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Instruction Manual

Tektronix

P6015A
1000X High Voltage Probe
070-8223-04

Warning

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

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Specifications

Warranted Characteristics

This section lists the various warranted characteristics that describe the P6015A High Voltage Probe. Included are warranted electrical and environmental characteristics.

Warranted characteristics are described in terms of quantifiable performance limits which are warranted.

The electrical characteristics listed in Table 1–3 apply under the following conditions:

- The probe and instrument with which it is used must have been calibrated at an ambient temperature of between +20 °C and +30 °C.
- The probe and instrument must be in an environment whose limits are described in Table 1-3.
- The probe and instrument must have had a warm-up period of at least 20 minutes before applying elevated voltages.

Table 1-3: Warranted Electrical Characteristics

Characteristic	Information	
Maximum input voltage DC + peak AC ¹	1.5 kV to 20 kV. See frequency derating curve in Figure 1-4. (DC plus peak AC rating is limited to temperatures below 35° C.)	
Peak pulse	40 kV ^a (Never exceed 20 kV rms) Duty cycle derating – 100 ms maximum duration at 10% maximum duty cycle. See duration and duty cycle derating curve in Figure 1-5. Altitude derating – Peak pulse derated linearly from 40 kV at 8000 feet (2440 m) to 30 kV at 15,000 feet (4570 m) altitude. Relative Humidity (RH) derating – Voltage derated with increasing temperature and relative humidity (see Figure 1-7).	
Bandwidth (-3 dB)	Test conditions: Test oscilloscope bandwidth must be ≥ 100 MHz, $Z_{source} = 25 \Omega$	
10-ft cable	75 MHz	
25-ft cable	25 MHz	
Rise Time ²		
10-ft cable	≤ 4.67 ns (calculated from bandwidth)	
25-ft cable	≤ 14 ns (calculated from bandwidth)	
DC attenuation	1000:1 $\pm 3\%$ (Excluding oscilloscope error)	Test conditions: Oscilloscope input resistance must be $1 M\Omega \pm 2\%$

¹ Characteristic not checked in manual

² T_r (ns) = .35/BW (MHz)

Table 1-4: Warranted Environmental Characteristics

Characteristic	Information
Temperature	
Nonoperating	-55°C to +75°C (-67°F to +167°F)
Operating	
DC + peak AC	0°C to +35°C (+32°F to +95°F)
Peak Pulse	0°C to +50°C (+32°F to +122°F)
	(See Table 1-1 on page 1-10 and <i>Time Limitations</i> Specification below)
Humidity	
Nonoperating / Operating	95% relative humidity at +50 °C (+122 °F). See Figure 1-7 for derating characteristics.
Maximum altitude	
Nonoperating	15,000 m (50,000 ft)
Operating	4,600 m (15,000 ft)
	Peak pulse voltage derated from 40 kV at 8000 feet (2440 m) to 30 kV at 15,000 feet (4570 m).
Vibration (random)	
Nonoperating	3.48 g rms from 5 to 500 Hz. Ten minutes on each axis.
Operating	2.66 g rms from 5 to 500 Hz. Ten minutes on each axis.
Shock (nonoperating)	500 g, half sine, 0.5 ms duration, 18 shocks total in three axis.
Time Limitations	
Less than 70% of Rated Input Voltage at 0-35°C	No time limit
Greater than 70% of Rated Input Voltage at 0-35°C	30 minutes maximum in any 2.5 hour period
35-50°C	15 minutes maximum in any 2.5 hour period

