Instructions

Tektronix

P6119B
100 MHz 1X & 10X Passive Probe

070-8000-05

Printed in the U.S.A.

Tektronix, Inc., P.O. Box 1000, Wilsonville, OR 97070–1000

Getting Started

This section gives a brief description of the P6119B probe along with important information for using the probe safely.

Product Description

The P6119B is compatible with general purpose oscilloscopes having a 1 MΩ input impedance and bandwidth up to 100 MHz.

General Safety Summary

Observe Maximum Working Voltage

Do not use the P6119B above 420 V (DC + peak AC). Refer to the derating chart on page 10.

Do Not Operate in an Explosive Atmosphere

To avoid personal injury or fire hazard, do not operate this product in an explosive atmosphere.

Do Not Immerse in Liquids

Clean the probe using a damp cloth. Refer to the cleaning instructions on page 7.

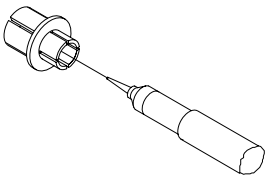
Do Not Use if Damaged

If you suspect that there is damage to this product, have it inspected by qualified service personnel.

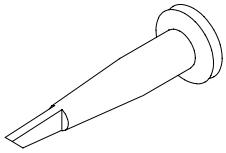
Accessories and Features

The P6119B probe is provided with several accessories designed to make probing and measurement a simpler task. Please take a moment to familiarize yourself with these accessories and their uses.

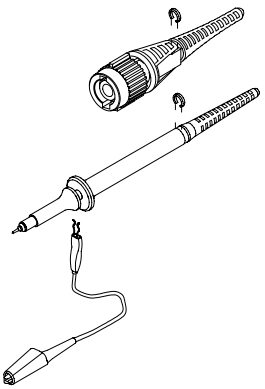
NOTE. *Remove and discard the protective cover on the tip of the probe before attempting to connect a probe tip accessory.*



BNC-to-probe tip adapter — To install the adapter, push the wide end firmly into a BNC connector. Then insert the probe tip firmly into the adapter.

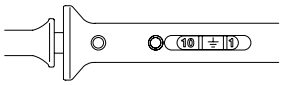
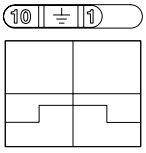
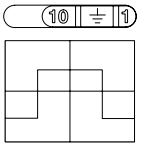
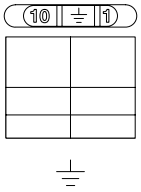
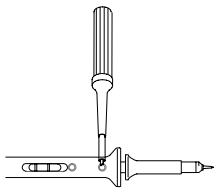


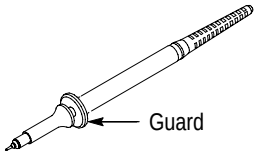
Retractable hook tip — Use the retractable hook tip to make hands-free measurements.



Marker rings — Attach the matching colored rings onto the probe cable and tip as shown.

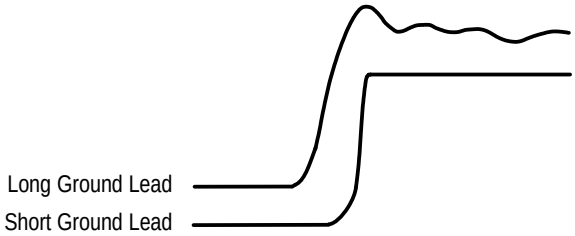
Ground lead — Use the alligator clip to attach the probe to a ground reference.

	Slide switch — Use the sliding switch to set probe attenuation.
 **10X**	In the forward position (toward the probe tip), the probe attenuates the input signal by 10X. Because the frequency range of the probe is greatest in the 10X-attenuating configuration, use the 10X setting as often as possible. Use a smaller volts/division setting of the oscilloscope to increase the display size of the signal. For very small amplitude signals however, you will need to use the 1X setting.
 **1X**	In the rearward position (farthest from the probe tip), the probe does not attenuate the input signal (1X-attenuating). This position is particularly useful when measuring small amplitude signals. Use caution to avoid exceeding the maximum input voltage at any given frequency when using the 1X position. Refer to Figure 2.
	In the middle position the probe output is set to ground. Setting the probe output momentarily to ground helps identify which oscilloscope trace is associated with the probe when the oscilloscope displays several channels. The ground position also allows you to easily adjust the ground reference when making measurements.
	Adjustment tool — Use the adjustment tool for probe compensation adjustments.



