

United States Department of Commerce  
National Institute of Standards and Technology



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**Certificate of Accreditation to ISO/IEC 17025:2005**

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**NVLAP LAB CODE: 200012-0**

**IPS Corporation Nagano Calibration Center**  
Nagano-ken  
Japan

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

**Calibration Laboratories**

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

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2017-11-20 through 2018-12-31

*Effective Dates*



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*Dana S. Gorman*  
For the National Voluntary Laboratory Accreditation Program



**CALIBRATION LABORATORIES**

**NVLAP LAB CODE 200012-0**

**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005**

<p><b>IPS Corporation Nagano Calibration Center</b>          1878-1, Ono, Tatsuno-machi,          Kamiina-gun, Nagano-ken 399-0601          JAPAN          Mr. Shuichi Aruga          Phone: +81-266-44-5200 Fax: +81-266-44-5300          E-mail: <a href="mailto:qa@ips-emc.co.jp">qa@ips-emc.co.jp</a>          URL: <a href="http://www.ips-emc.co.jp">http://www.ips-emc.co.jp</a></p>	<p><b>Fields of Calibration</b>          Electromagnetics – DC/Low Frequency          Time and Frequency          Electromagnetics – RF/Microwave</p>
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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) <sup>Notes 1,2</sup>**

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty <sup>Notes 3, 5</sup>	Remarks
<b>ELECTROMAGNETICS – DC/LOW FREQUENCY</b>			
<b>AC RESISTANCE and CURRENT (20/E02)</b>			
AC Current – Measure ESD Simulators Peak current (2 kV to 30 kV) Discharge current (30 ns to 800 ns)	7.5 A to 113 A	3.9 %	IEC 61000-4-2, ISO 10605 Oscilloscope
Surge Generator Field calibrations available <sup>Note 4</sup> Peak Current, Short circuit current waveform (8/20 μs, 5/320 μs)	0.3 A to 60 A	4.9 %	IEC 61000-4-5
	100 A to 2 kA	2.6 %	Oscilloscope
<b>DC VOLTAGE (20/E06)</b>			
DC Voltage - Measure Field calibrations available <sup>Note 4</sup>	0.01 V to 1000 V	0.11 %	DMM
ESD Simulators DC High Voltage	0.5 kV to 1 kV 1 kV to 3 kV 3 kV to 40 kV	2.3 % 1.2 % 1.1 %	IEC 61000-4-2, ISO 10605 DHM-40/10

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<b>Measured Parameter or Device Calibrated</b>	<b>Range</b>	<b>Expanded Uncertainty <sup>Notes 3, 5</sup></b>	<b>Remarks</b>
<b>LF AC VOLTAGE (20/E09)</b>			
AC Voltage - Measure Field calibrations available <sup>Note 4</sup> 0.1 V to 750 V	3 Hz to 5 Hz 5 Hz to 10 Hz 10 Hz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 300 kHz	3.1 % 0.46 % 0.12 % 0.18 % 0.79 % 5.2 %	DMM
10 mV to 5 V	DC to 100 MHz	3.3 %	Oscilloscope
5 V to 4 kV	DC to 50 MHz	3.8 %	Oscilloscope w/ HV Probe
EFT/Burst Field calibrations available <sup>Note 4</sup> Peak Voltage	100 V to 6 kV	3.0 %	IEC 61000-4-4 Oscilloscope
Peak Voltage with capacitive clamp		2.8 %	
Transient Generator Field calibrations available <sup>Note 4</sup> Peak Voltage	10 V to 600 V	4.1 %	ISO 7637-2, Annex C
Surge Generator Field calibrations available <sup>Note 4</sup> Peak Voltage, Open-circuit voltage waveform (1.2/50 μs, 10/700 μs)	100 V to 4 kV	2.8 %	IEC 61000-4-5 Oscilloscope
Overshoot/Undershoot Field calibrations available <sup>Note 4</sup> Voltage	1 V to 50 V	3.2 %	Oscilloscope

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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) Notes 1,2**

