



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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ELECTRICAL

Valid until: July 31, 2019

Certificate Number: 1627.01

In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the organization's compliance with A2LA's EPA ENERGY STAR[®] Accreditation Program ² requirements), accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC), Telecommunications, and Product Safety tests on the following types of products: Medical, Consumer, Industrial, Automotive, Commercial, Telecommunications, Military, Wireless, Marine, Test and Measurement, Aerospace, Lightning and Lasers.

Automotive Electromagnetic Compatibility (EMC) Testing

- Radiated Emissions Testing (electric and magnetic fields)*;
- Conducted Emissions Testing (voltage, current, pin and transient)*;
- Magnetic Field Immunity Testing (Loop Antenna and Helmholtz Coil Methods);
- Radio Frequency Immunity Testing (BCI, ALSE, Near Field and Direct RF Power Injection);
- Automotive Transients Testing;
- Electrostatic Discharge Testing (operating, handling, and I/O);
- Coupled Immunity (pulses and sinusoidal);
- Continuous Power Line Disturbances Immunity;
- Power Cycling Immunity;
- Ground Voltage Offset Immunity;
- Voltage Dropout;
- Voltage Overstress Immunity;
- Low Voltage Transients;
- Vehicle Electrical Tests

<u>Automotive Test Technology:</u>	<u>Test Method(s):</u>
Radiated Emissions Testing	CISPR25; Defence Standard 59-411 Part 3 Issue 1 Amendment 1 DRE02.B; B21 7110; ES 96200-00
Conducted Emissions Testing	CISPR25; ISO 7637-2; B21 7110; ES 96200-00
Magnetic Field Immunity Testing	ISO 11452-8, MIL-STD-461 RS101; Defence Standard 59-411 Part 3 Issue 1 Amendment 1 DRE02.B; ISO 11452-1; B21 7110; ES 96200-00

<u>Automotive Test Technology:</u>	<u>Test Method(s):</u>
Radio Frequency Immunity Testing	ISO 11452-4; ISO 11452-2; ISO 11452-9; SAE J1113-21; ISO 11452-7; ISO 11452-3; ISO 11452-5; B21 7110; ES 96200-00
Automotive Transients testing	ISO 7637-2; ISO 16750-2 (Load Dump); ISO 7637-3 (CCC only)
Electrostatic Discharge Testing	ISO 10605
Coupled Immunity	FMC1278; JLR-EMC-CS
Continuous Power Line Disturbances Immunity	FMC1278; JLR-EMC-CS; ISO 11452-10
Power Cycling Immunity	FMC1278; JLR-EMC-CS
Ground Voltage Offset Immunity	FMC1278; JLR-EMC-CS
Voltage Dropout	FMC1278
Voltage Overstress Immunity	FMC1278; JLR-EMC-CS
Low Voltage Transients	JLR-EMC-CS
Vehicle Electrical Tests	LV 124-1; LV 124; ISO 16750-2; IEE-32; GS 95003-2; GS 95024-2-1; GS 95024-2-2; ENS0310; CN 05 0215; Cummins 14269 14387; BSL-003; BSL-006; CS-11809; CS-11979; MBN LV 124-1; DC-10615; DC-10842; PF-9326; 9-90110; CS-2009.1; GMW3172; 7794Z-SAAA-000; ES 39110-00; ES 95400-10; ES 96100-02; JASO D 001-94; MES PW67600; ES-X82010; ES-X82115; 28400NDS02; 28400NDS03; 28401NDS02; J1113-11; J2139; J2628; TSC70212G; VW 80101; VW 80000



Electromagnetic Compatibility (EMC) Testing

Radiated Emissions Testing (electric and magnetic fields)*;
 Conducted Emissions Testing (voltage and current)*;
 Harmonic Emissions Testing*;
 Electrostatic Discharge Testing*; Electrical Fast Transient Testing*;
 Radiated Immunity Testing*; Conducted Immunity Testing*;
 Lightning Immunity Testing*;
 Voltage Dips, Interrupts and Voltage Variations Testing*;
 Magnetic Immunity Testing*;
 RF Power Measurements*;
 Frequency Stability Measurements*; Frequency Variations*;
 Longitudinal Induction Measurements*;
 Light Flicker Testing*;
 Low Frequency Disturbance Voltage Testing*;
 Disturbance Power Measurements*;
 Power Cross Overvoltage Testing*;
 Bonding and Grounding*;
 NEBS Electrical Safety*;
 Conducted Audio Frequency*;
 DC Potential Difference*;
 Short Circuit*;
 Discontinuous Disturbances*;
 RF Duty Cycle*;
 RF Transmission Mask Bandwidth*;
 Energy Efficiency*; EPA ENERGY STAR*

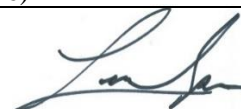
<u>Test Technology:</u>	<u>Test Method(s):</u>
<i>Emissions</i>	
Radiated and Conducted Emissions	47 CFR, FCC Part 15, Subpart B (using ANSI C63.4:2014) 47 CFR, FCC Part 18 (using FCC OET MP-5:1986); AS/NZS 1044; AS/NZS 1053; AS/NZS 2064; AS/NZS 3548; Canada ICES-001; Canada ICES-003; Canada ICES-005; Canada ICES-006; CISPR 11; EN 55011; SANS 211; AS/NZS CISPR 11; CISPR 13; EN 55013; SANS 213; AS/NZS CISPR 13; CISPR 14-1; EN 55014-1; SANS 214-1; AS/NZS CISPR 14.1; CISPR 15; EN 55015; SANS 215; CISPR 22; EN 55022; SANS 222; AS/NZS CISPR 22; SI 961 Part 32; CISPR 32; EN 55032; AS/NZS CISPR 32; VCCI-CISPR 32:2016; CNS 13438 (up to 6 GHz); CNS 13439; CNS 13803; GR-1089-CORE (using ANSI C63.4:2003, 2009); CSA C108.8-M1983; IEC 62236-4
Harmonics	IEC 61000-3-2; EN 61000-3-2; AS/NZS 61000.3.2; IEC 61000-3-12; EN 61000-3-12
Flicker	IEC 61000-3-3; EN 61000-3-3; AS/NZS 61000.3.3; IEC 61000-3-11; EN 61000-3-11



