



# National Accreditation Board for Testing and Calibration Laboratories

## SCOPE OF ACCREDITATION

**Laboratory Name :** SOCIETY FOR APPLIED MICROWAVE ELECTRONICS ENGINEERING AND RESEARCH (SAMEER)-EMC DIVISION, SECTOR 7, RAIN TREE MARG CBD BELAPUR, NAVI MUMBAI, MAHARASHTRA, INDIA

**Accreditation Standard** ISO/IEC 17025:2017

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**Validity** 14/09/2021 to 13/09/2023 **Last Amended on** 19/01/2023

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
Permanent Facility					
1	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Combination Wave Surge Test System Current Front Time	Using Digital Storage Oscilloscope & Current Transformer by Direct method	6.4 $\mu$ s to 9.6 $\mu$ s	12.3%
2	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Combination Wave Surge Test System Current Pulse Width	Using Digital Storage Oscilloscope & Current Transformer by Direct method	16 $\mu$ s to 24 $\mu$ s	12.3%
3	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Combination Wave Surge Test Systems: Current Amplitude	Using Digital Storage Oscilloscope & Current Transformer by Direct method	$\pm$ 0.25 kA to $\pm$ 3 kA	12.76%
4	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Combination Wave Surge Test Systems: Voltage Amplitude	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	$\pm$ 0.5 kV to $\pm$ 6 kV	12.98%
5	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Combination Wave Surge Test Systems: Voltage Front Time	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.84 $\mu$ s to 1.56 $\mu$ s	15.1%



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6	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Combination Wave Surge Test Systems: Voltage Pulse Width	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	40 $\mu$ s to 60 $\mu$ s	12.5%
7	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Conducted RF Test System: AM Depth (10 Hz to 13.6 GHz)	Using Spectrum Analyzer by Direct method	0 to 100 %	3.3%
8	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Conducted RF Test System: Error of Monitor Input (9 kHz to 400 MHz)	Using Signal Generator & Power Meter by Direct method	-40 dBm to +13 dBm	0.4 dB to 0.6 dB
9	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Conducted RF Test System: Frequency Accuracy	Using Frequency Counter by Direct method	9 kHz to 400 MHz	1.7%
10	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Conducted RF Test System: Gain (10 Hz to 400 MHz)	Using Spectrum Analyzer by Direct method	Up to 50 dB	0.7dB
11	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Conducted RF Test System: Harmonics Level (up to Third Harmonics) [10 Hz to 400 MHz]	Using Spectrum Analyzer by Direct method	Up to -90 dBc	0.7dB
12	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Conducted RF Test System: Level Accuracy (9 kHz to 400 MHz)	Using Spectrum Analyzer & Power Meter by Direct method	-30 dBm to +10 dBm	0.1 dB to 0.3 dB



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13	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Coupling Factor/Coupling Loss (9kHz to 8.5GHz) * Directional Coupler * EM Clamp	Using Vector Network Analyser by Direct Method	1 dB to 70 dB	0.3 dB to 0.7 dB
14	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Damped Oscillatory Wave Generator Current Amplitude	Using Digital Storage Oscilloscope & Current Transformer by Direct method	1 A to 15 A	12.76%
15	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Damped Oscillatory Wave Generator: Oscillation Frequency	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	90 kHz to 110 kHz	12.4%
16	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Damped Oscillatory Wave Generator: Voltage Amplitude	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	±0.25 kV to ±4 kV	12.93%
17	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Damped Oscillatory Wave Generator: Voltage Decay (Ratio of Pk10 to Pk1)	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	Up to 0.5	13%
18	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Damped Oscillatory Wave Generator: Voltage Decay (Ratio of Pk5 to Pk1)	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.5	13%



