User Manual

Tektronix

RSA3408A Option 23
W-CDMA Uplink Analysis Software

071-1673-00

This document applies to firmware version 1.0
and above.

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Preface

This manual describes how to use the RSA3408A Option 23 W-CDMA Uplink Analysis Software. For details on the standard functions of the analyzer, refer to the *RSA3408A 8 GHz Real-Time Spectrum Analyzer User Manual*.

About This Manual

The manual consists of the following sections:

- *Getting Started* describes the overview of the W-CDMA uplink analysis.
- *Operating Basics* explains the menu functions and measurement procedures.
- *Appendices* provide additional information about scale setting ranges.

The analyzer uses Microsoft Windows XP as the operating system. This manual does not describe common usage of Windows XP. Refer to your Windows manuals as necessary.

Related Documents

The following documents are also available for the analyzer.

- *RSA3408A User Manual*
  (Standard accessory; Tektronix part number 071-1617-XX)
  Describes how to install the analyzer and how to work with the menus, and details the standard functions. Also shows the specifications.
- *RSA3408A Programmer Manual*
  (Standard accessory; PDF, Tektronix part number 077-0003-XX)
  Contains an alphabetical listing of the programming commands and other information related to controlling the analyzer over the GPIB interface.

PDF Manual

The programmer manual described above is a PDF document (the file size is about 5 MB). The file is stored in this directory on the analyzer hard disk:

C:\Program Files\Tektronix\wca200a\Manuals

Use the USB or LAN interface to copy the file onto your PC. Refer to the *RSA3408A User Manual* for using the interface.

Conventions

This manual uses the following conventions:

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

  Press **SPAN**.

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

  Press the MODE: **DEMOD** key.

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

  Press the **Source** side key.

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

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

Contacting Tektronix

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Getting Started

Getting Started

This section outlines the uplink analysis according to the W-CDMA standard using Option 23. Table 1–1 summarizes the additional functions in Option 23 by measurement mode.

Table 1–1: Additional functions in Option 23

Measurement mode	Additional functions
S/A (spectrum analysis)	W-CDMA ACLR measurement
Demod (modulation analysis)	Nine measurement functions such as code domain power
Time (time analysis)	None

Figure 1–1 shows an example of the uplink analysis in the Demod mode.

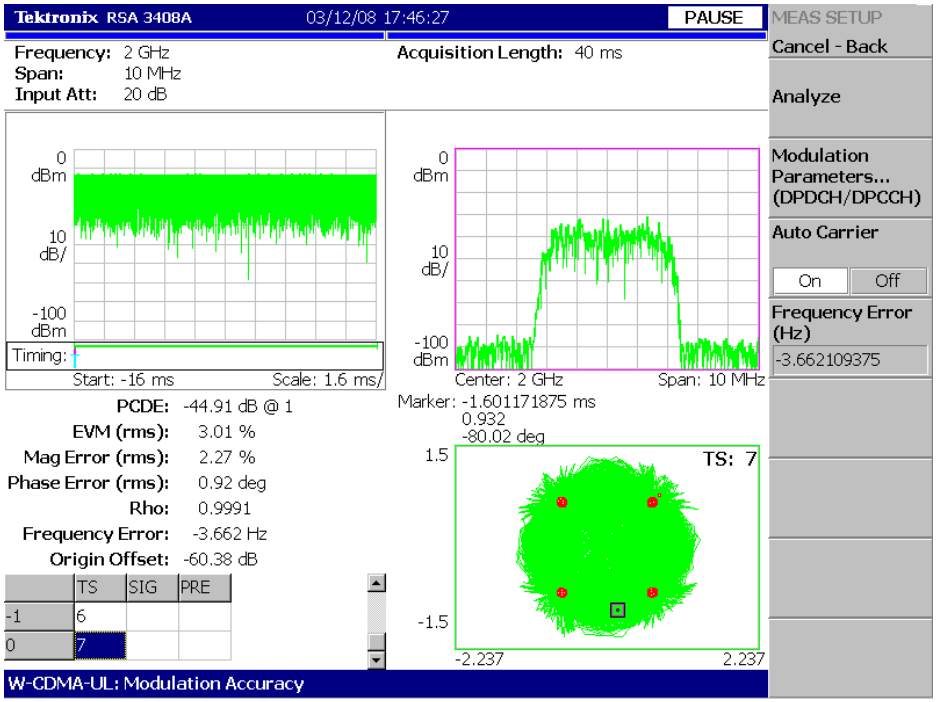

Figure 1–1: W-CDMA uplink analysis display

Signal Type

The analyzer supports three types of W-CDMA uplink signals:

- DPDCH (Dedicated Physical Data Channel) / DPCCH (Dedicated Physical Control Channel)
- PRACH (Physical Random Access Data Channel)
- PCPCH (Physical Common Packet Channel)

Definition of Analysis

The analyzer covers the W-CDMA uplink parameters listed in Table 1–2.

***NOTE**. The analyzer de-spreads DPCCH and the control part of the incoming signal, using the frequency and phase to establish synchronization. If the level of DPCCH or the control part is much lower than the level of the other channels, accurate analysis may not be performed.*

Table 1–2: Uplink parameters

	DPDCH/DPCCH		PRACH		PCPCH	
Item	**DPDCH**	**DPCCH**	**Data part**	**Control part**	**Data part**	**Control part**
Chip rate	3.84 Mcps					
Symbol rate	15, 30, 60, 120, 240, 480, 960 ksps	15 ksps	15, 30, 60, 120 ksps	15 ksps	15, 30, 60, 120, 240, 480, 960 ksps	15 ksps
Max. number of channels	6	1	1	1	1	1
Frame structure	15 time-slots, 10 ms					
Time slot	2560 chips, 667 μs					
Scrambling code	Long or short Number: 0 to 16,777,215		Long Number: 0 to 8,191		Long Number: 8,192 to 40,959	
Preamble	–		4096 chips, 1.067 ms		4096 chips, 1.067 ms	
Modulation method	BPSK for each channel					
Baseband filter	Root-cosine with α=0.22 (default); 0.0001≤α≤1 settable					

Measurement Functions

The analyzer has the following measurement functions:

- *Code domain power*
  Measures power relative to the total power for each channel.
- *Time vs. Code domain power*
  Measures the relative power at symbol points for each channel in time series.
- *Code domain power spectrogram*
  Measures the code domain power continuously for up to 150 slots (0.1 sec) and displays spectrogram for each slot.
- *Vector/Constellation*
  Measures the vector loci and chip points for entire 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 a time slot.

