



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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CALIBRATION

Valid To: October 31, 2020

Certificate Number: 2357.29

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1, 5}:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2, 4} (±)	Comments
DC Voltage – Generate (Fixed Points)	1 V 1.018 V 10 V	0.4 µV/V 0.4 µV/V 0.2 µV/V	Direct transfer techniques performed utilizing Fluke 732A/732B
DC Voltage – Measure and Generate	10 µV to 10 V (>10 to 100) V (>100 to 1000) V	0.2 µV/V x [0.7 + (1.1 V/U) ²] ^{1/2} 0.3 µV/V 0.6 µV/V	Characterization of MFC's with 732, 752 (720), and a null detector, or by using a characterized DMM or MFC Utilized in MFC and long scale DMM calibrations (i.e. Fluke 57x0A and 85x8A)
DC Voltage – Generate ³	(0.01 to 0.22) V (> 0.22 to 2.2) V (> 2.2 to 22) V (> 22 to 220) V (> 220 to 1100) V	4 µV/V + 2 µV 5 µV/V + 3 µV 4 µV/V + 10 µV 5 µV/V + 0.15 mV 6 µV/V + 1 mV	Fluke 57x0A
DC Voltage – Measure ³	(0.01 to 0.1) V (> 0.1 to 1) V (> 1 to 10) V (> 10 to 100) V (> 100 to 1100) V	5 µV/V + 3 µV 4 µV/V + 9 µV 5 µV/V + 15 µV 5 µV/V + 0.15 mV 7 µV/V + 1.5 mV	HP 3458A or Fluke 85x8A

Parameter/Equipment	Range	CMC ^{2,4} ($\pm$)	Comments
DC Current – Generate	0.1 μ A (> 0.1 to < 1) μ A (> 1 to < 10) μ A 10 μ A to 2 A (> 2 to 10) A (> 10 to 20) A (> 20 to 100) A	35 μ A/A 8 μ A/A 8 μ A/A 6 μ A/A 12 μ A/A 14 μ A/A 20 μ A/A	Characterized MFC and transconductance amplifier i.e. Fluke 85x8A, 884xA, HP 3458A, calibrations
DC Current³ – Generate and Measure	10 μ A to 220 μ A > 220 μ A to < 2.2 mA (> 2.2 to 22) mA (> 22 to 220) mA > 0.22 to 2.2 A (> 2.2 to 10) A	80 μ A/A 50 μ A/A 50 μ A/A 60 μ A/A + 1 μ A 80 μ A/A + 25 μ A 400 μ A/A + 0.48 mA	Fluke 57xA, Fluke 85x8A
DC Current – Measure	0.1 μ A (> 0.1 to < 1) μ A (> 1 to < 10) μ A 10 μ A to 2 A (> 2 to 10) A (> 10 to 20) A (> 20 to 100) A	35 μ A/A 6 μ A/A 6 μ A/A 4 μ A/A 15 μ A/A 20 μ A/A 30 μ A/A	Standard reference resistors, shunts and an 8.5-digit DMM i.e. 52120A, 55xx and 57xx calibrations
DC Current³ – Measuring Devices (current clamps only)	(0 to 1000) A	5 mA/A	Fluke 552xA, Fluke 5500A/COIL, and a DMM
DC Current – Measuring Devices (current clamps only)	5 mA to 30 A > 50 mA to 50 A > 50 mA to 250 A (> 5 to 500) A	0.22 mA/A + 0.35 μ A 0.5 mA/A + 4 μ A 0.22 mA/A + 0.35 μ A 13 mA/A + 0.1 mA	Coil with N=5 Coil with N=10 Coil with N=50 Coil with N=250
DC Resistance – Measure and Generate	(10 to < 100) $\mu\Omega$ 100 $\mu\Omega$ to < 1 m Ω (1 to < 10) m Ω 10 m Ω to < 1 Ω 1 Ω to < 10 k Ω 10 k Ω to 1 M Ω (> 1 to 100) M Ω (> 100 to 1000) M Ω (> 1 to 10) G Ω	22 $\mu\Omega/\Omega$ 4.6 $\mu\Omega/\Omega$ 2.3 $\mu\Omega/\Omega$ 1.2 $\mu\Omega/\Omega$ 0.3 $\mu\Omega/\Omega$ 0.5 $\mu\Omega/\Omega$ 2 $\mu\Omega/\Omega$ 8 $\mu\Omega/\Omega$ 400 $\mu\Omega/\Omega$	Calibration of standard resistors with MI 6010 or MI 6000 bridge For standard resistor calibrations and long scale meter calibration station characterization

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Resistance³ – Measure and Generate	0.1 Ω to 1.9 Ω (> 1.9 to 10) Ω (> 10 to 19) Ω (> 19 to 190) Ω >190 Ω to 1.9 kΩ (>1.9 to 19 kΩ) (> 19 to 190 kΩ) > 190 kΩ to 1.9 MΩ (> 1.9 to 10) MΩ (> 10 to 19) MΩ (> 19 to 100) MΩ	85 μΩ/Ω 30 μΩ/Ω 25 μΩ/Ω 20 μΩ/Ω 15 μΩ/Ω 12 μΩ/Ω 15 μΩ/Ω 20 μΩ/Ω 35 μΩ/Ω 70 μΩ/Ω 0.12 mΩ/Ω	Fluke 57x0A, Fluke 85x8A
DC Power – Power Meter and Calibrators	10 mW to 20 kW	34 μW/W	Fluke 552xA

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure, Fixed Points			Fluke 792A and characterized Fluke 57x0
1 mV	10 Hz 20 Hz, 30 Hz 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	0.45 mV/V 0.42 mV/V 0.42 mV/V 0.42 mV/V 0.42 mV/V 0.42 mV/V 0.42 mV/V 0.45 mV/V 0.45 mV/V 0.5 mV/V 0.6 mV/V	Voltage measuring range: 2.2 mV
2 mV	10 Hz 20 Hz, 30 Hz 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	0.22 mV/V 0.2 mV/V 0.2 mV/V 0.2 mV/V 0.2 mV/V 0.2 mV/V 0.2 mV/V 0.22 mV/V 0.22 mV/V 0.25 mV/V 0.3 mV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate, Fixed Points (cont)			Fluke 792A and characterized Fluke 57x0A
	2 mV	10 Hz 0.2 mV/V 20 Hz 0.18 mV/V 30 Hz, 40 Hz, 55 Hz, 60 Hz 0.17 mV/V 120 Hz, 300 Hz, 400 Hz 0.17 mV/V 500 Hz, 1 kHz, 10 kHz 0.17 mV/V 20 kHz, 30 kHz, 50 kHz 0.17 mV/V 70 kHz 0.17 mV/V 100 kHz 0.18 mV/V 200 kHz, 300 kHz, 500 kHz 0.19 mV/V 700 kHz, 800 kHz 0.22 mV/V 1 MHz 0.25 mV/V	Voltage measuring range: 7 mV
	6 mV	10 Hz 0.12 mV/V 20 Hz, 30 Hz, 0.1 mV/V 40 Hz, 55 Hz, 60 Hz 0.1 mV/V 120 Hz, 300 Hz, 400 Hz 0.1 mV/V 500 Hz, 1 kHz, 10 kHz 0.1 mV/V 20 kHz, 30 kHz, 50 kHz 0.1 mV/V 70 kHz, 100 kHz 0.1 mV/V 200 kHz, 300 kHz, 500 kHz 0.12 mV/V 700 kHz, 800 kHz 0.14 mV/V 1 MHz 0.17 mV/V	
	2 mV	10 Hz 0.19 mV/V 20 Hz, 30 Hz, 0.16 mV/V 40 Hz, 55 Hz, 60 Hz 0.16 mV/V 120 Hz, 300 Hz, 400 Hz 0.16 mV/V 500 Hz, 1 kHz, 10 kHz 0.16 mV/V 20 kHz, 30 kHz 0.16 mV/V 50 kHz, 70 kHz, 100 kHz 0.17 mV/V 200 kHz, 300 kHz, 500 kHz 0.18 mV/V 700 kHz 0.2 mV/V 800 kHz 0.21 mV/V 1 MHz 0.25 mV/V	Voltage measuring range: 22 mV

