Scope of Accreditation
For
Tra-Cal, LLC

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In recognition of a successful assessment to ISO/IEC 17025:2005, ANSI/NCSL Z540-1:1994(R2002), and ANSI/NCSL Z540.3:2006(R2014) sub-clause 5.3 to the following Calibration and Measurement Capabilities, accreditation has been granted to **Tra-Cal, LLC** for the following:

Accreditation granted through: **May 31, 2019**

Calibration

Electrical – Capacitance[1]

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Capacitance – Source 1 kHz	1 nF	0.2 pF	GR 1404-A Capacitor GR 1409-T Capacitor Fluke 5520A Calibrator
1 kHz	0.1 µF	0.0000 29 µF	
10 Hz to 10 kHz	190 pF to 1.0999 nF	0.028 nF	
10 Hz to 3 kHz	1.1 nF to 3.2999 nF	0.031 nF	
10 Hz to 1 kHz	3.3 nF to 10.9999 nF	0.044 nF	
10 Hz to 1 kHz	(11 to 32.99) nF	0.21 nF	
10 Hz to 1 kHz	(33 to 109.99) nF	0.44 nF	
10 Hz to 1 kHz	(110 to 329.99) nF	1.3 nF	
(10 to 600) Hz	(0.33 to 1.09) µF	0.007 2 µF	
(10 to 300) Hz	(1.1 to 3.29) µF	0.014 µF	
(10 to 150) Hz	(3.3 to 10.99) µF	0.045 µF	
(10 to 120) Hz	(11 to 32.99) µF	0.19 µF	
(10 to 80) Hz	(33 to 109.99) µF	0.69 µF	
DC to 50 Hz	(110 to 329.99) µF	2.1 µF	
DC to 20 Hz	(0.33 to 1.09) mF	0.009 mF	
DC to 6 Hz	(1.1 to 3.29) mF	0.021 mF	
DC to 2 Hz	(3.3 to 10.99) mF	0.069 mF	
DC to 0.6 Hz	(11 to 32.99) mF	0.32 mF	
DC to 0.2 Hz	(33 to 99.99) mF	1.4 mF	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Capacitance - Measure 1 kHz	(200 pF to 20 µF)	0.045 µF	GenRad 1689 Precision RLC Digibridge

Electrical – Current[1]

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Current – Source	(0 to 2.2) mA (2.2 to 22) mA (22 to 220) mA (0.22 to 2.2) A	0.000 15 mA 0.001 5 mA 0.018 mA 0.24 mA	Fluke 5700A Calibrator
	(2.2 to 11) A	0.007 4 A	Fluke 5520A Calibrator
	(11 to 20) A	0.023A	
	(20 to 100) A	2.7 A	HP 6260B power supply
DC Current – Measure	(0 to 100) nA (0.1 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	0.3 nA 0.000 97 µA 0.000 45µA 0.003 2 µA 0.005 mA 0.007 mA 0.011 mA 0.15 mA	Agilent 3458A 8 ½ Digit Multimeter
	(1 to 10) A	0.025 A	Fluke 45 Multimeter
DC Current - Measure	(0 to 25) A (25 to 50) A (50 to 100) A (100 to 750) A (750 to 1 000) A	0.29 % of reading 0.34 % of reading 0.34 % of reading 0.36 % of reading 0.31 % of reading	Current Shunt Monitored with DMM
AC Current - Source	(0 to 220) µA (10 to 20) Hz (20 to 40) Hz 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	 0.2 µA 0.11 µA 0.042 µA 0.18 µA 0.46 µA	Fluke 5700A Calibrator
	(0.22 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	 0.002 mA 0.001 1mA 0.000 42 mA 0.001 8 mA 0.004 6 mA	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
AC Current - Source	(2.2 to 22) mA		Fluke 5700A Calibrator
	(10 to 20) Hz	0.021 mA	
	(20 to 40) Hz	0.011 mA	
	40 Hz to 1 kHz	0.004 2 mA	
	(1 to 5) kHz	0.018 mA	
	(5 to 10) kHz	0.046 mA	
AC Current - Source	(22 to 220) mA		
	(10 to 20) Hz	0.2 mA	
	(20 to 40) Hz	0.11 mA	
	40 Hz to 1 kHz	0.047 mA	
	(1 to 5) kHz	0.18 mA	
	(5 to 10) kHz	0.46 mA	
	(0.22 to 2.2) A		
	40 Hz to 1 kHz	0.001 9 A	
	(1 to 5) kHz	0.002 2 A	
	(5 to 10) kHz	0.025 A	
	(2.2 to 11) A		Fluke 5700A/5725 Calibrator
	40 Hz to 1 kHz	0.007 9 A	
	(1 to 5) kHz	0.012 A	
	(5 to 10) kHz	0.042 A	
AC Current - Measure	(0 to 100) µA		Agilent 3458A 8 ½ Digit DMM
	(10 to 20) Hz	0.5 uA	
	(20 to 45) Hz	0.22 uA	
	45 Hz to 1 kHz	0.13 uA	
	(0.1 to 1.0) mA		
	(10 to 20) Hz	0.004 6 mA	
	(20 to 45) Hz	0.002 mA	
	(45 to 100) Hz	0.001 mA	
	100 Hz to 5 kHz	0.000 77mA	
	(5 to 20) kHz	0.000 92 mA	
	(20 to 50) kHz	0.005 1 mA	
	(50 to 100) kHz	0.008 1 mA	
	(1 to 10) mA		
	(10 to 20) Hz	0.049 mA	
	(20 to 45) Hz	0.02 mA	
	(45 to 100) Hz	0.011 mA	
	100 Hz to 5 kHz	0.007 7 mA	
	(5 to 20) kHz	0.011 mA	
	(20 to 50) kHz	0.051 mA	
	(50 to 100) kHz	0.081 mA	
	(10 to 100) mA		
	(10 to 20) Hz	0.49 mA	
	(20 to 45) Hz	0.2 mA	
	(45 to 100) Hz	0.11 mA	
	100 Hz to 5 kHz	0.077 mA	
	(5 to 20) kHz	0.11 mA	
	(20 to 50) kHz	0.51 mA	
	(50 to 100) kHz	0.81 mA	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
AC Current - Measure	(0.1 to 1.0) A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	 0.005 A 0.002 4 A 0.001 7 A 0.001 8 A 0.003 9 A 0.012 A	Agilent 3458A 8 ½ Digit DMM
AC Current - Measure	(1 to 10) A 45 Hz to 1 kHz	 0.34 A	Fluke 45 DMM

