National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:1999

IPS Corporation
1878-1, Harumiya Ono, Tatsuno-machi,
Kamiina-gun, Nagano-ken, PO Box 399-0601
Nagano 399-0601
JAPAN
Mr. Osamu Kubota
Phone: +81-266-44-5200 Fax: +81-266-44-5300
E-mail: kubota@ips-emc.co.jp
URL: http://www.ips-emc.co.jp

CALIBRATION LABORATORIES **NVLAP LAB CODE 200012-0**

ELECTROMAGNETICS - RF MICROWAVE

NVLAP Code: 20/R08
Microwave Antenna Parameters

Range	*Best Uncertainty (±)* [note 1]	*Remarks*
Dipole Antenna (such as the VHA9103/UHA9105)		
30 MHz to 80 MHz (Tuned 80 MHz)	0.6 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) EMI Receiver used
30 MHz to 300 MHz	0.6 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) EMI Receiver used
300 MHz to 1000 MHz	0.8 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) EMI Receiver used
Biconical Antenna (such as the BBA9106)		
30 MHz to 300 MHz	0.8 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) EMI Receiver used

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30 MHz to 300 MHz	0.7 dB	Horizontal Antenna Factor (D = 3 m, H = 2 m) EMI Receiver used
30 MHz to 300 MHz	0.8 dB	Horizontal Antenna Factor (D = 3 m, H = 1 m) EMI Receiver used
30 MHz to 300 MHz	0.8 dB	Vertical Antenna Factor (D = 3 m, H = 1.5 m) EMI Receiver used
30 MHz to 300 MHz	1.0 dB	Vertical Antenna Factor (D = 3 m, H = 1m) EMI Receiver used
30 MHz to 300 MHz	0.7 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) Network Analyzer used
30 MHz to 300 MHz	0.6 dB	Horizontal Antenna Factor (D = 3 m, H = 2 m) Network Analyzer used
30 MHz to 300 MHz	0.7 dB	Horizontal Antenna Factor (D = 3 m, H = 1 m) Network Analyzer used
30 MHz to 300 MHz	0.8 dB	Vertical Antenna Factor (D = 3 m, H = 1.5 m) Network Analyzer used
30 MHz to 300 MHz	0.9 dB	Vertical Antenna Factor (D = 3 m, H = 1 m) Network Analyzer used

Log-Periodic Antenna (such as the USLP9143/UHALP9108A)

300 MHz to 1000 MHz	1.2 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) EMI Receiver used
300 MHz to 1000 MHz	1.1 dB	Horizontal Antenna Factor (D = 3 m, H = 2 m) EMI Receiver used

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300 MHz to 1000 MHz	1.1 dB	Horizontal Antenna Factor (D = 3 m, H = 1 m) EMI Receiver used
300 MHz to 1000 MHz	1.1 dB	Vertical Antenna Factor (D = 3 m, H = 1.5 m) EMI Receiver used
300 MHz to 1000 MHz	1.2 dB	Vertical Antenna Factor (D = 3 m, H = 1 m) EMI Receiver used
300 MHz to 1000 MHz	1.1 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) Network Analyzer used
300 MHz to 1000 MHz	1.1 dB	Horizontal Antenna Factor (D = 3 m, H = 2 m) Network Analyzer used
300 MHz to 1000 MHz	1.1 dB	Horizontal Antenna Factor (D = 3 m, H = 1 m) Network Analyzer used
300 MHz to 1000 MHz	1.1 dB	Vertical Antenna Factor (D = 3 m, H = 1.5 m) Network Analyzer used
300 MHz to 1000 MHz	1.2 dB	Vertical Antenna Factor (D = 3 m, H = 1 m) Network Analyzer used
Bi-log Antenna (such as the CBL6112B)		
300 MHz to 1000 MHz	1.3 dB	Horizontal Antenna Factor (D = 10 m, H = 2 m) EMI Receiver used
300 MHz to 1000 MHz	1.3 dB	(D = 10 m, H = 2 m) Network Analyzer used
300 MHz to 1000 MHz	1.3 dB	(D = 3 m, H = 2 m) Network Analyzer used
LISN *note 2*		
9 kHz to 108 MHz	2.01 %	Impedance
9 kHz to 108 MHz	0.2 dB	Insertion Loss