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty Notes 3, 5	Remarks
Voltage Dip Simulator Field calibrations available Note 4 AC Voltage	10 V to 500 V	0.4 %	DMM
<b>TIME and FREQUENCY</b>			
<b>FREQUENCY DISSEMINATION (20/F01)</b>			
EFT/Burst (100 V to 6 kV) Field calibrations available Note 4 Repetition frequency Burst duration Burst period	1 kHz to 500 kHz	0.6 % 0.6 % 0.4 %	IEC 61000-4-4 Oscilloscope
Voltage Dip Simulator Field calibrations available Note 4 Duration Time	10 ms to 5 s	2.4 %	Oscilloscope
Frequency - Measure Field calibrations available Note 4 50 Hz / 60 Hz	1 Hz to 1 GHz	0.5 % 0.1 %	Oscilloscope DMM
Differential - Time Measure Field calibrations available Note 4	1 ns to 5 s	0.6 %	Oscilloscope
Differential - Phase Field calibrations available Note 4	0° to 360°	2.5°	Oscilloscope
<b>PULSE WAVEFORM (20/F04)</b>			
ESD Simulators (2 kV to 30 kV) Rise time	0.6 ns to 1 ns	6.9 %	IEC 61000-4-2, ISO 10605 (Excluding RC time constant) Oscilloscope
EFT/Burst (100 V to 6 kV) Field calibrations available Note 4 Without Capacitive Clamp Rise time Impulse duration With Capacitive Clamp	1 ns to 10 ns 10 ns to 500 ns	1.5 % 1.0 %	IEC 61000-4-4 Oscilloscope

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<b>Measured Parameter or Device Calibrated</b>	<b>Range</b>	<b>Expanded Uncertainty <sup>Notes 3, 5</sup></b>	<b>Remarks</b>
Rise time	1 ns to 10 ns	1.4 %	
Impulse duration	10 ns to 500 ns	0.6 %	
Surge Generator Field calibrations available <sup>Note 4</sup> Open-circuit voltage waveform (100 V to 4 kV) (1.2/50 µs, 10/700 µs) Rise Time Half value duration	0.5 µs to 20 µs 10 µs to 1000 µs	3.5 % 3.7 %	IEC 61000-4-5  Oscilloscope
Short-circuit current waveform (50 A to 2 kA) (8/20 µs, 5/320 µs) Rise Time Half value duration	1 µs to 20 µs 10 µs to 500 µs	3.4 % 2.3 %	
Transient Generator (10 V to 600 V) Field calibrations available <sup>Note 4</sup> Rise Time Pulse Width	1 ns to 50 ms 50 ns to 3 s	5.8 % 5.9 %	ISO 7637-2, Annex C  Oscilloscope
Voltage Dip Simulator (10 V to 500 V) Field calibrations available <sup>Note 4</sup> Rise/Fall Time	1 µs to 5 µs	2.7 %	IEC 61000-4-11  Oscilloscope
<b>ELECTROMAGNETICS – RF/MICROWAVE</b>			
<b>MICROWAVE ANTENNA PARAMETERS (20/R08)</b>			
Dipole Antenna (such as the VHA9103/UHA9105) Horizontal Antenna Factor (D = 10 m, H = 2 m)	30 MHz to 80 MHz (Tuned at 80 MHz) 30 MHz to 300 MHz 300 MHz to 1 GHz	0.6 dB 0.6 dB 0.8 dB	Substitution method EMI Receiver Network Analyzer

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**CALIBRATION AND MEASUREMENT CAPABILITIES (CMC)** Notes 1,2

<b>Measured Parameter or Device Calibrated</b>	<b>Range</b>	<b>Expanded Uncertainty</b> <small>Notes 3, 5</small>	<b>Remarks</b>
Biconical Antenna (such as the BBA9106) Antenna Factor Horizontal (D = 10 m, H = 2 m) Horizontal (D = 3 m, H = 2 m) Horizontal (D = 3 m, H = 1 m) Vertical (D = 3 m, H = 1.5 m) Vertical (D = 3 m, H = 1 m)	30 MHz to 300 MHz	0.7 dB 0.6 dB 0.7 dB 0.8 dB 0.9 dB	Substitution method  Network Analyzer
Log-Periodic Antenna (such as the USLP9143/UHALP9108A) Antenna Factor Horizontal (D = 10 m, H = 2 m) Horizontal (D = 3 m, H = 2 m) Horizontal (D = 3 m, H = 1 m) Vertical (D = 3 m, H = 1.5 m) Vertical (D = 3 m, H = 1 m)	300 MHz to 1GHz	1.1 dB 1.1 dB 1.1 dB 1.1 dB 1.2 dB	Substitution method  Network Analyzer
Bi-log Antenna (such as the CBL6112B) Horizontal Antenna Factor (D = 10 m, H = 2 m) (D = 3 m, H = 2 m)	30 MHz to 1 GHz	1.3 dB 1.3 dB	Substitution method  Network Analyzer
Biconical Antenna Antenna Factor Horizontal (D = 1 m, H = 3 m) Vertical (D = 1 m, H = 3 m)	25 MHz to 300 MHz	0.5 dB 0.4 dB	SAE ARP958  Network Analyzer
Log-Periodic Antenna Antenna Factor Horizontal (D = 1 m, H = 3 m)	150 MHz to 300 MHz	0.7 dB	SAE ARP958  Network Analyzer