Electrical – Inductance

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Inductance – Source 1 kHz	100 µH	0.29 µH	GR 1482-B
1 kHz	10 mH	0.012 mH	GR 1482-H
1 kHz	100 mH	0.13 mH	GR 1482-L
(0.1 to 1) kHz	500 mH	0.76 mH	GR 1482-N
100 Hz	1 H	0.001 3 H	GR 1482-P
1 kHz	1 H	0.001 3 H	GR 1482-P
(0.1 to 1) kHz	10 H	0.015 H	GR 1482-T
(0.1 to 1) kHz	10 H	0.015 H	GR 1482-T
Inductance - Measure 1 kHz	100 µH to 10 H	0.23 % of reading 0.29 µH	GenRad 1689

Electrical – Resistance[1]

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Resistance Source	1 Ω	85 µΩ	L&N 4020B resistor
	10 Ω	0.99 mΩ	L&N 4025B resistor
	100 Ω	3.8 mΩ	L&N 4030B resistor
	1 kΩ	28 mΩ	L&N 4035B resistor
	10 kΩ	0.13 Ω	Fluke 742A-10k resistor
	100 kΩ	3.4 Ω	L&N 4045B resistor
	1 MΩ	38 Ω	L&N 4050B resistor

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Resistance Source	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	0.000 13 Ω 0.000 013 Ω 0.000 094 Ω 0.000 15 Ω 0.000 25 Ω 0.000 41 Ω 0.002 Ω 0.003 3 Ω 0.018 Ω 0.039 Ω 0.22 Ω 0.55 Ω 4.1 Ω 62 kΩ 35 kΩ 53 kΩ 62 kΩ	Fluke 5700A Calibrator
Resistance Source	(0 to 11) Ω (11 to 33) Ω (33 to 110) Ω (110 to 330) Ω (0.33 to 1.1) kΩ (1.1 to 3.29) kΩ (3.3 to 11) kΩ (11 to 32.99) kΩ (33 to 110) kΩ (110 to 330) kΩ 330 kΩ to 1.1 MΩ (1.1 to 3.3) MΩ (3.3 to 11) MΩ (11 to 33) MΩ (33 to 110) MΩ (110 to 330) MΩ (330 to 1 100) MΩ	0.001 2 Ω 0.001 7 Ω 0.001 7 Ω 0.002 9 Ω 0.006 1 Ω 0.034 Ω 0.083 Ω 0.34 Ω 0.84 Ω 3.2 Ω 6.9 Ω 50 Ω 210 Ω 3.5 kΩ 9.7 kΩ 140 kΩ 1.4 MΩ	Fluke 5520A Calibrator
Resistance Measure	(0 to 1) Ω	81 μΩ	Agilent 3458A 8 ½ Digit Multimeter
	(1 to 10) Ω	0.39 mΩ	
	(10 to 100) Ω	2.5 mΩ	
	(0.1 to 1) kΩ	17 mΩ	
Resistance Measure	(1 to 10) kΩ	17 mΩ	Agilent 3458A 8 ½ Digit Multimeter
	(10 to 100) kΩ	1.7 Ω	
	(0.1 to 1) MΩ	27 Ω	
	(1 to 10) MΩ	0.61 MΩ	
	(10 to 100) MΩ	4.2 MΩ	
	(0.1 to 1) GΩ	8.2 MΩ	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
RTD Resistance Simulation Pt 395, 100 Ω	(-200 to 800) °C	0.27 ºC	Fluke 5520A Calibrator
Pt 385, 200 Ω	(-200 to 630) °C	0.2 ºC	