<u>Test Technology:</u>	<u>Test Method(s):</u>
<i>Immunity</i>	
Electrostatic Discharge (ESD)	IEC 61000-4-2; EN 61000-4-2; AS/NZS 61000.4.2
Radiated Immunity (RFI)	IEC 61000-4-3; EN 61000-4-3; AS/NZS 61000.4.3
Electrical Fast Transient / Burst (EFT)	IEC 61000-4-4; EN 61000-4-4; AS/NZS 61000.4.4
Surge	IEC 61000-4-5; EN 61000-4-5; AS/NZS 61000.4.5; IEC 61000-4-12; EN 61000-4-12; IEC 61000-4-18; EN 61000-4-18
Conducted Immunity	IEC 61000-4-6; EN 61000-4-6; AS/NZS 61000.4.6; EN 61000-4-16
Magnetic Immunity	IEC 61000-4-8; EN 61000-4-8; AS/NZS 61000.4.8; IEC 61000-4-9; EN 61000-4-9
Voltage Dips and Interrupts	IEC 61000-4-11; EN 61000-4-11; EN 61000-4-29; IEC 61000-4-29
DC Ripple	IEC 61000-4-17; EN 61000-4-17
<i>Product Family and Industry Specific Standards</i> <i>(includes Emissions and Immunity tests and EN and IEC equivalents)</i>	ANSI C62.41; ANSI T1.315:2007; AS/NZS 3200.1.2; AS/NZS 61000.6.3; AS/NZS 61000.6.4; AS 62040.2; BV Marine Rules, Pt. C, Chapter 3, Sec 6; CISPR 14-2; SANS 214-2; AS/NZS CISPR 14.2; CISPR 16-1-1; SANS 216-1-1; AS/NZS CISPR 16.1.1; CISPR 16-1-2; SANS 216-1-2; AS/NZS CISPR 16.1.2; CISPR 16-1-3; SANS 216-1-3; AS/NZS CISPR 16.1.3; CISPR 16-1-4; SANS 216-1-4; AS/NZS CISPR 16.1.4; CISPR 16-1-5; SANS 216-1-5; AS/NZS CISPR 16.1.5; CISPR 16-2-1; SANS 216-2-1; AS/NZS CISPR 16.2.1; CISPR 16-2-2; SANS 216-2-2; AS/NZS CISPR 16.2.2; CISPR 16-2-3; SANS 216-2-3; AS/NZS CISPR 16.2.3; CISPR 16-2-4; SANS 216-2-4; AS/NZS CISPR 16.2.4; CISPR 16-2-5; AS/NZS CISPR 16.2.5; CISPR 20; SANS 2200; AS/NZS CISPR 20; CISPR 24; SANS 224; AS/NZS CISPR 24; SI 961 Part 6.2; CISPR 35; EN 55035; AS/NZS CISPR 35; CNS 13783-1; ETSI ETR 283; ETS 300 132-1; ETS 300 132-2; ETS 300 386-1; EN 300 386; EN 300 386-2; EN 50083-2; EN 50091-2; EN 50121-3-2; EN 50130-4; EN 50270; EN 54-2; EN 55014-2; EN 55016-1-1; EN 55016-1-2; EN 55016-1-3 EN 55016-1-4; EN 55016-1-5; EN 55016-2-1; EN 55016-2-2; EN 55016-2-3; EN 55016-2-4; EN 55016-2-5;



<u>Test Technology:</u>	<u>Test Method(s):</u>
<p><i>Product Family and Industry Specific Standards (includes Emissions and Immunity tests, and EN and IEC equivalents) (cont.)</i></p>	<p>EN 55020; EN 55024; EN 55103-1; EN 55103-2; EN 60255-26; EN 60555, Part 2; EN 60555, Part 3; EN 60601-1-2; EN 60601-2-2; IEC 60601-2-2; EN 60601-2-24; IEC 60601-2-24; EN 60601-2-47; EN 60669-2-1; IEC 60669-2-1; EN 60945; IEC 60945; EN 61000-6-1; IEC 61000-6-1; EN 61000-6-2; IEC 61000-6-2; EN 61000-6-3; IEC 61000-6-3; EN 61000-6-4; IEC 61000-6-4; EN TS 61000-6-5; IEC/EN 61000-6-5; IEC 61131-2; EN 61131-2; EN 61204-3; IEC 61204-3; EN 61326; EN 61326-1; IEC 61326-1; EN 61326-2-1; IEC 61326-2-1; EN 61326-2-2; IEC 61236-2-2; EN 61326-2-3; IEC 61326-2-3; EN 61326-2-4; IEC 61326-2-4; EN 61326-2-5; IEC 61326-2-5; EN 61326-3-1; IEC 61326-3-1; EN 61547; IEC 61547; EN 61800-3; IEC 61800-3; EN 62040-2; IEC 62040-2; EN 62040-3; IEC 62040-3; GR-78-CORE (ESD only); GR-1089-CORE; GR-3108-CORE (Section 5, Issue 2); IEC 1800-3; IEC 60092-504; EN 60092-504; IEC 60601-1-2; CSA C22.2 No. 60601-1-2; IEC TS 61000-6-5; IEC 61850-3; EN 61850-3; IEEE 1613; IEEE C37.90.2:2004 RTCA/DO-160 (Sections 15, 16, 18, 19.3.1, 19.3.2, 19.3.3, 20.4; Section 20.5 (Category S and T), 21.4, 21.5, & 25); UL 1449; Verizon VZ.TPR.9205; IEC 60947-5-2; EN 60947-5-2; IEC 60947-5-3; EN 60947-5-3; IEC 60974-10;</p>
<p><i>Automotive Standards</i></p>	<p>GMW 14241; United Nations E/ECE/324 E/ECE/TRANS/505 Addendum 9/Rev.5 Regulation No. 10 Annex 7 (Section 6.5; 7.10); Annex 8 (Section 6.6); Annex 9 (Section 6.8; 6.10; 7.18); Annex 10 (Section 6.7; 6.9; 7.17; 7.19); Annex 17 (Section 7.11); Annex 18 (Section 7.12); Annex 19 (Section 7.13); Annex 20 (Section 7.14); Annex 21 (Section 7.15); Annex 22 (Section 7.16)</p>



<u>Test Technology:</u>	<u>Test Method(s):</u>
<i>FDA Microwave Security</i>	21 CFR 1030.10
<i>Marine Standards</i> (includes Emissions and Immunity tests)	ABS Steel Vessels 2015 Part 4, Chapter 9, Section 7; ABS High Speed Craft 2015, Part 4, Section 11; BV Marine Rules, Pt C, Chapter 3, Sec 6; DNV Standard for Certification No. 2.4 2006; IACS req. 1991 Rev.6, 2014: E10; IEC 60533; Lloyd's Register Type Approval System 2015; MEPC.108(49), Part 2
<i>Military</i>	MIL-STD-883F (ESD); MIL-STD-883K (ESD)
<i>Customer Specific Standards</i> (NEBS, Verizon, AT&T (SBC), Qwest Standards)	APC DVT #6; APC DVT #7; APC DVT #8; APC DVT #12; APC DVT #13; ATT-TP-76200; Comcast Headend/Controlled Environment Devices Review Plan; GR-78-CORE (ESD Only); GR-1089-CORE; GR-3108-CORE (Section 5, Issue 2); Sun Microsystems (Oracle) 990-1151-07; Verizon VZ.TPR.9205
<i>Country Specific Standards</i>	
Australia/New Zealand Radio Standards	AS/NZS 4268; AS/NZS 4295; AS/NZS 4771; RFS29; Radiocommunications (Short Range Devices) Standard 2014; Radiocommunications (Low Interference Potential Devices) Class License 2000; Radiocommunications (Analogue Speech [Angle Modulated] Equipment) Standard 2014;
Canada Radio Standards	RSS-Gen Issue 4, November 13, 2014; RSS-102 (RF exposure evaluation) Issue 5, March 2015; RSS-102 (Nerve Stimulation) Issue 5, March 2015; RSS-111 Issue 5, September 2014; RSS-112 Issue 1, February 2008; RSS-117 Issue 3, January 2016; RSS-119 Issue 12, May 2015; RSS-123 Issue 3, February 2015; RSS-125 Issue 2, Revision 1, March 2000; RSS-127 Issue 1, August 2009; RSS-130 Issue 1, October 2013; RSS-131 Issue 3, May 2017; RSS-132 Issue 3, January 2013; RSS-133 Issue 6, January 2013; RSS-134 Issue 2, February 2016; RSS-135 Issue 2, June 2009; RSS-137 Issue 2, February 2009;