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19	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Damped Oscillatory Wave Generator: Voltage Rise Time	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	60 ns to 90 ns	12.43%
20	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Decoupling of Common Mode Disturbance(9 kHz to 230 MHz) * Coupling Decoupling Network * Impedance Stabilization Network	Using Vector Network Analyzer by Direct method	1 dB to 70 dB	0.3 dB to 0.7 dB
21	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrical Fast Transient Test System Burst Duration(at 5kHz)	Using Digital Storage Oscilloscope by Direct method	12 ms to 18 ms	12.2%
22	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrical Fast Transient Test System Burst Period	Using Digital Storage Oscilloscope by Direct method	240 ms to 360 ms	12.4%
23	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrical Fast Transient Test System Pulse Amplitude	Using Digital Storage Oscilloscope by Direct method	± 0.125 kV to ± 6 kV	12.9%
24	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrical Fast Transient Test System Pulse Rise Time	Using Digital Storage Oscilloscope by Direct method	3.5 ns to 6.5 ns	12.41%



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25	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrical Fast Transient Test System Pulse Width	Using Digital Storage Oscilloscope by Direct method	35 ns to 65 ns	12.4%
26	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrical Fast Transient Test System Repetation Frequency	Using Digital Storage Oscilloscope by Direct method	5 kHz to 100 kHz	12.4%
27	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : Current at 180 ns (Contact Discharge Mode) [RC Module: 150 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.55 A to 5.55 A	9.3%
28	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : Current at 360 ns (Contact Discharge Mode) [RC Module: 150 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.3 A to 3 A	9.2%
29	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : Current at 360 ns (Contact Discharge Mode) [RC Module: 330 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.3 A to 3 A	9.2%



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30	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : Current at 65 ns (Contact Discharge Mode) [RC Module: 330 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	4 A to 40 A	9.1%
31	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : DC Voltage (Air Discharge Mode)	Using HV Volt Meter by Direct method	±2 kV to ±30 kV	3%
32	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : First Peak Current (Contact Discharge Mode) [RC Module: 150 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	7.5 A to 75 A	9%
33	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : First Peak Current (Contact Discharge Mode) [RC Module: 150 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	7.5 A to 75 A	9%
34	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : First Peak Current (Contact Discharge Mode) [RC Module: 330 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	7.5 A to 75 A	9%



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35	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : Rise Time (Contact Discharge Mode) [RC Module: 330 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.6 ns to 1 ns	10.6%
36	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator : Rise Time (Contact Discharge Mode) [RC Module: 330 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.6 ns to 1 ns	10.6%
37	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator :Current at 180 ns (Contact Discharge Mode) [RC Module: 330 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.55 A to 5.55 A	9.3%
38	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Current at 130 ns (Contact Discharge Mode) [RC Module: 330 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	2 A to 20 A	9.2%
39	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Current at 30 ns (Contact Discharge Mode)	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	4 A to 30 A	6.8%



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40	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Current at 30 ns (Contact Discharge Mode) [RC Module: 150 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	4 A to 40 A	9.1%
41	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Current at 60 ns (Contact Discharge Mode)	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	2 A to 15 A	6.8%
42	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Current at 60 ns (Contact Discharge Mode) [RC Module: 150 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	2 A to 20 A	9.4%
43	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: DC Voltage (Air Discharge Mode)	Using HV Voltmeter by Direct method	±2 kV to ±30 kV	2.9%
44	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: First Peak Current (Contact Discharge Mode)	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	±7.5 A to 56.25 A	6.8%





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45	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: First Peak Current (Contact Discharge Mode) [RC Module: 330 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	7.5 A to 75 A	9%
46	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Rise Time (Contact Discharge Mode)	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.68 ns to 0.92 ns	10.4%
47	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Rise Time (Contact Discharge Mode) [RC Module: 150 pF/2000 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.6 ns to 1 ns	10.6%
48	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Electrostatic Discharge Generator: Rise Time (Contact Discharge Mode) [RC Module: 150 pF/330 ohm]	Using Target-Attenuator-Cable Chain & Digital Storage Oscilloscope by Direct method	0.68 ns to 0.92 ns	10.7%
49	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Amplitude Relationship( Quasi Peak/ Average)	Using Calibration Pulse Generator by Direct method	9 kHz to 1 GHz	0.8dB



