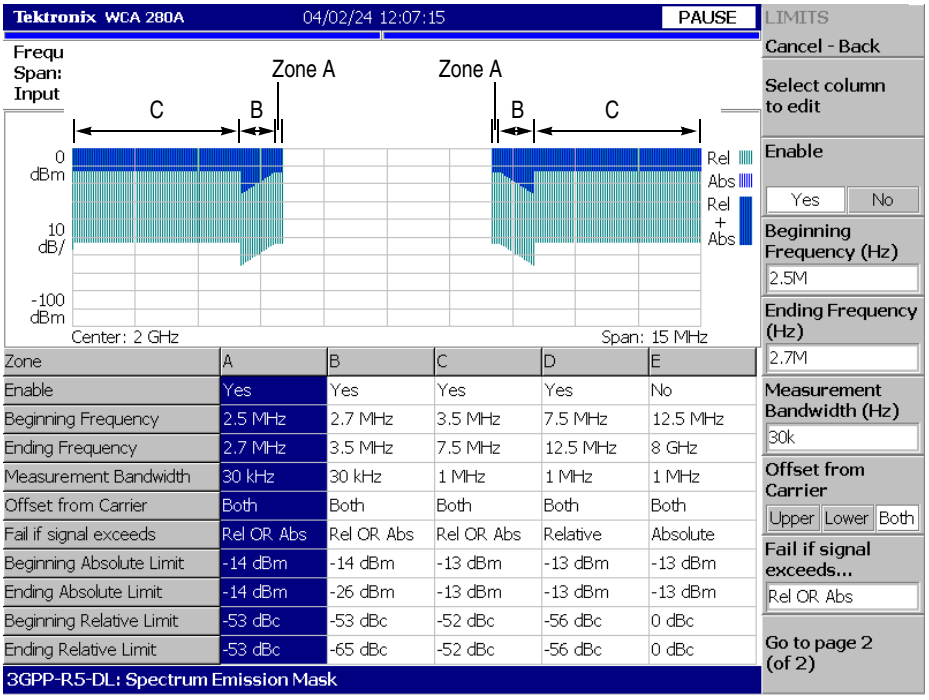


Figure 2-10: Spectrum emission mask measurement limits editor

Table 2-2 lists the measurement limit items that can be set in the measurement limits editor.

Table 2-2: Limit settings for the spectrum emission mask measurement

Item	Description	Limit ranges
Enable	Enables or disables use of the mask in the specified zone (A, B, C, D, or E).	-
Beginning Frequency	Sets the beginning frequency relative to the center frequency for the zone.	–8 to 8 GHz
Ending Frequency	Sets the ending frequency relative to the center frequency for the zone.	–8 to 8 GHz
Measurement Bandwidth	Sets the measurement RBW (Resolution Bandwidth) for the zone.	–8 to 8 GHz
Offset from Carrier	Specifies which offset side is to be measured. You can select Upper (positive), Lower (negative), or Both.	-
Fail if signal exceeds	Selects the fail mode to detect failure conditions between the measurement results and the test limits. The choices are: ■ Absolute: Failure is detected when one of the absolute measurement results is larger than the Beginning Absolute Limit and/or Ending Absolute Limit. ■ Relative: Failure is detected when one of the relative measurement results is larger than the Beginning Relative Limit and/or Ending Relative Limit. ■ Rel OR Abs: Failure is detected when one of the absolute measurement results is larger than the Beginning Absolute Limit and Ending Absolute Limit OR one of the relative measurement results is larger than the Beginning Relative Limit and Ending Relative Limit. ■ Rel AND Abs: Failure is detected when one of the absolute measurement results is larger than the Beginning Absolute Limit and Ending Absolute Limit AND one of the relative measurement results is larger than the Beginning Relative Limit and Ending Relative Limit.	-
Beginning Absolute Limit	Sets an absolute level limit at Beginning Frequency.	–200 to 200 dBm
Ending Absolute Limit	Sets an absolute level limit at Ending Frequency.	–200 to 200 dBm
Beginning Relative Limit	Sets a relative level limit at Beginning Frequency.	–200 to 200 dBc
Ending Relative Limit	Sets a relative level limit at Ending Frequency.	–200 to 200 dBc

Perform the following steps to set measurement limits in the limits editor:

1. Press the **Select column to edit** side key.
2. Turn the general purpose knob (or press the arrow keys just above the knob) to select the column that you want to edit.
3. Press the **Enable** side key to enable or disable use of the limits for the zone.
4. Press the side key corresponding to the limit item, and then use the general purpose knob or the arrow keys to set the value.
5. If you want to use a given measurement limit set for the frequency band of Band I, II, or III defined in 3GPP-R5, press the **Default limits to...** side key and then select the band. Refer to *Appendix A: Measurement Limit Defaults* for information about the default settings of each measurement limit.
6. When you press the **Rescale Graph** side key, the graph is rescaled to match the set limits.

Saving and Loading Measurement Limits

Measurement limits that set in the limits editor can be saved to a file and loaded from a file. This section describes how to save and load measurement limits.

Refer to the *WCA230A and WCA280A User Manual* for further information about file operation including how to enter a file name and how to delete a file.

Saving the Limits. Perform the following steps to save the current limits to a file:

1. When you open the spectrum emission mask measurement limits editor, press the **Cancel-Back (MENU)** side key to return the measurement limit editor (see Figure 2-9 on page 2-14).
2. Press the **Save Limits** side key to open the **Save to File** menu.

   You can save the limits by using the preset file name or by entering a new file name.
3. To use the preset file name, press one of the following side keys: **Save to LimitsA**, **Save to LimitsB**, or **Save to LimitsC**.
4. To enter a new file name, type a file name in the text box at the top of the menu, and then press the **Save File Now** side key.

The file extension *.lmt is automatically added to the limits file.

Loading the Limits. Perform the following steps to load the limits from a file:

1. When you open the spectrum emission mask measurement limits editor, press the **Cancel-Back (MENU)** side key to return the measurement limit editor (see Figure 2-9 on page 2-14).
2. Press the **Load Limits** side key to open the Load From File menu.
3. To load limits from the preset file, press one of the following side keys: **Load from LimitsA**, **Load from LimitsB**, or **Load from LimitsC**.
4. To load limits from an existing file, select the file from the file list, and then press the **Load File Now** side key.

Downlink Analysis in the Demod Mode

This section describes the basic operation of the 3GPP-R5 downlink analysis in the Demod (Modulation Analysis) mode. You can access the measurement items by pressing **DEMOD** →**Standard...** →**3GPP-R5-DL** as shown in Figure 2-11.

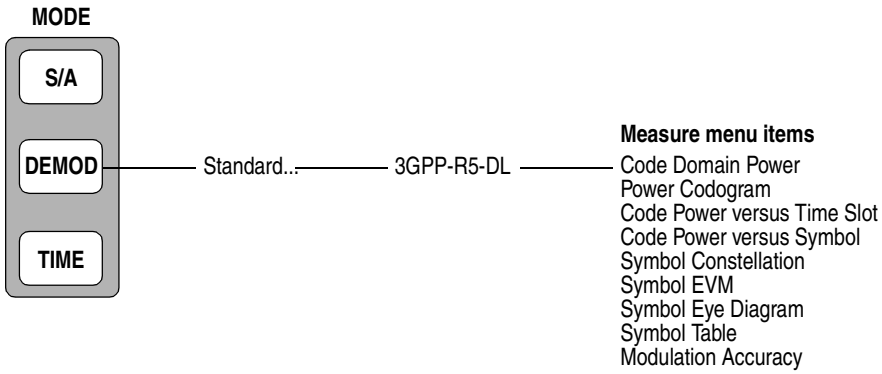


Figure 2-11: Downlink analysis measurement menu in the Demod mode

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

Measurement Procedure

The following procedure shows you how to acquire data of multiple slots in advance, measure continuous data, and obtain continuous code domain power:

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

1. Press the **DEMOD** key on the front panel.
2. Press the side key **Standard... →3GPP-R5-DL**.
3. Press the **FREQUENCY/CHANNEL** key on the front panel to set frequency.

   If you use the channel table, do these steps:

   a. Press the **Channel Table...** side key and select **W-CDMA-DL**.

   b. Press the **Channel** side key and select a channel by rotating the general purpose knob.

   The center frequency is set to the value corresponding to the channel.
4. Press the **SPAN** key on the front panel to set the span.
5. Press the **AMPLITUDE** key on the front panel to set the amplitude appropriately.

NOTE. *If the input level is too high, A/D OVERFLOW displays in the red box at the center top of the screen. If this occurs, raise the reference level.*

6. Press the **TIMING** key on the front panel and then the **Acquisition Length** side key to set the time length to acquire one block.

   Suppose that one block contains M frames; the acquisition length is calculated with this equation:

   $$\text{(One block acquisition length)} = M \times \text{(One frame acquisition length)}$$

   One frame acquisition length is determined by span and indicated on the **Spectrum Length** side key.

   The number of frames M required for measuring N slots must meet the following condition:

   $$M > K \times (N + 1.2) + 1$$

   where
   K = 16.7 (for the span of 20 MHz and 15 MHz)
   8.34 (for the span of 10 MHz)
   4.17 (for the span of 5 MHz)

7. After acquiring measurement data, stop the data acquisition. If you are acquiring data in the continuous mode, press the **RUN/STOP** key.
8. Press the **MEASURE** key on the front panel and select measurement items. For example, press the **Power Codogram** side key to observe the code domain power spectrogram.
9. Press the **MEAS SETUP** key on the front panel and set the measurement parameters. Refer to page 2-25 for details of the Meas Setup menu.
10. Set the analysis range in the overview. Refer to the *WCA230A and WCA280A User Manual* for the details.
11. Press the **Analyze** side key to perform measurement for the frames in the analysis range. The measurement result and waveform are displayed in the main view.

    Change the scale and format of the view as needed. Refer to page 2-28 for setting views specific to the 3GPP-R5 downlink analysis.
12. If the level of input signals is low, the waveform may not be displayed correctly. In this case, perform the following procedure:

NOTE. *The 3GPP-R5 downlink signal analysis may not be performed correctly if the P-SCH, S-SCH, and PCPICH channels are too low to be detected. An error occurs when one of these channel levels is lower than several tenths the sum of other channel levels. In this case, set Scrambling Code Search to Off and specify the scrambling code with the Scrambling Code side key.*

   a. Press the **MEAS SETUP** key on the front panel.
   b. Press the **Modulation Parameters...** side key.
   c. Press the **Scrambling Code Search** side key to select **Off**.
   d. Press the **Scrambling Code** side key and enter the scrambling code.

   The analyzer performs the measurement with the value set here in place of detecting the scrambling code.

   e. Press the **MEAS SETUP** key on the front panel.
   f. Press the **Analyze** side key to perform measurement for the frames in the analysis range.

Figure 2-12 shows an example of the code domain power measurement.

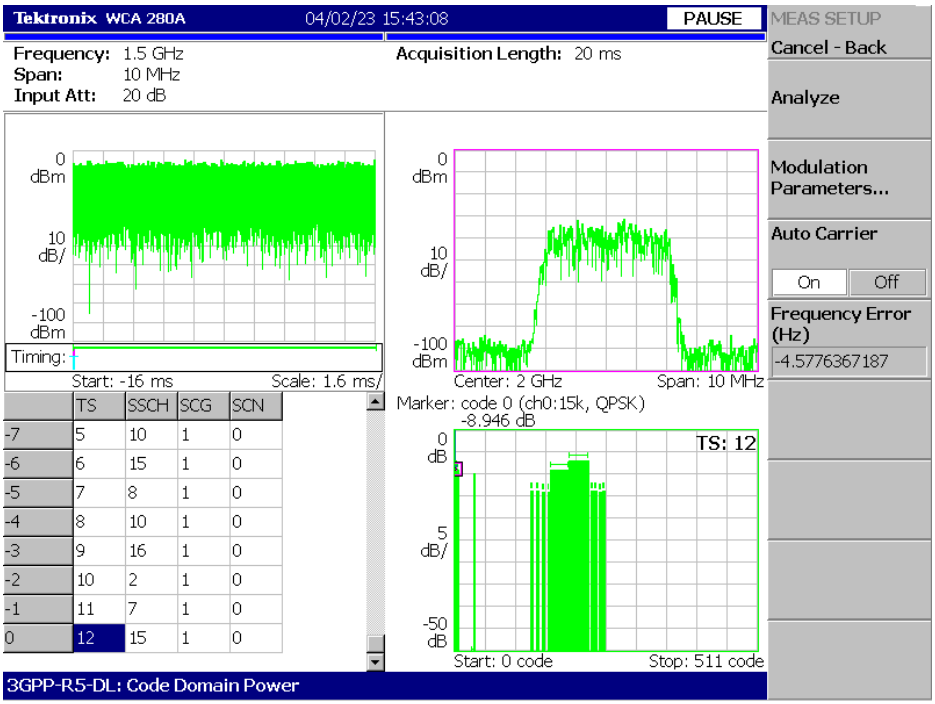


Figure 2-12: Example of the code domain power measurement

Change the scale and format of the view as needed. Refer to page 2-28 for setting views specific to the 3GPP-R5 uplink analysis.

Measurement Setup Menu

The Meas Setup menu for the 3GPP-R5 downlink modulation analysis contains the following controls:

Analyze Performs measurements for time slots in the analysis range.

NOTE. *When you change settings of the parameters in the Meas Setup menu described below, press the* **Analyze** *side key to perform the measurement for the modified settings.*

Modulation Parameters... Sets a measurement parameter to a non-standard value. The following controls are provided:

Scrambling Code Search. Selects whether to perform analysis by detecting a scrambling code from input signals.

- **On.** Detects a scrambling code automatically from the input signal to perform the measurement.
- **Off.** *Default*. Performs measurement using the scrambling code that has been set manually with **Scrambling Code** described below.

NOTE. *The manual mode (Scrambling Code Search Off) should be used with the appropriate scrambling code for reliable detection when either multiple code channels are active or the sync channels have low power.*

Also refer to *Note* on page 2-23.

Scrambling Code. Sets the scrambling code number when you select Off in Scrambling Code Search. The analyzer performs measurement using the set scrambling code. Range: 0 to 24575 (default: 0).

The 3GPP standard defines the scrambling code with the following formulas. Input the n value to set the code.

Primary scrambling code:	n = 16 * i	where i = 0 to 511
Secondary scrambling code:	n = 16 * i + k	where k = 1 to 15

Use Alternative Scramb. Code... Selects the de-spread method to display the measurement results:

- **Not Used.** *Default*. Uses the primary scrambling code only (without the left and the right alternative scrambling codes) to de-spread the input signal.
- **Primary.** Uses the primary scrambling with the left and the right alternative scrambling codes to de-spread the input signal.
- **Left Alternative.** Uses the left alternative scrambling code to de-spread the input signal.
- **Right Alternative.** Uses the right alternative scrambling code to de-spread the input signal.

Primary, **Left Alternative** and **Right Alternative** use the proprietary algorithm to enhance the sensitivity by approximately 20 to 30 dB compared to **Not Used**. **Not Used** does not use the alternative scrambling codes, providing faster measurements.

Use SCH Part. Selects whether to include or exclude the SCH portion when calculating the code domain power.

- **On.** Calculates the code domain power by including the SCH portion.
- **Off.** *Default.* Calculates the code domain power by excluding the SCH portion.

Composite. Determines whether to perform the composite analysis (automatic detection of symbol rate).

- **On.** *Default.* Specifies that the composite analysis is performed.
- **Off.** Specifies that the composite analysis is not performed.

NOTE. *You should usually specify that composite analysis is performed. If a normal analysis does not result, select Off in this command and select a specific symbol rate with Symbol Rate in the View: Define menu.*

16QAM Detection. Selects whether to detect the QPSK or 16QAM code channel automatically.

- **On.** *Default.* Automatically detects whether the code channel is QPSK or 16QAM.
- **Off.** Assumes that all code channels are QPSK.

Measurement Filter... Selects a filter for demodulating digitally-modulated signals:

- None (no filter)
- RootRaisedCosine (default)

Reference Filter... Selects a filter for creating reference data:

- None (no filter)
- RaisedCosine (default)
- Gaussian

For the filters, refer to *Process Flow of Digitally-Modulated Signal* in the *WCA230A and WCA280A User Manual*.

Filter Parameter. Sets the a/BT value for Measurement Filter and Reference Filter described above. Range: 0.0001 to 1 (default: 0.22).

Auto Carrier Selects whether to detect the carrier automatically.

- **On.** *Default.* Automatically detects the carrier for every frame. The error from the center frequency is shown on the **Freq Error** side key.
- **Off.** Sets the carrier frequency using **Frequency Offset** described below.

Frequency Offset Sets the carrier frequency when **Auto Carrier** is selected to Off. Input the carrier offset from the center frequency.

EVM IQ Origin Offset Determines whether to include or exclude the I/Q origin offset in the EVM, Rho, and PCDE calculation.

- **Include.** *Default.* Includes the I/Q origin offset in the EVM, Rho, and PCDE calculation.
- **Exclude.** Excludes the I/Q origin offset from the calculation.

Scale and Format of View

The following main views are specific for the measurement items of the 3GPP-R5 downlink analysis in Demod mode:

- Code domain power
- Power codogram
- Code power versus Time slot
- Code power versus Symbol
- Symbol constellation
- Symbol EVM
- Symbol eye diagram
- Symbol table
- Modulation accuracy

Each view (and its specific menu) is described on the following pages. In the main view, the time slot table shown in Figure 2-13 is displayed in addition to waveform and measurement results.

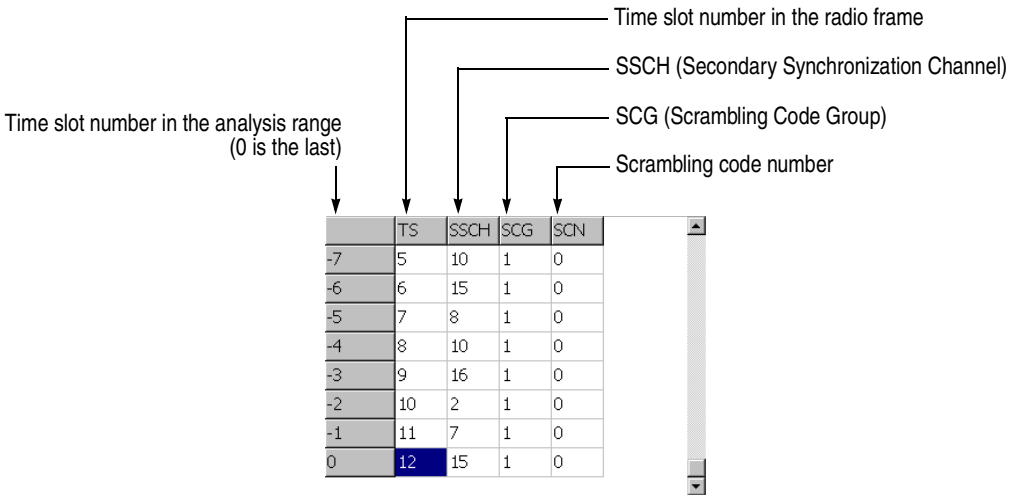


Figure 2-13: Time slot table

View: Define Menu

The View: Define menu is common to all main views of the 3GPP-R5 downlink measurement items. It contains the following controls:

Show Views. Selects the view style:

- **Single.** Displays only the view selected by the VIEW: **SELECT** key.
- **Multi.** *Default.* Displays the overview, subview, and main view.

Overview Content... Selects a view to display in the overview:

- Waveform (power versus time)
- Spectrogram

Subview Content... Selects a view to display in the subview:

- Spectrum
- Code Domain Power
- Power Codogram
- CDP vs Time Slot (code domain power versus time slot)
- CDP vs Symbol (code domain power versus symbol)
- Symbol Constellation
- Symbol EVM
- Symbol Eye Diagram
- Symbol Table
- Modulation Accuracy

Time Slot. Sets a time slot number to position the marker.
Range: 0 to the number of slots –1

Channelization Code. Sets a channelization code number to position the marker.
Range: 0 to 511 channels

Multi Slot. Selects whether to display single slot or multiple slots in the main view. This selection affects only the code domain power versus symbol view and the symbol EVM view. In the other views, it has no effect.

- **Off.** Displays one time-slot selected by the **Time Slot** side key.
- **On.** Displays up to 15 time-slots in the main view.

Menu Off. Removes the side menu from the screen to expand the waveform and measurement result area. Press the **MENU** side key when you return to the original display.

Show SCH Part. Determines whether to display SCH at the beginning of data.

- **Off.** Hides the SCH part.
- **On.** Displays the SCH part.

Symbol Rate... Sets the symbol rate for displaying symbol constellation:

- 960 k
- 480 k
- 240 k
- 120 k
- 60 k
- 30 k
- 15 k
- 7.5 k
- Composite

The default is Composite for multi-rate.

Code Domain Power

When you select Code Domain Power in the Measure menu, the code domain power is displayed for each channelization code, as shown in Figure 2-14.

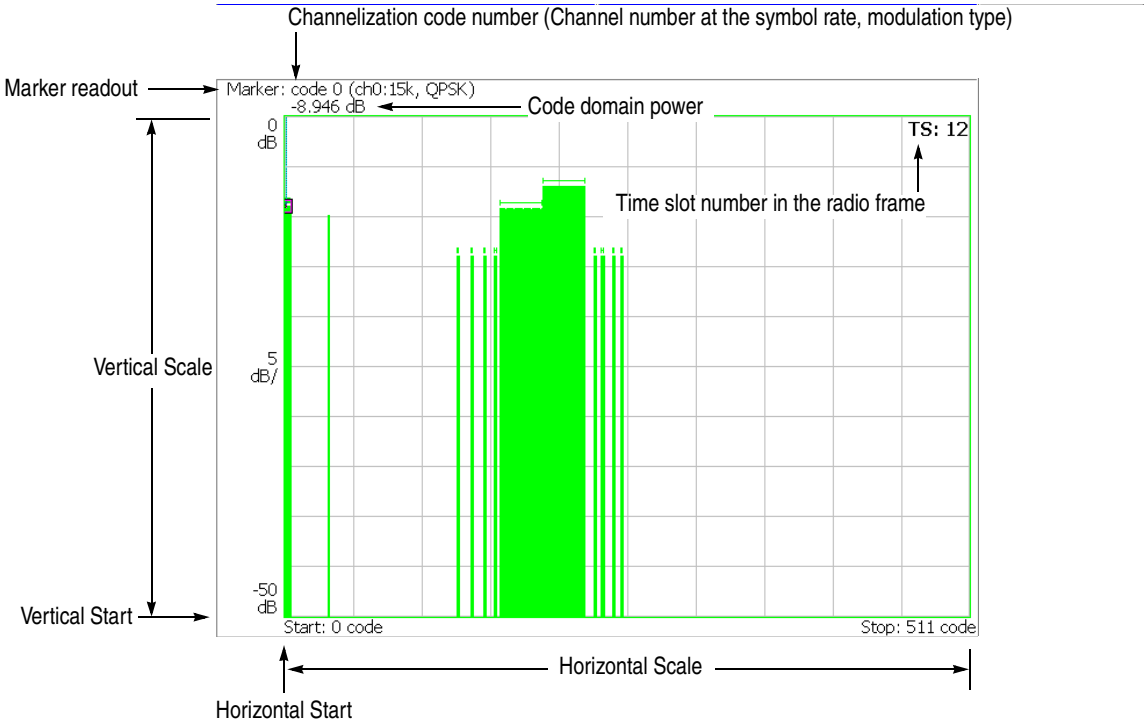


Figure 2-14: Code domain power

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis.
Range: 16 to 512 channels.

Horizontal Start. Sets the start channel number of the horizontal axis.
Range: 0 to [512 –(Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.
Range: 50 µ to 50 dB.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.
Range: –50 to Vertical Scale [dB].

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

Y Axis. Selects whether to represent the vertical axis (amplitude) with relative or absolute values.

- **Relative.** The vertical axis represents power relative to the total power of all channels.
- **Absolute.** The vertical axis represents absolute power of each channel

Power Codogram

When you select Power Codogram in the Measure menu, the code domain power is displayed in spectrogram, as shown in Figure 2-15.

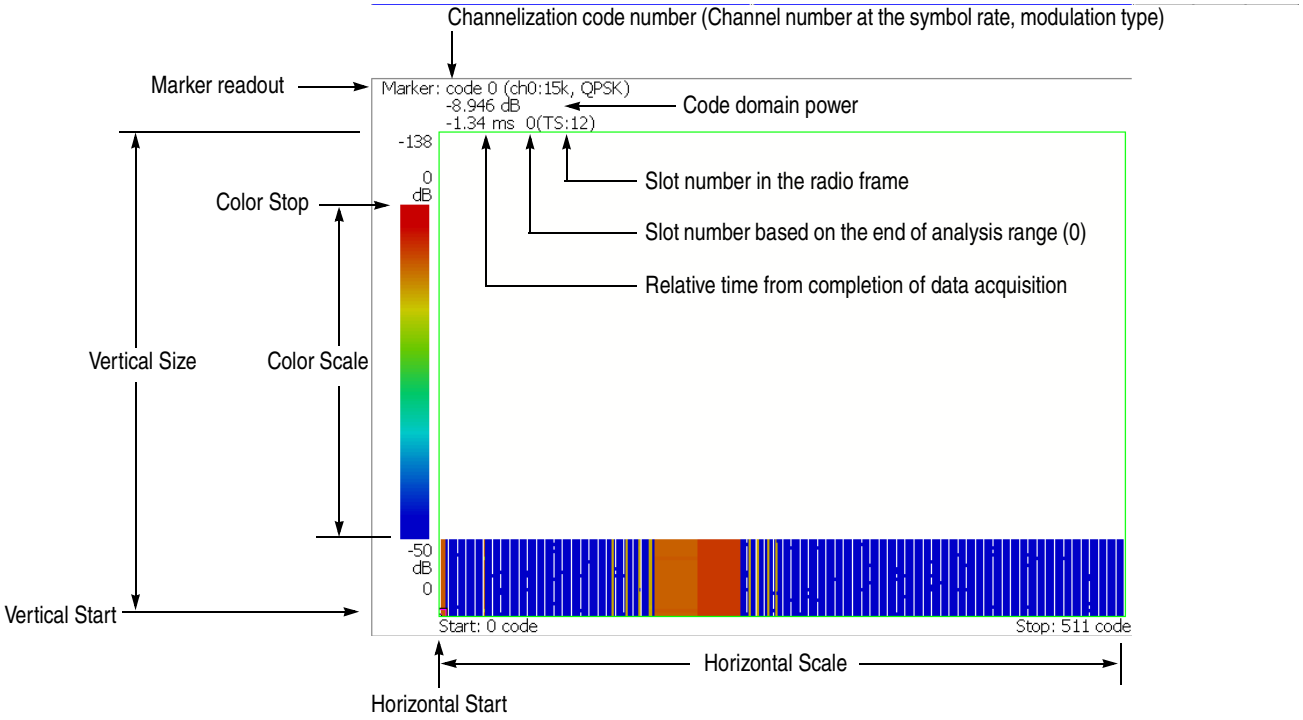


Figure 2-15: Power codogram

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis.
Range: 16 to 512 channels.

Horizontal Start. Sets the start channel number of the horizontal axis.
Range: 0 to [512 – (Horizontal Scale)].

Vertical Size. Sets the full scale of the vertical axis in frames.
Range: 58 to 59392.

Vertical Start. Sets the start frame number of the vertical axis.

Color Scale. Sets the scale of the color axis (the value obtained by subtracting the minimum value from the maximum power).

- 5 dB
- 10 dB
- 20 dB
- 50 dB

The spectrogram is displayed in 100 steps (100 colors) from the minimum value (blue) to the maximum value (red) in the default state.

Color Stop. Sets the maximum value (top edge) of the color axis.
Range: –50 to Color Scale [dB].

Full Scale. Sets Color Stop to 0 (zero) and Color Scale to 50 dB.

Y Axis. Selects whether to represent the Y (color) axis with relative or absolute values.

- **Relative.** The Y axis represents power relative to the total power of all channels.
- **Absolute.** The Y axis represents absolute power of each channel.

Code Power versus Time Slot

When you select Code Power versus Time Slot in the Measure menu, the code domain power is displayed for each slot, as shown in Figure 2-16.

