



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

ELITE ELECTRONIC ENGINEERING, INC.<sup>1</sup>

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MECHANICAL

Valid to: June 30, 2019

Certificate Number: 1786.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above, *as well as the satellite laboratory location listed below*, for the following mechanical tests:

**Test Technology**

**Test Method(s)**

Humidity  
(5 to 97) %

MIL-STD-810 (C/E/F/G), Methods 507 and 520;  
MIL-STD-202 (F/G), Methods 103 and 106;  
SAE J1455, Sec. 4.2, 4.12; SAE J575, Section 4.4;  
RTCA/DO-160 (D/E/F/G), Section 6.0;  
EIA-364-31;  
GMW 3172, Section 9.4;  
IACS-E10, Test 6;  
IEC 60068-3-4; IEC 60068-2-30; IEC 60068-2-38; IEC 60068-2-78;  
ISTA 2A 2008;  
US CAR-2, Section 5.6.2;  
ISO 16750-4;  
FAA AC 150/5345-3G, -5B, -10H, -43H, -49D, -51B, -52A, 54B;  
USCAR21-3, Section 4.5.4

Temperature Cycling,  
Temperature Steady State,  
Temperature Life  
Thermal Shock  
(-100 to 350) °C  
(Ramps up to 60°C/min)  
(<15sec transitions)

MIL-STD-810 (E/F/G) Methods 501, 502, 503, 520, and 524;  
MIL-STD-202 (F/G) Methods 107 and 108;  
IEC 60068-2-1; IEC 60068-2-2; IEC 60068-2-28; IEC 60068-2-14;  
SAE J1455, Sections 4.1 and 4.12;  
EIA-364-32;  
RTCA/DO-160 (D/E/F/G), Sections 4 and 5;  
US CAR-2, Sections 5.6.1 and 5.6.3;  
GMW 3172, Section 9.4;

**Test Technology**

**Test Method(s)**

Temperature Cycling, Temperature Steady State, Temperature Life Thermal Shock (Cont'd)	IACS-E10, Tests 5 and 11; ISTA 2A 2008; ISO 16750-4; FAA AC 150/5345-5B, -10H, -12F, -26D, -28G, -39D, -42H, -43H, -44K, -46E, -49D, -50B, -51B, -52A, -54B, -55A; FAA EB-67D; US CAR-21, Section 4.5.5
Immersion	MIL-STD-810 (E/F/G), Method 512; MIL-STD-202 (F/G), Method 104; SAE J1455, Section 4.3; SAE J575, Section 4.3; US CAR-2, Section 5.6.5; IEC 529; IEC 60529; ISO 16750-4; GMW 3127, Section 5.8; ISO 20653; FAA AC 150/5345-26D, -39D, -44K, -46E, -47C
Ice & Freezing Rain	MIL-STD-810 (E/F/G), Method 521; RTCA/DO-160 (D/E/F/G), Section 24; NEMA 250; FAA AC 150/5345-12F
Rain, Drip, and Water Spray	MIL-STD-810 (E/F/G), Method 506; SAE J1455, Section 4.5; SAE J575, Section 4.3; RTCA/DO-160 (D/E/F/G), Section 10; IEC 60529; IEC 60068-2-17; ISO 16750-4; ISO 20653; DIN 40 050; NEMA 250; GMW 3127, Section 9.5; FAA AC 150/5345-12F, -28G, -43H, -44K, -46E, -50B, -51B, -54B
Dust Blowing and Settling	MIL-STD-810 (E/F/G), Method 510, Procedure I; MIL-STD-202 (F/G), Method 110; IEC 60529; ISO 20653; ISO 16750-4; SAE J1455, Section 4.7, Alternate Method; RTCA/DO-160(D/E/F/G), Section 12, Procedure D; DIN 40 050; NEMA 250; GMW 3127, Section 9.5
Salt Spray (Corrosion)	ASTM B117; ASTM G85; MIL-STD-810 (E/F/G), Method 509; MIL-STD-202 (F/G), Method 101; SAE J1455, Section 4.3; SAE J575, Sections 4.6, 4.7; RTCA/DO-160 (D/E/F/G), Section 14;

