

# **RIGOL**

## **User's Guide**

### **RP5600A Passive Probe**

**Dec. 2011**

**RIGOL Technologies, Inc.**



# Guaranty and Declaration

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## Publication Number

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

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



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**WARNING**

Warning statements indicate the conditions or practices that could result in injury or loss of life.

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**CAUTION**

Caution statements indicate the conditions or practices that could result in damage to this product or other property.

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**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 be accessible potentially.

**CAUTION** indicates a potential 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**

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## 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.

### Cleaning:

Clean the probe regularly according to its operating conditions. To clean the exterior surface, perform the following steps:

1. Disconnect the probe from all power sources.
2. Clean the loose dust on the outside of the probe with a lint-free cloth (with mild detergent or water).



#### **CAUTION**

To avoid damages to the probe, do not expose it to corrosive liquids.

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#### **WARNING**

To avoid injury resulting from short circuit, make sure the probe is completely dry before reconnecting into a power source.

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# **Contents**

Guaranty and Declaration ..... I  
General Care and Cleaning ..... III  
RP5600A Probe at a Glance ..... 1  
General Inspection ..... 2  
Accessories ..... 3  
To Connect to the Oscilloscope ..... 6  
To Use the Probe ..... 8  
Compensation Adjustments ..... 11  
Characteristics ..... 14  
Warranty ..... 15  
Contact Us ..... 16

## **RP5600A Probe at a Glance**

The **RIGOL** RP5600A passive probe provides up to 600 MHz bandwidth and uses modular structure allowing users to replace the probe tips. The probe has compact structure and uses snap-on BNC connector for easy connection with the oscilloscope.

### **Features:**

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

## General Inspection

When you get a new RP5600A probe, you are suggested to take the following steps to inspect the probe.

### 1. **Inspect the shipping container for damage.**

Keep the damaged shipping container or cushioning material until the contents of the shipment have been checked for completeness and the instrument has passed both electrical and mechanical tests.

The consigner or carrier shall be liable for the damage to the probe resulting from shipment. **RIGOL** would not be responsible for free maintenance/rework or replacement of the unit.

### 2. **Inspect the probe.**

In case of any damage, or defect, or failure, 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**.



## Accessories

The figure and table below list the standard accessories for RP5600A. All the accessories can be ordered and purchased from **RIGOL**.