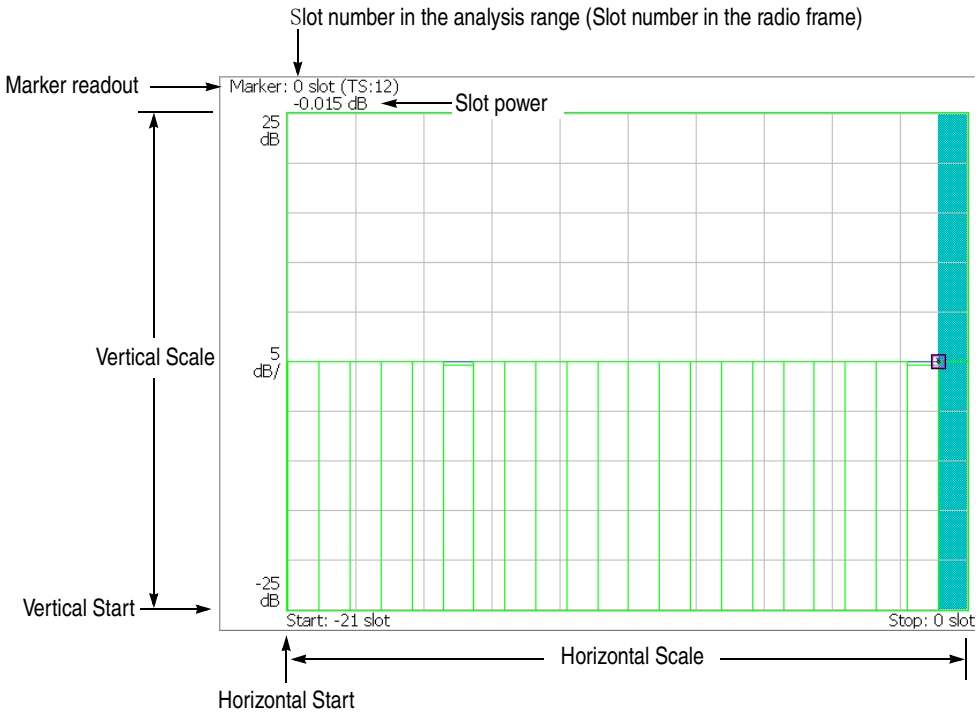


Figure 2-16: Code domain power versus Time slot

View: Scale Menu

Use the following controls to scale the view:

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

Horizontal Scale. Sets the scale of the horizontal axis (number of slots).
Range: N/8 to N slots (N: the number of slots in the analysis range.)

Horizontal Start. Sets the start slot number of the horizontal axis.
Range: −(N − 1) to [1 − (Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.
Range: 50 µ to 50 dB.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.
Range: − 25 to [(Vertical Scale) + 25] dB.

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

Y Axis. Selects whether to represent the vertical (amplitude) axis with relative or absolute values.

- **Relative.** The vertical axis represents time slot power relative to the power of the first time slot in the analysis range.
- **Absolute.** The vertical axis represents absolute power of time slots.

Select Power. Selects the channel to show the power for each time slot.

- **Code.** Shows the power of all channels or the specified channel depending on the setting of Total Power described below.
- **PSCH.** Shows the power of the PSCH (Primary Synchronization Channel).
- **SSCH.** Shows the power of the SSCH (Secondary Synchronization Channel).

Total Power. Determines whether to display the total power for each time slot when you select Code with Select Power described above.

- **On.** *Default.* Displays the total power of all channels for each time slot.
- **Off.** Displays power of the channel specified with Channelization Code in the View: Define menu (refer to page 2-29).

Code Power versus Symbol

When you select Code Power versus Symbol in the Measure menu, the code domain power is displayed for each symbol, as shown in Figure 2-17.

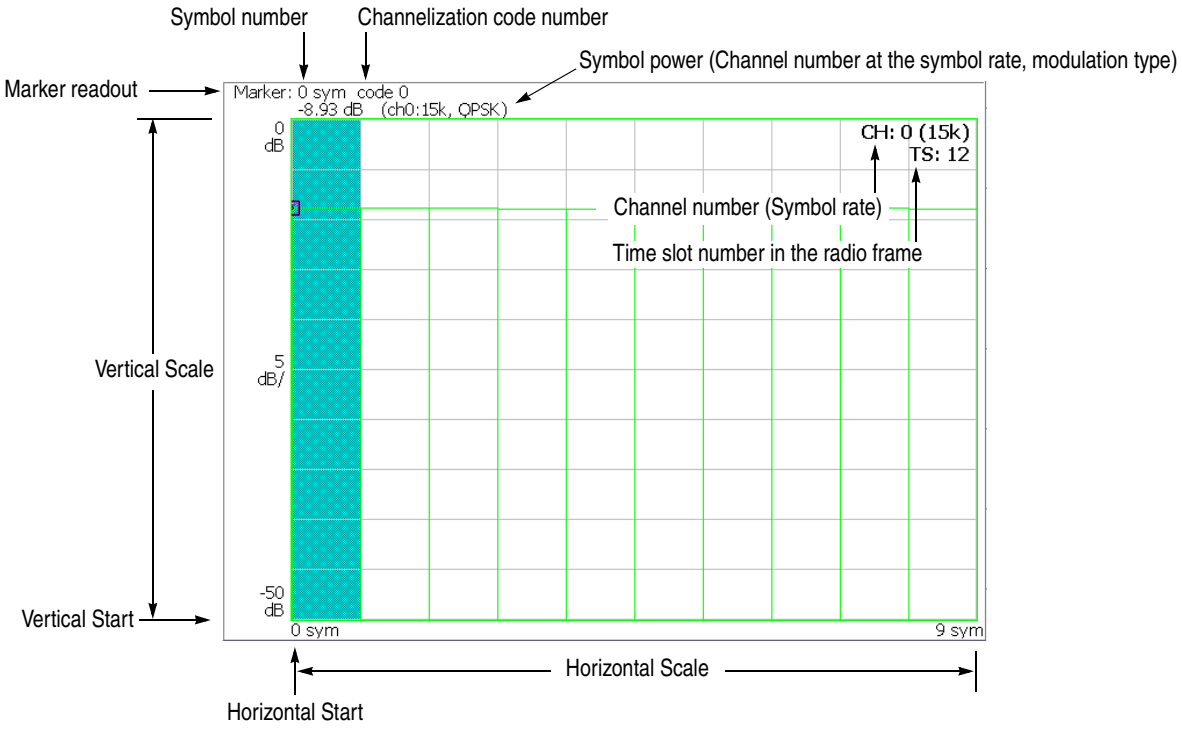


Figure 2-17: Code domain power versus Symbol

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis (number of symbols).
Range: 0 to 320 symbols.

Horizontal Start. Sets the start symbol number of the horizontal axis.
Range: 0 to [(initial value of Horizontal Scale) − (set value of Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.
Range: 50 µ to 50 dB.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.
Range: −50 to Vertical Scale [dB].

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

Y Axis. Selects whether to represent the vertical (amplitude) axis with relative or absolute values.

- **Relative.** The vertical axis represents power relative to the total power of all channels.
- **Absolute.** The vertical axis represents absolute power of each channel.

Symbol Constellation

The symbol constellation is displayed when you select Symbol Constellation in the Measure menu, as shown in Figure 2-18.

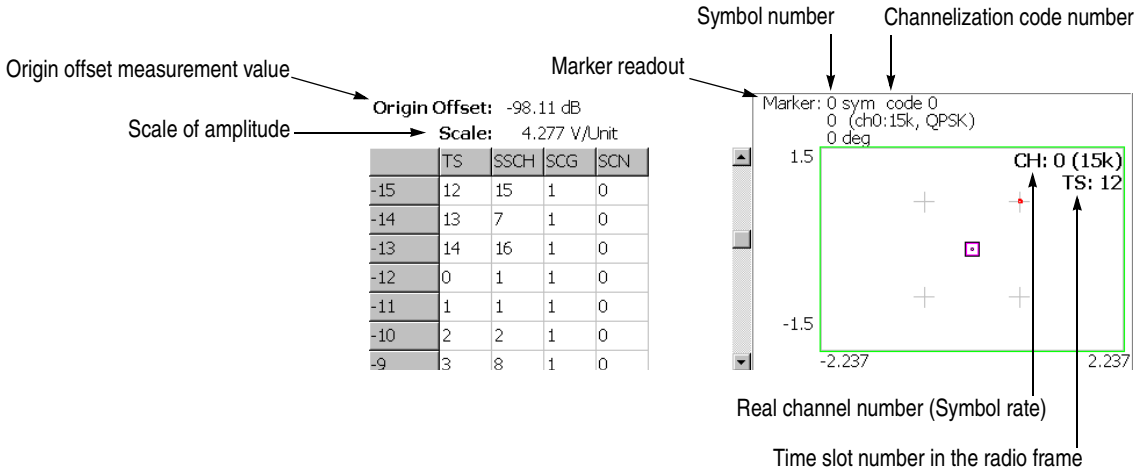


Figure 2-18: Symbol constellation

View: Scale Menu

Use the following controls to set the scale:

Measurement Content... Selects vector or constellation display.

- **Vector.** Selects vector display. A signal represented by phase and amplitude is displayed in polar coordinate or IQ diagram. The red point indicates the symbol position of the measured signal, and the yellow trace indicates the locus of the signal between symbols.
- **Constellation.** Selects constellation display. It is the same as the vector display, except that only symbols of the measured signal are indicated in red, and the locus between symbols is not shown. The cross marks indicate the symbol positions of an ideal signal.

You can select degree or radian for the angular unit by pressing **SYSTEM** → **Instrument Setup...** → **Angular Units...**

Symbol EVM

When you select Symbol EVM in the Measure menu, EVM (Error Vector Magnitude) is displayed for each symbol, as shown in Figure 2-19.

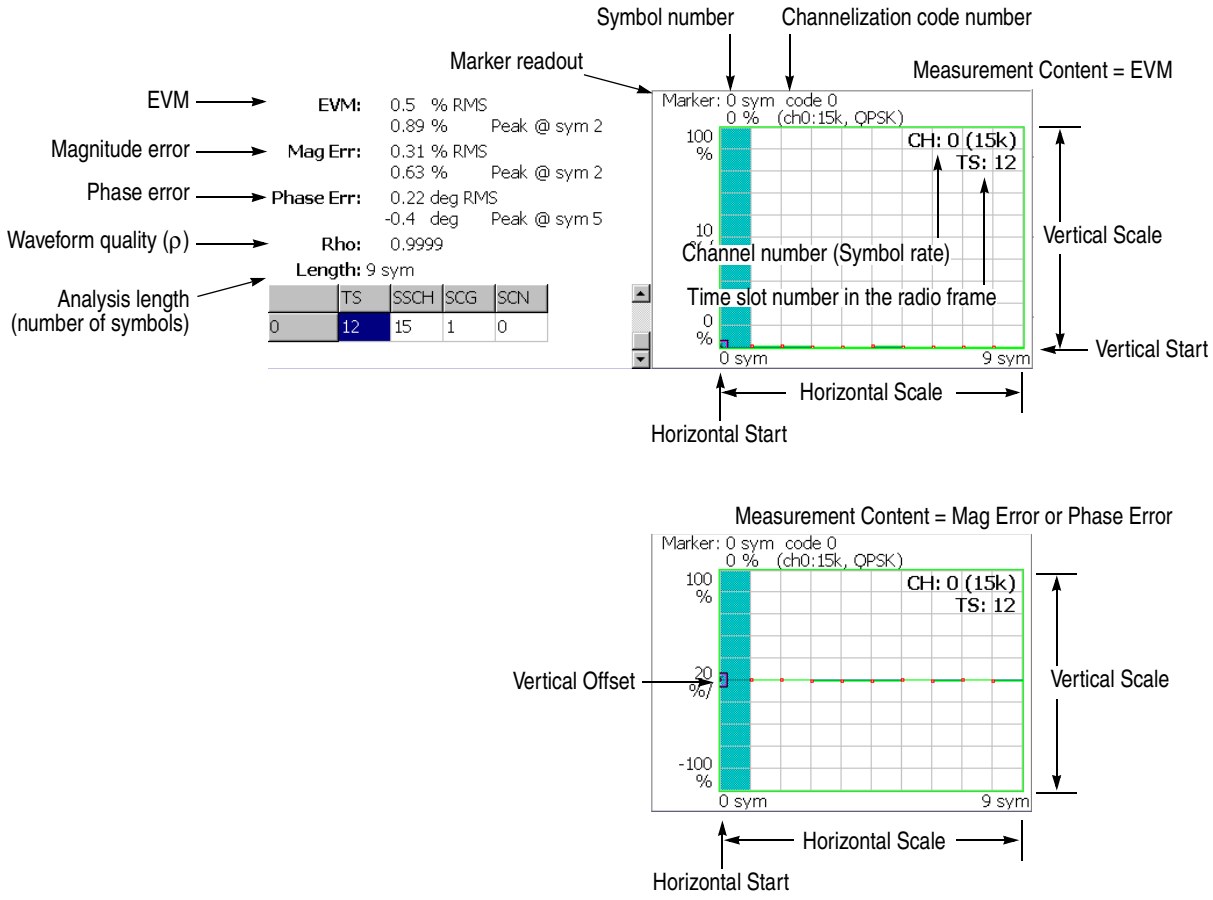


Figure 2-19: Symbol EVM

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis (number of symbols). Range: 0 to 320 symbols.

Horizontal Start. Sets the start symbol number of the horizontal axis. Range: 0 to [(initial value of Horizontal Scale) − (set value of Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis. Refer to Table 2-3 for the setting range.

Vertical Start. Sets the minimum value (bottom edge) of the vertical axis when the measurement content is EVM. Refer to Table 2-3 for the setting range.

Vertical Offset. Sets the center value ((maximum + minimum) / 2) of the vertical axis when the measurement content is Mag Error or Phase Error. Refer to Table 2-3 for the setting range.

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

Measurement Content... Selects how to display the vertical axis:

- **EVM.** Represents the vertical axis with EVM.
- **Mag Error.** Represents the vertical axis with magnitude error.
- **Phase Error.** Represents the vertical axis with phase error.

Table 2-3: Vertical scale setting range

Measurement Content...	Vertical Scale	Vertical Start	Vertical Offset
EVM	100µ to 100%	−100 to 100%	-
Mag Error	200µ to 200%	-	−200 to 200%
Phase Error	450µ to 450°	-	−450 to 450°

You can select degree or radian for the angular unit by pressing **SYSTEM** → **Instrument Setup...** → **Angular Units...**

Symbol Eye Diagram

The symbol eye diagram is displayed when you select Symbol Eye Diagram in the Measure menu, as shown in Figure 2-20.

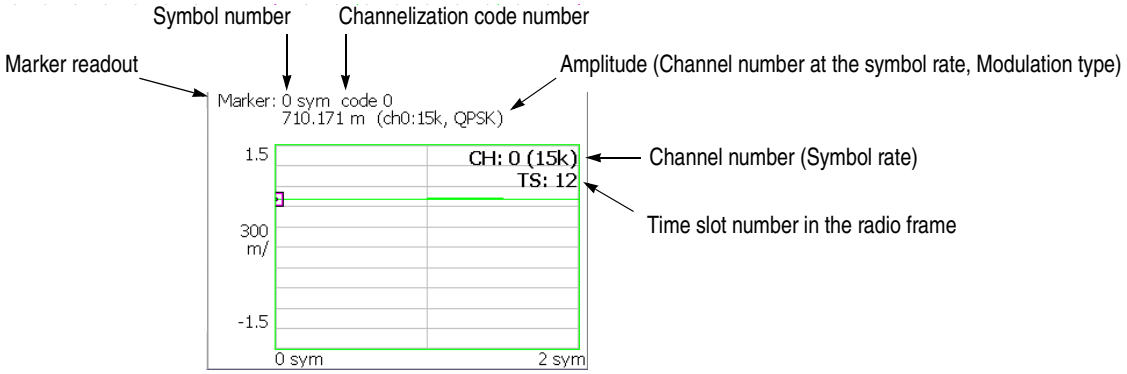


Figure 2-20: Symbol eye diagram

View: Scale Menu

Use the following controls to scale the view.

Measurement Content... Selects the vertical axis of eye diagram.

- **I.** *Default*. Displays I data on the vertical axis.
- **Q.** Displays Q data on the vertical axis.
- **Trellis.** Displays phase on the vertical axis.

Eye Length. Enters the number of display symbols on the horizontal axis. Range: 1 to 16 (default: 2)

Symbol Table

The symbol table is displayed when you select Symbol Table in the Measure menu, as shown in Figure 2-21.

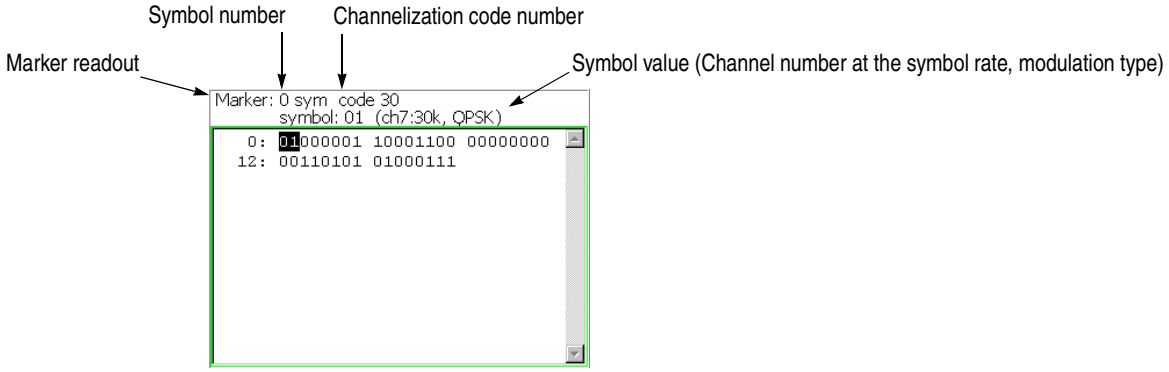


Figure 2-21: Symbol table

View: Scale Menu

Use the following controls to scale the view:

Radix. Selects the radix for displaying the table:

- **Hex.** Hexadecimal digit
- **Oct.** Octal digit
- **Bin.** *Default.* Binary digit

Hex and Oct indicate values of binary data string in units of modulation symbol.

Rotate. Sets the start position. Range: 0 to 3.

Modulation Accuracy

The constellation of all channels before the de-spread is displayed when you select Modulation Accuracy in the Measure menu.

When you press the VIEW: **SELECT** key on the front panel to select the constellation view, the measurement results for the time slot are displayed instead of the overview, as shown in Figure 2-22.

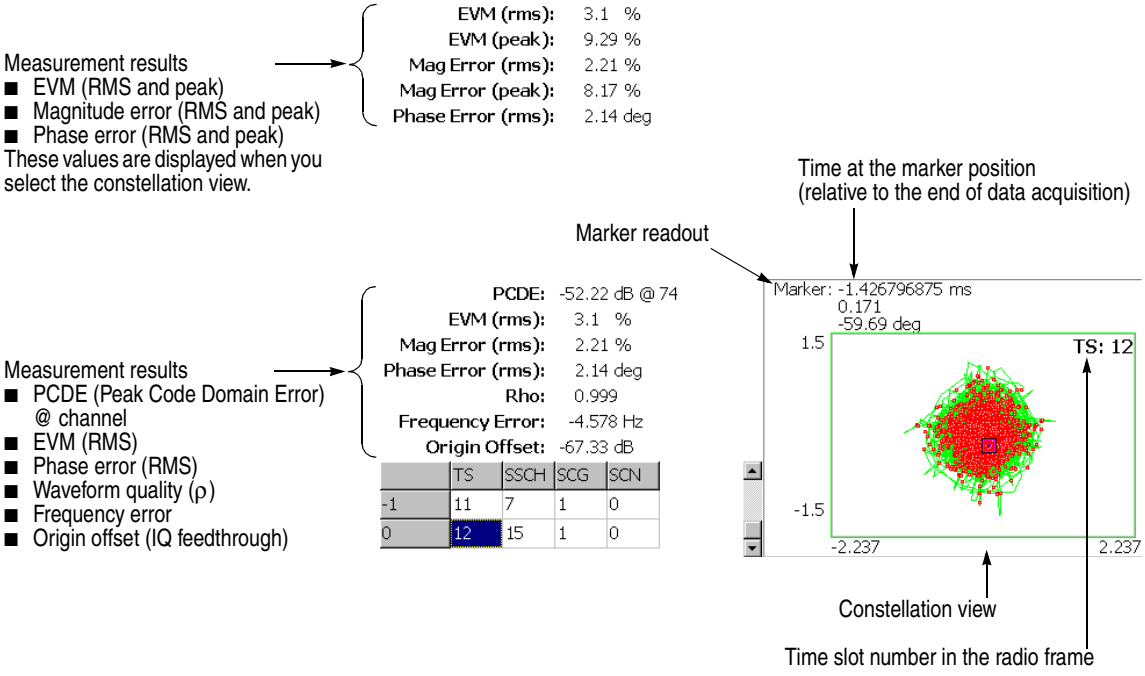


Figure 2-22: Modulation accuracy

The view settings are the same as for Symbol Constellation. Refer to *Symbol Constellation* on page 2-39.

Uplink Analysis in the Demod Mode

This section describes the basic operation for the 3GPP-R5 uplink analysis in the Demod (modulation analysis) mode. You can access the measurement item by pressing **DEMOD →Standard... →3GPP-R5-UL** as shown in Figure 2-23.

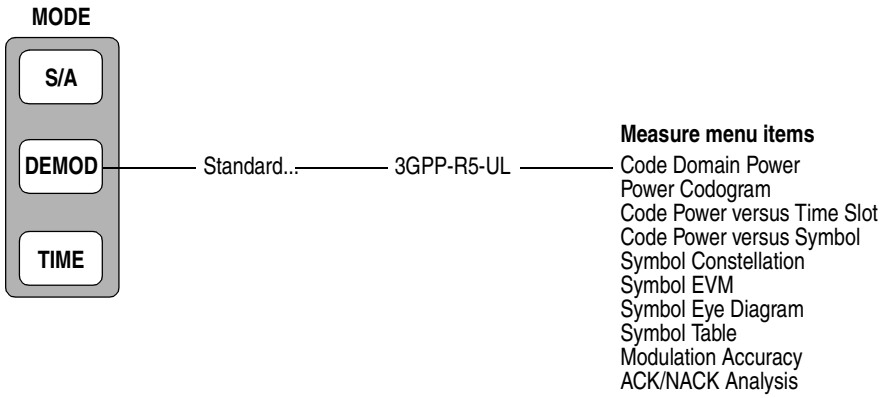


Figure 2-23: Uplink analysis measurement menu in the Demod mode

The 3GPP-R5 uplink modulation analysis is based on the standard digital modulation analysis function. For the digital modulation analysis, refer to the *WCA230A and WCA280A User Manual*.

Measurement Procedure

The following procedure shows you how to acquire data of multiple slots in advance, measure continuous data, and obtain continuous code domain power:

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

1. Press the **DEMOD** key on the front panel.
2. Press the side key **Standard... →3GPP-R5-UL**.
3. Press the **FREQUENCY/CHANNEL** key on the front panel to set frequency.

   If you use the channel table, do these steps:

   - Press the **Channel Table...** side key and select **W-CDMA-UL**.
   - Press the **Channel** side key and select a channel by rotating the general purpose knob.

   The center frequency is set to the value corresponding to the channel.
4. Press the **SPAN** key on the front panel to set the span.
5. Press the **AMPLITUDE** key on the front panel to set the amplitude appropriately.

NOTE. *If the input level is too high, A/D OVERFLOW displays in the red box at the center top of the screen. If this occurs, raise the reference level.*

6. Press the **TIMING** key on the front panel and then the **Acquisition Length** side key to set the time length to acquire one block.

   Suppose that one block contains M frames; the acquisition length is calculated with this equation:

   $$\text{(One block acquisition length)} = M \times \text{(One frame acquisition length)}$$

   One frame acquisition length is determined by span and indicated on the Spectrum Length side key.

   The number of frames M required for measuring N slots must meet the following condition:

   $$M > K \times (N + 1.2) + 1$$

   where
   K = 16.7 (for span 20 MHz and 15 MHz)
   8.34 (for span 10 MHz)
   4.17 (for span 5 MHz)

7. After acquiring measurement data, stop the acquisition.
   If you are acquiring data in the continuous mode, press the **RUN/STOP** key.
8. Press the **MEASURE** key on the front panel and select measurement items.
   For example, press the **Power Codogram** side key to observe the code domain power spectrogram.
9. Press the **MEAS SETUP** key on the front panel and set the measurement parameters. Refer to page 2-48 for details of the Meas Setup menu.
10. Set the analysis range in the overview using the Timing menu.
    Refer to the *WCA230A and WCA280A User Manual* for the details.
11. Press the **Analyze** side key to perform measurement for the frames in the analysis range. The measurement result and waveform are displayed in the main view.

Figure 2-24 shows an example of the code domain power measurement.

Figure 2-24: Example of the code domain power measurement

Change the scale and format of the view as needed. Refer to page 2-54 for setting views specific to the 3GPP-R5 uplink analysis.

Measurement Setup Menu

The Meas Setup menu for the uplink analysis contains the following controls:

Analyze Performs measurements for time slots in the analysis range.

NOTE. *When you change settings in the Meas Setup menu, press the* **Analyze** *side key to perform the measurement for the modified settings.*

Modulation Parameters... Sets a measurement parameter to a non-standard value.
The following setting items are provided:

Measurement Mode... Selects the type of uplink signal.
(Not available for the ACK/NACK analysis.)

- DPDCH/DPCCH (default)
- PRACH
- PCPCH

Scrambling Code Type. *Available for the DPDCH/DPCCH measurement mode*.
Selects the scrambling code type:

- Long (default)
- Short

Scrambling Code. Sets the scrambling code number.
Range: 0 to 16777215 (default: 0).

Threshold. *Available for the PRACH measurement mode*.
Sets the threshold level to detect a burst.
Range: −100 to 10 dB relative to the reference level (default: −30 dB).

Measurement Filter... Selects a filter for demodulating digitally-modulated signals:

- None (no filter)
- RootRaisedCosine (default)

Reference Filter... Selects a filter for creating reference data:

- None (no filter)
- RaisedCosine (default
- Gaussian

For the filters, refer to *Process Flow of Digitally-Modulated Signal* in the *WCA230A and WCA280A User Manual*.

Filter Parameter. Sets an α/BT value for Measurement Filter and Reference Filter described above. Range: 0.0001 to 1 (default: 0.22)

Auto Carrier Selects whether to detect the carrier automatically.

- **On.** *Default.* Automatically detects the carrier for every frame. The error from the center frequency is shown on the **Freq Error** side key.
- **Off.** Sets the carrier frequency using **Frequency Offset**.

Frequency Offset Sets the carrier frequency when Off is selected in **Auto Carrier**. Input the carrier offset from the center frequency.

EVM IQ Origin Offset Determines whether or not to take into account the I/Q origin offset for the EVM, Rho and PCDE measurement results.

- **Include.** *Default.* Takes into account the I/Q origin offset for the results.
- **Exclude.** Ignores the I/Q origin offset for the results.

ACK/NACK Analysis Measurement Menu. The following controls are only for ACK/NACK analysis.

Subframe Offset Select Selects how to specify the subframe offset.

- **Auto.** *Default.* The symbol table is displayed for any offset.
- **STO.** Sets the Subframe to Time-Slot Offset (STO) using the **Subframe to TS Offset** side key.
- **DTO.** Sets the Downlink Time Offset (DTO) using the **Downlink Time Offset** side key.

Subframe to TS Offset Specifies the subframe to time-slot offset when you select **STO** with the **Subframe Offset Select** side key. Range: 0 to 9 symbols (default: 0).

The subframe to time-slot offset is the time offset between the start of the DPDCH time slot and the start of the HS-DPCCH subframe (see Figure 2-25).

Downlink Time Offset Specifies the downlink time offset when you select **DTO** with the **Subframe Offset Select** side key. Range: 0 to 149 symbols (default: 1).

The downlink time offset is the time offset between the start of HS-SCCH and the start of DPCH (see Figure 2-25).