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate, Fixed Points (cont)			
	6 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	1 mV/V 80 µV/V 80 µV/V 80 µV/V 80 µV/V 75 µV/V 75 µV/V 80 µV/V 90 µV/V 0.1 mV/V 0.14 mV/V 0.16 mV/V
	10 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	80 µV/V 60 µV/V 60 µV/V 60 µV/V 60 µV/V 55 µV/V 55 µV/V 60 µV/V 70 µV/V 80 µV/V 0.1 mV/V 0.12 mV/V
	20 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz, 30 kHz 50 kHz, 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	60 µV/V 40 µV/V 40 µV/V 35 µV/V 35 µV/V 35 µV/V 45 µV/V 50 µV/V 70 µV/V 80 µV/V

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate Fixed Points (cont)			
	20 mV	10 Hz 90 µV/V 20 Hz, 30 Hz, 40 Hz, 55 Hz 65 µV/V 60 Hz, 120 Hz, 300 Hz 65 µV/V 400 Hz, 500 Hz 60 µV/V 1 kHz, 10 kHz 60 µV/V 20 kHz, 30 kHz 55 µV/V 50 kHz, 70 kHz 55 µV/V 100 kHz 65 µV/V 200 kHz, 300 kHz 80 µV/V 500 kHz 90 µV/V 700 kHz, 800 kHz 0.12 mV/V 1 MHz 0.14 mV/V	Voltage measuring range: 70 mV
	40 mV	10 Hz 75 µV/V 20 Hz, 30 Hz, 40 Hz, 55 Hz 55 µV/V 60 Hz, 120 Hz, 300 Hz 55 µV/V 400 Hz, 500 Hz 50 µV/V 1 kHz, 10 kHz 50 µV/V 20 kHz, 30 kHz 45 µV/V 50 kHz, 70 kHz 45 µV/V 100 kHz 55 µV/V 200 kHz, 300 kHz 65 µV/V 500 kHz 75 µV/V 700 kHz, 800 kHz 0.1 mV/V 1 MHz 0.12 mV/V	
	60 mV	10 Hz 60 µV/V 20 Hz, 30 Hz, 40 Hz, 55 Hz 40 µV/V 60 Hz, 120 Hz, 300 Hz 40 µV/V 400 Hz, 500 Hz 35 µV/V 1 kHz, 10 kHz 35 µV/V 20 kHz, 30 kHz 35 µV/V 50 kHz, 70 kHz, 100 kHz 30 µV/V 200 kHz, 300 kHz 40 µV/V 500 kHz 50 µV/V 700 kHz, 800 kHz 70 µV/V 1 MHz 80 µV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate Fixed Points (cont) 60 mV 100 mV, 200 mV	10 Hz 20 Hz, 30 Hz 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	40 µV/V 30 µV/V 30 µV/V 30 µV/V 30 µV/V 30 µV/V 30 µV/V 40 µV/V 75 µV/V 0.1 mV/V 0.12 mV/V	Voltage measuring range: 220 mV
	10 Hz 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz, 20 kHz 30 kHz, 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	15 µV/V 12 µV/V 12 µV/V 12 µV/V 8 µV/V 8 µV/V 8 µV/V 9 µV/V 20 µV/V 30 µV/V 40 µV/V 45 µV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate Fixed Points (cont)			
200 mV	10 Hz 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz, 20 kHz 30 kHz, 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	15 µV/V 12 µV/V 12 µV/V 12 µV/V 8 µV/V 8 µV/V 8 µV/V 9 µV/V 20 µV/V 30 µV/V 40 µV/V 45 µV/V	Voltage measurement range: 700 mV
300 mV, 400 mV	10 Hz, 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	12 µV/V 12 µV/V 12 µV/V 8 µV/V 8 µV/V 6 µV/V 7 µV/V 9 µV/V 20 µV/V 30 µV/V 40 µV/V 45 µV/V	
500 mV, 600 mV, 700 mV	10 Hz, 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz, 20 kHz 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	12 µV/V 12 µV/V 12 µV/V 5 µV/V 5 µV/V 5 µV/V 6 µV/V 9 µV/V 20 µV/V 30 µV/V 40 µV/V 45 µV/V	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – Generate Fixed Points (cont)			
600 mV	10 Hz, 20 Hz	12 μV/V	Voltage measurement range: 2.2 V
	30 Hz, 40 Hz, 55 Hz	12 μV/V	
	60 Hz, 120 Hz, 300 Hz	12 μV/V	
	400 Hz, 500 Hz	5 μV/V	
	1 kHz, 10 kHz, 20 kHz	5 μV/V	
	30 kHz, 50 kHz	5 μV/V	
	70 kHz	6 μV/V	
	100 kHz	9 μV/V	
	200 kHz, 300 kHz	20 μV/V	
	500 kHz	30 μV/V	
	700 kHz, 800 kHz	40 μV/V	
	1 MHz	45 μV/V	
	1 V, 2 V	10 Hz	
20 Hz, 30 Hz, 40 Hz		4 μV/V	
55 Hz, 60 Hz, 120 Hz		4 μV/V	
300 Hz, 400 Hz, 500 Hz		4 μV/V	
1 kHz, 10 kHz, 20 kHz		4 μV/V	
30 kHz, 50 kHz, 70 kHz		4 μV/V	
100 kHz, 200 kHz		6 μV/V	
300 kHz, 500 kHz		8 μV/V	
700 kHz, 800 kHz		10 μV/V	
1 MHz		20 μV/V	
2 V, 3 V, 4 V 5 V, 6 V, 7 V		10 Hz	5 μV/V
	20 Hz, 30 Hz, 40 Hz	4 μV/V	
	55 Hz, 60 Hz, 120 Hz	4 μV/V	
	300 Hz, 400 Hz, 500 Hz	4 μV/V	
	1 kHz, 10 kHz, 20 kHz	4 μV/V	
	30 kHz, 50 kHz, 70 kHz	4 μV/V	
	100 kHz, 200 kHz	6 μV/V	
	300 kHz, 500 kHz	8 μV/V	
	700 kHz, 800 kHz	10 μV/V	
	1 MHz	20 μV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate Fixed Points (cont) 6 V, 8 V, 10 V 20 V 20 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz, 120 Hz 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz, 200 kHz 300 kHz, 500 kHz 700 kHz, 800 kHz 1 MHz	5 µV/V 4 µV/V 4 µV/V 4 µV/V 4 µV/V 4 µV/V 4 µV/V 6 µV/V 8 µV/V 10 µV/V 20 µV/V	Voltage measurement range: 22 V
	10 Hz, 20 Hz 30 Hz, 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	6 µV/V 6 µV/V 6 µV/V 6 µV/V 6 µV/V 6 µV/V 8 µV/V 9 µV/V 10 µV/V 12 µV/V 18 µV/V 25 µV/V	
	10 Hz, 20 Hz 30 Hz, 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	7 µV/V 7 µV/V 7 µV/V 7 µV/V 7 µV/V 7 µV/V 8 µV/V 10 µV/V 12 µV/V 25 µV/V 35 µV/V	Voltage measurement range: 70 V

