



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

NEBRASKA CENTER FOR EXCELLENCE IN ELECTRONICS

4740 Discovery Drive

Lincoln, NE 68521-5376

Nic Johnson email: njohnson@nceelabs.com

ELECTRICAL

Valid to: May 31, 2022

Certificate Number 1953.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electromagnetic compatibility tests:

Test Technology:

Test Method(s) ^{1,2}:

Emissions

*Unintentional Radiators
Radiated and Conducted
(up to 220 GHz)*

47 CFR, FCC Part 15, Subpart B (using ANSI C63.4-2014);
47 CFR, FCC Part 18 (using MP-5:1986);
CISPR 11; EN 55011; AS/NZS CISPR 11; KN 11;
CISPR 12; EN 55012; CAN/CSA-CISPR 12-10;
CISPR 14-1; EN 55014-1 (*excluding clicks*);
CISPR 22; EN 55022; AS/NZS CISPR 22 (2002); KN 22;
SANS 222; CISPR 32; EN 55032; KN 32;
AS/NZS 4771; AS/NZS 4268; AS/NZS CISPR 32
CNS 13438 (*up to 6 GHz*);
GB 9254 (1998); GB 17625.1 (2003);
VCCI V-3-2011 (*up to 6 GHz*); VCCI V-32

Current Harmonics

IEC 61000-3-2; EN 61000-3-2; AS/NZS 61000.3.2

Voltage Fluctuations and Flicker

IEC 61000-3-3; EN 61000-3-3; AS/NZS 61000.3.3

Magnetic Fields

IATA DGR Section 3.9.2.2 and PI953

Immunity

Electrostatic Discharge (ESD)

IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2;
AS/NZS 61000.4.2; SANS 61000-4-2; ISO 10605

Radio Frequency, Radiated
(80 MHz to 6 GHz, 10 V/m)

IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3;
AS/NZS 61000.4.3; SANS 61000-4-3; ISO 11452-1

Test Technology:**Test Method(s) ^{1,2}:*****Immunity (cont.)***

| | |
|--|---|
| Electrical Fast Transient / Burst | IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4; AS/NZS 61000.4.4; SANS 61000-4-4 |
| Surge Immunity | IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5; AS/NZS 61000.4.5; SANS 61000-4-5 |
| Radio Frequency, Conducted | IEC 61000-4-6; EN 61000-4-6; KN 61000-4-6; AS/NZS 61000.4.6; SANS 61000-4-6; ISO 11452-2 |
| Power Line Magnetic Field | IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8; AS/NZS 61000.4.8; SANS 61000-4-8 |
| Voltage Dips and Fluctuations | IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11; AS/NZS 61000.4.11 |
| Pulse Magnetic Field | IEC 61000-4-9; SANS 61000-4-9 |
| Ring Wave | IEC 61000-4-12 |
| Radio Frequency Conducted (0 Hz to 150 kHz, 10Vrms) | IEC 61000-4-16 |
| Radio Frequency, Radiated with Stripline (80 MHz to 400 MHz, 200V/m) | ISO 11452-5 |

***Transmitters and Receivers
(up to 220 GHz)***

| | |
|---|--|
| Unlicensed Transmitters | 47 CFR, FCC Part 15, Subpart C; ANSI C63.10-2013 |
| U-NII without DFS Intentional Radiators | 47 CFR, FCC Part 15, Subpart E; FCC Guidance KDB Publication 789033; ANSI C63.10-2013 |
| Licensed Transmitters (up to 40 GHz) | 47 CFR, FCC Part 15, Subpart F; ANSI C63.10-2013 |
| Commercial Mobile Services (FCC Licensed Radio Service Equipment) | 47 CFR FCC Part 22, 24, 25, 27 (below 3 GHz); FCC Guidance KDB Publication 971168; ANSI C63.26-2015; ANSI/TIA-603-D/E-2016 |
| General Mobile Radio Services (FCC Licensed Radio Service Equipment) | 47 CFR FCC Part 22, 90, 95, 97, 101 (below 3 GHz); ANSI C63.26-2015; ANSI/TIA-603-D/E-2016 |
| Maritime and Aviation Radio Services (FCC Licensed Radio Service Equipment) | 47 CFR FCC Part 80 and Part 87; ANSI C63.26-2015; ANSI/TIA-603-D/E-2016 |

Test Technology:

Test Method(s) ^{1,2}:

***Transmitters and Receivers
(up to 220 GHz) (cont.)***

Microwave and Millimeter Wave
Bands Radio Services (FCC Licensed
Radio Service Equipment)