<u>Test Technology:</u>	<u>Test Method(s):</u>
<p><i>Country Specific Standards (cont.)</i> Canada Radio Standards (cont.)</p>	<p>RSS-139 Issue 3, July 2015; RSS-140 Issue 1, April 2018; RSS-141 Issue 2, June 2010; RSS-142 Issue 5, April 2013; RSS-170 Issue 3, July 2015; RSS-181 Issue 1, April 1971 (Amendment - July 1987); RSS-182 Issue 5, January 2012; RSS-191 Issue 3, April 2008; RSS-192 Issue 3, January 2008; RSS-194 Issue 1, October 2007; RSS-195 Issue 2, April 2014; RSS-196 Issue 1, March 2010; RSS-197 Issue 1, February 2010; RSS-199 Issue 3, December 2016; RSS-210 Issue 9, August 2016; RSS-213 Issue 3, March 2015; RSS-215 Issue 2, June 2009; RSS-216 Issue 2, January 2016; RSS-220 Issue 1, March 2009; RSS-222 Issue 1, February 2015; RSS-236 Issue 1, September 2012; RSS-238 Issue 1, July 2013; RSS-243 Issue 3, February 2010; RSS-247 Issue 2, February 2017; RSS-251 Issue 1, November 2014; RSS-287 Issue 2, March 2014; RSS-288 Issue 1, January 2012; RSS-310 Issue 4, July 2015</p>
<p>Hong Kong EMC/Radio Standards</p>	<p>HKCA 1002; HKCA 1006; HKCA 1007; HKCA 1008; HKCA 1010; HKCA 1015; HKCA 1026; HKCA 1033; HKCA 1034; HKCA 1035; HKCA 1039; HKCA 1041; HKCA 1042; HKCA 1045; HKCA 1046; HKCA 1048; HKCA 1049; HKCA 1052; HKCA 1054; HKCA 1061; HKCA 1074</p>
<p>India</p>	<p>GR/PMB-01/01.MAR2007; GR/BWA-01/01.JUN2007; GR/WAN-01/02.APR2007; SD/EMI-02/03.MAY2006 (Amendment No. 1 dated 01/01/2008); SD/RAD-01/01.SEP2005; TBIC/F/CTI/TEC-2004, 2012</p>
<p>ITU EMC Standards</p>	<p>K.20; K.21; K.41; K.44</p>
<p>Japanese Radio Standards ¹</p>	<p>ARIB STD-T57; ARIB STD-T66; ARIB STD-T81; ARIB STD-T96; TELEC-T110; TELEC-T124; TELEC-T126</p>
<p>Japanese VCCI Standards</p>	<p>VCCI V-3 (up to 6 GHz); VCCI V-4</p>



<u>Test Technology:</u>	<u>Test Method(s):</u>
<i>Country Specific Standards (cont.)</i>	
Korea EMC/Radio Standards	<p>Regulations on Radio Equipment (Enforcement Decree of MSIT NO. 1, Jul 26, 2017); Unlicensed Radio Equipment Established Without Notice (MSIT Public Notification 2018-38, Jun 27, 2018); Technical Requirements for Radio Equipment for Telecommunication Services (RRA Public Notification 2017-3, Mar 31, 2017); Technical Requirements for the Human Protection against Electromagnetic Waves (MSIT Public Notification 2017-7, Aug 24, 2017); Technical Requirements for Measurement of Electromagnetic Field Strength (RRA Public Notification 2017-7, Aug 4, 2017); Conformity Assessment Procedure of Radio: KS X 3123 Conformity assessment test methods for radio equipment; Technical Requirements for Electromagnetic Compatibility (RRA Public Notification 2017-19, Dec 28, 2017); Test Methods for Electromagnetic Compatibility (RRA Announce 2017-71, Dec 28, 2017)</p>
(Korea Technical Requirements for EMC)	<p>Annex 1; Annex 2 (KN 11: 2015-12); Annex 2-2 (KN 60601-1-2); Annex 3 (KN 41); Annex 4 (KN 14-1); Annex 4-2 (KN 14-2: 2015-12); Annex 5 (KN 15: 2015-12); Annex 5-2 (KN 61547); Annex 6 (KN 50); Annex-6-2 (KN 51); Annex 7 (KN 60); Annex 8-1 (KN 301 489-1); Annex 8-2 (KN 301 489-7); Annex 8-3 (KN 301 489-17); Annex 8-8 (KN 301-489-03); Annex 9 (KN 62040-2); Annex 10 (KN 60947); Annex 11 (KN 32:2015-12); Annex 11-2 (KN 35:2015-12); Annex 12 (KN 61800-3); Annex 14 (KN 60945/60533); Annex 17 (KN 61000-6-3); Annex 17-2 (KN 61000-6-1); Annex 18 (KN 61000-6-4); Annex 18-2 (KN 61000-6-2)</p>



<u>Test Technology:</u>	<u>Test Method(s):</u>
<i>Country Specific Standards (cont.)</i> Mexico Radio Standards Conducted Emissions	NOM-083-SCT1-2002 NOM-084-SCTI-2002 Sections: 5.1, 5.3, 5.5 (all subsections); NOM-088/1-SCTI-2002 Sections: 6.1, 6.3, 6.4 (all subsections); NOM-088/2-SCTI-2002 Sections: 6.1, 6.2, 6.3, 6.4 (all subsections); IFT-008-2015 Sections: 5.1.4.1, 5.2.1, 5.2.2.1, 5.2.3, 5.3.1.1, 5.3.1.2, 5.3.1.3, 5.3.1.4, 5.3.1.5, 5.3.3, 5.4.1, 5.4.1 Method 1, 5.4.1 Method 2, 5.4.2 (A1-M1, A2, A2-M2, A2-M3, A2-M4), 5.4.3, 5.5.1, 5.5.2, 5.6.1, 5.6.2 (all subsections); NOM-208-SCFI-2016 (all subsections)
Radiated Emissions	NOM-084-SCTI-2002 Sections: 5.2, 5.4 (all subsections); NOM-088/1-SCTI-2002 Sections: 6.1, 6.2 (all subsections); NOM-088/2-SCTI-2002 Sections: 6.1, 6.2 (all subsections); IFT-008-2015 Sections: 5.1.4.2, 5.2.1, 5.2.2.1, 5.2.3, 5.3.1.1, 5.3.1.2, 5.3.1.3, 5.3.1.4, 5.3.1.5, 5.3.3, 5.4.1, 5.4.1 Method 1, 5.4.1 Method 2, 5.4.2 (A1-M1, A2, A2-M2, A2-M3, A2-M4), 5.4.3, 5.5.1, 5.5.2, 5.6.1, 5.6.2 (all subsections); NOM-208-SCFI-2016 (all subsections)
Singapore EMC/Radio Standards	IMDA TS EMC, March 2000; IMDA TS LMR, October 2016; IMDA TS SRD, April 2018; IMDA TS CMT, July 2017
South African EMC Standards (<i>other than CISPR equivalents</i>)	SANS 1718-1; SANS 61000-6-1; SANS 61000-6-2; SANS 61000-6-3; SANS 61000-6-4; SANS 61204-3; SANS 61326; SANS 61800-3; SANS 62040-2
Swedish EMC Standards	BAKOM 336.3
Taiwan EMC/Radio Standards	CNS 13438:2006 (<i>up to 6 GHz</i>); LP0002
Vietnam EMC/Radio Standards	QCVN 10:2010/BTTTT; QCVN 18:2017/BTTTT; QCVN 22:2010/BTTTT; QCVN 23:2011/BTTTT; QCVN 25:2011/BTTTT; QCVN 31:2011/BTTTT; QCVN 37:2011/BTTTT; QCVN 42:2011/BTTTT; QCVN 43:2011/BTTTT; QCVN 44:2011/BTTTT; QCVN 47:2015/BTTTT; QCVN 54:2011/BTTTT; QCVN 55:2011/BTTTT;