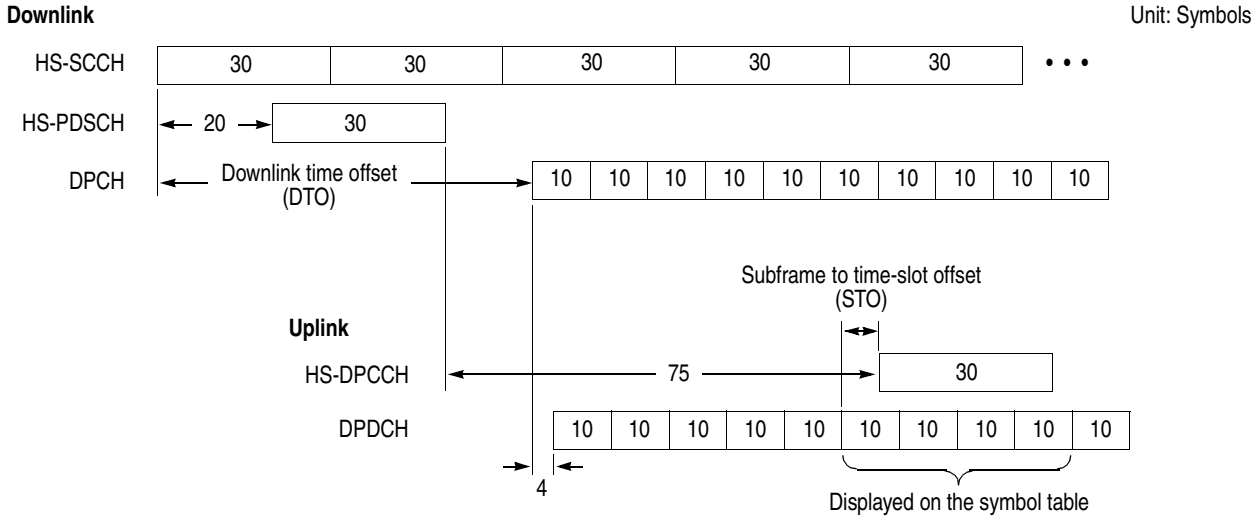


Figure 2-25: Subframe offset

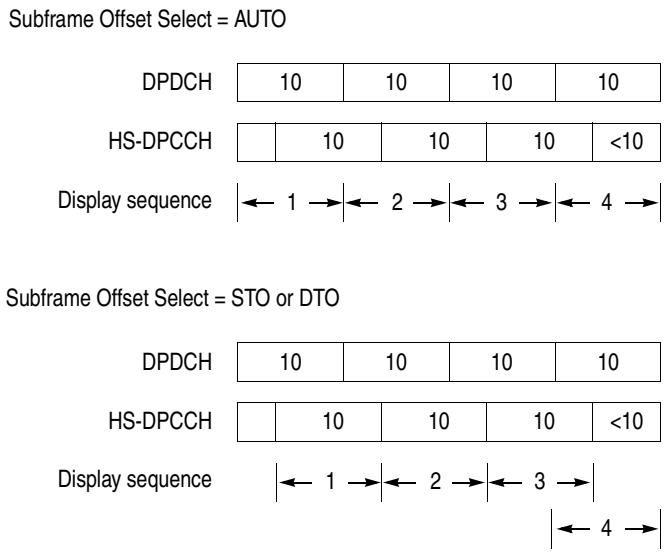
Update ACK/NACK Results Re-detects ACK and NACK indications on the existing time slot data to update the measurement result display after you change the subframe offset manually or abort the Analyze (top side key) operation.

Display Method for HS-DPCCH

The measurement results for each channel are normally displayed in the view for each time slot. But HS-DPCCH has the different display methods for the settings of Subframe Offset Select in the Meas Setup menu. This section describes how to display HS-DPCCH in each view.

Code Domain Power

- *When Subframe Offset Select is set to AUTO*
  Each time slot is displayed without offset as the other channels (see the upper part of Figure 2-26).
- *When Subframe Offset Select is set to STO (Subframe to Time slot Offset)*
  Each time slot is displayed with offset specified by Subframe to TS Offset in the Meas Setup menu. Also in the total power calculation for the relative value display, only HS-DPCCH is offset in the same way. But the last time slot is displayed without offset (see the lower part of Figure 2-26).
- *When Subframe Offset Select is set to DTO (Downlink Time Offset)*
  Each time slot is displayed in the same manner as when Subframe Offset Select is set to STO. But the number of offset symbols is determined by this formula: [151 − (Downlink Time Offset)] mod 10 (see the lower part of Figure 2-26).

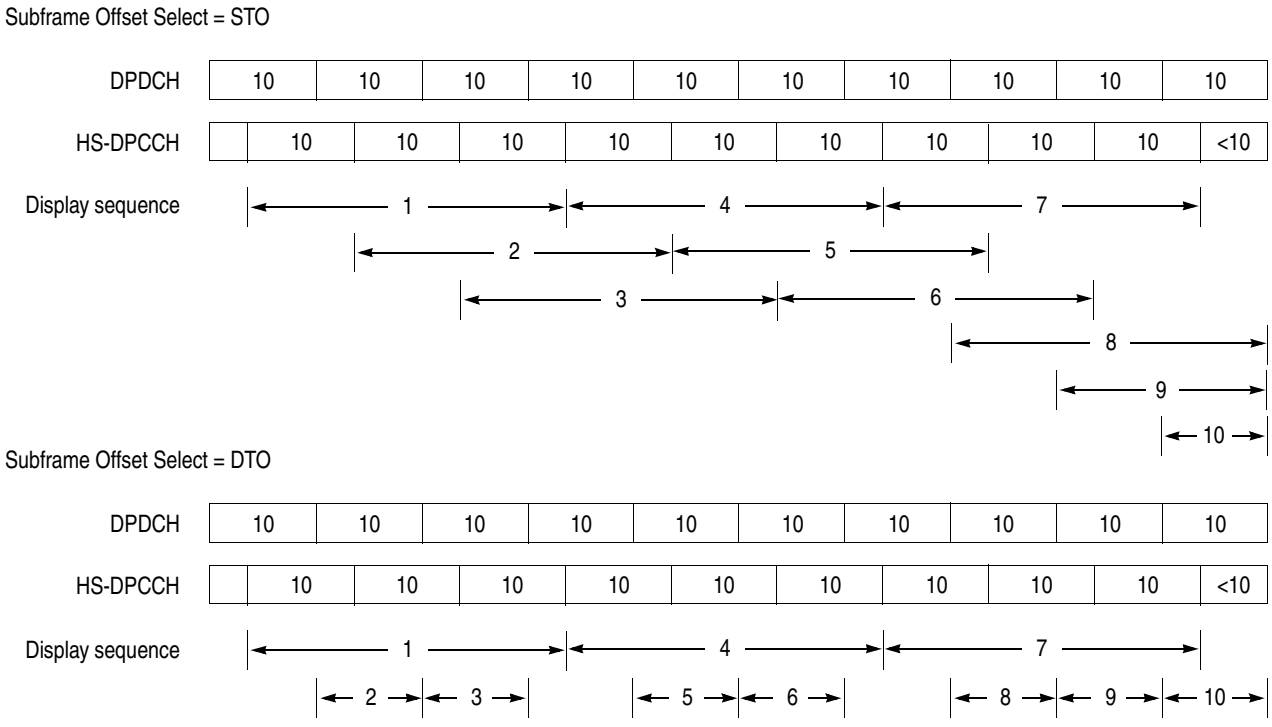


NOTE. "10" in the box represents the number of symbols in a time slot.

Figure 2-26: HS-DPCCH display method (Code domain power)

Code Power versus Symbol

- *When Subframe Offset Select is set to AUTO*
  10 symbols are displayed for each time slot without offset as the other channels (see the upper part of Figure 2-26 on page 2-51).
- *When Subframe Offset Select is set to STO (Subframe to Time slot Offset)*
  30 symbols are displayed for each time slot with offset specified by Subframe to TS Offset in the Meas Setup menu. Also in the total power calculation for the relative value display in the Code power versus Symbol view, only HS-DPCCH is offset in the same way (see the upper part of Figure 2-27). But when there are not enough symbols in the last part of the analysis range, 30, 20, and 10 symbols are displayed without offset as shown in the upper part of Figure 2-27, the display sequence 8, 9, and 10, respectively.
- *When Subframe Offset Select is set to DTO (Downlink Time Offset)*
  If the specified time slot is the first one in the subframe, symbols are displayed in the same manner as when Subframe Offset Select is set to STO. Otherwise symbols are displayed in the same manner as when Subframe Offset Select is set to AUTO (see the lower part of Figure 2-26).

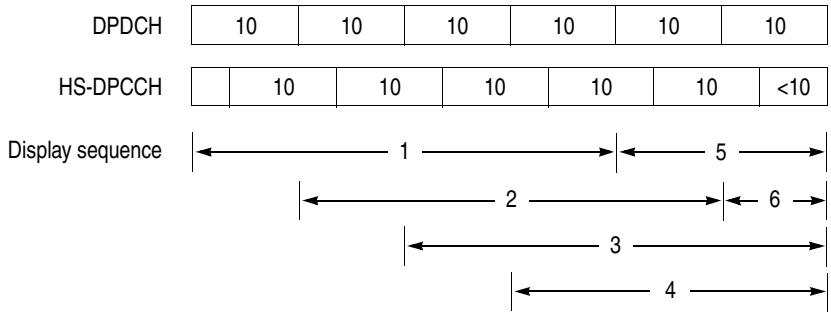


NOTE. "10" in the box represents the number of symbols in a time slot.

Figure 2-27: HS-DPCCH display method (Code power versus Symbol)

ACK/NACK Analysis

Symbols of four time slots (40 symbols) are displayed without offset (see the upper part of Figure 2-28). But for the last three time slots, 30, 20, and 10 symbols are displayed without offset as shown in the Figure 2-28, the display sequence 4, 5, and 6, respectively.



NOTE. "10" in the box represents the number of symbols in a time slot.

Figure 2-28: HS-DPCCH display method (ACK/NACK analysis)

Power Codogram, Code Power versus Time Slot, Symbol Constellation, Symbol EVM, Symbol Eye Diagram, and Symbol Table

Each time slot is displayed regardless HS-DPCCH.

Scale and Format of View

The following main views are specific for the measurement items of the 3GPP-R5 downlink analysis in Demod mode:

- Code domain power
- Power codogram
- Code power versus Time slot
- Code power versus Symbol
- Symbol constellation
- Symbol EVM
- Symbol eye diagram
- Symbol table
- Modulation accuracy
- ACK/NACK analysis

Each view (and its specific menu) is described on the following pages. In the main view, the time slot table shown in Figure 2-29 is displayed in addition to waveform and measurement results. Only the ACK/NACK analysis has its own time slot table, which is shown in Figure 2-39 on page 2-71.

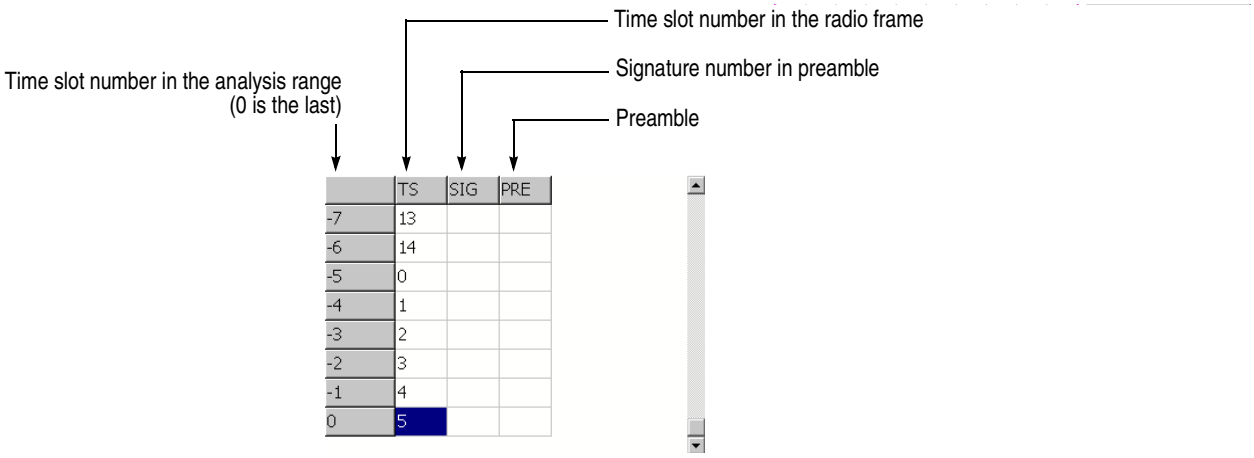


Figure 2-29: Time slot table

View: Define Menu

The View: Define menu is common to all main views of the 3GPP-R5 downlink measurement items. It contains the following controls:

Show Views. Selects the view style:

- **Single.** Displays only the view selected by the VIEW: **SELECT** key.
- **Multi.** *Default.* Displays the overview, subview, and main view.

Overview Content... Selects a view to display in the overview:

- Waveform (power versus time)
- Spectrogram

Subview Content... Selects a view to display in the subview:

- Spectrum
- Code Domain Power
- Power Codogram
- CDP vs Time Slot (code domain power versus time slot)
- CDP vs Symbol (code domain power versus symbol)
- Symbol Constellation
- Symbol EVM
- Symbol Eye Diagram
- Symbol Table
- Modulation Accuracy

Time Slot. Sets a time slot number to position the marker.
Range: 0 to the number of slots –1

Symbol Rate... Sets the symbol rate for displaying symbol constellation:

- 960 k
- 480 k
- 240 k
- 120 k
- 60 k
- 30 k
- 15 k

Channel Number. Sets a channel number to position the marker.
Range: Channel 0 to 7.

Menu Off. Removes the side menu from the screen to expand the waveform and measurement result area. Press the **MENU** side key when you return to the original display.

Change scale and format of the view as needed. For the details, refer to the *WCA230A and WCA280A User Manual* and the *WCA230A and WCA280A Option 23 User Manual.*

Code Domain Power

When you select Code Domain Power in the Measure menu, the code domain power is displayed for each channel, as shown in Figure 2-30.

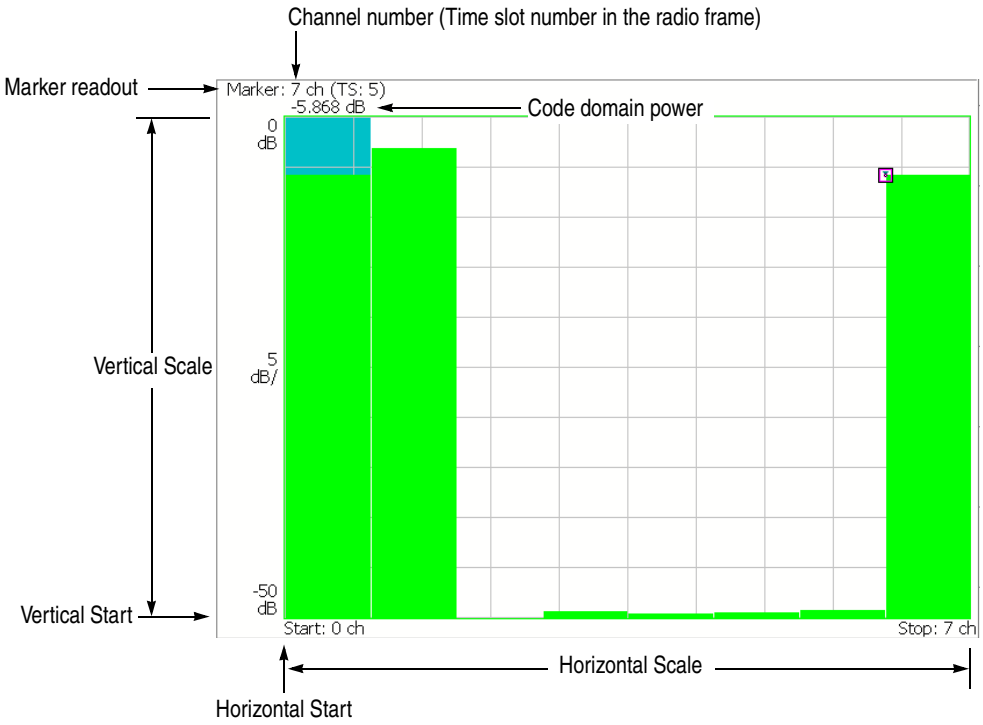


Figure 2-30: Code domain power

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis.
Range: 1 to 8 channels.

Horizontal Start. Sets the start channel number of the horizontal axis.
Range: 0 to [8 − (Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.
Range: 50 µ to 50 dB.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.
Range: −50 to Vertical Scale [dB].

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

Y Axis. Selects whether to represent the vertical axis (amplitude) with relative or absolute values.

- **Relative.** The vertical axis represents power relative to the total power of all channels.
- **Absolute.** The vertical axis represents absolute power of each channel

Power Codogram

When you select Power Codogram in the Measure menu, the code domain power is displayed in spectrogram, as shown in Figure 2-31.

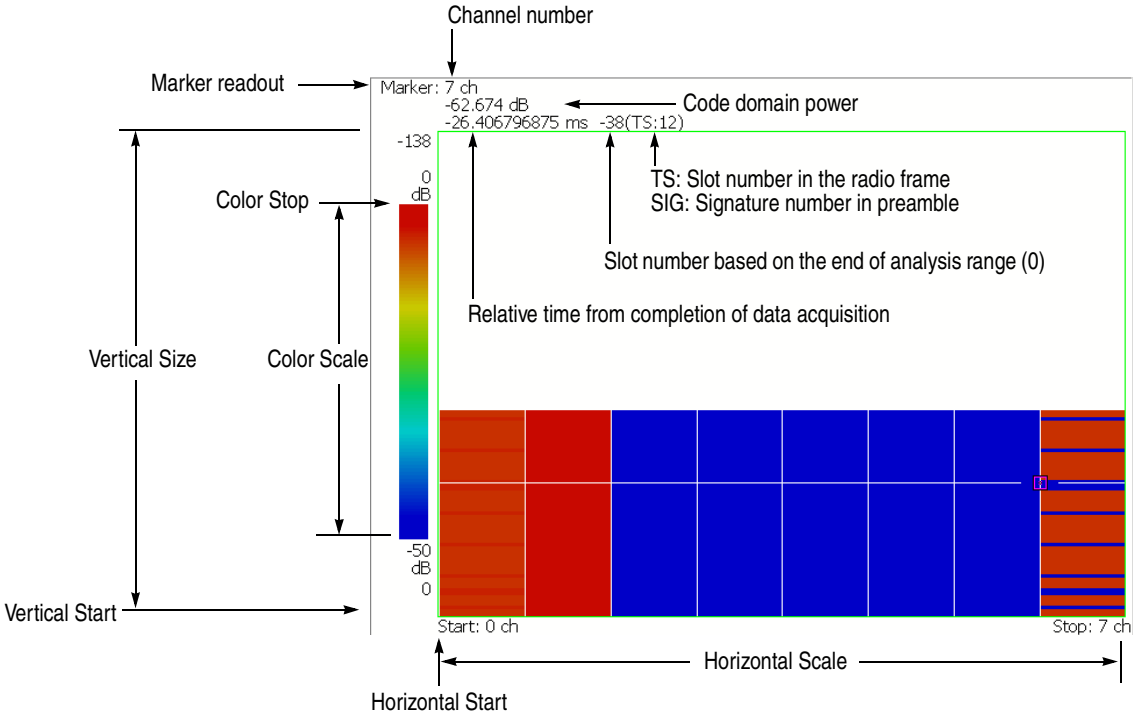


Figure 2-31: Power codogram

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis.
Range: 1 to 8 channels.

Horizontal Start. Sets the start channel number of the horizontal axis.
Range: 0 to [8 − (Horizontal Scale)].

Vertical Size. Sets the full scale of the vertical axis in frames.
Range: 58 to 59392 frames.

Vertical Start. Sets the start frame number of the vertical axis.

Color Scale. Sets the scale (the value subtracting the minimum power value from the maximum) of the color axis:

- 5 dB
- 10 dB
- 20 dB
- 50 dB

The spectrogram is displayed in 100 steps (100 colors) from the minimum value (blue) to the maximum value (red) in the default state.

Color Stop. Sets the maximum value (top edge) of the color axis.
Range: –50 to Color Scale [dB].

Full Scale. Sets Color Stop to 0 (zero) and Color Scale to 50 dB.

Y Axis. Selects whether to represent the Y (color) axis with relative or absolute values.

- **Relative.** The Y axis represents power relative to the total power of all channels.
- **Absolute.** The Y axis represents absolute power of each channel.

Code Power versus Time Slot

When you select Code Power versus Time Slot in the Measure menu, the code domain power is displayed for each slot, as shown in Figure 2-32.

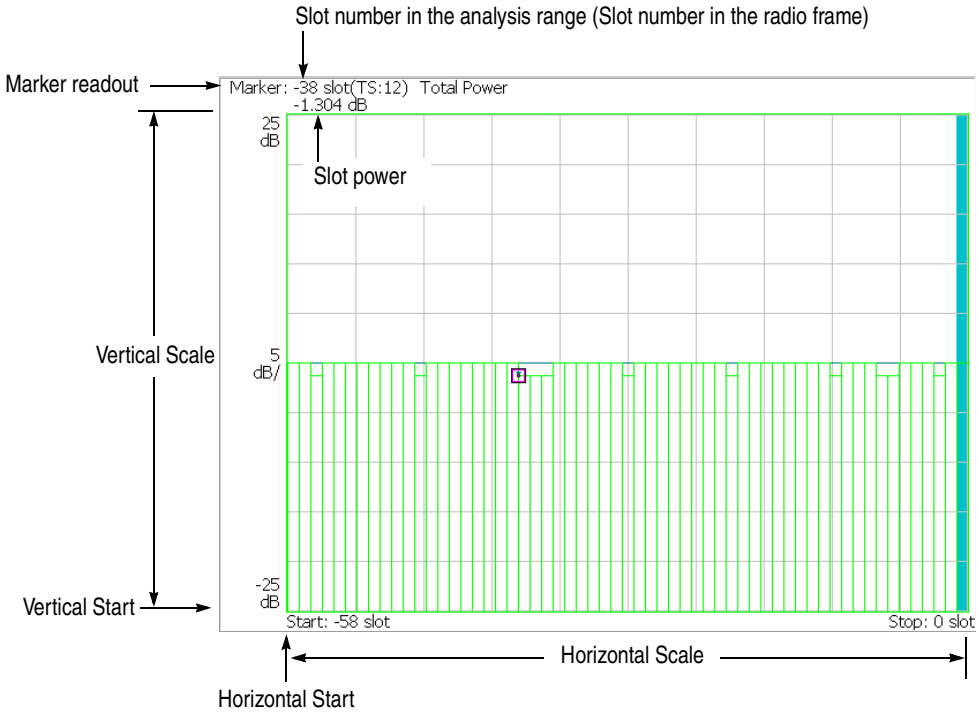


Figure 2-32: Code domain power versus Time slot

View: Scale Menu

Use the following controls to scale the view:

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

Horizontal Scale. Sets the scale of the horizontal axis (number of slots).
Range: N/8 to N slots (N: the number of slots in the analysis range.)

Horizontal Start. Sets the start slot number of the horizontal axis.
Range: −(N − 1) to [1 − (Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.
Range: 50 μ to 50 dB.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.
Range: − 25 to [(Vertical Scale) + 25] dB.

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

Y Axis. Selects whether to represent the vertical (amplitude) axis with relative or absolute values.

- **Relative.** The vertical axis represents time slot power relative to the power of the first time slot in the analysis range.
- **Absolute.** The vertical axis represents absolute power of time slots.

Select Power. Selects the channel to show the power for each time slot.

- **Code.** Shows the power of all channels or the specified channel, depending on the setting of Total Power described below.
- **PSCH.** Shows the power of the P-SCH (Primary Synchronization Channel).
- **SSCH.** Shows the power of the S-SCH (Secondary Synchronization Channel).

Total Power. Determines whether to display the total power for each time slot when you select Code with Select Power described above.

- **On.** *Default.* Displays the total power of all channels for each time slot.
- **Off.** Displays power of the channel specified with Channel Number in the View: Define menu (refer to page 2-56).

Code Power versus Symbol

When you select Code Power versus Symbol in the Measure menu, the code domain power is displayed for each symbol, as shown in Figure 2-33.

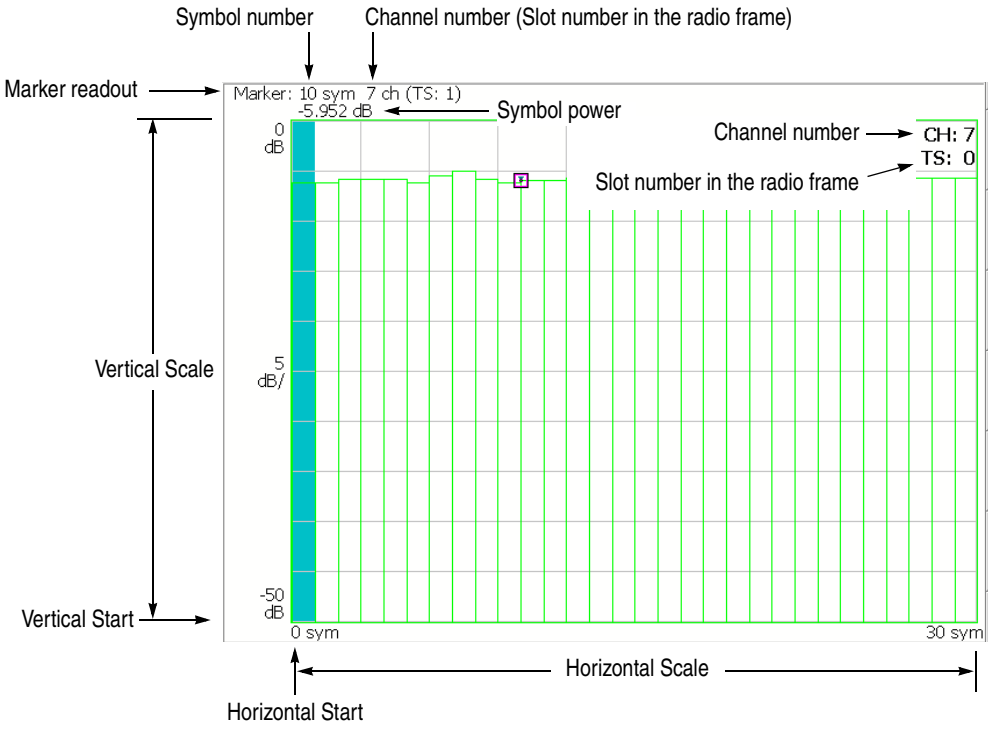


Figure 2-33: Code domain power versus Symbol

View: Scale Menu

Use the following controls to scale the view:

Auto Scale. Sets the start value and the scale of the vertical axis automatically to fit the waveform to the screen.

Horizontal Scale. Sets the scale of the horizontal axis (number of symbols).
Range: 0 to 640 symbols.

Horizontal Start. Sets the start symbol number of the horizontal axis.
Range: 0 to [(initial value of Horizontal Scale) − (set value of Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.
Range: 50 µ to 50 dB.

Vertical Stop. Sets the maximum value (top edge) of the vertical axis.
Range: −50 to Vertical Scale [dB].

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

Y Axis. Selects whether to represent the vertical (amplitude) axis with relative or absolute values.

- **Relative.** The vertical axis represents power relative to the total power of all channels.
- **Absolute.** The vertical axis represents absolute power of each channel.

Symbol Constellation

The symbol constellation is displayed when you select Symbol Constellation in the Measure menu, as shown in Figure 2-34.

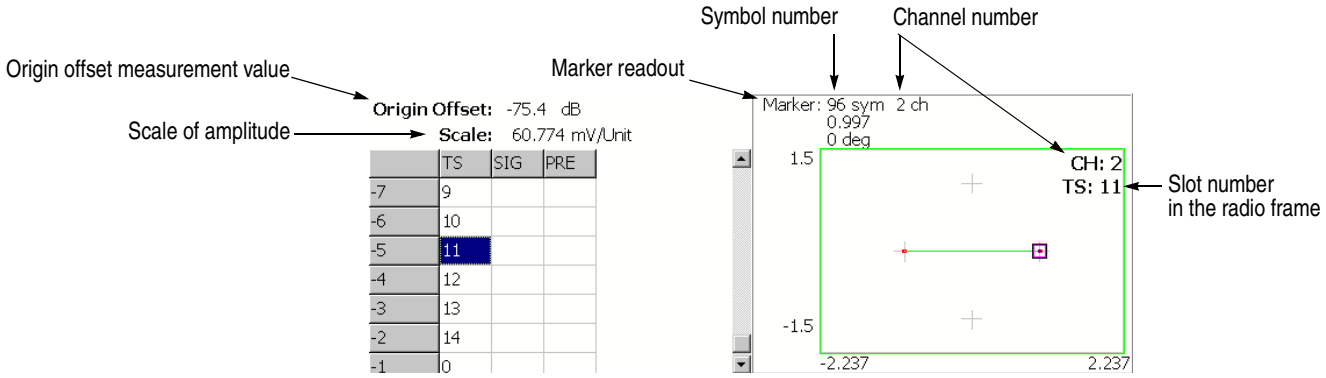


Figure 2-34: Symbol constellation

View: Scale Menu

Use the following controls to set the scale:

Measurement Content... Selects vector or constellation display.

- **Vector.** Selects vector display. A signal represented with phase and amplitude is displayed in polar coordinate or IQ diagram. The red point indicates the symbol position of the measured signal, and the yellow trace indicates the locus of the signal between symbols.
- **Constellation.** Selects constellation display. It is the same as the vector display, except that only symbols of the measured signal are indicated in red, and the locus between symbols is not shown. The cross marks indicate the symbol positions of an ideal signal.

You can select degree or radian for the angular unit by pressing **SYSTEM → Instrument Setup... → Angular Units...**

Symbol EVM

When you select Symbol EVM in the Measure menu, EVM (Error Vector Magnitude) is displayed for each symbol, as shown in Figure 2-35.