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – Generate Fixed Points (cont)			
30 V	10 Hz 20 Hz, 30 Hz 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	8 µV/V 7 µV/V 7 µV/V 7 µV/V 7 µV/V 7 µV/V 7 µV/V 9 µV/V 12 µV/V 15 µV/V 25 µV/V 35 µV/V	Voltage measurement range: 70 V
40 V, 50 V, 60 V, 70 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	9 µV/V 8 µV/V 8 µV/V 7 µV/V 7 µV/V 7 µV/V 9 µV/V 12 µV/V	
60 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	9 µV/V 8 µV/V 8 µV/V 7 µV/V 7 µV/V 7 µV/V 9 µV/V 12 µV/V	Voltage measurement range: 220 V

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – Generate Fixed Points (cont)			
100 V, 200 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	14 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 18 µV/V 30 µV/V	Voltage measurement range: 220 V
200 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz, 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	14 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 18 µV/V 30 µV/V	Voltage measurement range: 700 V
300 V, 400 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz, 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	16 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 18 µV/V 30 µV/V	
500 V, 600 V, 700 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz, 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	16 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 25 µV/V 35 µV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Generate Fixed Points (cont)			
200 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz, 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	14 µV/V 14 µV/V 14 µV/V 12 µV/V 12 µV/V 12 µV/V 18 µV/V 30 µV/V	Voltage measurement range: 1000 V
300 V, 500 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz, 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	16 µV/V 14 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 18 µV/V 30 µV/V	
600 V, 800 V, 1000 V	10 Hz 20 Hz, 30 Hz, 40 Hz 55 Hz, 60 Hz 120 Hz, 300 Hz, 400 Hz, 500 Hz, 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz	18 µV/V 14 µV/V 12 µV/V 12 µV/V 12 µV/V 12 µV/V 25 µV/V 35 µV/V	
AC Voltage – Measure and Generate			
(0.6 to 2.2) mV	(10 to < 20) Hz (20 to < 40) Hz (40 to 20) kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	1.1 mV/V + 0.9 µV 0.49 mV/V + 0.9 µV 0.28 mV/V + 0.9 µV 0.54 mV/V + 1.3 µV 0.80 mV/V + 1.7 µV 1.5 mV/V + 2.7 µV 1.6 mV/V + 4 µV 2.1 mV/V + 4 µV	Fluke 5790A/B Voltage range: 2.2 mV

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure and Generate (cont)			
(1.9 to 7) mV	(10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.57 mV/V + 0.9 µV 0.25 mV/V + 0.9 µV 0.14 mV/V + 0.9 µV 0.27 mV/V + 1.3 µV 0.40 mV/V + 1.7 µV 0.80 mV/V + 2.7 µV 0.87 mV/V + 4 µV 1.3 mV/V + 4 µV	Fluke 5790A/B Voltage range: 7 mV
(6 to 22) mV	(10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.19 mV/V + 0.9 µV 0.12 mV/V + 0.9 µV 73 µV/V + 0.9 µV 0.14 mV/V + 1.3 µV 0.21 mV/V + 1.7 µV 0.54 mV/V + 2.7 µV 0.57 mV/V + 4 µV 0.93 mV/V + 4 µV	Voltage range: 22 mV
(19 to 70) mV	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V + 1 µV 0.16 mV/V + 1 µV 80 µV/V + 1 µV 43 µV/V + 1 µV 80 µV/V + 1.3 µV 0.17 mV/V + 1.7 µV 0.34 mV/V + 2.7 µV 0.44 mV/V + 4 µV 0.73 mV/V + 4 µV	Voltage range: 70 mV
(60 to 220) mV	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V + 1 µV 0.14 mV/V + 1 µV 56 µV/V + 1 µV 25 µV/V + 1 µV 46 µV/V + 1.3 µV 0.11 mV/V + 1.7 µV 0.16 mV/V + 2.7 µV 0.24 mV/V + 4 µV 0.63 mV/V + 4 µV	Voltage range: 220 mV

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure and Generate (cont)	(190 to 700) mV	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V + 1 µV 0.14 mV/V + 1 µV 50 µV/V + 1 µV 21 µV/V + 1 µV 33 µV/V + 1.3 µV 53 µV/V + 1.7 µV 0.11 mV/V + 2.7 µV 0.20 mV/V + 4 µV 0.60 mV/V + 4 µV
	600 mV to 2.2 V	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V 0.13 mV/V 43 µV/V 15 µV/V 30 µV/V 47 µV/V 0.10 mV/V 0.17 mV/V 0.56 mV/V
	(1.9 to 7) V	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V 0.13 mV/V 44 µV/V 15 µV/V 31 µV/V 53 µV/V 0.12 mV/V 0.25 mV/V 0.73 mV/V
	(6 to 22) V	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V 0.13 mV/V 44 µV/V 17 µV/V 31 µV/V 53 µV/V 0.12 mV/V 0.25 mV/V 0.73 mV/V

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure and Generate (cont)	(19 to 70) V	(9.5 to < 10) Hz (10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.67 mV/V 0.13 mV/V 45 µV/V 20 µV/V 37 µV/V 61 µV/V 0.13 mV/V 0.27 mV/V 0.73 mV/V
	(60 to 220) V	(10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz	0.13 mV/V 45 µV/V 19 µV/V 45 µV/V 64 µV/V 0.14 mV/V 0.29 mV/V
	(190 to 700) V	(10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz	0.13 mV/V 64 µV/V 26 µV/V 80 µV/V 0.27 mV/V
	(600 to 1050) V	(10 to < 20) Hz (20 to < 40) Hz 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz	0.13 mV/V 64 µV/V 25 µV/V 80 µV/V 0.27 mV/V