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50	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Amplitude Relationship( Peak/quasi Peak)	Using Calibration Pulse Generator by Direct method	9 kHz to 1 GHz	0.8dB
51	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Display Error of Average Detector with Sinusoidal Signal	Using Signal Generator by Direct method	9 kHz to 6 GHz	0.7dB
52	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Display Error of Peak Detector With Sinusoidal Signal	Using Signal Generator by Direct method	9 kHz to 6 GHz	0.7dB
53	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Display Error of Quasi Peak Detector (PRF L ref) Band A	Using Calibration Pulse Generator by Direct method	100 Hz	0.8dB
54	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Display Error of Quasi Peak Detector (PRF L ref) Band B	Using Calibration Pulse Generator by Direct method	100 Hz	0.8dB
55	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Display Error of Quasi Peak Detector (PRF L ref) Band C/D	Using Calibration Pulse Generator by Direct method	100 Hz	0.8dB
56	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	EMI Test Receiver Return Loss( 0 dB to 70 dB)	Using Vector Network Analyzer by Direct method	9 kHz to 8.5 GHz	0.8dB



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57	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Impedance (30 MHz to 230 MHz ) * Impedance Stabilization Network * Coupling & Decoupling Network	Using Vector Network Analyzer by Direct method	1 Ohm to 210 Ohm	6.55 % to 17.8 %
58	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Impedance (9kHz to 30MHz) * Line Impedance Stabilization Network * Coupling & Decoupling Network and Termination	Using Vector Network Analyzer by Direct method	1 Ohm to 210 Ohm	6.55 % to 17.89 %
59	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Impulse Generator as per ISO/IEC 60950-1	Using Vector Network Analyzer by Direct method	1.2 $\mu$ s to 50 $\mu$ s	12.27%



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60	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Insertion Loss ( 0dB to 90 dB ) * Attenuator * Transient Limiter * Line Impedance Stabilization Network * Bulk Current Injection Probe * Directional Coupler * RF Cables or similar Equipments * 50 Ohm	Using Vector Network Analyser by Direct Method	9 kHz to 8.5 GHz	0.3 dB to 0.8 dB
61	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Isolation (9kHz to 8.5 GHz) * Line Impedance Stabilization Network * Dual Directional Coupler	Using Vector Network Analyzer by Direct method	1 dB to 90 dB	0.3 dB to 0.8 dB
62	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Phase Angle (9kHz to 30 MHz) Line Impedance Stabilization Network	Using Vector Network Analyzer by Direct method	-90° to 90°	6.55 % to 17.8 %



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63	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Return Loss (9kHz to 8.5GHz) * Antenna * Attenuator * Amplifier * Termination/ Load * Directional Coupler * 50 ohm Conical Adapter Line or any similar devices * RF Cables	Using Vector Network Analyzer by Direct method	1 dB to 70 dB	0.3 dB to 0.7 dB
64	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Amplifier( Pre Amplifier) Return Loss of Power Input Port & Output Port ( 9kHz to 8.5 GHz )	Using Vector Network Analyzer by Direct method	0 dB to 90 dB	0.3 dB to 0.7 dB
65	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Amplifiers (Power Amplifier): Gain (10 Hz to 6 GHz)	Using Spectrum Analyzer & Signal Generator by Direct method	Up to 90 dB	0.7dB
66	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Amplifiers (Power Amplifier): Harmonics Distortion (10 Hz to 13.6 GHz; up to 1000 W)	Using Spectrum Analyzer & Signal Generator by Direct method	Up to -90 dBc	0.7dB
67	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Amplifiers (Pre-amplifier): Gain (10 Hz to 6 GHz)	Using Spectrum Analyzer & Signal Generator by Direct method	Up to 90 dB	0.7dB



