

SPECIFICATIONS

Description

The P6109 is a miniature, 10X passive probe for use with DC to 150 MHz oscilloscopes which have a 20 pF nominal input capacitance. It is fully compatible with the Tektronix family of miniature probe accessories. The P6109 is available with 1.5, 2.0 and 3.0-meter cables.

Electrical Characteristics

Attenuation: 10X \pm 0.3% at dc. (Probe installed on 224X Oscilloscope.)

Input Resistance (System): 10 M Ω \pm 0.15%. (See Figure 1.)

Input Capacitance (See Figure 1.):
1.5-meter probe: \sim 11.8 pF.
2.0-meter probe: \sim 13.2 pF.
3.0-meter probe: \sim 15.5 pF.

Compensation Range: 18 pF to 22 pF.

System Bandwidth (-3 dB):

Use of the P6109 on any oscilloscope with a bandwidth measured to be greater than 150 MHz from a properly terminated 50-ohm source, and having an input capacitance of 20 pF \pm 2 pF, will result in a system bandwidth of at least 150 MHz. A similar correspondence is achieved for all oscilloscopes of lower bandwidth and identical capacitance range.

Maximum Nondestructive Input Voltage:

500 V (dc + peak ac) to 1.3 MHz. (See Figure 2 for voltage curve.)

Environmental Characteristics

Temperature Range (Operating): -15°C to $+75^{\circ}\text{C}$ ($+5^{\circ}\text{F}$ to $+167^{\circ}\text{F}$).

Temperature Range (Nonoperating): -62°C to $+85^{\circ}\text{C}$ (-80°F to $+185^{\circ}\text{F}$).

Humidity:

Five cycles (120 hr) at 95% to 97% relative humidity. Per Tek Standard 062-2847-00, Class 3. Ref to MIL-E-16400F, paragraph 4.5.9 through 4.5.9.5.1, class 4.

Physical Characteristics

Probe Cable Length and Net Weight (Includes Accessories):

1.5-meter probe (5.0 ft):	100 g (3.52 oz).
2.0-meter probe (6.6 ft):	112 g (3.94 oz).
3.0-meter probe (9.9 ft):	135 g (4.73 oz).

Safety

To avoid explosion, do not operate product in an explosive atmosphere unless it has been specifically certified for such operation.

This product meets the requirements of UL 1244.

NOTE

Always position the adjustment cover in the detent position over the adjustment opening.

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INSTRUCTION SHEET
WITH PARTS HISTORY
NO. 070-6157-00
PRODUCT GROUP 60