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<b>Measured Parameter or Device Calibrated</b>	<b>Range</b>	<b>Expanded Uncertainty <sup>Notes 3, 5</sup></b>	<b>Remarks</b>
Horizontal (D = 1 m, H = 3 m)	300 MHz to 1 GHz	0.3 dB	
Horizontal (D = 1 m, H = 3 m)	1 GHz to 1.8 GHz	0.5 dB	
Vertical (D = 1 m, H = 3 m)	150 MHz to 300 MHz	0.4 dB	
Vertical (D = 1 m, H = 3 m)	300 MHz to 1 GHz	0.2 dB	
Vertical (D = 1 m, H = 3 m)	1 GHz to 1.8 GHz	0.4 dB	
Horn Antenna			
Antenna Factor			
Free Space (D = 1 m, H = 3 m)	0.75 GHz to 8.5 GHz	1.0 dB	Network Analyzer
	0.75 GHz to 18 Hz	1.4 dB	Spectrum Analyzer
NSA Measurement			CISPR 16-1-4, and ANSI C63.4
Field calibrations available <sup>Note 4</sup>			Network Analyzer
Horizontal	30 MHz to 200 MHz	1.4 dB	
Vertical		1.7 dB	
Horizontal	200 MHz to 1 GHz	1.4 dB	
Vertical		1.5 dB	
SVSWR Measurement			CISPR 16-1-4, and ANSI C63.4
Field calibrations available <sup>Note 4</sup>			Network Analyzer
Horizontal	1 GHz to 3 GHz	2.2 dB	Spectrum Analyzer
Vertical		2.1 dB	
Horizontal	3 GHz to 6 GHz	2.4 dB	
Vertical		2.7 dB	
Horizontal	6 GHz to 12 GHz	2.5 dB	
Vertical		1.9 dB	
Horizontal	12 GHz to 18 GHz	2.0 dB	
Vertical		1.9 dB	
Absorbing Clamp			CISPR 16-1-3:2004
Clamp Factor	30 MHz to 300 MHz	0.8 dB	Original Method
	300 MHz to 1 GHz	1.1 dB	Network Analyzer
Decoupling Factor (DF)	30 MHz to 150 MHz	1.3 dB	

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<b>Measured Parameter or Device Calibrated</b>	<b>Range</b>	<b>Expanded Uncertainty <sup>Notes 3, 5</sup></b>	<b>Remarks</b>
Decoupling Factor (DR)	150 MHz to 1GHz 30 MHz to 150 MHz 150 MHz to 1GHz	4.4 dB 0.9 dB 6.1 dB	
Biconical, Log-peridic, Hybrid Antenna			Standard Site Method ANSI C63.5: 2006 (OATS Calibration) (excluding GSCF)
Horizontal Antenna Factor (D = 10 m, H = 2 m)	20 MHz to 30 MHz 30 MHz to 300 MHz 300 MHz to 1 GHz 1 GHz to 1.8 GHz	1.1 dB 1.0 dB 0.9 dB 1.2 dB	ANSI C63.5: 2006 Clause 4.4.1 (OATS Calibration)
Biconical, Log-periodic, Hybrid Antenna			
Antenna Symmetry	20 MHz to 300 MHz 300 MHz to 1 GHz 1 GHz to 1.8 GHz	0.6 dB 0.6 dB 0.5 dB	
Horn Antenna			
Free Space Antenna Factor (D = 3 m)	0.75 GHz to 8.5 GHz 0.75 GHz to 18 GHz	1.0 dB 1.2 dB	Network Analyzer Spectrum Analyzer
Loop Antenna – Antenna Factor	9 kHz to 30 MHz	1.2 dB	Standard Field Strength Method
Large Loop Antenna – Validation Factor Field calibrations available <sup>Note 4</sup>	9 kHz to 30 MHz	0.8 dB	CISPR 16-1-4 Annex C
<b>SCATTERING PARAMETERS (20/R18)</b>			
Impedance & VSWR - Measure Field calibrations available <sup>Note 4</sup>	9 kHz to 300 kHz 300 kHz to 3 GHz 3 GHz to 6 GHz	2.0 % 1.2 % 2.2 %	Network Analyzer
Directional Coupler (9 kHz to 6 GHz) Field calibrations available <sup>Note 4</sup>			
Insertion Loss	0 dB to 60 dB	0.20 dB	Network Analyzer

