SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017
& ANSI/NCSL Z540-1-1994

ADVANCED TEST EQUIPMENT CORP
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CALIBRATION

Valid To: April 30, 2027 Certificate Number: 3410.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with R205 – A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations[1, 7]:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
DC Voltage – Generate	Up to 220 mV 220 mV to 2.2 V (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V Up to 2 kV (2 to 20) kV (20 to 140) kV	7.6 µV/V + 0.39 µV 4.8 µV/V + 0.62 µV 3.4 µV/V + 2.4 µV 3.8 µV/V + 3.9 µV 4.8 µV/V + 39 µV 7.4 µV/V + 390 µV 0.053 % + 0.46 V 0.12 % + 4.6 V 0.21 %	Fluke 5720A Vitrek VM 4600 Ross VMP 200
DC Voltage – Measure	Up to 100 mV (0.1 to 1) V (1 to 10) V (10 to 100) V (100 to 1000) V Up to 2 kV (2 to 20) kV (20 to 140) kV	6.9 µV/V + 0.35 µV 5.1 µV/V + 0.35 µV 4.7 µV/V + 0.58 µV 7.2 µV/V + 35 µV 8.7 µV/V + 0.12 mV 0.053 % + 0.46 V 0.12 % + 4.6 V 0.21 %	Agilent 3458A Vitrek VM 4600 Ross VMP 200A

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
DC Current – Generate	Up to 220 µA 220 µA to 2.2 mA (2.2 to 22) mA (22 to 220) mA 220 mA to 2.2 A (1.1 to 3.0) A (3 to 11) A (11 to 20.5) A	41 µA/A + 5.5 nA 32 µA/A + 6.2 nA 32 µA/A + 39 nA 43 µA/A + 0.62 µA 74 µA/A + 12 µA 0.030 % + 31 µA 0.040 % + 0.39 mA 0.083 % + 0.59 mA	Fluke 5720A Fluke 552XA
DC Current – Measure	Up to 100 nA 100 nA to 1 µA (1 to 10) µA (10 to 100) µA (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (0.1 to 1) A Up to 10 A (11 to 20) A (20 to 200) A Up to 700 A	0.025 % + 47 pA 46 µA/A + 47 pA 25 µA/A + 0.12 nA 24 µA/A + 0.93 nA 26 µA/A + 5.8 nA 24 µA/A + 58 nA 41 µA/A + 0.58 µA 0.015 % + 12 µA 60 µA/A + 35 µA 0.024 % + 35 µA 0.087 % + 0.35 mA 0.17 % + 1.0 A	Agilent 3458A Fluke Y5020 w/ Agilent 3458A L&N 4363 w/ Agilent 3458A Yokogawa WT3000 w/ CT
DC Power – Generate			
330 µA	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.017 % 0.017 % 0.019 % 0.019 % 0.013 %	Fluke 552XA
(0.33 to 3.3) mA	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.0092 % 0.0091 % 0.0093 % 0.010 % 0.0094 %	
(3.3 to 33) mA	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.010 % 0.0095 % 0.010 % 0.010 % 0.010 %	

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
DC Power – Generate (cont)			
(33 to 330) mA	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.010 % 0.012 % 0.010 % 0.010 % 0.010 %	Fluke 552XA
(0.33 to 1.1) A	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.019 % 0.019 % 0.019 % 0.019 % 0.020 %	
(1.1 to 3) A	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.032 % 0.034 % 0.032 % 0.032 % 0.032 %	
(3 to 11) A	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.047 % 0.047 % 0.047 % 0.047 % 0.044 %	
(11 to 20.5) A	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1000) V	0.082 % 0.081 % 0.081 % 0.081 % 0.083 %	
DC Resistance – Generate	Up to 11 Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (0.33 to 1.1) kΩ (1.1 to 3.3) kΩ (3.3 to 11) kΩ (11 to 33) kΩ (33 to 110) kΩ (110 to 330) kΩ (0.33 to 1.1) MΩ (1.1 to 3.3) MΩ	34 µΩ/Ω + 0.78 µΩ 27 µΩ/Ω + 1.2 mΩ 29 µΩ/Ω + 1.1 mΩ 28 µΩ/Ω + 1.6 mΩ 23 µΩ/Ω + 1.6 mΩ 25 µΩ/Ω + 16 mΩ 24 µΩ/Ω + 16 mΩ 42 µΩ/Ω + 0.16 Ω 24 µΩ/Ω + 0.16 Ω 26 µΩ/Ω + 1.6 Ω 27 µΩ/Ω + 1.6 Ω 49 µΩ/Ω + 24 Ω	Fluke 552XA

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
DC Resistance – Generate (cont)	(3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 1100) MΩ	0.011 % + 39 Ω 0.020 % + 2.0 kΩ 0.041 % + 2.4 kΩ 0.24 % + 78 kΩ 1.2 % + 0.39 MΩ	Fluke 552XA
Fixed Points	1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 kΩ 1.9 kΩ 10 kΩ 19 kΩ 100 kΩ 190 kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	87 µΩ/Ω 89 µΩ/Ω 24 µΩ/Ω 26 µΩ/Ω 11 µΩ/Ω 11 µΩ/Ω 8.1 µΩ/Ω 8.1 µΩ/Ω 8.1 µΩ/Ω 8.3 µΩ/Ω 12 µΩ/Ω 11 µΩ/Ω 21 µΩ/Ω 25 µΩ/Ω 38 µΩ/Ω 46 µΩ/Ω 99 µΩ/Ω	Fluke 5720A
	1 mΩ 10 mΩ 100 mΩ 1 Ω 10 kΩ	0.12 % 0.10 % 0.15 % 44 µΩ/Ω 7.1 µΩ/Ω	L&N 4363 L&N 4361 L&N 4360 L&N 4210 ESI SR104
Decade Resistance Generate	10 MΩ 20 MΩ 30 MΩ 40 MΩ 50 MΩ 60 MΩ 70 MΩ 80 MΩ 90 MΩ 100 MΩ 110 MΩ	70 µΩ/Ω 75 µΩ/Ω 75 µΩ/Ω 75 µΩ/Ω 75 µΩ/Ω 77 µΩ/Ω 82 µΩ/Ω 76 µΩ/Ω 76 µΩ/Ω 76 µΩ/Ω 76 µΩ/Ω	ESI SR1050
Fixed Resistor	1.0 GΩ: 100 V 200 V 1000 V 5000 V	 0.0078 % 0.0077 % 0.041 % 0.035 %	Ohm-Labs 109

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
DC Resistance – Generate (cont)			
Fixed Resistor	10 GΩ: 100 V 200 V 1000 V 5000 V 100 GΩ: 200 V 500 V 1000 V 5000 V 1 TΩ: 200 V 500 V 1000 V 5000 V	 0.11 % 0.025 % 0.061 % 0.065 % 0.63 % 0.64 % 0.91 % 0.92 % 12 % 12 % 14 % 14 %	 Ohm-Labs 110 Ohm-Labs 111 Ohm-Labs 112
DC Resistance – Measure	Up to 10 Ω (10 to 100) Ω (0.1 to 1) kΩ (1 to 10) kΩ (10 to 100) kΩ (0.1 to 1) MΩ (1 to 10) MΩ (10 to 100) MΩ (0.1 to 1.0) GΩ	18 µΩ/Ω + 58 µΩ 15 µΩ/Ω + 0.58 mΩ 12 µΩ/Ω + 0.63 mΩ 12 µΩ/Ω + 6.3 mΩ 12 µΩ/Ω + 63 mΩ 31 µΩ/Ω + 2.4 Ω 73 µΩ/Ω + 0.12 kΩ 0.15 % + 1.2 kΩ 0.58 % + 12 kΩ	Agilent 3458A

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
AC Voltage – Generate			
(0 to 2.2) mV	(20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	0.032 % + 3.9 µV 0.032 % + 3.9 µV 0.058 % + 3.9 µV 0.070 % + 4.7 µV 0.64 % + 9.3 µV 0.64 % + 20 µV 1.1 % + 20 µV	Fluke 5720A