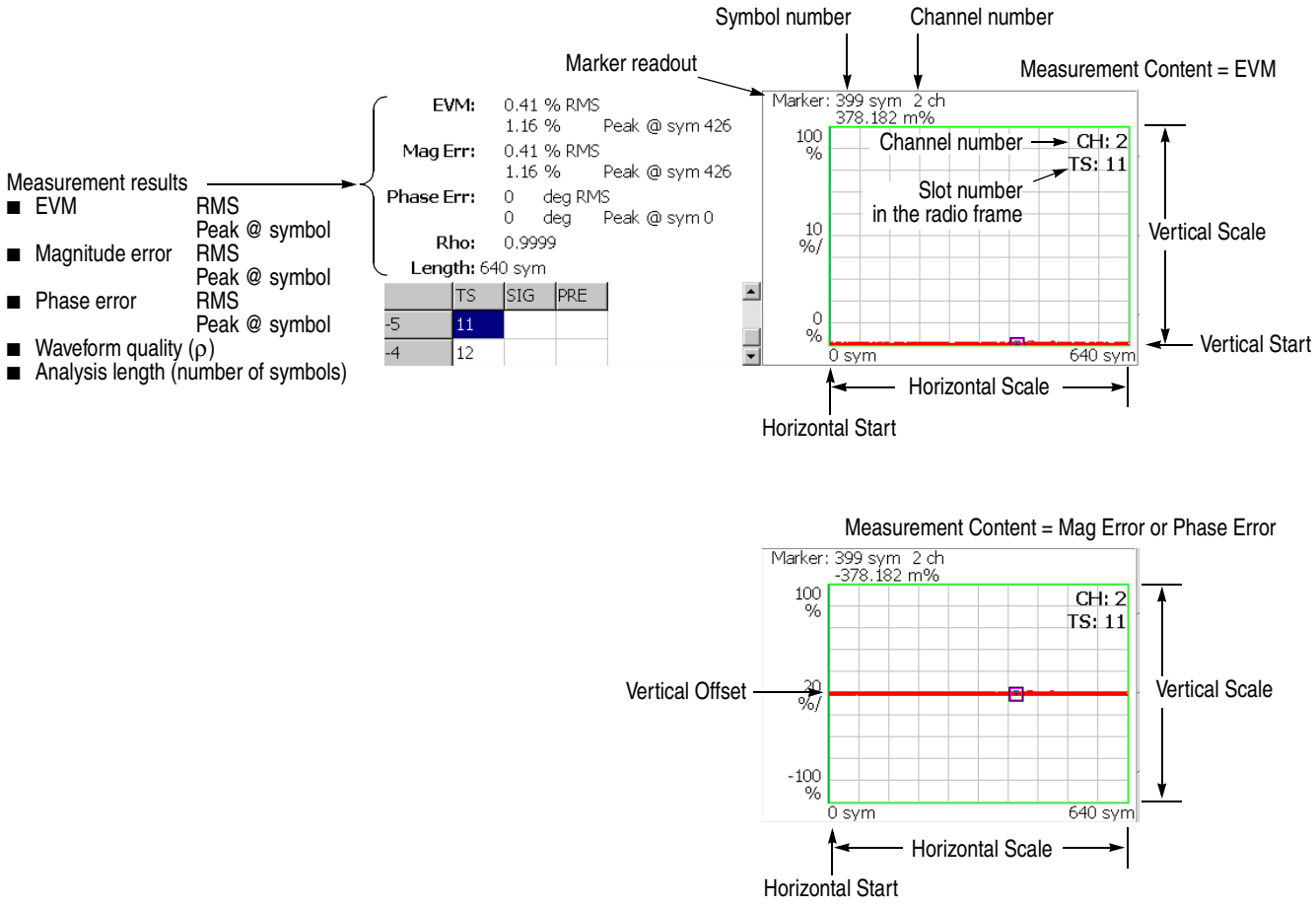


Figure 2-35: Symbol EVM

NOTE. *The uplink signals are BPSK modulated and all channels are mapped on either I or Q axis, so the Symbol EVM view does not show the phase error measurement result. Also, when you set the* Measurement Content *(refer to page 2-67) to* Phase Error, *the measurement waveform is not displayed.*

View: Scale Menu

Use the following controls to scale the view:

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

Horizontal Scale. Sets the scale of the horizontal axis (number of symbols). Range: 0 to 640 symbols.

Horizontal Start. Sets the start symbol number of the horizontal axis. Range: 0 to [(initial value of Horizontal Scale) − (set value of Horizontal Scale)].

Vertical Scale. Sets the scale of the vertical axis.

Vertical Start. Sets the minimum value (bottom edge) of the vertical axis when the measurement content is EVM. Refer to Table 2-4 for the setting range.

Vertical Offset. Sets the center value ((maximum + minimum) / 2) of the vertical axis when the measurement content is Mag Error or Phase Error. Refer to Table 2-4 for the setting range.

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

Measurement Content... Selects how to display the vertical axis:

- **EVM.** Represents the vertical axis with EVM (Error Vector Magnitude).
- **Mag Error.** Represents the vertical axis with magnitude error.
- **Phase Error.** Represents the vertical axis with phase error.

Table 2-4: Vertical scale setting range

Measurement Content...	Vertical Scale	Vertical Start	Vertical Offset
EVM	100µ to 100%	−100 to 100%	-
Mag Error	200µ to 200%	-	−200 to 200%
Phase Error	450µ to 450°	-	−450 to 450°

You can select degree or radian for the angular unit by pressing **SYSTEM** → **Instrument Setup...** → **Angular Units...**

Symbol Eye Diagram

The symbol eye diagram is displayed when you select Symbol Eye Diagram in the Measure menu, as shown in Figure 2-36.

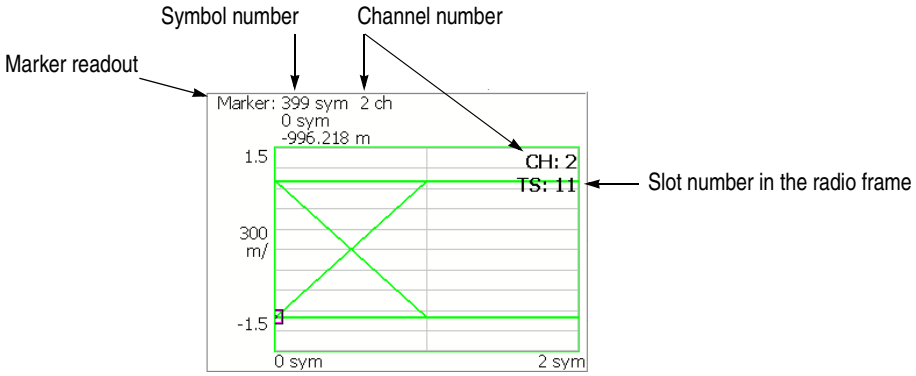


Figure 2-36: Symbol eye diagram

View: Scale Menu

Use the following controls to scale the view:

Measurement Content... Selects the vertical axis of eye diagram.

- **I.** *Default*. Displays I data on the vertical axis.
- **Q.** Displays Q data on the vertical axis.
- **Trellis.** Displays phase on the vertical axis.

Eye Length. Enters the number of display symbols on the horizontal axis. Range: 1 to 16 (default: 2)

Symbol Table

The symbol table is displayed when you select Symbol Table in the Measure menu, as shown in Figure 2-37.

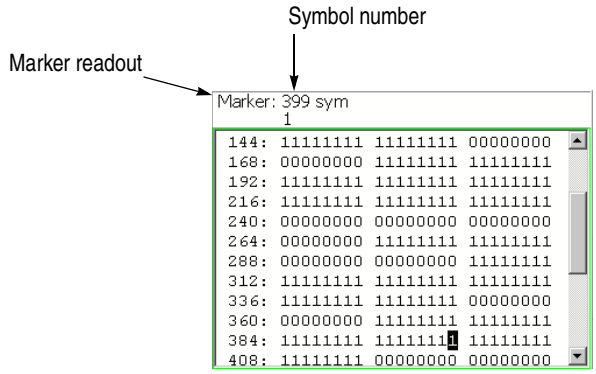


Figure 2-37: Symbol table

View: Scale Menu

Use the following controls to scale the view:

Radix. Selects the radix for displaying the table:

- **Hex.** Hexadecimal digit
- **Oct.** Octal digit
- **Bin.** *Default.* Binary digit

Hex and Oct indicate values of binary data string in units of modulation symbol.

NOTE. *The BPSK modulation signal contains one-bit data in a symbol, so the symbol table has the same values for all the radices.*

Rotate. Sets the start position. Range: 0 to 3.

Modulation Accuracy

The constellation of all channels before the de-spread is displayed when you select Modulation Accuracy in the Measure menu.

When you press the VIEW: **SELECT** key on the front panel to select the constellation view, the measurement results for the time slot are displayed instead of the overview, as shown in Figure 2-38.

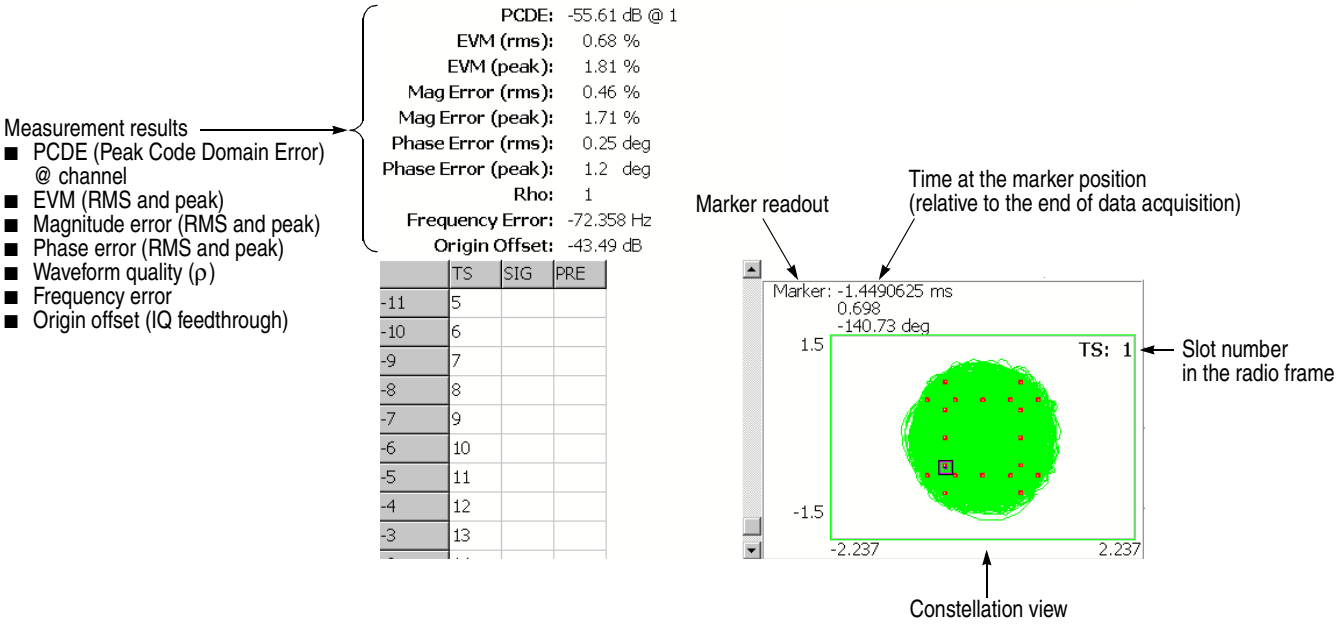


Figure 2-38: Modulation accuracy

The view settings are the same as for Symbol Constellation. Refer to *Symbol Constellation* on page 2-65.

ACK/NACK Analysis

The ACK/NACK analysis detects and displays the arrival of ACK and NACK indications, DTX (Discontinuous Transmission), and CQI (Channel Quality Indicator) from the UE (User Equipment). Also, measures the power versus time against a mask and display other contents of the indications.

Figure 2-39 shows an example of the ACK/NACK analysis measurement display.

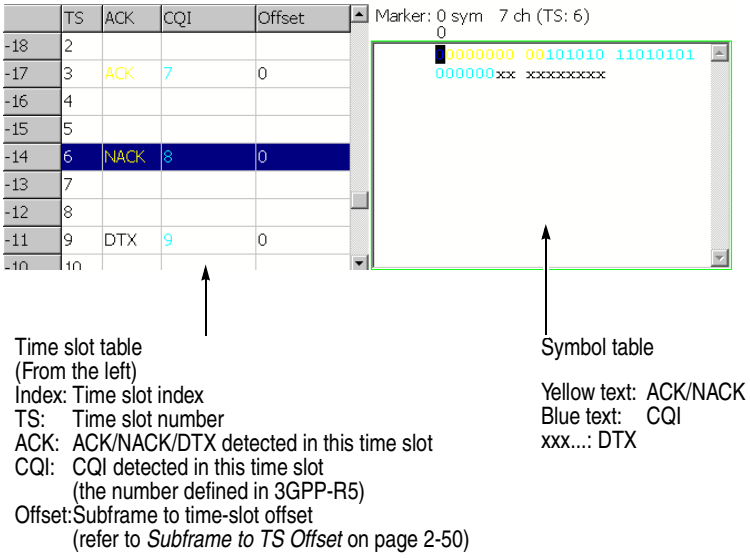


Figure 2-39: ACK/NACK

When the TS index is changed to a time slot that does not contain the beginning of an HS-DPCCH subframe, the symbol table text is all white. When an ACK or NACK time slot is selected, the symbol table text color changes to show the position of the ACK/NACK symbols (yellow) and the CQI symbols (blue).

Syntax and Commands

Command Groups

This section lists the commands added in Option 27 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* (Tektronix part number 071-1255-xx).

NOTE. *The GPIB commands for the WCA200 Series analyzer are based on SCPI Version 1999.0. However, all commands for the WCA230A/WCA280A Option 27 are not defined in the standard.*

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 modes added in Option 27

Mnemonic	Meaning
SADLR5_3G	3GPP-R5 downlink spectrum analysis
SAULR5_3G	3GPP-R5 uplink spectrum analysis
DEMDLR5_3G	3GPP-R5 downlink modulation analysis
DEMULR5_3G	3GPP-R5 uplink modulation analysis

Functional Groups

The commands added in Option 27 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.
:MMEMory	Control file saving/loading to/from the hard disk or floppy disk.
:READ	Obtain the measurement results with acquiring data.
:SENSe	Set up detailed conditions for each measurement.

The following sections list the commands by group.

NOTE. *Throughout the header descriptions in this section, the word* ***Standard*** *in italics is substituted for either of the following two measurement standards:* SADLR5_3GPP *(3GPP-R5 downlink spectrum analysis) or* SAULR5_3GPP *(3GPP-R5 uplink spectrum analysis).*

:CONFigure Commands

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

Table 3-3: :CONFigure commands

Header	Description
:CONFigure:DLR5_3GPP	Sets the analyzer for the modulation analysis in 3GPP-R5 downlink.
:CONFigure:*Standard*:ACLR	Sets the analyzer to the ACLR measurement default settings.
:CONFigure:*Standard*:CFRequency	Sets the analyzer to the carrier frequency measurement default settings.
:CONFigure:*Standard*:CHPower	Sets the analyzer to the channel power measurement default settings.
:CONFigure:*Standard*:EBWidth	Sets the analyzer to the EBW measurement default settings.
:CONFigure:SADLR5_3GPP:MCAClr	Sets the analyzer to the multi-carrier ACLR measurement default settings.
:CONFigure:*Standard*:OBWidth	Sets the analyzer to the OBW measurement default settings.
:CONFigure:*Standard*:SEMask	Sets the analyzer to the spectrum emission mask test default settings.
:CONFigure:ULR5_3GPP	Sets the analyzer for the modulation analysis in 3GPP-R5 uplink.

:DISPlay Commands

Control how to show measurement data on the screen.

Table 3-4: :DISPlay commands

Header	Description
:DISPlay:DLR5_3GPP subgroup	Related to modulation analysis for 3GPP-R5 downlink
:DISPlay:DLR5_3GPP:AVIew:CCODe(?)	Sets the channelization code to position the marker.
:DISPlay:DLR5_3GPP:AVIew:MSLot:HEAD(?)	Sets the number of the head of the time slot to be displayed.
:DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe](?)	Determines whether to display the multiple or the single slot.
:DISPlay:DLR5_3GPP:AVIew:SHORtcode(?)	Selects the short code to display.
:DISPlay:DLR5_3GPP:AVIew:SRATe(?)	Selects the symbol rate for downlink analysis.
:DISPlay:DLR5_3GPP:AVIew:SSCHpart(?)	Determines whether to show SCH.
:DISPlay:DLR5_3GPP:AVIew:TSLot(?)	Selects the time slot to display.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet(?)	Sets the minimum color-axis value (bottom end) in the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe(?)	Sets the color-axis full scale in the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat(?)	Selects the main view display format.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:RADix(?)	Selects the base of symbols in the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:OFFSet(?)	Sets the minimum horizontal value (left end) in the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe(?)	Sets the horizontal full scale in the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FIT	Runs auto-scale on the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FULL	Sets the main view's vertical axis to the default full scale.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet(?)	Sets the minimum vertical value (bottom end) in the main view.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit(?)	Selects the unit for the main view's vertical axis.
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:RANGe(?)	Sets the vertical full scale in the main view.
:DISPlay:*Standard* subgroup	Related to spectrum analysis for 3GPP-R5 downlink
:DISPlay:*Standard*:SPECtrum:X[:SCALe]:OFFSet(?)	Sets the minimum horizontal value (left end).
:DISPlay:*Standard*:SPECtrum:X[:SCALe]:PDIVision(?)	Defines the display area along the horizontal axis.
:DISPlay:*Standard*:SPECtrum:Y[:SCALe]:FIT	Runs auto-scale.
:DISPlay:*Standard*:SPECtrum:Y[:SCALe]:FULL	Sets the vertical axis to the default full scale.
:DISPlay:*Standard*:SPECtrum:Y[:SCALe]:OFFSet(?)	Sets the minimum vertical value (bottom end).
:DISPlay:*Standard*:SPECtrum:Y[:SCALe]:PDIVision(?)	Sets the vertical full scale.
:DISPlay:ULR5_3GPP subgroup	Related to modulation analysis for 3GPP-R5 uplink
:DISPlay:ULR5_3GPP:AVIew:CNUMber(?)	Sets the channelization code to position the marker.
:DISPlay:ULR5_3GPP:AVIew:SRATe(?)	Selects the symbol rate for uplink analysis.
:DISPlay:ULR5_3GPP:AVIew:TSLot(?)	Selects the time slot to display.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet(?)	Sets the minimum color-axis value (bottom end) in the subview.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe(?)	Sets the color-axis full scale in the subview.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat(?)	Selects the subview display format.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:RADix(?)	Selects the base of symbols in the subview.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:X[:SCALe]:OFFSet(?)	Sets the minimum horizontal value (left end) in the subview.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe(?)	Sets the horizontal full scale in the subview.

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

Header	Description
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FIT	Runs auto-scale on the subview.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FULL	Sets the subview's vertical axis to the default full scale.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet(?)	Sets the minimum vertical value (bottom end) in the subview.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit(?)	Selects the unit for the subview's vertical axis.
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:RANGe(?)	Sets the vertical full scale in the subview.

: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:DLR5_3GPP subgroup	Related to modulation analysis for 3GPP-R5 downlink
:FETCh:DLR5_3GPP?	Returns measurement results of the downlink modulation analysis.
:FETCh:*Standard* subgroup	3GPP-R5 spectrum analysis related
:FETCh:*Standard*:ACLR?	Returns the ACLR measurement results.
:FETCh:*Standard*:CFRequency?	Returns the carrier frequency measurement results.
:FETCh:*Standard*:CHPower?	Returns the channel power measurement results.
:FETCh:*Standard*:EBWidth?	Returns the EBW measurement results.
:FETCh:SADLR5_3GPP:MCAClr?	Returns the multi-carrier ACLR measurement results.
:FETCh:*Standard*:OBWidth?	Returns the OBW measurement results.
:FETCh:*Standard*:SEMask?	Returns the spectrum emission mask measurement results.
:FETCh:*Standard*:SPECtrum:ACLR?	Returns spectrum waveform data of the ACLR measurement.
:FETCh:*Standard*:SPECtrum:CFRequency?	Returns spectrum waveform data of the carrier frequency measurement.
:FETCh:*Standard*:SPECtrum:CHPower?	Returns spectrum waveform data of the channel power measurement.
:FETCh:*Standard*:SPECtrum:EBWidth?	Returns spectrum waveform data of the EBW measurement.
:FETCh:SADLR5_3GPP:SPECtrum:MCAClr?	Returns spectrum waveform data of the multi-carrier ACLR measurement.
:FETCh:*Standard*:SPECtrum:OBWidth?	Returns spectrum waveform data of the OBW measurement.
:FETCh:*Standard*:SPECtrum:SEMask?	Returns spectrum waveform data of the spectrum emission mask measurement.
:FETCh:ULR5_3GPP subgroup	Related to modulation analysis for 3GPP-R5 uplink
:FETCh:ULR5_3GPP?	Returns measurement results of the uplink modulation analysis.

:MMEMory Commands

Use these commands to manipulate files on the hard disk or floppy disk.

Table 3-6: :MMEMory commands

Header	Description
:MMEMory:LOAD:LIMit	Loads the limit from the specified file.
:MMEMory:STORe:LIMit	Stores the limit in the specified file.
:MMEMory:STORe:STABle	Stores the symbol table in the specified file.

: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 3-7: :READ commands

Header	Description
:READ:*Standard*:ACLR?	Returns the ACLR measurement results.
:READ:*Standard*:CFRequency?	Returns the carrier frequency measurement results.
:READ:*Standard*:CHPower?	Returns the channel power measurement results.
:READ:*Standard*:EBWidth?	Returns the EBW measurement results.
:READ:SADLR5_3GPP:MCACIr?	Returns the multi-carrier ACLR measurement results.
:READ:*Standard*:OBWidth?	Returns the OBW measurement results.
:READ:*Standard*:SEMask?	Returns the spectrum emission mask measurement results.
:READ:*Standard*:SPECtrum:ACLR?	Returns spectrum waveform data of the ACLR measurement.
:READ:*Standard*:SPECtrum:CFRequency?	Returns spectrum waveform data of the carrier frequency measurement.
:READ:*Standard*:SPECtrum:CHPower?	Returns spectrum waveform data of the channel power measurement.
:READ:*Standard*:SPECtrum:EBWidth?	Returns spectrum waveform data of the EBW measurement.
:READ:SADLR5_3GPP:SPECtrum:MCACIr?	Returns spectrum waveform data of the multi-carrier ACLR measurement.
:READ:*Standard*:SPECtrum:OBWidth?	Returns spectrum waveform data of the OBW measurement.
:READ:*Standard*:SPECtrum:SEMask?	Returns spectrum waveform data of the spectrum emission mask measurement.

:SENSe Commands

Set the detailed measurement conditions.

Table 3-8: :SENSe commands

Header	Description
[:SENSe]:DLR5_3GPP subgroup	Related to the 3GPP-R5 modulation analysis.
[:SENSe]:DLR5_3GPP:BLOCk(?)	Sets the number of the block to measure.
[:SENSe]:DLR5_3GPP:CARRier:OFFSet(?)	Sets the carrier frequency offset.
[:SENSe]:DLR5_3GPP:CARRier:SEARch(?)	Determines whether to detect the carrier automatically.
[:SENSe]:DLR5_3GPP:COMPosite(?)	Determines whether to perform the composite analysis.
[:SENSe]:DLR5_3GPP:DTYPe:SEARch(?)	Determines whether to detect the demodulation type of the code channel.
[:SENSe]:DLR5_3GPP:EVM:IQOoffset(?)	Determines whether to include the I/Q origin offset in the analysis.
[:SENSe]:DLR5_3GPP:FILTer:ALPHa(?)	Sets the filter factor.
[:SENSe]:DLR5_3GPP:FILTer:MEASurement(?)	Selects the measurement filter.
[:SENSe]:DLR5_3GPP:FILTer:REFerence(?)	Selects the reference filter.
[:SENSe]:DLR5_3GPP[:IMMediate]	Runs the 3GPP-R5 downlink analysis calculation on the acquired data.
[:SENSe]:DLR5_3GPP:LENGth(?)	Defines the analysis range.
[:SENSe]:DLR5_3GPP:OFFSet(?)	Sets the measurement start position.
[:SENSe]:DLR5_3GPP:SCHPart(?)	Determines whether to include the SCH part in the analysis.
[:SENSe]:DLR5_3GPP:SCODe:ALTernative(?)	Selects the alternative scrambling code.
[:SENSe]:DLR5_3GPP:SCODe:NUMBer(?)	Sets the scrambling code.
[:SENSe]:DLR5_3GPP:SCODe:SEARch(?)	Determines whether to enable automatic detection of the scrambling code.
[:SENSe]:*Standard*:ACLR subgroup	Related to the ACLR measurement.
[:SENSe]:*Standard*:ACLR:FILTer:COEFficient (?)	Sets the filter factor (α/BT).
[:SENSe]:*Standard*:ACLR:FILTer:TYPE (?)	Selects a filter.
[:SENSe]:*Standard*:ACLR:SGAin (?)	Sets or queries the gain offset for the second adjacent channel.
[:SENSe]:*Standard*:ACLR:LIMit:ADJacent<x>[:STATe] (?)	Determines whether to enable the adjacent limit testing.
[:SENSe]:*Standard*:CFRequency subgroup	Related to the carrier frequency measurement.
[:SENSe]:*Standard*:CFRequency:CRESolution(?)	Sets the counter resolution.
[:SENSe]:*Standard*:CHPower subgroup	Related to the channel power measurement.
[:SENSe]:*Standard*:CHPower:BANDwidth|:BWIDth :INTegration(?)	Sets the channel bandwidth for the channel power measurement.
[:SENSe]:*Standard*:CHPower:FILTer:COEFficient(?)	Sets the filter roll-off rate for the channel power measurement.
[:SENSe]:*Standard*:CHPower:FILTer:TYPE(?)	Selects the filter for the channel power measurement
[:SENSe]:*Standard*:CHPower:LIMit[:STATe](?)	Determines whether to enable the limit testing.
[:SENSe]:*Standard*:EBWidth subgroup	Related to the EBW measurement.
[:SENSe]:*Standard*:EBWidth:XDB(?)	Sets the relative power from the peak for the measurement.

Table 3-8: :SENSe commands (cont.)

Header	Description
[:SENSe]:SADLR5_3GPP:MCAClr subgroup	Related to the multi-carrier ACLR measurement.
[:SENSe]:SADLR5_3GPP:MCAClr:CARRier[:THReshold](?)	Sets the threshold level to detect the carrier.
[:SENSe]:SADLR5_3GPP:MCAClr:FILTer:COEFficient(?)	Sets the filter factor (α/BT).
[:SENSe]:SADLR5_3GPP:MCAClr:FILTer:TYPE(?)	Selects a filter.
[:SENSe]:SADLR5_3GPP:MCAClr:LIMit:ADJacent<x>[:STATe](?)	Determines whether to enable the adjacent limit testing.
[:SENSe]:SADLR5_3GPP:MCAClr:NCORrection(?)	Determines whether to perform the noise correction.
[:SENSe]:*Standard*:OBWidth subgroup	Related to the OBW measurement.
[:SENSe]:*Standard*:OBWidth:LIMit[:STATe](?)	Determines whether to enable the limit testing.
[:SENSe]:*Standard*:OBWidth:PERCent(?)	Sets the occupied bandwidth for the OBW measurement.
[:SENSe]]:*Standard*:SEMask subgroup	Related to the spectrum emission mask measurement.
[:SENSe]:*Standard*:SEMask:BANDwidth|:BWIDth:INTegration(?)	Sets the channel bandwidth for the spectrum emission mask measurement.
[:SENSe]:*Standard*:SEMask:FILTer:COEFficient(?)	Sets the filter roll-off rate for the spectrum emission mask measurement.
[:SENSe]:*Standard*:SEMask:FILTer:TYPE(?)	Selects the filter for the spectrum emission mask measurement.
[:SENSe]:*Standard*:SEMask:LIMit:ZONE<x>[:STATe](?)	Determines whether to enable the zone limit testing.
[:SENSe]:*Standard*:SEMask:RCHannel:LEVel(?)	Sets the reference channel level to measure the spurious emission level.
[:SENSe]:*Standard*:SEMask:RCHannel:MODE(?)	Selects the mode to define the reference channel level.
[:SENSe]:ULR5_3GPP subgroup	Related to modulation analysis for 3GPP-R5 uplink.
[:SENSe]:ULR5_3GPP:BLOCk(?)	Sets the number of the block to be measured.
[:SENSe]:ULR5_3GPP:CARRier:OFFSet(?)	Sets the carrier frequency offset.
[:SENSe]:ULR5_3GPP:CARRier:SEARch(?)	Determines whether to detect the carrier automatically.
[:SENSe]:ULR5_3GPP:FILTer:ALPHa(?)	Sets the filter factor (α/BT).
[:SENSe]:ULR5_3GPP:FILTer:MEASurement(?)	Selects the measurement filter.
[:SENSe]:ULR5_3GPP:FILTer:REFerence(?)	Selects the reference filter.
[:SENSe]:ULR5_3GPP[:IMMediate]	Starts 3GPP-R5 downlink analysis calculation.
[:SENSe]:ULR5_3GPP:LENGth(?)	Defines the analysis range.
[:SENSe]:ULR5_3GPP:OFFSet(?)	Sets the measurement start position.
[:SENSe]:ULR5_3GPP:SCODe:NUMBer(?)	Sets the scrambling code number.
[:SENSe]:ULR5_3GPP:SCODe:TYPE(?)	Selects or queries the scrambling code type.
[:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe(?)	Sets the downlink time offset.
[:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot](?)	Sets or queries the subframe to time-slot offset.
[:SENSe]:ULR5_3GPP:SFRame:SEARch(?)	Determines whether to detect the subframe offset automatically.
[:SENSe]:ULR5_3GPP:UANResult	Updates the ACK/NACK results.