Pt 385, 500 Ω	(-200 to 630) °C	0.22 ºC	
Pt 385, 1 k Ω	(-200 to 630) °C	0.46 ºC	
Pt 3916, 100 Ω	(-200 to 630) °C	0.29 ºC	
Pt 3926, 100 Ω	(-200 to 630) °C	0.14 ºC	
Cu 427, 10 Ω	(-100 to 260) °C	0.35 ºC	

Electrical – RF Power

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
RF Power - Source			
10 MHz to 2.3 GHz	(-20 to 18) dBm	1.1 dB	HP 8340B/83554A Signal Generator
(2.3 to 18.6) GHz	(-20 to 18) dBm	1.7 dB	
(18.6 to 26.5) GHz	(-20 to 18) dBm	2.3 dB	
(26.5 to 40) GHz	(-25 to 3) dBm	1.2 dB	HP 83650B Signal Generator
(40 to 50) GHz	(-25 to 0) dBm	2.2 dB	
200 Hz to 10.0 MHz	(-86.98 to 13.01) dBm	0.42 dB	HP 3335A Signal Generator
10MHz to 80.0MHz	(-86.98 to 13.01) dBm	0.13 dB	
RF Power Flatness - Source			
200 Hz to 10 MHz	(-86.98 to 13.01) dBm	0.42 dBm	HP 3335A Signal Generator
10 MHz to 25 MHz	(-86.98 to 13.01) dBm	0.14 dBm	
25 MHz to 80 MHz	(-86.98 to 13.01) dBm	0.21 dBm	
10 MHz to 2.3 GHz	(-20 to 18) dBm	1.1 dB	HP8340B Signal Generator
(2.3 to 18.6) GHz	(-20 to 18) dBm	1.7 dB	
(18.6 to 26.5) GHz	(-20 to 18) dBm	2.3 dB	
(26.5 to 40) GHz	(-25 to 3) dBm	1.2 dB	HP 83650B Signal Generator
(40 to 50) GHz	(-25 to 0) dBm	2.2 dB	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
RF Relative Attenuation 2.5 MHz to 26.5 GHz	(-12 to 0) dB (-12 to -22) dB (-22 to -31) dB (-31 to -40) dB (-40 to -50) dB (-50 to -61) dB (-61 to -71) dB (-71 to -80) dB (-80 to -90) dB (-90 to -100) dB (-100 to -110) dB (-110 to -120) dB	0.18 dB 0.21 dB 0.23 dB 0.27 dB 0.29 dB 0.32 dB 0.34 dB 0.51 dB 0.60 dB 0.62 dB 0.65 dB 0.69 dB	HP 8902A Measuring Receiver w/11793A
RF Power - Measure (-127 to -30) dBm	150 kHz to 2.6 GHz	0.33 dB + 0.1 dB/dB	HP 8902A Measuring Receiver w/11722A Sensor
(-25 to +20) dBm	100 kHz to 4.2 GHz 10 MHz to 18 GHz 50 MHz to 26.5 GHz 50 MHz to 50 GHz	0.29 dB 0.13 dB 0.23 dB 0.4 dB	HP 438A Power Meter w/ 8482A Sensor w/ 8481A Sensor w/ 8485A Sensor w/ 8487A Sensor
Distortion	20 Hz to 20 kHz (20 to 100) kHz	1.5 dB 3.1 dB	HP 8903B

Electrical – Voltage[1]