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
AC Voltage – Generate (cont)			
(2.2 to 22) mV	(20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	0.016 % + 3.9 µV 0.016 % + 3.9 µV 0.021 % + 3.9 µV 0.049 % + 4.7 µV 0.14 % + 9.3 µV 0.17 % + 20 µV 0.38 % + 20 µV	Fluke 5720A
(22 to 220) mV	(20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	92 µV/V + 6.2 µV 83 µV/V + 6.2 µV 0.020 % + 6.2 µV 0.047 % + 16 µV 0.087 % + 20 µV 0.14 % + 24 µV 0.28 % + 47 µV	
(0.22 to 2.2) V	(20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	87 µV/V + 16 µV 45 µV/V + 7.8 µV 72 µV/V + 9.3 µV 0.011 % + 31 µV 0.041 % + 78 µV 0.094 % + 0.20 mV 0.17 % + 0.31 mV	
(2.2 to 22) V	(20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (300 to 500) kHz (0.5 to 1) MHz	89 µV/V + 0.16 mV 47 µV/V + 55 µV 72 µV/V + 93 µV 0.010 % + 0.20 mV 0.034 % + 0.62 mV 0.096 % + 2.0 mV 0.19 % + 3.1 mV	
(22 to 220) V	(20 to 40) Hz (0.04 to 20) kHz (20 to 50) kHz (50 to 100) kHz	88 µV/V + 1.6 mV 54 µV/V + 0.55 mV 79 µV/V + 0.93 mV 0.017 % + 2.4 mV	
(220 to 1100) V	(0.05 to 1) kHz	81 µV/V + 3.1 mV	

Parameter/Range	Frequency	CMC[2, 4, 5] (±)	Comments
AC Voltage – Measure			
(0 to 10) mV	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.027 % + 1.3 µV 0.036 % + 1.3 µV 0.12 % + 1.3 µV 0.62 % + 1.3 µV 5.0 % + 2.3 µV	Agilent 3458A synchronous sub-sampled mode
(10 to 100) mV	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	85 µV/V + 2.3 µV 0.017 % + 2.3 µV 0.035 % + 2.3 µV 0.10 % + 2.3 µV 0.40 % + 12 µV 1.2 % + 12 µV	
(0.1 to 1) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	91 µV/V + 23 µV 0.017 % + 23 µV 0.035 % + 23 µV 0.093 % + 23 µV 0.36 % + 0.12 mV 0.67 % + 0.12 mV	
(1 to 10) V	(1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz (0.3 to 1) MHz	92 µV/V + 0.47 mV 94 µV/V + 0.23 mV 0.018 % + 0.23 mV 0.037 % + 0.23 mV 0.11 % + 0.23 mV 0.45 % + 1.2 mV 1.2 % + 1.2 mV	
(10 to 100) V	40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	0.024 % + 2.3 mV 0.024 % + 2.3 mV 0.041 % + 2.3 mV 0.14 % + 2.3 mV	
(100 to 700) V	40 Hz to 1 kHz (1 to 20) kHz	0.047 % + 17 mV 0.072 % + 17 mV	
(0.5 to 2) kV (2 to 20) kV	60 Hz 60 Hz	0.18 % + 2.3 V 0.19 % + 23 V	Vitrek 4600A
(10 to 100) kV	60 Hz	1.4 %	Ross VMP200

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
AC Current – Generate			
Up to 220 µA	(0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.039 % + 7.8 nA 0.046 % + 12 nA 0.11 % + 62 nA	Fluke 5720A
(0.22 to 2.2) mA	(0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.012 % + 31 nA 0.020 % + 0.11 µA 0.11 % + 0.62 µA	
(2.2 to 22) mA	(0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.012 % + 0.31 µA 0.021 % + 0.55 µA 0.11 % + 4.7 µA	
(22 to 220) mA	(0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.013 % + 2.4 µA 0.021 % + 3.1 µA 0.11 % + 9.3 µA	
(0.22 to 2.2) A	(0.04 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.026 % + 31 µA 0.043 % + 78 µA 0.63 % + 0.16 mA	
(1.1 to 3.0) A	(10 to 45) Hz (0.045 to 1) kHz (1 to 5) kHz (5 to 10) kHz	0.15 % + 78 µA 0.059 % + 78 µA 0.47 % + 0.78 mA 2.0 % + 3.9 mA	Fluke 552XA
(3 to 11) A	(45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	0.053 % + 1.6 mA 0.082 % + 1.6 mA 2.5 % + 1.6 mA	
(11 to 20.5) A	(45 to 100) Hz (0.1 to 1) kHz (1 to 5) kHz	0.10 % + 3.9 mA 0.19 % + 3.9 mA 2.4 % + 3.9 mA	
Clamp-On Only (Toroidal-Type)			
(10 to 16.5) A	(45 to 65) Hz (65 to 440) Hz	0.39 % + 3.6 mA 0.97 % + 3.6 mA	Fluke 552XA w/ 5500/coil
(16.5 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.39 % + 29 mA 0.99 % + 32 mA	
(150 to 1025) A	(45 to 65) Hz (65 to 440) Hz	0.69 % + 0.22 A 0.95 % + 0.23 A	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
AC Current – Generate (cont)			
Clamp-On Only (Other-Type)			
(10 to 16.5) A	(45 to 65) Hz (65 to 440) Hz	1.1 % + 35 mA 1.2 % + 35 mA	Fluke 552XA w/ 5500/coil
(16.5 to 150) A	(45 to 65) Hz (65 to 440) Hz	0.69 % + 0.29 A 1.3 % + 0.29 A	
(150 to 1025) A	(45 to 65) Hz (65 to 440) Hz	0.70 % + 1.1 A 1.2 % + 1.1 A	
AC Current – Measure			
Up to 100 µA	45 Hz to 1 kHz	0.072 % + 35 nA	Agilent 3458A
(0.1 to 1) mA	(45 to 100) Hz (0.1 to 5) kHz (5 to 10) kHz	0.070 % + 0.23 µA 0.036 % + 0.23 µA 0.070 % + 0.23 µA	
(1 to 10) mA	(45 to 100) Hz (0.1 to 5) kHz (5 to 10) kHz	0.070 % + 2.3 µA 0.036 % + 2.3 µA 0.036 % + 2.3 µA	
(10 to 100) mA	(45 to 100) Hz (0.1 to 5) kHz (5 to 10) kHz	0.070 % + 23 µA 0.036 % + 23 µA 0.070 % + 23 µA	
(0.1 to 1) A	(45 to 100) Hz (0.1 to 5) kHz	0.094 % + 0.23 mA 0.12 % + 0.23 mA	
Up to 10 A	(50 to 100) Hz (100 to 300) Hz (0.3 to 1) kHz (1 to 3) kHz (3 to 4) kHz (4 to 5) kHz	0.032 % + 13 mA 0.033 % + 13 mA 0.040 % + 13 mA 0.069 % + 13 mA 0.83 % + 13 mA 0.94 % + 13 mA	Fluke Y5020 w/ Agilent 3458A
(10 to 20) A	(50 to 100) Hz (100 to 300) Hz (0.3 to 1) kHz (1 to 3) kHz (3 to 4) kHz (4 to 5) kHz	0.036 % + 23 mA 0.036 % + 23 mA 0.042 % + 23 mA 0.067 % + 23 mA 0.081 % + 23 mA 0.097 % + 23 mA	

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
AC Current – Measure (cont)			
Up to 500 A	(60 to 400) Hz	0.07 % + 1.2 A	Yokogawa WT3000 w/ CT
AC Power – Generate			
(45 to 65) Hz (PF = 1)			
(3.3 to 30) mA	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.041 % + 4.8 µW 0.037 % + 37 µW 0.043 % + 0.37 mW 0.040 % + 1.2 mW 0.047 % + 6.1 mW	Fluke 552XA
(33 to 330) mA	(33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.037 % + 49 µW 0.037 % + 0.37 mW 0.037 % + 3.7 mW 0.038 % + 12 mW 0.046 % + 61 mW	
(29 to 330) µA	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.14 % 0.13 % 0.13 % 0.14 % 0.13 % 0.13 %	
(0.33 to 3.3) mA	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.10 % 0.085 % 0.085 % 0.085 % 0.084 % 0.089 %	
(3.3 to 33) mA	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.053 % 0.041 % 0.041 % 0.041 % 0.043 % 0.050 %	
(33 to 330) mA	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V	0.053 % 0.041 % 0.041 %	