Measurement Process

The analyzer processes the input signals internally as shown in Figure 1–2.

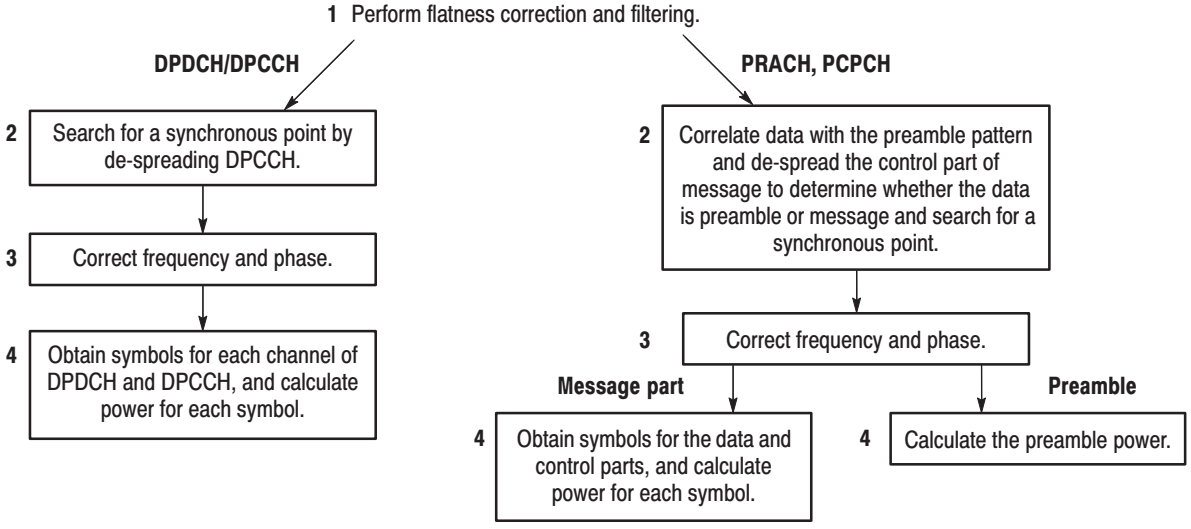

Figure 1–2: Internal process for W-CDMA uplink analysis

Modulation Analysis Measurement Items

The W-CDMA uplink analysis provides the following nine measurement items in the Demod (modulation analysis) mode. Select the measurement items with the **MEASURE** menu.

- **Code Domain Power.** Displays code domain power for each short code.
- **Power Codogram.** Displays code domain power with a spectrogram.
- **Code Power versus Time Slot.** Displays code domain power for each time slot.
- **Code Power versus Symbol.** Displays code domain power for each symbol.
- **Symbol Constellation.** Displays a symbol constellation.
- **Symbol EVM.** Displays EVM for each symbol.
- **Symbol Eye Diagram.** Displays a symbol eye diagram.
- **Symbol Table.** Displays a symbol table.
- **Modulation Accuracy.** Displays constellation and measurement results for each time slot. The results were obtained before de-spread occurred.

Measurement Menu

Figure 1–3 shows the measurement menu items added in Option 23.

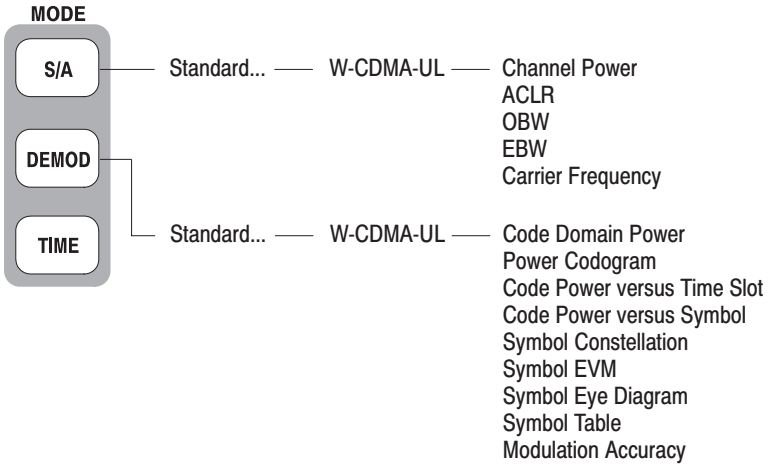

Figure 1–3: W-CDMA uplink measurement menu

The following sections provide the measurement procedures.

Operating Basics

Basic Operation in the S/A Mode

This section describes the basic operation in the S/A (Spectrum Analysis) mode.

Measurement Procedure

Use the following procedure for the spectrum measurement in the S/A mode.

1. Press the **S/A** key on the front panel.
2. Press the side key **Standard...→ W-CDMA-UL**.

***NOTE**. For details on setting frequency, span, and amplitude, refer to the RSA3408A User Manual.*

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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-UL**.

   b. 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. Set span and 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.*

---

5. Press the **MEASURE** key on the front panel and select a measurement item:
   - Channel Power
   - ACLR (Adjacent Channel Leakage Power Ratio)
   - OBW (Occupied Bandwidth)
   - EBW (Emission Bandwidth)
   - Carrier Frequency

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

All the measurement items except ACLR are the same as in the normal spectrum analysis. For details on these items, refer to the RSA3408A User Manual. The ACLR measurement is described below.

ACLR Measurement

The ACLR (Adjacent Channel Leakage Power Ratio) measurement procedure according to the W-CDMA standard is described below. The W-CDMA ACLR measurement is based on the ACPR measurement function in the normal spectrum analysis. For the basics, refer to *ACPR Measurement* in the *RSA3408A User Manual.*

The following settings are fixed according to the W-CDMA 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 on page 2–2, set the parameters in the Measurement Setup menu as follows:

Measurement Setup Menu

Use the Measurement Setup menu to set the ACLR measurement parameters:

Sweep. Selects how to scan the 25 MHz span.

- **On.** *Default*. Acquires an input signal with five scans by the channel spacing (5 MHz).
- **Off.** Acquires an input signal with a single scan in the 25 MHz span.

Noise Cancellation. Determines whether to subtract noise level from signal level to obtain the measurement results.

- **On.** Measures noise level first, and since then, subtracts the noise level from signal level to calculate ACLR measurement values.
- **Off.** *Default*. Calculates ACLR measurement values directly from the input signal level.