<u>Test Technology:</u>	<u>Test Method(s):</u>
<i>Country Specific Standards (cont.)</i> Vietnam EMC/Radio Standards	QCVN 65:2013/BTTTT; QCVN 70:2013/BTTTT; QCVN 77:2013/BTTTT; QCVN 73:2013/BTTTT; QCVN 74:2013/BTTTT; QCVN 88:2015/BTTTT; QCVN 92:2015/BTTTT; QCVN 95:2015/BTTTT; QCVN 96:2015/BTTTT; QCVN 110:2017/BTTTT; QCVN 112:2017/BTTTT; QCVN 118:2018/BTTTT TCN 68-255:2006; TCVN 7189:2009; TCVN 7317:2003; TCVN 7600:2010; TCVN 7326-1:2003
<i>Radiocommunications</i>	
EU RED Radio Standards	EN 300 220-1; EN 300 220-2; EN 300 220-3; EN 300 330-1; EN 300 330-2; EN 300 440-1; EN 300 440-2; EN 300 328; EN 300 385; EN 301 893; EN 302 208-1; EN 302 208-2; EN 302 567; EN 300 086-1; EN 300 086-2; EN 300 296-1; EN 300 296-2; EN 300 113-1; EN 300 113-2; EN 300 390-1; EN 300 390-2; EN 300 392-2; EN 300 394-1; EN 300 396-2; EN 303 035-1; EN 303 035-2; EN 300 224-1; EN 300 224-2; EN 300 135-1; EN 300 135-2; EN 300 224-1; EN 300 224-2; EN 300 433-1; EN 300 433-2; EN 62479; IEC 62479 (up to 6 GHz)
EU RED EMC Standards	EN 300 339; EN 301 489-01; EN 301 489-03; EN 301 489-17; EN 302 054-1; EN 302 054-2; EN 302 064-1; EN 302 064-2; EN 302 291-1; EN 302 291-2

<i>FCC Standards and Test Methods Supporting TCB Status †</i>	<i>Maximum Frequency</i>
Unintentional Radiators (FCC Part 15, Subpart B)	ANSI C63.4-2014 40000 MHz
Industrial, Scientific, and Medical Equipment (FCC Part 18) • Consumer ISM equipment	FCC MP-5 (February 1986) 200000 MHz
Intentional Radiators (FCC Part 15 Subpart C)	ANSI C63.10-2013 200000 MHz
UPCS (FCC Part 15, Subpart D) • Unlicensed Personal Communication Systems devices	ANSI C63.17-2013 40000 MHz



<i>FCC Standards and Test Methods Supporting TCB Status †</i>	<i>Maximum Frequency</i>
U-NII without DFS Intentional Radiators (FCC Part 15, Subpart E) • Unlicensed National Information Infrastructure Devices (U-NII without DFS)	ANSI C63.10-2013 40000 MHz
U-NII with DFS Intentional Radiators (FCC Part 15 Subpart E) • Unlicensed National Information Infrastructure U-NII) Devices with Dynamic Frequency Selection (DFS)	FCC KDB Publication 905462 D02 UNII DFS Compliance Procedures New Rules v01 (April 8, 2016) 40000 MHz
UWB Intentional Radiators (FCC Part 15, Subpart F) • Ultra-wideband Operation	ANSI C63.10-2013 200000 MHz
BPL Intentional Radiators (FCC Part 15, Subpart G) • Access Broadband Over Power Line (Access BPL)	ANSI C63.10-2013 40000 MHz
White Space Device Intentional Radiators (FCC Part 15, Subpart H) • White Space Devices	ANSI C63.10-2013 40000 MHz
Commercial Mobile Services (FCC Licensed Radio Service Equipment) • Part 22 (cellular) • Part 24 • Part 25 (non-microwave) • Part 27	ANSI/TIA-603-D TIA-102.CAAA-D 40000 MHz
General Mobile Radio Services (FCC Licensed Radio Service Equipment) • Part 22 (non-cellular) • Part 90 (non-microwave) • Part 95 • Part 97 • Part 101 (non-microwave)	ANSI/TIA-603-D TIA-102.CAAA-D 200000 MHz
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) • Part 96	ANSI/TIA-603-D TIA-102.CAAA-D 40000 MHz
Maritime and Aviation Radio Services (FCC Licensed Radio Service Equipment) • Part 80 • Part 87	ANSI/TIA-603-D 200000 MHz
Microwave and Millimeter Bands Radio Services (FCC Licensed Radio Service Equipment) • Part 25 • Part 74 • Part 90 (90Y, 90Z, DSRC) • Part 101	ANSI/TIA-603-D TIA-102.CAAA-D 200000 MHz



FCC Standards and Test Methods Supporting TCB Status †		Maximum Frequency
Broadcast Radio Services (FCC Licensed Radio Service Equipment) <ul style="list-style-type: none"> • Part 73 • Part 74 (non-microwave) 	ANSI/TIA-603-D TIA-102.CAAA-D	40000 MHz
Signal Boosters (Part 20) <ul style="list-style-type: none"> • Wideband Consumer signal boosters • Provider-specific signal boosters • Industrial signal boosters 	FCC KDB Publication 935210 D03 Signal Booster Measurements v04 (February 12, 2016) FCC KDB Publication 935210 D04 Provider Specific Booster Measurements v02 (February 12, 2016) FCC KDB Publication 935210 D05 Indus Booster Basic Measurements v01r01 (February 12, 2016)	40000 MHz

Specific Type of Radio Equipment		Cert. Ord. Ref., Art. 2, Para. 1	Japanese Test Method
Citizen Radio		Item 3	Schedule 13
Cordless Telephone		Item 7	Schedule 21
Specified Low Power Radio Equipment	Telemetry, Data Transmission Tele-Control	Item 8	Schedule 22-1 (Notification Section 1 No.1) / Schedule 22-2 (Notification Section 1 No.2) / Schedule 22-3 (Notification Section 1 No.3)
	Medical Telemeter	Item 8	Schedule 22-4 (Notification Section 2)
	Body Implantable Medical Telemetry and Body Implantable Medical Data Transmission	Item 8	Schedule 22-5 (Notification Section 3)
	433 MHz Data Transmission Used for International Transportation	Item 8	Schedule 22-6 (Notification Section 4)
	Radio Call	Item 8	Schedule 22-7 (Notification Section 5)
	Radio Microphones	Item 8	Schedule 22-8 (Notification Section 6)
	Radio Microphone for Hearing Aid	Item 8	Schedule 22-9 (Notification Section 7)
	Wireless Phone	Item 8	Schedule 22-10 (Notification Section 8)
	Wireless Phone for Voice-Assisted	Item 8	Schedule 22-11 (Notification Section 9)



Specific Type of Radio Equipment		Cert. Ord. Ref., Art. 2, Para. 1	Japanese Test Method
Specified Low Power Radio Equipment	Radio Equipment for Use in Identification of Moving Objects	Item 8	Schedule 22-12 (Notification Section 10) / Schedule 22-13 (Notification Section 10) 953.5 MHz only non-frequency hopping
	Millimeter Wave Radar	Item 8	Schedule 22-14 (Notification Section 11)
	Radio Equipment for Millimeter Wave Image Transmission or Data Transmission	Item 8	Schedule 22-15 (Notification Section 12)
	Detection Sensor for Moving Objects	Item 8	Schedule 22-16 (Notification Section 13)
	Animal Detection Reporting System	Item 8	Schedule 22-17 (Notification Section 14)
Low Power Security System		Item 13	Schedule 36
2.4 GHz Band Advanced Low-Power Data Communication System (2400-2483.5 MHz)		Item 19	Schedule 43
2.4 GHz Band Low Power Data Communications System (2471-2497 MHz)		Item 19-2	Schedule 44
2.4 GHz Band Advanced Low Power Data Communications System (For Model Aircraft Radio Control)		Item 19-2-2	Schedule 43
2.4 GHz Band Low Power Data Communications System (For Model Aircraft Radio Control)		Item 19-2-3	Schedule 44
5.2, 5.3 GHz Band Low Power Data Communication System		Item 19-3	Schedule 45
5.6 GHz Band Low-Power Data Communication System		Item 19-3-2	Schedule 45
Quasi-Millimeter Wave Band Low-Power Data Communication System		Item 19-4	Schedule 46
Land Mobile Station For 5 GHz Band Wireless Access System (0.01 Watt or Less Power Antenna)		Item 19-11	Schedule 47
Digital Cordless Telephone in Narrowband TDMA		Item 21	Schedule 50
Digital Cordless Telephone (DECT) in broadband TDMA		Item 21-2	Schedule 81
Digital Cordless Telephone in OFDMA / TDMA Method (sPHS)		Item 21-3	Schedule 82
Phs Land Mobile Station		Item 22	Schedule 50
Mobile Station for Dedicated Short-Range Communications System		Item 32	Schedule 64
Test Station for Dedicated Short-Range Communications System		Item 33-2	Schedule 64
Ultra-Wide Band (UWB) Radio System		Item 47	Schedule 70