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – DC Voltage – Transfer			Thermal Transfer Standards Fluke 792A
	2 mV	10 Hz 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz 30 kHz, 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	Voltage range: 22 mV
	6 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	
10 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	0.11 mV/V 90 µV/V 85 µV/V 85 µV/V 85 µV/V 85 µV/V 85 µV/V 90 µV/V 0.11 mV/V 0.12 mV/V 0.15 mV/V 0.19 mV/V 90 µV/V 65 µV/V 65 µV/V 60 µV/V 60 µV/V 55 µV/V 55 µV/V 60 µV/V 75 µV/V 90 µV/V 0.12 mV/V 0.14 mV/V 75 µV/V 55 µV/V 55 µV/V 50 µV/V 50 µV/V 45 µV/V 45 µV/V 55 µV/V 65 µV/V 75 µV/V 95 µV/V 0.12 mV/V	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments	
AC Voltage – DC Voltage – Transfer (cont)	20 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz, 20 kHz 30 kHz, 50 kHz 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	60 µV/V 40 µV/V 40 µV/V 35 µV/V 35 µV/V 30 µV/V 30 µV/V 40 µV/V 50 µV/V 70 µV/V 80 µV/V	Voltage range: 22 mV
	60 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz, 30 kHz 50 kHz, 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	35 µV/V 25 µV/V 25 µV/V 25 µV/V 25 µV/V 25 µV/V 40 µV/V 50 µV/V 70 µV/V 80 µV/V	Voltage range: 220 mV
	100 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz, 30 kHz 50 kHz, 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	15 µV/V 12 µV/V 12 µV/V 8 µV/V 8 µV/V 8 µV/V 20 µV/V 30 µV/V 40 µV/V 45 µV/V	
	200 mV	10 Hz 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz, 20 kHz 30 kHz, 50 kHz, 70 kHz, 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	15 µV/V 12 µV/V 11 µV/V 11 µV/V 7 µV/V 7 µV/V 7 µV/V 8 µV/V 20 µV/V 30 µV/V 40 µV/V 45 µV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – DC Voltage – Transfer (cont)	200 mV	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz, 30 kHz 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	12 µV/V 11 µV/V 11 µV/V 7 µV/V 7 µV/V 7 µV/V 8 µV/V 18 µV/V 30 µV/V 40 µV/V 45 µV/V
	300 mV, 400 mV, 500 mV, 600 mV, 700 mV	10 Hz, 20 Hz, 30 Hz 40 Hz, 55 Hz, 60 Hz 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz, 30 kHz 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	11 µV/V 11 µV/V 11 µV/V 7 µV/V 7 µV/V 7 µV/V 8 µV/V 18 µV/V 30 µV/V 40 µV/V 45 µV/V
	600 mV	10 Hz, 20 Hz 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz 1 kHz, 10 kHz 20 kHz, 30 kHz, 50 kHz 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	11 µV/V 11 µV/V 11 µV/V 4 µV/V 4 µV/V 5 µV/V 6 µV/V 8 µV/V 18 µV/V 30 µV/V 40 µV/V 45 µV/V

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – DC Voltage – Transfer (cont)	1 V, 2 V	10 Hz 4 µV/V 20 Hz 3 µV/V 30 Hz, 40 Hz, 55 Hz 2 µV/V 60 Hz, 120 Hz 2 µV/V 300 Hz, 400 Hz, 500 Hz 2 µV/V 1 kHz, 10 kHz 2 µV/V 20 kHz, 30 kHz, 50 kHz 2 µV/V 70 kHz 3 µV/V 100 kHz 4 µV/V 200 kHz, 300 kHz 5 µV/V 500 kHz 7 µV/V 700 kHz, 800 kHz 9 µV/V 1 MHz 15 µV/V	Voltage range: 2.2 V
	2 V, 3 V, 4 V, 5 V, 6 V, 7 V	10 Hz 4 µV/V 20 Hz 3 µV/V 30 Hz, 40 Hz, 55 Hz 2 µV/V 60 Hz, 120 Hz 2 µV/V 300 Hz, 400 Hz, 500 Hz 2 µV/V 1 kHz, 10 kHz, 20 kHz 2 µV/V 30 kHz, 50 kHz, 70 kHz 2 µV/V 100 kHz 4 µV/V 200 kHz, 300 kHz 5 µV/V 500 kHz 6 µV/V 700 kHz 8 µV/V 800 kHz 9 µV/V 1 MHz 15 µV/V	Voltage range: 7 V
	6 V, 8 V	10 Hz 4 µV/V 20 Hz 3 µV/V 30 Hz, 40 Hz, 55 Hz 2 µV/V 60 Hz, 120 Hz 2 µV/V 300 Hz, 400 Hz, 500 Hz 2 µV/V 1 kHz, 10 kHz, 20 kHz 2 µV/V 30 kHz, 50 kHz, 70 kHz 2 µV/V 100 kHz 4 µV/V 200 kHz, 300 kHz 5 µV/V 500 kHz 7 µV/V 700 kHz, 800 kHz 9 µV/V 1 MHz 15 µV/V	Voltage range: 22 V

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – DC Voltage – Transfer (cont)			
	10 V	10 Hz 4 µV/V 20 Hz, 30 Hz, 40 Hz, 55 Hz 3 µV/V 60 Hz, 120 Hz 3 µV/V 300 Hz, 400 Hz, 500 Hz 3 µV/V 1 kHz, 10 kHz, 20 kHz 3 µV/V 30 kHz, 50 kHz, 70 kHz 3 µV/V 100 kHz 4 µV/V 200 kHz, 300 kHz 5 µV/V 500 kHz 7 µV/V 700 kHz, 800 kHz 9 µV/V 1 MHz 15 µV/V	Voltage range: 22 V
	20 V	10 Hz, 20 Hz, 30 Hz, 40 Hz 6 µV/V 55 Hz, 60 Hz, 120 Hz 6 µV/V 300 Hz, 400 Hz, 500 Hz 6 µV/V 1 kHz, 10 kHz, 20 kHz 6 µV/V 30 kHz, 50 kHz, 70 kHz 3 µV/V 100 kHz 7 µV/V 200 kHz, 300 kHz 9 µV/V 500 kHz 12 µV/V 700 kHz, 800 kHz 18 µV/V 1 MHz 25 µV/V	
	20 V	10 Hz, 20 Hz, 30 Hz, 40 Hz 6 µV/V 55 Hz, 60 Hz, 120 Hz 6 µV/V 300 Hz, 400 Hz, 500 Hz 6 µV/V 1 kHz, 10 kHz, 20 kHz 6 µV/V 30 kHz, 50 kHz, 70 kHz 3 µV/V 100 kHz 7 µV/V 200 kHz, 300 kHz 9 µV/V 500 kHz 12 µV/V 700 kHz, 800 kHz 18 µV/V 1 MHz 25 µV/V	Voltage range: 70 V

