

RIGOL

User's Guide

RP5600 Passive Probe

July 2010

RIGOL Technologies, Inc.

Guaranty and Declaration

Copyright

© 2010 RIGOL Technologies, Inc. All Rights Reserved.

Trademark Information

RIGOL is a registered trademark of **RIGOL** Technologies, Inc.

Notices

- **RIGOL** products are protected by patent law in and outside of P.R.C.
- **RIGOL** reserves the right to modify or change parts of or all the specifications and pricing policies at company's sole decision.
- Information in this publication replaces all previously corresponding material.
- **RIGOL** shall not be liable for losses caused by either incidental or consequential in connection with the furnishing, use or performance of this manual as well as any information contained.
- Any part of this document is forbidden to copy or photocopy or rearrange without prior written approval of **RIGOL**.

Product Certification

RIGOL guarantees this product conforms to the national and industrial standards in China. International standard conformance certification is in progress, e.g. ISO.

Contact Us

If you have any problem or requirement when using our products, please contact **RIGOL** or your local distributors, or visit:

www.rigol.com

General Inspection

When you get a new RP5600 probe, you are suggested to take the following steps to inspect the probe.

1. Inspect the shipping container for damage.

If there are damages in the container or foam, keep them until the whole machine and the accessories passing the electrical and mechanical tests.

If your probe has damaged during shipping, please contact your carrier and **RIGOL** sales office responsible for this business.

2. Inspect the probe.

In case of any mechanical damage or defect, or if the probe does not operate properly or pass performance tests, notify your **RIGOL** Sales Representative.

3. Check the accessories.

Accessories supplied with the probe are listed in the "**Accessories**" section. If the contents are incomplete or damaged, please contact the local sales representative of **RIGOL**.

Safety Terms and Symbols

Terms in This Guide. These terms may appear in this manual:



WARNING: Indicate the conditions or practices that could result in injury or loss of life.



CAUTION: Indicate the conditions or practices that could result in damage to this product or other property.

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury or hazard may immediately happen.

WARNING indicates an injury or hazard may not immediately happen.

CAUTION indicates that a damage to the instrument or other property might occur.

Symbols on the Product. These symbols may appear on the product:



**Hazardous
Voltage**



**Refer to
Instructions**



**Protective
Earth
Terminal**



**Chassis
Ground**



**Test
Ground**

Contents

Guaranty and Declaration..... I
General Inspection II
Safety Terms and Symbols III
Contents..... IV
RP5600 Probe at a Glance.....1
Accessories2
To Connect to the Oscilloscope5
To Use the Probe.....7
Compensation Adjustments..... 10
Characteristics..... 12
General Care and Cleaning 13
Warranty 14

RP5600 Probe at a Glance

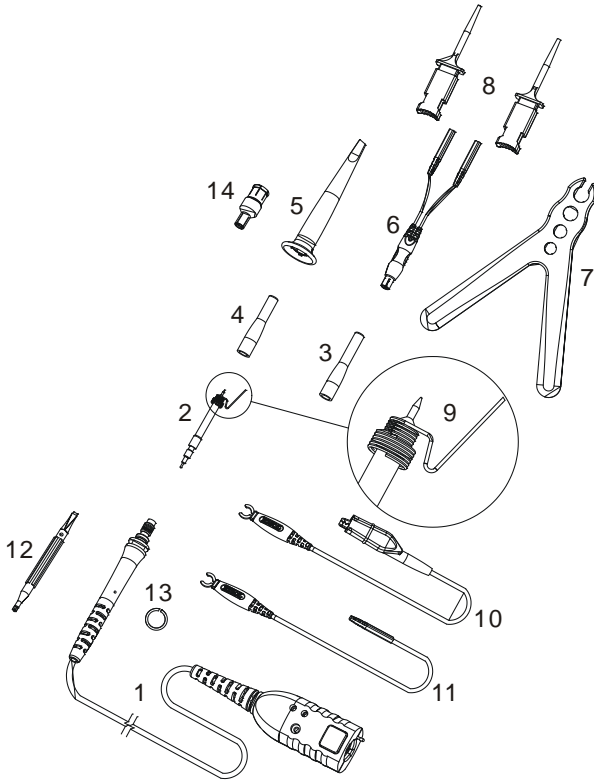
The RP5600 passive probe of **RIGOL** with the bandwidth up to 600MHz, uses modular structure allowing to replace the probe tips. The probe has compact structure and uses snap-on BNC connector which can be easily connected to the oscilloscope.