Guard — The guard provides a finger barrier for protection from electric shock.

WARNING. *To avoid electric shock when using the probe, keep fingers behind the guard on the probe body.*



To see the best signal, use the shortest possible ground lead and signal path.

Maintenance

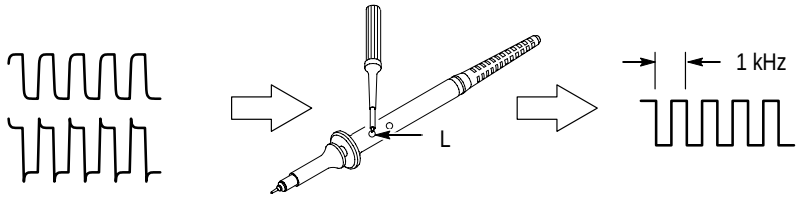
This section describes how to maintain the probe.

Low-Frequency Probe Compensation

Before taking any measurements using a probe, first check the compensation of the probe and adjust it to match the channel inputs.

Most oscilloscopes have a square wave reference signal available at a terminal on the front panel used to compensate the probe. Connect the probe to the signal source to display a 1 kHz test signal on your oscilloscope.

Compensate the probe by adjusting **L** on the probe so that the corners of the square wave are square.



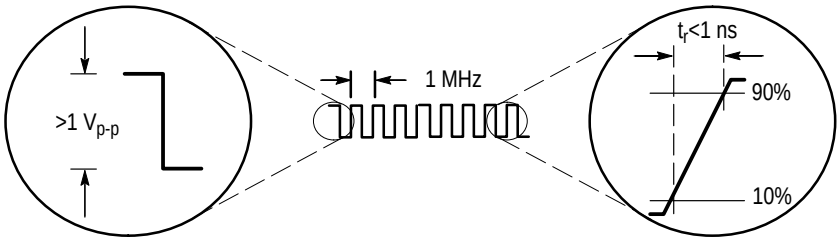
Adjust trimmer **L** until you see a flat-top square wave on the display.

High-Frequency Probe Compensation

The probe high-frequency compensation should seldom require adjustment; however, your probe may require high-frequency adjustment if any of the following are true:

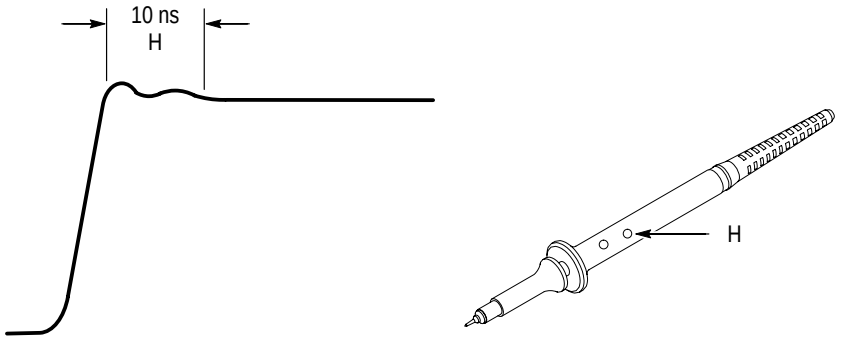
- the probe has high-frequency aberrations
- the probe does not perform at the rated bandwidth
- you have installed the probe on an oscilloscope having an input capacitance near the limits of the probe compensation range (See Table 1.)

To perform the high-frequency compensation adjustment you will need a signal source that has all of the following characteristics:



- square-wave output at 1 MHz
- fast rise output with rise time less than 1 ns
- output properly terminated

Connect the probe to the signal source to display a 1 MHz test signal on your oscilloscope. The display should be similar to that shown in Figure 1(a).