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AC 100 V to 240 V with 50 Hz	0.17 %	Series Voltage Drop
DC 100 V to 28 V	0.15 %	Series Voltage Drop
CDN *note 2*		
100 kHz to 230 MHz	1.35 %	Impedance
100 kHz to 230 MHz	0.2 dB	Insertion Loss
RF Amplifier *note 2*		
9 kHz to 6 GHz	0.2 dB	Gain, 4395A + 87512A and or 8753ES
9 kHz to 6 GHz	3.57 %	Impedance (VSWR), 4395A + 87512A and/or 8753ES
ESD Simulators		
7.5 A to 60A (2 kV to 15 kV)	1.7 %	Peak current, 54845A
0.7 ns to 1 ns (2 V to 1.5 kV)	5.0 %	Rise time, 54845A
4 A to 30 A (2 kV to 15 kV)	1.7 %	Discharge current at 30 ns, 54845A
2 A to 15 A (2 kV to 15 kV)	1.7 %	Discharge current at 60 ns, 54845A
EFT/Burst *note 2*		
0.25 kV to 4 kV	1.7 %	Peak voltage, 54845A
3.5 ns to 6.5 ns (0.25 kV to 4 kV)	1.1 %	Rise time, 54845A
35 ns to 65 ns (0.25 kV to 4 kV)	0.9 %	Impulse duration, 54845A
2.5 kHz to 5 kHz (0.25 kV to 4 kV)	1.2 %	Repetition frequency, 54622A
12 ms to 18 ms (0.25 kV to 4 kV)	1.0 %	Burst duration, 54622A
240 ms to 360 ms (0.2 5 kV to 4 kV)	1.0 %	Bust period, 54622A
Directional Coupler *note 2*		
9 kHz to 6 GHz, 0 dB to 60 dB	0.20 dB	Coupling Factor
9 kHz to 6 GHz, 0 dB to 70 dB	0.44 dB	Coupling Factor
9 kHz to 6 GHz, 0 dB to 80 dB	0.95 dB	Coupling Factor

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9 kHz to 6 GHz	0.20 dB	Insertion Loss
EM Clamp *note 2*		
0.1 MHz to 230 MHz	0.5 dB	Insertion Loss
150 ohm to 50 ohm Adaptor *note 2*		
0.1 MHz to 230 MHz	0.5 dB	Insertion Loss
Current Probe/Current Injection Probe *note 2*		
10 kHz to 500 MHz	0.4 dB	Insertion Loss
10 kHz to 500 MHz	0.5 dB ohm	Transfer Impedance
Hi-Impedance Probe *note 2*		
9 kHz to 30 kHz	0.3 dB	Voltage Division Factor
50 ohm Termination *note 2*		
9 kHz to 500 MHz	2.02 %	Impedance and VSWR, 4395A + 87512A
30 KHz to 1.3 GHz	1.13 %	Impedance and VSWR, 8753ES
1.3 GHz to 3 GHz	1.76 %	Impedance and VSWR, 8753ES
3 GHz to 6 GHz	3.57 %	Impedance and VSWR, 8753ES
RF Attenuator *note 2*		
9 kHz to 6 GHz	0.2 dB	Insertion Loss
9 kHz to 6 GHz	3.57 %	Impedance (VSWR), 4395A+ 8753ES
Impedance Measure (Reflection Coefficient, VSWR)		
9 kHz to 500 MHz	2.02 %	Impedance, Refl. Coefficient & VSWR, 4395A + 87512A

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100 kHz to 1.8 GHz	2.01 %	Impedance, Refl. Coefficient & VSWR, 4396B
30 kHz to 1.3 GHz	1.13 %	Impedance, Refl. Coefficient & VSWR, 8753ES
1.3 GHz to 3 GHz	1.76 %	Impedance, Refl. Coefficient & VSWR, 8753ES
3 GHz to 6 GHz	3.57 %	Impedance, Refl. Coefficient & VSWR, 8753ES
RF Insertion Loss/Gain Measure		
9 kHz to 500 MHz, 0 dB to 60 dB	0.20 dB	4395A + 87512A
100 kHz to 1.8 GHz, 0 dB to 60 dB	0.15 dB	4396B
30 kHz to 1.3 GHz, 0 dB to 60 dB	0.09 dB	8753ES
1.3 GHz to 3 GHz, 0 dB to 60 dB	0.10 dB	8753ES
3 GHz to 6 GHz, 0 dB to 60 dB	0.15 dB	8753ES

1. Represents an expanded uncertainty using a coverage factor, k = 2, at an approximate level of confidence of 95 %.
2. Items available for on-site service.

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