Features:

- Analog bandwidth up to 600MHz.
- Precise and tenuous probe tip.
- Auto identification of the probe attenuation ratio (need to be supported by the oscilloscope).
- Firm, durable and retractable normal probe hook.
- Equipped with many kinds of ground lines to connect to different earth terminals.

Accessories

The figure and table below list the standard accessories and options of RP5600. All the accessories can be ordered and purchased from **RIGOL**.



CAUTION: The measurement category of the combination of the probe and the accessories (used to assist the measurement) is the lower one in the combination.

Standard Accessories

Item#	Name	Number	Qty
1	Probe	RP5600-0200101	1
2	Probe tip	RP5600-0200201	2
3	Barrel Insulator (long)	RP5600-0200301	1
4	Barrel Insulator (short)	RP5600-0200401	1
5	General purpose retractable hook tip	RP5600-0200501	1
6	Dual-lead adapter	RP5600-0200601	1
7	Probe bracket	RP5600-0200701	1
8	SMD clip	RP5600-0200801	2
9	Spring clip	RP5600-0200901	2
10	Alligator ground lead	RP5600-0201001	1
11	Socketed ground lead	RP5600-0201101	1
12	Screwdriver	RP5600-0201201	1
13	Sign loop	RP5600-0201301	8
14	BNC adapter	RP5600-0201401	1

1 Probe

Main body of the probe

2 Probe Tip

Front Component of the probe

3,4 Barrel Insulator (long, short)

When using the short one, the ground terminal is exposed in favor of using the spring clip. While using the long one, the ground terminal will be covered completely to avoid short circuit between the probe and the circuit under test.

5 General Purpose Retractable Hook Tip

It is retractable.

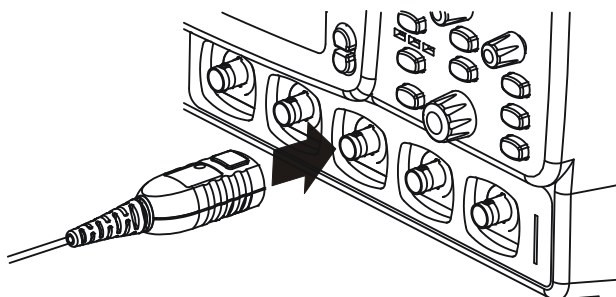
- 6** Dual-lead Adapter
Lead out a plug from the signal terminal and the ground terminal of the probe respectively.
- 7** Probe Bracket
To lay and fix the probe during the measurement.
- 8** SMD Clip
Lead out the pin signal of the circuit under test.
- 9** Spring clip
Connect to the probe tip for grounding and can improve the high-frequency response.
- 10** Alligator Ground Lead
Ground the probe reliably for safety operation and accurate signal reading.
- 11** Socketed Ground Lead
The same usage as the alligator ground lead but use different joint (see in the figure of the standard accessory)
- 12** Screwdriver
Be used in probe compensation adjustment.
- 13** Sign Loop
Fix the sign loop on the probe to distinguish the probes connected to different channels.
- 14** BNC Adapter
Use this adapter to connect the probe to a BNC terminal.

Options (used in high-frequency compensation adjustment)

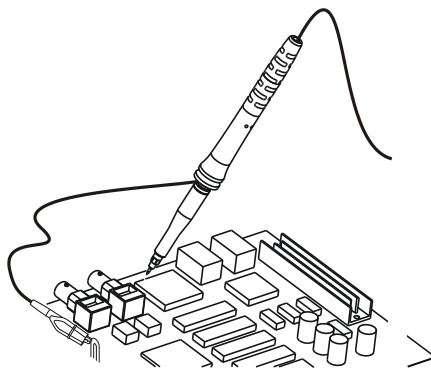
Item#	Name	Number
1	50Ω feedthrough	RP5600-0300101