Parameter/Equipment	Range	CMC[2, 4, 5] (±)	Comments
AC Power – Generate (cont)			
(45 to 65) Hz (PF = 1)			
(33 to 330) mA	(3.3 to 33) V (33 to 330) V (330 to 1020) V	0.041 % 0.043 % 0.048 %	Fluke 552XA
(0.33 to 1.1) A	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.063 % 0.052 % 0.052 % 0.052 % 0.052 % 0.054 %	
(1.1 to 3) A	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.072 % 0.061 % 0.061 % 0.060 % 0.061 % 0.065 %	
(3 to 11) A	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.080 % 0.072 % 0.072 % 0.072 % 0.072 % 0.072 %	
(11 to 20.5) A	(1 to 33) mV (33 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1020) V	0.12 % 0.12 % 0.12 % 0.12 % 0.12 % 0.12 %	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Capacitance – Generate			
(0.19 to 0.4) nF	(0.01 to 10) kHz	0.68 % + 7.8 pF	Fluke 552XA
(0.4 to 1.1) nF	(0.01 to 10) kHz	0.46 % + 7.8 pF	
(1.1 to 3.3) nF	(0.01 to 3) kHz	0.41 % + 7.8 pF	
(3.3 to 11) nF	(0.01 to 1) kHz	0.22 % + 7.8 pF	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Capacitance – Generate (cont)			
(11 to 33) nF	(0.01 to 1) kHz	0.21 % + 78 pF	Fluke 552XA
(33 to 110) nF	(0.01 to 1) kHz	0.21 % + 78 pF	
(110 to 330) nF	(0.01 to 1) kHz	0.21 % + 0.24 nF	
(0.33 to 1.1) µF	(10 to 600) Hz	0.21 % + 0.78 nF	
(1.1 to 3.3) µF	(10 to 300) Hz	0.21 % + 2.4 nF	
(3.3 to 11) µF	(10 to 150) Hz	0.22 % + 7.8 nF	
(11 to 33) µF	(10 to 120) Hz	0.34 % + 24 nF	
(33 to 110) µF	(10 to 80) Hz	0.37 % + 78 nF	
(110 to 330) µF	(10 to 50) Hz	0.38 % + 0.24 µF	
(0.33 to 1.1) mF	(10 to 20) Hz	0.39 % + 0.78 µF	
(1.1 to 3.3) mF	(0 to 6) Hz	0.37 % + 2.4 µF	
(3.3 to 11) mF	(0 to 2) Hz	0.38 % + 7.8 µF	
(11 to 33) mF	(0 to 0.6) Hz	0.60 % + 24 µF	
(33 to 110) mF	(0 to 0.2) Hz	0.87 % + 78 µF	
Oscilloscope –			
Level Sine Wave– Amplitude Characteristics (50 kHz)	5 mVp-p	1.6 % + 0.24 mV	Fluke 5820A
	10 mVp-p	1.7 % + 0.24 mV	
	20 mVp-p	1.7 % + 0.24 mV	
	50 mVp-p	1.7 % + 0.24 mV	
	100 mVp-p	1.7 % + 0.24 mV	
	200 mVp-p	1.7 % + 0.24 mV	
	0.5 Vp-p	1.7 % + 0.24 mV	
	1 Vp-p	1.7 % + 0.24 mV	
	2 Vp-p	1.7 % + 0.24 mV	
	3.5 Vp-p	1.6 % + 0.24 mV	
	5 Vp-p	1.6 % + 0.24 mV	
Leveled Sine Flatness Test (50 kHz)			
5.5 V	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.2 % + 0.24 mV	
	200 MHz	2.4 % + 0.24 mV	
	300 MHz	2.4 % + 0.24 mV	
	400 MHz	3.3 % + 0.24 mV	
	500 MHz	3.4 % + 0.24 mV	
	600 MHz	3.7 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
3.4 V	1 MHz 10 MHz 50 MHz 100 MHz 200 MHz 300 MHz 400 MHz 500 MHz 600 MHz 700 MHz 800 MHz 900 MHz 1.0 GHz 1.1 GHz 1.2 GHz 1.3 GHz 1.4 GHz 1.5 GHz 1.6 GHz 1.7 GHz 1.8 GHz 1.9 GHz 2.0 GHz 2.1 GHz 500 kHz 1 MHz 10 MHz 50 MHz 100 MHz 200 MHz 300 MHz 400 MHz 500 MHz 600 MHz 700 MHz 800 MHz 900 MHz	2.0 % + 0.24 mV 2.0 % + 0.24 mV 2.1 % + 0.24 mV 2.2 % + 0.24 mV 2.2 % + 0.24 mV 2.5 % + 0.24 mV 2.8 % + 0.24 mV 3.3 % + 0.24 mV 3.6 % + 0.24 mV 4.6 % + 0.24 mV 4.4 % + 0.24 mV 4.4 % + 0.24 mV 4.5 % + 0.24 mV 4.7 % + 0.24 mV 5.1 % + 0.24 mV 4.9 % + 0.24 mV 4.5 % + 0.24 mV 4.5 % + 0.24 mV 4.4 % + 0.24 mV 5.7 % + 0.24 mV 5.5 % + 0.24 mV 5.2 % + 0.24 mV 5.1 % + 0.24 mV 5.1 % + 0.24 mV 2.0 % + 0.24 mV 2.0 % + 0.24 mV 2.0 % + 0.24 mV 2.2 % + 0.24 mV 2.1 % + 0.24 mV 2.5 % + 0.24 mV 2.5 % + 0.24 mV 3.6 % + 0.24 mV 3.4 % + 0.24 mV 3.8 % + 0.24 mV 4.4 % + 0.24 mV 4.3 % + 0.24 mV 4.4 % + 0.24 mV	Fluke 5820A

