

# Specifications

The characteristics listed in this section apply under the following conditions:

- The instrument operates in a 0° to 40° C ambient environment unless otherwise noted.
- The instrument warms up for at least 20 minutes.
- The instrument is adjusted at an ambient temperature between 20° and 30° C.

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**NOTE.** All specifications are warranted unless marked "typical." Typical characteristics are not guaranteed but are provided for the convenience of the user.

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**NOTE.** Input limits apply to signals with frequencies less than 1 kHz.

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**Table 1: Vertical Deflection Characteristics**

Characteristic	TAS 220 Description	TAS 250 Description
Frequency Bandwidth (–3 dB)	DC to 20 MHz (5 mV/div to 5 V/div at 5° to 35° C)	DC to 50 MHz (at 0° to 10° C and 35 to 40° C)
	DC to 15 MHz	DC to 40 MHz (at 0° to 5° C and 35° to 40° C)
	DC to 10 MHz (1mV/div to 2 mV/div)	DC to 15 MHz
Vertical Gain (15° to 35° C)	5 mV/div to 5 V/div:   ±3%	
	1 mV/div to 2 mV/div:   ±5%	
Variable Gain (Typical)	To 1/2.5 or less of the readout indicated value.	
Common Mode Rejection Ratio (Typical)	50 kHz:   >50:1	
	10 MHz:   >10:1	
Input Impedance (Typical)	1 MΩ, 30 pF	
Vertical Linearity (Typical)	±0.1 division or less of amplitude change when a waveform of two divisions at graticule center is moved vertically.	
DC Balance Shift (Typical)	5 mV/div to 5 V/div:   ±0.5 divisions	
	1 mV/div to 2 mV/div:   ±2.0 divisions	

**Table 1: Vertical Deflection Characteristics (Cont.)**

Characteristic	TAS 220 Description	TAS 250 Description
Chopping Repetition Frequency (Typical)	250 kHz	
Maximum Input Voltage	400 V (DC + peak AC)	
Channel Isolation (Typical)	50 kHz: 1000:1	
	10 MHz: 100:1	
	20 MHz: 30:1	50 MHz: 30:1
CH 1 Signal Output (Typical)	100 mV/div open circuit	
	50 mV/div into 50 $\Omega$	
CH 2 INV Balance (Typical)	$\leq 1$ division balanced point variation	

**Table 2: Horizontal Characteristics TAS 200 Series**

Characteristic	Description
Standard Sweep Time Accuracy	15° to 35° C: $\pm 3\%$
	0° to 15° C and 35° to 40° C: $\pm 4\%$
Magnified Sweep Time Accuracy	1 $\mu\text{s}/\text{div}$ to 0.5 sec/div: $\pm 5\%$
	0.1 to 0.5 $\mu\text{s}/\text{div}$ : $\pm 8\%$
Sweep Linearity	
Standard	$\pm 3\%$
X10 MAG	$\pm 5\%$
X10 MAG	0.1 to 0.5 $\mu\text{s}/\text{div}$ : $\pm 8\%$

**Table 3: Readout Characteristics TAS 200 Series**

Characteristic	Description
Readout Resolution	1/25 div
Readout Accuracy	$\pm 3\% + 1/25$ div
Readout Modes	$\Delta V$ , $\Delta T$ , $1/\Delta T$

**Table 4: Trigger Characteristics**

Characteristic	TAS 220 Description	TAS 250 Performance Description
Sensitivity		
0.5 divisions (internal), 0.1 V (external)	DC to 5 MHz	DC to 10 MHz
1.5 divisions (internal), 0.2 V (external)	5 to 20 MHz	10 to 50 MHz
2.0 divisions (internal), 0.2 V (external)	Video	Video
Input Impedance (Typical)	1 M $\Omega$ , 30 pF	
Maximum Input Signal	100 V (DC + peak AC)	

**Table 5: Typical Z-Axis Characteristics TAS 200 Series**

Characteristic	Description
Maximum Input Voltage	50 V (DC + peak AC)
Sensitivity	3 V <sub>p-p</sub> (Trace becomes brighter with negative input.)
Frequency Bandwidth	DC to 5 MHz
Input Resistance	5 k $\Omega$

**Table 6: Typical X-Y Mode Operation**

Characteristic	TAS 220 Description	TAS 250 Description
Sensitivity	Same as CH 1 vertical axis	
Sensitivity Accuracy	5 mV to 5 V/div: $\pm 4\%$ 1 to 2 mV/div: $\pm 6\%$	
Frequency Bandwidth	DC to 1 MHz	DC to 2 MHz
X-Y Phase Difference	$\leq 3^\circ$ from DC to 50 kHz	$\leq 3^\circ$ from DC to 100 kHz
EXT HOR Sensitivity	0.1 V/div	

**Table 7: Typical Probe Compensation Signal Characteristics TAS 200 Series**

Characteristic	Description
Waveform	Positive going square wave
Frequency	1 kHz
Duty Ratio	50:50
Output Level	2 V <sub>p-p</sub>
Output Resistance	2 k $\Omega$

**Table 8: Environmental Characteristics**

Characteristic	Description
Temperature	
Operating	0° to 40° C
Nonoperating	-40° to +70° C  Tested to MIL-T-28800D, paragraphs 4.5.5.1.3 and 4.5.5.1.4, except in 4.5.5.1.3 steps 4 and 5 (0° C operating test) are performed ahead of step 2 (-40° C nonoperating test). Equipment shall remain off upon return to room ambient during step 6. Excessive condensation shall be removed before operating during step 7.
Altitude	
Operating	≤4,570 meters (15,000 feet). Maximum operating temperature decreases 1° C per 300 m (1,000 feet) above 1,500 m (5,000 feet).
Nonoperating	≤15,250 meters (50,000 feet)
Relative Humidity	
Operating	30° to 40° C, 90% relative humidity +0%, -5%
Nonoperating	30° to 60° C, 90% relative humidity +0%, -5%  Five cycles (120 hours) referenced to MIL-T-28800D paragraph 4.5.1.2.2 for type III, class 5 instruments. Operating and nonoperating at 90%, +0%, -5% relative humidity.
Vibration (Operating)	15 minutes along each of three major axes at a total displacement of 0.015 inch peak-to-peak (2.4 g at 55 Hz) with frequency varied from 10 Hz to 55 Hz to 10 Hz in one minute sweeps. Hold for 10 minutes at 55 Hz in each of three major axes. All major resonances must be above 55 Hz.
Shock (Operating and Nonoperating)	30 g, half-sine, 11 ms duration, three shocks per axis each direction, for a total of 18 shocks.
Radiated and Conducted Emissions	Meets EN55011, class A.
Safety	Listed CSA C22.2 No. 231 and UL1244

**Table 9: Typical Mechanical Characteristics TAS 200 Series**

Characteristic	Description
Dimensions	32.7 cm × 16.2 cm × 46.3 cm (12.9 inch × 6.38 inch × 18.2 inch)
Weight	7.0 kg (15.4 lbs)
Operating Voltages	100 V, 120 V, 220 V, 240 V, 10% variation from selector range permitted.
Line Frequency	50 or 60 Hz
Power Consumption	70 VA