

Agilent 1156/7/8A Active Probes for Infiniium Oscilloscopes

Product Overview



Agilent 1156/7/8A active probe with accessories

Features

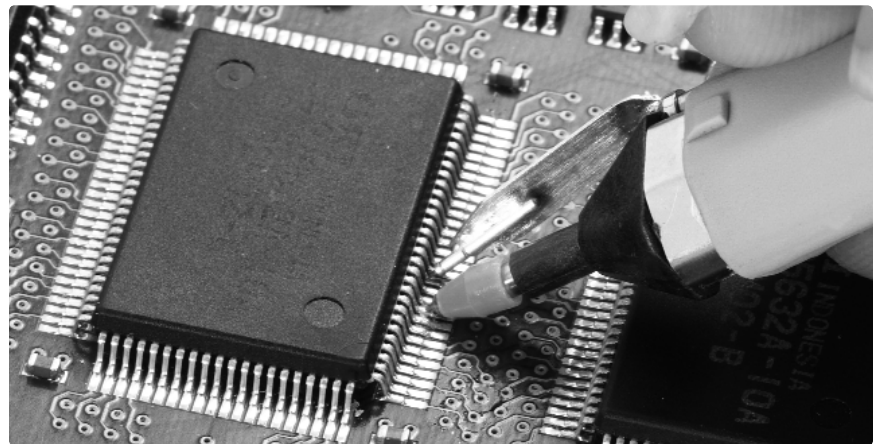
- 4 GHz, 2.5 GHz, and 1.5 GHz bandwidth models
- Small size makes probing easier
- 88 ps rise time (on 4 GHz model)
- 100 k Ω , 0.8 pF, non-resonant input impedance
- ± 15 V offset
- 5 V peak-to-peak dynamic range
- Accessories designed for minimal loading on your device and optimum response
- Compatible with the Infiniium AutoProbe Interface

As the speeds in your design increase, you may notice more overshoot, ringing, and other perturbations when connecting an oscilloscope probe. Probes form a resonant circuit where they connect to the device. If this resonance is within the bandwidth of the oscilloscope probe you are using, it will be difficult to determine if the measured perturbations are due to your circuit or the probe.

Agilent is the only company that has overcome the resonance formed by the connection of a probe to a device. The Agilent 1156/7/8A probes optimize performance to make your job easier:

- High input impedance of 100 k Ω and 0.8 pF that never resonates low
- Flat frequency response across the entire bandwidth of the probe
- A full 5 V peak-to-peak dynamic range, and
- ± 15 V of offset.

Combined with the Agilent 54846A Infiniium scope, the 1158A 4 GHz probe offers you a full 2.25 GHz of system bandwidth, giving you accurate insight into your high-speed devices.



Agilent 1156/7/8A active probe with resistive signal pin and ground blade



Agilent Technologies

Small Size

Have you experienced problems with large, clunky probes? If so, you probably found your probe awkward to hold and had difficulty connecting to your signals. With the 1156/7/8A's small size you can handle the probe expertly and gain access to tight spaces. Plus, the low mass makes the probe more durable. Agilent makes your job easier – giving you performance that is easy to use.

Faithful Reproduction of Your Signal

Now you can accurately measure your high-speed signals without introducing errors from a probe that has a resonant input impedance or non-flat frequency response. Resistance is placed as close as possible to the point being probed, which keeps the input impedance from resonating low, and it also allows a flat frequency response across the entire bandwidth of the probe. Finally, there is a high bandwidth active probe where the waveform on screen matches the waveform at the probe tip. No other probe currently on the market offers a flat response for the entire bandwidth of a 4 GHz probe!

With the wide dynamic range and ± 15 V of offset, the probe can be used in a wide variety of applications.