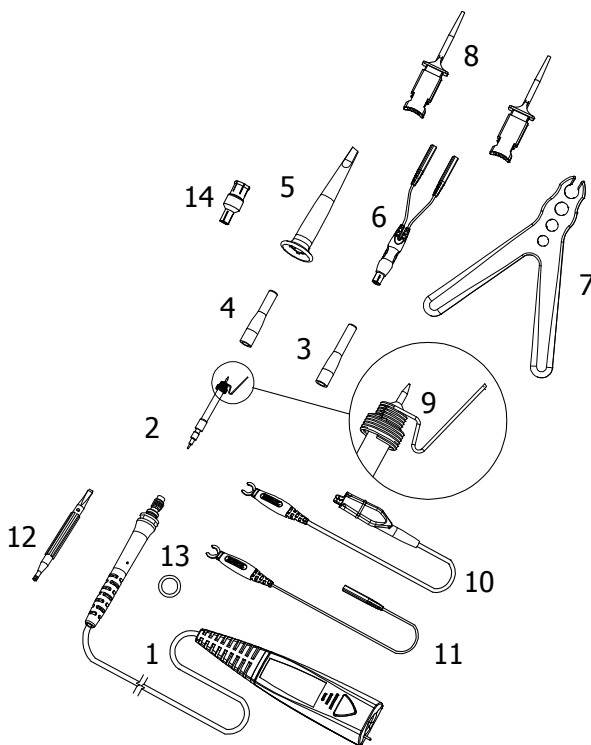


Figure 1 RP5600A Accessories



### 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.

Table 1 RP5600A Accessories

<b>Item#</b>	<b>Name</b>	<b>Part No.</b>	<b>Qty</b>
1	Probe	RP5600A-0200101	1
2	Probe tip	RP5600A-0200201	2
3	Barrel insulator (long)	RP5600A-0200301	1
4	Barrel insulator (short)	RP5600A-0200401	1
5	General purpose retractable hook tip	RP5600A-0200501	1
6	Dual-lead adapter	RP5600A-0200601	1
7	Probe bracket	RP5600A-0200701	1
8	SMD clip	RP5600A-0200801	2
9	Spring ground	RP5600A-0200901	2
10	Alligator ground lead	RP5600A-0201001	1
11	Socketed ground lead	RP5600A-0201101	1
12	Screwdriver	RP5600A-0201201	1
13	Sign loop	RP5600A-0201301	8
14	BNC adapter	RP5600A-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 ground spring. When using the long one, the ground terminal is covered completely to avoid short circuit between the probe and the circuit under test.

**5. General Purpose Retractable Hook Tip**

Directly connect the probe head to the circuit under test to spare your hands.

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**6. Dual-lead Adapter**

Lead out a plug from the signal terminal and the ground terminal of the probe respectively.

**7. Probe Bracket**

Lay and fix the probe during the measurement.

**8. SMD Clip**

Lead out the pin signal of the circuit under test.

**9. Spring Ground**

Connect to the probe tip for grounding to improve the high-frequency response.

**10. Alligator Ground Lead**

Ground the probe reliably for safe operation and accurate signal reading.

**11. Socketed Ground Lead**

The usage is the same as the alligator ground lead but it uses different joint (refer to the figure of standard accessories).

**12. Screwdriver**

Used in probe compensation adjustment.

**13. Sign Loop**

Fix sign loops of different colors on the probes to distinguish the probes connected to different channels.

**14. BNC Adapter**

Use this adapter to connect the probe to a BNC connector.

## To Connect to the Oscilloscope

1. Connect the BNC connector of probe to the desired channel or the external trigger input terminal of the oscilloscope. Push it straight on until it latches into place.

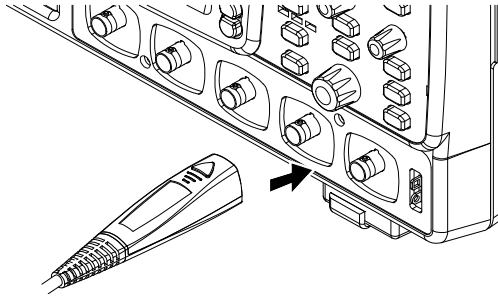


Figure 2 To Connect the Oscilloscope

2. Connect the probe to the circuit under test.

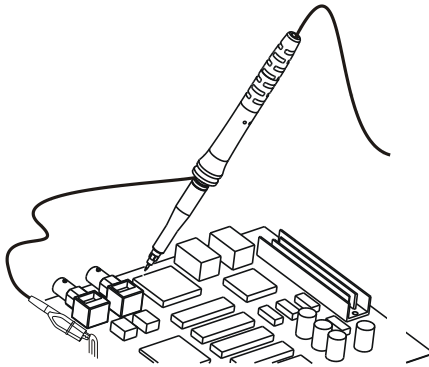


Figure 3 To Connect the Circuit under Test

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 probe connector out from the BNC connector of the oscilloscope in the arrow direction as shown in the Figure 4 (b).

