



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: December 31, 2024

Certificate Number: 5102.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations^{1,3}:

I. Electrical – RF/Microwave

Parameter/Equipment	Range	CMC ² (±)	Comments
ESD Simulators – Peak Voltage	(1900 to 31 500) V	430 V ± 150 V	Calibration method based on IEC 61000-4-2
Peak Current Rise Time (800 ps)	(6.38 to 129.38) A (600 to 1000) ps	2.3 A ± 0.50 A 54 ps	Rhode & Schwarz RTO2022 with EMC PARTNER ESD-TARGET2 DN w/ Huber Suhner cable and 2x MCL 20 dB attenuators (for contact discharge) and EMC PARTNER ESD-VERI-V (for air discharge).
Current at T1 (30 ns) Current at T2 (60 ns)	(2.8 to 78) A (1.4 to 39) A	1.2 A ± 0.30 A 0.60 A ± 0.10 A	

Parameter/Equipment	Range	CMC ² (±)	Comments
ESD Simulators –			Calibration method based on ISO 10605 in conjunction with IEC 61000-4-2.
Peak Voltage	(1900 to 31 500) V	400 V ± 170 V	
Peak Current	(6.75 to 146.25) A	3.1 A ± 0.60 A	
Rise Time (850 ps)	(700 to 1000) ps	71 ps	Rhode & Schwarz RTO 2022 with EMC PARTNER ESD-TARGET2 DN w/ Huber Suhner cable and 2x MCL 20 dB attenuators (for contact discharge) and EMC PARTNER ESD-VERI-V (for air discharge).
Current at T1 (65 ns)	(2.8 to 78) A	1.0 A ± 0.30 A	
Current at T2 (130 ns)	(1.4 to 39) A	0.40 A ± 0.20 A	
Current at T1 (180 ns)	(0.39 to 10.73) A	0.14 A ± 0.040 A	
Current at T2 (360 ns)	(0.15 to 6.75) A	0.10 A ± 0.020 A	
Current at T1 (400 ns)	(0.39 to 10.73) A	0.16 A ± 0.050 A	
Current at T2 (800 ns)	(0.15 to 6.75) A	0.09 A ± 0.020 A	
Electric Fast Transient (EFT) / Burst Generators (Includes CDNs) –			Calibration method based on IEC 61000-4-4.
Peak Voltage w/50 Ω Ld	(112.5 to 3850) V	54 V ± 24 V	
Pulse Width w/50 Ω Ld	(35 to 65) ns	1.8 ns	Rohde & Schwarz RTO2022 with EMC PARTNER VERI50-EFT (for 50 Ω Load)/EMC PARTNER VERI1k-EFT (for 1 kΩ Load).
Peak Voltage w/1 kΩ Ld	(192 to 7980) V	160 V ± 75 V	
Pulse Width w/1 kΩ Ld	(45 to 150) ns	4.5 ns	
Rise Time	(3.5 to 6.5) ns	0.90 ns	
Burst Period	(270 to 330) ms	2.9 ms	
Burst Frequency @ 5 kHz	(4 to 6) kHz	0.30 kHz	
Burst Pulse Width @ 5 kHz	(12 to 18) ms	0.30 ms	
Burst Frequency @ 100 kHz	(80 to 120) kHz	5.4 kHz	
Burst Pulse Width @ 100 kHz	(0.6 to 0.9) ms	0.040 ms	

Parameter/Equipment	Range	CMC ² (±)	Comments
Combination Wave Generator (CWG) / Surge Generators (Includes CDNs) –			Calibration method based on IEC 61000-4-5.
Peak Voltage Rise Time (Open Ckt) Pulse Width (Open Ckt)	(225 to 8800) V (0.84 to 1.56) μs (40 to 60) μs	93 V ± 50 V 0.50 μs ± 0.20 μs 3.3 μs ± 2.0 μs	Rohde & Schwarz RTO2022 with Testec TT-SI9010 high voltage differential Probe (for measurements up to 6 kV)/Tektronix P6015A high voltage probe (for measurements above 6 kV) and Pearson current monitor and attenuator 110A/A10.
Peak Current Rise Time (Short Ckt) Pulse Width (Short Ckt)	(112.5 to 4400) A (6.4 to 9.6) μs (16 to 24) μs	44 A ± 25 A 0.50 μs ± 0.20 μs 3.3 μs ± 2.0 μs	
Overshoot	(0 to 2640) V/A	0.20 V/A	
CDN Peak Current CDN Rise Time (Short Ckt) CDN Pulse Width (Short Ckt)	(18.77 to 733.26) A (1.75 to 3.25) μs (17.5 to 32.5) μs	9.2 A ± 5.0 A 0.50 μs ± 0.20 μs 3.3 μs ± 2.0 μs	
CDN Residual Voltage	(0 to 900) V	47 V	
Phase Shift	(0 to 360) °	6.8 °	
Telecom Impulse Generators (Includes CDNs) –			
Peak Voltage Rise Time (Open Ckt) Pulse Width (Open Ckt)	(225 to 8800) V (7 to 13) μs (560 to 860) μs	80 V ± 48 V 0.010 μs 0.30 μs	Rohde & Schwarz RTO2022 with Testec TT-SI9010 high voltage differential probe (measurements up to 6 kV)/Tektronix P6015A high voltage probe (measurements above 6 kV) and Pearson current monitor 110A.
Peak Current Rise Time (Short Ckt) Pulse Width (Short Ckt)	(5.63 to 192.5) A (4 to 6) μs (256 to 344) μs	1.9 A ± 1.2 A 0.50 μs 0.10 μs	

Parameter/Equipment	Range	CMC ² (±)	Comments
Ring Wave Generators (Includes CDNs) –			Calibration method based on IEC 61000-4-12.
Peak Voltage	(225 to 8800) V	80 V	Rohde & Schwarz RTO2022 with Testec TT-SI9010 high voltage differential probe (measurements up to 6 kV)/Tektronix P6015A high voltage probe (measurements above 6 kV) and Pearson current monitor / attenuator 110A/A10.
Voltage Rise Time	(350 to 650) ns	21 ns	
Peak Current	(7.5 to 732.6) A	5.5 A	
Current Rise Time	(0 to 1000) ns	61 ns	
Frequency	(90 to 110) kHz	2.0 kHz	
Impedance Calculation at 12 Ω	(11.52 to 14.4) Ω	0.70 Ω	
Impedance Calculation at 30 Ω	(28.8 to 36) Ω	1.2 Ω	
Voltage Dips, Variations, and Interruption Generators –			Calibration method based on IEC 61000-4-11.
Output Voltage	(42 to 126) VAC	4.7 VAC	Rohde & Schwarz RTO2022 with Testec TT-SI9010 high voltage differential probe (measurements up to 6 kV)/Tektronix P6015A high voltage probe (measurements above 6 kV) and Pearson current monitor / attenuator 110A/A10.
Rise Time	(1 to 5) μs	0.50 μs	
Period @ 50ms	(47.5 to 52.5) ms	0.40 ms	
Period @ 200ms	(190 to 210) ms	0.90 ms	
Shift	(0 to 360) °	1.1 °	
Frequency	(58.8 to 61.2) Hz	1.5 Hz	
Overshoot/Undershoot	(42 to 126) VAC	4.1 VAC	
Voltage	(42 to 126) VAC	4.7 VAC	
Current	(0 to 6.3) A	0.30 A	

¹ This laboratory offers commercial calibration services.

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



Accredited Laboratory

A2LA has accredited

HV TECHNOLOGIES, Inc.

Manassas, VA

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 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 20th day of December 2022.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 5102.01
Valid to December 31, 2024

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