***NOTE**. When you change amplitude and frequency settings, the Noise Cancellation setting returns to Off. Turn it on again if necessary.*

Measurement Filter Shape... Selects a filter shape:
Rect (rectangle) or 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)

Figure 2–1 displays an example of the ACLR measurement. Measured values are displayed in the lower part of the screen.

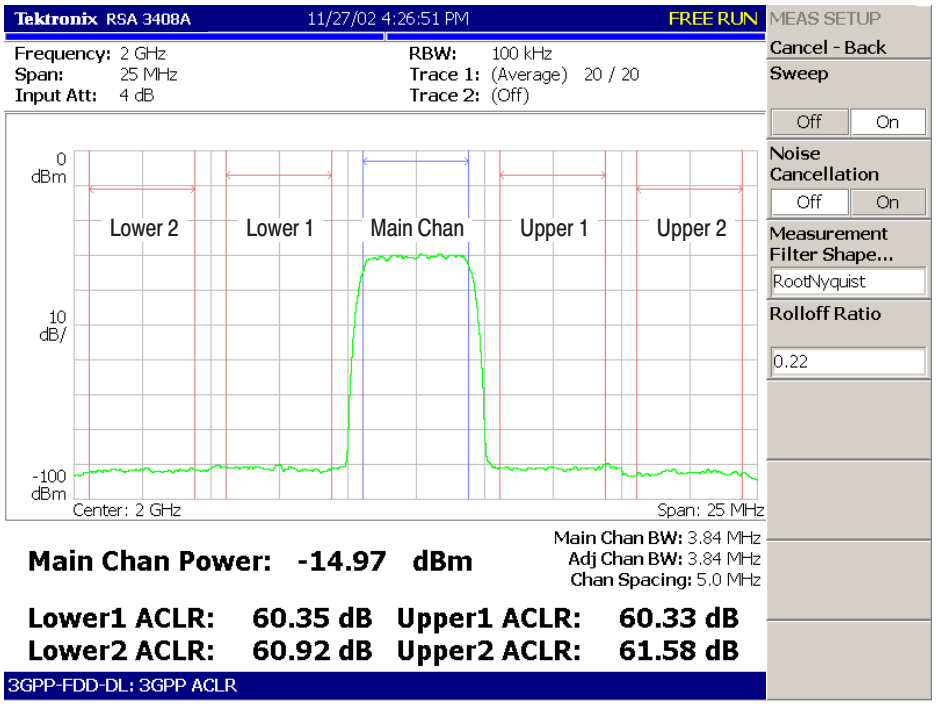


Figure 2–1: W-CDMA ACLR measurement

Basic Operation in the Demod Mode

This section describes the basic operation in the Demod (Modulation Analysis) mode. The W-CDMA uplink analysis in the Demod mode is based on the digital modulation analysis function. For the digital modulation analysis, refer to the *RSA3408A User Manual.*

Measurement Procedure

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

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

***NOTE**. For details on setting frequency, span, and amplitude, refer to the RSA3408A User Manual.*

If you use the channel table, do these steps:

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

   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. Set span and amplitude appropriately.

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

5. 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:

   (One block acquisition length) = M × (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)
   For PRACH and PCPCH, preamble is excluded.

6. After acquiring measurement data, stop acquisition of data.
   If you are acquiring data in the continuous mode, press the **RUN/STOP** key.

7. Press the **MEASURE** key on the front panel to select measurement items. For example, press the **Code Domain Power** side key to observe code domain power.

8. Press the **MEAS SETUP** key on the front panel to set the measurement parameters. Refer to page 2–8 for details of the MEAS SETUP menu.

   a. Press the side key **Modulation Parameters...→ Measurement Mode...** and select the type of signal: DPDCH/DPCCH, PRACH, or PCPCH.

   b. Perform the following procedure based on the type of signal.

   For DPDCH/DPCCH
   Press the **Scrambling Code Type** side key to select the type of scrambling code: Long or Short.

   For PRACH or PCPCH
   Press the **Threshold** side key to set the threshold for judging an input signal as burst. The setting range is –100 to 10 dB relative to the reference level.

   c. Press the **Scrambling Code** side key to input the scrambling code number.

9. Set the analysis range in the overview.
   Refer to the *RSA3408A User Manual* for the details.

10. Press the **MEAS SETUP** key on the front panel and then the **Analyze** side key to perform measurement for the frames in the analysis range. The measurement results and waveform are displayed in the main view.

    Change the scale and format of view as needed. Refer to page 2–11 for information about setting the views specific to W-CDMA uplink analysis.

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

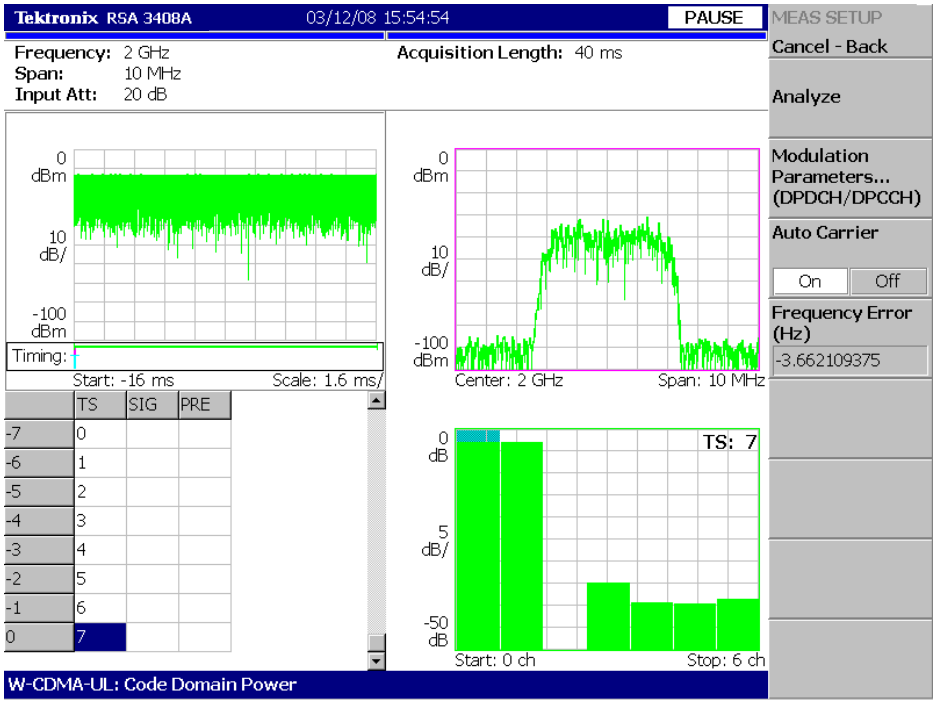


Figure 2–2: Code domain power measurement example

Meas Setup Menu

The Meas Setup menu for the W-CDMA uplink analysis contains the following items:

Analyze Performs analysis for time slots in the analysis range.