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – DC Voltage – Transfer (cont)			
30 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz, 30 kHz 50 kHz, 70 kHz 100 kHz 200 kHz, 300 kHz 500 kHz 700 kHz, 800 kHz 1 MHz	7 µV/V 6 µV/V 6 µV/V 6 µV/V 6 µV/V 6 µV/V 8 µV/V 12 µV/V 15 µV/V 25 µV/V 35 µV/V	Voltage range: 70 V
40 V, 50 V, 60 V, 70 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz 30 kHz, 50 kHz 70 kHz 100 kHz	8 µV/V 7 µV/V 7 µV/V 6 µV/V 6 µV/V 6 µV/V 8 µV/V 12 µV/V	
60 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz 30 kHz, 50 kHz 70 kHz 100 kHz	8 µV/V 7 µV/V 7 µV/V 6 µV/V 6 µV/V 6 µV/V 8 µV/V 12 µV/V	Voltage range: 220 V
100 V	10 Hz 20 Hz, 30 Hz, 40 Hz, 55 Hz 60 Hz, 120 Hz, 300 Hz 400 Hz, 500 Hz, 1 kHz 10 kHz, 20 kHz 30 kHz, 50 kHz 70 kHz 100 kHz	12 µV/V 11 µV/V 11 µV/V 11 µV/V 11 µV/V 11 µV/V 18 µV/V 30 µV/V	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – DC Voltage – Transfer (cont)			
200 V	10 Hz	12 µV/V	Voltage range: 220 V
	20 Hz, 30 Hz, 40 Hz, 55 Hz	12 µV/V	
	60 Hz, 120 Hz, 300 Hz	12 µV/V	
	400 Hz, 500 Hz, 1 kHz	11 µV/V	
	10 kHz, 20 kHz	11 µV/V	
	30 kHz, 50 kHz	11 µV/V	
	70 kHz	18 µV/V	
	100 kHz	30 µV/V	
200 V	10 Hz	15 µV/V	Voltage range: 1000 V
	20 Hz	13 µV/V	
	30 Hz, 40 Hz, 55 Hz	12 µV/V	
	60 Hz, 120 Hz, 300 Hz	12 µV/V	
	400 Hz, 500 Hz	11 µV/V	
	1 kHz, 10 kHz	11 µV/V	
	20 kHz, 30 kHz, 50 kHz	11 µV/V	
	70 kHz	18 µV/V	
	100 kHz	30 µV/V	
300 V	10 Hz	15 µV/V	
	20 Hz, 30 Hz	12 µV/V	
	40 Hz, 55 Hz, 60 Hz	11 µV/V	
	120 Hz, 300 Hz, 400 Hz	11 µV/V	
	500 Hz, 1 kHz, 10 kHz	11 µV/V	
	20 kHz, 30 kHz, 50 kHz	11 µV/V	
	70 kHz	18 µV/V	
	100 kHz	30 µV/V	
500 V	10 Hz	17 µV/V	
	20 Hz, 30 Hz	12 µV/V	
	40 Hz, 55 Hz, 60 Hz	11 µV/V	
	120 Hz, 300 Hz, 400 Hz	11 µV/V	
	500 Hz, 1 kHz, 10 kHz	11 µV/V	
	20 kHz, 30 kHz, 50 kHz	11 µV/V	
	70 kHz	18 µV/V	
	100 kHz	35 µV/V	
600 V, 800 V, 1000 V	10 Hz	17 µV/V	
	20 Hz, 30 Hz	12 µV/V	
	40 Hz, 55 Hz, 60 Hz	11 µV/V	
	120 Hz, 300 Hz, 400 Hz	11 µV/V	
	500 Hz, 1 kHz, 10 kHz	11 µV/V	
	20 kHz, 30 kHz, 50 kHz	11 µV/V	
	70 kHz	18 µV/V	
	100 kHz	35 µV/V	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure and Generate³			
(60 to 220) mV	(10 to 20) Hz >20 Hz to 40 kHz > 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.84 mV/V 0.38 mV/V 0.27 mV/V 0.48 mV/V 1.4 mV/V 1.7 mV/V 2.5 mV/V 5.2 mV/V	Fluke 57x0A and Fluke 85x8A / HP 3458A
(>220 to 2.2) mV	(10 to 20) Hz >20 Hz to 40 kHz > 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.95 mV/V 0.3 mV/V 0.11 mV/V 0.22 mV/V 0.62 mV/V 1.2 mV/V 3 mV/V 6.7 mV/V	
(>2.2 to 22) V	(10 to 20) Hz >20 Hz to 40 kHz > 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz (> 100 to 300) kHz (> 300 to 500) kHz > 500 kHz to 1 MHz	0.95 mV/V 0.3 mV/V 0.11 mV/V 0.22 mV/V 0.43 mV/V 1.4 mV/V 3.6 mV/V 7.4 mV/V	
(>22 to 220) V	(10 to 20) Hz >20 Hz to 40 kHz > 40 Hz to 20 kHz (> 20 to 50) kHz (> 50 to 100) kHz	0.95 mV/V 0.3 mV/V 0.13 mV/V 0.41 mV/V 0.95 mV/V	
(>220 to 1100) V	(10 to 50) Hz >50 Hz to 1 kHz (> 1 to 20) kHz (> 20 to 30) kHz	0.5 mV/V 0.15 mV/V 0.20 mV/V 0.50 mV/V	
(>220 to 750) V	(30 to 50) kHz (> 50 to 100) kHz	0.5 mV/V 1.8 mV/V	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Voltage – Generate			Fluke 552xA Rectangular voltage, triangular voltage at 50 Ω and 1 MΩ
1 mV	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz (200 to 700) kHz 700 kHz to 1 MHz	0.50 mV/V 0.50 mV/V 0.50 mV/V 0.70 mV/V 0.90 mV/V	
2 mV	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz (200 to 700) kHz 700 kHz to 1 MHz	0.30 mV/V 0.30 mV/V 0.30 mV/V 0.50 mV/V 0.80 mV/V	
6 mV, 10 mV, 20 mV	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz (200 to 700) kHz 700 kHz to 1 MHz	0.20 mV/V 0.20 mV/V 0.20 mV/V 0.50 mV/V 0.80 mV/V	
40 mV	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz (200 to 700) kHz 700 kHz to 1 MHz	0.20 mV/V 0.20 mV/V 0.20 mV/V 0.50 mV/V 0.80 mV/V	
60 mV	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz (200 to 700) kHz 700 kHz to 1 MHz	0.15 mV/V 0.15 mV/V 0.15 mV/V 0.50 mV/V 0.80 mV/V	
100 mV to 30 V	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz (200 to 700) kHz 700 kHz to 1 MHz	0.10 mV/V 0.10 mV/V 0.10 mV/V 0.45 mV/V 0.80 mV/V	
(40 to 100) V	(10 to 40) Hz 55 Hz to 10 kHz (10 to 100) kHz	0.10 mV/V 0.10 mV/V 0.10 mV/V	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – DC Current – Transfer			
300 µA, 1 mA, 3 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz > 70 kHz to 100 kHz	15 µA/A 11 µA/A 15 µA/A 15 µA/A 25 µA/A 30 µA/A 35 µA/A	Fluke A40B
5 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz > 70 kHz to 100 kHz	13 µA/A 13 µA/A 22 µA/A 32 µA/A 39 µA/A 49 µA/A 67 µA/A	
10 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	15 µA/A 11 µA/A 15 µA/A 15 µA/A 25 µA/A 25 µA/A 25 µA/A	
20 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	13 µA/A 13 µA/A 14 µA/A 14 µA/A 15 µA/A 20 µA/A 22 µA/A	