Superior Accessories

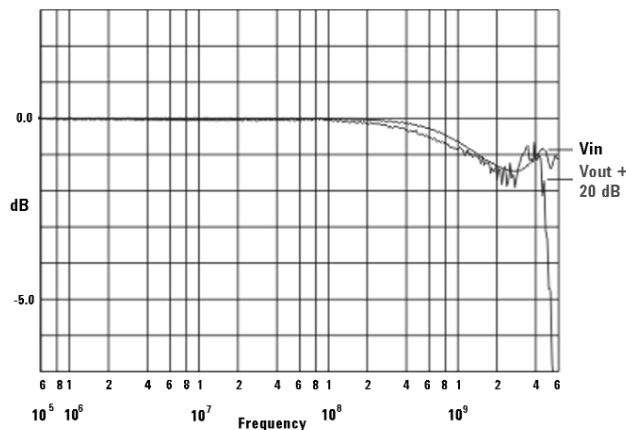
Your device under test (DUT) determines the type of probing accessories you need. Of course, there are electrical trade-offs depending on the type of connection you use. Longer connections from your DUT produce lower performance probing systems.

Agilent offers a variety of accessories optimized to give you the most accurate reproduction of your signal. In addition, the performance of each accessory is characterized for you. Now you can make informed decisions and get the best measurement for your environment. Superior performance combined with the knowledge to use it - that's how Agilent helps you do your job better.

This suite of accessories is properly damped to give you a flat transmitted response and non-resonant input impedance. Use these supplied accessories to get the best performance from your probe:

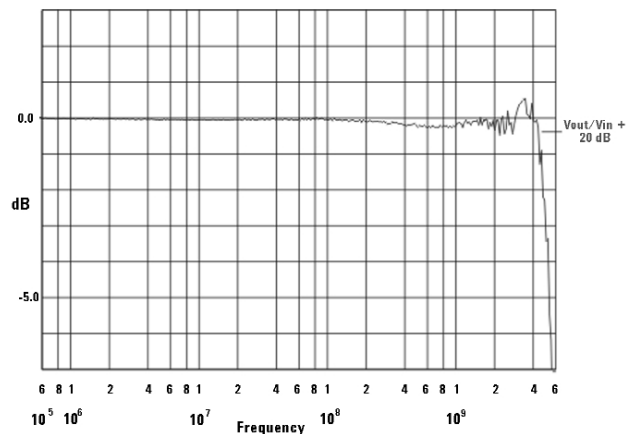
- | | |
|---------------------------------------------|-------------|
| • Resistive signal pin (orange) | E2640A |
| • Solderable-tip 5 cm resistive signal lead | E2638A |
| • Socket-end 5 cm resistive signal lead | 01156-82105 |
| • Socket-end 10 cm resistive signal lead | 01156-82108 |
| • Ground blade assembly | E2641A |
| • Solderable SMT ground pin | 1253-5054 |
| • Solderable through-hole ground pin | 1252-7150 |

Vin and Vout when driven from a 25Ω source



Notice how closely the output matches the input

Response = Vout/Vin



The flat response means the waveform on the scope screen will match the waveform at the probe tip - across the entire 4 GHz bandwidth.

Specifications and Characteristics

Bandwidth ¹	(-3dB)
1156A	>1.5 GHz
1157A	>2.5 GHz
1158A	>4 GHz
System Bandwidth	
1 GHz	1156A with 54835A
1.5 GHz	1157A with 54845A
2.25 GHz	1158A with 54846A
Rise and Fall time (10% to 90%)	
1156A	<233 ps
1157A	<140 ps
1158A	<88 ps
<i>calculated from $t_r = 0.35/\text{bandwidth}$</i>	
Input Capacitance	0.8 pF
Input Resistance ¹	100 k Ω 1%
Flatness, Swept Response	
0.2 dB, 100 kHz to 100 MHz	
0.4 dB, 100 MHz to 2.5 GHz	
2.0 dB, 2.5 GHz to 4.0 GHz	
Flatness, Step Response	
15% overshoot, 35 ps input edge	
10% overshoot, 75 ps input edge	
2%, 1 ns after edge	
Dynamic Range ²	
>5.0 V peak-to-peak	
dc Attenuation ¹	
10:1 \pm 3% before calibration ⁴	
10:1 \pm 1% after calibration ⁴	
Zero offset error referred to input ¹	
<30 mV before calibration	
<5 mV after calibration	
Offset Range ¹	\pm 15.0 V
Offset Accuracy ¹	
<3% of setting before calibration ⁴	
1% of setting after calibration ⁴	
Noise referred to input	
3.0 mVrms	
Propagation Delay	
5.5 ns	
Maximum Input Voltage	
40 V peak, CAT I ³	
ESD Tolerance	
>5 kV from 100pF, 300 Ω HBM	
Temperature Drift	
Offset: <1.0 mV/ $^{\circ}$ C	
Attenuation (Gain):	
0.1 %/ $^{\circ}$ C	