(a) Area Of Waveform Affected By Adjustment

(b) Location of Adjustment

Figure 1: HF Compensation

Adjust trimmer **H** until the waveform is flat on top and has a square leading edge.

Cleaning

To prevent damage to probe materials, avoid using chemicals that contain benzine, benzene, toluene, xylene, acetone, or similar solvents.

Do not immerse the probe or use abrasive cleaners.

Dirt may be removed with a soft cloth dampened with a mild detergent and water solution, or isopropyl alcohol.

Replacing Probe Parts

Other than accessories, only the probe tip is replaceable.

Replacement probe tips are available as optional accessories. Refer to the replaceable parts list at the end of this manual for more information.

To remove a tip assembly, firmly grasp the pointed tip with pliers and withdraw the assembly from the barrel.

No tools are required to install a replacement tip. Insert a new probe tip into the probe barrel as far as possible using finger pressure. If necessary, seat the plastic portion of the tip against the probe barrel by pressing the tip gently but firmly against a hard surface, such as a wood block or table top.

Specifications

These characteristics apply to a P6119B probe installed on a Tektronix 2252 oscilloscope. When used with another instrument, the oscilloscope must have an input impedance of 1 MΩ and a bandwidth not less than 100 MHz or more than 115 MHz.

The instrument must have a warm-up period of at least 20 minutes and be in an environment that does not exceed the limits described in Table 3.

Table 1: Electrical Characteristics

Attenuation (system)	1X, 10X ±1.35% at DC	
Input Resistance (system)	1X: 10X:	1 MΩ ± 1.0% 10 MΩ ± 1.3%
Input Capacitance	1X: 10X:	90 pF to 115 pF 17.5 pF to 19.5 pF (18.5 pF typical)
Compensation Range	15 pF to 35 pF	
System Bandwidth (–3 dB)	1X: 10X:	DC to 10 MHz DC to 100 MHz
Maximum Working (Nondestructive) Input Voltage	420 V (DC+peak AC) (See Figure 2)	

Table 2: Certifications and Compliances

Approvals	UL1244 – Standard for electrical measuring and test equipment

Table 3: Physical and Environmental Characteristics

Net Weight (including accessories)	< 320 g (0.7 lb)
Cable Length	2 meters
Temperature Range[1]	
Operating	–15° C to +65° C (+5° F to +149° F)
Nonoperating	–62° C to +85° C (–80° F to +185° F)
Humidity[1]	95% to 97% Relative Humidity (30° C to 60° C)

[1] Tektronix Standard 062-2847-00, class 3. Refer to MIL-E-16400F, paragraph 4.5.9 through 4.5.9.5.1, class 4.

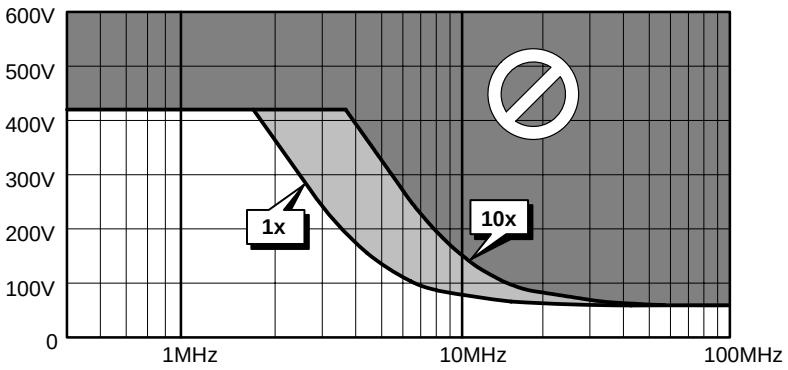


Figure 2: Maximum Working Voltage Derating Curve (VDC + Peak AC)

