

Instructions

Tektronix

P6138A
10X 400 MHz Passive Probe
070-9695-01

CE

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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 purchase from an authorized Tektronix distributor. If any such 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. Batteries are excluded from this warranty.

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, shipping charges prepaid, and with a copy of customer proof of purchase. 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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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

Only qualified personnel should perform service procedures.

Injury Precautions

Avoid Overvoltage. To avoid electric shock or fire hazard, do not apply potential to any terminal, including the common terminal, that varies from ground by more than the maximum rating for that terminal.

Avoid Electric Shock. To avoid injury or loss of life, do not connect or disconnect probes or test leads while they are connected to a voltage source.

Do Not Operate Without Covers. To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.

Do Not Operate in Wet/Damp Conditions. To avoid electric shock, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere. To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Keep Probe Surface Clean and Dry. To avoid electric shock and erroneous readings, keep probe surface clean and dry.

Product Damage Precautions

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Immerse in Liquids. Clean the probe using a soft cloth dampened with a mild detergent and water solution. Do not use any other chemicals or abrasives.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:



WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*



CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:



DANGER
High Voltage



Protective Ground
(Earth) Terminal



ATTENTION
Refer to Manual



Double
Insulated

**Certifications and
Compliances**

Refer to the specifications section for a listing of certifications and compliances that apply to this product.

Features and Accessories

The P6138A probe is a compact, high-impedance, 10X passive probe designed for use with Tektronix TDS 400 series digitizing oscilloscopes. The P6138A probe meets the requirements of UL3111-1 for ground-referenced applications and is fully compatible with the Tektronix family of 3.5 mm probe accessories.

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

Table 1 illustrates the features and accessories of the P6138A probe.

Table 1: Features and Accessories

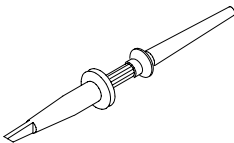
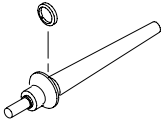
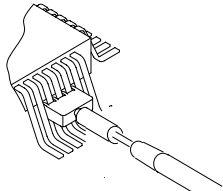
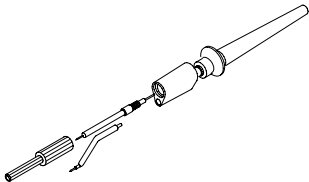
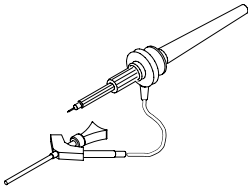
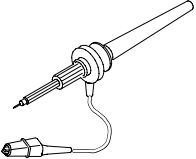
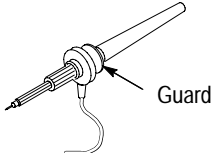
Feature/Accessory	Description	Applications/Notes
	Retractable hook tip	Connects the probe tip to wires and component leads for hands-free measurement. NOTE. For a solid connection, firmly push and twist the hook tip onto the probe tip before using.
	Marker bands	Color codes the probe to the oscilloscope input when more than one probe is in use. Clip one band around the strain relief of the probe head and the matching band on the strain relief of probe output.
	SureFoot™ probe tips	Provides fault-free probing of SMD packages that have lead spacings of 25 mil JEDEC or 0.65 mm EIAJ. To connect, simply push the SureFoot™ onto the probe tip and then probe the SMD package. The tines of the adapter prevent the probe tip from slipping or shorting to adjacent leads. The list of optional accessories on page 8 includes SureFoot™ tips for probing SMD packages with lead spacings of 50 mil JEDEC or .5 mm EIAJ.
	Low-inductance ground	Connects the probe ground to a ground reference close to the signal source. The short lead minimizes aberrations on high-frequency signals caused by the inductance of the ground lead.
	SMT KlipChip™ and ground lead	Connects the probe ground to small or hard to reach ground reference points.

Table 1: Features and Accessories (Cont.)

Feature/Accessory	Description	Applications/Notes
	Ground lead with insulated alligator clip	Connects the probe ground to ground reference.
	Guard	Keeps fingers away from the probe tip for protection against electric shock.



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

Probe Compensation

Because of variations in oscilloscope input characteristics, check and adjust the low-frequency (LF) compensation when you connect the probe to a different oscilloscope input.