TEK PROBE
AND ACCESSORIES

P6109
10X PASSIVE PROBE

Tektronix
COMMITTED TO EXCELLENCE

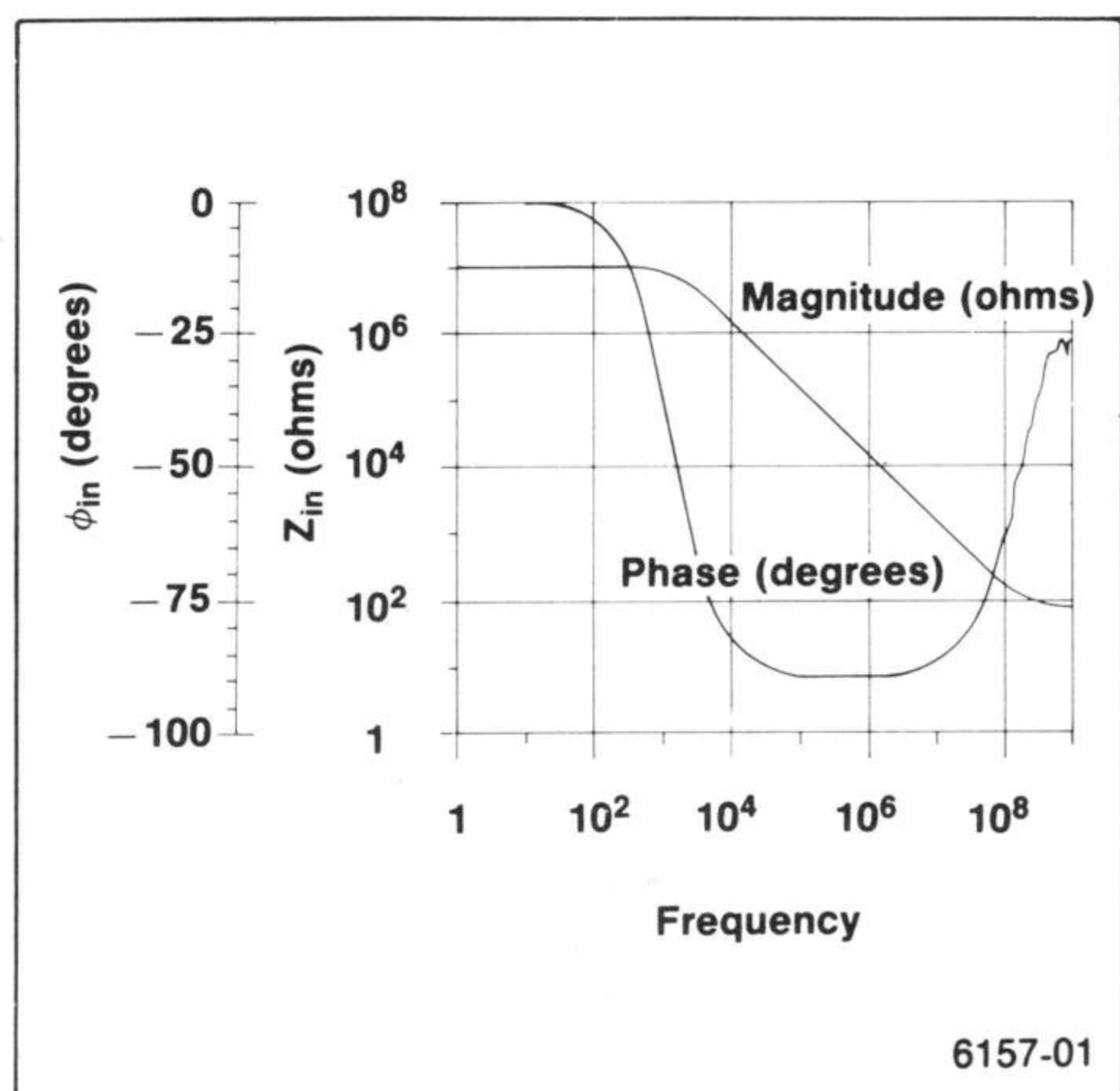


Figure 1. Typical input impedance.