:CONFigure Commands

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

Command Tree

Header	Parameter
:CONFigure	
:DLR5_3GPP	
:SADLR5_3GPP|:SAULR5_3GPP	
:ACLR	
:CFRequency	
:CHPower	
:EBWidth	
:MCAClr	
:OBWidth	
:SEMask	
:ULR5_3GPP	

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

:CONFigure:DLR5_3GPP (No Query Form)

Sets the analyzer to the default settings for the 3GPP-R5 downlink modulation measurements. This command is equivalent to the following key sequence:

DEMOD key →**Standard...** side key →**3GPP-R5-DL** side key →**PRESET** key

Syntax `:CONFigure:DLR5_3GPP`

Arguments None

Measurement Modes DEMDLR5_3G

Examples `:CONFigure:DLR5_3GPP`
sets the analyzer to the default settings for the 3GPP-R5 downlink modulation measurements.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:ACLR (No Query Form)

Sets the analyzer to the default settings of the ACLR (Adjacent Channel Leakage Power Ratio) measurement for 3GPP-R5. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →{ **3GPP-R5-DL** | **3GPP-R5-UL** } side key →**PRESET** key →**ACLR** side key

Syntax `:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:ACLR`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:CONFigure:SADLR5_3GPP:ACLR`
sets the analyzer to the default settings of the downlink ACLR measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:CFRequency (No Query Form)

Sets the analyzer to the default settings of the carrier frequency measurement for 3GPP-R5. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →{ **3GPP-R5-DL | 3GPP-R5-UL** } side key →**PRESET** key →**Carrier Frequency** side key

Syntax `:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:CFRequency`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:CONFigure:SADLR5_3GPP:CFRequency`
sets the analyzer to the default settings of the downlink carrier frequency measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:CHPower (No Query Form)

Sets the analyzer to the default settings of the channel power measurement for 3GPP-R5. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →{ **3GPP-R5-DL | 3GPP-R5-UL** } side key →**PRESET** key →**Channel Power** side key

Syntax `:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:CHPower`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:CONFigure:SADLR5_3GPP:CHPower`
sets the analyzer to the default settings of the downlink channel power measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:EBWidth (No Query Form)

Sets the analyzer to the default settings of the EBW (Emission Bandwidth) measurement for 3GPP-R5. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →{ **3GPP-R5-DL | 3GPP-R5-UL** } side key →**PRESET** key →**EBW** side key

Syntax `:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:EBWidth`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:CONFigure:SADLR5_3GPP:EBWidth`
sets the analyzer to the default settings of the downlink EBW measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP:MCAClr (No Query Form)

Sets the analyzer to the default settings of the multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink analysis. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →**3GPP-R5-DL** side key →**PRESET** key →**MC-ACLR** side key

Syntax `:CONFigure:SADLR5_3GPP:MCAClr`

Arguments None

Measurement Modes SADLR5_3G

Examples `:CONFigure:SADLR5_3GPP:MCAClr`
sets the analyzer to the default settings of the multi-carrier ACLR measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:OBWidth (No Query Form)

Sets the analyzer to the default settings of the OBW (Occupied Bandwidth) measurement for 3GPP-R5. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →{ **3GPP-R5-DL | 3GPP-R5-UL** } side key →**PRESET** key →**OBW** side key

Syntax `:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:OBW`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:CONFigure:SADLR5_3GPP:OBWidth`
sets the analyzer to the default settings of the downlink OBW measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:SEMask (No Query Form)

Sets the analyzer to the default settings of the spectrum emission mask measurement for 3GPP-R5. This command is equivalent to the following key sequence:

S/A key →**Standard...** side key →{ **3GPP-R5-DL | 3GPP-R5-UL** } side key →**PRESET** key →**Spectrum Emission Mask** side key

Syntax `:CONFigure:SADLR5_3GPP|:SAULR5_3GPP:SEMask`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:CONFigure:SADLR5_3GPP:SEMask`
sets the analyzer to the default settings of the downlink spectrum emission mask measurement.

Related Commands `:INSTrument[:SELect]`

:CONFigure:ULR5_3GPP (No Query Form)

Sets the analyzer to the default settings of the 3GPP-R5 uplink modulation analysis. This command is equivalent to the following key sequence:

DEMOD key →**Standard...** side key →**3GPP-R5-UL** side key →**PRESET** key

Syntax `:CONFigure:ULR5_3GPP`

Arguments None

Measurement Modes DEMULR5_3G

Examples `:CONFigure:ULR5_3GPP`
sets the analyzer to the default settings for the 3GPP-R5 uplink modulation measurements.

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 3-9: :DISPlay command subgroups

Command header	Function	Refer to:
:DISPlay:DLR5_3GPP	Controls display for the 3GPP-R5 downlink modulation analysis.	page 3-16
:DISPlay:SADLR5_3GPP|:SAULR5_3GPP	Controls display of the 3GPP-R5 spectrum analysis.	page 3-35
:DISPlay:ULR5_3GPP	Controls display for the 3GPP-R5 uplink modulation analysis.	page 3-39

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

:DISPlay:DLR5_3GPP Subgroup

The :DISPlay:DLR5_3GPP commands control display of the 3GPP-R5 downlink modulation analysis.

NOTE. *To use a command from this group, you must have selected DEMDLR5_3G (3GPP-R5 downlink modulation analysis) in the :INSTrument[:SELect] command.*

Command Tree

Header	Parameter
:DISPlay	
:DLR5_3GPP	
:AVIew	
:CCODe	<number>
:MSLot	
:HEAD	<numeric_value>
[:STATe]	<boolean>
:SHORtcode	<number>
:SRATe	COMPosite | R960S | R480S | R240S | R120S | R60S | R30S | R15S | R7P5S
:SSCHpart	<boolean>
:TSLot	<number>
:MVIew|:SVIew	
:COLor	
[:SCALe]	
:OFFSet	<amplitude>
:RANge	<relative_amplitude>
:ELENgth	<numeric_value>
:FORMat	OFF | CSGRam | CPCCode | CPSHortcode | CPSYmbol | CPTSlot | SCONste | SVECtor | SEVM | SMERror | SPERror | SIEYe | SQEYe | STEYe | STABle | CONSte | VECTor
:POWer	
:SELect	CODE | PSCH | SSCH
[:TOTal]	<boolean>
:RADix	BINary | OCTal | HEXadecimal
:ROTation	<numeric_value>
:X	
[:SCALe]	
:OFFSet	<numeric_value>
:RANGe	<numeric_value>
:Y	
[:SCALe]	
:FIT	
:FULL	
:OFFSet	<numeric_value>
:PUNit	RELative | ABSolute
:RANGe	<numeric_value>

:DISPlay:DLR5_3GPP:AVIew:CCODe(?)

Sets or queries the channelization code to position the marker in the 3GPP-R5 downlink modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:CCODe <number>
:DISPlay:DLR5_3GPP:AVIew:CCODe?
```

Arguments

<number>::=<NR1> specifies the channelization code number.
Range: Channel 0 to 511.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:CCODe 100
```
sets the channelization code to 100 to position the marker.

:DISPlay:DLR5_3GPP:AVIew:MSLot:HEAD(?)

Sets or queries the index of the time slot to be displayed at the left edge on the view when :DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe] is On. This function is not supported by local operation.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:MSLot:HEAD <number>
:DISPlay:DLR5_3GPP:AVIew:MSLot:HEAD?
```

Arguments

<number>::=<NR1> specifies the index of the time slot to be displayed at the left edge on the view. Range: –15985 to –14.

When the number of analyzed time slots is 15 or less, this command has no effect on the analyzer setting and the query returns the value of –(the number of analyzed time slots – 1).

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:MSLot:HEAD –100
```
sets the number of the head of the time slot to –100.

Related Commands

```
:DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe]
```

:DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe](?)

Determines whether to display the multiple or the single slot.

The multiple slot is valid when :DISPlay:DLR5_3GPP:MVIew:FORMat is set to CPSYmbol, CPRSlot, SEVM, SMERror, SPERror, or CSGRam.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe]
   { OFF | ON | 0 | 1 }

:DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe]?
```

Arguments

OFF or 0 displays the single slot.

ON or 1 displays the multiple slot. You can specify the index of the time slot to be displayed at the left edge on the view with the :DISPlay:DLR5_3GPP:AVIew :MSLot:HEAD command.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:MSLot:STATe ON
```

displays the multiple slot.

Related Commands

:DISPlay:DLR5_3GPP:AVIew:MSLot:HEAD, :DISPlay:DLR5_3GPP:MVIew:FORMat

:DISPlay:DLR5_3GPP:AVIew:SHORtcode(?)

Sets or queries the short code (channelization code) to position the marker in the 3GPP-R5 downlink modulation analysis.

This command is equivalent to :DISPlay:DLR5_3GPP:AVIew:CCODe.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:SHORtcode <number>
```

```
:DISPlay:DLR5_3GPP:AVIew:SHORtcode?
```

Arguments

<number>::=<NR1> specifies the short code number.
Range: Channel 0 to 511.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:SHORtcode 100
```
sets the short code to 100 to position the marker.

Related Commands

```
:DISPlay:DLR5_3GPP:AVIew:CCODe
```

:DISPlay:DLR5_3GPP:AVIew:SRATe(?)

Sets or queries the symbol rate for the measurement in the 3GPP-R5 downlink modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:SRATe { COMPosite | R960S
| R480S | R240S | R120S | R60S | R30S | R15S | R7P5S }

:DISPlay:DLR5_3GPP:AVIew:SRATe?
```

Arguments The arguments specify the symbol rates as listed below:

Table 3-10: Symbol rate settings

Argument	Symbol rate
COMPosite (default)	Corresponds to multi-rate
R960S	960k
R480S	480k
R240S	240k
R120S	120k
R60S	60k
R30S	30k
R15S	15k
R7P5S	7.5k

NOTE. *If a normal analysis does not result, select OFF in the [:SENSe]:DLR5_3GPP:COMPosite command and then select one of the symbol rates (other than COMPosite) listed in Table 3-10.*

Measurement Modes DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:SRATe R960S
```

sets the symbol rate to 960 k.

Related Commands

```
[:SENSe]:DLR5_3GPP:COMPosite
```

:DISPlay:DLR5_3GPP:AVIew:SSCHpart(?)

Determines whether to show SCH at the head of data in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:SSCHpart { OFF | ON | 0 | 1 }
```

```
:DISPlay:DLR5_3GPP:AVIew:SSCHpart?
```

Arguments

`OFF` or `0` hides SCH.

`ON` or `1` shows SCH.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:SSCHpart ON
```
shows SCH.

:DISPlay:DLR5_3GPP:AVIew:TSLot(?)

Sets or queries the number of the time slot to be displayed in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:AVIew:TSLot <number>
```

```
:DISPlay:DLR5_3GPP:AVIew:TSLot?
```

Arguments

`<number>::=<NR1>` specifies the number of the time slot to be displayed. Range: Slot –15999 to 0.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:AVIew:TSLot –100
```
sets the time slot number to –100.

:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet(?)

Sets or queries the minimum value on the color, or amplitude, axis when the view displays a spectrogram in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet
   <value>

:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet?
```

Arguments

<value>::=<NRf> specifies the minimum value on the color axis. Range: –100 to 0 dBm.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:COLor:SCALe:OFFSet –100
```

sets the minimum value on the color axis in the main view to –100 dBm.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe(?)

Sets or queries full scale of the color, or amplitude, axis when the view displays a spectrogram in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe
   <value>

:DISPlay:DLR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe?
```

Arguments

<value>::={ 5 | 10 | 20 | 50 } (dB) specifies full scale of the color axis in the spectrogram view.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:COLor:SCALe:RANGe 50
```

sets full scale of the color axis to 50 dB.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:ELENgth(?)

Selects or queries the eye length of the eye diagram in the main view or subview during the 3GPP-R5 modulation analysis. This command is valid when :DISPlay :DLR5_3GPP:MVIew|:SVIew:FORMat is set to SIEYe, SQEYe, or STEYe.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:ELENgth <value>
```

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:ELENgth?
```

Arguments

<value>::=<NR1> specifies the eye length of the eye diagram.
Range: 1 to 16.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:ELENgth 8
```
sets the eye length to 8 in the main view.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat(?)

Selects or queries the main view or subview display format in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat { OFF | CSGRam
| CPCCode | CPSHortcode | CPSYmbol | CPTSlot
| SCONste | SVECtor | SEVM | SMERror | SPERror
| SIEYe | SQEYe | STEYe | STABle | CONSte | VECTor }

:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat?
```

Arguments

Table 3-11 shows the arguments and display formats:

Table 3-11: Main view display formats

Argument	Format
OFF	Hides all measurement results
CSGRam	Code domain power spectrogram
CPCCode	Code domain power versus channelization code
CPSHortcode	Code domain power versus short code
CPSYmbol	Code domain power versus symbol
CPTSlot	Code domain power versus time slot
SCONste	Symbol constellation
SVECtor	Symbol vector
SEVM	Symbol EVM
SMERror	Symbol amplitude error
SPERror	Symbol phase error
SIEYe	Symbol eye diagram (vertical axis: I)
SQEYe	Symbol eye diagram (vertical axis: Q)
STEYe	Symbol trellis diagram (vertical axis: Phase)
STABle	Symbol table
CONSte	Constellation and modulation accuracy measurement results
VECTor	Vector locus

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:FORMat CSGRam
```

displays the code domain power spectrogram in the main view.

:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer:SELect(?)

Selects or queries the channel to show the power for each time slot.in the Code power versus Time slot view. This command is valid when :DISPlay:DLR5_3G-PP:MVIew|:SVIew:FORMat is set to CPTSlot (Code power versus Time slot).

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer:SELect
   { CODE | PSCH | SSCH }

:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer:SELect?
```

Arguments

`CODE` shows the power of all channels or the specified channel, depending on the setting of the :DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer[:TOTal] command.

`PSCH` shows the power of the P-SCH (Primary Synchronization Channel).

`SSCH` shows the power of the S-SCH (Secondary Synchronization Channel).

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:POWer:SELect SSCH
```

shows the power of the S-SCH in the main view.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat,
:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer[:TOTal]
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer[:TOTal](?)

Determines whether to display the total power for each time slot in the Code power versus Time slot view. This command is valid when :DISPlay :DLR5_3GPP :MVIew|:SVIew:FORMat is set to CPTSlot (Code power versus Time slot).

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer[:TOTal]
   { ON | OFF | 1 | 0 }

:DISPlay:DLR5_3GPP:MVIew|:SVIew:POWer[:TOTal]?
```

Arguments

`OFF` or `0` displays power of the channel specified with the :DISPlay:DLR5_3GPP:AVIew:CNUMber command.

`ON` or `1` displays the total power of all channels for each time slot.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:POWer:TOTal ON
```

displays the total power of all channels for each time slot in the main view.

Related Commands

`:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:DLR5_3GPP:MVIew|:SVIew:RADix(?)

Selects or queries the base of symbols on the main view or subview in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat is set to STABle (symbol table).

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:RADix
   { BINary | OCTal | HEXadecimal }

:DISPlay:DLR5_3GPP:MVIew|:SVIew:RADix?
```

Arguments

`BINary` selects binary notation.

`OCTal` selects octal notation.

`HEXadecimal` selects hexadecimal notation.

Measurement Modes

DEMDLR5_3G

Examples

`:DISPlay:DLR5_3GPP:MVIew:RADix BINary`
selects binary notation for the base of symbols in the main view.

Related Commands

`:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:DLR5_3GPP:MVIew|:SVIew:ROTation(?)

Selects or queries the rotation of the symbol table in the main view or subview during the 3GPP-R5 modulation analysis. This command is valid when :DISPlay :DLR5_3GPP:MVIew|:SVIew:FORMat is set to STABle (symbol table).

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:ROTation <value>
```

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:ROTation?
```

Arguments

<value>::=<NR1> specifies the rotation of the symbol table.
Range: 0 to 3.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:ROTation 1
```
sets the rotation to 1 in the main view.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:OFFSet(?)

Sets or queries the minimum horizontal value (left end) on the main view or subview in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:OFFSet
   <value>

:DISPlay:DLR5_3GPP:MVIew|:SVIew: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 B-1 in Appendix C.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:X:SCALe:OFFSet 0
```

sets the minimum horizontal value to channel 0 when the main view displays a code domain power spectrogram.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe(?)

Sets or queries full scale of the horizontal axis on the main view or subview in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe
   <value>

:DISPlay:DLR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe?
```

Arguments

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

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:X:SCALe:RANGe 512
```

sets the horizontal full scale to 512 channels when the main view displays a code domain power spectrogram.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FIT (No Query Form)

Runs auto-scale on the main view or subview in the 3GPP-R5 modulation analysis. The auto-scale automatically sets the start value and scale of the vertical axis to best display the waveform.

This command is valid when :DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat is set to CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax `:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FIT`

Arguments None

Measurement Modes DEMDLR5_3G

Examples `:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:FIT`
runs the auto-scale on the main view.

Related Commands `:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FULL (No Query Form)

Sets the main view or subview's vertical axis to the default full scale in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat is set to CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax `:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FULL`

Arguments None

Measurement Modes DEMDLR5_3G

Examples `:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:FULL`
sets the main view’s vertical axis to the default full scale.

Related Commands `:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet(?)

Sets or queries the minimum vertical value (bottom end) in the main view or subview in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat is set to CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet
   <value>

:DISPlay:DLR5_3GPP:MVIew|:SVIew: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 B-1 in Appendix C.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:OFFSet 0
```

sets the bottom end of the vertical axis to channel 0 when the main view displays a code domain power spectrogram.

Related Commands

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit(?)

Selects or queries the unit on the Y (power) axis in the main view or subview during the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat is set to CSGRam, CPSHortcode, CPSYmbol, or CPTSlot.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit
   { RELative | ABSolute }

:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit?
```

Arguments

`RELative` represents the relative channel power to the total power of all the channels along the Y axis in dB.

`ABSolute` represents the absolute power of each channel along the Y axis in dBm.

Measurement Modes

DEMDLR5_3G

Examples

`:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:PUNit RELative` represents the relative power along the Y axis in the main view.

Related Commands

`:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:RANGe(?)

Sets or queries full scale of the vertical axis on the main view or subview in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat is set to CSGRam, CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax

```
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:RANGe
   <value>

:DISPlay:DLR5_3GPP:MVIew|:SVIew: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 B-1 in Appendix C.

Measurement Modes

DEMDLR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:RANGe 50
```

sets the vertical full scale to 50 slots when the main view displays a power codogram.

Related Commands

:DISPlay:DLR5_3GPP:MVIew|:SVIew:FORMat

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP Subgroup

The :DISPlay:SADLR5_3GPP|:SAULR5_3GPP commands control display of the spectrum analysis of the channel power, ACLR, spectrum emission mask, and OBW measurements for the 3GPP-R5 standard.

NOTE. *To use a command in this group, you must have selected SADLR5_3G (spectrum analysis for 3GPP-R5 downlink) or SAULR5_3G (spectrum analysis for 3GPP-R5 uplink) in the :INSTrument[:SELect] command.*

Command Tree

Header **Parameter**

```
:DISPlay
   :SADLR5_3GPP|:SAULR5_3GPP
      :SPECtrum
         :X
            [:SCALe]
               :OFFSet
               :PDIVision <frequency>
         :Y
            [:SCALe]
               :FIT
               :FULL
               :OFFSet    <amplitude>
               :PDIVision <relative_amplitude>
```

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:X[:SCALe]:OFFSet(?)

Sets or queries the minimum horizontal value (left end) in the spectrum view.

Syntax

```
:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:X[:SCALe]
:OFFSet <value>

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:X[:SCALe]
:OFFSet?
```

Arguments

<value>::=<NRf> specifies the minimum value of the horizontal axis.
Range: Center frequency ±25 MHz.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:DISPlay:SADLR5_3GPP:SPECtrum:X:SCALe:OFFSet 1GHz
```

sets the minimum value of the horizontal axis to 1 GHz.

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:X[:SCALe]:PDIVision(?)

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

Syntax

```
:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:X[:SCALe]
:PDIVision <value>

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:X[:SCALe]
:PDIVision?
```

Arguments

<value>::=<NRf> specifies the horizontal scale (per division).
Range: 0 to 2.5 MHz.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:DISPlay:SADLR5_3GPP:SPECtrum:X:SCALe:PDIVision 2.5MHz
```

sets the horizontal scale to 2.5 MHz/div.

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]:FIT (No Query Form)

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

Syntax `:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]:FIT`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:DISPlay:SADLR5_3GPP:SPECtrum:Y:SCALe:FIT`
runs the auto-scale on the spectrum view.

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]:FULL (No Query Form)

Sets the vertical axis to the default full scale on the spectrum view.

Syntax `:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]:FULL`

Arguments None

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:DISPlay:SADLR5_3GPP:SPECtrum:Y:SCALe:FULL`
sets the vertical axis to the default full scale on the spectrum view.

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]:OFFSet(?)

Queries the minimum vertical value (bottom end) on the spectrum view.

Syntax

```
:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]
:OFFSet <value>

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]
:OFFSet?
```

Arguments

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

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:DISPlay:SADLR5_3GPP:Y:SCALe:OFFSet –100
```

sets the minimum vertical value to –100 dBm.

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]:PDIVision(?)

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

Syntax

```
:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]
:PDIVision <value>

:DISPlay:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:Y[:SCALe]
:PDIVision?
```

Arguments

<value>::=<NRf> sets the vertical scale (per division). Range: 0 to 10 dB.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:DISPlay:SADLR5_3GPP:Y:SCALe:PDIVision 10
```

sets the full scale of the vertical axis to 10 dB/div.

:DISPlay:ULR5_3GPP Subgroup

The :DISPlay:ULR5_3GPP commands control display of the 3GPP-R5 uplink modulation analysis.

NOTE. *To use a command from this group, you must have selected DEMULR5_3G (3GPP-R5 uplink modulation analysis) in the :INSTrument[:SELect] command.*

Command Tree

```
Header                    Parameter
:DISPlay
   :ULR5_3GPP
      :AVIew
         :CNUMber        <number>
         :SRATe          R960S | R480S | R240S | R120S
                         | R60S | R30S | R15S
         :TSLot          <number>
      :MVIew|:SVIew
         :COLor
            [:SCALe]
               :OFFSet   <amplitude>
               :RANge    <relative_amplitude>
         :ELENgth        <numeric_value>
         :FORMat         OFF | ANACk | CSGRam | CPCNumber
                         | CPSYmbol | CPTSlot
                         | SCONste | SVECtor
                         | SEVM | SMERror | SPERror
                         | SIEYe | SQEYe | STEYe | STABle
         :POWer
            [:TOTal]     <boolean>
         :RADix          BINary | OCTal | HEXadecimal
         :ROTation       <numeric_value>
         :X
            [:SCALe]
               :OFFSet   <numeric_value>
               :RANGe    <numeric_value>
         :Y
            [:SCALe]
               :FIT
               :FULL
               :OFFSet   <numeric_value>
               :PUNit    RELative | ABSolute
               :RANGe    <numeric_value>
```

:DISPlay:ULR5_3GPP:AVIew:CNUMber(?)

Sets or queries the channel number to position the marker in the 3GPP-R5 uplink modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:AVIew:CNUMber <number>

:DISPlay:ULR5_3GPP:AVIew:CNUMber?
```

Arguments

<number>::=<NR1> specifies the channel number.
Range: Channel 0 to 7.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:AVIew:CNUMber 5
```

sets the channel number to 5 to position the marker.

:DISPlay:ULR5_3GPP:AVIew:SRATe(?)

Sets or queries the symbol rate for the measurement in the 3GPP-R5 uplink modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:AVIew:SRATe { R960S | R480S | R240S
| R120S | R60S | R30S | R15S }

:DISPlay:ULR5_3GPP:AVIew:SRATe?
```

Arguments

The arguments specify the symbol rates as listed below:

Table 3-12: Symbol rate settings

Argument	Symbol rate
R960S	960k
R480S	480k
R240S	240k
R120S	120k
R60S	60k
R30S	30k
R15S	15k

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:AVIew:SRATe R960S
```

sets the symbol rate to 960 k.

:DISPlay:ULR5_3GPP:AVIew:TSLot(?)

Sets or queries the number of the time slot to be displayed in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:AVIew:TSLot <number>

:DISPlay:ULR5_3GPP:AVIew:TSLot?
```

Arguments

<number>::=<NR1> specifies the number of the time slot to be displayed. Range: Slot –15999 to 0.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:AVIew:TSLot –100
```

sets the time slot number to –100.

:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet(?)

Sets or queries the minimum value of the color, or amplitude, axis when the subview displays a spectrogram in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet
   <value>

:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:OFFSet?
```

Arguments

<value>::=<NRf> specifies the minimum color-axis value.
Range: –100 to 0 dBm.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:SVIew:COLor:SCALe:OFFSet –100
```

sets the minimum color-axis value in the subview to –100 dBm.

Related Commands

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe(?)

Sets or queries full scale of the color, or amplitude, axis when the subview displays a spectrogram in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe
   <value>

:DISPlay:ULR5_3GPP:MVIew|:SVIew:COLor[:SCALe]:RANGe?
```

Arguments

<value>::={ 5 | 10 | 20 | 50 } (dB) specifies full scale of the color axis.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:SVIew:COLor:SCALe:RANGe 50
```

sets full scale of the color axis to 50 dB in the subview.

Related Commands

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:ULR5_3GPP:MVIew|:SVIew:ELENgth(?)

Selects or queries the eye length of the eye diagram in the main view or subview during the 3GPP-R5 modulation analysis. This command is valid when :DISPlay :ULR5_3GPP:MVIew|:SVIew:FORMat is set to SIEYe, SQEYe, or STEYe.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:ELENgth <value>
```

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:ELENgth?
```

Arguments

<value>::=<NR1> specifies the eye length of the eye diagram.
Range: 1 to 16.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:MVIew:ELENgth 8
```
sets the eye length to 8 in the main view.

Related Commands

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat(?)

Sets or queries the main view or subview display format in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat { OFF | CSGRam
| CPSHortcode | CPSYmbol | CPTSlot | SCONste | SVECtor
| SEVM | SMERror | SPERror | SIEYe | SQEYe | STEYe
| STABle | CONSte | VECTor}

:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat?
```

Arguments

Table 3-11 shows the arguments and display formats:

Table 3-13: Main view display formats

Argument	Format
OFF	Hides all measurement results
CSGRam	Code domain power spectrogram
CPSHortcode	Code domain power versus short code
CPSYmbol	Code domain power versus symbol
CPTSlot	Code domain power versus time slot
SCONste	Symbol constellation
SVECtor	Symbol vector
SEVM	Symbol EVM
SMERror	Symbol amplitude error
SPERror	Symbol phase error
SIEYe	Symbol eye diagram (vertical axis: I)
SQEYe	Symbol eye diagram (vertical axis: Q)
STEYe	Symbol trellis diagram (vertical axis: Phase)
STABle	Symbol table
CONSte	Constellation and modulation accuracy measurement results
VECTor	Vector locus

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:SVIew:FORMat CSGRam
```

displays the code domain power spectrogram in the subview.

:DISPlay:ULR5_3GPP:MVIew|:SVIew:POWer[:TOTal](?)

Determines whether to display the total power for each time slot in the Code power versus Time slot view. This command is valid when :DISPlay :ULR5_3GPP:MVIew|:SVIew:FORMat is set to CPTSlot (Code power versus Time slot).

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:POWer[:TOTal]
   { ON | OFF | 1 | 0 }

:DISPlay:ULR5_3GPP:MVIew|:SVIew:POWer[:TOTal]?
```

Arguments

`OFF` or `0` displays power of the channel specified with the :DISPlay:ULR5_3GPP:AVIew:CNUMber command.

`ON` or `1` displays the total power of all channels for each time slot.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:MVIew:POWer:TOTal ON
```

displays the total power of all channels for each time slot in the main view.

Related Commands

`:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:ULR5_3GPP:MVIew|:SVIew:RADix(?)

Selects or queries the base of symbols on the main view or subview in the 3GPP-R5 modulation analysis.

NOTE. *This command is valid when :DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat is set to STABle (symbol table).*

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:RADix
   { BINary | OCTal | HEXadecimal }

:DISPlay:ULR5_3GPP:MVIew|:SVIew:RADix?
```

Arguments

`BINary` selects binary notation.

