Instructions

Tektronix

P6109B
100 MHz 10X Passive Probe
With Readout

070-7849-02

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Getting Started

Product Description

The P6109B is compatible with Tektronix 2200 series oscilloscopes.The probe can also be used with other general purpose oscilloscopes having a 1 MΩ input impedance and bandwidth up to 100 MHz.

The P6109B is also compatible with Tektronix oscilloscopes that automatically detect probe attenuation and adjust the scale readout accordingly.

The P6109B probe is listed with Underwriters Laboratories Inc. and meets the requirements of UL 1244.

General Safety Summary

Observe Maximum Working Voltage

Do not use the P6109B above 42 VDC. Refer to the derating chart on page 9.

Do Not Operate an Explosive Atmosphere

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

Do Not Immerse in Liquids

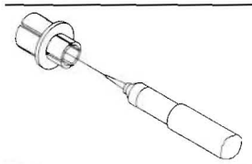
Clean the probe using a damp cloth. Refer to the cleaning instructions on page 6.

Do Not Use if Damaged

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

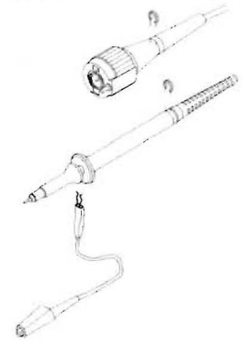
Accessories and Features

The P6109B 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.



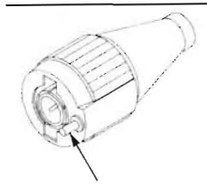
BNC-to-probe tip adapter—To install the adapter, push the wide end firmly into a BNC connector. Then insert the probe tip firmly into the adapter.

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

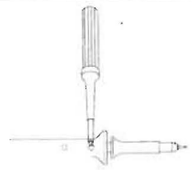


Marker rings—Attach the matching colored rings onto the probe cable and tip as shown.

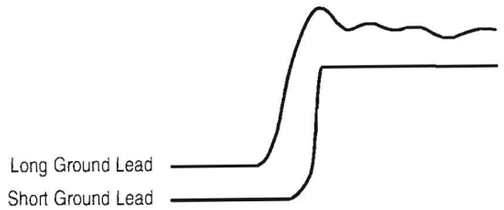
Ground lead—Use the alligator clip to attach the probe to a ground reference.



The P6109B is compatible with Tektronix oscilloscopes that automatically detect and display the attenuation factor of the probe.



Adjustment tool—Use the adjustment tool for probe compensation adjustments.



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

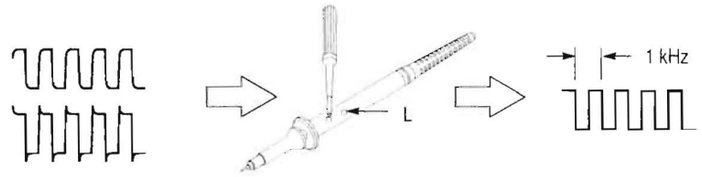
Maintenance

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.



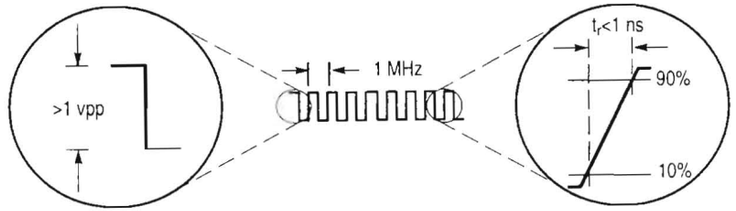
Adjust trimmer **L** until you see a flat-top square wave on the display.

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 doesn't 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.)

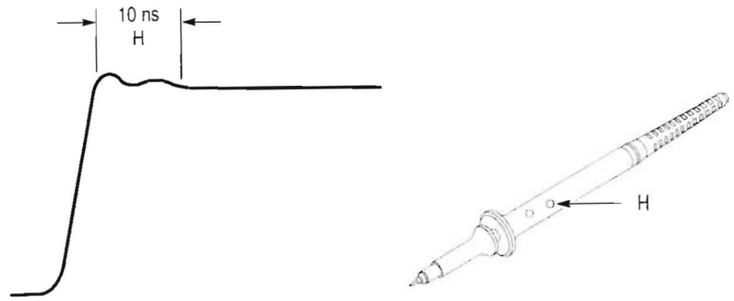
To perform the high-frequency compensation adjustment you will need a signal source that has all of the following characteristics:



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

The Tektronix PG506A Calibration Generator meets these requirements when 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 P6109B 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 2.