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Coupling Factor	0 dB to 60 dB 60 dB to 70 dB 70 dB to 80 dB	0.20 dB 0.44 dB 0.95 dB	IEC 61000-4-6
EM Clamp / Decoupling Clamp 0.1 MHz to 230 MHz Field calibrations available <sup>Note 4</sup>			
Insertion Loss	100 kHz to 230 MHz	0.4 dB	
Impedance	100 kHz to 100MHz 100MHz to 230MHz	6.0 % 8.8 %	
Decoupling Factor	100 kHz to 100MHz 100MHz to 230MHz	0.6 dB 0.7 dB	Network Analyzer
Coupling Factor	100 kHz to 100MHz 100MHz to 230MHz	0.7 dB 0.6 dB	
50 ohm to 150 ohm Adaptor 0.1 MHz to 230 MHz Field calibrations available <sup>Note 4</sup>			
Insertion Loss	0 dB to 60 dB	0.3 dB	
Current Probe/Current Injection Probe 10 kHz to 500 MHz Field calibrations available <sup>Note 4</sup>			IEC 61000-4-6
Insertion Loss	0 dB to 60 dB	0.5 dB	
Transfer Impedance	0 dB to 60 dB	0.5 dB ohm	
Calibration Jig of Current Injection Probe Field calibrations available <sup>Note 4</sup>			IEC 61000-4-6
Transmission Loss	150 kHz to 230MHz	0.6 dB	
Hi-Impedance Probe 9 kHz to 30 MHz Field calibrations available <sup>Note 4</sup>			

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<b>Measured Parameter or Device Calibrated</b>	<b>Range</b>	<b>Expanded Uncertainty <sup>Notes 3, 5</sup></b>	<b>Remarks</b>
Voltage Division Factor	0 dB to 60 dB	0.3 dB	
RF Insertion Loss/Gain Measure Field calibrations available <sup>Note 4</sup>			
9 kHz to 300 kHz	0 dB to 60 dB	0.20 dB	
300 kHz to 3 GHz		0.10 dB	
3 GHz to 6 GHz		0.13 dB	
LISN Field calibrations available <sup>Note 4</sup>			
Insertion Loss	9 kHz to 108 MHz	0.2 dB	
Impedance	9 kHz to 30 MHz 30 MHz to 108 MHz	2.1 % 3.3 %	
Phase	9 kHz to 30 MHz 30 MHz to 108 MHz	4.9° 6.6°	
Isolation	9 kHz to 108 MHz	2.9 dB	
CDN Field calibrations available <sup>Note 4</sup>			
Insertion Loss	100 kHz to 230 MHz	0.2 dB	
Impedance	100 kHz to 80 MHz 80 MHz to 230 MHz	1.4 % 2.1 %	
CMAD Field calibrations available <sup>Note 4</sup>			
Transmission Coefficient	30 MHz to 200 MHz	0.0051 (linear)	
Reflection Coefficient	30 MHz to 200 MHz	0.013 (linear)	

**END**

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Notes

**Note 1:** A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

**Note 2:** Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

**Note 3:** The uncertainty associated with a measurement in a CMC is an expanded uncertainty with a level of confidence of approximately 95 %, typically using a coverage factor of  $k = 2$ . However, laboratories may report a coverage factor different than  $k = 2$  to achieve the 95 % level of confidence. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

**Note 3a:** The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

**Note 3b:** As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

**Note 3c:** As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions*. However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.1.h. of NIST Handbook 150, Procedures and General Requirements.

**Note 4:** Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

**Note 5:** Values listed with percent (%) are percent of reading or generated value unless otherwise noted.

**Note 6:** NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

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