47 CFR FCC Parts 25, 30, 74, 90, 95, 101;
ANSI C63.26-2015; ANSI/TIA-603-D/E-2016

**Military Standards
MIL-STD**

MIL-STD 461F/G;
RE101, RE102, CE102; CS101, CS116, RS101;
RTCA/DO-160F, Section 21; RTCA/DO-160F, Section 15

**Canada
(excluding DFS)**

ICES-001, ICES-002, ICES-003;
RSS-GEN; RSS-111; RSS-117; RSS-119; RSS-123; RSS-125;
RSS-127; RSS-131; RSS-135; RSS-137; RSS-141; RSS-142;
RSS-170; RSS-181; RSS-182; RSS-192; RSS-194; RSS-197;
RSS-210; RSS-216; RSS-220; RSS-222; RSS-236;
RSS-244; RSS-247

Japan

Japan Radio Tests Radio Law No. 131, Ordinance of MPT No. 37,
1981, MIC Notification No. 88:2004, Table No. 22-11;
ARIB STD-T66, Regulation 18

Radio Communication

ETSI EN 300 328; ETSI EN 300 683 (excluding DFS);
ETSI EN 300 220-2;
ETIS EN 300 330;
ETSI EN 300 440;
ETSI EN 300 113-1;

Product Standards

Immunity, Household Appliances,
and Electric Tools

EN 55014-2; CISPR 14-2

Sound and Television Broadcast
Receivers and Associated
Equipment, Immunity

EN 55020; CISPR 20

Emissions, Information
Technology Equipment

EN 55022; CISPR 22; KN 22; AS/NZS CISPR 22

Immunity, Information Technology
Equipment

EN 55024; CISPR 24; KN 24; AS/NZS CISPR 24

Immunity, Multimedia Equipment

EN 55035; CISPR 35; KN 35

Emissions, Multimedia Equipment

EN 55032; CISPR 32; KN 32; AS/NZS CISPR 32

Test Technology:**Test Method(s) ^{1,2}:*****Product Standards (cont.)***

| | |
|--|---|
| Electrical and Electronic Installation in Ships – EMC | IEC 60533; KN 60533 |
| Agriculture and Forestry Machinery | EN 14982; ISO 14982 (<i>excluding power transients</i>) |
| Earth-Moving Machinery | EN 13766; ISO 13766 (<i>emissions and ESD only</i>) |
| Immunity Requirements for Components of Fire, Intruder, and Social Alarms | EN 50130-4 |
| Medical Electrical Equipment | IEC 60601-1-2; EN 60601-1-2 |
| Electrical Equipment for Measurement, Control, and Laboratory Use | IEC 61326-1; EN 61326-1 |
| Requirement for EMC Unprotected Area | IEC 61326-2-1; EN 61326-2-1 |
| Requirements for Transducers with Integrated or Remote Signal Conditioning | IEC 61326-2-3; EN 61326-2-3 |
| Generic Immunity for Residential, Commercial, and Light Industrial | IEC 61000-6-1; EN 61000-6-1; AS/NZS 61000.6.1; KN 61000-6-1 |
| Generic Immunity for Industrial Environments | IEC 61000-6-2; EN 61000-6-2; AS/NZS 61000.6.2; KN 61000-6-2 |
| Generic Emissions for Residential, Commercial, and Light Industrial | IEC 61000-6-3; EN 61000-6-3; AS/NZS 61000.6.3; KN 61000-6-3 |
| Generic Emissions for Industrial Environments | IEC 61000-6-4; EN 61000-6-4; AS/NZS 61000.6.4; KN 61000-6-4 |
| Maritime navigation and radiocommunication equipment and systems - General requirements - Methods of testing and required test results | IEC 60945; KN 60945 |

Test Technology:

Test Method(s) ^{1,2}:

Product Standards (cont.)