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:

- DPDCH/DPCCH
- PRACH
- PCPCH

Scrambling Code Type. Selects the scrambling code type when the Measurement Mode is DPDCH/DPCCH:

- Long
- Short

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

Threshold. Sets the threshold for judging input signal as burst when the Measurement Mode is PRACH or PCPCH.

Range: –100 to 10 dB relative to the reference level.

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

- None (no filter)
- RootRaisedCosine

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

- None (no filter)
- RaisedCosine
- Gaussian

For the filters, refer to *Process Flow of Digitally-Modulated Signal* in the *RSA3408A User Manual*.

Filter Parameter. Sets the 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** described below.

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

Determining the Symbol Rate

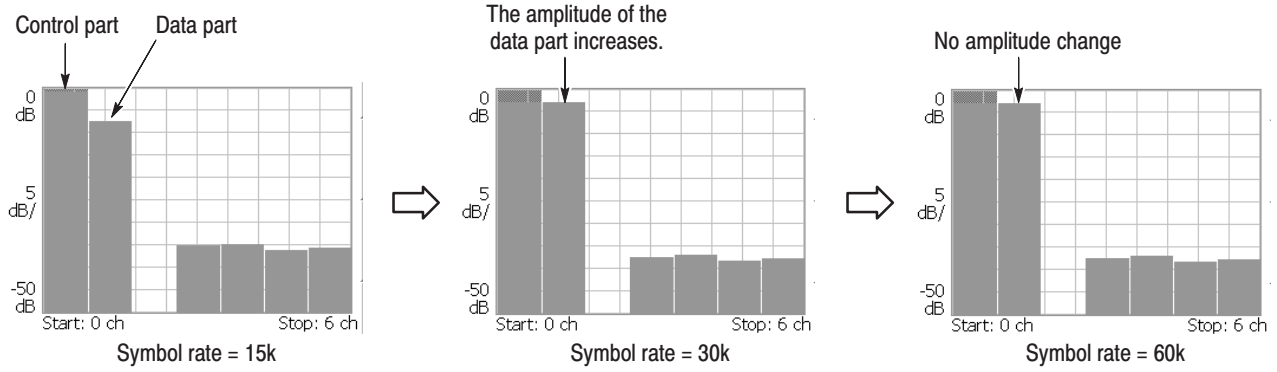
If the symbol rate of the analysis data is unknown, use the following steps to determine the rate.

1. Press **DEMOD → Standard...→ W-CDMA-UL**.
2. Press **MEASURE → Code Domain Power**.
3. Referring to the basic measurement procedure described just above, set the measurement parameters and display the measurement results and graph on the main view.
4. Press the VIEW: **DEFINE** key and then **Symbol Rate...** side key.
5. Select **15k** (the minimum value).

   Check the amplitude of the data part adjacent to the control part.
6. Set the symbol rate to the next higher value (initially 30k).

   Check whether the amplitude of the data part is larger than the previous one.

Repeat step 6 until the amplitude remains unchanged. The symbol rate of the analysis data is determined to the value immediately before the one for which the amplitude does not change (see Figure 2–3).



In this example, the symbol rate of the analysis data is 30k.

Figure 2–3: Determining the symbol rate

Scale and Format of View

The following main views are specific for the measurement items of W-CDMA uplink analysis.

- 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 are described on the following pages. In the main view, the time slot table shown in Figure 2–4 is displayed in addition to waveform and measurement result.

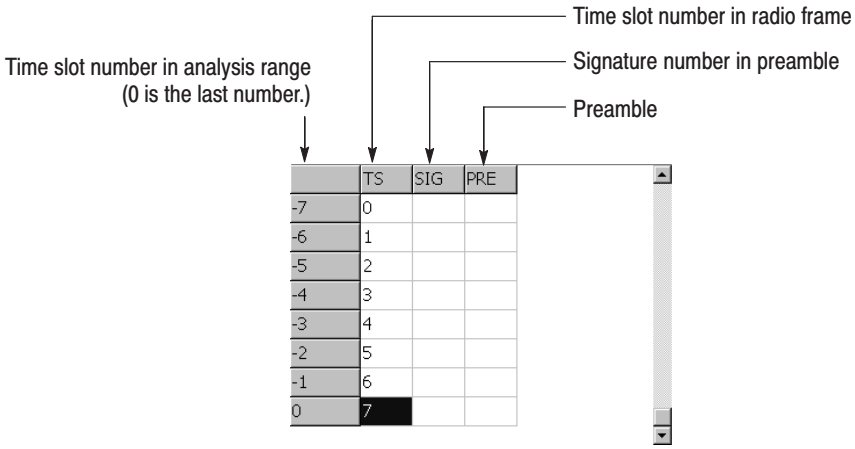


Figure 2–4: Time slot table

View: Define Menu

The View: Define menu is common to all main views of the W-CDMA uplink measurement items, and contains the following controls:

Show Views. Selects the view style:

- **Single.** Displays on screen only the view selected by the VIEW: **SELECT** key on the front panel.
- **Multi.** Displays the overview, subview, and main view (default).

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
- Code Power versus Time Slot
- Code 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 number of slots – 1

Symbol Rate. Sets symbol rate for displaying symbol constellation:

- 15k
- 30k
- 60k
- 120k
- 240k
- 480k
- 960k (default)

Short Code. Sets a short code number to position the marker.
Range: 0 to 6 channels

Code Domain Power

If you select **Code Domain Power** in the Measure menu, code domain power is displayed for each short code. See the display in Figure 2–5.

View: Scale Menu

Use the following menu items to set the scale:

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. Range 1.75 to 7 channels.

Horizontal Start. Sets the start channel number of the horizontal axis.

Vertical Scale. Sets the scale of the vertical axis. Range: 1 to 100 dB.