`OCTal` selects octal notation.

`HEXadecimal` selects hexadecimal notation.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:MVIew:RADix BINary
```

selects binary notation for the base of symbols in the main view.

Related Commands

`:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:ULR5_3GPP:MVIew|:SVIew:ROTation(?)

Selects or queries the rotation of the symbol table in the main view or subview during the 3GPP-R5 modulation analysis. This command is valid when :DISPlay :ULR5_3GPP:MVIew|:SVIew:FORMat is set to STABle (symbol table).

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:ROTation <value>
```

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:ROTation?
```

Arguments

<value>::=<NR1> specifies the rotation of the symbol table.
Range: 0 to 3.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:ULR5_3GPP:MVIew:ROTation 1
```
sets the rotation to 1 in the main view.

Related Commands

:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat

:DISPlay:ULR5_3GPP:MVIew|:SVIew:X[:SCALe]:OFFSet(?)

Sets or queries the minimum horizontal value (left end) in the main view or subview in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:X[:SCALe]:OFFSet
   <value>

:DISPlay:ULR5_3GPP:MVIew|: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 B-1 in Appendix C.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:SVIew:X:SCALe:OFFSet 0
```

sets the minimum horizontal value to channel 0 when the subview displays a power codogram.

Related Commands

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:ULR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe(?)

Sets or queries full scale of the horizontal axis in the main view or subview in the 3GPP-R5 modulation analysis.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:X[:SCALe]:RANGe
   <value>

:DISPlay:ULR5_3GPP:MVIew|: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 B-1 in Appendix C.

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:SVIew:X:SCALe:RANGe 512
```

sets the horizontal full scale to 512 channels when the subview displays a code domain power spectrogram.

Related Commands

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat
```

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FIT (No Query Form)

Runs auto-scale in the main view or subview in the 3GPP-R5 modulation analysis. The auto-scale automatically sets the start value and scale of the vertical axis to best display the waveform.

This command is valid when :DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat is set to CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax `:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FIT`

Arguments None

Measurement Modes DEMULR5_3G

Examples `:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:FIT`
runs the auto-scale on the main view.

Related Commands `:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FULL (No Query Form)

Sets the main view or subview's vertical axis to the default full-scale value in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat is set to CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax `:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:FULL`

Arguments None

Measurement Modes DEMULR5_3G

Examples `:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:FULL`
sets the main view's vertical axis to the default full-scale value.

Related Commands `:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet(?)

Sets or queries the minimum vertical value (bottom end) in the main view or subview in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat is set to CSGRam, CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet
   <value>

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:OFFSet?
```

Arguments

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

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:MVIew:Y:SCALe:OFFSet 0
```

sets the bottom of the vertical axis to channel 0 when the main view displays a code domain power spectrogram.

Related Commands

:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit(?)

Selects or queries the unit on the Y (color) axis in the main view or subview during the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat is set to CSGRam, CPSHortcode, CPSYmbol, or CPTSlot.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit
   { RELative | ABSolute }

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit?
```

Arguments

`RELative` represents the relative channel power to the total power of all the channels along the Y axis in dB.

`ABSolute` represents the absolute power of each channel along the Y axis in dBm.

Measurement Modes

DEMULR5_3G

Examples

`:DISPlay:DLR5_3GPP:SVIew:Y:SCALe:PUNit RELative` represents the relative power along the Y axis in the subview.

Related Commands

`:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat`

:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:RANGe(?)

Sets or queries full scale of the vertical axis in the main view or subview in the 3GPP-R5 modulation analysis.

This command is valid when :DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat is set to CSGRam, CPSHortcode, CPSYmbol, CPTSlot, SEVM, SMERror, or SPERror.

Syntax

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:RANGe
   <value>
```

Arguments

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

Measurement Modes

DEMULR5_3G

Examples

```
:DISPlay:DLR5_3GPP:SVIew:Y:SCALe:RANGe 50
```

sets the vertical axis full scale to 50 slots when the subview displays a code domain power spectrogram.

Related Commands

```
:DISPlay:ULR5_3GPP:MVIew|:SVIew:FORMat
```

:FETCh Commands

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

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
   :DLR5_3GPP?          CSHortcode | CCODe | CSYMbol
                        | CTSLot | SCONste
                        | EVM | AEVM | PEVM
                        | MERRor | AMERror | PMERror | PERRor
                        | APERror | PPERror | RHO | FERRor
                        | OOFFset | STABle | TSNumber
                        | SSCHannel | SCGRoup | SCNumber
                        | TLENgth | PCDE | PCDE | CEVM
                        | CMERror | CPERror | CRHO | COOF
   :SADLR5_3GPP|:SAULR5_3GPP
      :ACLR?
      :CFRequency?
      :CHPower?
      :EBWidth?
      :MCACLr?
      :OBWidth?
      :SEMask?
      :SPECtrum?
         :ACLR?
         :CFRequency?
         :CHPower?
         :EBWidth?
         :MCACLr?
         :OBWidth?
         :SEMask?
   :ULR5_3GPP?          ANACk | CNUMber | CSYMbol | CTSLot
                        | SCONste | EVM | AEVM | PEVM
                        | MERRor | AMERror | PMERror | PERRor
                        | APERror | PPERror | RHO | FERRor
                        | OOFFset | STABle | TSNumber
                        | TLENgth | PCDE | CEVM
                        | CMERror | CPERror | CRHO | COOF
                        | SIGNature | PREamble
```

For the :FETCh:SADLR5_3GPP command subgroup, if you want to perform a FETCh operation on fresh data, use the :READ commands on page 3-81. The :READ commands acquire a new input signal and fetch the measurement results from the data

For the :FETCh:DLR5_3GPP and :FETCh:ULR5_3GPP command subgroups, if you want to perform a FETCh operation on fresh data, use the [:SENSe]:DLR5_3GPP[:IMMediate] or the [:SENSe]:ULR5_3GPP[:IMMediate] command (refer to page 3-102 or 3-132, respectively).

:FETCh:DLR5_3GPP? (Query Only)

Returns measurement results of the 3GPP-R5 downlink modulation analysis.

Syntax

```
:FETCh:DLR5_3GPP? { CSHortcode | CCODe | CSYMbol
| CTSLot | SCONste | EVM | AEVM | PEVM
| MERRor | AMERror | PMERror | PERRor | APERror | PPERror
| RHO | FERRor | OOFFset | STABle | TSNumber
| SSCHannel | SCGRoup | SCNumber | TLENgth | PCDE
| CEVM | CMERror | CPERror | CRHO | COOF }
```

Arguments Information queried is listed below for each of the arguments:

Table 3-14: Queried information on the 3GPP-R5 downlink analysis results

Argument	Information queried
CSHortcode	Power of each short code for the specified TS
CCODe	Power of each channelization code for the specified TS
CSYMbol	Each symbol power of the specified TS/SC
CTSLot	Power of each time slot for the specified SC
SCONste	Symbol position data for the specified TS/SC
EVM	Measurement results of Error Vector Magnitude for the specified TS/SC
AEVM	RMS value of EVM for the specified TS/SC
PEVM	Peak value of EVM for the specified TS/SC and its symbol number
MERRor	Amplitude error for the specified TS/SC
AMERror	RMS value of amplitude error for the specified TS/SC
PMERror	Peak amplitude error for the specified TS/SC and its symbol number
PERRor	Phase error for the specified TS/SC
APERror	RMS value of phase error for the specified TS/SC
PPERror	Peak phase error for the specified TS/SC and its symbol number
RHO	Value of waveform quality (ρ) for the specified TS/SC
FERRor	Frequency error for the specified TS
OOFFset	Value of origin offset for the specified TS/SC
STABle	Data from symbol table for the specified TS/SC
TSNumber	Slot number in radio frame for the specified TS
SSCHannel	Secondary Synchronization Channel (SSCH) number for the specified TS
SCGRoup	Scrambling code group for the specified TS
SCNumber	Scrambling code number for the specified TS
TLENgth	Number of analyzed TSs
PCDE	PCDE (Peak Code Domain Error) for the specified TS, and the SC number
CEVM	RMS and peak values of chip EVM for the specified TS
CMERror	RMS and peak values of chip amplitude error for the specified TS
CPERror	RMS and peak values of chip phase error for the specified TS
CRHO	Chip waveform quality (ρ) for the specified TS
COOF	Chip origin offset for the specified TS

*** TS: Time slot; SC: Short code**

To specify the time slot, use the :DISPlay:DLR5_3GPP:AVIew:TSLot command.

To specify the short code, use the :DISPlay:DLR5_3GPP:AVIew:SHORtcode command.

Returns Returns are listed below for each of the arguments:

CSHortcode.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each short code in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 512

CCODe.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each short code in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 512

CSYMbol.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each symbol in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 640

CTSLot.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each time slot in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 16000

SCONste.
#<Num_digit><Num_byte><Ip(1)><Qp(1)>...<Ip(n)><Qp(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Ip(n)> is the symbol position on the I axis in volt.
<Qp(n)> is the symbol position on the Q axis in volt.
Both <Ip(1)> and <Qp(1)> are in the 4-byte little endian floating-point format specified in IEEE 488.2. n: Max 640.

EVM. #<Num_digit><Num_byte><Evm(1)><Evm(2)>...<Evm(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Evm(n)> is the value of EVM of symbol in percent (%).
4-byte little endian floating-point format specified in IEEE 488.2
n: Max 640

AEVM. <aevm>::=<NRf> is the EVM RMS value in percent (%).

PEVM. <pevm>,<symb>

Where
<pevm><NRf> is the EVM peak value in percent (%).
<symb>::=<NR1> is the symbol number for the EVM peak value.

MERRor.
#<Num_digit><Num_byte><Merr(1)><Merr(2)>...<Merr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Merr(n)> is the value of amplitude error of symbol in percent (%).
4-byte little endian floating-point format specified in IEEE 488.2
n: Max 640

AMERror. <amer>::=<NRf> is the amplitude error RMS value in percent (%).

PMERror. <pmer>,<symb>

Where
<pmer>::=<NRf> is the amplitude error peak value in percent (%).
<symb>::=<NR1> is the symbol number for the amplitude error peak value.

PERRor.
#<Num_digit><Num_byte><Perr(1)><Perr(2)>...<Perr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Perr(n)> is the value of phase error of symbol in degree.
4-byte little endian floating-point format specified in IEEE 488.2
n: Max 640

APERror. <pmer>::=<NRf> is the phase error RMS value in degree.

PPERror. <pmer>,<symb>

Where
<pmer>::=<NRf> is the phase error peak value in degree.
<symb>::=<NRf> is the symbol number of phase error peak value.

RHO. <rho>::=<NRf> is the measured value of waveform quality.

FERRor. <ferr>::=<NRf> is the measured value of frequency error in Hz.

OOFFset. <ooff>::=<NRf> is the measured value of origin offset in dB.

STABLe.
#<Num_digit><Num_byte><Sym(1)><Sym(2)>...<Sym(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Sym(n)>::=<NR1> is the symbol data.
n: Max 640.

TSNumber. <tsnum>::=<NR1> is the slot number in radio frame.

SSCHannel. <ssch>::=<NR1> is the Secondary Synchronization Channel (SSCH) number.

SCGRoup. <scgr>::=<NR1> is the scrambling code group.

SCNumber. <scnum>::=<NR1> is the scrambling code number.

TLENgth. <tlen>::=<NR1> is the number of analyzed time slots.

PCDE. <pcde>,<scod>

Where
<pcde>::=<NRf> is the PCDE (Peak Code Domain Error) value in dB.
<scod>::=<NRf> is the short code number for the PCDE

CEVM. <cevma>,<cevmp>

Where
<cevma>::=<NRf> is the RMS value of chip EVM in percent (%)
<cevmp>::=<NRf> is the peak value of chip EVM in percent (%)

CMERror. <cmera>,<cmerp>

Where
<cmera>::=<NRf> is the RMS value of chip amplitude error in percent (%)
<cmerp>::=<NRf> is the peak value of chip amplitude error in percent (%)

CPERror. <cpera>,<cperp>

Where
<cpera>::=<NRf> is the RMS value of chip EVM in percent (%)
<cperp>::=<NRf> is the peak value of chip EVM in percent (%)

CRHO. <crho>::=<NRf> is the chip waveform quality (ρ)

COOF. <coof>::=<NRf> is the chip origin offset in dB

Measurement Modes DEMDLR5_3G

Examples

```
:FETCh:DLR5_3GPP? CSHortcode
```

might return #3512xxxx... (512-byte data) for the power measurement results for each short code.

Related Commands :DISPlay:DLR5_3GPP:AVIew:SHORtcode, :DISPlay:DL3DLR5_3GPPGpp:AVIew:TSLot, :INSTrument[:SELect]

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:ACLR? (Query Only)

Returns the results of the ACLR (Adjacent Channel Leakage Power Ratio) measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:ACLR?`

Arguments None

Returns `<Pass_Fail>,<Chpower>,<Laclr1>,<Uaclr1>,<Laclr2>,<Uaclr2>`

Where
`<Pass_Fail>::={ 1 |– 1 | 0 }` is the limit test result.
1: Pass, –1: Fail, 0: No decision (measurement limits disabled).
`<Chpower>::=<NRf>` is the channel power measured value in dBm.
`<Laclr1>::=<NRf>` is the 1st lower adjacent channel ACLR in dBc.
`<Uaclr1>::=<NRf>` is the 1st upper adjacent channel ACLR in dBc.
`<Laclr2>::=<NRf>` is the 2nd lower adjacent channel ACLR in dBc.
`<Uaclr2>::=<NRf>` is the 2nd upper adjacent channel ACLR in dBc.

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:ACLR?`
might return `1,– 18.17,59.35,56.83,57.88,58.52` for the downlink ACLR measurement results.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:CFRequency? (Query Only)

Returns the results of the carrier frequency measurement in the 3GPP-R5 analysis.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:CFRequency?`

Arguments None

Returns `<Cfreq>::=<NRf>` is the carrier frequency measured value in Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:CFRequency?`
might return `2.025E+9`, indicating that the carrier frequency is 2.025 GHz.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:CHPower? (Query Only)

Returns the results of the channel power measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:CHPower?`

Arguments None

Returns `<pass_fail>,<chpower>,<power_density>`

Where
`<pass_fail>::={ 1 | 0 }` is the measurement result; 1: Pass or 0: Fail.
`<chpower>::=<NRf>` is the channel power measured value in dBm.
`<power_density>::=<NRf>` is the power density measured value in dBm/Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:CHPower?`
might return `1,–2.0375E+001,–8.1274E+001` for the channel power measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:EBWidth? (Query Only)

Returns the results of the EBW (Emission Bandwidth) measurement in the 3GPP-R5 analysis.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:EBWidth?`

Arguments None

Returns `<ebw>::=<NRf>` is the EBW in Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:EBWidth?`
might return `3.843E+6`, indicating that the EBW is 3.843 MHz.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP:MCACLr? (Query Only)

Returns the results of the multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink analysis.

Syntax

```
:FETCh:SADLR5_3GPP:MCACLr?
```

Arguments

None

Returns

```
<Pass_Fail>,<Mainchannel_No>,<Totalpower>,
<Chpower1>,<Chpower2>,<Chpower3>,<Chpower4>,
<Laclr1>,<Uaclr1>,<Laclr2>,<Uaclr2>
```

Where
<Pass_Fail>::={ 1 |– 1 | 0 } is the limit test result.
1: Pass, –1: Fail, 0: No decision (measurement limits disabled).
<Mainchannel_No>::=<NR1> is the number of main channels (1 to 4).
<Totalpower>::=<NRf> is the total power measured value in dBm.
<Chpower1>::=<NRf> is the power measured value for Channel 1 in dBm.
<Chpower2>::=<NRf> is the power measured value for Channel 2 in dBm.
<Chpower3>::=<NRf> is the power measured value for Channel 3 in dBm.
<Chpower4>::=<NRf> is the power measured value for Channel 4 in dBm.
<Laclr1>::=<NRf> is the first lower adjacent channel ACLR in dBc.
<Uaclr1>::=<NRf> is the first upper adjacent channel ACLR in dBc.
<Laclr2>::=<NRf> is the second lower adjacent channel ACLR in dBc.
<Uaclr2>::=<NRf> is the second upper adjacent channel ACLR in dBc.

Invalid data is returned as --1000.

Measurement Modes

SADLR5_3G

Examples

```
:FETCh:SADLR5_3GPP:MCACLr?
```

might return `1,4,– 12.18,– 18.14,– 18.04,– 18.16,– 18.17, 59.35,56.83,57.88,58.52` for the multi-carrier ACLR measurement results.

Related Commands

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

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:OBWidth? (Query Only)

Returns the results of the OBW (Occupied Bandwidth) measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:OBWidth?`

Arguments None

Returns `<pass_fail>,<obw>`

Where
`<pass_fail>::={ 1 | 0 }` is the measurement result; 1: Pass or 0: Fail.
`<obw>::=<NRf>` is the occupied bandwidth in Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:OBWidth?`
might return `1,1.27333E+006` for the OBW measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SEMask? (Query Only)

Returns the results of the spectrum emission mask measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SEMask?`

Arguments None

Returns `<pass_fail>::={ 1 | 0 }` is the measurement result; 1: Pass or 0: Fail.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SEMask?`
might return `1` for the spectrum emission mask measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:ACLR? (Query Only)

Returns the spectrum waveform data of the ACLR (Adjacent Channel Leakage Power Ratio) measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:ACLR?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:ACLR?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the ACLR measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CFRequency? (Query Only)

Returns the spectrum waveform data of the carrier frequency measurement in the 3GPP-R5 analysis.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CFRequency?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:CFRequency?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the carrier frequency measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CHPower? (Query Only)

Returns the spectrum waveform data of the channel power measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CHPower?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:CHPower?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the channel power measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:EBWidth? (Query Only)

Returns the spectrum waveform data of the EBW (Emission Bandwidth) measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:EBWidth?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:EBWidth?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the EBW measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP:SPECtrum:MCACLr? (Query Only)

Returns the spectrum waveform data of the multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink analysis.

Syntax `:FETCh:SADLR5_3GPP:SPECtrum:MCACLr?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:MCACLr?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the multi-carrier ACLR measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:OBWidth? (Query Only)

Returns the spectrum waveform data of the OBW (Occupied Bandwidth) measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:OBWidth?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:OBWidth?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the OBW measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:SEMask? (Query Only)

Returns the spectrum waveform data of the spectrum emission mask measurement for 3GPP-R5 standard.

Syntax `:FETCh:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:SEMask?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:FETCh:SADLR5_3GPP:SPECtrum:SEMask?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the spectrum emission mask measurement.

Related Commands `:INSTrument[:SELect]`

:FETCh:ULR5_3GPP? (Query Only)

Returns measurement results of the 3GPP-R5 uplink analysis.

Syntax

```
:FETCh:ULR5_3GPP? { ANACk | CNUMber | CSYMbol | CTSLot
| SCONste | EVM | AEVM | PEVM | MERRor
| AMERror | PMERror | PERRor | APERror | PPERror
| RHO | FERRor | OOFFset | STABle | TSNumber | TLENgth
| PCDE | CEVM | CMERror | CPERror | CRHO | COOF
| SIGNature | PREamble }
```

Arguments

Information queried is listed below for each of the arguments:

Table 3-15: Queried information on the 3GPP-R5 uplink analysis results

Argument	Information queried
ANACk	ACK/NACK for the specified TS
CNUMber	Power of each channelization code for the specified TS
CSYMbol	Each symbol power of the specified TS/SC
CTSLot	Power of each time slot for the specified SC
SCONste	Symbol position data for the specified TS/SC
EVM	Measurement results of Error Vector Magnitude for the specified TS/SC
AEVM	RMS value of EVM for the specified TS/SC
PEVM	Peak value of EVM for the specified TS/SC and its symbol number
MERRor	Amplitude error for the specified TS/SC
AMERror	RMS value of amplitude error for the specified TS/SC
PMERror	Peak amplitude error for the specified TS/SC and its symbol number
PERRor	Phase error for the specified TS/SC
APERror	RMS value of phase error for the specified TS/SC
PPERror	Peak phase error for the specified TS/SC and its symbol number
RHO	Value of waveform quality (ρ) for the specified TS/SC
FERRor	Frequency error for the specified TS
OOFFset	Value of origin offset for the specified TS/SC
STABle	Data from symbol table for the specified TS/SC
TSNumber	Slot number in radio frame for the specified TS
TLENgth	Number of analyzed TSs
PCDE	PCDE (Peak Code Domain Error) for the specified TS, and the SC number
CEVM	RMS and peak values of chip EVM for the specified TS
CMERror	RMS and peak values of chip amplitude error for the specified TS
CPERror	RMS and peak values of chip phase error for the specified TS
CRHO	Chip waveform quality (ρ) for the specified TS
COOF	Chip origin offset for the specified TS
SIGNature	Sinature number in preamble
PREamble	Preamble

*** TS: Time slot; SC: Short code**

To specify the time slot, use the :DISPlay:ULR5_3GPP:AVIew:TSLot command. To specify the short code, use the :DISPlay:ULR5_3GPP:AVIew:CNUMber command.

Returns Returns are listed below for each of the arguments:

ANACk. <count>[,<anack(1)>,<cqi(1)>,<offset(1)>
[,<anack(2)>,<cqi(2)>,<offset(2)>...
[,<anack(10)>,<cqi(10)>,<offset(10)>]]]]]]]]]]

Where
<count>::=<NR1> is the number of data sets that follow.
It depends on the [:SENSe]:ULR5_3GPP :SFRame:SEARch setting as shown in the table below. Zero (0) means that the data is not for the head of subframe.

[:SENSe]:ULR5_3GPP:SFRame:SEARch setting	<count> value
AUTO	0 to 10
STSLot or DTIMe	0 or 1

<anack(i)>::=<NR1> is the indicator.
0: ACK, 1: NACK, or 2: DTX (Discontinuous Transmission).

<cqi(i)>::=<NR1> is the value of CQI detected in the time slot (0 to 29).

<offset(i)>::=<NR1> is the subframe offset (0 to 9).

CNUMber.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each short code in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 512

CSYMbol.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each symbol in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 640

CTSLot.
#<Num_digit><Num_byte><Cpwr(1)><Cpwr(2)>...<Cpwr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Cpwr(n)> is the relative or absolute power value for each time slot in dB or dBm. 4-byte little endian floating-point format specified in IEEE 488.2.
n: Max 16000

SCONste.
#<Num_digit><Num_byte><Ip(1)><Qp(1)>...<Ip(n)><Qp(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Ip(n)> is the symbol position on the I axis in volt.
<Qp(n)> is the symbol position on the Q axis in volt.
Both <Ip(1)> and <Qp(1)> are in the 4-byte little endian floating-point format specified in IEEE 488.2. n: Max 640.

EVM. #<Num_digit><Num_byte><Evm(1)><Evm(2)>...<Evm(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Evm(n)> is the value of EVM of symbol in percent (%).
4-byte little endian floating-point format specified in IEEE 488.2
n: Max 640

AEVM. <aevm>::=<NRf> is the EVM RMS value in percent (%).

PEVM. <pevm>,<symb>

Where
<pevm><NRf> is the EVM peak value in percent (%).
<symb>::=<NR1> is the symbol number for the EVM peak value.

MERRor.
#<Num_digit><Num_byte><Merr(1)><Merr(2)>...<Merr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Merr(n)> is the value of amplitude error of symbol in percent (%).
4-byte little endian floating-point format specified in IEEE 488.2
n: Max 640

AMERror. <amer>::=<NRf> is the amplitude error RMS value in percent (%).

PMERror. <pmer>,<symb>

Where
<pmer>::=<NRf> is the amplitude error peak value in percent (%).
<symb>::=<NR1> is the symbol number for the amplitude error peak value.

PERRor.
#<Num_digit><Num_byte><Perr(1)><Perr(2)>...<Perr(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Perr(n)> is the value of phase error of symbol in degree.
4-byte little endian floating-point format specified in IEEE 488.2
n: Max 640

APERror. <pmer>::=<NRf> is the phase error RMS value in degree.

PPERror. <pmer>,<symb>

Where
<pmer>::=<NRf> is the phase error peak value in degree.
<symb>::=<NRf> is the symbol number of phase error peak value.

RHO. <rho>::=<NRf> is the measured value of waveform quality.

FERRor. <ferr>::=<NRf> is the measured value of frequency error in Hz.

OOFFset. <ooff>::=<NRf> is the measured value of origin offset in dB.

STABLe.
#<Num_digit><Num_byte><Sym(1)><Sym(2)>...<Sym(n)>

Where
<Num_digit> is the number of digits in <Num_byte>.
<Num_byte> is the number of bytes of the data that follow.
<Sym(n)>::=<NR1> is the symbol data.
n: Max 640.

TSNumber. <tsnum>::=<NR1> is the slot number in radio frame.

TLENgth. <tlen>::=<NR1> is the number of analyzed time slots.

PCDE. <pcde>,<scod>

Where
<pcde>::=<NRf> is the PCDE (Peak Code Domain Error) value in dB.
<scod>::=<NRf> is the short code number for the PCDE

CEVM. <cevma>,<cevmp>

Where
<cevma>::=<NRf> is the RMS value of chip EVM in percent (%)
<cevmp>::=<NRf> is the peak value of chip EVM in percent (%)

CMERror. <cmera>,<cmerp>

Where
<cmera>::=<NRf> is the RMS value of chip amplitude error in percent (%)
<cmerp>::=<NRf> is the peak value of chip amplitude error in percent (%)

CPERror. <cpera>,<cperp>

Where
<cpera>::=<NRf> is the RMS value of chip EVM in percent (%)
<cperp>::=<NRf> is the peak value of chip EVM in percent (%)

CRHO. <crho>::=<NRf> is the chip waveform quality (ρ)

COOF. <coof>::=<NRf> is the chip origin offset in dB

SIGNature. <sig>::=<NR1> is the signature number in the preamble.

PREamble. <pre>::=<NR1> is the preamble.

Measurement Modes DEMULR5_3G

Examples

```
:FETCh:ULR5_3GPP? ANACk
```

might return 1,1,7,5 as the result of the ACK/NACK analysis.

Related Commands :INSTrument[:SELect],[:SENSe]:ULR5_3GPP:SFRame:SEARch

:MMEMory Commands

The :MMEMory commands allow you to manipulate files on the hard disk or floppy disk.

For details on file manipulation, refer to the *WCA230A and WCA280A User Manual*.

Command Tree

Header	Parameter
:MMEMory	
:LOAD	
:LIMit	<file_name>
:STORe	
:LIMit	<file_name>
:STABle	<file_name>

:MMEMory:LOAD:LIMit (No Query Form)

Loads limits from the specified file.
This command is valid only in the S/A (spectrum analysis) mode.

Syntax `:MMEMory:LOAD:LIMit <file_name>`

Arguments `<file_name>::=<string>` specifies the file from which to load limits. The file extension is .lmt.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:MMEMory:LOAD:LIMit "C:\My Documents\Test.lmt"`
loads limits from the file Test.lmt in the My Documents folder.

:MMEMory:STORe:LIMit (No Query Form)

Stores the current limits in the specified file.
This command is valid only in the S/A (spectrum analysis) mode.

Syntax `:MMEMory:STORe:LIMit <file_name>`

Arguments `<file_name>::=<string>` specifies the file in which to store the current limits. The file extension is .lmt.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:MMEMory:STORe:LIMit "C:\My Documents\Test.lmt"`
stores the current limits in the file Test.lmt in the My Documents folder.

:MMEMory:STORe:STABle (No Query Form)

Stores the symbol table in the specified file.
This command is valid only in the Demod (modulation analysis) mode.

Syntax `:MMEMory:STORe:STABle <file_name>`

Arguments `<file_name>::=<string>` specifies the file to store the symbol table. The file is in text format with its extension of .sym.

The header of the file has the following information in this order:

- Date and time
- Modulation
- Symbol rate
- Measurement filter
- Reference filter
- Filter factor (α)
- Slot number
- Short code number
- Time from the data end point of the first symbol

Measurement Modes DEMDLR5_3G, DEMULR5_3G

Examples `:MMEMory:STORe:STABle "C:\My Documents\Data1.sym"` stores the symbol table in the file Data1.sym in the My Documents folder.

:READ Commands

The :READ commands acquire an input signal once in the single mode and obtain the measurement results from the 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 on page 3-53.