To Connect to the Oscilloscope

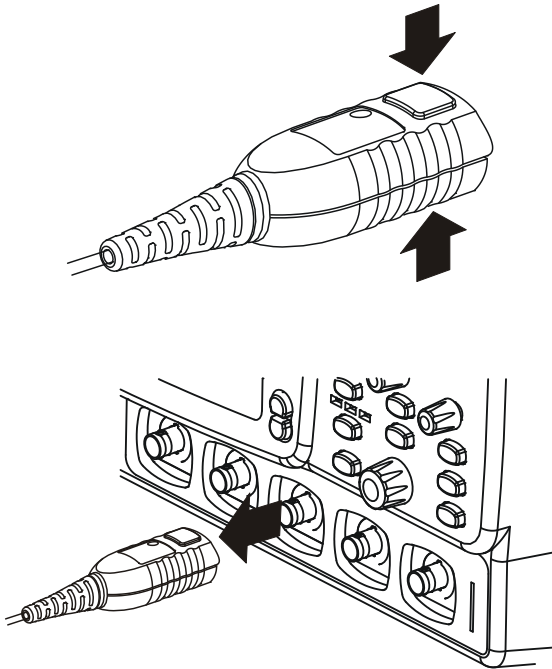
- 1 Connect the probe to the channel or the external trigger input of the oscilloscope. Push it straight on until it latches firmly.



- 2 Connect the probe to the circuit under test.



- 3 To disconnect the probe from the oscilloscope, push the small buttons on the top and bottom of the probe connector, and then pull the connector out from the front panel of the oscilloscope.



CAUTION: Do not attempt to twist the probes on the oscilloscope's BNC connector, which might cause damage to the probe.

To Use the Probe



CAUTION: If users do not follow the instructions in the Guide when using the probe, the protection provided by the probe might decline or disappear.



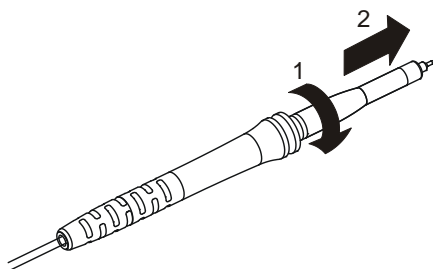
CAUTION: Do not solder the probe tip to any surface, Or else the probe tip would be damaged.



CAUTION: If using the probe without any accessories, the probe might cause short circuit when connected to the circuit.

To connect the probe to the circuit under test

When using the probe to measure some hard-to-reach positions, you can spare the probe accessories.



RP5600 has two kinds of barrel insulators: long and short. The figure above uses the long one which can rotate in the direction of arrow 1 and can be taken off in the direction of arrow 2.

The barrel insulator can be rotated to various positions:

- Screw down the barrel insulator and add the spring ground to the probe tip for grounding.
- Unscrew the barrel insulator to cover the probe front and insulate the ground.

Barrel insulator with ground accessories

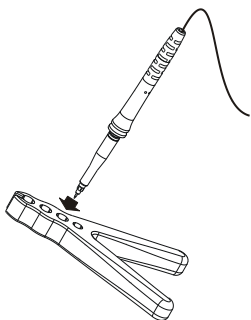
Ground the probe by connecting either the alligator ground, the Socketed ground lead or the spring ground which all provides a ground point. It is necessary to use the barrel insulator in conjunction with any of the ground accessories so as to avoid possible short circuit.

Barrel insulator (short) with general purpose retractable hook tip

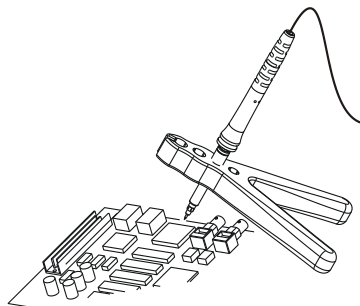
Connect the ground lead to the probe and connect the hook tip by pressing the probe hook tip towards the probe. Then, press the hook tip to expose the front conductor and connect it to the testing point.

Probe bracket

The probe bracket can facilitate your circuit testing. Users can place the probe on the bracket to spare their hands. As shown in the figures below, choose the proper holes to insert the probe into the bracket and connect it to the testing point, then place the whole equipment to a proper position.



Usage Method



Placement Method

**WARNING:**

RP5600 and the oscilloscope use the same terminal ground (complies to OSHA condition) and the exposed metal surface of the probe and the oscilloscope must be grounded. In particular application using floating ground measurement, the operator has the potential danger of electric shock which could be fatal (depends on the voltage and current conditions).

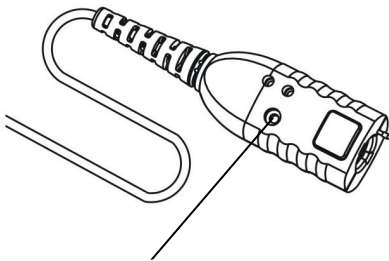
Compensation Adjustments

You are suggested to compensate the probe so as to match its characteristics with the oscilloscope. The probes can be adjusted for both low-frequency compensation and high-frequency compensation. You should make low-frequency compensation of the probe when it is connected to the oscilloscope for the first time (or adjust it at any time) while high-frequency compensation can be adjusted regularly.