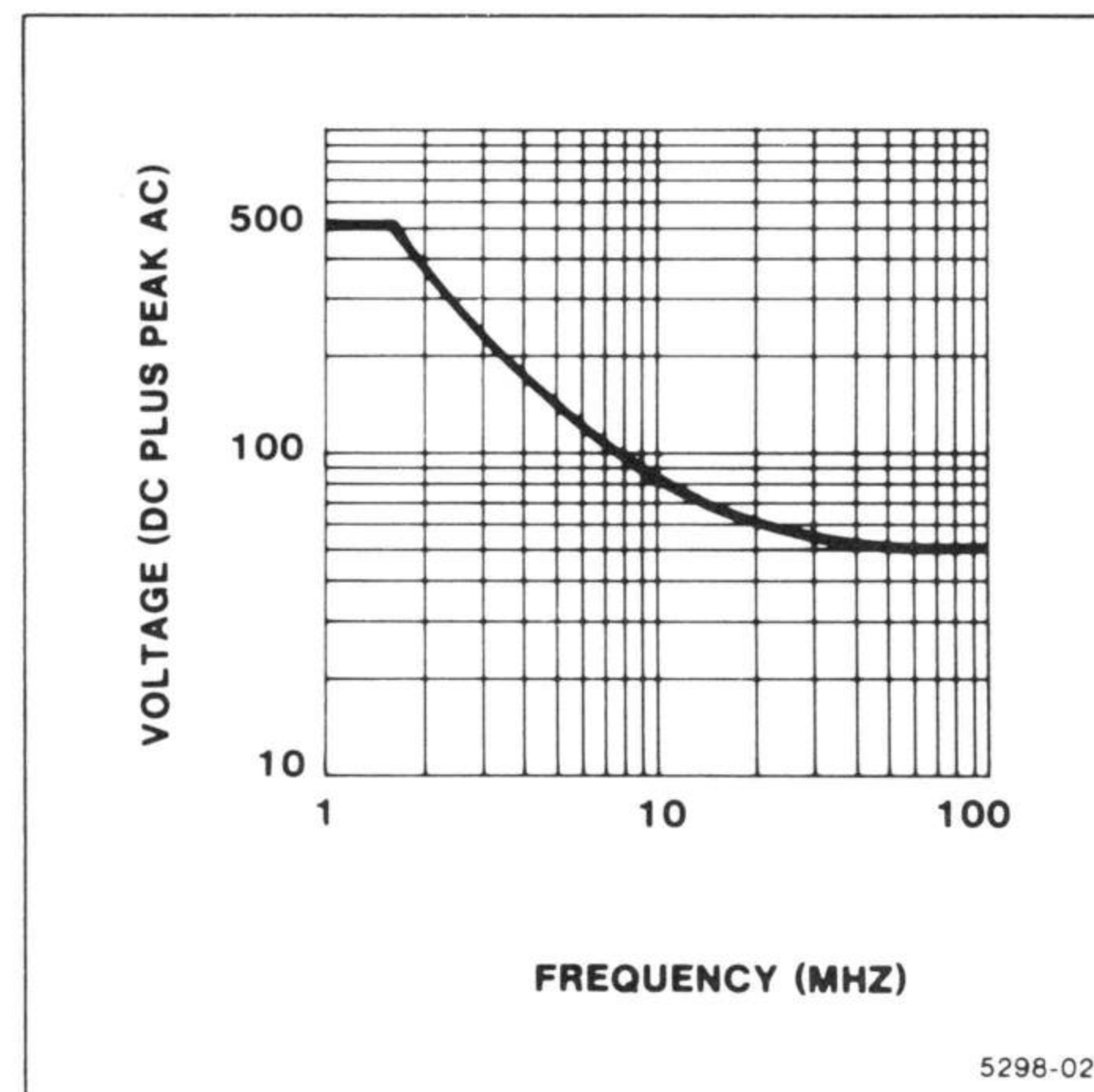
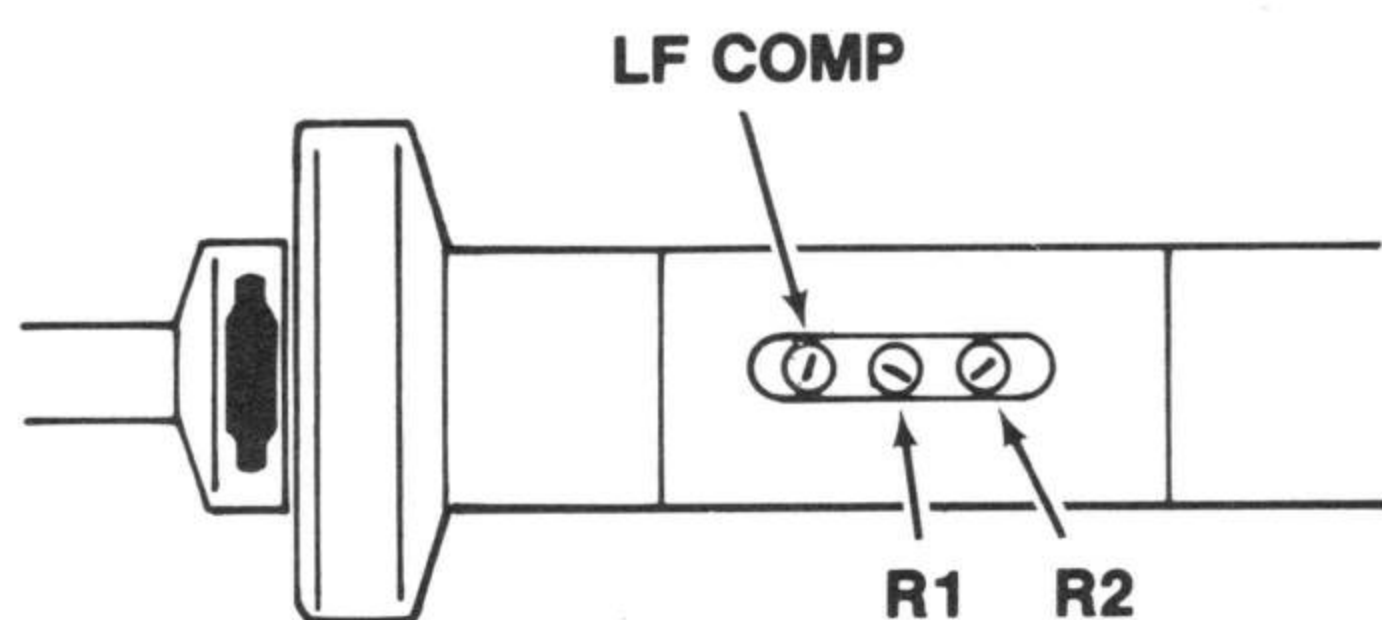