Vertical Stop. Sets the maximum value (top edge) of vertical axis. Range: –100 to 100 dB.

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

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

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

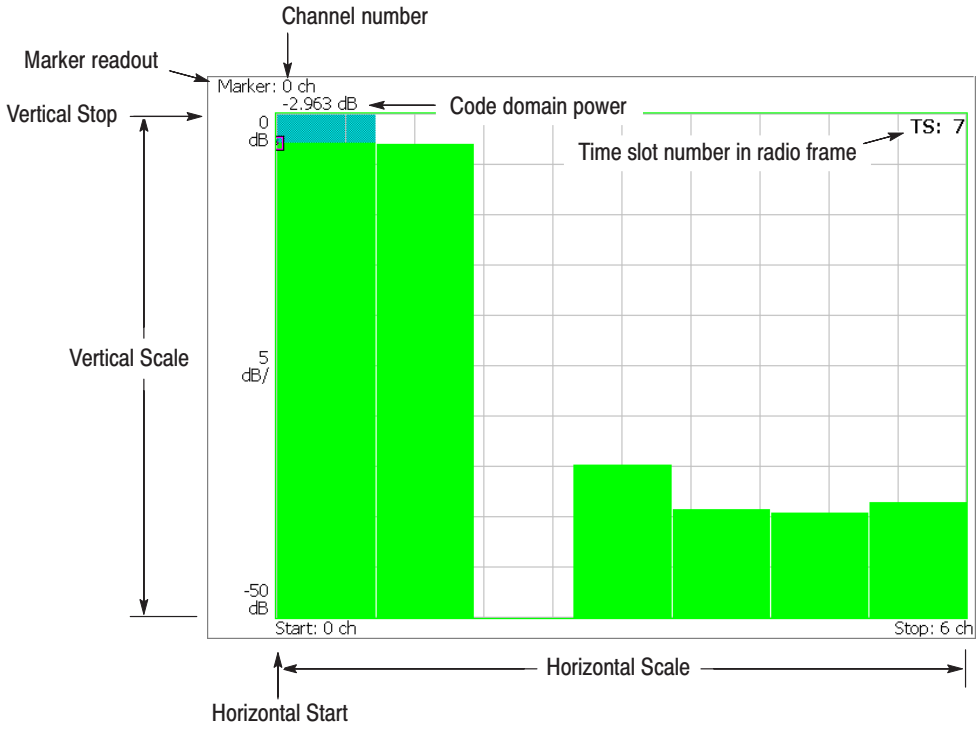


Figure 2–5: Code domain power versus Short code

Power Codogram

If you select **Power Codogram** in the Measure menu, code domain power is displayed with spectrogram. See the power codogram example in Figure 2–6.

View: Scale Menu

Use the following menu items to set the scale:

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. Range 1.75 to 7 channels.

Horizontal Start. Sets start channel number of the horizontal axis.

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 (the value subtracting the minimum power value from the maximum power value) of the color axis:

- 10 dB
- 20 dB
- 50 dB
- 100 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 50 dB.

Full Scale. Sets the maximum value of the color axis to the reference level and the height to 100 dB.

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

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

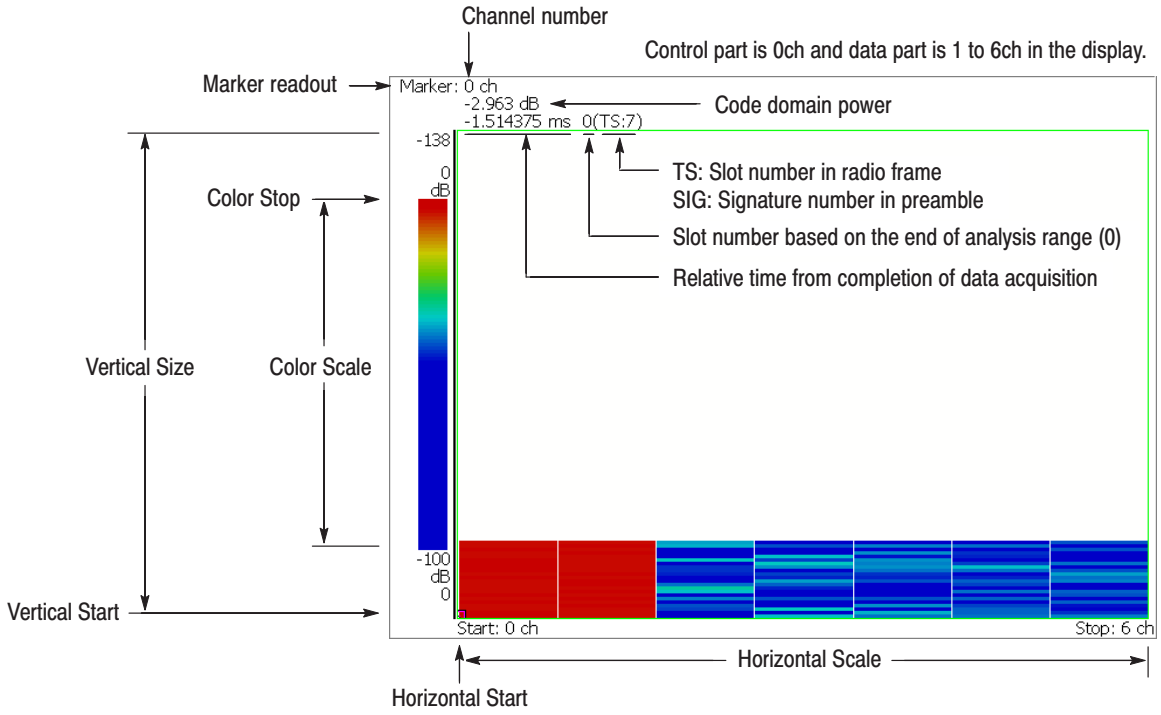


Figure 2–6: Power codogram

Code Power versus Time Slot

If you select **Code Power versus Time Slot** in the Measure menu, code domain power is displayed for each time slot. See the display in Figure 2–7.

View: Scale Menu

Use the following menu items to set the scale:

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

Horizontal Scale. Sets scale of the horizontal axis (number of slots).

Horizontal Start. Sets the start slot number of the horizontal axis.

Vertical Scale. Sets scale of the vertical axis. Range: 1 to 100 dB

Vertical Stop. Sets the maximum value (top edge) of the vertical axis. Range: –100 to 100 dB.