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68	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Amplifiers (Pre-amplifier): Harmonics Distortion (10 Hz to 13.6 GHz)	Using Spectrum Analyzer & Signal Generator by Direct method	Up to -90 dBc	1dB
69	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Signal Generator: Amplitude Modulation (AM) Depth Mod rate: 10 Hz to 6 GHz, CF : 1kHz	Using Spectrum Analyzer by Direct method	1 % to 100 %	4%
70	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Signal Generator: Frequency Accuracy	Using Frequency Counter by Direct method	9 kHz to 6 GHz	3.3%
71	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Signal Generator: Harmonic Level (up to Third Harmonic) [10 Hz to 12 GHz]	Using Spectrum Analyzer by Direct method	Up to -90 dBc	0.4dB
72	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	RF Signal Generator: Level Accuracy (9 kHz to 6 GHz)	Using Spectrum Analyzer & Power Meter by Direct method	-60 dBm to +19 dBm	0.1 dB to 0.3 dB
73	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Short Circuit Current	Using Digital Storage Oscilloscope & Current Transformer by Direct method	133 A to 333 A	12.75%



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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured / Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
74	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Short Circuit Current Rise Time	Using Digital Storage Oscilloscope & Current Transformer by Direct method	1 $\mu$ s	12.3%
75	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Generator: Decay in Voltage (Ratio of Pk2 to Pk1)	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.4 to 1.1	13.5%
76	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Generator: Decay in Voltage (Ratio of Pk3 to Pk2)	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.4 to 0.8	13.5%
77	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Generator: Decay in Voltage (Ratio of Pk4 to Pk3)	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.4 to 0.8	13.5%
78	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Generator: Open Circuit Voltage	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.25 kV to 4 kV	12.98%
79	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Generator: Open Circuit Voltage Rise Time	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0.35 $\mu$ s to 0.65 $\mu$ s	12.5%



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80	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Ring Wave Generator: Voltage Oscillation Frequency	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	90 kHz to 110 kHz	12.47%
81	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Surge Generator Peak Voltage as per ISO/IEC 60065	Using Digital Storage Oscilloscope by Direct method	500 V to 6 kV	12.27%
82	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Target Attenuator Cable Chain Insertion Loss Variation 100 kHz to 1 GHz	Using Vector Network Analyzer by Direct method	± 0.5 dB	0.3 dB to 0.7 dB
83	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Target Attenuator Cable Chain Insertion Loss Variation 1GHZ to 4 GHz	Using Vector Network Analyzer by Direct method	-1.2 dB to 1.2 dB	0.3 dB to 0.7 dB
84	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Target-Attenuator-Cable Chain: DC Resistance	Using Digital Multimeter by Direct method	2.1 Ohm	0.75%
85	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Target-Attenuator-Cable Chain: Low Frequency Transfer Impedance	Using Digital Multimeter by Direct method	0.060 Ohm to 0.20 Ohm	0.6%





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86	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Telecommunication Surge Test Systems: Current Amplitude	Using Digital Storage Oscilloscope & Current Transformer by Direct method	±12.5 A to ±100 A	12.9%
87	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Telecommunication Surge Test Systems: Current Duration	Using Digital Storage Oscilloscope & Current Transformer by Direct method	256 μs to 384 μs	12.39%
88	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Telecommunication Surge Test Systems: Current Front Time	Using Digital Storage Oscilloscope & Current Transformer by Direct method	4 μs to 6 μs	12.47%
89	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Telecommunication Surge Test Systems: Voltage Amplitude	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	±0.5 kV to ±4 kV	12.78%
90	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Telecommunication Surge Test Systems: Voltage Duration	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	560 μs to 840 μs	12.21%
91	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Telecommunication Surge Test Systems: Voltage Front Time	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	7 μs to 13 μs	14.22%



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92	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Voltage Dips & Interruption: Dips/Interruption Time	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	10 ms to 5 s	12.04%
93	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Voltage Dips & Interruption: Output Voltage at No Load (Nominal Line Voltage)	Using Digital Storage Oscilloscope & HV Differential Probe by Direct method	0 to 100 %	12.9%
94	ELECTRO-TECHNICAL-EMI/ EMC (Measure)	Voltage Division Factor ( 150 kHz to 230 MHz ) * Coupling Decoupling Network (CDN) * Impedance Stabilization Network	Using Vector Network Analyzer by Direct method	1 dB to 70 dB	0.3 dB to 0.7 dB

\* CMCs represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k = 2.