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			Fluke 5820A
1.3 V	1.0 GHz	4.3 % + 0.24 mV	
	1.1 GHz	4.5 % + 0.24 mV	
	1.2 GHz	5.0 % + 0.24 mV	
	1.3 GHz	4.5 % + 0.24 mV	
	1.4 GHz	4.6 % + 0.24 mV	
	1.5 GHz	4.6 % + 0.24 mV	
	1.6 GHz	4.6 % + 0.24 mV	
	1.7 GHz	6.4 % + 0.24 mV	
	1.8 GHz	6.1 % + 0.24 mV	
	1.9 GHz	5.5 % + 0.24 mV	
	2.0 GHz	5.4 % + 0.24 mV	
	2.1 GHz	5.7 % + 0.24 mV	
1.2 V	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.1 % + 0.24 mV	
	100 MHz	2.1 % + 0.24 mV	
	200 MHz	2.4 % + 0.24 mV	
	300 MHz	2.5 % + 0.24 mV	
	400 MHz	3.3 % + 0.24 mV	
	500 MHz	3.3 % + 0.24 mV	
	600 MHz	3.9 % + 0.24 mV	
	700 MHz	4.6 % + 0.24 mV	
	800 MHz	4.3 % + 0.24 mV	
	900 MHz	4.4 % + 0.24 mV	
	1.0 GHz	4.3 % + 0.24 mV	
	1.1 GHz	4.3 % + 0.24 mV	
	1.2 GHz	4.5 % + 0.24 mV	
	1.3 GHz	4.4 % + 0.24 mV	
	1.4 GHz	4.4 % + 0.24 mV	
	1.5 GHz	4.4 % + 0.24 mV	
	1.6 GHz	5.3 % + 0.24 mV	
	1.7 GHz	5.3 % + 0.24 mV	
	1.8 GHz	5.5 % + 0.24 mV	
	1.9 GHz	5.2 % + 0.24 mV	
	2.0 GHz	5.1 % + 0.24 mV	
	2.1 GHz	5.1 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
400 mV	500 kHz	2.0 % + 0.24 mV	Fluke 5820A
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.2 % + 0.24 mV	
	200 MHz	2.5 % + 0.24 mV	
	300 MHz	2.5 % + 0.24 mV	
	400 MHz	4.1 % + 0.24 mV	
	500 MHz	3.7 % + 0.24 mV	
	600 MHz	3.8 % + 0.24 mV	
	700 MHz	5.4 % + 0.24 mV	
	800 MHz	4.9 % + 0.24 mV	
	900 MHz	5.0 % + 0.24 mV	
	1.0 GHz	4.7 % + 0.24 mV	
	1.1 GHz	4.8 % + 0.24 mV	
	1.2 GHz	5.3 % + 0.24 mV	
	1.3 GHz	5.0 % + 0.24 mV	
	1.4 GHz	4.9 % + 0.24 mV	
	1.5 GHz	4.8 % + 0.24 mV	
	1.6 GHz	5.5 % + 0.24 mV	
	1.7 GHz	6.4 % + 0.24 mV	
	1.8 GHz	6.1 % + 0.24 mV	
	1.9 GHz	5.4 % + 0.24 mV	
	2.0 GHz	5.6 % + 0.24 mV	
	2.1 GHz	6.2 % + 0.24 mV	
399 mV	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.1 % + 0.24 mV	
	200 MHz	2.4 % + 0.24 mV	
	300 MHz	2.5 % + 0.24 mV	
	400 MHz	3.4 % + 0.24 mV	
	500 MHz	3.3 % + 0.24 mV	
	600 MHz	3.8 % + 0.24 mV	
	700 MHz	4.6 % + 0.24 mV	
	800 MHz	4.3 % + 0.24 mV	
	900 MHz	4.5 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
399 mV	1.0 GHz	4.3 % + 0.24 mV	Fluke 5820A
	1.1 GHz	4.4 % + 0.24 mV	
	1.2 GHz	4.4 % + 0.24 mV	
	1.3 GHz	4.5 % + 0.24 mV	
	1.4 GHz	4.4 % + 0.24 mV	
	1.5 GHz	4.4 % + 0.24 mV	
	1.6 GHz	4.5 % + 0.24 mV	
	1.7 GHz	5.5 % + 0.24 mV	
	1.8 GHz	5.2 % + 0.24 mV	
	1.9 GHz	5.1 % + 0.24 mV	
	2.0 GHz	5.1 % + 0.24 mV	
	2.1 GHz	5.1 % + 0.24 mV	
100 mV	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.1 % + 0.24 mV	
	100 MHz	2.2 % + 0.24 mV	
	200 MHz	2.5 % + 0.24 mV	
	300 MHz	2.5 % + 0.24 mV	
	400 MHz	4.2 % + 0.24 mV	
	500 MHz	3.7 % + 0.24 mV	
	600 MHz	3.6 % + 0.24 mV	
	700 MHz	5.2 % + 0.24 mV	
	800 MHz	4.8 % + 0.24 mV	
	900 MHz	4.9 % + 0.24 mV	
	1.0 GHz	4.6 % + 0.24 mV	
	1.1 GHz	4.5 % + 0.24 mV	
	1.2 GHz	5.1 % + 0.24 mV	
	1.3 GHz	5.1 % + 0.24 mV	
	1.4 GHz	4.8 % + 0.24 mV	
	1.5 GHz	4.7 % + 0.24 mV	
	1.6 GHz	4.8 % + 0.24 mV	
	1.7 GHz	6.4 % + 0.24 mV	
	1.8 GHz	6.1 % + 0.24 mV	
	1.9 GHz	5.3 % + 0.24 mV	
	2.0 GHz	5.6 % + 0.24 mV	
	2.1 GHz	6.1 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
99 mV	500 kHz	2.0 % + 0.24 mV	Fluke 5820A
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.2 % + 0.24 mV	
	200 MHz	2.4 % + 0.24 mV	
	300 MHz	2.5 % + 0.24 mV	
	400 MHz	3.3 % + 0.24 mV	
	500 MHz	3.3 % + 0.24 mV	
	600 MHz	3.6 % + 0.24 mV	
	700 MHz	4.6 % + 0.24 mV	
	800 MHz	4.3 % + 0.24 mV	
	900 MHz	4.3 % + 0.24 mV	
	1.0 GHz	4.4 % + 0.24 mV	
	1.1 GHz	4.4 % + 0.24 mV	
	1.2 GHz	4.4 % + 0.24 mV	
	1.3 GHz	4.4 % + 0.24 mV	
	1.4 GHz	4.4 % + 0.24 mV	
	1.5 GHz	4.3 % + 0.24 mV	
	1.6 GHz	4.5 % + 0.24 mV	
	1.7 GHz	5.7 % + 0.24 mV	
	1.8 GHz	5.3 % + 0.24 mV	
	1.9 GHz	5.1 % + 0.24 mV	
	2.0 GHz	5.1 % + 0.24 mV	
	2.1 GHz	5.1 % + 0.24 mV	
40 mV	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.2 % + 0.24 mV	
	50 MHz	2.3 % + 0.24 mV	
	100 MHz	2.3 % + 0.24 mV	
	200 MHz	2.6 % + 0.24 mV	
	300 MHz	2.6 % + 0.24 mV	
	400 MHz	4.1 % + 0.24 mV	
	500 MHz	3.7 % + 0.24 mV	
	600 MHz	3.9 % + 0.24 mV	
	700 MHz	4.4 % + 0.24 mV	
	800 MHz	4.4 % + 0.24 mV	
	900 MHz	4.4 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
40 mV	1.0 GHz	4.5 % + 0.24 mV	Fluke 5820A
	1.1 GHz	4.4 % + 0.24 mV	
	1.2 GHz	4.5 % + 0.24 mV	
	1.3 GHz	4.4 % + 0.24 mV	
	1.4 GHz	4.4 % + 0.24 mV	
	1.5 GHz	4.3 % + 0.24 mV	
	1.6 GHz	4.5 % + 0.24 mV	
	1.7 GHz	5.7 % + 0.24 mV	
	1.8 GHz	5.3 % + 0.24 mV	
	1.9 GHz	5.1 % + 0.24 mV	
	2.0 GHz	5.1 % + 0.24 mV	
	2.1 GHz	5.1 % + 0.24 mV	
39 mV	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.2 % + 0.24 mV	
	200 MHz	2.4 % + 0.24 mV	
	300 MHz	2.4 % + 0.24 mV	
	400 MHz	4.1 % + 0.24 mV	
	500 MHz	3.6 % + 0.24 mV	
	600 MHz	3.6 % + 0.24 mV	
	700 MHz	4.4 % + 0.24 mV	
	800 MHz	4.5 % + 0.24 mV	
	900 MHz	4.6 % + 0.24 mV	
	1.0 GHz	4.6 % + 0.24 mV	
	1.1 GHz	4.6 % + 0.24 mV	
	1.2 GHz	5.1 % + 0.24 mV	
	1.3 GHz	4.8 % + 0.24 mV	
	1.4 GHz	5.2 % + 0.24 mV	
	1.5 GHz	5.1 % + 0.24 mV	
	1.6 GHz	4.8 % + 0.24 mV	
	1.7 GHz	6.3 % + 0.24 mV	
	1.8 GHz	5.7 % + 0.24 mV	
	1.9 GHz	5.2 % + 0.24 mV	
	2.0 GHz	5.1 % + 0.24 mV	
	2.1 GHz	6.1 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
10 mV	500 kHz	2.0 % + 0.24 mV	Fluke 5820A
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.2 % + 0.24 mV	
	200 MHz	2.4 % + 0.24 mV	
	300 MHz	2.4 % + 0.24 mV	
	400 MHz	4.1 % + 0.24 mV	
	500 MHz	3.6 % + 0.24 mV	
	600 MHz	3.6 % + 0.24 mV	
	700 MHz	4.4 % + 0.24 mV	
	800 MHz	4.5 % + 0.24 mV	
	900 MHz	4.6 % + 0.24 mV	
	1.0 GHz	4.6 % + 0.24 mV	
	1.1 GHz	4.6 % + 0.24 mV	
	1.2 GHz	5.1 % + 0.24 mV	
	1.3 GHz	4.8 % + 0.24 mV	
	1.4 GHz	5.2 % + 0.24 mV	
	1.5 GHz	5.1 % + 0.24 mV	
	1.6 GHz	4.8 % + 0.24 mV	
	1.7 GHz	6.3 % + 0.24 mV	
	1.8 GHz	6.1 % + 0.24 mV	
	1.9 GHz	5.3 % + 0.24 mV	
	2.0 GHz	5.1 % + 0.24 mV	
	2.1 GHz	6.1 % + 0.24 mV	
5 mV	500 kHz	2.0 % + 0.24 mV	
	1 MHz	2.0 % + 0.24 mV	
	10 MHz	2.0 % + 0.24 mV	
	50 MHz	2.2 % + 0.24 mV	
	100 MHz	2.3 % + 0.24 mV	
	200 MHz	2.6 % + 0.24 mV	
	300 MHz	2.6 % + 0.24 mV	
	400 MHz	3.6 % + 0.24 mV	
	500 MHz	3.5 % + 0.24 mV	
	600 MHz	3.7 % + 0.24 mV	
	700 MHz	5.1 % + 0.24 mV	
	800 MHz	4.5 % + 0.24 mV	
	900 MHz	4.7 % + 0.24 mV	

