

RIGOL DS1054Z

RIGOL DS1054Z Digital Oscilloscope User Manual

Model: DS1054Z

1. INTRODUCTION

The RIGOL DS1054Z is a 4-channel digital oscilloscope offering a 50MHz bandwidth, 1GSa/s real-time sampling rate, and a 24Mpt record length. It incorporates RIGOL's innovative UltraVision technology to provide advanced display and analysis capabilities. This manual provides essential information for the proper setup, operation, and maintenance of your DS1054Z oscilloscope.

2. KEY FEATURES

- 50 MHz bandwidth with 4 analog channels.
- Up to 1 GSa/s real-time sampling rate.
- Standard 12 Mpts memory depth, upgradeable to 24 Mpts.
- Innovative UltraVision technology for enhanced signal visibility.
- Waveform capture rate up to 30,000 wfms/s.
- 7-inch WVGA (800x480) display with multi-level intensity grading.
- All-in-one signal debugging and emulation.
- Accelerated analysis and debugging for I2C, RS232, and SPI designs.

3. PRODUCT OVERVIEW

This section provides a visual and functional overview of the RIGOL DS1054Z Digital Oscilloscope.

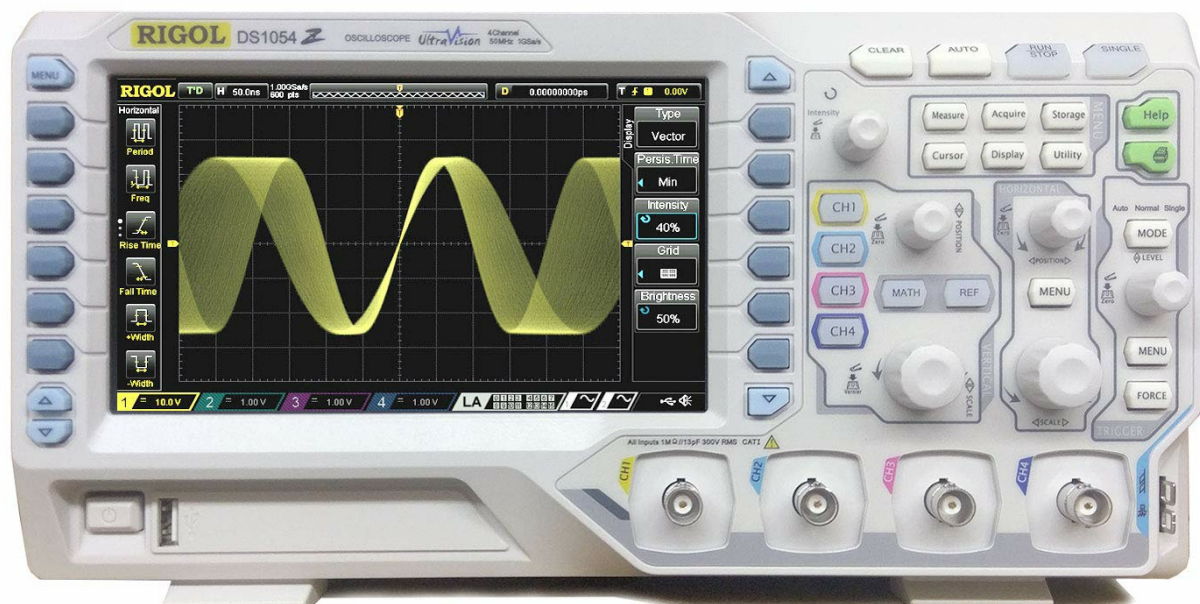


Figure 1: Front view of the RIGOL DS1054Z Digital Oscilloscope, showing the display, control panel, and input channels.

標準装備となった拡張機能

◆ 24Mptsメモリ・オプション



◆ 拡張トリガ・オプション



◆ 波形レコード&プレイ・バック・オプション



◆ RS-232, I2C, SPI デコード・オプション

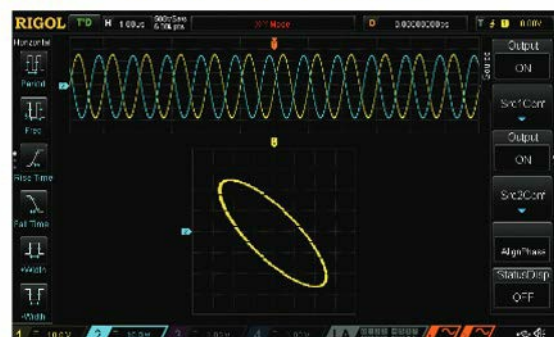


Figure 2: Rear view of the RIGOL DS1054Z Digital Oscilloscope, displaying power input, USB, LAN, and auxiliary output ports.