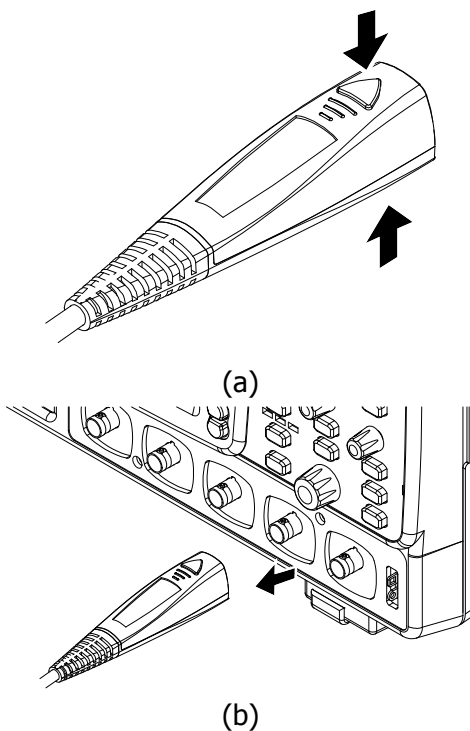


Figure 4 To Disconnect the Oscilloscope



**CAUTION**

Do not attempt to twist the probes on or off the oscilloscope's BNC connector, otherwise the probe might be damaged.

## To Use the Probe



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**CAUTION**

To avoid any damage or loss, please use the probe according to the User's Guide.

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**CAUTION**

Do not solder the probe tip to any surface, or else the probe tip would be damaged.

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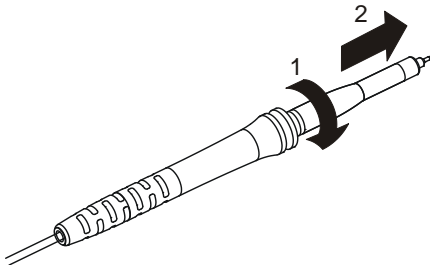
**CAUTION**

If using the probe without any accessories, short circuit might occur when the probe is connected to the circuit.

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### 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.



RP5600A has two kinds of barrel insulators: long and short. The insulator shown in the figure above is the long one. You can screw the barrel insulator in the direction of arrow 1 and take it off in the

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direction of arrow 2.

The barrel insulator can be screwed to various positions:

- With the barrel insulator screwed all the way on, a spring ground may be added to the probe tip to provide ground contact.
- With the barrel insulator screwed most of the way out, the barrel insulator covers the front component of the probe.

### **To use the ground accessories**

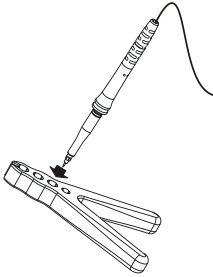
Ground the probe by connecting the alligator ground, the socketed ground lead or the spring ground which all provide reference for a ground point. It is necessary to use the barrel insulator in conjunction with any of the ground accessories so as to avoid possible short circuit.

### **To use the general purpose retractable hook tip**

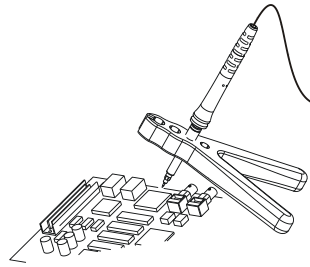
Insert the probe hook tip into the barrel insulator to connect it to the probe tip. Then, connect the hook tip to the point to be tested by pressing the retractable hook tip body towards the probe body.

### **To use the 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 on the next page, insert the probe into the proper hole on the bracket and connect the probe tip to the point to be tested, then place the whole equipment to a proper position.



Using Method



Placement Method



**WARNING**

RP5600A must be used with oscilloscopes that have a common terminal at ground potential (complying with OSHA requirements and the National Electric Code). Exposed metal surfaces of the probe and the oscilloscope must be grounded. Failure to ground the common terminal during certain applications, such as those requiring the oscilloscope to be powered from external battery, might expose the operator to an electrical shock hazard that could be lethal (depending on the voltage and current conditions).

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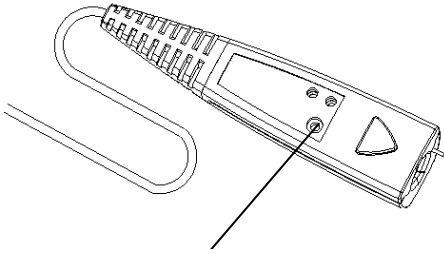
## Compensation Adjustments

You are suggested to compensate the probe to match 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 made regularly.