Figure 2. Typical voltage derating versus frequency.

OPERATING CONSIDERATIONS

Probe Grounding. Inductance introduced by a long signal lead or ground lead will form a resonant circuit that will ring and distort the true waveform if driven by a signal containing significant frequency components at or above resonance. The ground lead and signal input connections should be as short as possible to maintain the best waveform fidelity.

Probe Compensation. Due to variations in oscilloscope input characteristics, probe low-frequency compensation may need adjustment after moving the probe from one input to another. To adjust, apply the probe tip to a square-wave signal of 1 kHz (such as an oscilloscope calibrator output). Rotate the sleeve on the probe head to expose the probe l-f adjustment (see illustration). Using a low-reactance alignment tool, adjust the compensation capacitor to obtain the squarest waveform front corner. High-frequency compensation seldom requires adjustment. However, if the probe has excessive h-f aberrations or insufficient bandwidth, h-f adjustments can be made with R1 and R2, (for this process, remove the adjustment-opening cover by carefully spreading the cover apart and pushing it toward the rear of the probe body). A 100 KHz, fast rise (< 1 ns) square-wave generator (such as a Tektronix PG 506) terminated into a 50-ohm load should be used. Connection can be made to this source with a BNC-to-miniature probe tip adapter (Tek PN 013-0084-00). The resulting oscilloscope display should be adjusted for the best rise time and flattest response in the first ~30 ns (see "TYPICAL ADJUSTMENT PROCEDURE" for further information). Always move the adjustment cover into the detent position over the adjustment opening when adjustments have been completed.