4. SETUP

1. **Unpacking:** Carefully remove the oscilloscope and all accessories from the packaging. Verify that all included

components (power cord, USB cable, 4x 150MHz probes) are present.

2. **Power Connection:** Connect the provided power cord to the AC input on the rear panel of the oscilloscope and then to a suitable AC power outlet (100 V~240 V).
3. **Power On:** Press the power button located on the front panel to turn on the device. The display will illuminate, and the system will initiate its startup sequence.
4. **Probe Connection:** Connect the 150MHz probes to the desired input channels (CH1-CH4) on the front panel. Ensure a secure connection.
5. **Initial Probe Compensation:** Before taking measurements, it is recommended to perform probe compensation to ensure accurate readings. Refer to the detailed user guide for specific instructions on probe compensation.

5. OPERATING INSTRUCTIONS

This section covers basic operational procedures for the DS1054Z oscilloscope.

5.1 Basic Waveform Acquisition

1. **Connect Signal:** Connect the probe to the signal source you wish to measure.
2. **Select Channel:** Press the corresponding channel button (e.g., **CH1**) to enable the channel.
3. **Auto Setup:** For a quick display of the waveform, press the **AUTO** button. The oscilloscope will automatically adjust vertical, horizontal, and trigger settings.
4. **Manual Adjustments:** Use the vertical scale (V/div) and position knobs for each channel, and the horizontal scale (s/div) and position knobs to fine-tune the waveform display.

5.2 Trigger Functions

The DS1054Z offers various trigger types to stabilize and capture specific events.

- **Edge Trigger:** Triggers on a rising or falling edge of a signal.
- **Pulse Width Trigger:** Triggers on pulses of a specified width.
- **Slope Trigger:** Triggers on signals with a specific rise or fall time.
- **Video Trigger:** Triggers on standard video signals.
- **Pattern Trigger:** Triggers when a specific logic pattern is met across multiple channels.
- **Duration Trigger:** Triggers on events lasting a specified duration.

To access trigger settings, press the **TRIGGER MENU** button and use the soft keys and multi-function knob to configure the desired trigger type and parameters.

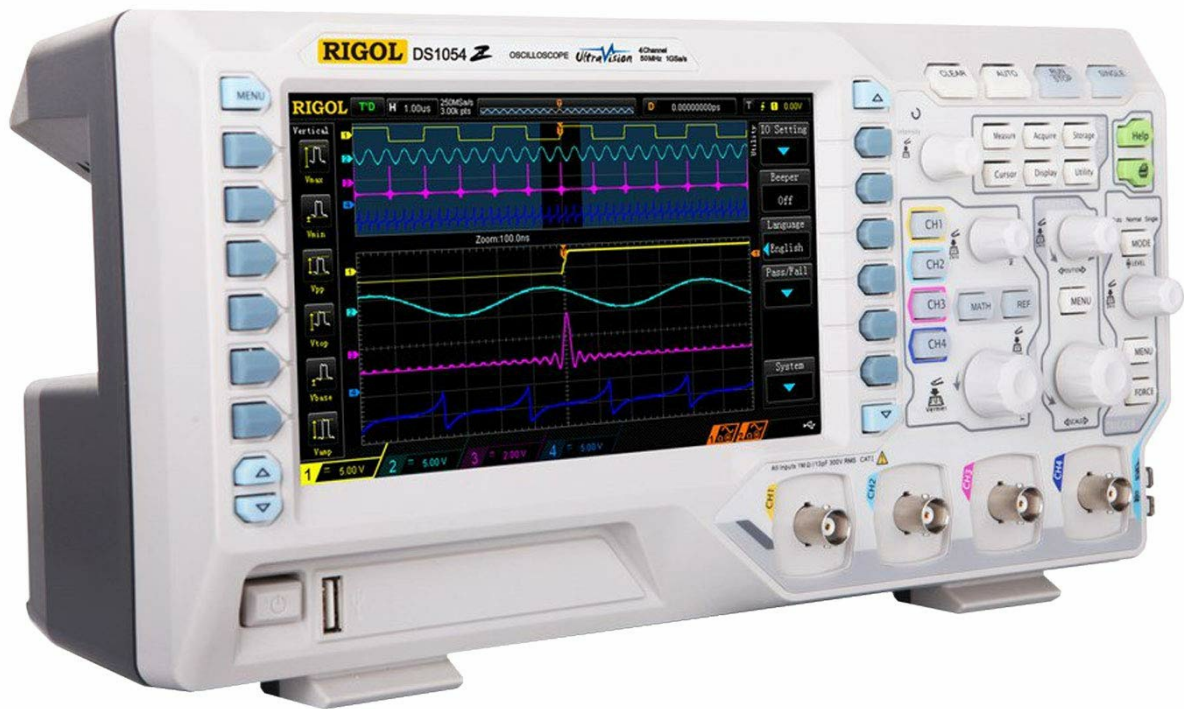


Figure 3: Oscilloscope display illustrating various expanded functions and trigger options, including memory depth settings.