Specific Type of Radio Equipment	Cert. Ord. Ref., Art. 2, Para. 1	Japanese Test Method
Ultra-Wide Band (UWB) Radar System	Item 47-2	Schedule 83

<u>Test Technology:</u>	<u>Test Method(s):</u>
EPA ENERGY STAR[®] Testing²	
<i>Electronics and Office Equipment</i>	
Uninterruptible Power Supplies	ENERGY STAR Product Specification for Uninterruptible Power Supplies (UPS) (v1.1, August 2012); ENERGY STAR Test Method for Uninterruptible Power Supplies, Rev. May 2012
Telephony (Cordless Telephones only)	ENERGY STAR Product Specification for Telephony (v3.0, October 2014); ENERGY STAR Test Method for Telephony (<i>Analog Only</i>), Rev. November 2013
Computers	ENERGY STAR Product Specification for Computers (v6.1, October 2014); ENERGY STAR Test Method for Computers, Rev. March 2016
<i>Audio/Video</i>	ENERGY STAR Product Specification for Audio/Video (v3.0, December 2014); ENERGY STAR Test Method for Audio/Video, Rev. July 2012
<i>Other</i>	
Water Coolers	ENERGY STAR Product Specification for Water Coolers (v2.0, Feb 2014); ENERGY STAR Test Method for Water Coolers, Rev. March 2013
AC Output Devices	IEC 62040-3
DC Output Devices	ATIS-0600015
ENERGY STAR[®] Lighting Methods of Measurement²	
Color Measurements	ANSI C78.376:2001; ANSI C78.377:2015; CIE 13.3-1995; CIE 15:2004; IES LM-16:1993; IES LM-58-13; IES TM-30-15
Electrical Measurement	IES LM-9-09; IES LM-45:2015; IES LM-66-14 ANSI C78.389:2004; ANSI C82.2:2002; ANSI C82.77-10:2014; IEC 62301 Ed. 2.0:2011; ANSI C62.41.2-2002; Energy Star [®] Recommended Practice - Light Source Flicker; Energy Star [®] Run Up Time Test Method Sept 2015; Energy Star [®] Start Time Test Method Sept 2015; Energy Star [®] Test Method -Noise Sept 2015



<u>Test Technology:</u>	<u>Test Method(s):</u>
Life Tests	IES LM-40-10; IES LM-47-12; IES LM-49-12; IES LM-65-14; IES LM-80-08; Energy Star [®] Lamps V 2.0; Energy Star Lamps V 2.0; Energy Star [®] Ambient Temperature Life Test Method Sept 2015; Energy Star [®] Elevated Temperature Life Test Method Sept 2015; Energy Star [®] Elevated Temperature Light Output Ratio Test Method Sept 2015
Photometric Measurements	IES LM-41-14; IES LM-46-04; IES LM-54-12; IES LM-79-08; IES LM-82-12; IES LM-84-14; IES LM-10-96; IES LM-20-13; IES TM-21-11; 10 CFR Part 430 Appendix W Subpart B 81 FR 59385; 81 FR 43403; Energy Star [®] Recommended Practice -Light Output on a Dimmer
Electrical, Photometric, Color, Life Testing	Energy Star Lamps V 2.0; Energy Star Luminaires V 2.0
In-Situ Temperature Testing	ANSI/UL 1598 Sections 19.7, 19.10-16; UL 1598C; ANSI/UL 153; ANSI/UL 1574:2004 Section 54

Telecommunications Testing:

Telecommunications Registration; General Test Methods; Lightning Surge; Drop Testing; Balance Testing; Signal Power (metallic and longitudinal); Frequency Measurements; Pulse Templates; Leakage Testing; Impedance Testing; Hearing Aid Compatibility Testing (*excluding volume control*); Protocol Analysis and Jitter Testing.

<u>Telecom Standard:</u>	<u>Title:</u>
<i>Taiwan Standards</i>	
RTTE01	2.4 GHz Radio-frequency Telecommunication Terminal Equipment Technical Specification



Product Safety Testing:

Power Input*, Permanence of Marking*, Accessibility*, Permissibly Limits*, Energy Hazard Measurement*, SELV Circuits*, TNV Limits*, Limited Current*, Capacitor Discharge / Voltage Limitation*, Ring Signal*, Humidity Conditioning*, Creepage / Clearance / Distance Thru Insulation (*excluding CTI*)*, Limited Power Measurement*, Ground Bond / Earthing*, Ground Continuity*, Temperature*, Stability*, Applied Force*, Steel Sphere Impact*, Impact Hammer*, Mold Stress*, Battery Reverse Current*, Ball Pressure*, Leakage Current*, Component Abnormal*, Electric Strength*, Impulse*, Overvoltage*, Acoustic Sound pressure*, 130mm / 20mm flame*, Needle Flame*, Hot Flaming Oil*, Locked Rotor/Motor Armature*, Vibration, Bump, Drop*, Strain Relief*, Torque*, Insulation Resistance*, Sound Level*, Handle Loading*, Liquid Overflow*, Spillage*, Liquid Leakage*, Transformer Shorts / Overloads*, Rain Test*, Wall Mount*, Laser Radiation (*excluding x-ray*)*, Voltage Surge*, Functionality*, Protective Impedance Abnormal*, Capacitor Short Circuit Abnormal*, Output Abnormal*, Multi-Supply Abnormal*, Cooling Abnormal*, Heating Device Abnormal*, Interlock Abnormal*, Rigidity*, Cleaning*, Push*, Pull*, Direct Plug-in Moment*, Starting Current*, Component Short Circuit*, Glow Wire*, Cord Tag Permanence*, Flexing*, Hot Wire Ignition*, Coating Adhesion*

<u>Product Safety Standard:</u>	<u>Title:</u>
<i>North American Standards</i>	
FCC 16 CFR 1505	Electric Toys
FCC 21 CFR 1040.10	Performance Standard for Laser Products
UL 153	Portable Electric Luminaires
UL 197	Standard for Commercial Electric Cooking Appliances
UL 250	Household Refrigerators and Freezers
UL 498	Attachment Plugs and Receptacles
UL 498A	Current Taps and Adapters
UL 499	Electric Heating Appliances
UL 507	Electric Fans
UL 588	Seasonal and Holiday Decorative Products
UL 696; ASTM F963	Electric Toys (Electrical Tests Only)
UL 697; UL 745 (<i>see UL 60745</i>)	Toy Transformers
UL 763	Standard for Motor-Operated Commercial Food Preparing Machines
UL 817	Cord Sets and Power-Supply Cords
UL 859	Electric Personal Grooming Appliances
UL 935	Standard for Fluorescent-Lamp Ballasts
UL 982	Motor-operated Household Food Preparing Machines
UL 1012	Power Units other than Class 2
UL 1026	Electric Household Cooking and Food Serving Appliances
UL 1082	Household Electric Coffee Makers and Brewing-type Appliances
UL 1083	Household Electric Skillets and Frying-type Appliances
UL 1278	Movable and Wall or Ceiling-hung Electric Room Heaters
UL 1310	Class 2 Power Units
UL 1363	Re-locatable Power Taps
UL 1431	Personal Hygiene and Health Care Appliances
UL 1598	Luminaires
UL 1647	Motor-operated Massage and Exercise Machines
UL 1786	Direct Plug-in Nightlights
UL 1838	Low Voltage Landscape Lighting Systems