Parameter/Range	Frequency	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Leveled Sine Flatness Test (50 kHz)			
5 mV	1.0 GHz 1.1 GHz 1.2 GHz 1.3 GHz 1.4 GHz 1.5 GHz 1.6 GHz 1.7 GHz 1.8 GHz 1.9 GHz 2.0 GHz 2.1 GHz	4.5 % + 0.24 mV 4.5 % + 0.24 mV 4.5 % + 0.24 mV 4.5 % + 0.24 mV 4.5 % + 0.24 mV 4.5 % + 0.24 mV 4.6 % + 0.24 mV 6.8 % + 0.24 mV 5.8 % + 0.24 mV 5.3 % + 0.24 mV 5.2 % + 0.24 mV 5.2 % + 0.24 mV	Fluke 5820A
10 mV	200 MHz 300 MHz 400 MHz 500 MHz 600 MHz	3.8 % + 0.24 mV 4.2 % + 0.24 mV 5.5 % + 0.24 mV 5.5 % + 0.24 mV 5.6 % + 0.24 mV	

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Oscilloscope –			
Amplitude/Vertical Gain Characteristics – Volt Function			
DC, Square @ 1 kHz (1 MΩ)	1.8 mV_{pk-pk} 12 mV_{pk-pk} 22 mV_{pk-pk} 56 mV_{pk-pk} 90 mV_{pk-pk} 155 mV_{pk-pk} 220 mV_{pk-pk} 560 mV_{pk-pk} 0.9 V_{pk-pk} 3.75 V_{pk-pk} 6.6 V_{pk-pk} 30.8 V_{pk-pk} 55 V_{pk-pk}	1.3 % + 32 µV 1.6 % + 32 µV 0.080 % + 32 µV 0.080 % + 32 µV 0.080 % + 32 µV 0.090 % + 32 µV 0.090 % + 32 µV 0.080 % + 32 µV 0.10 % + 32 µV 0.090 % + 32 µV 0.10 % + 32 µV 0.080 % + 32 µV 0.080 % + 32 µV	Fluke 5820A

Parameter/Equipment	Range	CMC[2, 5] (±)	Comments
Oscilloscope – (cont)			
Amplitude/Vertical Gain Characteristics – Volt Function			
Square @ 1 kHz (50 Ω)	1.8 mV_{pk-pk} 6.4 mV_{pk-pk} 10.9 mV_{pk-pk} 28 mV_{pk-pk} 44.9 mV_{pk-pk} 78 mV_{pk-pk} 110 mV_{pk-pk} 280 mV_{pk-pk} 0.45 V_{pk-pk} 0.78 V_{pk-pk} 1.1 V_{pk-pk} 2.5 V_{pk-pk}	1.5 % + 32 µV 0.65 % + 32 µV 0.79 % + 32 µV 0.23 % + 32 µV 0.22 % + 32 µV 0.72 % + 32 µV 0.44 % + 32 µV 0.43 % + 32 µV 0.39 % + 32 µV 0.38 % + 32 µV 0.52 % + 32 µV 0.48 % + 32 µV	Fluke 5820A
Leveled Sine Frequency Source	(0.05 to 600) MHz (0.6 to 2.1) GHz	10 µHz/Hz 28 µHz/Hz	
Time Marker	2.0 ns 5.0 ns 10.0 ns 20.0 ns 50.0 ns 100.0 ns 10.0 ms 20.0 ms 50.0 ms 100 ms 2.0 s 5.0 s	2.3 ms/s 1.6 ms/s 0.90 ms/s 0.60 ms/s 0.60 ms/s 68 ms/s 0.20 ms/s 3.5 ms/s 58 ms/s 0.20 ms/s 1.7 ms/s 4.0 ms/s	
Rise Time: 0.4 V @ 1 MHz	≤ 150 ps	250 ps	
4 mV to 2.5 V_{pk-pk} 1 kHz to 10 MHz	≤ 300 ps	250 ps	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Calibration of Thermocouple Indicators –			
Type J	(-210 to -100) °C (-100 to -30) °C (-30 to 150) °C (150 to 760) °C (760 to 1200) °C	0.24 °C 0.17 °C 0.57 °C 0.21 °C 0.24 °C	Fluke 552XA
Type K	(-200 to -100) °C (-100 to -25) °C (-25 to 120) °C (120 to 1000) °C (1000 to 1372) °C	0.28 °C 0.19 °C 0.22 °C 0.26 °C 0.70 °C	
Type T	(-250 to -150) °C (-150 to 0) °C (0 to 120) °C (120 to 400) °C	0.51 °C 0.22 °C 0.17 °C 0.19 °C	
Electrical Calibration of RTDs –			
Pt 385, 100 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C (630 to 800) °C	0.065 °C 0.088 °C 0.088 °C 0.094 °C 0.11 °C 0.19 °C	Fluke 552XA
Pt 3926, 100 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 630) °C	0.065 °C 0.075 °C 0.087 °C 0.093 °C 0.11 °C	
Pt 3916, 100 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.039 °C 0.055 °C 0.063 °C 0.063 °C 0.070 °C 0.11 °C	

Parameter/Equipment	Range	CMC[2] (±)	Comments
Electrical Calibration of RTDs – (cont)			
Pt 385, 500 Ω	(-200 to 0) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.032 °C 0.039 °C 0.063 °C 0.063 °C 0.071 °C 0.086 °C	Fluke 552XA
Pt 385, 1 kΩ	(-200 to -80) °C (0 to 100) °C (100 to 300) °C (300 to 400) °C (400 to 600) °C (600 to 630) °C	0.025 °C 0.039 °C 0.057 °C 0.057 °C 0.057 °C 0.18 °C	
Ni 120, 120 Ω	(-80 to 0) °C (0 to 100) °C (100 to 260) °C	0.079 °C 0.055 °C 0.040 °C	
Cu 427, 10 Ω	(-100 to 260) °C	0.094 °C	

II. Electrical – RF/Microwave

Parameter/Range	Frequency	CMC[2, 3] (±)	Comments
LISN			
Insertion Loss	(0 to 110) dB 9 kHz to 108 MHz (108 to 400) MHz	 0.23 dB 0.26 dB	ANSI C63.4 CISPR 25 & CISPR 16-1- 2,
Impedance – Magnitude	(0 to 5000) Ω 9 kHz to 108 MHz (108 to 400) MHz	 0.90 Ω 2.2 Ω	ISO 7637-2, MIL-STD461, RTCA DO-160 CISPR 22,
Phase	(0 to 360)° 9 kHz to 108 MHz (108 to 400) MHz	 0.79° 3.9°	CISPR 32 Agilent E5061B Agilent 85032B
Isolation	(0 to 110) dB 9 kHz to 400 MHz	 0.24 dB	

