Specifications 2

Maximum Ratings

Characteristic	Performance Requirement	Supplemental Information
Maximum Input Voltage		The maximum allowable voltage between any input terminal and chassis ground.
0.35 V/Hz Range	0.35 VRMS/Hz, 350 VRMS maximum	
2.5 V/Hz Range	2.5 VRMS/Hz, 350 VRMS maximum	
Maximum DC Input Current		For best performance no DC current should be permitted. DC input of 20 µA will decrease AC input voltage rating about 10% and increase distortion slightly
0.35 V/Hz Range	200 µA	
2.5 V/Hz Range	200 µA	
Maximum Ouput Current		
0.35 V/Hz Range	100 mA	
2.5 V/Hz Range	100 mA	

Technical Specifications

The following specifications apply for operation over a temperature of 15°C (59+.86°F) with 20% to 50% relative humidity, and DC input current < 1µA.

Characteristic	Performance Requirement	Supplemental Information
Linearity Error (3-Terminal)		Linearity errors are given in parts per million (ppm) of input.
0.35 V/Hz Range		
50 Hz to 1.0 kHz	± 0.9 ppm for settings 0.1 to 1.0000999	
	$(0.9\sqrt{10 \times Setting} + 0.01ppm)$ for settings 0.01 to 0.1	
200 Hz to 1 kHz	$(0.9\sqrt{10 \times Setting} + 0.01ppm)$ for settings -0.001 to 0.01	Verification of linearity errors is traceable to N.I.S.T. uncertainty of 0.5 ppm of input.
50 Hz to 200 Hz	$(0.9\sqrt{100 \times Setting} + 0.01ppm)$ for settings -0.001 to 0.01	

Technical Specifications (continued)

Characteristic	Performance Requirement	Supplemental Information
Linearity Error (3-Terminal)		Linearity errors are given in parts per million (ppm) of input.
0.35 V/Hz Range		
1.0 kHz to 20 kHz	Multiply the 50 Hz to 1.0 kHz values by a factor of f^2, where f = frequency in KHz	Verification of linearity errors is traceable to N.I.S.T. uncertainty of 0.5ppm of input.
10 Hz to 50 Hz	Multiply the 50 Hz to 1.0 kHz values by a factor of $50/f$, where f = frequency in kHz	
Linearity Error (3-Terminal)		Linearity errors are given in parts per million (ppm) of input.
2.5 V/Hz Range		
50 Hz to 400 Hz	± (1 ppm + 0.9 ppm x Ratio)	Verification of linearity errors is traceable to N.I.S.T. uncertainty of 0.5ppm of input.
400 Hz to 1 kHz	Multiply the 50 Hz to 400 Hz values by a factor of $\left(\frac{f}{400}\right)^2$ where f = frequency in Hz	
10 Hz to 50 Hz	Multiply the 50 Hz to 400 Hz values by a factor of $50/f$, where f = frequency in Hz	
Incremental Linearity		Cardinal points are all settings in multiples of 0.01 from 0.00 to 1.00 (i.e. 0.00, 0.01, 0.02... , 0.99, 1.00
0.35 V/Hz Range	±0.1 ppm of input for operation ±100 ppm of all cardinal points, at a frequency of 1 kHz and at ratio settings ≥ 0.1	
2.5 V/Hz Range	±0.1 ppm of input for operation ±100 ppm of all cardinal points, at a frequency of 100 Hz and at ratio settings ≥ 0.1	
Maximum Phase Shift		Applies for settings above 0.1
0.35 V/Hz Range		1 mrad = 1 ppm of input
10 Hz to 100 Hz	5μrad at 100 Hz, increasing to 50μrad at 10 Hz	Verification with NIST traceability limited to 5.0 ppm of input.
100 Hz to 20 kHz	50μrad at 1 kHz, increasing to 1 mrad at 20 kHz	
2.5 V/Hz Range		Applies for settings above 0.1
10 Hz to 100 Hz	20μrad at 100 Hz, increasing to 200μrad at 10 Hz	1 mrad = 1 ppm of input
100 Hz to 1 kHz	20μrad at 100 Hz, increasing to 200 μrad at 1 kHz	Verification with NIST traceability limited to 5.0 ppm of input.

Technical Specifications (continued)

Characteristic	Performance Requirement	Supplemental Information
Output Noise		
0.35 and 2.5 V/Hz Range		
10 Hz to 10 kHz	Less than 5 μ VRMS	Output noise not harmonically related to the input signal.
10 kHz to 1 MHz	Less than 100 μ VRMS	
Common Mode Isolation Output Low to Chassis		
0.35 and 2.5 V/Hz Range	> 100 MΩ in parallel with < 1000 pF	
Input Impedance		
0.35 V/Hz Range		
50 Hz to 1 kHz	> 40 kΩ	
2.5 V/Hz Range		Applies for inputs > 10 VRMS
10 Hz to 100 Hz	> 100 kΩ	
Above 100 Hz	100 kΩ decreasing with frequency	
Number of Decades		
0.35 V/Hz Range	Seven	
2.5 V/Hz Range	Eight	
Resolution		
0.35 V/Hz Range	0.1 ppm of input	
2.5 V/Hz Range	0.01 ppm of input	
Range		
0.35 V/Hz Range	-0.0010000 to +1.0009999	
2.5 V/Hz Range	-0.00010000 to +1.00009999	
Input Inductance		
0.35 V/Hz Range	100 H to 400 H	
2.5 V/Hz Range	700 H to 2.1 kH	

Technical Specifications (continued)

Characteristic	Performance Requirement	Supplemental Information
Input Capacitance		
0.35 V/Hz Range	2 nF typical	
2.5 V/Hz Range	12 nF typical	
Output Series Inductance		Measurements valid with input shorted.
0.35 V/Hz Range	2 μH to 30 μH	The series inductance will vary with ratio setting.
2.5 V/Hz Range	2 μH to 70 μH	
Output Series Resistance		Measurements valid with input shorted.
0.35 V/Hz Range	400 mΩ to 7 Ω	The series inductance will vary with ratio setting.
2.5 V/Hz Range	500 mΩ to 12 Ω	