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { “SADLR5_3G” | “SAULR5_3G” }
   ```

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	
:SADLR5_3GPP|:SAULR5_3GPP	
:ACLR?	
:CFRequency?	
:CHPower?	
:EBWidth?	
:MCAClr?	
:OBWidth?	
:SEMask?	
:SPECtrum?	
:ACLR?	
:CFRequency?	
:CHPower?	
:EBWidth?	
:MCAClr?	
:OBWidth?	
:SEMask?	

:READ:SADLR5_3GPP|:SAULR5_3GPP:ACLR? (Query Only)

Returns the results of the ACLR (Adjacent Channel Leakage Power Ratio) measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:ACLR?`

Arguments None

Returns `<Pass_Fail>,<Chpower>,<Laclr1>,<Uaclr1>,<Laclr2>,<Uaclr2>`

Where
`<Pass_Fail>::={ 1 |– 1 | 0 }` is the limit test result.
1: Pass, –1: Fail, 0: No decision (measurement limits disabled).
`<Chpower>::=<NRf>` is the channel power measured value in dBm.
`<Laclr1>::=<NRf>` is the 1st lower adjacent channel ACLR in dBc.
`<Uaclr1>::=<NRf>` is the 1st upper adjacent channel ACLR in dBc.
`<Laclr2>::=<NRf>` is the 2nd lower adjacent channel ACLR in dBc.
`<Uaclr2>::=<NRf>` is the 2nd upper adjacent channel ACLR in dBc.

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:ACLR?`
might return `1,– 18.17,59.35,56.83,57.88,58.52` for the downlink ACLR measurement results.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:CFRequency? (Query Only)

Returns the results of the carrier frequency measurement in the 3GPP-R5 analysis.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:CFRequency?`

Arguments None

Returns `<Cfreq>::=<NRf>` is the carrier frequency measured value in Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:CFRequency?`
might return `2.025E+9`, indicating that the carrier frequency is 2.025 GHz.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:CHPower? (Query Only)

Returns the results of the channel power measurement for 3GPP-R5 dstandard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:CHPower?`

Arguments None

Returns `<pass_fail>,<chpower>,<power_density>`

Where
`<pass_fail>::={ 1 | 0 }` is the measurement result; 1: Pass or 0: Fail.
`<chpower>::=<NRf>` is the channel power measured value in dBm.
`<power_density>::=<NRf>` is the power density measured value in dBm/Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:CHPower?`
might return `1,–2.0375E+001,–8.1274E+001` for the channel power measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:EBWidth? (Query Only)

Returns the results of the EBW (Emission Bandwidth) measurement in the 3GPP-R5 analysis.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:EBWidth?`

Arguments None

Returns `<ebw>::=<NRf>` is the EBW in Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:EBWidth?`
might return `3.843E+6`, indicating that the EBW is 3.843 MHz.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP:MCAClr? (Query Only)

Returns the results of the multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink analysis.

Syntax `:READ:SADLR5_3GPP:MCAClr?`

Arguments None

Returns `<Pass_Fail>,<Mainchannel_No>,<Totalpower>,`
`<Chpower1>,<Chpower2>,<Chpower3>,<Chpower4>,`
`<Laclr1>,<Uaclr1>,<Laclr2>,<Uaclr2>`

Where
`<Pass_Fail>::={ 1 |– 1 | 0 }` is the limit test result.
1: Pass, –1: Fail, 0: No decision (measurement limits disabled).
`<Mainchannel_No>::=<NR1>` is the number of main channels (1 to 4).
`<Totalpower>::=<NRf>` is the total power measured value in dBm.
`<Chpower1>::=<NRf>` is the power measured value for Channel 1 in dBm.
`<Chpower2>::=<NRf>` is the power measured value for Channel 2 in dBm.
`<Chpower3>::=<NRf>` is the power measured value for Channel 3 in dBm.
`<Chpower4>::=<NRf>` is the power measured value for Channel 4 in dBm.
`<Laclr1>::=<NRf>` is the first lower adjacent channel ACLR in dBc.
`<Uaclr1>::=<NRf>` is the first upper adjacent channel ACLR in dBc.
`<Laclr2>::=<NRf>` is the second lower adjacent channel ACLR in dBc.
`<Uaclr2>::=<NRf>` is the second upper adjacent channel ACLR in dBc.

Invalid data is returned as --1000.

Measurement Modes SADLR5_3G

Examples `:READ:SADLR5_3GPP:MCAClr?`
might return `1,4,– 12.18,– 18.14,– 18.04,– 18.16,– 18.17, 59.35,56.83,57.88,58.52` for the multi-carrier ACLR measurement results.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:OBWidth? (Query Only)

Returns the results of the OBW (Occupied Bandwidth) measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:OBWidth?`

Arguments None

Returns `<pass_fail>,<obw>`

Where
`<pass_fail>::={ 1 | 0 }` is the measurement result; 1: Pass or 0: Fail.
`<obw>::=<NRf>` is the occupied bandwidth in Hz.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:OBWidth?`
might return `1,1.27333E+006` for the OBW measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SEMask? (Query Only)

Returns the results of the spectrum emission mask measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SEMask?`

Arguments None

Returns `<pass_fail>`

Where
`<pass_fail>::={ 1 | 0 }` is the measurement result; 1: Pass or 0: Fail.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SEMask?`
might return `1` for the spectrum emission mask measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:ACLR? (Query Only)

Returns the spectrum waveform data of the ACLR (Adjacent Channel Leakage Power Ratio) measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:ACLR?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:ACLR?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the ACLR measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CFRequency? (Query Only)

Returns the spectrum waveform data of the carrier frequency measurement in the 3GPP-R5 analysis.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CFRequency?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:CFRequency?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the carrier frequency measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CHPower? (Query Only)

Returns the spectrum waveform data of the channel power measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:CHPower?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:CHPower?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the channel power measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:EBWidth? (Query Only)

Returns the spectrum waveform data of the EBW (Emission Bandwidth) measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:EBWidth?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:EBWidth?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the EBW measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP:SPECtrum:MCACLr? (Query Only)

Returns the spectrum waveform data of the multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink analysis.

Syntax `:READ:SADLR5_3GPP:SPECtrum:MCACLr?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:MCACLr?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the multi-carrier ACLR measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:OBWidth? (Query Only)

Returns the spectrum waveform data of the OBW (Occupied Bandwidth) measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:OBWidth?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:OBWidth?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the OBW measurement.

Related Commands `:INSTrument[:SELect]`

:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:SEMask? (Query Only)

Returns the spectrum waveform data of the spectrum emission mask measurement for 3GPP-R5 standard.

Syntax `:READ:SADLR5_3GPP|:SAULR5_3GPP:SPECtrum:SEMask?`

Arguments None

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 spectrum amplitude in dBm.
Four-byte little endian floating-point format specified IEEE 488.2.
n: Max 240001

Invalid data is returned as –1000.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples `:READ:SADLR5_3GPP:SPECtrum:SEMask?`
might return `#510240xxx...` (10240-byte data) as the spectrum waveform data of the spectrum emission mask measurement.

Related Commands `:INSTrument[:SELect]`

:SENSe Commands

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

Table 3-16: :SENSe command subgroups

Command header	Function	Refer to:
[:SENSE]:DLR5_3GPP	Set up the modulation analysis for 3GPP-R5 downlink.	page 3-96
[:SENSE]:SADLR5_3GPP|:SAULR5_3GPP:ACLR	Set up the ACLR measurement.	page 3-106
[:SENSE]:SADLR5_3GPP|:SAULR5_3GPP:CFRequency	Set up the carrier frequency measurement.	page 3-110
[:SENSE]:SADLR5_3GPP|:SAULR5_3GPP:CHPower	Set up the channel power measurement.	page 3-111
[:SENSE]:SADLR5_3GPP|:SAULR5_3GPP:EBWidth	Set up the EBW measurement.	page 3-114
[:SENSE]:SADLR5_3GPP:MCAClr	Set up the multi-carrier ACLR measurement.	page 3-115
[:SENSE]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth	Set up the OBW measurement.	page 3-119
[:SENSE]:SADLR5_3GPP|:SAULR5_3GPP:SEMask	Set up the spectrum emission mask measurement.	page 3-121
[:SENSE]:ULR5_3GPP	Set up the modulation analysis for 3GPP-R5 uplink.	page 3-127

[:SENSe]:DLR5_3GPP Subgroup

The [:SENSe]:DLR5_3GPP commands set up conditions for the 3GPP-R5 downlink modulation analysis.

NOTE. *To use a command of this group, you must have selected DEMDLR5_3G (3GPP-R5 downlink modulation analysis mode) with the :INSTrument[:SELect] command.*

Command Tree

Header	Parameter
[:SENSe]	
:DLR5_3GPP	
:BLOCk	<numeric_value>
:CARRier	
:OFFSet	<frequency>
:SEARch	<boolean>
:COMPosite	<boolean>
:DTYPe	
:SEARch	<boolean>
:EVM	
:IQOoffset	INCLude | EXCLude
:FILTer	
:ALPHa	<ratio>
:MEASurement	OFF | RRCosine
:REFerence	OFF | RCOSine | GAUSsian
[:IMMediate]	
:LENGth	<numeric_value>
:OFFSet	<numeric_value>
:SCHPart	<boolean>
:SCODe	
:ALTernative	NUSed | PRIMary | LEFT | RIGHt
:NUMBer	<code_number>
:SEARch	<boolean>

[:SENSe]:DLR5_3GPP:BLOCk(?)

Sets or queries the number of the block to measure in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:BLOCk <number>

[:SENSe]:DLR5_3GPP:BLOCk?
```

Arguments

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

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:BLOCk –5
```

sets the block number to –5.

[:SENSe]:DLR5_3GPP:CARRier:OFFSet(?)

Sets or queries the carrier frequency offset in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:CARRier:OFFSet <freq>
```

```
[:SENSe]:DLR5_3GPP:CARRier:OFFSet?
```

Arguments

<freq>::=<NRf> specifies the carrier frequency offset.
Range: –Fs to Fs (Fs: Span)

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:CARRier:OFFSet 10MHz
```
sets the carrier frequency offset to 10 MHz.

[:SENSe]:DLR5_3GPP:CARRier:SEARch(?)

Determines whether to detect the carrier automatically in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:CARRier:SEARch { OFF | ON | 0 | 1 }
```

```
[:SENSe]:DLR5_3GPP:CARRier:SEARch?
```

Arguments

OFF or 0 specifies that the carrier is not detected automatically. Set the carrier frequency offset using the [:SENSe]:DLR5_3GPP:CARRier:OFFSet command.

ON or 1 specifies that the carrier is detected automatically.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:CARRier:SEARch ON
```
specifies that the carrier is detected automatically.

Related Commands

```
[:SENSe]:DLR5_3GPP:CARRier:OFFSet
```

[:SENSe]:DLR5_3GPP:COMPosite(?)

Determines whether to perform the composite analysis (automatic detection of symbol rate) in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:COMPosite { OFF | ON | 0 | 1 }
```

```
[:SENSe]:DLR5_3GPP:COMPosite?
```

Arguments

`OFF` or `0` specifies that composite analysis is not performed.

`ON` or `1` specifies that composite analysis is performed.

NOTE. *You should usually specify that composite analysis is performed. If a normal analysis does not result, select OFF in this command and select a specific symbol rate in :DISPlay:DLR5_3GPP:AVIew:SRATe.*

Measurement Modes DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:COMPosite ON
```

specifies that the composite analysis is performed.

Related Commands `:DISPlay:DLR5_3GPP:AVIew:SRATe`

[:SENSe]:DLR5_3GPP:DTYPe:SEARch(?)

Determines whether to detect the demodulation type of the code channel (QPSK or 16QAM) automatically.

Syntax

```
[:SENSe]:DLR5_3GPP:DTYPe:SEARch { OFF | ON | 0 | 1 }
```

```
[:SENSe]:DLR5_3GPP:DTYPe:SEARch?
```

Arguments

`OFF` or `0` specifies that the code channel is QPSK.

`ON` or `1` specifies that the code channel is automatically detected (QPSK or 16QAM).

Measurement Modes DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:DTYPe:SEARch ON
```

specifies that the code channel is automatically detected.

[:SENSe]:DLR5_3GPP:EVM:IQOoffset(?)

Determines whether to include the I/Q origin offset in the EVM (Error Vector Magnitude), Rho (waveform quality), and PCDE (Peak Code Domain Error) calculation.

Syntax

```
[:SENSe]:DLR5_3GPP:EVM:IQOoffset { INCLude | EXCLude }
```

```
[:SENSe]:DLR5_3GPP:EVM:IQOoffset?
```

Arguments

`INCLude` includes the I/Q origin offset in the EVM, Rho, and PCDE calculation.

`EXCLude` excludes the I/Q origin offset from the calculation.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:EVM:IQOoffset INCLude
```
includes the I/Q origin offset in the calculation.

[:SENSe]:DLR5_3GPP:FILTer:ALPHa(?)

Sets or queries the filter factor (α/BT) in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:FILTer:ALPHa <value>
```

```
[:SENSe]:DLR5_3GPP:FILTer:ALPHa?
```

Arguments

`<value>::=<NRf>` specifies the filter factor (α/BT). Range: 0 to 1.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:FILTer:ALPHa 0.5
```
sets the filter factor to 0.5.

[:SENSe]:DLR5_3GPP:FILTer:MEASurement(?)

Selects or queries the measurement filter in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:FILTer:MEASurement
   { OFF | RRCosine }

[:SENSe]:DLR5_3GPP:FILTer:MEASurement?
```

Arguments

`OFF` specifies that no measurement filter is used.

`RRCosine` selects the Root Raised Cosine filter.

Measurement Modes DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:FILTer:MEASurement RRCosine
```

selects the Root Raised Cosine filter as the measurement filter.

[:SENSe]:DLR5_3GPP:FILTer:REFerence(?)

Selects or queries the reference filter in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:FILTer:REFerence
   { OFF | RCOSine | GAUSsian }

[:SENSe]:DLR5_3GPP:FILTer:REFerence?
```

Arguments

`OFF` specifies that no reference filter is used.

`RCOSine` selects the Raised Cosine filter.

`GAUSsian` selects the Gaussian filter.

Measurement Modes DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:FILTer:REFerence RCOSine
```

selects the Raised Cosine filter as the reference filter.

[:SENSe]:DLR5_3GPP[:IMMediate] (No Query Form)

Runs the 3GPP-R5 downlink analysis calculation on the acquired data. To acquire data, use the :INITiate command.

Syntax `[:SENSe]:DLR5_3GPP[:IMMediate]`

Arguments None

Measurement Modes DEMDLR5_3G

Examples `:SENSe:DLR5_3GPP:IMMediate`
runs the 3GPP-R5 downlink analysis calculation.

Related Commands `:INITiate`

[:SENSe]:DLR5_3GPP:LENGth(?)

Defines or queries the range for the 3GPP-R5 downlink analysis.

Syntax `[:SENSe]:DLR5_3GPP:LENGth <value>`

`[:SENSe]:DLR5_3GPP:LENGth?`

Arguments `<value>::=<NRf>` specifies the analysis range by the number of data points.
Range: 1 to 1024 × (block size).
To set the block size, use the [:SENSe]:BSIZe command. For the [:SENSe]:BSIZe command, refer to the *WCA230A and WCA280A Programmer Manual.*

Measurement Modes DEMDLR5_3G

Examples `:SENSe:DLR5_3GPP:LENGth 1000`
sets the length of the analysis range to 1000 points.

Related Commands `[:SENSe]:BSIZe`

[:SENSe]:DLR5_3GPP:OFFSet(?)

Sets or queries the measurement start position in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:OFFSet <value>
```

```
[:SENSe]:DLR5_3GPP:OFFSet?
```

Arguments

<value>::=<NRf> specifies the measurement start position by the number of data points. Range: 0 to 1024 × (block size) –1.
To set the block size, use the [:SENSe]:BSIZe command. For the [:SENSe]:BSIZe command, refer to the *WCA230A and WCA280A Programmer Manual.*

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:OFFSet 100
```
sets the measurement start position to point 100.

Related Commands

[:SENSe]:BSIZe

[:SENSe]:DLR5_3GPP:SCHPart(?)

Determines whether to include the SCH part in the analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:SCHPart { OFF | ON | 0 | 1 }
```

```
[:SENSe]:DLR5_3GPP:SCHPart?
```

Arguments

OFF or 0 specifies that the SCH part is not included in the analysis.

ON or 1 specifies that the SCH part is included in the analysis.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:SCHPart ON
```
specifies that the SCH part is included in the analysis.

[:SENSe]:DLR5_3GPP:SCODe:ALTernative(?)

Selects or queries the alternative scrambling code in the 3GPP-R5 downlink modulation analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:SCODe:ALTernative
   { NUSed | PRIMary | LEFT | RIGHt }

[:SENSe]:DLR5_3GPP:SCODe:ALTernative?
```

Arguments

`NUSed` (default) uses the primary scrambling code only (without the left and the right alternative scrambling codes) to de-spread the input signal.

`PRIMary` uses the primary scrambling with the left and the right alternative scrambling codes to de-spread the input signal.

`LEFT` uses the left alternative scrambling code to de-spread the input signal.

`RIGHt` uses the right alternative scrambling code to de-spread the input signal.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:SCODe:ALTernative RIGHt
```

uses the right alternative scrambling code to de-spread the input signal.

[:SENSe]:DLR5_3GPP:SCODe:NUMBer(?)

Sets or queries the scrambling code in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:SCODe:NUMBer <value>
[:SENSe]:DLR5_3GPP:SCODe:NUMBer?
```

Arguments

<value>::=<NR1> specifies the scrambling code. Range: 0 to 24575.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:SCODe:NUMBer 3
```
sets the scrambling code to 3.

Related Commands

```
[:SENSe]:DLR5_3GPP:SCODe:SEARch
```

[:SENSe]:DLR5_3GPP:SCODe:SEARch(?)

Determines whether automatic detection of the scrambling code is on or off in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:DLR5_3GPP:SCODe:SEARch { OFF | ON | 0 | 1 }
[:SENSe]:DLR5_3GPP:SCODe:SEARch?
```

Arguments

OFF or 0 specifies that the scrambling code is not detected automatically. To set it, use the [:SENSe]:DLR5_3GPP:SCODe:NUMBer command above.

ON or 1 specifies that the scrambling code is detected automatically.

Measurement Modes

DEMDLR5_3G

Examples

```
:SENSe:DLR5_3GPP:SCODe:SEARch ON
```
specifies that the scrambling code is detected automatically.

Related Commands

```
[:SENSe]:DLR5_3GPP:SCODe:NUMBer
```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR Subgroup

The [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP commands set up conditions for the ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink and uplink analyses.

Command Tree

```
Header                              Parameter
[:SENSe]
   :SADLR5_3GPP|:SAULR5_3GPP
      :ACLR
         :FILTer
            :COEFficient  <numeric_value>
            :TYPE         RECTangle | RNYQuist
         :LIMit
            :ADJacent<x>
               [:STATe]   <boolean>
         :SGAin           <gain_offset>
```

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { "SADLR5_3G" | "SAULR5_3G" }
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP|:SAULR5_3GPP:ACLR
   ```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:FILTer:COEFficient (?)

Sets or queries the filter factor (α/BT) when you have selected RNYQuist (Root Nyquist filter) in the [:SENSe]:SADLR5_3GPP:SADLR5_3GPP|:ACLR :FILTer:TYPE command for the 3GPP-R5 ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:FILTer
:COEFficient <value>

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:FILTer
:COEFficient?
```

Arguments

<value>::=<NRf> specifies the filter factor. Range: 0.0001 to 1 (default: 0.22).

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:ACLR:FILTer:COEFficient 0.5
```

sets the filter factor to 0.5.

Related Commands

[:SENSe]:SADLR5_3GPP|:SADLR5_3GPP:ACLR:FILTer:TYPE

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:FILTer:TYPE (?)

Selects or queries the filter for the 3GPP-R5 ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:FILTer:TYPE
   { RECTangle | RNYQuist }

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:FILTer:TYPE?
```

Arguments

RECTangle selects the rectangular filter.

RNYQuist selects the Root Nyquist filter.

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:ACLR:FILTer:TYPE RNYQuist
```

selects the Root Nyquist filter.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:LIMit:ADJacent<x>[:STATe] (?)

Determines whether to enable or disable the adjacent limit testing for the 3GPP-R5 ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:LIMit
:ADJacent<x>[:STATe] { ON | OFF | 1 | 0 }

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:LIMit
:ADJacent<x>[:STATe]?
```

Where ADJacent<x>
::={ ADJacent[1] | ADJacent2 | ADJacent3 | ADJacent4 }
ADJacent1: 1st lower adjacent channel
ADJacent2: 1st upper adjacent channel
ADJacent3: 2nd lower adjacent channel
ADJacent4: 2nd upper adjacent channel

Arguments

ON or 1 enables the adjacent limit testing.

OFF or 0 disables the adjacent limit testing.

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:ACLR:LIMit:ADJacent1 ON
```

enables the limit testing for the first adjacent in the ACLR measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:SGAin (?)

Sets or queries the gain offset for the second adjacent channel in the 3GPP-R5 ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:SGAin <value>
```

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:ACLR:SGAin?
```

Arguments

<value>::=<NRf> specifies the gain offset for the second adjacent channel. Range: 3 to 15 dB.

NOTE. *The upper limit of the range may be smaller than 15 dB, depending on amplitude settings and/or calibration results. You can check the upper limit value with the* **2nd Adj Channel Gain** *side key in the Meas Setup menu; Turn the general purpose knob clockwise to obtain the maximum value.*

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:ACLR:SGAin 10
```

sets the gain offset to 10 dB.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CFRequency Subgroup

The [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CFRequency commands set up conditions for the carrier frequency measurement in the 3GPP-R5 downlink or uplink analysis..

Command Tree

Header	Parameter
[:SENSe]	
:SADLR5_3GPP|:SAULR5_3GPP	
:CFRequency	
:CRESolution	<numeric_value>

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { “SADLR5_3G” | “SAULR5_3G” }
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP|:SAULR5_3GPP:CFRequency
   ```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CFRequency:CRESolution(?)

Sets or queries the counter resolution for the carrier frequency measurement in the 3GPP-R5 analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CFRequnecy
:CRESolution <value>
```

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CFRequnecy
:CRESolution?
```

Arguments

<value>::=<NRf> specifies the counter resolution.
Setting value (Hz): 0.001, 0.01, 0.1, 1, 10, 100, 1k, 10k, 100k, or 1M

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:CFRequnecy:CRESolution 1kHz
```

sets the counter resolution to 1 kHz.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower Subgroup

The [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower commands set up conditions for the channel power measurement in the 3GPP-R5 downlink or uplink analysis..

Command Tree

Header	Parameter
[:SENSe]	
:SADLR5_3GPP|:SAULR5_3GPP	
:CHPower	
:BANDwidth|:BWIDth	
:INTegration	<numeric_value>
:FILTer	
:COEFficient	<numeric_value>
:TYPE	RECTangle | GAUSsian | NYQuist | RNYQuist
:LIMit	
[:STATe]	<boolean>

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { “SADLR5_3G” | “SAULR5_3G” }
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP|:SAULR5_3GPP:CHPower
   ```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:BANDwidth|:BWIDth :INTegration(?)

Sets or queries the channel bandwidth for the channel power measurement in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:BANDwidth
|:BWIDth:INTegration <value>

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:BANDwidth
|:BWIDth:INTegration?
```

Arguments

<value>::=<NRf> specifies the channel bandwidth.
Range: (Bin bandwidth) × 8 to full span [Hz].
Refer to the *WCA230A and WCA280A User Manual* for the bin bandwidth.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:CHPower:BANDwidth:INTegration
   2.5MHz
```

sets the channel bandwidth to 2.5 MHz for the channel power measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:FILTer:COEFficient(?)

Sets or queries the filter roll-off rate for the channel power measurement in the 3GPP-R5 downlink analysis when you have selected NYQuist or RNYQuist in the [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower FILTer:TYPE command.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:FILTer
:COEFficient <value>

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:FILTer
:COEFficient?
```

Arguments

<value>::=<NRf> specifies the roll-off rate. Range: 0.0001 to 1 (default: 0.5)

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:CHPower:FILTer:COEFficient 0.1
```

sets the filter roll-off rate to 0.1 for the channel power measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:FILTer:TYPE(?)

Selects or queries the filter for the channel power measurement in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:FILTer:TYPE
   { RECTangle | GAUSsian | NYQuist | RNYQuist }

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:FILTer:TYPE?
```

Arguments

`RECTangle` selects the Rectangular filter.

`GAUSsian` selects the Gaussian filter.

`NYQuist` selects the Nyquist filter.

`RNYQuist` selects the Root Nyquist filter.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:CHPower:FILTer:TYPE NYQuist
```

selects the Nyquist filter for the channel power measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:LIMit[:STATe](?)

Determines whether to enable or disable the limit testing for the channel power measurement in the 3GPP-R5 analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:LIMit
[:STATe] { ON | OFF | 1 | 0 }

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:CHPower:LIMit
[STATe]?
```

Arguments

`ON` or `1` enables the limit testing.

`OFF` or `0` disables the limit testing.

Measurement Modes SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:CHPower:LIMit:STATe ON
```

enables the limit testing for the channel power measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:EBWidth Subgroup

The [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:EBWidth commands set up conditions for the EBW (Emission Bandwidth) measurement in the 3GPP-R5 downlink or uplink analysis..

Command Tree

Header	Parameter
[:SENSe]	
:SADLR5_3GPP|:SAULR5_3GPP	
:EBWidth	
:XDB	<numeric_value>

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { "SADLR5_3G" | "SAULR5_3G" }
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP|:SAULR5_3GPP:EBWidth
   ```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:EBWidth:XDB(?)

Sets or queries the level relative to the maximum peak at which the EBW is measured in the 3GPP-R5 analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:EBWidth:XDB <value>
```

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:EBWidth:XDB?
```

Arguments

<value>::=<NRf> is the level at which the EBW is measured.
Specify the amplitude relative to the maximum peak.
Range: −100 to −1 dB (default: −30 dB).

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:EBWidth:XDB -20
```

specifies that the EBW is measured at a level −20 dB lower than the maximum peak.

[:SENSe]:SADLR5_3GPP:MCAClr Subgroup

The [:SENSe]:SADLR5_3GPP:MCAClr commands set up conditions for the multi-carrier ACLR (Adjacent Channel Leakage Power Ratio) measurement in the 3GPP-R5 downlink analysis.

Command Tree

Header	Parameter
[:SENSe]	
:SADLR5_3GPP	
:MCAClr	
:CARRier	
[:THReshold]	<numeric_value>
:FILTer	
:COEFficient	<numeric_value>
:TYPE	RECTangle | RNYQuist
:LIMit	
:ADJacent<x>	
[:STATe]	<boolean>

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G:

   ```
   :INSTrument[:SELect] "SADLR5_3G"
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP:MCAClr
   ```

[:SENSe]:SADLR5_3GPP:MCAClr:CARRier[:THReshold](?)

Sets or queries the threshold level to detect the carrier for the multi-carrier ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP:MCAClr:CARRier[:THReshold]
   <value>

[:SENSe]:SADLR5_3GPP:MCAClr:CARRier[:THReshold]?
```

Arguments

<value>::=<NRf> specifies the threshold level to detect the carrier. Range: −30 to −1 dBc relative to the main channel power.

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:MCAClr:CARRier:THReshold -5
```

sets the the threshold level to −5 dBc.

Related Commands

```
[:SENSe]:SADLR5_3GPP:MCAClr:FILTer:TYPE
```

[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:COEFficient(?)

Sets or queries the filter factor (α/BT) when you have selected RNYQuist (Root Nyquist filter) in the [:SENSe]:SADLR5_3GPP:MCACLr:FILTer:TYPE command for the multi-carrier ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:COEFficient <value>

[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:COEFficient?
```

Arguments

<value>::=<NRf> specifies the filter factor. Range: 0 to 1.

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:MCACLr:FILTer:COEFficient 0.5
```

sets the filter factor to 0.5.

Related Commands

[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:TYPE

[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:TYPE(?)

Selects or queries the filter for the multi-carrier ACLR measurement.

Syntax

```
[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:TYPE
   { RECTangle | RNYQuist }

[:SENSe]:SADLR5_3GPP:MCACLr:FILTer:TYPE?
```

Arguments

RECTangle selects the rectangular filter.

RNYQuist selects the Root Nyquist filter.

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:MCACLr:FILTer:TYPE RNYQuist
```

selects the Root Nyquist filter.

[:SENSe]:SADLR5_3GPP:MCACLr:LIMit:ADJacent<x>[:STATe](?)