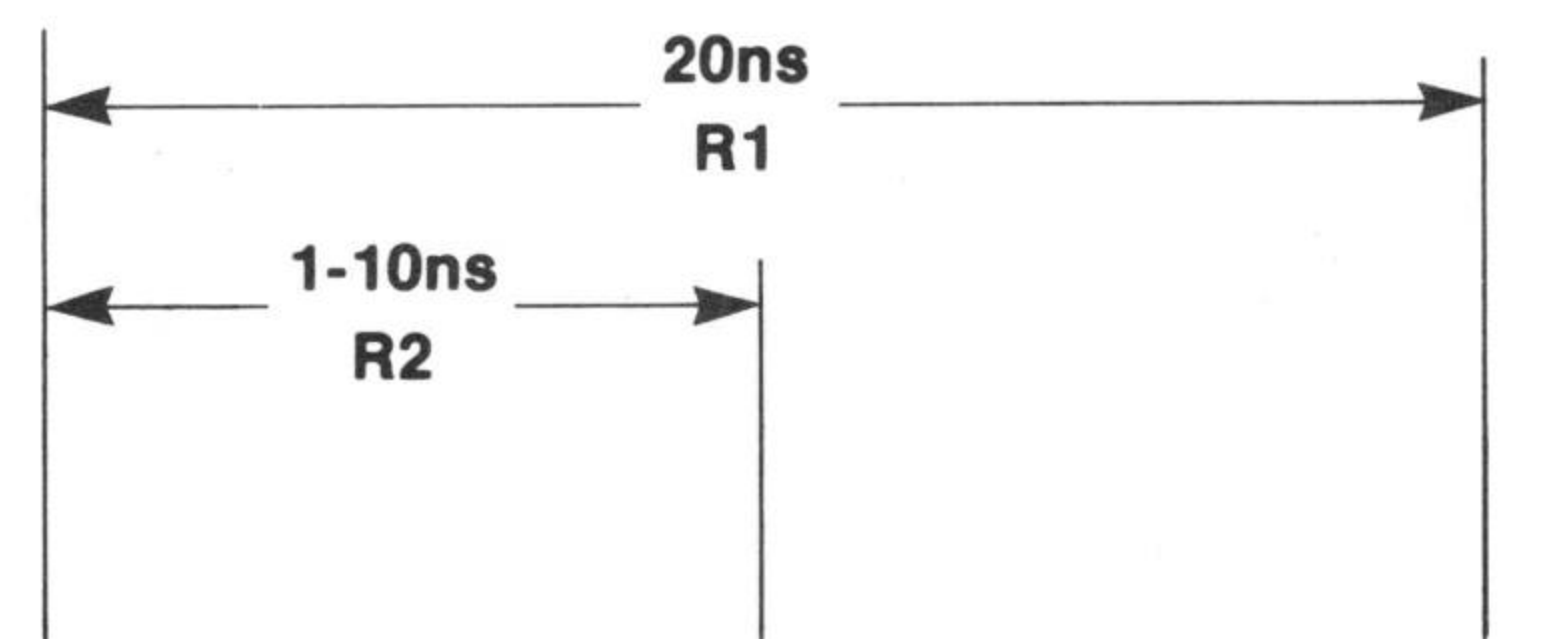
WARNING

The following servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any probe maintenance while the probe is connected to a signal source.

MAINTENANCE

Cleaning. Accumulated dirt can be removed with a soft cloth dampened with a nonresidue type cleaner, preferably isopropyl alcohol. Before using any other type of cleaner, consult your Tektronix Service Center or representative. In particular, avoid benzene, toluene, xylene, acetone, MEK, or similar solvents.

Probe Module Replacement. Modular construction has been used to simplify repair. The probe head, cable assembly, tip assembly, and protective plastic sleeve are available as separate units through your Field Office or representative. The probe tip is easily replaceable by unscrewing the old tip and replacing it with a new one. The entire probe-head assembly or cable can be replaced by simply pulling the probe-head away from the cable and installing a new unit. To install a new adjustment-opening cover, remove the old cover, carefully spread the new cover apart and slip it over the cable with the notched end towards the tip of the probe. Carefully push the cover forward to the recessed slot. When the cover is seated in the slot, rotate it to the detent position to cover the adjustment opening.



TYPICAL ADJUSTMENT PROCEDURE:

1. Adjust LF Compensation.
2. Adjust R1 for smoothest response.
3. Adjust R2 for overall flatness.
4. Readjust R1 or R2 if necessary because of interaction.

5ns/div.