EMC Standard for Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands

ETSI EN 300 413

EMC standard for Satellite Earth Stations and Systems (SES); Harmonised Standard for Mobile Earth Stations (MES), including handheld earth stations, for Satellite Personal Communications Networks (S-PCN) operating in the 1,6 GHz/2,4 GHz frequency band under the Mobile Satellite Service (MSS)

ETSI EN 300 441

EMC Standard for SRD Operating on Frequencies Between 9 kHz and 25 GHz

ETSI EN 300 683 (*excluding section 9.6*)

EMC Standard for Radio Equipment and Services; Part 1 – Common Technical Requirements

ETSI EN 301 489-1; KN 301 489-1; ETSI EN 301 489-17; KN 301 489-17; EAC Voluntary Voting System Guidelines (2015), Vol. 1 Section 4.1.2.4-12; Vol. 2 Section 8

Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

EN 61010-1; IEC 61010-1; UL61010-1; CAN/CSA C22.2 No. 61010-1

Particular Requirements for Electrical Equipment for the Heating of Materials

EN 61010-2-010; IEC 61010-2-010

Exclusions:

6.7.1.3 – Tracking Index

Measurements,

9.3.1/14.7 – Flammability Testing,

10.5.3 – Vicat Testing,

11.7 – Fluid Pressure and leakage,

12.2 – Ionizing Radiation

12.3 – UV Radiation,

12.4 – Microwave Radiation,

12.5.2 – Ultrasonic Pressure

Test Technology:

Test Method(s) ^{1,2}:

Product Standards (cont.)

Particular Requirements for Automatic and Semi-automatic Laboratory Equipment for Analysis and Other Purposes

EN 61010-2-081; IEC 61010-2-081

Information Technology Equipment – Safety

EN 60950-1; IEC 60950-1; ANSI/UL 60950-1; CAN/CSAC22.2 No. 60950-1-07

Exclusions:

4.3.13 – Ionizing Radiation,

4.7.3 – Materials Tests

Safety of machinery - Electrical equipment of machines

IEC 60204-1

Audio/video, information and communication technology equipment - Part 1: Safety requirements

IEC 62368-1; AS/NZS 62368-1

Household and Similar Electrical Appliances – Safety

EN 60335-1; IEC 60335-1; UL60335-1; CAN/CSA C22.2 No. 60335-1

Exclusions:

Clause 21.1 – Spring Hammer Test

Clause 23.3 – Wire Flexing Test

Clause 25.14 – Supply Cord Flexing Test

Clause 30 – Material Tests

Ingress Protection, up to IP67

IEC 60529

¹ When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*.

² The laboratory is only accredited for testing activities outlined within the test methods listed above. Reference to any other activity within these standards, such as risk management or risk assessment, does not fall within the laboratory's accredited capabilities

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1 ³:

| Rule Subpart/Technology | Test Method | Maximum Frequency (MHz) |
|--|--|--------------------------------|
| <u>Unintentional Radiators</u> Part 15B | ANSI C63.4-2014 | 220000 |
| <u>Industrial, Scientific, and Medical Equipment</u> Part 18 | FCC MP-5 (February 1986) | 220000 |
| <u>Intentional Radiators</u> Part 15C | ANSI C63.10-2013 | 220000 |
| <u>U-NII without DFS Intentional Radiators</u> Part 15E | ANSI C63.10-2013 | 220000 |
| <u>UWB Intentional Radiators</u> Part 15F | ANSI C63.10-2013 | 220000 |
| <u>Commercial Mobile Services (FCC Licensed Radio Service Equipment)</u> Part 22 (cellular), Part 24, Part 25 (below 3 GHz), Part 27 | FCC Guidance KDB Publication 971168; ANSI C63.26-2015; ANSI/TIA-603-D/E | 220000 |
| <u>General Mobile Radio Services (FCC Licensed Radio Service Equipment)</u> Part 22 (non-cellular), Part 90 (below 3 GHz), Part 95, Part 97 (below 3 GHz), Part 101 (below 3 GHz) | ANSI C63.26-2015; ANSI/TIA-603-D/E | 220000 |
| <u>Maritime and Aviation Radio Services</u> Part 80, Part 87 | ANSI C63.26-2015; ANSI/TIA-603-D/E | 220000 |
| <u>Microwave and Millimeter Bands Radio Services</u> Parts 25, 30, 74, 90 (above 3 GHz), 95 (above 3 GHz), 97 (above 3 GHz), and 101 | ANSI C63.26-2015; ANSI/TIA-603-D/E; FCC Guidance KDB Publication 653005 | 220000 |

³Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (<https://apps.fcc.gov/oetcf/eas/>) for a listing of FCC approved laboratories.



Accredited Laboratory

A2LA has accredited

NEBRASKA CENTER FOR EXCELLENCE IN ELECTRONICS

Lincoln, NE

for technical competence in the field of

Electrical Testing

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 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 14th day of September 2020.

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

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1953.01
Valid to May 31, 2022

For the tests to which this accreditation applies, please refer to the laboratory's «field» Scope of Accreditation.