Parameter/Range	Range	CMC ^{2,4} (±)	Comments
AC Current – DC Current – Transfer (cont)			
	30 mA	(10 to 40) Hz	13 µA/A
		> 40 Hz to 1 kHz	13 µA/A
		(> 1 to 10) kHz	15 µA/A
		(> 10 to 20) kHz	15 µA/A
		(> 20 to 50) kHz	18 µA/A
		(> 50 to 70) kHz	22 µA/A
		(> 70 to 100) kHz	29 µA/A
	50 mA	(10 to 40) Hz	13 µA/A
		> 40 Hz to 1 kHz	13 µA/A
		(> 1 to 10) kHz	15 µA/A
		(> 10 to 20) kHz	15 µA/A
		(> 20 to 50) kHz	15 µA/A
		(> 50 to 70) kHz	15 µA/A
		(> 70 to 100) kHz	18 µA/A
	100 mA	(10 to 40) Hz	14 µA/A
		> 40 Hz to 1 kHz	14 µA/A
		(> 1 to 10) kHz	14 µA/A
		(> 10 to 20) kHz	15 µA/A
		(> 20 to 50) kHz	16 µA/A
		(> 50 to 70) kHz	16 µA/A
		(> 70 to 100) kHz	16 µA/A
	200 mA	(10 to 40) Hz	15 µA/A
		> 40 Hz to 1 kHz	15 µA/A
		(> 1 to 10) kHz	15 µA/A
		(> 10 to 20) kHz	16 µA/A
		(> 20 to 50) kHz	17 µA/A
		(> 50 to 70) kHz	17 µA/A
		(> 70 to 100) kHz	17 µA/A
	300 mA	(10 to 40) Hz	13 µA/A
		> 40 Hz to 1 kHz	13 µA/A
		(> 1 to 10) kHz	13 µA/A
		(> 10 to 20) kHz	13 µA/A
		(> 20 to 50) kHz	17 µA/A
		(> 50 to 70) kHz	24 µA/A
		(> 70 to 100) kHz	28 µA/A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Current – DC Current – Transfer (cont)	500 mA	(10 to 40) Hz	13 µA/A
		> 40 Hz to 1 kHz	13 µA/A
		(> 1 to 10) kHz	13 µA/A
		(> 10 to 20) kHz	13 µA/A
		(> 20 to 50) kHz	14 µA/A
		(> 50 to 70) kHz	17 µA/A
		(> 70 to 100) kHz	17 µA/A
	1 A	(10 to 40) Hz	13 µA/A
		> 40 Hz to 1 kHz	13 µA/A
		(> 1 to 10) kHz	13 µA/A
		(> 10 to 20) kHz	17 µA/A
		(> 20 to 50) kHz	17 µA/A
		(> 50 to 70) kHz	17 µA/A
		(> 70 to 100) kHz	21 µA/A
	2 A	(10 to 40) Hz	15 µA/A
		> 40 Hz to 1 kHz	15 µA/A
		(> 1 to 10) kHz	15 µA/A
		(> 10 to 20) kHz	17 µA/A
		(> 20 to 50) kHz	21 µA/A
		(> 50 to 70) kHz	29 µA/A
		(> 70 to 100) kHz	43 µA/A
	3 A	(10 to 40) Hz	21 µA/A
		> 40 Hz to 1 kHz	21 µA/A
		(> 1 to 10) kHz	21 µA/A
		(> 10 to 20) kHz	27 µA/A
		(> 20 to 50) kHz	46 µA/A
		(> 50 to 70) kHz	64 µA/A
		(> 70 to 100) kHz	90 µA/A
	5 A	(10 to 40) Hz	20 µA/A
		> 40 Hz to 1 kHz	20 µA/A
		(> 1 to 10) kHz	20 µA/A
		(> 10 to 20) kHz	21 µA /A
		(> 20 to 50) kHz	30 µA/A
		(> 50 to 70) kHz	45 µA/A
		(> 70 to 100) kHz	65 µA/A

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – DC Current – Transfer (cont)			
10 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	24 µA/A 25 µA/A 25 µA/A 25 µA/A 53 µA/A 64 µA/A 84 µA/A	
20 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	34 µA/A 34 µA/A 43 µA/A 43 µA/A 64 µA/A 86 µA/A 0.11 mA/A	
50 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	45 µA/A 45 µA/A 56 µA/A 56 µA/A 76 µA/A 0.11 mA/A 0.15 mA/A	
100 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	64 µA/A 64 µA/A 81 µA/A 83 µA/A 93 µA/A 0.14 mA/A 0.17 mA/A	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Current – Measure and Generate			
100 µA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	65 µA/A 60 µA/A 65 µA/A 70 µA/A 75 µA/A 80 µA/A 0.10 mA/A	Fluke A40(A), Fluke 57x0A
300 µA, 1 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	25 µA/A 15 µA/A 25 µA/A 35 µA/A 45 µA/A 50 µA/A 80 µA/A	
3 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	20 µA/A 15 µA/A 25 µA/A 35 µA/A 45 µA/A 50 µA/A 80 µA/A	
5 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	26 µA/A 24 µA/A 29 µA/A 36 µA/A 42 µA/A 49 µA/A 68 µA/A	
10 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	19 µA/A 17 µA/A 23 µA/A 31 µA/A 39 µA/A 44 µA/A 64 µA/A	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – Measure and Generate (cont)			
20 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	19 µA/A 17 µA/A 23 µA/A 31 µA/A 38 µA/A 44 µA/A 65 µA/A	Fluke A40(A), Fluke 57x0A
30 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	19 µA/A 17 µA/A 24 µA/A 31 µA/A 39 µA/A 45 µA/A 67 µA/A	
50 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	19 µA/A 17 µA/A 24 µA/A 31 µA/A 38 µA/A 42 µA/A 63 µA/A	
100 mA	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	20 µA/A 17 µA/A 23 µA/A 31 µA/A 38 µA/A 43 µA/A 63 µA/A	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – Measure and Generate (cont)			
200 mA	(10 to 40) Hz	21 µA/A	Fluke A40(A), Fluke 57x0A
	> 40 Hz to 1 kHz	18 µA/A	
	(> 1 to 10) kHz	24 µA/A	
	(> 10 to 20) kHz	32 µA/A	
	(> 20 to 50) kHz	39 µA/A	
	(> 50 to 70) kHz	43 µA/A	
	(> 70 to 100) kHz	63 µA/A	
300 mA	(10 to 40) Hz	19 µA/A	
	> 40 Hz to 1 kHz	17 µA/A	
	(> 1 to 10) kHz	23 µA/A	
	(> 10 to 20) kHz	30 µA/A	
	(> 20 to 50) kHz	42 µA/A	
	(> 50 to 70) kHz	49 µA/A	
	(> 70 to 100) kHz	69 µA/A	
500 mA	(10 to 40) Hz	19 µA/A	
	> 40 Hz to 1 kHz	17 µA/A	
	(> 1 to 10) kHz	23 µA/A	
	(> 10 to 20) kHz	30 µA/A	
	(> 20 to 50) kHz	40 µA/A	
	(> 50 to 70) kHz	46 µA/A	
	(> 70 to 100) kHz	65 µA/A	
1 A	(10 to 40) Hz	20 µA/A	
	> 40 Hz to 1 kHz	18 µA/A	
	(> 1 to 10) kHz	23 µA/A	
	(> 10 to 20) kHz	33 µA/A	
	(> 20 to 50) kHz	42 µA/A	
	(> 50 to 70) kHz	46 µA/A	
	(> 70 to 100) kHz	66 µA/A	
2 A	(10 to 40) Hz	22 µA/A	
	> 40 Hz to 1 kHz	18 µA/A	
	(> 1 to 10) kHz	25 µA/A	
	(> 10 to 20) kHz	32 µA/A	
	(> 20 to 50) kHz	44 µA/A	
	(> 50 to 70) kHz	52 µA/A	
	(> 70 to 100) kHz	76 µA/A	

