THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

IET LABS, INC.
West Roxbury, MA

for technical competence in the field of

Calibration

The accreditation covers the specific calibrations listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories." This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Presented this 10th day of February 2004.

American Association for Laboratory Accreditation
Corporate SEAL 1978 District of Columbia
A2LA

President
For the Accreditation Council
Certificate Number 2073.01
Valid to April 30, 2006

REVISED 12/29/2004

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

SCOPE OF ACCREDITATION TO ISO 17025-1999
& ANSI/NCSL Z540-1-1994

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CALIBRATION

Valid To: April 30, 2006 Certificate Number: 2073.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1]:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
DC Resistance – Measure	1 mΩ 10 mΩ 100 mΩ 1 Ω	200 parts in 10^6 100 parts in 10^6 43 parts in 10^6 7.5 parts in 10^6	Current characterization method
	10 Ω 100 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ	4.5 parts in 10^6 3.5 parts in 10^6 2.6 parts in 10^6 2.6 parts in 10^6 4 parts in 10^6 4.1 parts in 10^6 6.3 parts in 10^6	DMM transfer method
	100 MΩ 1 GΩ 10 GΩ 100 GΩ 1 TΩ	8.5 parts in 10^6 100 parts in 10^6 220 parts in 10^6 0.2 % 2 %	Voltage characterization method
DC Resistance Measuring Equipment	1 mΩ 10 mΩ 100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ	20 parts in 10^6 30 parts in 10^6 23 parts in 10^6 5 parts in 10^6 4 parts in 10^6 3 parts in 10^6 1.7 parts in 10^6 1.7 parts in 10^6 3.7 parts in 10^6 3.7 parts in 10^6 6.2 parts in 10^6 10 parts in 10^6 100 parts in 10^6	SRX-0.001 SRX-0.01 SRX-0.1 SRL-1 SRL-10 SRL-100 SRL-1k SRL-10k SRL-100k SRL-1M SRL-10M SRC-100M SRC-1G

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
DC Resistance Measuring Equipment (cont)	10 GΩ 100 GΩ 1 TΩ	220 parts in 10^6 0.2 % 2 %	SRC-10G SRC-100G SRC-1T
Capacitance – Measure 1000 Hz	 1 pF 10 pF 100 pF 1000 pF	 0.01 % + 30 aF 5.2 parts in 10^6 5.9 parts in 10^6 4.8 parts in 10^6	GenRad 1404 and 1620
Capacitance – Measure 50 Hz $\leq f \leq$ 1 kHz 12 Hz $\leq f \leq$ 100 kHz	 10 aF to 11 μF 10 aF to 100 mF	 0.01 % + 30 aF 0.02 %	 GenRad 1620 Quadtech 1689 f = specified frequency range
Capacitance Measuring Equipment – Fixed Points at 1 kHz	 1 pF 10 pF 100 pF 1000 pF 10 nF 100 nF 1 μF 10 μF 100 μF 1 mF 10 mF	 0.01 % 4 parts in 10^6 5 parts in 10^6 6 parts in 10^6 0.01 % 0.01 % 0.01 % 0.02 % 0.05 % 0.4 % 0.3 %	 Fused silica standard GenRad 1404-C GenRad 1404-B GenRad 1404-A IET SC-10 nF IET SC-100 nF IET SC-1 μF IET SC-10 μF IET S-100 μF GenRad 1417 GenRad 1417

Parameter/Frequency	Range	Best Uncertainty[2] (±)	Comments
Capacitance Measuring Equipment – (cont) Fixed Points			
at 100 Hz	100 mF	0.4 %	GenRad 1417
	1 F	0.6 %	GenRad 1417
Inductance – Measure			
12 Hz ≤ f ≤ 100 kHz	1 pH to 1 MH	0.02 %	GenRad 1693 f = specified frequency range
Inductance – Measure			GenRad 1482 series standard inductors by transfer method with precision LCR meter
100 Hz	50 µH	0.1 %	
400 Hz		0.1 %	
1 kHz		0.1 %	
10 kHz		0.1 %	
100 Hz	100 µH	0.1 %	
400 Hz		0.1 %	
1 kHz		0.1 %	
10 kHz		0.1 %	
100 Hz	200 µH	0.1 %	
400 Hz		0.1 %	
1 kHz		0.1 %	
10 kHz		0.1 %	
100 Hz	500 µH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	1 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	
100 Hz	2 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	

Parameter/Frequency	Range	Best Uncertainty[2] (±)	Comments
Inductance – Measure (cont)			GenRad 1482 series standard inductors by transfer method with precision LCR meter
100 Hz	5 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	10 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	
100 Hz	20 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	50 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	100 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	
100 Hz	200 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	500 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.051 %	
100 Hz	1 H	0.021 %	
400 Hz		0.021 %	
1 kHz		0.051 %	
100 Hz	2 H	0.023 %	
400 Hz		0.023 %	
1 kHz		0.051 %	
100 Hz	5 H	0.023 %	
400 Hz		0.1 %	
1 kHz		0.2 %	

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
Inductance Measuring Equipment –			GenRad 1482 series standard inductors
100 Hz	10 H	0.021 %	
400 Hz		0.1 %	
1 kHz		0.2 %	
100 Hz	50 μH	0.1 %	
400 Hz		0.1 %	
1 kHz		0.1 %	
10 kHz		0.1 %	
100 Hz	100 μH	0.1 %	
400 Hz		0.1 %	
1 kHz		0.1 %	
10 kHz		0.1 %	
100 Hz	200 μH	0.1 %	
400 Hz		0.1 %	
1 kHz		0.1 %	
10 kHz		0.1 %	
100 Hz	500 μH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	1 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	
100 Hz	2 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	5 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	10 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
Inductance Measuring Equipment – (cont)			GenRad 1482 series standard inductors
100 Hz	20 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	50 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	100 mH	0.021 %	
400 Hz		0.021 %	
1 kHz		0.021 %	
10 kHz		0.051 %	
100 Hz	200 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.023 %	
10 kHz		0.051 %	
100 Hz	500 mH	0.023 %	
400 Hz		0.023 %	
1 kHz		0.051 %	
100 Hz	1 H	0.021 %	
400 Hz		0.021 %	
1 kHz		0.051 %	
100 Hz	2 H	0.023 %	
400 Hz		0.023 %	
1 kHz		0.051 %	
100 Hz	5 H	0.023 %	
400 Hz		0.1 %	
1 kHz		0.2 %	
100 Hz	10 H	0.021 %	
400 Hz		0.1 %	
1 kHz		0.2 %	

Parameter/Equipment	Range	Best Uncertainty[2] (±)	Comments
DC Voltage – Measure	(0 to 200) mV 200 mV to 2 V (2 to 20) V (20 to 200) V (200 to 1000) V	4.5 μV/V + 0.1 μV 3 μV/V + 0.4 μV 3 μV/V + 4 μV 4.5 μV/V + 40 μV 4.5 μV/V + 1 mV	Fluke 8508A
DC Voltage Measuring Equipment – Cardinal Points	1 V 1.018 V 10 V 6.3 V 18 V 18.9 V	3 μV/V + 0.4 μV 3 μV/V + 0.4 μV 3 μV/V + 4 μV 3 μV/V + 4 μV 5 μV/V + 4 μV 5 μV/V + 4 μV	Voltage characterization method with Fluke 8508A

[1] This laboratory offers commercial calibration service.

[2] "Best Uncertainty" 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 of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer's device, to the environment (if the calibration is performed in the field) and to influences from the circumstances of the specific calibration.