Parameter/Range	Frequency	CMC[2, 3, 4, 6] (±)	Comments
CDN's & Adapters (50 to 150) Ω Adapter Insertion Loss Phase Impedance Voltage Division Factor	 (0 to 110) dB 9 kHz to 230 MHz (0 to 110) dB 9 kHz to 230 MHz (0 to 5000) Ω 9 kHz to 230 MHz (0 to 110) dB 9 kHz to 230 MHz	 0.20 dB 1.2° 2.5 Ω 0.44 dB	 IEC/EN 61000-4-6 CISPR 16-1-2 CISPR 15, CISPR 16-2-1, CISPR 22 Agilent E5061B Agilent 85032B
RF Laser Isotropic E-Field Probe – TEM Cell – Frequency Response Linearity Isotropic Response LF Chamber – Frequency Response Isotropic Response Anechoic Chamber – Frequency Response Isotropic Relative Deviation	 5 kHz to 200 MHz (-6 to 10) dB (5 to 300) V/m (0 to 10) dB (300 to 1800) MHz (-10 to 13) dB (0 to 10) dB (1.8 to 45.5) GHz (-10 to 13) dB (0 to 10) dB	 0.64 dB 2.0 dB 0.64 dB 0.90 dB 0.90 dB 1.1 dB 1.1 dB	 IEEE 1309 substitution method Transfer standards: NBM-520, EF0391, EF5091, EA5091
RF Power – Measure Power Reference 1 mW, Type-N(f) 50 Ω	 50 MHz	 0.60 %	 Agilent 432A w/ 478A-H75

Parameter/Range	Frequency	CMC[2, 3, 4, 6] (±)	Comments
Electrical – RF/Microwave Tuned RF Power Measure			
(0 to -10) dB	100 kHz to 2 GHz	0.18 dB	Keysight E4448A w/ N5532B-504, N5532A-550, & source
(-10 to -20) dB		0.23 dB	
(-20 to -30) dB		0.28 dB	
(-30 to -40) dB		0.33 dB	
(-40 to -50) dB		0.39 dB	
(-50 to -60) dB		0.45 dB	
(-60 to -70) dB		0.53 dB	
(-70 to -80) dB		0.57 dB	
(-80 to -90) dB		0.64 dB	
(-90 to -100) dB		0.68 dB	
(-100 to -110) dB		0.76 dB	
(-110 to -120) dB		0.79 dB	
(-120 to -129) dB		0.86 dB	
(0 to -10) dB	(2 to 10) GHz	0.24 dB	
(-10 to -20) dB		0.26 dB	
(-20 to -30) dB		0.29 dB	
(-30 to -40) dB		0.31 dB	
(-40 to -50) dB		0.34 dB	
(-50 to -60) dB		0.37 dB	
(-60 to -70) dB		0.41 dB	
(-70 to -80) dB		0.45 dB	
(-80 to -90) dB		0.49 dB	
(-90 to -100) dB		0.53 dB	
(-100 to -110) dB		0.57 dB	
(-110 to -120) dB		0.61 dB	
(-120 to -130) dB		0.64 dB	
(-130 to -140) dB		0.68 dB	
(0 to -10) dB	(10 to 18) GHz	0.24 dB	
(-10 to -20) dB		0.26 dB	
(-20 to -30) dB		0.29 dB	
(-30 to -40) dB		0.31 dB	
(-40 to -50) dB		0.34 dB	
(-50 to -60) dB		0.38 dB	
(-60 to -70) dB		0.41 dB	
(-70 to -80) dB		0.45 dB	
(-80 to -90) dB		0.49 dB	
(-90 to -100) dB		0.53 dB	
(-100 to -110) dB		0.57 dB	
(-110 to -120) dB		0.61 dB	
(-120 to -130) dB		0.64 dB	
(-130 to -137) dB		0.68 dB	

Parameter/Range	Frequency	CMC[2, 3, 4, 6] (±)	Comments
Electrical – RF/Microwave Tuned RF Power Measure (cont)			
(0 to -10) dB	(18 to 26.5) GHz	0.35 dB	Keysight E4448A w/ N5532B-504, N5532A-550, & source
(-10 to -20) dB		0.37 dB	
(-20 to -30) dB		0.38 dB	
(-30 to -40) dB		0.4 dB	
(-40 to -50) dB		0.41 dB	
(-50 to -60) dB		0.45 dB	
(-60 to -70) dB		0.49 dB	
(-70 to -80) dB		0.49 dB	
(-80 to -90) dB		0.53 dB	
(-90 to -100) dB		0.57 dB	
(-100 to -110) dB		0.61 dB	
(-110 to -120) dB		0.64 dB	
(-120 to -123) dB		0.68 dB	
(0 to -10) dB	(26.5 to 45) GHz	0.61 dB	
(-10 to -20) dB		0.61 dB	
(-20 to -30) dB		0.61 dB	
(-30 to -40) dB		0.64 dB	
(-40 to -50) dB		0.64 dB	
(-50 to -60) dB		0.64 dB	
(-60 to -70) dB		0.68 dB	
(-70 to -80) dB		0.72 dB	
(-80 to -90) dB		0.72 dB	
(-90 to -100) dB		0.76 dB	
(0 to -10) dB	(45 to 50) GHz	0.61 dB	
(-10 to -20) dB		0.61 dB	
(-20 to -30) dB		0.61 dB	
(-30 to -40) dB		0.64 dB	
(-40 to -50) dB		0.64 dB	
(-50 to -60) dB		0.64 dB	
(-60 to -70) dB		0.68 dB	
(-70 to -80) dB		0.72 dB	
(-80 to -88) dB		0.72 dB	
Amplitude Modulation – Measure			
Rate: 50 Hz to 10 kHz, Depth: (5 to 99) %	(0.15 to 10) MHz	2.5 % + 1 digit	Keysight E4448A w/ N5532A

Parameter/Range	Frequency	CMC[2, 3, 4, 6] (±)	Comments
Amplitude Modulation – Measure (cont)			
Rate: 50 Hz to 10 kHz, Depth: Up to 99 %	(0.15 to 10) MHz	3.6 % + 1 digit	Keysight E4448A w/ N5532A
50 Hz to 50 kHz, Depth: (5 to 99) %	(10 to 1300) MHz	1.4 % + 1 digit	
50 Hz to 100 kHz, Depth: Up to 99 %	(10 to 1300) MHz	3.6 % + 1 digit	
50 Hz to 100 kHz, Depth: (20 to 99) %	100 kHz to 50 GHz	5.0 %	Keysight E4448A w/ N5532B-504, N5532A-550
Frequency Modulation – Measure			
Rate: 20 Hz to 10 kHz Deviation: ≤ 40 kHz $_{peak}$	(0.25 to 10) MHz	2.3 % + 1 digit	Keysight E4448A w/ N5532A
50 Hz to 100 kHz Deviation: ≤ 400 kHz $_{peak}$	(10 to 1300) MHz	1.2 % + 1 digit	
Rate: 20 Hz to 200 kHz Deviation: ≤ 400 kHz $_{peak}$	(10 to 1300) MHz	5.8 % + 1 digit	Keysight E4448A w/ N5532B-504, N5532A-550
Rate: 50 Hz to 100 kHz, Deviation: ≤ 400 kHz $_{peak}$	(0.01 to 26.5) GHz	1.2 % + 1 digit	
Rate: 20 Hz to 200 kHz, Deviation: ≤ 400 kHz $_{peak}$	(0.01 to 26.5) GHz	5.8 % + 1 digit	
Rate: 50 Hz to 200 kHz Peak Dev ≤ 400 kHz, $\beta > 32$	250 kHz to 50 GHz	1.7 %	Keysight E4448A w/ N5532B-504, N5532A-550 β is the ratio of the frequency deviation to the modulation rate