<u>Product Safety Standard:</u>	<u>Title:</u>
UL 1993	Self-ballasted Lamps and Lamp Adapters
UL 8750	Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products
UL 60065	Audio, Video and Similar Electronic Apparatus – Safety Requirements
UL 60335-1	Household and Similar Electrical Appliances
UL 60335-2-3	Safety of Household and Similar Appliances, Part 2: Particular Requirements for Electronic Irons
UL 60335-2-8	Shavers, Hair Clippers, and Similar Appliances
UL 60335-2-34	Motor-compressors
UL 60601-1 ⁴	Medical Electrical Equipment. Part 1: General Requirements for Safety
ANSI/AAMI ES60601-1 ⁴	Medical Electrical Equipment. Part 1: General Requirements for Basic Safety and Essential Performance
ANSI/AAMI HA60601-1-11	Medical Electrical Equipment and Medical Electrical Systems Used in the Home Healthcare Environment
ANSI/AAMI 60601-2-47	Basic Safety and Essential Performance of Ambulatory Electrocardiographic Systems
UL 60745-1	Hand-Held Motor-operated Electric Tools
UL 60745-2-1	Drills and Impact Drills
UL 60745-2-2	Screwdrivers and Impact Wrenches
UL 60745-2-3	Grinders, Polishers, and Disk-type Sanders
UL 60745-2-4	Sanders and Polishers, other than Disk-type
UL 60745-2-5	Circular Saws
UL 60745-2-6	Hammers
UL 60745-2-8	Shears and Nibblers
UL 60745-2-9	Tappers
UL 60745-2-11	Reciprocating Saws
UL 60745-2-12	Concrete Vibrators
UL 60745-2-14	Planers
UL 60745-2-17	Routers and Trimmers
UL 60745-2-18	Strapping Tools (formerly 745-2-34)
UL 60745-2-19	Jointers (formerly 745-2-37)
UL 60745-2-20	Portable Band Saws (formerly 745-2-33)
UL 60745-2-21	Drain Cleaners (formerly 745-2-35)
UL 745-2-30	Staplers
UL 745-2-31	Diamond Core Drills
UL 745-2-32	Magnetic Drill Presses
UL 745-2-36	Hand Motor Tools
UL 60950-1	Information Technology Equipment – Safety – Part 1: General Requirements.
UL 60950-21	Information Technology Equipment – Safety – Part 21: Remote Power Feeding
UL 60950-22	Information Technology Equipment – Safety – Part 22: Equipment Installed Outdoors
UL 60950-23	Information Technology Equipment – Safety – Part 23: Large Data Storage Equipment



<u>Product Safety Standard:</u>	<u>Title:</u>
UL 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use, Part 1: General Requirements
UL 61010-2-010	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use, Part 1: Particular Requirements for Laboratory Equipment for the Heating of Materials
UL 61010-2-030	Information Technology Equipment – Safety – Part 2-030: Particular Requirements for Testing and Measuring Circuits
UL 61010-031	Information Technology Equipment – Safety – Part 031: Hand-held Probe Assemblies for Electrical Measurement and Test
UL 62109-1	Standard for Safety of power converters for use in photovoltaic power systems – Part 1: General requirements
UL 62368-1	Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements
UL 1741	Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
UL 1778	Uninterruptible Power Systems
<i>Australian/New Zealand Standards</i>	
AS/NZS 60065	Approval and Test Specification – Mains Operated Electronic and Related Equipment for Household and Similar General Use
AS/NZS 60950.1	Information Technology Equipment – Safety – General Requirements
<i>Canadian Standards</i>	
CAN/CSA C22.2 No. 12	Portable Electric Luminaires
CAN/CSA C22.2 No. 21	Cord Sets and Power-Supply Cords
CAN/CSA C22.2 No. 37	Seasonal and Holiday Decorative Products
CAN/CSA C22.2 No. 42-10	Attachment Plugs and Receptacles
CAN/CSA C22.2 No. 46	Movable and Wall or Ceiling-hung Electric Room Heaters
CAN/CSA C22.2 No. 63	Household Refrigerators and Freezers
CAN/CSA C22.2 No. 64	Household Electric Coffee Makers and Brewing-type Appliances
CAN/CSA C22.2 No. 66.1	Low Voltage Transformers – Part 1: General Requirements
CAN/CSA C22.2 No. 66.2	Low Voltage Transformers – Part 2: General Purpose Transformers
CAN/CSA C22.2 No. 66.3	Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers
CAN/CSA C22.2 No. 68	Motor-operated Massage and Exercise Machines
CAN/CSA C22.2 No. 68-09	Motor-operated appliances (household and commercial)
CAN/CSA C22.2 No. 74	Fluorescent Lamp Ballasts
CAN/CSA C22.2 No. 94.1	Enclosures for Electrical Equipment, Non-environmental Considerations
CAN/CSA C22.2 No. 100	Motors and Generators



<u>Product Safety Standard:</u>	<u>Title:</u>
CAN/CSA C22.2 No. 107.1	General Use Power Supplies
CAN/CSA C22.2 No. 107.3	Uninterruptible Power Systems
CAN/CSA C22.2 No. 109	Commercial Electric Cooking Appliances
CAN/CSA C22.2 No. 113	Electric Fans
CAN/CSA C22.2 No. 149	Electric Toys (Electrical Tests Only)
CAN/CSA C22.2 No. 173	Toy Transformers
CAN/CSA C22.2 No. 195	Motor-operated Household Food Preparing Machines
CAN/CSA C22.2 No. 223	Class 2 Power Units
CAN/CSA C22.2 No. 250	Luminaires
CAN/CSA C22.2 No. 250.4	Portable Electric Luminaires
CAN/CSA C22.2 No. 250.13	LED Equipment for Use in Lighting Products
CAN/CSA C22.2 No.1993	Self-ballasted Lamps and Lamp Adapters
CAN/CSA E335-2-13	Household Electric Skillets and Frying-type Appliances
CAN/CSA E570	Track Lighting Systems
CAN/CSA C22.2 No. 745-2-3	Grinders, Polishers, and Disk-type Sanders
CAN/CSA C22.2 No. 745-2-30	Staplers
CAN/CSA C22.2 No. 745-2-31	Diamond Core Drills
CAN/CSA C22.2 No. 745-2-32	Magnetic Drill Presses
CAN/CSA C22.2 No. 745-2-36	Hand Motor Tools
CAN/CSA E968	Self-ballasted Lamps and Lamp Adapters
CAN/CSA C22.2 No. 1335.1	Electric Heating Appliances
CAN/CSA C22.2 No. 60065	Audio, Video, and Similar Electronic Apparatus – Safety Requirements
CAN/CSA C22.2 No. 60335-1	Household and Similar Electrical Appliances
CAN/CSA C22.2 No. 60335-2-3	Safety Requirements and Similar Electrical Appliances, Part 2: Particular Requirements for Electric Irons
CAN/CSA C22.2 No. 60335-2-5	Dishwashers
CAN/CSA C22.2 No. 60335-2-8	Shavers, Hair Clippers, and Similar Appliances
CAN/CSA C22.2 No. 60335-2-9	Grills, Toasters and Similar Portable Cooking Appliances
CAN/CSA C22.2 No. 60335-2-13	Deep Fat Fryers, Frying Pans and Similar Appliances
CAN/CSA C22.2 No. 60335-2-23	Appliances for Skin or Hair Care
CAN/CSA C22.2 No. 60335-2-34	Motor Compressors
CAN/CSA C22.2 No. 60601-1 ⁴	Medical Electrical Equipment. Part 1: General Requirements for Safety and Essential Performance
CAN/CSA C22.2 No. 60601-1-6	Usability
CAN/CSA C22.2 No. 60601-1-11	Medical Electrical Equipment and Medical Electrical Systems Used in the Home Healthcare Environment
CAN/CSA C22.2 No. 60601-2-10	Nerve and Muscle Stimulators
CAN/CSA C22.2 No. 60601-2-18	Hand-held Motor-operated Electric Tools Endoscopic Equipment
CAN/CSA C22.2 No. 60601-2-22	Surgical, Cosmetic, Therapeutic, and Diagnostic Laser Equipment
CAN/CSA C22.2 No. 60601-2-47	Ambulatory Electrocardiographic Systems
CAN/CSA C22.2 No. 60601-2-57	Non-Laser Light Source Equipment Intended for Therapeutic, Diagnostic, Monitoring and Cosmetic/Aesthetic Use
CAN/CSA C22.2 No. 60745-1	Hand-Held Motor-Operated Electric Tools
CAN/CSA C22.2 No. 60745-2-1	Drills and Impact Drills