<b><u>Test Technology</u></b>	<b><u>Test Method(s)</u></b>
Salt Spray (Corrosion) (Cont'd)	US CAR-2, Section 6.6.4; GMW 3172, Section 9.4.7; IACS-E10, Test 12; IEC 60068-2-11; IEC 60068-2-52; ISO 16750-4; FAA AC 150/5345-28G, -39D, -43H, -45C, -46E, 50B, 51B, 52A
Explosive Atmosphere	MIL-STD-810 (E/F/G), Method 511; MIL-STD-202 (F/G), Method 109; RTCA/DO-160 (D/E/F/G), Section 9
Fluids Susceptibility	MIL-STD-810 (E/F/G), Methods 504 and 518; MIL-STD-202 (F/G), Method 215; SAE J1211, Section 4.4; SAE J1455, Section 4.4; SAE J575, Sections 4.8 and 4.9; RTCA/DO-160 (D/E/F/G), Section 11; US CAR-2 Sec. 6.4; ISO 16750-5; FAA AC 150/5345-42H, -46E
Solar Radiation	MIL-STD-810 (E/F/G), Method 505; FAA AC 150/5345-12F, -39D, -43H, -44K, -45C, -46E, -50B, -51B, -52A, -54B
Flammability	MIL-STD-202 (F/G), Method 111; FMVSS 302; RTCA/DO-160 (D/E/F/G), Section 26, Category C
Vibration Random and Sine 25k force pound 3" stroke 2 Hz to 3 kHz	MIL-STD-810 (E/F/G), Method 520; MIL-STD-202 (F/G), Methods 201, 204, and 214; IEC 60068-2-6; IEC 60068-2-64; IEC 61373:2010; ISO 16750-3; CEI IEC 255-21-1; SAE J1455, Sections 4.10 and 4.12; SAE J575, Section 4.2; RTCA/DO-160 (D/E/F/G), Section 8; US CAR-2, Sections 5.4.6 and 5.8; EIA-364-28; GMW 3172, Section 9.3; IACS-E10, Test 7; ISTA 2A 2008; FAA AC 150/5345-46E
Mechanical Shock	MIL-STD-810 (E/F/G), Methods 516 and 519; MIL-STD-202 (F/G), Methods 203 and 213; RTCA/DO-160 (D/E/F/G), Section 7; EIA-364-27; GMW 3172, Section 9.3; IEC 60068-2-27; IEC-60068-2-29; IEC 60068-2-3; ISO 16750-3; CEI IEC 255-21-2; SAE J1455, Section 4.11;

<b><u>Test Technology</u></b>	<b><u>Test Method(s)</u></b>
Mechanical Shock ( <i>Cont'd</i> )	ISTA 2A 2008; US CAR-2, Sections 5.4.6 and 5.8; FAA AC 150/5345-46E, -47C; IEC 61373:2010
Transportation Vibration	ISTA 1A 2001, 1B 2001, 1D 2001 ( <i>except for sequence # 3</i> ), 2A 2008; MIL-STD-810 (E, F, G), Method 514, Procedure II
UN Manual of Tests and Criteria	Tests T1 (Altitude Simulation), T2 (Thermal Test), T3 (Vibration), T4 (Shock), T5 (External Short Circuit), and T7 (Overcharge)
Gravel Bombardment	SAE J400; SAE J1455, Section 4.8; ISO 16750-3; ISO 20567-1

<sup>1</sup>This accreditation covers the testing performed at the main laboratory listed above, and the following satellite laboratory listed below:

201 Eisenhower Lane South, Unit 219  
Lombard, IL 60418

<b><u>Test Technology</u></b>	<b><u>Test Method(s)</u></b>
Connector and Cable Testing (5,000 to 20,000) lbs 20"/min	GMW 3172, Sections 9.3.6 through 9.3.10; EIA-364, 38; US CAR-2, Sections 5.2 through 5.4; US CAR-21-3 Section 4.4; FAA AC 150/5345-26D, Sections 4.2.2.2, 4.2.3, and 4.2.4, -47C
UN Manual of Tests and Criteria	Tests T1 (Altitude Simulation), T2 (Thermal Test), T3 (Vibration), T4 (Shock), T5 (External Short Circuit), & T7 (Overcharge)
Seal/Leakage	FAA AC 150/5345-10H, -42H, -46E
Yield Device	FAA AC 150/5345-27D, -28G, -39D, -44K, -46E, -50B, -51B, -52A, -55A
Load	FAA AC 150/5345-27D, -28G, -39D, -42H, -43H, -46E, -50B, -52A, -55A
Surface Temperature	FAA AC 150/5345-46E
Impact	ASTM E23; ASTM D6110; FAA AC 150/5345-42H
Accelerated Life Test	FAA AC 150/5345-46E; FAA EB-67D
Transformer Tests	FAA AC 150/5345-47C (Section 4.2.4)

**Test Technology**

**Test Method(s)**

Humidity  
(5 to 97) %

MIL-STD-810 (C/E/F/G), Methods 507 and 520;  
MIL-STD-202 (F/G), Methods 103 and 106;  
SAE J1455, Sections 4.2 and 4.12; SAE J575, Section 4.4;  
RTCA/DO-160 (D/E/F/G), Section 6.0;  
EIA-364-31;  
GMW 3172, Section 9.4;  
IACS-E10, Test 6;  
IEC 60068-3-4; IEC 60068-2-30; IEC 60068-2-38; IEC 60068-2-78;  
ISTA 2A 2008;  
US CAR-2, Section 5.6.2; US CAR21-3, Section 4.5.4;  
ISO 16750-4;  
FAA AC 150/5345-3G, -5B, -10H, -43H, -49D, -51B, -52A, -54B