Parameter/Range	Frequency	CMC[2, 4, 6] (±)	Comments
Phase Modulation – Measure Rate: (0.2 to 10) kHz (0.2 to 20) kHz (0.2 to 20) kHz Rate: 200 Hz to 20 kHz Deviation: > 8.0 rad	 150 kHz to 10 MHz 10 MHz to 1.3 GHz (0.01 to 26.5) GHz 100 kHz to 50 GHz	 4.6 % + 1 digit 3.5 % + 1 digit 3.5 % + 1 digit 1.0 %	 Keysight E4448A w/ N5532B-504, N5532A-550 Keysight E4448A w/ N5532B-504, N5532A-550
Harmonic Measurements (-20 to -80) dB	 100 kHz to 50 GHz	 0.39 dB	 Keysight E4448A w/ N5532B-504, N5532A-550
Single Sideband Phase Noise (SSB) – Measure CW Frequency: 10 MHz to 50 GHz	 Offset from CW: 100 Hz to 1 MHz Noise Sidebands (-97 to -156) dbc/Hz	 1.9 dB	 Keysight E4448A, w/ N5532B-504, N5532A-550
Pulse Response – Measuring Equipment (EMI Receiver) Sine Wave Accuracy Pulse Response for CISPR Bands A, B, C, & D for Absolute Amplitude & Variation with Repetition Frequency	 60 dBµV Bands A, B 40 dBµV Bands C, D Band A (0 to 120) dB (9 to 150) kHz	 0.41 dB 0.64 dB 0.57 dB	 CISPR 16-1-1 w/ Keysight E4448A, N5532B-504, N5532A-550, & IGUU 2918

Parameter/Range	Frequency	CMC[2, 4, 6] (±)	Comments
Pulse Response – Measuring Equipment (EMI Receiver) (cont)			
Pulse Response for CISPR Bands A, B, C, & D for Absolute Amplitude & Variation with Repetition Frequency	Band B (0 to 120) dB (0.15 to 30) MHz Band C (0 to 120) dB (30 to 1000) MHz Band D (0 to 120) dB (30 to 1000) MHz	0.57 dB 0.79 dB 0.68 dB	CISPR 16-1-1 w/ Keysight E4448A, N5532B-504, N5532A-550, & IGUU 2918
Reflection S_{11}/S_{22} Measure – Magnitude & Phase			
(0 to 0.25) lin	(0.1 to 100) kHz	(0.0037 to 0.0065) lin (1.5 to 180)°	Agilent E5061B & 85032B Type N precision cal kit
(0.25 to 0.5) lin		(0.0065 to 0.0093) lin (1.1 to 1.5)°	
(0.5 to 0.75) lin		(0.0093 to 0.013) lin (0.94 to 1.1)°	
(0.75 to 1) lin		(0.013 to 0.016) lin (0.90 to 0.94)°	
(0 to 0.25) lin	(0.1 to 10) MHz	(0.0037 to 0.0069) lin (1.6 to 180)°	
(0.25 to 0.5) lin		0.0069 to 0.011) lin (1.3 to 1.6)°	
(0.5 to 0.75) lin		0.011 to 0.016) lin (1.2 to 1.3)°	
(0.75 to 1) lin		0.016 to 0.021) lin (1.2)°	
(0 to 0.25) lin	(0.01 to 1) GHz	0.0037 to 0.0069) lin (1.6 to 180)°	
(0.25 to 0.5) lin		(0.0069 to 0.011) lin (1.3 to 1.6)°	

Parameter/Range	Frequency	CMC[2, 4, 6] (±)	Comments
Reflection S_{11}/S_{22} Measure – Magnitude & Phase			
(0.5 to 0.75) lin	(0.01 to 1) GHz	(0.011 to 0.016) lin (1.2 to 1.3)°	Agilent E5061B & 85032B Type N precision cal kit
(0.75 to 1) lin		(0.016 to 0.021) lin (1.2)°	
(0 to 0.25) lin	(1 to 3) GHz	(0.0050 to 0.0090) lin (2.1 to 180)°	Agilent E5061B & 85032B Type N precision cal kit
(0.25 to 0.5) lin		(0.0090 to 0.015) lin (1.7 to 2.1)°	
(0.5 to 0.75) lin		(0.015 to 0.022) lin (1.7)°	
(0.75 to 1) lin		(0.022 to 0.030) lin (1.7 to 1.8)°	
(0 to 0.25) lin	(3 to 20) GHz	(0.0080 to 0.0010) lin (180 to 2.5)°	Agilent E8364A & 85056A 2.4mm w/slide load cal kit
(0.25 to 0.5) lin		(0.0010 to 0.014) lin (2.5 to 1.5)°	
(0.5 to 0.75) lin		(0.014 to 0.019) lin (1.5 to 1.7)°	
(0.75 to 1) lin		(0.019 to 0.026) lin (1.5)°	
(0 to 0.25) lin	(20 to 40) GHz	(0.013 to 0.018) lin (180 to 4.0)°	
(0.25 to 0.5) lin		(0.018 to 0.024) lin (4.0 to 2.7)°	
(0.5 to 0.75) lin		(0.024 to 0.032) lin (2.7 to 2.5)°	
(0.75 to 1) lin		(0.032 to 0.043) lin (2.5)°	
(0 to 0.25) lin	(40 to 50) GHz	(0.017 to 0.022) lin (180 to 5.0)°	

Parameter/Range	Frequency	CMC[2, 6] (±)	Comments
Reflection S_{11}/S_{22} Measure – Magnitude & Phase (cont)			
(0.25 to 0.5) lin	(40 to 50) GHz	(0.022 to 0.029) lin (5.0 to 3.4)°	Agilent E8364A & 85056A 2.4mm w/slide load cal kit
(0.5 to 0.75) lin		(0.029 to 0.040) lin (3.4 to 3.1)°	
(0.75 to 1) lin	(40 to 50) GHz	(0.040 to 0.06) lin (3.1)°	
Transmission Measurements – S_{21} / S_{12} Magnitude & Phase			
Type N			
(10 to -20) dB	(0.1 to 100) kHz	(0.073 to 0.11) dB (0.49 to 0.71)°	Agilent E5061B & 85032B Type N precision cal kit
(-20 to -30) dB		(0.11 to 0.12) dB (0.70 to 0.81)°	
(-30 to -40) dB		(0.12 to 0.15) dB (0.81 to 0.99)°	
(-40 to -50) dB		(0.15 to 0.21) dB (1.0 to 1.4)°	
(-50 to -60) dB		(0.21 to 0.38) dB (1.4 to 2.6)°	
(-60 to -70) dB		(0.38 to 0.91) dB (2.6 to 6.4)°	
(10 to -20) dB	100 kHz to 1 GHz	(0.081 to 0.12) dB (0.55 to 0.77)°	
(-20 to -30) dB		(0.14 to 0.15) dB (0.75 to 0.85)°	
(-30 to -40) dB		(0.13 to 0.15) dB (0.85 to 0.98)°	

Parameter/Range	Frequency	CMC[2, 6] (±)	Comments
Transmission Measurements – S_{21} / S_{12} Magnitude & Phase (cont)			
Type N			
(-40 to -50) dB	100 kHz to 1 GHz	(0.15 to 0.19) dB (0.98 to 1.2)°	Agilent E5061B & 85032B Type N precision cal kit
(-50 to -60) dB		(0.18 to 0.26) dB (1.2 to 1.7)°	
(-60 to -70) dB	100 kHz to 1 GHz	(0.26 to 0.46) dB (1.7 to 3.1)°	
(10 to -20) dB	(1 to 3) GHz	(0.11 to 0.14) dB (0.78 to 0.98)°	
(-20 to -30) dB	(0.1 to 100) kHz	(0.14 to 0.16) dB (0.93 to 1.1)°	
(-30 to -40) dB		(0.16 to 0.18) dB (1.1 to 1.2)°	
(-40 to -50) dB		(0.18 to 0.21) dB (1.0 to 1.2)°	
(-50 to -60) dB		(0.21 to 0.28) dB (1.2 to 1.9)°	
(-60 to -70) dB		(0.28 to 0.47) dB (1.9 to 3.2)°	
(10 to -20) dB	(1 to 20) GHz	(0.12 to 0.11) dB (0.77 to 0.69)°	Agilent E8364A & 85056A 2.4 mm w/slide load cal kit
(-20 to -30) dB		(0.11 to 0.12) dB (0.69 to 0.78)°	
(-30 to -40) dB		(0.12 to 0.14) dB (0.78 to 0.91)°	
(-40 to -50) dB		(0.14 to 0.17) dB (0.91 to 1.2)°	