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

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

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

Total Power. Determines whether to display total power of time slots.

- **On.** Displays total power of time slots.
- **Off.** Displays power of the short code specified with Short Code (refer to page 2–13) for each time slot.

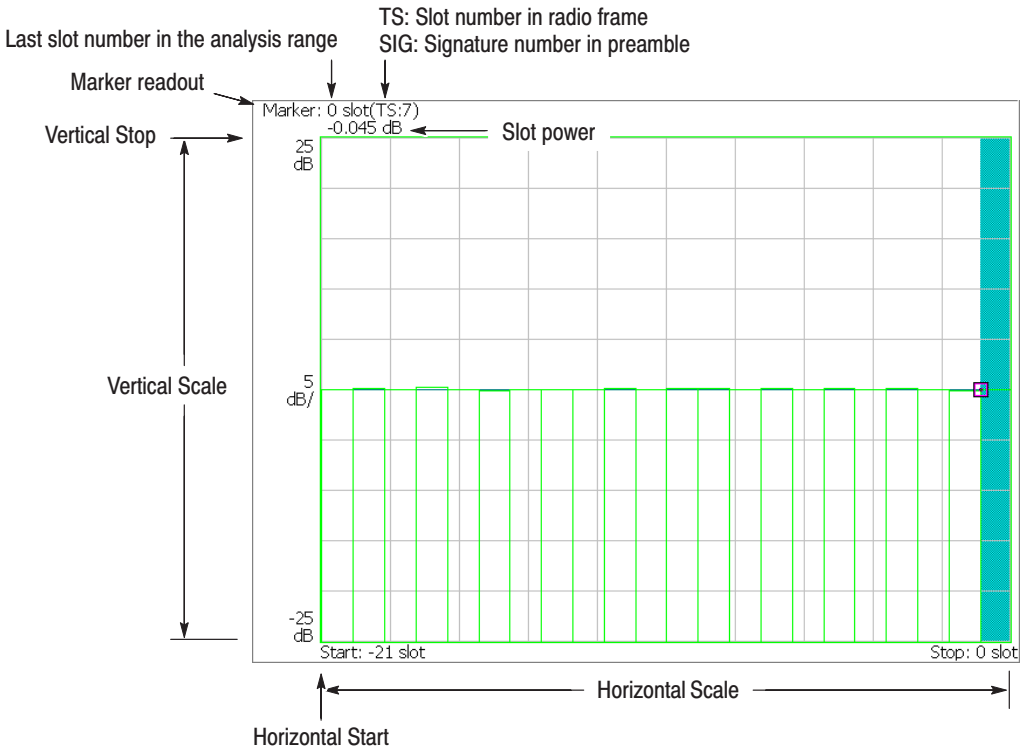


Figure 2–7: Code domain power versus Time slot

Code Power versus Symbol

If you select **Code Power versus Symbol** in the Measure menu, code domain power is displayed for each symbol. See the display in Figure 2–8.

View: Scale Menu

Use the following menu items to set the scale:

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).

Horizontal Start. Sets the start symbol number of the horizontal axis.

Vertical Scale. Sets the scale of the vertical axis. Range: 1 to 100 dB

Vertical Stop. Sets the maximum value (top edge) of the vertical axis. Range: –100 to 100 dB.

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

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

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

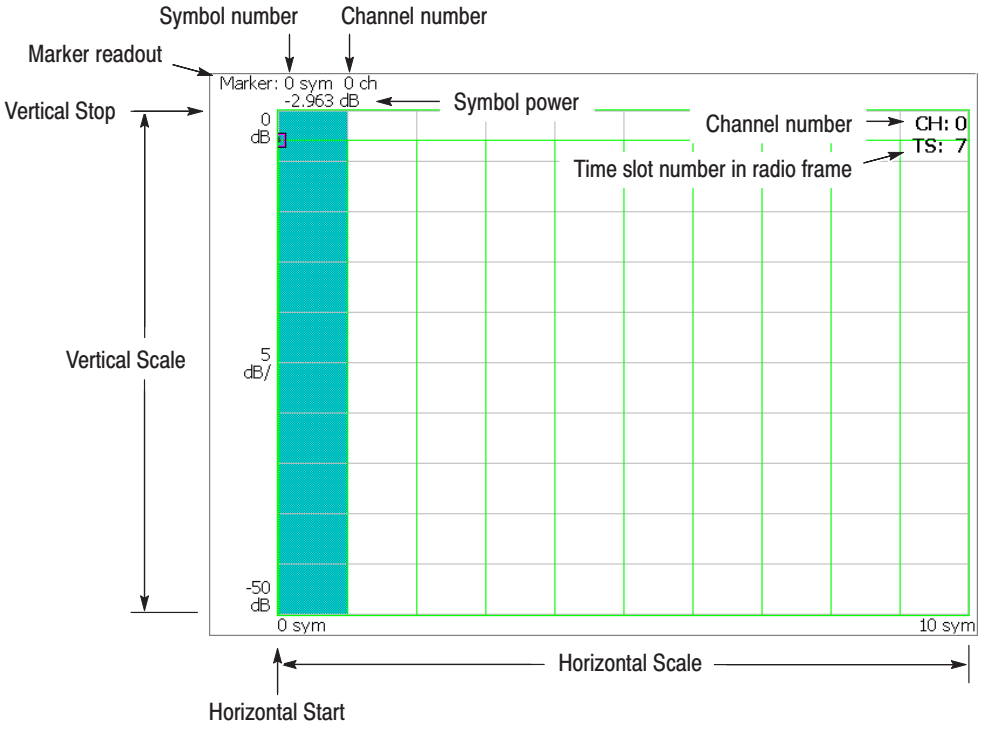


Figure 2–8: Code domain power versus Symbol

Symbol Constellation

The symbol constellation is displayed when you select **Symbol Constellation** in the Measure menu. See the display in Figure 2–9.

View: Scale Menu

Use the following menu items 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 measured signal, and the yellow trace indicates locus of signal between symbols.
- **Constellation.** Selects constellation display. Although it is basically same as the vector display, only symbols of measured signal are indicated in red, and locus between symbols is not shown. The cross marks indicate symbol positions of ideal signal.