Temperature Cycling,  
Temperature Steady State,  
Temperature Life  
Thermal Shock  
(-100 to 350) °C

MIL-STD-810 (E/F/G) Methods 501, 502, 503, 520, and 524;  
MIL-STD-202 (F/G) Methods 107, 108;  
IEC 60068-2-1; IEC 60068-2-2; IEC 60068-2-28; IEC 60068-2-14;  
SAE J1455, Sections 4.1 and 4.12;  
EIA-364-32;  
RTCA/DO-160 (D/E/F/G), Sections 4 and 5;  
US CAR-2, Sections 5.6.1 and 5.6.3; US CAR-21-3, Section 4.5.5;  
GMW 3172, Section 9.4;  
IACS-E10, Tests 5 and 11;  
ISTA 2A 2008;  
ISO 16750-4;  
FAA AC 150/5345-5B, -10H, -12F, -26D, -28G, -39D, -42H, -43H, -44K,  
-46E, -49D, -50B, -51B, -52A, -54B, -55A; FAA EB-67D

Altitude  
(-1.5 to 100) k ft

MIL-STD-810 (E/F/G), Methods 500 and 520;  
MIL-STD-202 (F/G), Method 105C, Test Conditions A, B, and C;  
SAE J1455, Section 4.9;  
RTCA/DO-160 (D/E/F/G), Section 4.0;  
EIA-364-20;  
US CAR-2 5.6.6;  
IEC 60068-20-13;  
FAA AC 150/5345-5B, -10H, -51B

Acceleration

MIL-STD-810 (E/F/G), Method 513;  
MIL-STD-202 (F/G), Method 212, Conditions A and C

Photometry, Luminous  
Flux<sup>2</sup>  
2-meter Integrating  
Sphere with  
spectroradiometer;  
4pi and 2pi geometries;  
(6 to 159,000) lumens

LM-79-08; LM-45-15;  
49 CFR 571.108 (FMVSS 108); 49 CFR 564 (Part 564);  
CMVSS 108;  
SAE J573; SAE J2560;  
UNECE Reg 37, Reg 99;  
CIE 84

**Test Technology**

**Test Method(s)**

Photometry, Luminous Intensity<sup>2</sup>  
64' (19.5 m) Type A Goniophotometer; (Steady, Flashing); (0.01 to 1,000,000) cd

FAA AC 150/5345-12F, -28G, -43H, -46E, -50B, -51B, -52A, -55A; FAA EB-67D; IES LM-79-08, Section 9.1; ICAO Annex 14, Volume 1 (7<sup>th</sup> Edition); TP312 (5<sup>th</sup> Edition); SAE J222; SAE J575; SAE J581; SAE J582; SAE J583; SAE J585; SAE J586; SAE J588; SAE J591; SAE J592; SAE J593; SAE J595; SAE J845; SAE J852; SAE J914; SAE J1319; SAE J1373; SAE J1383; SAE J1395; SAE J1398; SAE J1424; SAE J1432; SAE J1735; SAE J1889; SAE J1957; SAE J2009; SAE J2039; SAE J2040; SAE J2042; SAE J2087; SAE J2139; SAE J2261; SAE J2595; SAE J2650; SAE AS8037; 49 CFR 571.108 (FMVSS 108); CMVSS 108; UNECE Reg 38; NFPA 1901, Chapter 13; GSA/KKK-A-1822F, Section 3.8; GMW 14906, Section 4.5.5; CIE 70

Colorimetry, Chromaticity<sup>2</sup> Spectrometer (350 to 1050) nm

FAA AC 150/5345-12F, -28G, -43H, -46E, -50B, -51B, -52A, -55A; FAA EB-67D; SAE J576; SAE J578; AS25050; IES LM-79-08, Section 12.1; IES LM-58-13; TM-30-15; CIE 13.3, 15; ICAO Annex 14, Volume 1 (7<sup>th</sup> Edition); TP312 (5<sup>th</sup> Edition)

<sup>2</sup> Also using customer specified methods directly related to the technologies and parameters listed above.

On the following products and materials:

Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors



## *Accredited Laboratory*

A2LA has accredited

### **ELITE ELECTRONIC ENGINEERING INC.**

*Downers Grove, IL*

for technical competence in the field of

### **Mechanical 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 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 23<sup>rd</sup> day of October 2017.

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

President and CEO  
For the Accreditation Council  
Certificate Number 1786.02  
Valid to June 30, 2019

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