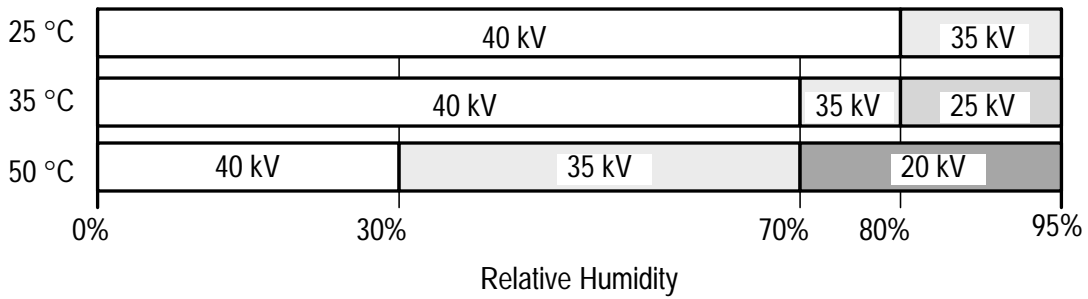


Figure 1-7: Humidity Derating Chart

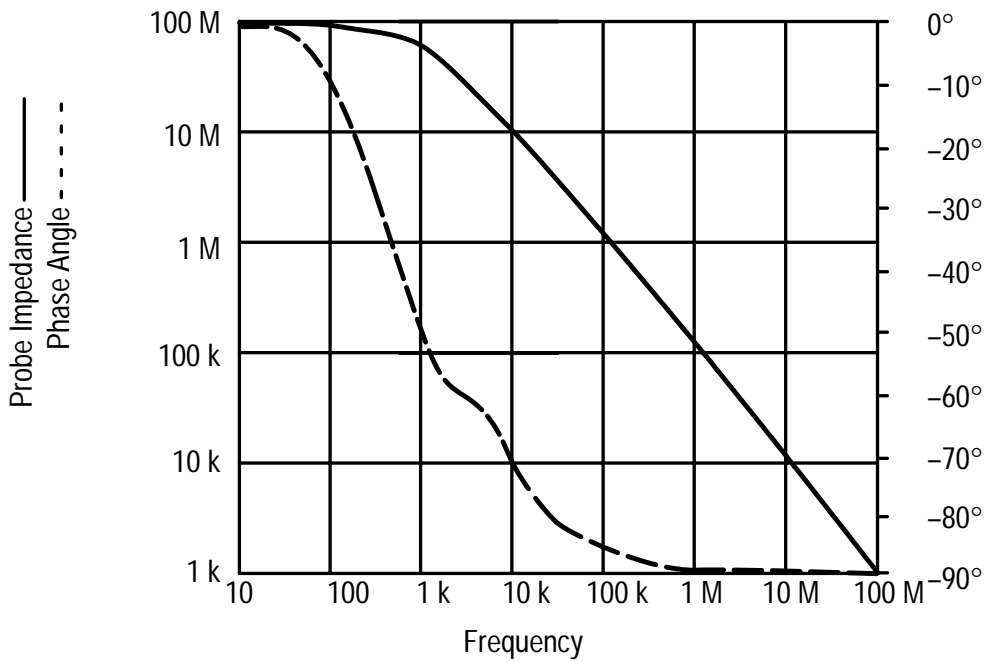


Figure 1-8: Typical Input Impedance and Phase

Typical and Nominal Characteristics

This section lists the various typical and nominal characteristics that describe the P6015A High Voltage Probe.

Nominal characteristics are determined by design and/or inspection. Nominal characteristics do not have tolerance limits.

Typical characteristics are described in terms of typical or average performance. Typical characteristics are not warranted.

Table 1–5: Typical Electrical Characteristics

Characteristic	Information
Input resistance	100 M Ω \pm 2%. See Figure 1–8 for typical input impedance curve.
Input capacitance	\leq 3 pF when probe is properly LF compensated. See Figure 1–8 for typical input impedance curve.
LF compensation range	7 pF to 49 pF
Aberrations	25% p-p for the first 200 ns on a 100 MHz oscilloscope when used with 10 in (25.4 cm) ground lead. <10% p-p typical after first 200 ns; \pm 5% after the first 400 ns.
Temperature coefficient of DC attenuation	0.006% per degree C ¹
Voltage coefficient of DC attenuation	0.018% per kV
Delay time	10 ft cable: 14.7 ns 25 ft cable: 33.3 ns

¹ Resistor temperature rose 60°C at 20 kV rms over a 30 minute period.

Table 1–6: Nominal Mechanical Characteristics

Characteristic	Information
Diameter (probe body)	8.9 cm (3.5 in) maximum
Length (probe body)	34.5 cm (13.6 in)
Length (cable)	
10-ft cable	3.05 m (10 ft)
25-ft cable	7.62 m (25 ft)
Compensation box	2.5 × 4.1 × 8.3 cm (1 × 1.6 × 3.25 in)
Net weight (probe assembly)	
10-ft cable	0.66 kg (1.47 lbs)
25-ft cable	0.75 kg (1.66 lbs)
Shipping weight (including accessories)	
10-ft cable	2.85 kg (6.27 lbs)
25-ft cable	2.93 kg (6.46 lbs)