

GENERAL INFORMATION

INTRODUCTION

The P6202A is a DC to 500 M Hz Field-Effect Transistor probe with 10X attenuation. It provides active probe measurement capabilities for oscilloscopes and other test instrumentation.

Use of standard miniature probe-tip accessories is facilitated by the miniature tip on the probe body. A coding pin on the BNC output connector actuates the 10X readout scale factor on oscilloscopes equipped with this feature. Switched offset capabilities are provided by the probe's COARSE and FINE controls. A load switch located in the output BNC connector allows the probe to be used with instruments having either high-impedance or 50-Q inputs.

Standard and optional accessories for the P6202A Probe are listed in the "Replaceable Mechanical Parts" section of the manual and are described in the "Operating Instructions" section.

SPECIFICATION

The electrical characteristics listed in Tables 1-1 through 1-3 are applicable to a calibrated P6202A Probe operating within the environmental conditions stated in Table 1-4 and being used with a calibrated oscilloscope system. Physical characteristics are listed in Table 1-5.

Items listed in the "Performance Requirements" column are qualitative or quantitative limits that may be checked by completing the procedures contained in the "Performance Check" part of this manual (see Section 4). Verification procedures for items listed in the "Supplemental Information" column are not provided in the "Performance Check" part; these items are either explanatory notes, performance characteristics for which no absolute limits are specified, or characteristics that are impractical to check.

Table 1-1
Electrical Characteristics (Probe Only)

Characteristics	Performance Requirements	Supplemental Information
Bandwidth	Dc to ≥ 500 MHz (-3 dB).	Calculated from rise time.
Transient Response	0.7 ns or less.	
Rise Time		
Aberrations		$\pm 5\%$, 6% p-p total within first 4 ns. $\pm 3\%$, 4% p-p total after 4 ns.
Attenuation	10X $\pm 4\%$.	With ± 1.0 V signal input and with load switch set to INT; or with external load of $50 \Omega \pm 1\%$, load switch set to EXT.
High Frequency Gain	$\pm 3\%$ (roll off or overshoot).	
Input Impedance	10 MO $\pm 2\%$.	
Resistance		
Capacitance	Approximately 2.0 pF, dc to 500 MHz.	
Input Dynamic Range	0 to ± 6.0 V.	Signal compression or expansion 3% or less of a ± 6.0 V input signal.

Table 1-1 (cont.)

Characteristics	Performance Requirements	Supplemental Information
Output Zero	±10 mV.	
Dc Offset Range	0 to ±55 V maximum.	0 to 50 V with COARSE offset control. 0 to 5 V with FINE offset control.
Tangential Noise	150 μV or less at the probe output (equivalent to 1.5 mV or less at probe tip).	Rms noise value is approximately 1/2 of tangentially measured value.
Dc Thermal Drift	150/μV/°C or less at the probe output (equivalent to 1.5 mV/°C at probe tip).	
Output Load Required		50 Ω ±1% with load switch at EXT. 500 kΩ or higher with load switch at INT.
Maximum Nondestructive Input Voltage	±200 V (dc + peak ac).	
Signal Delay (Probe Tip to Output Connector)	Approximately 12 ns.	
Power Requirements		+15V dc ±4% (60 mA maximum). -15V dc ±4% (60 mA maximum).

Table 1-2
Electrical Characteristics (Optional 10X Attenuation Head)

Characteristics	Performance Requirements	Supplemental Information
Attenuation	10X $\pm 2\%$.	Total attenuation with 10X Attenuator head attached to probe is 100X $\pm 6\%$.
Input Resistance	10 M Ω $\pm 2\%$.	With probe.
Input Capacitance	Approximately 2.0 pF, dc to 500 MHz.	
Input Dynamic Range	0 to ± 60 V.	With probe.
Dc Offset Range	0 to ± 200 V.	With probe.
Maximum Nondestructive Input Voltage	± 200 V (dc + peak ac).	
Bandwidth	Dc to 500 MHz.	With probe. Calculated from rise time.
Transient Response Rise Time	0.7 ns or less.	With probe.
Aberrations		$\pm 5\%$ in addition to probe aberrations.

Table 1-3
Electrical Characteristics (Optional AC
Coupler)

Characteristics	Performance Requirements	Supplemental Information
Bandwidth	<16 Hz (-3 dB) to \geq 500 MHz (-3 dB).	With probe. Calculated from rise time.
Transient Response	0.7 ns or less.	With probe.
Rise Time		
Aberrations		\pm 5% in addition to probe aberrations.
Input Capacitance	Approximately 4.0 pF.	
Maximum Nondestructive Input Voltage	\pm 200 V (dc + peak ac).	

Table 1-4 Environmental Characteristics

Characteristics	Description
Temperature Nonoperating	-40°C to +65°C (-40°F to +149°F).
Operating	0°C to +50°C (+32° F to +122° F).
Altitude Nonoperating	To 50,000 ft (15,000 m).
Operating	To 15,000 ft (5000 m).
Humidity Nonoperating and Operating	Five cycles (120 hours) to 95% relative humidity. Reference to MIL-E-16400F paragraph 4.5.9 through 4.5.9.5.1 Class 4.
Shock Nonoperating	To 400 g's, 1/2 sine, 1/2 ms, 1 ms, and 2 ms duration.
Transportation	Qualifies under National Safe Transit Association Preshipment Test Procedure 1 A.

**Table 1-5 Physical
Characteristics**

Characteristics	Description
Dimensions Cable Length Signal	2 m
Input Power Connector to Probe	1.3 m
Net Weight (includes Standard Accessories)	1.9 1b (0.9 kg)