Parameter/Range	Frequency	CMC[2, 4, 6] (±)	Comments
Transmission Measurements – S_{21} / S_{12} Magnitude & Phase (cont)			
Type N			
(-50 to -60) dB	(1 to 20) GHz	(0.17 to 0.24) dB (1.2 to 1.6)°	Agilent E8364A & 85056A 2.4 mm w/slide load cal kit
(-60 to -70) dB		(0.24 to 0.40) dB (1.6 to 2.7)°	
(10 to -20) dB	20 GHz to 40 GHz	(0.29 to 0.19) dB (2.1 to 1.2)°	
(-20 to -30) dB		(0.19 to 0.20) dB (1.2 to 1.3)°	
(-30 to -40) dB		(0.20 to 0.22) dB (1.3 to 1.5)°	
(-40 to -50) dB		(0.22 to 0.26) dB (1.5 to 1.7)°	
(-50 to -60) dB		(0.26 to 0.34) dB (1.7 to 2.3)°	
(-60 to -70) dB		(0.34 to 0.60) dB (2.3 to 4.1)°	
(10 to -20) dB	(40 to 50) GHz	(0.39 to 0.29) dB (2.8 to 1.9)°	
(-20 to -30) dB		(0.29 to 0.30) dB (1.9 to 2.0)°	
(-30 to -40) dB		(0.30 to 0.33) dB (2.0 to 2.2)°	
(-40 to -50) dB		(0.33 to 0.38) dB (2.2 to 2.6)°	
(-50 to -60) dB		(0.38 to 0.50) dB (2.6 to 3.4)°	
(-60 to -70) dB		(0.50 to 0.87) dB (3.4 to 6.0)°	

Parameter/Range	Frequency	CMC[2, 4, 6] (±)	Comments
Low Frequency Magnetic Field			
(50 to 60) Hz	(0.1 to 25) µT	5.4 % + 0.09 µT	Picotest G5100A Schwarzbeck HHS 5206-16
10 Hz to 20 kHz	(0.1 to 1) µT (1 to 10) µT	4.8 % + 0.0082 µT 6.4 %	Schwarzbeck NFCN 9734 Agilent 34401A
(20 to 50) kHz	(0.1 to 1) µT (1 to 10) µT	6.9 % 5.6 % + 0.012 µT	Fluke i430-FLEXI-TF-II Narda ELT-400
(50 to 100) kHz	(0.1 to 1) µT (1 to 3) µT	7.8 % 5.1 % + 0.027 µT	

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
ESD Simulators –			ANSI C63.16 ISO10605 SAE J1113-13 calibration method based on IEC/EN 61000-4-2, IEC 801-2 Brandenburg 149-03 attenuator Tek TDS7404 w/ ESD target
Contact Voltage	200 V to 30 kV	0.28 %	
Rise Time	(0.7 to 1) ns	4.0 %	
Peak Current	(7.5 to 112.5) A	5.7 %	
30 ns Current	(4 to 60) A	5.7 %	
60 ns Current	(2 to 30) A	5.8 %	
EFT/Burst Generators –			IEC/EN 61000-4-4, ANSI/IEEE C37.90, ISO 7637-2 Tektronix TDS5104 w/ attenuator set
Voltage	20 V to 8 kV	3.1 %	
Rise/Fall Time	5 ns	7.2 %	
Pulse Width	(35 to 200) ns	1.2 %	
Burst Duration	(0.5 to 20) ms	1.9 %	
Burst Period	(100 to 300) ms	1.4 %	
Repetition Rate	1 kHz to 1 MHz	1.1 %	

Parameter/Equipment	Range	CMC[2, 4, 6] (±)	Comments
Transient Generators –			
Front/Rise Time –			
Open Circuit	1 µs to 10 ms	2.8 %	IEC/EN 61000-4-5, IEC 61000-4-9, IEC 61000-4-10, IEC 61000-4-12, IEC 61000-4-18, ANSI C37.90, ANSI C62.41, ISO 7637-2 ISO 16750-2, UL1449, GR1089
Short Circuit	(1 to 100) µs	2.5 %	
Fall Time			
Open Circuit	1 µs to 10 ms	2.2 %	
Short Circuit	(1 to 100) ms	2.5 %	
Pulse Width –			
Open Circuit	1 µs to 1000 ms	2.1 %	
Pulse Width-			
Short Circuit	1 µs to 1 ms	1.1 %	Tektronix TDS5104 w/high voltage deferential probe & current probe
Open Circuit Voltage	10 V to 20 kV	2.9 %	
Short Circuit Current	1 A to 4 kA	2.3 %	
Ring/Oscillatory Wave –			
Rise Time	75 ns (0.5 to 1.5) µs	2.2 %	
Fall Time	75 ns (0.5 to 1.5) µs	2.3 %	
Frequency	5 kHz to 1 MHz	0.81 %	
Flicker & Harmonics – Measure			IEC/EN 61000-3-3; IEC/EN 61000-3-12; IEC 61000-4-15; IEC 61000-3-2; IEC 61000-3-11; IEC 61000-4-7;
Voltage Fluctuations (Flicker)	230V, 50 Hz	0.61 %	
Mains Harmonic Emissions	(100 to 280) V (0.1 to 20) A (20 to 75) A	0.053 % + 5.3 mV 0.21 % + 2.2 µA 0.88 % + 4.8 µA	CNS-HFC-III Agilent 3458A-001 Tektronix TDS5104B Yokogawa WT3000
	(0.5 to 179.5)°	0.11°	w/ CT

Parameter/Equipment	Range	CMC[2, 4, 6] (±)	Comments
PQT – Voltage Dips & Interruptions –			
Output Voltage	Up to 260 V AC or DC	2.4 %	IEC/EN 61000-4-11 IEC/EN 61000-4-29 IEC/EN 61000-4-34 SEMI F47 Tektronix TDS5104B
Phase Angle	(0 to 359)°	0.49 %	
Pulse Rise/Fall Time	(1 to 5) µs	2.1 %	
RF Bulk Injection Probe –			IEC 61000-4-6, DO 160, CISPR 16-1-2, CISPR 22, CISPR 25, CISPR 32 Agilent VNA E5061B
Insertion Loss	(0 to -40) dB 10 Hz to 3 GHz	4.2 dB	

III. Thermodynamics

Parameter/Equipment	Range	CMC[2, 6] (±)	Comments
Temperature – Measure	(-196 to 420) °C	0.59 °C	PRT w/ precision thermometer readout
Relative Humidity – Measuring Equipment			
Fixed Points	11 % RH 33 % RH 75 % RH	1.6 % RH 1.6 % RH 2.0 % RH	Vaisala HMK-15

IV. Time & Frequency

Parameter/Equipment	Range	CMC[2, 6] (±)	Comments
Frequency – Measuring Equipment			
Fixed Point			
Aging Rate	10 MHz	1.2 nHz/Hz	GPS receiver
Frequency Accuracy	Up to 1 kHz (1 to 100) kHz 100 kHz to 1 MHz (1 to 80) MHz	2.1 nHz/Hz 14 nHz/Hz 11 nHz/Hz 7.1 nHz/Hz	Agilent 33250A referenced to GPS receiver
	50 MHz to 40 GHz	11 nHz/Hz	Anritsu 68369B
Frequency – Measure	0.1 Hz to 230 MHz	3.0 nHz/Hz	Agilent 53132A referenced to GPS receiver
	(10 to 525) MHz (0.5 to 40) GHz	9.9 nHz/Hz 8.2 nHz/Hz	HP 5352A

[1] This laboratory offers commercial 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. CMCs 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] *M* is the Mismatch error. Uncertainty does not include mismatch error due to connections of the device to other devices in actual use. Mismatch uncertainties, due to the reflection coefficient of the device to be calibrated, are to be included in the overall measurement uncertainty. The approach of determining expanded uncertainties at approximately the 95% level of confidence, (using a coverage factor of k = 2) is to be applied for this calculation as well.

[4] In the statement of CMC, percentages are percentage of reading, unless otherwise indicated.

[5] 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 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.

[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.

[7] This scope meets A2LA's *P112 Flexible Scope Policy*.

Accredited Laboratory

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for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and 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 21st day of July 2025.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3410.01
Valid to April 30, 2027

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