REPLACEABLE PARTS LIST

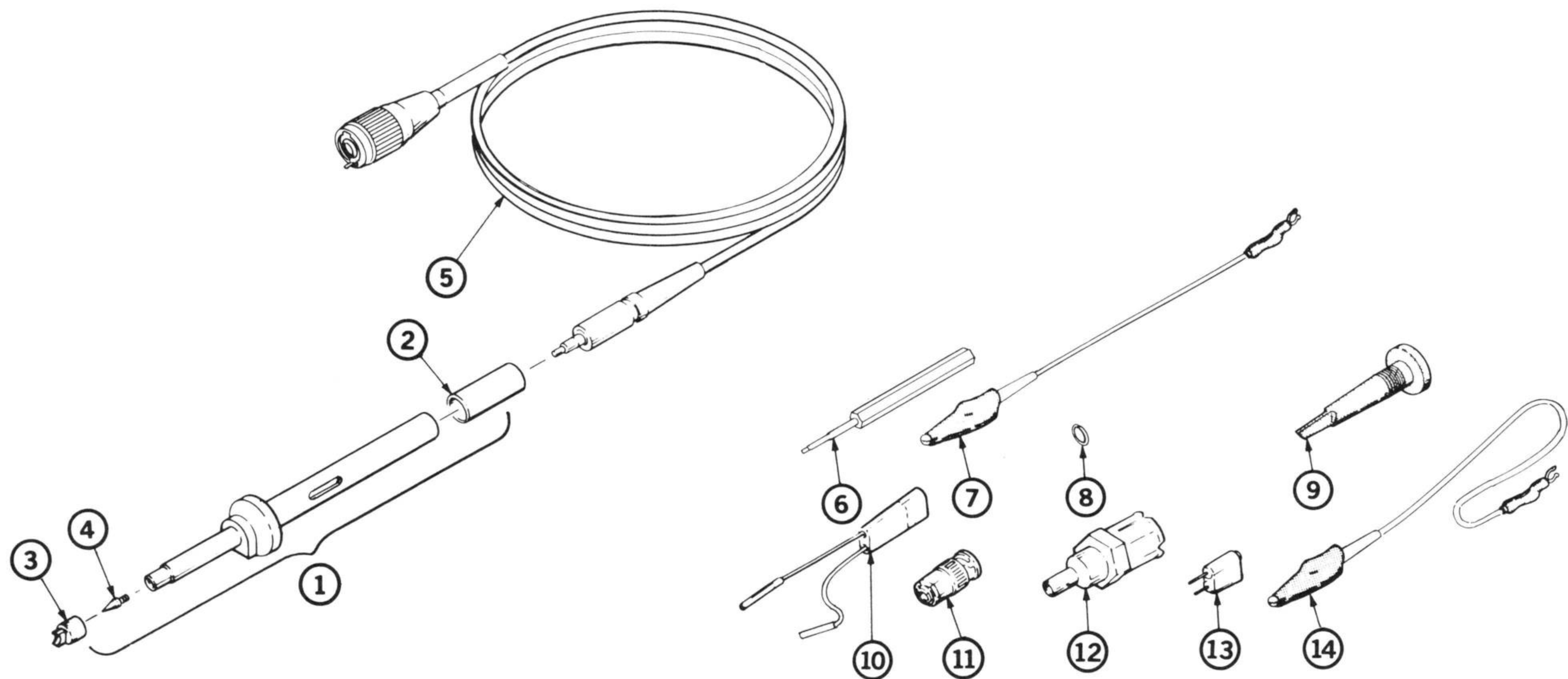


Figure 3. P6109 replaceable parts and accessories.