Determines whether to enable or disable the adjacent limit testing for the multi-carrier ACLR measurement in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP:MCACLr:LIMit:ADJacent<x>[:STATe]
   { ON | OFF | 1 | 0 }

[:SENSe]:SADLR5_3GPP:MCACLr:LIMit:ADJacent<x>[:STATe]?
```

Where ADJacent<x>
::={ ADJacent[1] | ADJacent2 | ADJacent3 | ADJacent4 }
ADJacent1: 1st lower adjacent channel
ADJacent2: 1st upper adjacent channel
ADJacent3: 2nd lower adjacent channel
ADJacent4: 2nd upper adjacent channel

Arguments

ON or 1 enables the adjacent limit testing.

OFF or 0 disables the adjacent limit testing.

Measurement Modes

SADLR5_3G

Examples

```
:SENSe:SADLR5_3GPP:MCACLr:LIMit:ADJacent1 ON
```

enables the limit testing for the first adjacent in the multi-carrier ACLR measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth Subgroup

The [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth commands set up conditions for the OBW (Occupied Bandwidth) measurement in the 3GPP-R5 downlink or uplink analysis..

Command Tree

Header	Parameter
[:SENSe]	
:SADLR5_3GPP|:SAULR5_3GPP	
:OBWidth	
:LIMit	
[:STATe]	<boolean>
:PERCent	<numeric_value>

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { “SADLR5_3G” | “SAULR5_3G” }
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP|:SAULR5_3GPP:OBWidth
   ```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth:LIMit[:STATe](?)

Determines whether to enable or disable the limit testing for the OBW measurement in the 3GPP-R5 analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth:LIMit
[:STATe] { ON | OFF | 1 | 0 }

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth:LIMit
[:STATe]?
```

Arguments

`ON` or `1` enables the limit testing.

`OFF` or `0` disables the limit testing.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

`:SENSe:SADLR5_3GPP:OBWidth:LIMit:STATe ON`
enables the limit testing for the OBW measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth:PERCent(?)

Sets or queries the occupied bandwidth for the OBW measurement in the 3GPP-R5 analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth:PERCent
<value>

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:OBWidth:PERCent?
```

Arguments

`<value>::=<NRf>` specifies the occupied bandwidth.
Range: 80 to 99.99% (default: 99%).

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

`:SENSe:SADLR5_3GPP:OBWidth:PERCent 95PCT`
sets the occupied bandwidth to 95% for the OBW measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask Subgroup

The [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask commands set up conditions for the spectrum emission mask measurement in the 3GPP-R5 downlink or uplink analysis.

Command Tree

Header	Parameter
[:SENSe]	
:SADLR5_3GPP|:SAULR5_3GPP	
:SEMask	
:BANDwidth|:BWIDth	
:INTegration	<numeric_value>
:FILTer	
:COEFficient	<numeric_value>
:TYPE	RECTangle | GAUSsian | NYQuist | RNYQuist
:LIMit	
:ZONE<x>	
[:STATe]	<boolean>
:RCHannel	
:LEVel	<numeric_value>
:MODE	AUTO | MANual

Prerequisites for Use

You must run the following two commands before using a command of this group:

1. Execute the :INSTrument command to set the measurement mode to SADLR5_3G or SAULR5_3G:

   ```
   :INSTrument[:SELect] { “SADLR5_3G” | “SAULR5_3G” }
   ```

2. Execute the :CONFigure command to start the measurement with the default settings:

   ```
   :CONFigure:SADLR5_3GPP|:SAULR5_3GPP:SEMask
   ```

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:BANDwidth|:BWIDth :INTegration(?)

Sets or queries the channel bandwidth for the spectrum emission mask measurement in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:BANDwidth
|:BWIDth:INTegration <value>

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:BANDwidth
|:BWIDth:INTegration?
```

Arguments

<value>::=<NRf> specifies the channel bandwidth.
Range: (Bin bandwidth) × 8 to full span [Hz].
Refer to the *WCA230A and WCA280A User Manual* for the bin bandwidth.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:SEMask:BANDwidth:INTegration 2.5MHz
```

sets the channel bandwidth to 2.5 MHz for the spectrum emission mask measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer:COEFficient(?)

Sets or queries the filter roll-off rate for the spectrum emission mask measurement in the 3GPP-R5 downlink analysis when you have selected NYQuist or RNYQuist in the [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer:TYPE command.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer
:COEFficient <value>

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer
:COEFficient?
```

Arguments

<value>::=<NRf> specifies the roll-off rate.
Range: 0.0001 to 1 (default: 0.5)

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:SEMask:FILTer:COEFficient 0.1
```

sets the filter roll-off rate to 0.1 for the spectrum emission mask measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer:TYPE(?)

Selects or queries the filter for the spectrum emission mask measurement in the 3GPP-R5 downlink analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer:TYPE
   { RECTangle | GAUSsian | NYQuist | RNYQuist }

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:FILTer:TYPE?
```

Arguments

`RECTangle` selects the rectangular filter.

`GAUSsian` selects the Gaussian filter.

`NYQuist` selects the Nyquist filter.

`RNYQuist` selects the Root Nyquist filter.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

`:SENSe:SADLR5_3GPP:SEMask:FILTer:TYPE NYQuist` selects the Nyquist filter for the spectrum emission measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:LIMit:ZONE<x>[:STATe](?)

Determines whether to enable or disable the zone limit testing for the spectrum emission mask measurement in the 3GPP-R5 analysis.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:LIMit:ZONE<x>
[:STATe] { ON | OFF | 1 | 0 }
```

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:LIMit:ZONE<x>
[:STATe]?
```

Where
`ZONE<x>::={ ZONE[1] | ZONE2 | ZONE3 | ZONE4 | ZONE5 }`
Zone 1, 2, 3, 4, and 5 correspond to Zone A, B, C, D, and E in the limit editor, respectively.

Arguments

`ON` or `1` enables the zone limit testing.

`OFF` or `0` disables the zone limit testing.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

`:SENSe:SADLR5_3GPP:SEMask:LIMit:ZONE1:STATe ON`
enables the limit testing for Zone 1 in the spectrum emission mask measurement.

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel:LEVel(?)

Sets or queries the reference channel level to measure the spurious emission level in dBc when the you have selected MANual in the [:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel:MODE command.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel
:LEVel <value>
```

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel
:LEVel?
```

Arguments

<value>::=<NRf> specifies the reference level. Range: –150 to 30 dBm

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:SEMask:RCHannel:LEVel –10dBm
```

sets the reference channel level to –10 dBm for the spectrum emission mask measurement.

Related Commands

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel:MODE

[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel:MODE(?)

Selects or queries the mode of the reference channel level to measure the spurious emission level in dBc.

Syntax

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel
:MODE { AUTO | MANual }
```

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel
:MODE?
```

Arguments

`AUTO` specifies that the reference level is measured from the input signal.

`MANual` specifies that the reference level is defined by the [:SENSe] :SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel:LEVel command.

Measurement Modes

SADLR5_3G, SAULR5_3G

Examples

```
:SENSe:SADLR5_3GPP:SEMask:RCHannel:MODE AUTO
```

sets the mode of the reference channel level to AUTO for the spectrum emission mask measurement.

Related Commands

```
[:SENSe]:SADLR5_3GPP|:SAULR5_3GPP:SEMask:RCHannel
:LEVel
```

[:SENSe]:ULR5_3GPP Subgroup

The [:SENSe]:ULR5_3GPP commands set up conditions for the 3GPP-R5 uplink modulation analysis.

NOTE. *To use a command of this group, you must have selected DEMULR5_3G (3GPP-R5 uplink modulation analysis mode) with the :INSTrument[:SELect] command.*

Command Tree

Header	Parameter
[:SENSe]	
:ULR5_3GPP	
:BLOCk	<numeric_value>
:CARRier	
:OFFSet	<frequency>
:SEARch	<boolean>
:EVM	
:IQOoffset	INCLude | EXCLude
:FILTer	
:ALPHa	<numeric_value>
:MEASurement	OFF | RRCosine
:REFerence	OFF | RCOsine | GAUssian
[:IMMediate]	
:LENGth	<numeric_value>
:MMOde	DPCH | PRACh | PCPCh
:OFFSet	<numeric_value>
:SCODe	
:NUMBer	<numeric_value>
:TYPE	LONG | SHORt
:SFRame	
:OFFSet	
:DTIMe	<numeric_value>
[:STSLot]	<numeric_value>
:SEARch	AUTO | STSLot | DTIMe
:THReshold	
[:BURSt]	<numeric_value>
:UANResult	

[:SENSe]:ULR5_3GPP:BLOCk(?)

Sets or queries the number of the block to measure in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:BLOCk <number>
```

```
[:SENSe]:ULR5_3GPP:BLOCk?
```

Arguments

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

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:BLOCk –5
```

sets the block number to –5.

[:SENSe]:ULR5_3GPP:CARRier:OFFSet(?)

Sets or queries the carrier frequency offset in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:CARRier:OFFSet <freq>
```

```
[:SENSe]:ULR5_3GPP:CARRier:OFFSet?
```

Arguments

`<freq>::=<NRf>` specifies the carrier frequency offset.
Range: –Fs to Fs (Fs: Span)

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:CARRier:OFFSet 10MHz
```
sets the carrier frequency offset to 10 MHz.

[:SENSe]:ULR5_3GPP:CARRier:SEARch(?)

Determines whether to detect the carrier automatically in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:CARRier:SEARch { OFF | ON | 0 | 1 }
```

```
[:SENSe]:ULR5_3GPP:CARRier:SEARch?
```

Arguments

`OFF` or `0` specifies that the carrier is not detected automatically.
Set the carrier frequency offset using the [:SENSe]:ULR5_3GPP:CARRier:OFFSet command.

`ON` or `1` specifies that the carrier is detected automatically.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:CARRier:SEARch ON
```
specifies that the carrier is detected automatically.

Related Commands

```
[:SENSe]:ULR5_3GPP:CARRier:OFFSet
```

[:SENSe]:ULR5_3GPP:EVM:IQOoffset(?)

Determines whether to include the I/Q origin offset in the EVM (Error Vector Magnitude), Rho (waveform quality), and PCDE (Peak Code Domain Error) calculation.

Syntax

```
[:SENSe]:ULR5_3GPP:EVM:IQOoffset { INCLude | EXCLude }
```

```
[:SENSe]:ULR5_3GPP:EVM:IQOoffset?
```

Arguments

`INCLude` includes the I/Q origin offset in the EVM, Rho, and PCDE calculation.

`EXCLude` excludes the I/Q origin offset from the calculation.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:IQOoffset INCLude
```
includes the I/Q origin offset in the calculation.

[:SENSe]:ULR5_3GPP:FILTer:ALPHa(?)

Sets or queries the filter factor (α/BT) for the measurement and the reference filters in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:FILTer:ALPHa <value>
```

```
[:SENSe]:ULR5_3GPP:FILTer:ALPHa?
```

Arguments

`<value>::=<NRf>` specifies the filter factor. Range: 0 to 1.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:FILTer:ALPHa 0.5
```
sets the filter factor to 0.5.

[:SENSe]:ULR5_3GPP:FILTer:MEASurement(?)

Selects or queries the measurement filter in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:FILTer:MEASurement
   { OFF | RRCosine }

[:SENSe]:ULR5_3GPP:FILTer:MEASurement?
```

Arguments

`OFF` specifies that no measurement filter is used.

`RRCosine` selects the Root Raised Cosine filter.

Measurement Modes DEMULR5_3G

Examples

`:SENSe:ULR5_3GPP:FILTer:MEASurement RRCosine`
selects the Root Raised Cosine filter.

[:SENSe]:ULR5_3GPP:FILTer:REFerence(?)

Selects or queries the reference filter in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:FILTer:REFerence
   { OFF | RCOSine | GAUSsian }

[:SENSe]:ULR5_3GPP:FILTer:REFerence?
```

Arguments

`OFF` specifies that no reference filter is used.

`RCOSine` selects the Raised Cosine filter.

`GAUSsian` selects the Gaussian filter.

Measurement Modes DEMULR5_3G

Examples

`:SENSe:ULR5_3GPP:FILTer:REFerence RCOSine`
selects the Raised Cosine filter.

[:SENSe]:ULR5_3GPP[:IMMediate] (No Query Form)

Runs the 3GPP-R5 uplink analysis calculation for the acquired data.
To acquire data, use the :INITiate command.

Syntax `[:SENSe]:ULR5_3GPP[:IMMediate]`

Arguments None

Measurement Modes DEMULR5_3G

Examples `:SENSe:ULR5_3GPP:IMMediate`
runs the 3GPP-R5 uplink analysis calculation.

Related Commands `:INITiate`

[:SENSe]:ULR5_3GPP:LENGth(?)

Defines or queries the range for the 3GPP-R5 uplink analysis.

Syntax `[:SENSe]:ULR5_3GPP:LENGth <value>`

`[:SENSe]:ULR5_3GPP:LENGth?`

Arguments `<value>::=<NRf>` specifies the analysis range by the number of data points.
Range: 1 to 1024 × (block size).
To set the block size, use the [:SENSe]:BSIZe command. For the [:SENSe]:BSIZe command, refer to the *WCA230A and WCA280A Programmer Manual.*

Measurement Modes DEMULR5_3G

Examples `:SENSe:ULR5_3GPP:LENGth 1000`
sets the analysis range to 1000 points.

Related Commands `[:SENSe]:BSIZe`

[:SENSe]:ULR5_3GPP:MMOde(?)

Selects or queries the mobile mode in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:MMOde { DPCH | PRACh | PCPCh }
```

```
[:SENSe]:ULR5_3GPP:MMOde?
```

Arguments

`DPCH` selects the DPDCH/DPCCH mode.

`PRACh` selects the PRACH mode.

`PCPCh` selects the PCPCH mode.

Measurement Modes DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:MMOde PRACh
```

selects the PRACH mode.

[:SENSe]:ULR5_3GPP:OFFSet(?)

Sets or queries the measurement start position in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:OFFSet <value>
```

```
[:SENSe]:ULR5_3GPP:OFFSet?
```

Arguments

`<value>::=<NRf>` specifies the measurement start position by the number of data points. Range: 0 to 1024 × (block size) –1.
To set the block size, use the [:SENSe]:BSIZe command. For the [:SENSe]:BSIZe command, refer to the *WCA230A and WCA280A Programmer Manual.*

Measurement Modes DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:OFFSet 100
```

sets the measurement start position to point 100.

Related Commands `[:SENSe]:BSIZe`

[:SENSe]:ULR5_3GPP:SCODe:NUMBer(?)

Sets or queries the scrambling code in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:SCODe:NUMBer <value>
[:SENSe]:ULR5_3GPP:SCODe:NUMBer?
```

Arguments

<value>::=<NR1> specifies the scrambling code. Range: 0 to 16777215.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:SCODe:NUMBer 3
```

sets the scrambling code to 3.

[:SENSe]:ULR5_3GPP:SCODe:TYPE(?)

Selects or queries the scrambling code type.

Syntax

```
[:SENSe]:ULR5_3GPP:SCODe:TYPE { LONG | SHORt }
[:SENSe]:ULR5_3GPP:SCODe:TYPE?
```

Arguments

LONG selects the long code.

SHORt selects the short code.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:SCODe:TYPE LONG
```

selects the long code.

Related Commands

[:SENSe]:ULR5_3GPP:MMODe

[:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe(?)

Sets or queries the downlink time offset when [:SENSe]:ULR5_3GPP:SFRame :SEARch is set to DTIMe. The downlink time offset is the time offset between the start of HS-SCCH and the start of DPCH.

Syntax

```
[:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe <value>

[:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe?
```

Arguments

<value>::=<NRf> specifies the downlink time offset.
Range: 0 to 149 symbols.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:SFRame:OFFSet:DTIMe 35
```

sets the downlink time offset to 35 symbols.

Related Commands

```
[:SENSe]:ULR5_3GPP:SFRame:SEARch
```

[:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot](?)

Sets or queries the subframe to time-slot offset when [:SENSe]:ULR5_3GPP :SFRame:SEARch is set to STSLot. The subframe to time-slot offset is the time offset between the start of the DPDCH time slot and the start of the HS-DPCCH subframe.

Syntax

```
[:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot] <value>

[:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot]?
```

Arguments

<value>::=<NRf> specifies the subframe to time-slot offset.
Range: 0 to 9 symbols.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:SFRame:OFFSet:STSLot 5
```

sets the subframe to time-slot offset to 5 symbols.

Related Commands

```
[:SENSe]:ULR5_3GPP:SFRame:SEARch
```

[:SENSe]:ULR5_3GPP:SFRame:SEARch(?)

Determines whether to detect the subframe offset automatically in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:SFRame:SEARch
   { AUTO | STSLot | DTIMe }

[:SENSe]:ULR5_3GPP:SFRame:SEARch?
```

Arguments

`AUTO` specifies that the subframe offset is detected automatically (default).

`STSLot` specifies the subframe to time-slot offset.
Set the offset using the [:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot] command.

`DTIMe` specifies the downlink time offset.
Set the offset using the [:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe command.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:SFRame:SEARch AUTO
```
specifies that the subframe offset is detected automatically.

Related Commands

`[:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe`,
`[:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot]`

[:SENSe]:ULR5_3GPP:THReshold[:BURSt](?)

Sets or queries the threshold level to detect a burst. This command is valid when [:SENSe]:ULR5_3GPP:MMOde is set to PRACh.

Syntax

```
[:SENSe]:ULR5_3GPP:THReshold[:BURSt] <value>
```

```
[:SENSe]:ULR5_3GPPP:THReshold[:BURSt]?
```

Arguments

<value>::=<NRf> specifies the threshold level to detect a burst.
Range: −100 to 10 dB.

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:THReshold:BURSt -20
```
sets the threshold to −20 dB.

Related Commands

```
[:SENSe]:ULR5_3GPP:MMOde
```

[:SENSe]:ULR5_3GPP:UANResult (No Query Form)

pdates the ACK/NACK results by re--detecting ACK and NACK indications on the existing time slot data in the 3GPP-R5 uplink analysis.

Syntax

```
[:SENSe]:ULR5_3GPP:UANResult
```

Arguments

None

Measurement Modes

DEMULR5_3G

Examples

```
:SENSe:ULR5_3GPP:UANResult
```
updates the ACK/NACK results.

Appendices

Appendix A: Factory Default Settings

This section provides tables of the following defaults:

- GPIB command defaults
- Measurement limit defaults

GPIB Command Defaults

The *RST command returns the instrument settings to the factory defaults for the measurement mode specified with :INSTrument[:SELect], as shown in the following tables. The column to the far right shows the measurement modes in which the command is available.

Table A-1: Factory initialization settings, :DISPlay commands

Header	Default value
:DISPlay:DLR5_3GPP subgroup	
:DISPlay:DLR5_3GPP:AVIew:MSLot[:STATe]	OFF
:DISPlay:DLR5_3GPP:AVIew:SHORtcode	0
:DISPlay:DLR5_3GPP:AVIew:SRATe	COMPosite
:DISPlay:DLR5_3GPP:AVIew:SSCHpart	OFF
:DISPlay:DLR5_3GPP:AVIew:TSLot	0
:DISPlay:DLR5_3GPP:MVIew:FORMat	OFF
:DISPlay:DLR5_3GPP:MVIew|:SVIew:RADIx	BINary
:DISPlay:DLR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit	RELative
:DISPlay:DLR5_3GPP:SVIew:FORMat	SPECtrum
:DISPlay:ULR5_3GPP subgroup	
:DISPlay:ULR5_3GPP:AVIew:SRATe	R960S
:DISPlay:ULR5_3GPP:AVIew:TSLot	0
:DISPlay:ULR5_3GPP:MVIew:FORMat	OFF
:DISPlay:ULR5_3GPP:MVIew|:SVIew:RADIx	BINary
:DISPlay:ULR5_3GPP:MVIew|:SVIew:Y[:SCALe]:PUNit	RELative
:DISPlay:ULR5_3GPP:SVIew:FORMat	SPECtrum

NOTE. *In Table A-2, Standard*::={ :SADLR5_3GPP | :SAULR5_3GPP }.

Table A-2: Factory initialization settings, :SENSe commands

Header	Default value
[:SENSe]:DLR5_3GPP subgroup	
[:SENSe]:DLR5_3GPP:BLOCk	0
[:SENSe]:DLR5_3GPP:CARRier:OFFSet	0
[:SENSe]:DLR5_3GPP:CARRier:SEARch	ON
[:SENSe]:DLR5_3GPP:COMPosite	ON
[:SENSe]:DLR5_3GPP:EVM:IQOoffset	ON
[:SENSe]:DLR5_3GPP:FILTer:ALPHa	0.22
[:SENSe]:DLR5_3GPP:FILTer:MEASurement	RRCosine
[:SENSe]:DLR5_3GPP:FILTer:REFerence	RCOSine
[:SENSe]:DLR5_3GPP:LENGth	512000
[:SENSe]:DLR5_3GPP:OFFSet	0
[:SENSe]:DLR5_3GPP:SCHPart	OFF
[:SENSe]:DLR5_3GPP:SCODe:ALTernative	NUSed
[:SENSe]:DLR5_3GPP:SCODe:NUMBer	0
[:SENSe]:DLR5_3GPP:SCODe:SEARch	OFF
[:SENSe]:*Standard*:ACLR subgroup	
[:SENSe]:*Standard*:ACLR:FILTer:COEFficient	0.22
[:SENSe]:*Standard*:ACLR:FILTer:TYPE	RNYQuist
[:SENSe]:*Standard*:ACLR:LIMit:ADJacent<x>[:STATe]	ON
[:SENSe]:*Standard*:ACLR:SGAIn	5 dB
[:SENSe]:*Standard*:CFRequency subgroup	
[:SENSe]:*Standard*:ACLR:CFRequency:CRESolution	1 Hz
[:SENSe]:*Standard*:CHPower subgroup	
[:SENSe]:*Standard*:CHPower:BANDwidth|:BWIDth:INTegration	3.84 MHz
[:SENSe]:*Standard*:CHPower:FILTer:COEFficient	0.5
[:SENSe]:*Standard*:CHPower:FILTer:TYPE	RECTangle
[:SENSe]:*Standard*:CHPower:LIMit[:STATe]	OFF
[:SENSe]:*Standard*:EBWidth subgroup	
[:SENSe]:*Standard*:EBWidth:XDB	−30 dB
[:SENSe]:SADLR5_3GPP:MCACIr subgroup	
[:SENSe]:SADLR5_3GPP:MCACIr:CARRier[:THReshold]	-10 dBc
[:SENSe]:SADLR5_3GPP:MCACIr:FILTer:COEFficient	0.22
[:SENSe]:SADLR5_3GPP:MCACIr:FILTer:TYPE	RNYQuist
[:SENSe]:SADLR5_3GPP:MCACIr:LIMit:ADJacent<x>[:STATe]	ON
[:SENSe]:*Standard*:OBWidth subgroup	
[:SENSe]:*Standard*:OBWidth:LIMit[:STATe]	ON
[:SENSe]:*Standard*:OBWidth:PERCent	99
[:SENSe]:*Standard*:SEMask subgroup	
[:SENSe]:*Standard*:SEMask:BANDwidth|:BWIDth:INTegration	3.84 MHz
[:SENSe]:*Standard*:SEMask:FILTer:COEFficient	0.5
[:SENSe]:*Standard*:SEMask:FILTer:TYPE	RECTangle

Table A-2: Factory initialization settings, :SENSe commands

Header	Default value
[:SENSe]:*Standard*:SEMask:LIMit:ZONE<x>[:STATe]	ON
[:SENSe]:*Standard*:SEMask:RCHannel:LEVel	0
[:SENSe]:*Standard*:SEMask:RCHannel:MODE	AUTO
[:SENSe]:ULR5_3GPP subgroup	
[:SENSe]:ULR5_3GPP:BLOCk	0
[:SENSe]:ULR5_3GPP:CARRier:OFFSet	0
[:SENSe]:ULR5_3GPP:CARRier:SEARch	ON
[:SENSe]:ULR5_3GPP:EVM:IQOoffset	INCLude
[:SENSe]:ULR5_3GPP:FILTer:ALPHa	0.22
[:SENSe]:ULR5_3GPP:FILTer:MEASurement	RRCosine
[:SENSe]:ULR5_3GPP:FILTer:REFerence	RCOSine
[:SENSe]:ULR5_3GPP:LENGth	512000
[:SENSe]:ULR5_3GPP:MMOde	DPCH
[:SENSe]:ULR5_3GPP:OFFSet	0
[:SENSe]:ULR5_3GPP:SCODe:NUMBer	0
[:SENSe]:ULR5_3GPP:SCODe:TYPE	LONG
[:SENSe]:ULR5_3GPP:SFRame:OFFSet:DTIMe	1
[:SENSe]:ULR5_3GPP:SFRame:OFFSet[:STSLot]	0
[:SENSe]:ULR5_3GPP:SFRame:SEARch	DTIMe
[:SENSe]:ULR5_3GPPP:THReshold[:BURSt]	−30 dB

Measurement Limit Defaults

Tables A-3, A-4, and A-5 list the default limit settings used to perform the pass/file testing for the 3GPP-R5 downlink measurements. Refer to *Using the Measurement Limits Editor* on page 2-14 for procedures to edit the measurement limits.

Common Limits

Tables A-3 lists the default values of the common measurement limits that can be used for the channel power, ACLR, and OBW measurements for Band I, II, and III defined in 3GPP-R5.

Table A-3: Common limits (Band I, II, and III)

Limit	Enable	Lower	Upper	Units
Channel Power	No	21.5	26.5	dBm
OBW	Yes	N.A	5 M	Hz
ACLR 1st Lower Channel	Yes	N.A	45	dB
ACLR 1st Upper Channel	Yes	N.A	45	dB
ACLR 2nd Lower Channel	Yes	N.A	50	dB
ACLR 2nd Upper Channel	Yes	N.A	50	dB

SEM Offset from Channel Limits

Tables A-4 and A-5 list the default values of the measurement limits that can be used for the spectrum emission mask measurement for Band I, II, and III defined in 3GPP-R5.

Table A-4: SEM limits in Band I and III

Zone	A	B	C	D	E
Enable	Yes	Yes	Yes	Yes	No
Beginning Frequency	2.5 MHz	2.7 MHz	3.5 MHz	7.5 MHz	12.5 MHz
Ending Frequency	2.7 MHz	3.5 MHz	7.5 MHz	12.5 MHz	8 GHz
Measurement Bandwidth	30 kHz	30 kHz	1 MHz	1 MHz	1 MHz
Offset from Carrier	Both	Both	Both	Both	Both
Failure if signal exceeds	Rel OR Abs	Rel OR Abs	Rel OR Abs	Relative	Absolute
Beginning Absolute Limit	-14 dBm	-14 dBm	-13 dBm	-13 dBm	-13 dBm
Ending Absolute Limit	-14 dBm	-26 dBm	-13 dBm	-13 dBm	-13 dBm
Beginning Relative Limit	-53 dBc	-53 dBc	-52 dBc	-56 dBc	0 dBc
Ending Relative Limit	-53 dBc	-65 dBc	-52 dBc	-56 dBc	0 dBc

Table A-5: SEM limits in Band II

Zone	A	B	C	D	E
Enable	Yes	Yes	Yes	Yes	No
Beginning Frequency	2.5 MHz	2.7 MHz	3.5 MHz	7.5 MHz	12.5 MHz
Ending Frequency	2.7 MHz	3.5 MHz	7.5 MHz	12.5 MHz	8 GHz
Measurement Bandwidth	30 kHz	30 kHz	1 MHz	1 MHz	1 MHz
Offset from Carrier	Both	Both	Both	Both	Both
Failure if signal exceeds	Rel OR Abs	Rel OR Abs	Rel OR Abs	Relative	Absolute
Beginning Absolute Limit	-15 dBm	-15 dBm	-13 dBm	-13 dBm	-13 dBm
Ending Absolute Limit	-15 dBm	-26 dBm	-13 dBm	-13 dBm	-13 dBm
Beginning Relative Limit	-53 dBc	-53 dBc	-52 dBc	-56 dBc	0 dBc
Ending Relative Limit	-53 dBc	-65 dBc	-52 dBc	-56 dBc	0 dBc

Appendix B: Scale Setting Range

This section lists the setting ranges of the horizontal and the vertical scales for the views used in the 3GPP-R5 analysis.

Table B-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	- (Tf × Nf) to 0 s [1]	-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	- (Tf × Nf) to 0 s [1]	Fixed
EVM	- (Tf × Nf) to 0 s [1]	-100 to +200% (EVM) -300 to +300% (amplitude error) -675 to +675 deg. (phase error)
Eye diagram	- (Tf × Nf) to 0 s [1]	Fixed
Symbol table	0 to (1024 × Nf) symbols	NA
CDP spectrogram [2]	0 to 511 channels	Slot -3999 to 0 Slot -15999 to 0 (Option 02)
CDP vs. Short code [2]	0 to 511 channels	-200 to +100 dB/dBm
CDP vs. Symbol [2]	0 to 639 symbols	-200 to +100 dB/dBm
CDP vs. Time slot [2]	Slot -3999 to 0 Slot -15999 to 0 (Option 02)	-200 to +100 dB/dBm
Symbol constellation	0 to 639 symbols	Fixed
Symbol EVM	0 to 639 symbols	-100 to +200% (EVM) -300 to +300% (amplitude error) -675 to +675 deg. (phase error)
Symbol eye diagram	0 to 639 symbols	Fixed

1. Tf: Frame time; Nf: Frame number

2. CDP: Code Domain Power

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