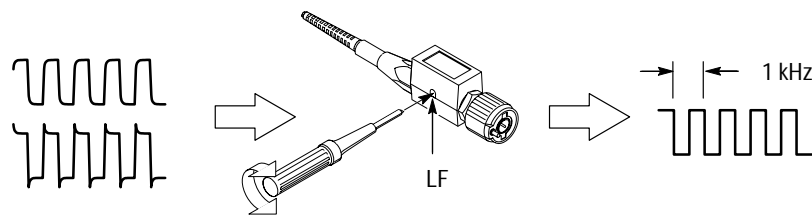


Figure 1: Low-frequency compensation

Use the following procedure to compensate the probe.

1. Connect the probe to the probe adjustment signal on the oscilloscope.
2. Press **AUTOSET** or otherwise adjust the oscilloscope so that it displays a meaningful waveform.
3. Turn on the 20 MHz bandwidth limit of the oscilloscope.
4. Turn on the high-resolution acquisition mode of the oscilloscope.
5. Adjust the trimmer in the probe as shown in Figure 1.

Specifications

The characteristics listed in Table 2 apply to a P6138A probe installed on a Tektronix TDS 460A oscilloscope unless otherwise noted.

These specifications apply when the instrument has had a warm-up period of at least 10 minutes and is in an environment that does not exceed the limits described in Table 3.

Table 2: Electrical characteristics

Characteristic	Description
System attenuation	10X \pm 1.0% at DC
System input resistance (typical)	10 M Ω \pm 1.0%
System input capacitance (typical)	10.0 pF \pm 0.8 pF at 1 kHz
Compensation range (typical)	12 pF to 18 pF at 1 kHz
System bandwidth (-3 dB)	400 MHz (TDS 460A and TDS 430A) 200 MHz (TDS 420A)
Maximum rated input voltage	300 V _{RMS} CAT II (See Figure 2)

Table 3: Environmental characteristics

Characteristic	Description
Net weight	110 g (0.24 lbs)
Temperature range ¹	
Operating	-15° C to +55° C (+5° F to +131° F)
Nonoperating	-62° C to +85° C (-80° F to +185° F)
Humidity ¹	Tested at 95% to 97% relative humidity

¹ Tek Standard 062-2847-00, class 3.