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Voltage - Source	(0 to 220) mV	6.6 µV	Fluke 5700A/5725A Calibrator
	(0.22 to 2.2) V	22 µV	
	(2.2 to 11) V	0.1 mV	
	(11 to 22) V	0.23 mV	
	(22 to 220) V	2.4 mV	
	(220 to 1 000) V	15 mV	
DC Voltage – Measure	1 µV to 100 mV	3.3 µV	Agilent 3458A 8 ½ Digit Multimeter
	(0.1 to 1) V	14 µV	
	(1 to 10) V	59 µV	
	(10 to 100) V	0.8 mV	
	(100 to 1 000) V	16 mV	
	(1 to 10) kV	360 V	Fluke 80K-40 w/8 ½ Digit Multimeter
	(10 to 25) kV	400 V	
	(25 to 40) kV	1.9 kV	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
AC Voltage Source	2.2 mV 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 (0.5 to 1) MHz	 0.002 7 mV 0.001 8 mV 0.001 7 mV 0.003 1 mV 0.004 6 mV 0.007 6 mV 0.011 mV 0.015 mV	Fluke 5700A/5725A Calibrator
	22 mV to 220 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 (0.5 to 1) MHz	 0.015 mV 0.006 3 mV 0.003 4 mV 0.011 mV 0.024 mV 0.034 mV 0.047 mV 0.08 mV	
	220 mV to 2.2 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 (0.5 to 1) MHz	 0.15 mV 0.061 mV 0.028 mV 0.092 mV 0.2 mV 0.28 mV 0.46 mV 0.92 mV	
	2.2 V to 22 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 (0.5 to 1) MHz	 0.001 5 V 0.000 46 V 0.000 22 V 0.000 36 V 0.000 72 V 0.001 2 V 0.003 1 V 0.006 1 V	
AC Voltage Source	22 V 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 (0.5 to 1) MHz	 0.015 V 0.004 6 V 0.002 2 V 0.003 6 V 0.007 2 V 0.015 V 0.036 V 0.076 V	Fluke 5700A/5725A Calibrator

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
AC Voltage Source	220 V to 750 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 0.5 to 1) MHz	 0.15 V 0.046 V 0.023 V 0.064 V 0.15 V 0.41 V 1.4 V 3.3 V	Fluke 5700A/5725A Calibrator
	750 V (30 to 50) kHz (50 to 100) kHz	 0.52 V 2 V	Fluke 5725A Calibrator
	1100 V 50 Hz to 1 kHz	 0.12 V	Fluke 5700A Calibrator
	1100 V 40 Hz to 1 kHz (1 to 20) kHz (20 to 30) kHz	 0.11 V 0.21 V 0.76 V	Fluke 5725A Calibrator
AC Voltage – Measurement	10 mV to 100 mV (1 to 40) Hz 40Hz to 1kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	 0.003 6 mV 0.002 5 mV 0.003 6 mV 0.012 mV 0.058 mV 0.46 mV	Agilent 3458A 8 ½ Digit Multimeter
	(0.1 to 10) V (1 to 40) Hz 40Hz to 1kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz 300 kHz to 1MHz (1 to 2) MHz	 0.000 085 V 0.000 085 V 0.000 17 V 0.000 36 V 0.001 2 V 0.005 8 V 0.012 V 0.018 V	
AC Voltage – Measurement	(10 to 100) V (1 to 40) Hz 40Hz to 1kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	 0.024 V 0.024 V 0.024 V 0.041 V 0.14 V 0.46 V	Agilent 3458A 8 ½ Digit Multimeter
	(100 to 1 000) V (1 to 40) Hz 40 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz	 0.46 V 0.46 V 0.69 V 1.4 V 3.5 V	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
AC Voltage – Measurement	(2 to 20) mV 200 kHz to 1 MHz (1 to 10) MHz (10 to 20) MHz	1.7 mV 2.0 mV 2.5 mV	Fluke 8920A True RMS Voltmeter
	(0.02 to 20) V 200kHz to 1MHz (1 to 10) MHz (10 to 20) MHz	0.25 V 0.29 V 0.36 V	
Thermocouple Millivolt Simulation Type C	(0 to 2 316) °C	0.98 ºC	Fluke 5520A Calibrator
Type E	(-250 to 1 000) °C	0.44 ºC	
Type J	(-210 to 1 200) °C	0.31 ºC	
Type K	(-200 to 1 372) °C	0.47 ºC	
Type N	(-200 to 1 300) °C	0.47 ºC	
Type R	(0 to 1 767) °C	0.66 ºC	
Type S	(0 to 1 767) °C	0.55 ºC	
Type T	(-250 to 400) °C	0.73 ºC	
Type U	(-200 to 600) °C	0.65 ºC	