Replaceable Parts

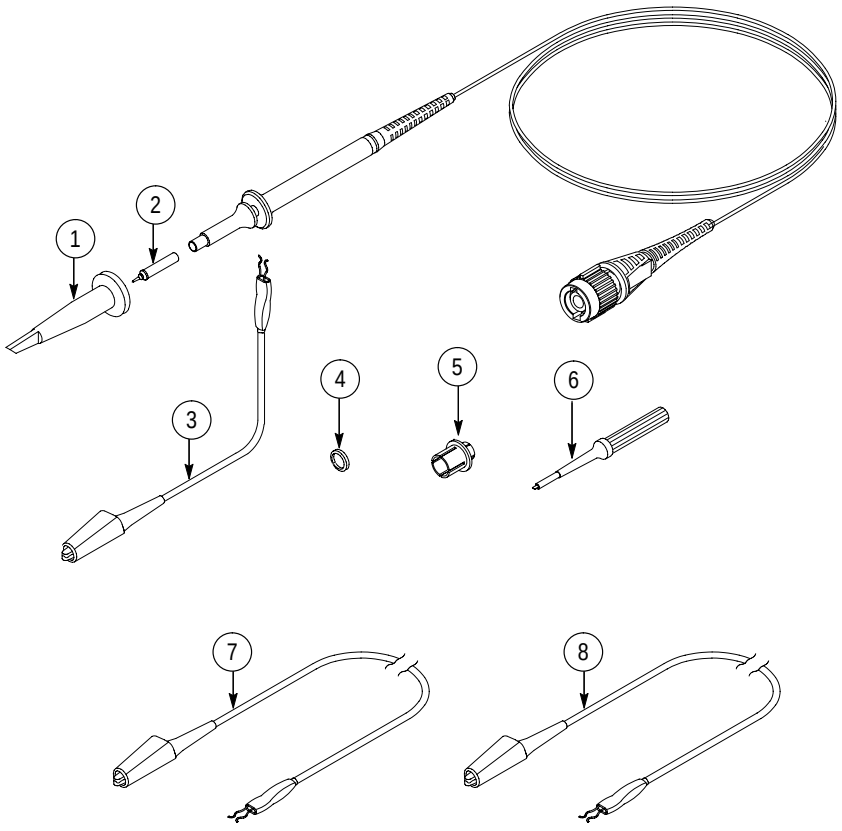


Figure 3: P6119B Replaceable Parts

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3–	————————			1	PROBE,PASSIVE:P6119B,100MHZ,1X–10X		
					STANDARD ACCESSORIES		
–2	See Opt. Acc.			1	CONTACT,ELEC:PROBE TIP W/INSULATOR ASSY		
	020–2134–01			1	ACCESSORY KIT:MINIATURE SIZE	80009	020213401
–1	013–0107–08			1	TIP,PROBE:MINIATURE/COMPACT SIZE	80009	013010708
–3	196–3120–01			1	LEAD,ELECTRICAL:23 AWG,6.0 L,GROUND	80009	196312001
–4	See Opt. Acc.			8	BAND,MARKER:2 EA. VARIOUS COLORS		
–5	————————			1	ADAPTER,CONN:BNC TO MINIATURE PROBE TIP		
–6	See Opt. Acc.			1	SCREWDRIVER:ADJUSTMENT TOOL		
	070–8000–05				MANUAL,TECH:INSTR,P6119B	80009	0707800005
					OPTIONAL ACCESSORIES		
–2	131–4997–01			1	CONTACT,ELEC:2 TIP–INSULATOR ASSEMBLIES	80009	131499701
–4	016–0633–00			1	MARKER SET,CA:2 EA VARIOUS COLORS	80009	016063300
–6	003–1433–01			1	SCREWDRIVER:ADJUSTMENT TOOL,PKG OF 5	80009	003143301
–7	196–3120–21			1	LEAD,ELECTRICAL:PROBE GROUND,28.0 L	80009	196312021
–8	196–3121–01			1	LEAD,ELECTRICAL:PROBE GROUND,12.0 L	80009	196312101

Mfr. Code	Manufacturer	Address	City, State, Zip Code
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077–0001

WARRANTY

Tektronix warrants that the products that it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If a product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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