5.3 Waveform Record and Playback

The DS1054Z allows for recording and playback of waveforms, which is useful for capturing transient events or analyzing long signal sequences.

1. **Access Record Function:** Navigate to the waveform record menu (refer to the full user manual for exact menu path).
2. **Configure Recording:** Set the desired record length and other parameters.
3. **Start/Stop Recording:** Initiate recording to capture waveforms. Stop recording when the desired data is acquired.
4. **Playback:** Use the playback controls to review the recorded waveforms.



Figure 4: Oscilloscope display showing the interface for waveform recording and playback, including controls for starting, stopping, and reviewing captured data.

6. SPECIFICATIONS

Parameter	Specification
Analog Bandwidth	50 MHz
Channels	4 Analog Channels
Max. Real-time Sample Rate	1 GSa/s (1 channel), 500 MSa/s (2 channels), 250 MSa/s (3/4 channels)
Max. Memory Depth	12 Mpts (1 channel), 6 Mpts (2 channels), 3 Mpts (3/4 channels); upgradeable
Max. Waveform Capture Rate	30,000 wfms/s
Vertical Input Impedance	1 MΩ ±2%
Vertical Input Range	1 mV/div to 10 V/div
Horizontal Time Base Range	5 ns/div to 50 s/div
Standard Trigger Functions	Edge, Pulse Width, Slope, Video, Pattern, Duration
Standard Bus Decode	Parallel Bus
Interfaces	USB Host & Device, LAN (LXI), AUX Output (Trigger Out, Pass/Fail)
Display	7.0-inch WVGA (800x480) TFT LCD, 64 intensity grading levels
Power Supply	AC: 100 V~240 V
Dimensions (WxHxD)	313.1 mm x 160.8 mm x 122.4 mm
Weight	Approx. 3.2 kg
Included Accessories	Power cord, USB cable, 4x 150MHz probes

7. MAINTENANCE

- **Cleaning:** Regularly clean the exterior of the oscilloscope with a soft, dry cloth. For stubborn dirt, use a cloth lightly dampened with water or a mild, non-abrasive cleaner. Avoid using harsh chemicals or solvents.
- **Ventilation:** Ensure that the ventilation openings on the device are not obstructed to prevent overheating.
- **Storage:** When not in use for extended periods, store the oscilloscope in a clean, dry environment, away from direct sunlight and extreme temperatures.
- **Probe Care:** Handle probes carefully. Avoid bending or stressing the cables excessively. Store probes properly to prevent damage to the tips and connectors.

8. TROUBLESHOOTING

This section addresses common issues you might encounter with your oscilloscope.

8.1 No Display After Power On

- Check if the power cord is securely connected to both the oscilloscope and the power outlet.

- Verify that the power outlet is functional.
- Ensure the power button is fully pressed.

8.2 Unstable Waveform

- Adjust the trigger level to a stable point on the waveform.
- Select an appropriate trigger type for the signal being measured (e.g., Edge trigger for periodic signals).
- Check the probe connection and ensure it is properly compensated.
- Verify the input signal's amplitude and frequency are within the oscilloscope's specifications.

8.3 No Signal Displayed

- Ensure the input channel is enabled (its corresponding button is lit).
- Check the probe connection to the signal source and the oscilloscope.
- Adjust the vertical scale (V/div) to a more sensitive setting.
- Press the **AUTO** button to allow the oscilloscope to automatically find the signal.

9. WARRANTY AND SUPPORT

9.1 Warranty Information

The RIGOL DS1054Z main unit comes with a standard **3-year warranty** from the date of purchase when bought through Amazon. Accessories such as modules, probes, and batteries are covered by a **1-year warranty**. This warranty covers operational defects confirmed by RIGOL Japan. Parallel import products are not eligible for warranty or free support from RIGOL Japan.

In case of a suspected malfunction, after our company confirms that the event is a malfunction, we will provide a replacement with the same product or repair service, or other appropriate response as determined by our company.

9.2 Initial Defect Exchange Policy

Returns are accepted within 14 days of product arrival for initial defects. Return shipping costs for reasons other than operational defects are borne by the purchaser. Questions regarding operational defects or usage are accepted via Amazon email.

9.3 Repair and Calibration

For repair or calibration services, please contact a domestic authorized RIGOL dealer.

9.4 Additional Resources and Support

User guides, datasheets, and software for the DS1054Z can be downloaded from the official RIGOL Japan website. If you require an instruction manual earlier, please contact us via Amazon message.