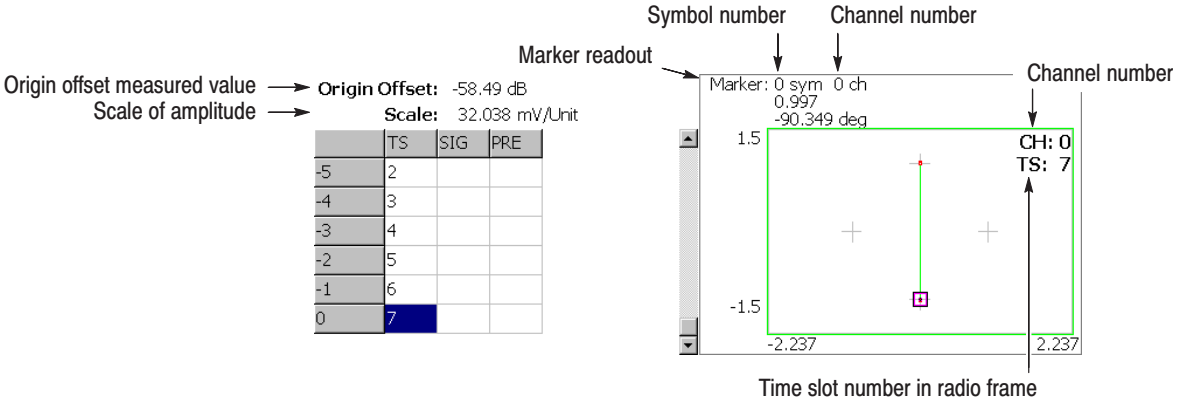


Figure 2–9: Symbol constellation

Symbol EVM

When you select **Symbol EVM** in the Measure menu, EVM is displayed for each symbol. See the display in Figure 2–10.

View: Scale Menu

Use the following menu items to set the scale:

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).

Horizontal Start. Sets the start symbol number of the horizontal axis.

Vertical Scale. Sets the scale of the vertical axis. Range: 100µ to 100% (EVM), 200µ to 200% (Mag Error), 450µ to 450° (Phase Error)

Vertical Start. When the measurement content is EVM, sets the minimum value (bottom edge) of the vertical axis. Range: –100 to 100% (EVM)

Vertical Offset. When the measurement content is Mag Error or Phase Error, sets the center value ((maximum + minimum) / 2) of the vertical axis.
Range: –200 to 200% (Mag Error), –450 to 450° (Phase Error)

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

Measurement Content... Selects a parameter of the vertical axis.

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

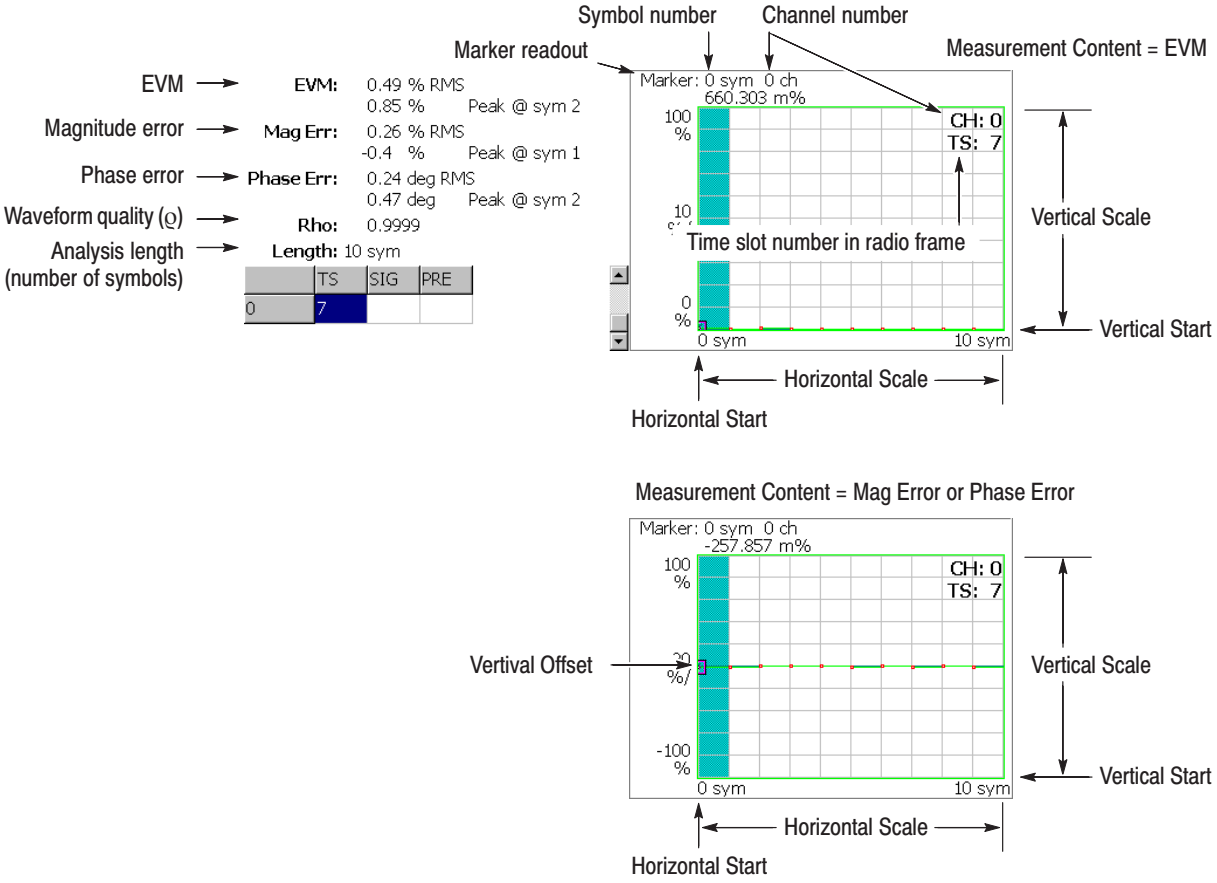


Figure 2–10: Symbol EVM

Symbol Eye Diagram

The symbol eye diagram is displayed when you select **Symbol Eye Diagram** in the Measure menu. See the display in Figure 2–11.

View: Scale Menu

Use the following menu items to set the scale:

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

- **I.** Displays I data on the vertical axis (default).
- **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 value: 2.