### Low-frequency compensation

Follow the steps below to make low-frequency compensation:

1. Connect the probe to a channel BNC connector and the probe compensation signal output terminal at the front-panel of the oscilloscope. Connect the ground alligator lead of the probe to the "Ground Terminal" under the probe compensation signal output terminal.
2. Press **Auto** at the front panel of the oscilloscope.
3. Set the low-frequency compensation adjustment on the probe using screwdriver provided via the low-frequency compensation adjustment hole on the probe to get the flattest pulse possible (as shown in figures on the next page).



Low-frequency  
Compensation Adjustment

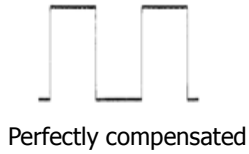
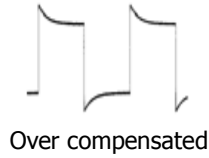


Table 2 Option (for high-frequency compensation adjustment)

Item#	Name	Part No.
1	50 Ω feedthrough adaptor	RP5600A-0300101

### High-frequency compensation

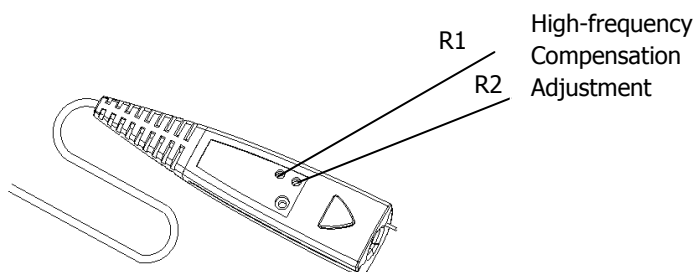
Low-frequency compensation must be performed before executing High-frequency compensation.

Follow the steps below to make high-frequency compensation:

1. Connect the 50 Ω feedthrough adaptor (option) to a generator with fast edge signal.
2. Connect the BNC adapter to the 50 Ω feedthrough adaptor.
3. Remove the accessories (the spring ground or the hook tip) at the probe head and the barrel insulator.
4. Connect the probe head to the BNC adapter (so as to connect it to the generator with fast edge signal) and connect the probe to

the oscilloscope.

5. Output a fast edge signal lower than 500 ps from the generator.
6. Press **Auto** at the front panel of the oscilloscope to view the waveform.
7. Use the screwdriver to adjust the resistors R1 and R2 of the high-frequency compensation.
8. Adjust the high frequency adjustment hole in small increments until the displayed waveform has flat tops and steep rising edges.



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**CAUTION**

It is recommended that the high-frequency compensation should be done by professionals.

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# Characteristics

<b>Performance Specification</b>	
Bandwidth	DC to 600 MHz
Attenuation Ratio	Fixed at 10:1
Input Impedance	10 MΩ±2%
Input Capacitance	12 pF±1 pF
Maximum Input	CAT II 300VAC <sup>[1]</sup>
Compensation Range	6 pF to 26 pF

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

**Note:**

[1] CAT I and CAT II Definitions

Installation Category (Overvoltage Category) I: signal level, special equipment or parts of equipment, telecommunication, electronic, etc., with smaller transient voltages than installation category (Overvoltage Category) II.

Installation Category (Overvoltage Category) II: local level, appliance, portable equipment etc., with smaller transient voltages than installation category (Overvoltage Category) III.

## **Warranty**

**RIGOL** warrants that its products mainframe and accessories will be free from defects in materials and workmanship within the warranty period.

If a product is proven to be defective within the respective period, **RIGOL** guarantees the free replacement or repair of products which are approved defective. To get repair service, 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 in cases regarding to indirect, particular and ensuing damage.

## **Contact Us**

If you have any problem or requirement when using our products, please contact RIGOL Technologies, Inc. or your local distributors.

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Overseas:

Please contact the local **RIGOL** distributors or sales office.

For the latest product information and service, visit our website:

<http://www.rigol.com>