Low-frequency compensation

Follow the steps below to make low-frequency compensation:

- 1 Connect the probe to the probe adjustment signal terminal at the front-panel of the oscilloscope to make compensation adjustment via the low-frequency compensation adjustment hole.
- 2 Press **Auto** at the front panel of the oscilloscope.
- 3 Set the low-frequency compensation adjustment on the probe using the metal plate or "cross" of the Screwdriver provided to get the smoothest pulse (as shown in figures below).



Low-frequency Compensation Adjustment



Over compensated



Perfectly compensated



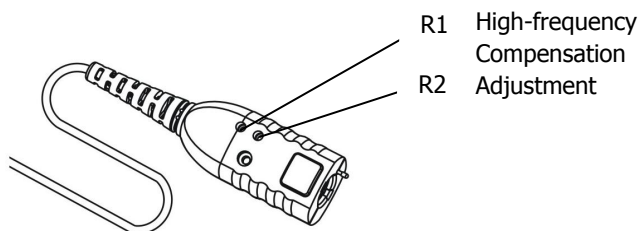
Under compensated

High-frequency compensation

Low-frequency compensation must be performed before executing High-frequency compensation.

Follow the steps below to make high-frequency compensation:


- 1 Connect the 50 Ω feedthrough (option) to a generator with quick edge signal.
- 2 Connect the BNC adapter to the 50 Ω feedthrough.
- 3 Remove the accessories (the spring or the hook tip) at the probe front and the barrel insulator.
- 4 Connect the probe tip to the BNC adapter and connect the probe to the oscilloscope.
- 5 Output a quick edge signal less than 500 ps from the generator.
- 6 Press **Auto** at the front panel of the oscilloscope to view the waveform.
- 7 Use the mental plate or "cross" on the Screwdriver to rotate the resistance R1 and R2 of the high-frequency compensation.
- 8 Adjust R1 and R2 alternately in tiny increments until the waveform displays flat tops and steep rising edges.



Characteristics

Performance Specification	
Bandwidth	DC ~ 600MHz
Attenuation Ratio	10:1
Input Impedance	10MΩ±2%
Input Capacitance	12pF±1pF
Maximum Input	CAT II 300VAC
Compensation Range	6pF ~ 26pF

General Specification	
Operation Environment	Temperature: 0°C ~ 50°C Humidity: 0 RH ~ 80%RH
Storage Environment	Temperature: -20°C ~ 60°C Humidity: 0 RH ~ 90%RH
Size	142±2cm
Weight	Approximately 48±2g

 This symbol indicates that the RP5600 probe is in compliance with European product regulations which include the EMC Directive and the Low Voltage Directive.

Installation (overvoltage) Category

The terminal of this product may have two Installation (overvoltage) categories:

Measurement Category II (CAT II). CAT II is for measurements performed on circuits directly connected to low-voltage installation (AC Line).

Measurement Category I (CAT I). CAT I is for measurements performed on circuits not directly connected to AC Line.

General Care and Cleaning

General Care

Do not store or leave the probe in places where it will be exposed to direct sunlight for long period of time.



CAUTION: To avoid damage to the probe, do not expose it to sprays, liquids, or solvents.

Cleaning

Clean the probe regularly according to the operation situation. Disconnect all the powers before cleaning the probe.

1. Wipe the floating dust on the exterior of the probe with a soft cloth or a wet soft cloth with neutral detergent. Make sure that the probe is completely dry before connecting it to power.
2. To avoid damage to the probe, do not use any corrosive chemical detergent.



WARNING: To avoid any short-circuit or personal injuries caused by moisture, make sure that the probe is completely dry before connecting it to power.

Warranty

RIGOL Technologies, Inc. warrants that its products' mainframe and accessories will be free from defects in materials and workmanship within the warranty period. Within the warranty period, **RIGOL** guarantees free replacement or repair of products which are proven defective. For detailed warranty description, please refer to **RIGOL** official website or the warranty card.

To get repair service or a complete copy of the warranty statement, please contact with your nearest **RIGOL** sales and service office.

RIGOL does not provide any other warranty items except the one being provided by this summary and the warranty statement. The warranty items include but not being subjected to the hint guarantee items related to tradable characteristic and any particular purpose. **RIGOL** will not take any responsibility for cases of indirect, particular and ensuing damages.