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Current – Measure and Generate (cont)			
3 A	(10 to 40) Hz	27 µA/A	Fluke A40(A), Fluke 57x0A
	> 40 Hz to 1 kHz	25 µA/A	
	(> 1 to 10) kHz	29 µA/A	
	(> 10 to 20) kHz	36 µA/A	
	(> 20 to 50) kHz	53 µA/A	
	(> 50 to 70) kHz	67 µA/A	
	(> 70 to 100) kHz	94 µA/A	
5 A	(10 to 40) Hz	26 µA/A	
	> 40 Hz to 1 kHz	25 µA/A	
	(> 1 to 10) kHz	29 µA/A	
	(> 10 to 20) kHz	36 µA/A	
	(> 20 to 50) kHz	52 µA/A	
	(> 50 to 70) kHz	65 µA/A	
	(> 70 to 100) kHz	92 µA/A	
10 A	(10 to 40) Hz	30 µA/A	
	> 40 Hz to 1 kHz	29 µA/A	
	(> 1 to 10) kHz	33 µA/A	
	(> 10 to 20) kHz	38 µA/A	
	(> 20 to 50) kHz	71 µA/A	
	(> 50 to 70) kHz	81 µA/A	
	(> 70 to 100) kHz	0.11 mA/A	
20 A	(10 to 40) Hz	38 µA/A	
	> 40 Hz to 1 kHz	37 µA/A	
	(> 1 to 10) kHz	48 µA/A	
	(> 10 to 20) kHz	52 µA/A	
	(> 20 to 50) kHz	79 µA/A	
	(> 50 to 70) kHz	0.10 mA/A	
	(> 70 to 100) kHz	0.13 mA/A	
30 A	(10 to 40) Hz	61 µA/A	
	> 40 Hz to 1 kHz	61 µA/A	
	(> 1 to 10) kHz	70 µA/A	
	(> 10 to 20) kHz	78 µA/A	
	(> 20 to 50) kHz	98 µA/A	
	(> 50 to 70) kHz	0.13 mA/A	
	(> 70 to 100) kHz	0.17 mA/A	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – Measure and Generate (cont)			
50 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	61 µA/A 61 µA/A 70 µA/A 78 µA/A 98 µA/A 0.13 mA/A 0.17 mA/A	Fluke A40(A), Fluke 57x0A
80 A, 100 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	68 µA/A 68 µA/A 85 µA/A 92 µA/A 0.10 mA/A 0.15 mA/A 0.19 mA/A	
AC Current – Measure and Generate³			
(10 to 220) µA	(10 to 20) Hz (> 20 to 40) Hz > 40 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz	0.7 mA/A 0.36 mA/A 0.14 mA/A 0.59 mA/A 1.7 mA/A	Fluke 57x0A, Fluke 8508A
> 220 µA to 2.2 mA	(10 to 20) Hz (> 20 to 40) Hz > 40 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz	0.7 mA/A 0.36 mA/A 0.14 mA/A 0.59 mA/A + 1 µA 1.7 mA/A + 1 µA	
(> 2.2 to 22) mA	(10 to 20) Hz (> 20 to 40) Hz > 40 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz	0.7 mA/A + 1 µA 0.36 mA/A + 1 µA 0.14 mA/A + 1 µA 0.59 mA/A + 5 µA 1.7 mA/A + 10 µA	
(> 22 to 220) mA	(10 to 20) Hz (> 20 to 40) Hz > 40 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz	0.7 mA/A + 5 µA 0.36 mA/A + 5 µA 0.14 mA/A + 5 µA 0.59 mA/A + 50 µA 1.7 mA/A + 0.1 mA	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – Measure and Generate³ (cont) > 220 mA to 2.2 A (> 2.2 to 11) A	20 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz 40 Hz to 1 kHz (> 1 to 5) kHz (> 5 to 10) kHz	0.64 mA A + 50 µA 0.76 mA/A + 0.1 mA 8.7 mA/A + 0.2 mA 0.47 mA A + 0.2 mA 1 mA/A + 0.5 mA 3.8 mA/A + 0.9 mA	Fluke 57x0A, Fluke 8508A
AC Current – Generate 100 µA 300 µA, 1 mA, 3 mA, 5 mA, 10 mA, 20 mA, 30 mA, 50 mA, 100 mA, 200 mA, 300 mA, 500 mA 1 A, 2 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz (10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz (10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	0.10 mA/A 95 µA/A 0.15 mA/A 0.15 mA/A 0.16 mA/A 0.16 mA/A 0.17 mA/A 75 µA/A 65 µA/A 0.14 mA/A 0.14 mA/A 0.14 mA/A 0.15 mA/A 0.16 mA/A 75 µA/A 70 µA/A 0.14 mA/A 0.14 mA/A 0.15 mA/A 0.15 mA/A 0.16 mA/A	Fluke 57x0A