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3-1	206-0360-00			1	PROBE HEAD ASSY:2.0 METER	80009	206-0360-00
	206-0362-00		8707	1	PROBE HEAD ASSY:1.0 METER	80009	206-0362-00
	206-0372-00	8708		1	PROBE HEAD ASSY:P6109 1.5 METER (OPTION 01 ONLY)	80009	206-0372-00
	206-0366-00			1	PROBE HEAD ASSY:3.0 METER (OPTION 03 ONLY)	80009	206-0366-00
-2	200-3342-00			1	.COVER,ACCESS:PROBE COMP	80009	200-3342-00
-3	-----			1	.TIP,PROBE:IC TEST (SEE OPTIONAL ACCESSORIES)		
-4	131-3723-00			1	.CONTACT,ELEC:SIGNAL,SST (SEE OPTIONAL ACCESSORIES)	80009	131-3723-00
-5	174-0392-00		8707	1	CABLE,ASSY,RF:50 OHM COAX,2.0 M,SMOKE TAN	80009	174-0392-00
	174-0715-00	8708		1	CABLE ASSY,RF:50 OHM COAX,2.0 M,BLACK	80009	174-0715-00
	174-0391-00		8707	1	CABLE ASSY,RF:83 OHM COAX,1.0 M,BLACK	80009	174-0391-00
	174-0714-00	8708		1	CABLE ASSY,RF:65 OHM COAX,1.5 M,SMOKE TAN (OPTION 01 ONLY)	80009	174-0714-00
	174-0393-00			1	CABLE ASSY,RF:39 OHM COAX,3.0 M,SLATE GRAY (OPTION 03 ONLY)	80009	174-0393-00
STANDARD ACCESSORIES							
-6	003-1364-01			1	SCREWDRIVER:PLASTIC	80009	003-1364-01
-7	196-3120-00			1	LEAD ELECTRICAL:23 AWG,5.0 L,GROUND	80009	196-3120-00
-8	-----			2	BAND,MARKER:0.371 DIA,WHITE,PLASTIC		
	-----			2	BAND,MARKER:0.371 DIA,YELLOW,PLASTIC		
	-----			2	BAND,MARKER:0.371 DIA,RED,PLASTIC		
	-----			2	BAND,MARKER:0.371 DIA,GREEN,PLASTIC (REPLACEABLE AS A KIT OF 9 COLORS) (SEE OPTIONAL ACCESSORIES)		
-9	013-0107-05			1	TIP,PROBE:RETRACTABLE HOOK ASSY	80009	013-0107-05
	070-6157-00			1	SHEET,TECHNICAL:INSTR,P6109	80009	070-6157-00
	131-3723-00			1	CONTACT,ELEC:SIGNAL,SST (SEE OPTIONAL ACCESSORIES)	80009	131-3723-00
OPTIONAL ACCESSORIES							
-10	015-0325-00			1	ADAPTER,PROBE:PROBE TO CONNECTOR PINS	80009	015-0325-00
-11	013-0084-01			1	ADAPTER,CONN:BNC TO PROBE	24931	28P156-1
-12	017-0088-00			1	CONN,PLUG,ELEC:50 OHM,GR	80009	017-0088-00
-13	013-0085-00			1	TIP,PROBE:GROUNDING	80009	013-0085-00
-14	196-3121-00			1	LEAD,ELECTRICAL:23 AWG,12.0 L	80009	196-3121-00
	015-0201-07			1	TIP,PROBE:IC TEST,PKG OF 10	80009	015-0201-07
	015-0201-08			1	TIP,PROBE:IC TEST,PKG OF 100	80009	015-0201-08
	016-0633-00			1	MARKER SET,CA:2 EA,9 COLORS	80009	016-0633-00
	131-3723-01			1	CONTACT,ELEC:SIGNAL,SST,PKG OF 5	80009	131-3723-01

Replaceable Parts - P6109

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

<u>Mfr. Code</u>	<u>Manufacturer</u>	<u>Address</u>	<u>City, State, Zip Code</u>
24931	SPECIALTY CONNECTOR CO INC	2620 ENDRESS PLACE P O BOX 0	GREENWOOD IN 46142
80009	TEKTRONIX INC	4900 S W GRIFFITH DR P O BOX 500	BEAVERTON OR 97077