<u>Product Safety Standard:</u>	<u>Title:</u>
CAN/CSA C22.2 No. 60745-2-2	Screwdrivers and Impact Wrenches
CAN/CSA C22.2 No. 60745-2-3	Grinders, Polishers and Disk-type Sanders
CAN/CSA C22.2 No. 60745-2-4	Sanders and Polishers, Other Than Disk-type
CAN/CSA C22.2 No. 60745-2-5	Circular Saws
CAN/CSA C22.2 No. 60745-2-6	Hammers
CAN/CSA C22.2 No. 60745-2-8	Shears and Nibblers
CAN/CSA C22.2 No. 60745-2-9	Tappers
CAN/CSA C22.2 No. 60745-2-11	Reciprocating Saws
CAN/CSA C22.2 No. 60745-2-12	Concrete Vibrators
CAN/CSA C22.2 No. 60745-2-14	Planers
CAN/CSA C22.2 No. 60745-2-17	Routers and Trimmers
CAN/CSA C22.2 No. 60745-2-18	Strapping Tools
CAN/CSA C22.2 No. 60745-2-19	Plate Jointers
CAN/CSA C22.2 No. 60745-2-20	Portable Band Saws
CAN/CSA C22.2 No. 60745-2-21	Drain Cleaners
CAN/CSA C22.2 No. 60950-1	Information Technology Equipment – Safety – Part 1: General Requirements
CAN/CSA C22.2 No. 60950-21	Information Technology Equipment – Safety – Part 21: Remote Power Feeding
CAN/CSA C22.2 No. 60950-22	Information Technology Equipment – Safety – Part 22: Equipment Installed Outdoors
CAN/CSA C22.2 No. 60950-23	Information Technology Equipment – Safety – Part 23: Large Data Storage Equipment
CAN/CSA C22.2 No. 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements
CAN/CSA C22.2 No. 61010-2-010	Laboratory Equipment for the Heating of Materials
CAN/CSA C22.2 No. 61010-2-030	Testing and Measuring Circuits
CAN/CSA C22.2 No. 61010-031	Hand-Held Probe Assemblies for Electrical Measurement and Test
CAN/CSA C22.2 No. 62109-1	Safety of Power Converters for use in Photovoltaic Power Systems – Part 1: General Requirements
CAN/CSA C22.2 No. 62109-2	Safety of Power Converters for use in Photovoltaic Power Systems – Part 2: Particular Requirements for Inverters
CAN/CSA C22.2 No. 62368-1	Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements
<i>International Standards</i>	
IEEE 1547	IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems
IEEE 1547.1	Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems
EN ISO 14121-1	Safety of Machinery – Risk Assessment – Part 1: Principles
IEC 60065 (1998, 2000, 2014)	Audio, Video and Similar Electronic Apparatus – Safety Requirements



<u>Product Safety Standard:</u>	<u>Title:</u>
IEC 60065 (2001/A1:2005/A2:2010); EN 60065 (2002/A1:2006/A11:2008/A2:2010/ A12:2011/ 2014/ AC:2016)	Audio, Video and Similar Electronic Apparatus – Safety Requirements ³
EN 60204-1; IEC 60204	Safety of Machinery – Electrical Equipment of Machines – Part 1: Specification for General Requirements
EN 60335-1:2012 (A1:2004, A2:2006 A11:2004, A12:2006, A13:2008, A14:2010, A15:2011/A2:2016); IEC 60335-1:2010 (A1:2004, A2:2006, A:2013)	Household and Similar Electrical Appliances
IEC 60335-2-3; EN 60335-2-3	Household and Similar Electrical Appliances – Safety – Part 2-3: Particular Requirements for Electric Irons
IEC 60335-2-6; EN 60335-2-6	Household and Similar Electrical Appliances – Safety – Part 2-6: Particular requirements for stationary cooking ranges, hobs, ovens and similar appliances
IEC 60335-2-8; EN 60335-2-8	Household and similar electrical appliances. Safety. Particular requirements for shavers, hair clippers and similar appliances
IEC 60335-2-9 (2016 Edition 6.2); EN 60335-2-9	Household and Similar Electrical Appliances: Particular Requirements for Grills, Toasters and Similar Portable Cooking Appliances
IEC 60335-2-13 (2016 Edition 6.1); EN 60335-2-13	Household and Similar Electrical Appliances: Particular Requirements for Deep Fat Fryers, Frying Pans, and Similar Appliances
IEC 60335-2-14; EN 60335-2-14	Household and Similar Electrical Appliances – Safety – Part 2-14: Particular Requirements for Kitchen Machines
IEC 60335-2-15 (2016 Edition 6.1); EN 60335-2-15	Household and Similar Electrical Appliances: Particular Requirements for Appliances for Heating Liquids
IEC/EN 60335-2-23; AS/NZS 60335.2.23	Household and Similar Electrical Appliances – Safety – Part 2-23: Particular Requirements for Appliances for Skin or Hair Care
IEC 60335-2-34; EN 60335-2-34	Household and Similar Electrical Appliances – Safety – Particular Requirements for Motor-compressors
IEC 60335-2-80 (2015 Edition 3); EN 60335-2-80	Household and Similar Electrical Appliances: Particular Requirements for Fans
IEC 60601-1-1 (2000) ⁴ ; EN 60601-1-1 (2001) ⁴	Medical Electrical Equipment – Part 1: General Requirements for Safety 1: Collateral Standard: Safety Requirements for Medical Electrical Systems
IEC 60601-1:2005 ⁴ + Corr.1:2006/ Corr.2:2007/A1:2012; EN 60601-1 (2006, 2012)	Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance
IEC 60601-1-4 (1999, 2000 Edition 1.1); EN 60601-1-4	Collateral Standard: Programmable Electrical Medical Systems
IEC 60601-1-6 (2010 Edition 3.0, 2013 Edition 3.1); EN 60601-1-6	General Requirements for Basic Safety and Essential Performance – Collateral Standard: Usability

