



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& ANSI/NCSL Z540-1-1994

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CALIBRATION

Valid To: May 31, 2012

Certificate Number: 2273.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,3} (±)	Comments ⁴
EFT/Burst Generator –			Verification of generator conformance to the waveform parameters and levels of:
Voltage	20 V to 8 kV	2.2 %	
Rise Time	5 ns ± 20 %	2.9 %	IEC 61000-4-4, EN 61000-4-4, GR 1089 CORE, ANSI C37.90, ISO 7637-2
Pulse Width	(35 to 200) ns	2.4 %	
Burst Duration	(0.5 to 20) ms	0.7 %	
Burst Period	(100 to 300) ms	0.7 %	Tektronix TDS 5052B Schaffner CAS 3025 attenuator set
Repetition Rate	1 kHz to 1 MHz	0.7 %	

Parameter/Equipment	Range	CMC ^{2,3} (±)	Comments ⁴
ESD Simulators –			Verification of generator conformance to the waveform parameters and levels of:
Tip Voltage	200 V to 30 kV ± 5 %	1.0 %	IEC 61000-4-2, EN 61000-4-2, IEC 801-2, ISO TR 10605, ISO 10605, SAE J1113 -13, ANSI C63.16, FORD ES-XW7T-1A278-AC, GMW 3097, DC-10614, DC-11224 Brandenburg HV meter 139D (up to 40kV, 30G Ohm input impedance),TEK TDS 7104 with Schaffner MD102 ESD target
Rise Time	(0.6 to 1) ns	90 ps	
Peak Current	(7.5 to 112.5) A ± 10 %	7.0 %	
30 ns Current	(4 to 60) A ± 30 %	11 %	
60 ns Current	(2 to 30) A	18 %	
65 ns current	(2 to 20) A	9 %	
130 ns current	(2 to 20) A	17 %	
180 ns current	(2 to 20) A	11 %	
360 ns current	(2 to 20) A	18 %	
400 ns current	(2 to 20) A	11 %	
800 ns current	(2 to 20) A	19 %	
RC Time Constant	600 ns ± 130 ns 300 ns ± 60 ns	15 ns 5 ns	
Transient Generator (Surge Generator)			
Front/Rise Time Open circuit Short circuit	1 µs to 10 ms (1 to 100) µs	2.8 %	IEC 61000-4-5 EN 61000-4-5 IEC 61000-4-9 IEC 61000-4-12 ANSI C62.41 UL1449 ISO7637-2 ITU Rec K.17, K.20, K.21 GR1089CORE; Tektronix TDS 5052B Schaffner MD 200 Pearson Model 110
Pulse Width Open circuit Short circuit	1 µs to 1000 ms 1 µs to 1 ms	2.5 %	
Open Circuit Voltage	10 V to 8 kV	2.6 %	
Short Circuit Current	1 A to 4 kA	2.4 %	
Repetition Rate	(0.1 to 100) s	0.7 %	
Ring/Oscillatory Wave Rise Time	(0.5 to 1.5) us	2.1 %	
Ring/Oscillatory Wave Frequency	5 kHz to 1MHz	0.7 %	
Ring/Oscillatory Wave Current	1 A to 4 kA	2.4 %	

Parameter/Equipment	Range	CMC ^{2,3} (±)	Comments ⁴
Dip/Interrupt Generator – Output Voltage Phase Angle Pulse Rise/Fall Time	Up to 260 V AC or DC (0 to 359) ° (1 to 5) ns	0.33 % 1.2 % 1.2 %	Verification of generator conformance to the waveform parameters and levels of: IEC 61000-4-11, EN 61000-4-11, Tektronix TDS 5052B
DC Voltage – Measure	(10 to 100) mV (0.1 to 1.0) V (1 to 10) V (10 to 100) V (100 to 1000) V	0.13 %	HP34401A
DC Current – Measure	(10 to 100) mA (0.1 to 1.0) A (1.0 to 3.0) A	0.20 %	HP34401A
Resistance – Measure	(0 to 10) Ω (10 to 100) Ω (0.1 to 100) kΩ	1.5%	HP34401A 4-wire measurement
AC Voltage – Measure, 10 Hz to 100 kHz	(10 to 100) mV (0.1 to 1.0) V (1 to 10) V (10 to 100) V (100 to 750) V	1.1 %	HP34401A
AC Current – Measure, 10 Hz to 5 kHz	(10 to 100) mA (0.1 to 1.0) A (1.0 to 3.0) A	0.86 %	HP34401A
AC Voltage – Measure	(1 to 100) V	2.5 %	Tektronix TDS 5052B Schaffner MD 200
AC Current – Measure	(0.1 to 100) A	2.4 %	Tektronix TDS 5052B Pearson Model 110

Parameter/Equipment	Range	CMC ^{2,3} (±)	Comments ⁴
Frequency – Measure	100 Hz to 1 MHz	0.7 %	Tektronix TDS 5052B, Pearson 101

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

² Calibration and Measurement Capability (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. Calibration and Measurement Capabilities 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 In the statement of CMC, all percentages are stated as percent of reading.

⁴ For standards or methods listed on the scope of accreditation without a revision date, laboratories are expected to be compliant in the use of the current version within one year of the date of publication of the standard test method or upon the date specified by the standard test method originator when the originator has implementation authority. When a superseded standard or method is required for an accredited calibration in support of customer needs, the scope will include the superseded date/version.