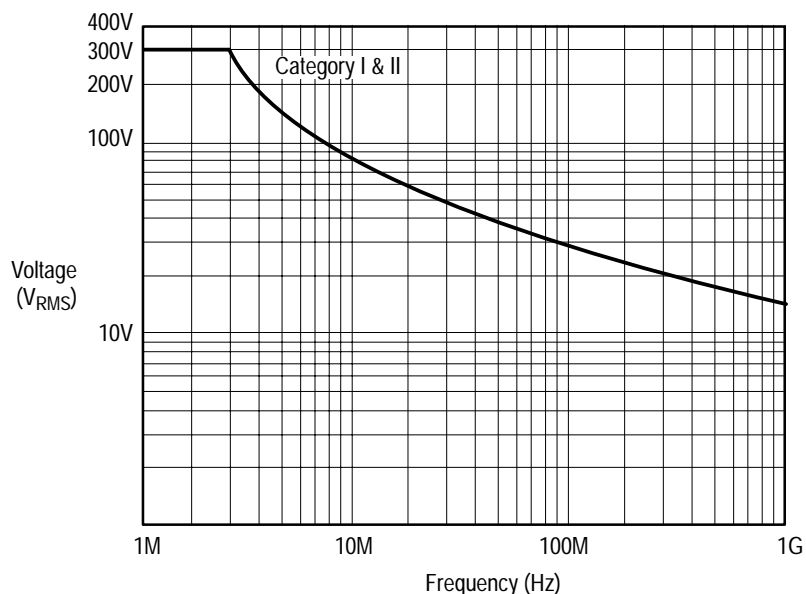


Figure 2: Voltage derating

Table 4: Certifications and compliances

<p>EC Declaration of Conformity</p>	<p>Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities:</p> <p>Low Voltage Directive 73/23/EEC as amended by 93/68/EEC:</p> <p>EN 61010-1/A2 Safety requirements for electrical equipment for measurement, control, and laboratory use</p> <p>EN 61010-2-031:1994 Particular requirements for hand-held probe assemblies for electrical measurement and test</p>
<p>Overvoltage Category</p>	<p>Category: Examples of Products in this Category:</p> <p>CAT III Distribution-level mains, fixed installation</p> <p>CAT II Local-level mains, appliances, portable equipment</p> <p>CAT I Signal levels in special equipment or parts of equipment, telecommunications, electronics</p>
<p>Pollution Degree 2</p>	<p>Do not operate in environments where conductive pollutants may be present.</p>
<p>Safety</p>	<p>UL3111-1, First Edition & IEC1010-2-031, First Edition</p> <p>CSA C22.2 No. 1010.1-92 & CAN/CSA C22.2 No. 1010.2.031-94</p> <p>EN61010-1/A2</p> <p>EN61010-2-031</p> <p>Overvoltage Category II, Pollution Degree 2</p>