Table 1: Electrical Characteristics

Attenuation (system)	10X ± 1.3% at DC
Input Resistance (system)	10 MΩ ± 1.3%
Input Capacitance	11.8 pF to 14.8 pF (13.3 pF nominal)
Compensation Range	15 pF to 35 pF
System Bandwidth (–3 dB)	DC to 100 MHz
Maximum Working (Nondestructive) Input Voltage	420 V (DC+peak AC) (See Figure 2)

Table 2: Physical and Environmental Characteristics

Net Weight (including accessories)	< 320 g (0.7 lb)
Cable Length	2 meters
Temperature Range[1]	
Operating	–15° C to +75° C (+5° F to +167° 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.

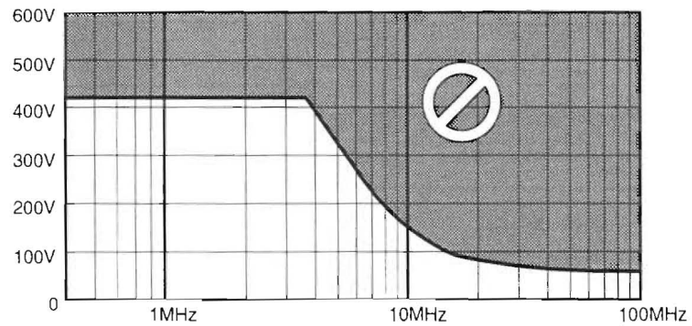


Figure 2: Maximum Working Voltage Derating Curve (VDC + Peak AC)

Replaceable Parts

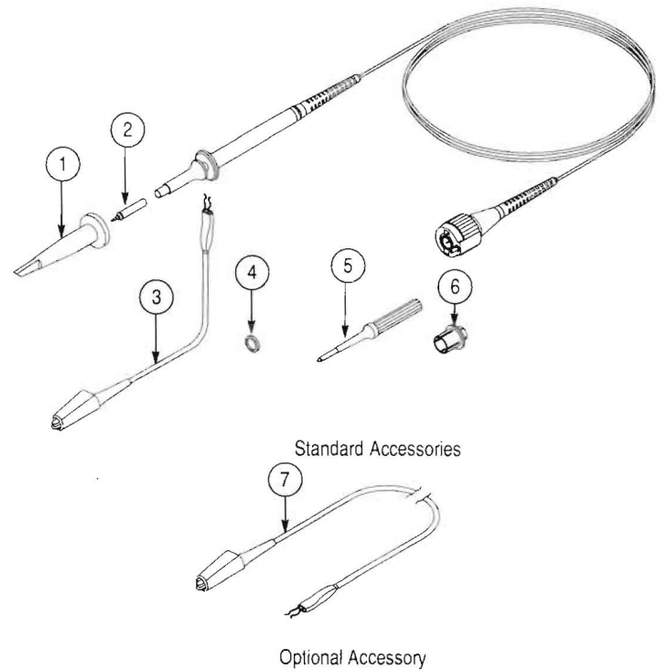


Figure 3: P6109B Replaceable Parts

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3–	————			1	PROBE,PASSIVE:P6109B,100MHZ,10X, W/READOUT		
–1	013–0107–07			1	TIP,PROBE:MINIATURE/COMPACT SIZE	80009	013010707
–2	————			1	CONTACT,ELEC:PROBE TIP W/INSULATOR ASSY		
–3	196–3120–00			1	LEAD,ELECTRICAL:23 AWG,6.0 L,GROUND	80009	196312000
					STANDARD ACCESSORIES		
	020–2031–00			1	ACCESSORY KIT:MINIATURE SIZE	80009	020203100
–4	————			8	.BAND,MARKER:2 EA VARIOUS COLORS		
–5	————			1	.SCREWDRIVER:ADJUSTMENT TOOL		
–6	————			1	.ADAPTER,CONN:BNC TO MINIATURE PROBE TIP		
	————			1	.2 TIP–INSULATOR ASSEMBLIES W/INFO CARD		
	070–7849–02				SHEET,TECHNICAL:INSTR,P6109B	80009	070784902
					OPTIONAL ACCESSORIES		
–7	196–3120–20			1	LEAD,ELECTRICAL:PROBE GROUND,28.0 L	80009	196312020
	016–0633–00			1	MARKER SET,CA:2 EA VARIOUS COLORS	80009	016063300
	003–1433–01			1	SCREWDRIVER:ADJUSTMENT TOOL,5 EA.	80009	003143301
	131–4997–02			1	CONTACT,ELEC:30 PKGS OF 2 EA	80009	131499702

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