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – Generate (cont)			
3 A, 5 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	80 µA/A 75 µA/A 0.14 mA 0.14 mA 0.15 mA 0.16 mA 0.17 mA	Fluke 57x0A, 5725A
10 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	80 µA/A 75 µA/A 0.14 mA/A 0.15 mA/A 0.16 mA/A 0.17 mA/A 0.19 mA/A	
20 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 10 to 20) kHz (> 20 to 50) kHz (> 50 to 70) kHz (> 70 to 100) kHz	90 µA/A 80 µA/A 0.14 mA/A 0.15 mA/A 0.17 mA/A 0.18 mA/A 0.20 mA/A	Fluke 57x0A, 52120A
30 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 20 to 30) kHz 50 kHz 70 kHz 100 kHz	90 µA/A 85 µA/A 0.15 mA/A 0.16 mA/A 0.17 mA/A 0.19 mA/A 0.23 mA/A	
50 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 20 to 30) kHz 50 kHz 70 kHz 100 kHz	90 µA/A 85 µA/A 0.15 mA/A 0.16 mA/A 0.18 mA/A 0.20 mA/A 0.24 mA/A	

Parameter/Range	Frequency	CMC ^{2, 4} (±)	Comments
AC Current – Generate (cont)			
80 A	(10 to 40) Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 20 to 30) kHz 50 kHz 70 kHz 100 kHz	0.10 mA/A 90 µA/A 0.16 mA/A 0.17 mA/A 0.18 mA/A 0.20 mA/A 0.24 mA/A	Fluke 57x0A, 52120A
100 A	10 Hz to 40 Hz > 40 Hz to 1 kHz (> 1 to 10) kHz (> 20 to 30) kHz 50 kHz 70 kHz 100 kHz	0.10 mA/A 95 µA/A 0.16 mA/A 0.17 mA/A 0.20 mA/A 0.23 mA/A 0.27 mA/A	
Inductance – Generate			
100 µH	100 Hz, 400 Hz, 1000 Hz, 10 kHz	0.5 mH/H	General Radio 1482-X
1 mH, 10 mH	100 Hz, 400 Hz, 1000 Hz, 10 kHz	0.4 mH/H	
100 mH	100 Hz, 400 Hz, 1000 Hz 10 kHz	0.4 mH/H 0.5 mH/H	
1 H, 2 H, 5 H	100 Hz; 400 Hz; 1000 Hz	0.4 mH/H	
10 H	100 Hz; 400 Hz 1000 Hz	0.4 mH/H 0.6 mH/H	

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Capactiance – Generate			
1 pF	100 Hz, 1 kHz, 10 kHz	0.12 mF/F	HP 1638x
10 pF, 0 pF	100 Hz 1 kHz 10 kHz 100 kHz 1000 kHz	70 mF/F 20 mF/F 80 mF/F 0.1 mF/F 0.4 mF/F	
1000 pF	100 Hz 1 kHz 10 kHz 100 kHz 1MHz	80 mF/F 20 mF/F 80 mF/F 0.15 mF/F 1.5 mF/F	
10 nF	100 Hz, 1 kHz, 10 kHz	0.1 mF/F	
100 nF, 1 µF	100 Hz 1 kHz 10 kHz	0.11 mF/F 0.11 mF/F 0.16 mF/F	
Capactiance – Measure			
≥ 100 pF	1 kHz, 10 kHz	0.55 mF/F	
≥ 1 nF to 3 nF	100 Hz, 1 kHz, 10 kHz	0.13 mF/F	
≥ 3 nF to 10 nF	100 Hz, 1 kHz, 10 kHz	0.33 mF/F	
≥ 10 nF to 100 nF	100 Hz, 1 kHz, 10 kHz	0.26 mF/F	
≥ 100 nF to 110 µF	100 Hz, 1 kHz, 10 kHz	0.35 mF/F	
Calibrators			Fluke 57x0A and HP 3458A
> 110 µF to 110 mF	DC	0.3 mF/F	
Pulse Characterization –			
Risetime – Measure: 14 ps to 25 ns	50 mV to 50 V	0.03 (t_r) + 4 ps	Periodic signals, pulse amplitudes t_r = actual rise time

Parameter/Equipment	Range	CMC ^{2, 4} ($\pm$)	Comments
Pulse Characterization – Risettime – Measure ³ 40 ps to 25 ns	50 mV to 50 V	$0.04 (t_r) + 4 \text{ ps}$	Periodic signals, pulse amplitudes t_r = actual rise time
Pulse Characterization – Risettime – Measuring devices and voltage probes 18 ps to 1 ns 500 ps to 3 ns 1.5 ns to 25 ns	(10 to 250) mV 0.25 V to 3 V 25 V and 50 V	$0.03 (t_r) + 8 \text{ ps}$ $0.02 (t_r) + 65 \text{ ps}$ $0.02 (t_r) + 120 \text{ ps}$	Tektronix DSA8300 + 80E06 / MSO64 + 80E10 and Picoseconds Lab 2600 (Isoview Mod) t_r = actual rise time
Pulse Characterization – Risettime – Measuring devices and voltage probes ³ 40 ps to 1 ns 500 ps to 3 ns 1.5 ns to 25 ns	(10 to 250) mV 25 mV to 3 V 25 V and 50 V	$0.04 (t_r) + 8 \text{ ps}$ $0.02 (t_r) + 65 \text{ ps}$ $0.02 (t_r) + 120 \text{ ps}$	Tektronix TDS8000 and 80E04 t_r = actual rise time
Pulse Characterization – Risettime – Current Clamp ³ (1.5 to 20) ns (100 to 300) ns	0.5 A and 1 A 5 A	$0.03 (t_r) + 200 \text{ ps}$ $0.03 (t_r)$	Picoseconds Lab 2600 (Isoview Mod) t_r = actual rise time

II. Time & Frequency

Parameter/Equipment	Range	CMC ^{2,6} ($\pm$)	Comments
Frequency – Measure 1 MHz 5 MHz 10 MHz (0.01 to 1) Hz 1 Hz to 150 MHz 150 MHz to 4.7 GHz	$\geq 0.5V$, over 24 h $\geq 0.5V$, over 1000 s	6 pHz/Hz 6 pHz/Hz 6 pHz/Hz 30 ps/s + W_{tf} 20 ps/s + W_{tf} 30 ps/s	Analog phase time difference measurement W_{tf} = relative Trigger uncertainty Digital Frequency measurement on a counting basis
Frequency – Measuring Equipment and Measure	(1 to 10) MHz 0.1 Hz to 20 GHz	10 pHz/Hz 10 nHz/Hz + U_{Tf}	1 MHz step size U_{Tf} = Trigger uncertainty

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMC's represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMC's are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

⁵ This scope meets A2LA's P112 Flexible Scope Policy.

⁶ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.



Accredited Laboratory

A2LA has accredited

FLUKE DEUTSCHLAND GMBH / TEKTRONIX GMBH

Köln, GERMANY

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – Specific Requirements: Calibration Laboratory Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system
(refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 22nd day of May 2020.

A blue ink signature of the Vice President, Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2357.29
Valid to November 30, 2020
Revised September 10, 2020

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.