Replaceable Parts

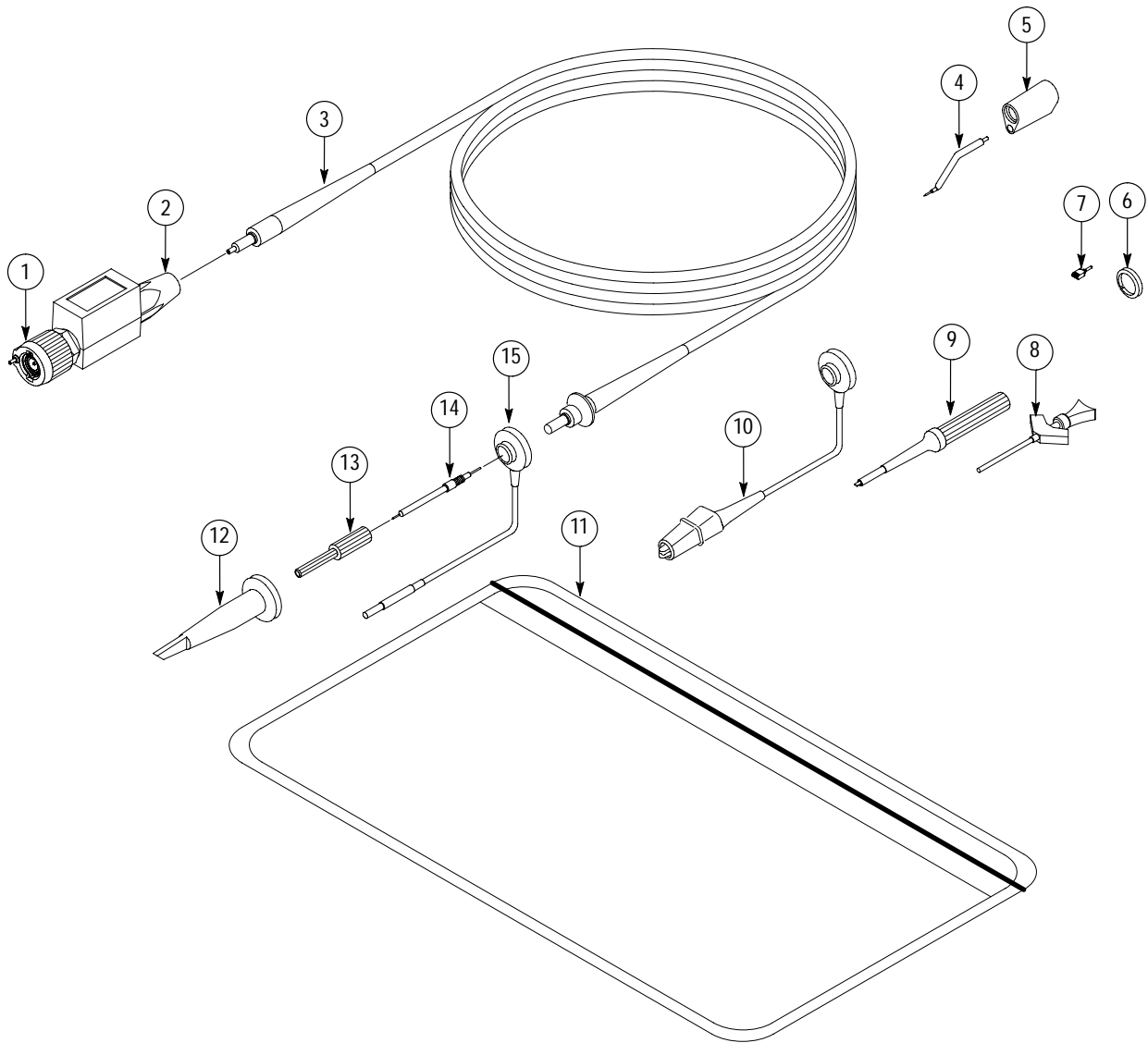


Figure 3: P6138A exploded view and standard accessories

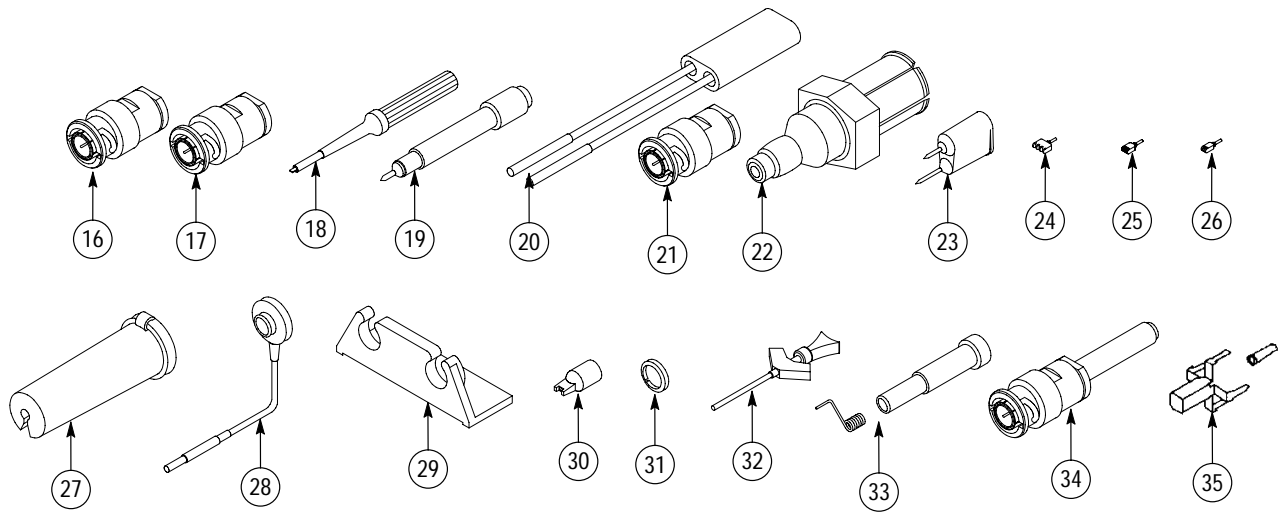


Figure 4: Optional accessories

Replaceable Parts

Replaceable Parts List

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
Replaceable Parts and Standard Accessories							
3-1	131-3219-00			1	CONN,RF PLUG:BNC,MALE,STR,THD,10X READOUT,DOVE GRAY,W/11K OHM RES,W/CODE PIN,0.813 L,0.5 HEX	24931	28P266-3
-2	200-3018-00			1	COVER,CABLE NIP:COMP BOX	0J260	ORDER BY DESCRIPTION
-3	174-3649-00			1	CA ASSY,RF:65 OHM COAX,1.3METER	80009	174-3649-00
-4	195-4240-00			1	LEAD,ELECTRICAL:0.025 DIA,COPPER,2.3 L	80009	195-4240-00
-5	343-1003-01			1	COLLAR,GND:P6130	TK2565	343-1003-01
-6	See Opt Acc.			2	MARKER BANDS 2 EACH VARIOUS COLORS		
-7	See Opt Acc.			2	SureFoot Adapters for 25 mil JEDEC and 0.65 mm EIAJ		
-8	206-0364-00			1	TIP,PROBE:MICROCKT TEST,0.05 CTR	80009	206-0364-00
-9	003-1433-00			1	SCREWDRIVER:ADJUSTMENT TOOL,METAL TIP PLASTIC,BLACK	TK2565	003-1433-00
-10	196-3305-00			1	LEAD,ELECTRICAL:22 AWG,6.0 L,W/CLIP	TK2469	196-3305-00
-11	-----			1	Pouch		
-12	013-0107-07			1	TIP,PROBE:MINIATURE/COMPACT SIZE	TK2565	013-0107-07
-13	204-1049-00			1	BODY SHELL:TIP COVER	TK2565	204-1049-00
-14	206-0392-00			1	PROBE TIP ASSY:10X,10.3PF,GRAY/BLUE	80009	206-0392-00
-15	196-3113-02			1	LEAD,ELECTRICAL:STRD,22 AWG,6.0 L,8-N	TK2469	196-3113-02
	070-9695-00			1	MANUAL, TECH: P6138A	80009	070-9695-00
Optional Accessories							
4-16	013-0226-00			1	CONNECTOR,BNC:BNC TO PROBE TIP ADAPTER STRAIGHT THRU	24931	28P264-2
-17	013-0227-00			1	CONNECTOR,BNC:50 OHM,BNC TO P TIP ADAPTER	24931	28P312-1
-18	003-1433-01			1	SCREWDRIVER:ADJUSTMENT TOOL,PKG OF 5 METAL TIP	80009	003-1433-01
-19	013-0202-02			1	ADAPTER,PROBE:SUBMINIATURE/COMPACT TO MINIATURE	TK2565	013-0202-02
-20	015-0325-00			1	ADAPTER,PROBE:PROBE TO CONNECTOR PINS (Requires 013-0202-02 adapter, Fig 4-20)	TK2565	015-0325-00