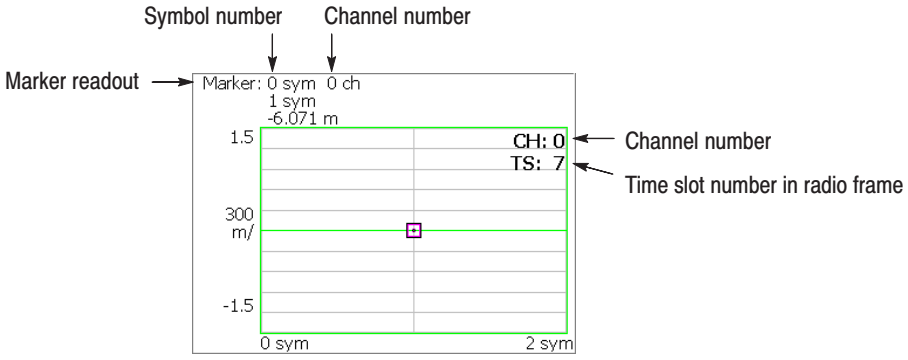


Figure 2–11: Symbol eye diagram

Symbol Table

When you select **Symbol Table** in the Measure menu, a symbol table is displayed. See Figure 2–12.

View: Scale Menu

Use the following menu items to set the scale:

Radix. Selects the radix for displaying the table:

- **Hex.** Hexadecimal digit
- **Oct.** Octal digit
- **Bin.** Binary digit (default)

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

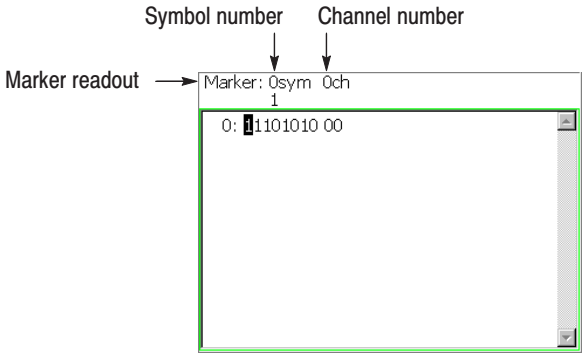


Figure 2–12: Symbol table

Modulation Accuracy

The constellation of all channels before de-spread occurs 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 shown instead of the overview (see Figure 2–13).

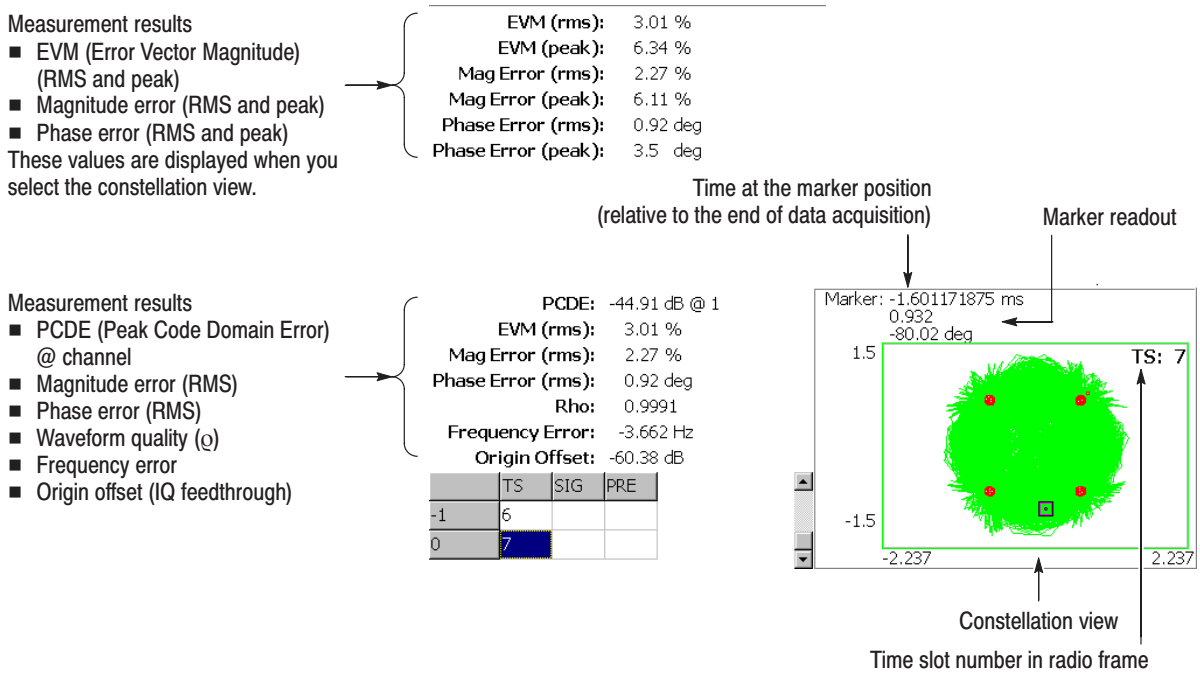


Figure 2–13: Modulation accuracy

The view settings are the same as for Symbol Constellation. Refer to *Symbol Constellation* on page 2–22.

Appendices

Appendix A: Scale Setting Range

This section lists the setting ranges of the horizontal and the vertical scales for the views used in the W-CDMA uplink analysis.

Table A–1: Display format and scale

Display format	Horizontal range	Vertical range
Spectrum	0 Hz to 8 GHz	–200 to +100 dBm
Spectrogram	0 Hz to 8 GHz	Frame –15999 to 0 Frame –63999 to 0 (Option 02)
Time domain view	– ($T_f \times N_f$) to 0 s *	–200 to +100 dBm (Amplitude) –30 to +30 V (I/Q level) –300 to +300% (AM) –38.4 to +38.4 MHz (FM/FVT) –675 to +675 deg. (PM)
Constellation	– ($T_f \times N_f$) to 0 s *	fixed
EVM	– ($T_f \times N_f$) to 0 s *	–100 to +200% (EVM) –300 to +300% (amplitude error) –675 to +675 deg. (phase error)
Eye diagram	– ($T_f \times N_f$) to 0 s *	fixed
Symbol table	0 to (1024 × N_f) symbols	NA
CDP spectrogram *	0 to 511 channels	Slot –3999 to 0 Slot –15999 to 0 (Option 02)
CDP vs. Short code *	0 to 511 channels	–200 to +100 dB/dBm
CDP vs. Symbol *	0 to 639 symbols	–200 to +100 dB/dBm
CDP vs. Time slot *	–3999 to 0 slot –15999 to 0 slot (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

* **T_f: Frame time; N_f: Frame number; CDP: Code Domain Power**

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