Thermodynamic – Humidity

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Relative Humidity (23 ± 5) °C	(10 to 80) % RH	2.4 % RH	Veriteq SP-2000 Logger

Thermodynamic – Thermodynamic Sources[1]

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Temperature Measurement (Ovens, Furnaces, Freezers, Chambers, Ice Baths – System Accuracy Test)	(-45 to 200) ºC	2.2 ºC	Fluke 51 with Type J TC probe
	(200 to 500) ºC	2.5 ºC	

Time and Frequency – Frequency / Period

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Frequency – Source[2]	10 MHz	$7.6 \cdot 10^{-11} \cdot f$	HP 58503A GPS Receiver
	DC to 20 MHz	$7.6 \cdot 10^{-11} \cdot f$ + 0.58 Hz	HP 3325B Generator
	10 MHz to 26.5 GHz	$7.6 \cdot 10^{-11} \cdot f$ + 1.2 Hz	HP 8340B Generator

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Frequency - Measure[1,2]	1 Hz to 225 MHz	$7.6 \cdot 10^{-11} \cdot f$ + 0.6 mHz	HP 53131A Counter
	10 Hz to 525 MHz	$7.6 \cdot 10^{-11} \cdot f$ + 0.58 Hz	5351B 50 Ω Counter
	(0.5 to 26.5) GHz	$7.6 \cdot 10^{-11} \cdot f$ + 0.58 Hz	5351B 50 Ω Counter
Frequency Modulation – Measure			
Rate (20 Hz to 10 kHz) 40 kHz Peak Deviation	CW (0.25 to 10) MHz	0.24 kHz	HP 8902A Measuring Receiver
Rate (20 Hz to 200 kHz) 400 kHz Peak Deviation	CW (0.01 to 1.3) GHz	5.9 kHz	
Amplitude Modulation – Measure			
Rate (20 Hz to 10 kHz) Depth (10 to 99) %	CW (0.15 to 10) MHz	3.6 % of reading	
Rate (50 Hz to 10 kHz) Depth (10 to 99) %	CW (0.15 to 10) MHz	2.4 % of reading	HP 8902A Measuring Receiver
Rate (20 Hz to 100 kHz) Depth (10 to 99) %	CW (0.01 to 1.3) GHz	3.6 % of reading	
Rate (50 Hz to 50 kHz) Depth (10 to 99) %	CW (0.01 to 1.3) GHz	1.3 % of reading	
Phase Modulation – Measure			
Rate (200 Hz to 10 kHz)	CW (0.15 to 10) MHz	1.3 rad	HP 8902A Measuring Receiver
Rate (200 Hz to 20 kHz)	CW (0.01 to 1.3) GHz	8.8 rad	

Time and Frequency – Oscilloscopes[1]

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Amplitude Square Wave into 1 MΩ (Peak-to-Peak)	(1 to 24.999) mV	0.075 mV	Fluke 5520A-SC600 Calibrator
	(25 to 109.99) mV	0.17 mV	
	110 mV to 2.1999 V	0.049 V	
	(2.2 to 10.999) V	0.013 V	
	(11 to 130) V	0.15 V	
Amplitude Square Wave into 50 Ω (Peak-to-Peak)	(1 to 24.999) mV	0.12 mV	Fluke 5520A-SC600 Calibrator
	(25 to 109.99) mV	0.36 mV	
	10 mV to 2.1999 V	0.005 8 V	
	(2.2 to 6.6) V	0.014 V	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Rise / Fall-time 50 Ω load 5 mV to 2.5 V (Peak-to-Peak)	1 kHz to 2 MHz	350 pS	Fluke 5520A-SC600 Calibrator
	2 MHz to 10 MHz	400 pS	
Bandwidth relative to 50 kHz 50 Ω load	(0.05 to 100) MHz	0.087 mV	Fluke 5520A-SC600 Calibrator
	(100 to 300) MHz	0.23 mV	
	(300 to 600) MHz	0.23 mV	
	(0.05 to 100) MHz	0.058 V	
	(100 to 300) MHz	0.058 V	
	(300 to 600) MHz	0.059 V	
Timebase 50 Ω Load	5 s to 50 mS	0.029 S	Fluke 5520A-SC600 Calibrator
	20 mS to 2 nS	0.002 9 mS	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and remarks. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
2) *f* is defined as the measured / generated frequency.

Approved by: _____ Date: May 31, 2016

R. Douglas Leonard
Chief Technical Officer

Re-Issued: 5/31/16