-21	013-0084-01			1	ADAPTER,CONN:BNC TO PROBE (Requires 013-0202-02 adapter, Fig 4-20)	24931	28P156-1
-22	017-0088-00			1	CONN,PLUG,ELEC:50 OHM,GR (Requires 013-0202-02 adapter, Fig 4-20)	80009	017-0088-00
-23	013-0085-00			1	TIP,PROBE:GROUNDING (Requires 013-0202-02 adapter, Fig 4-20)	80009	013-0085-00
-24	SF201			1	Pkg of 12 yellow SureFoot Adapters for 50 mil JEDEC	80009	SF201
-25	SF202			1	Pkg of 12 blue SureFoot Adapters for 25 mil JEDEC and 0.65 mm EIAJ	80009	SF202

Replaceable Parts List (Cont.)

Fig. & Index Number	Tektronix Part Number	Serial No. Effective	Serial No. Discont'd	Qty	Name & Description	Mfr. Code	Mfr. Part Number
4-26	SF203			1	Pkg of 12 red SureFoot Adapters for 0.5 mm EIAJ	80009	SF203
-27	352-0670-00			1	HOLDER,PROBE:ATTENUATOR TIPS (3)	TK2565	352-0670-00
-28	196-3113-03			1	LEAD,ELECTRICAL:STRD,22 AWG,3.0 L,8-N	TK2469	196-3113-03
-29	352-0351-00			1	HOLDER,PROBE:BLACK ABS P6000 SERIES	80009	352-0351-00
-30	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
-31	016-0633-00			1	MARKER SET,CA:2 EA VARIOUS COLORS	80009	016-0633-00
-32	SMG50			1	SMT KLIPCHIP:20 ADAPTERS	80009	SMG50
-33	016-1077-00			1	ACCESSORY KIT:GND TIP CONTACT,PKG OF 2 EAOF 5 LENGHTS W/COVER SHELL	80009	016-1077-00
-34	013-0254-00			1	ADAPTER,CONN:BNC TO PROBE TIP,MALE,STR,PROBE,2.14 L,INT 4.5 X 0.077 MM THD,COMPACT	24931	28P-302-2
-35	131-5031-00			1	CONNECTOR,PROBE:PKG OF 25, COMPACT	8009	131-5031-00

Manufacturers Cross Index

Mfr. Code	Manufacturer	Address	City, State, Zip Code
0J260	COMTEK MANUFACTURING OF OREGON	P O BOX 4200 M/S 16-207	BEAVERTON, OR 970764200
24931	BERG ELECTRONICS INC	BERG ELECTRONICS RF/COAXIAL DIV 2100 EARLYWOOD DR PO BOX 547	FRANKLIN, IN 46131
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON, OR 97077-0001
TK2469	UNITREK CORPORATION	3000 LEWIS & CLARK HWY SUITE 2	VANCOUVER, WA 98661
TK2565	VISION PLASTICS INC	26000 SW PARKWAY CENTER DRIVE	WILSONVILLE, OR 97070