<u>Product Safety Standard:</u>	<u>Title:</u>
IEC 60601-1-11 (2010, 2011, 2015); EN 60601-1-11	General Requirements for Basic Safety and Essential Performance – Collateral Standard: Requirements for Medical Electrical Equipment and Medical Electrical Systems used in the Home Healthcare Environment
IEC 60601-2-10 (2001, 2012 Edition 2.0); EN 60601-2-10	Particular Requirements for the Safety of Nerve and Muscle Stimulators
IEC 60601-2-18 (2009 Edition 3.0); EN 60601-2-18	Particular Requirements for the Basic Safety and Essential Performance of Endoscopic Equipment
IEC 60601-2-22 (1995, 2007, 2012 Edition 3.1); EN 60601-2-22	Particular Requirements for the Safety of Diagnostic and Therapeutic Laser Equipment
IEC 60601-2-26 (2002, 2012 Edition 3.0); EN 60601-2-26	Particular Requirements for the Safety of Electroencephalographs
IEC 60601-2-27 (2005, 2011 Edition 3.0, 2012 Edition 3.0); EN 60601-2-27	Particular Requirements for the Safety of Electrocardiographic Monitoring Equipment
IEC 60601-2-52 (2009, A:2010; A1:2015); EN 60601-2-52	Particular Requirements for the Safety of Electrically Operated Hospital Beds
IEC 60601-2-46 (1998, 2010 Edition 2.0); EN 60601-2-46	Particular Requirements for the Safety of Operating Tables
IEC 60601-2-47 (2001, 2012 Edition 2.0)	Particular Requirements for the Safety, including Essential Performance of Ambulatory Electrocardiographic Systems
IEC 60601-2-57 (2011 Edition 1); EN 60601-2-57	Particular Requirements for the Basic Safety and Essential Performance of Non-Laser Light Source Equipment intended for Therapeutic, Diagnostic, Monitoring and Cosmetic / Aesthetic use
IEC 62471; EN 62471	Photobiological Safety of Lamps and Lamp Systems
EN 60825-1 (1994, 2007, 2009, 2014); IEC 60825-1 (2001, 2007, 2014)	Safety of Laser Products Part 1: Equipment Classification, Requirements and User's Guide
IEC 60825-2 (2000-5, 2004 /Amd1:2006 /Amd2:2010); EN 60825-2	Safety of Laser Products – Part 2: Safety of Optical Communication Systems
IEC 60825-4 (1997-11, 2006, 2011); EN 60825-4	Safety of Laser Products – Part 4: Laser Guards
IEC 60950-1 (2005 /A1:2006 /A2:2010, 2013); EN 60950-1 (2006 /A11:2009 /A1:2010 /A12:2010 / A2:2013)	Information Technology Equipment – Safety – Part 1: General Requirements.
IEC 60950-21 (2002); EN 60950-21 (2003)	Information Technology Equipment – Safety – Part 21: Remote Power Feeding
IEC 60950-22 (2005; 2016); EN 60950-22 (2006, 2010)	Information Technology Equipment – Safety – Part 22: Equipment Installed Outdoors
IEC/EN 60950-23 (2005)	Information Technology Equipment – Safety – Part 23: Large Data Storage Equipment
IEC/EN 61010-1 (2001, 2010, 2014)	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use, Part 1: General Requirements

<u>Product Safety Standard:</u>	<u>Title:</u>
IEC/EN 61010-2-010 (2003, 2014 Edition 3.0)	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use – Part 2 – 010: Particular Requirements for Laboratory Equipment for the Heating of Materials
IEC/EN 61010-2-030 (2010)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2-030: Particular Requirements for Testing and Measuring Circuits
IEC/EN 61010-031 (2002, A1:2008)	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use – Part 031: Safety Requirements for Hand-Held Probe Assemblies for Electrical Measurement and Test
IEC/EN 62115	Electric Toys
IEC 62368-1 (2010; 2014); EN 62368-1	Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements
IEC 62366-1 (2015); EN 62366-1	Medical devices - Part 1: Application of Usability Engineering to Medical Devices
IEC 62911:2016; EN 62911	Audio, video and information technology equipment - Routine electrical safety testing in production
ISO 80601-2-12	Medical electrical equipment – Part 2-12: Particular requirements for basic safety and essential performance of critical care ventilators
ISO 80601-2-55	Medical electrical equipment – Part 2-55: Particular requirements for the basic safety and essential performance of respiratory gas monitors
ISO 80601-2-61	Medical electrical equipment – Part 2-61: Particular requirements for basic safety and essential performance of pulse oximeter equipment
ISO 80601-2-72	Medical electrical equipment – Part 2-72: Particular requirements for basic safety and essential performance of home healthcare environment ventilators for ventilator-dependent patients
IEC 60745-1; EN 60745-1	Hand-held motor-operated electric tools - Safety - Part 1: General requirements
IEC 60745-2-1; EN 60745-2-1	Hand-held motor-operated electric tools - Safety - Part 2-1: Particular requirements for drills and impact drills
IEC 60745-2-2; EN 60745-2-2	Hand-held motor-operated electric tools - Safety - Part 2-2: Particular requirements for screwdrivers and impact wrenches
IEC 60745-2-3; EN 60745-2-3	Hand-held motor-operated electric tools - Safety - Part 2-3: Particular requirements for grinders, polishers and disk-type sanders
IEC 60745-2-4; EN 60745-2-4	Hand-held motor-operated electric tools - Safety - Part 2-4: Particular requirements for sanders and polishers other than disk-type
IEC 60745-2-5; EN 60745-2-5	Hand-held motor-operated electric tools - Safety - Part 2-5: Particular requirements for circular saws

<u>Product Safety Standard:</u>	<u>Title:</u>
IEC 60745-2-6; EN 60745-2-6	Hand-held motor-operated electric tools - Safety - Part 2-6: Particular requirements for hammers
IEC 60745-2-8; EN 60745-2-8	Hand-held motor-operated electric tools - Safety - Part 2-8: Particular requirements for shears and nibblers
IEC 60745-2-9; EN 60745-2-9	Hand-held motor-operated electric tools - Safety - Part 2-9: Particular requirements for tappers
IEC 60745-2-11; EN 60745-2-11	Hand-held motor-operated electric tools - Safety - Part 2-11: Particular requirements for reciprocating saws
IEC 60745-2-12; EN 60745-2-12	Hand-held motor-operated electric tools - Safety - Part 2-12: Particular requirements for concrete vibrators
IEC 60745-2-14; EN 60745-2-14	Hand-held motor-operated electric tools - Safety - Part 2-14: Particular requirements for planers
IEC 60745-2-17; EN 60745-2-17	Hand-held motor-operated electric tools - Safety - Part 2-17: Particular requirements for routers and trimmers
IEC 60745-2-18; EN 60745-2-18	Hand-held motor-operated electric tools - Safety - Part 2-18: Particular requirements for strapping tools
IEC 60745-2-19; EN 60745-2-19	Hand-held motor-operated electric tools - Safety - Part 2-19: Particular requirements for jointers
<i>Israeli Standards</i>	
SI 60950 Part 1	Information Technology Equipment - Safety - Part 1: General Requirements
<i>Marine Standards</i>	
(Electrical Safety)	DNV Standard for Certification No. 2.4 (2006); Lloyd's Register Type Approval System (2002); IACS req. Rev.6, 2014:E10; ABS Steel Vessels 2016, Part 4, Chapter 9, Section 7; ABS High Speed Craft 2016, Part 4, Section 11; BV Marine Rules Pt C, Chapter 3, Sec 6; 46 CFR Part 162.060-30; DNVGL CG-0339; MEPC.174(5q8); MEPC 107(49) Part 3; BV BWMS Guidance Note NI 538 DT R01 E

* This laboratory offers field testing consistent with A2LA R104 – *General Accreditation of field testing and Field Calibration Laboratories* for the indicated test methods

¹ Lab is using 10m semi-anechoic chamber where required for testing at the following location: Bureau Veritas, No. 47, 14th Ling, Chai Pau Tsuen, Linkou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

²A2LA provides accreditation to the U.S. EPA's *Conditions and Criteria for Recognition of Laboratories for the ENERGY STAR Program* by verifying an organization's compliance to A2LA document *R222 - Specific Requirements - EPA ENERGY STAR Accreditation Program* and to the related test methods listed above.

Accreditation by A2LA does not infer Recognition by the EPA for ENERGY STAR testing. Please verify this organization's recognition status by using the EPA's searchable database, located at http://www.energystar.gov/index.cfm?fuseaction=recognized_bodies_list.show_RCB_search_form

³ This laboratory's scope contains withdrawn or superseded methods. As a clarifier, this indicates that the applicable method itself has been withdrawn or is now considered "historical" and not that the laboratory's accreditation for the method has been withdrawn.

⁴ 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.

† Accreditation 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.

A handwritten signature in black ink, appearing to be 'L. S. L.', located at the bottom right of the page.



Accredited Laboratory

A2LA has accredited

CURTIS-STRAUS, LLC

Littleton, MA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the A2LA R222 - Specific Requirements - EPA ENERGY STAR 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 8 January 2009*).



Presented this 20th day of September 2017.

A handwritten signature in black ink, written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 1627.01
Valid to July 31, 2019

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