Environmental Conditions

Temperature	
Operating	0 $^{\circ}$ C to +55 $^{\circ}$ C
Non-operating	-40 $^{\circ}$ C to +70 $^{\circ}$ C
Humidity	
Operating	Up to 95% relative humidity (non-condensing) at +40 $^{\circ}$ C
Non-operating	Up to 90% relative humidity at +65 $^{\circ}$ C
Power Requirements from AutoProbe Interface	
	+12 Vdc @ 3 mA typical
	+ 5 Vdc @ 35 mA typical
	-5 Vdc @ 37 mA typical
Weight	Approximately 0.69 kg

Probe Recommendation Table

Be sure your probe has enough bandwidth to utilize the full performance your scope offers. Use the selection table below for recommended configurations.

Infiniium 54800-Series oscilloscope	Probe	System Bandwidth
54835A (1.0 GHz)	1156A (1.5 GHz)	1.0 GHz
54845A (1.5 GHz)	1157A (2.5 GHz)	1.5 GHz
54846A (2.25 GHz)	1158A (4.0 GHz)	2.25 GHz

Ordering Information

- With the purchase of a new 54800-series Infiniium oscilloscope:
 - Option #012 (54810A, 54815A, 54820A, 54825A, 54835A) for 1156A
 - Option #013 (54845A) for 1157A
 - Option #014 (54846A) for 1158A
- For existing 54800-Series Infiniium oscilloscope customers order the 1156A**, 1157A**, or 1158A**

Each probe includes:

- Foam Case
- 12 Resistive signal pins (orange) (E2640A)
- 2 Solderable-tip 5 cm resistive signal leads (E2638A)
- 2 Socket-end 5 cm resistive signal leads (01156-82105)
- 2 Socket-end 10 cm resistive signal leads (01156-82108)
- 4 Micro clips (E2639A)*
- 12 Ground blade assemblies (E2641A)
- 12 Solderable SMT ground pins (1253-5054)
- 12 Solderable through-hole ground pins (1252-7150)
- 12 Offset ground pins (01156-27606)
- 2 Solderable-tip 5 cm ground leads (E2638A)
- 2 Socket-end 5 cm ground leads (01156-82103)
- 2 Socket-end 5 cm, 90 $^{\circ}$ pin ground leads (01156-82104)
- 1 User and Service Guide
- One-year warranty

* The 1156A only comes with 2 micro clips.

To order additional quantities, see Accessories.

Accessories

E2637A	Precision Measurement kit (includes 2 solderable ground sockets with 8 green resistive signal pins)
E2638A	Solderable - tip 5 cm resistive signal leads (10) with ground leads (3)
E2639A	Micro clips, Qty. 4
E2640A	Resistive signal pins, (orange) Qty. 8
E2641A	Ground blade assembly, Qty. 8
E2654A	EZ-Probe [®] Positioner

** The Infiniium 54800-Series scope requires version A.04.30 or greater of the application software to work with the 1156A/7A/8A probes. An LS-120 drive is required for this upgrade.

To receive your free Infiniium software update, go to our Infiniium web site:

www.agilent.com/find/Infiniium1

Related literature

Infiniium 54800 Series Oscilloscope Probes and Accessories
Data Sheet 5968-7141EUS/EN

Infiniium 54800 Series Oscilloscopes
Product Overview 5980-2397EUS/EN

Optimizing Oscilloscope Measurement Accuracy on High-Performance Systems with Agilent Active Probes Application Note 1385 5988-5021EN

¹ Denotes warranted specifications, all others are typical

² For waveforms with edges >3 ns, the dynamic range is 12.0 Vpeak-to-peak

³ Installation category (over voltage category) I: Signal level, special equipment, or parts of equipment, telecommunication, electronic, etc., with smaller transient overvoltage than installation category (overvoltage category) II.

⁴ Probe calibrated to scope channel (under Probes Setup menu)

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