SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

TDK TEST SERVICES
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CALIBRATION

Valid To: September 30, 2024 Certificate Number: 4867.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations[1, 4]:

I. Electrical – RF/Microwave

Parameter/Equipment	Frequency	CMC[2] (±)	Comments
Biconical Antenna – Antenna Factor – Polarization Horizontal/Vertical			
1 m	(20 to 300) MHz	0.81 dB	SAE ARP 958D/E
3 m	(30 to 300) MHz	0.61 dB 0.57 dB	SAE ARP 958D ANSI C63.5 (1998)
10 m	(30 to 300) MHz	1.17 dB 1.26 dB 0.98 dB 1.13 dB	CISPR 16-1-6 CISPR 16-1-6 ANSI C63.5 (1998) ANSI C63.5 (2006) ANSI C63.5 SAE ARP 958E
Conical Log Spiral/Log Spiral	200 MHz to 10 GHz	0.71 dB	SAE ARP 958D/E

Parameter/Equipment	Frequency	CMC[2] (±)	Comments
Dipole Antenna – Antenna Factor			
1 m	30 MHz to 2.4 GHz	0.54 dB	SAE ARP 958D/E
3 m	30 MHz to 1 GHz	0.63 dB 0.60 dB	SAE ARP 958D ANSI C63.5 (1998)
	1 GHz to 2.4 GHz	0.63 dB 0.60 dB	SAE ARP 958D ANSI C63.5
10 m	30 MHz to 1 GHz	1.04 dB 1.26 dB 0.98 dB	CISPR 16-1-6 CISPR 16-1-6 ANSI C63.5
	1 GHz to 2.4 GHz	0.98 dB	ANSI C63.5
Horn Antenna – Antenna Factor			
1 m	1 GHz to 20 GHz	0.49 dB 1.53 dB 0.83 dB	SAE ARP 958D/E ANSI C63.5 (1998) ANSI C63.5 (2006) ANSI C63.5 CISPR 16-1-6
	20 GHz to 40 GHz	1.85 dB 1.62 dB	SAE ARP 958D/E ANSI C63.5 (1998) ANSI C63.5 (2006) ANSI C63.5
3 m	1 GHz to 20 GHz	1.92 dB 1.53 dB 0.70 dB	SAE ARP 958D ANSI C63.5 (1998) ANSI C63.5 (2006) ANSI C63.5 CISPR 16-16
	20 GHz to 40 GHz	1.60 dB	SAE ARP 958D ANSI C63.5 (1998) ANSI C63.5 (2006) ANSI C63.5

Parameter/Equipment	Frequency	CMC[2] (±)	Comments
Hybrid Antenna – Antenna Factor			
1 m	30 MHz to 1 GHz	0.81 dB	SAE ARP 958D/E
	(1 to 8) GHz	0.53 dB 0.76 dB	SAE ARP 958D/E CISPR 16-1-6
3 m	30 MHz to 1 GHz	1.71 dB 1.51 dB	SAE ARP 958D ANSI C63.5 (1998)
	(1 to 8) GHz	1.15 dB 1.00 dB 0.69 dB	SAE ARP 958D ANSI C63.5 (1998) ANSI C63.5 (2006 ANSI C63.5 CISPR 16-1-6
10 m	30 MHz to 1 GHz	0.98 dB 1.17 dB 1.13 dB	ANSI C63.5 ANSI C63.5 (1998) ANSI C63.5 (2006) CISPR 16-1-6 SAE ARP 958E
	(1 to 8) GHz	1.47 dB	SAE ARP 958E
Loop Antenna – Antenna Factor	5 kHz to 30 MHz	0.92 dB	CISPR 16-1-6
LPDA (Log-Periodic Dipole Array Antenna) – Antenna Factor			
1 m	140 MHz to 1 GHz	0.58 dB	SAE ARP 958D/E
3 m	(1 to 8) GHz	0.53 dB 0.76 dB	SAE ARP 958D/E CISPR 16-1-6
	140 MHz to 1 GHz	1.71 dB 1.51 dB	SAE ARP 958D ANSI C63.5 (1998)
	(1 to 8) GHz	1.15 dB 1.00 dB 0.69 dB	SAE ARP 958D ANSI C63.5 ANSI C63.5 (1998) ANSI C63.5 (2006) CISPR 16-1-6

Parameter/Equipment	Frequency	CMC[2] (±)	Comments
LPDA (Log-Periodic Dipole Array Antenna) – Antenna Factor (cont)			
10 m	140 MHz to 1 GHz	1.00 dB 0.97 dB 0.86 dB	SAE ARP 958E CISPR 16-1-6 ANSI C63.5 ANSI C63.5 (1998) ANSI C63.5 (2006)
	(1 to 8) GHz	1.47 dB 1.27 dB	SAE ARP 958E ANSI C63.5 ANSI C63.5 (1998) ANSI C63.5 (2006)
Monopole Antenna – Antenna Factor	5 kHz to 30 MHz	0.79 dB	ANSI C63.5 CISPR 16-1-6 SAE ARP 958D/E
Antenna – Balance (Symmetry)	20 MHz to 300 MHz	1.16 dB	ANSI C63.4 ANSI C63.5 CISPR 16-1-4
Antenna – VSWR	5 kHz to 18 GHz	0.45 dB	CISPR 16-1-6 IEEE 149
Antenna – Cross Polarization	20 MHz – 18 GHz	0.69 dB	CISPR 16-1-4
Normalized Site Attenuation[3]	30 MHz – 1 GHz	1.31 dB	CISPR 16-1-4 ANSI C63.4a
Reference Site Method[3]	30 MHz – 1 GHz	1.27 dB	CISPR 16-1-4
Preamplifier - Gain	5 kHz to 30 MHz 30 MHz to 20 GHz 20 GHz to 40 GHz	0.44 dB 0.43 dB 0.69 dB	TTS-C-002

[1] This laboratory offers commercial calibration service.

[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] Field calibration service is available for this calibration. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g., resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

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

Accredited Laboratory

A2LA has accredited

TDK TEST SERVICES

Cedar Park, TX

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 September 2022.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4867.01
Valid to September 30, 2024

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