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LUMAWISE Endurance S Connector Platform

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the TE connectivity LUMAWISE Endurance S connector platform for roadway and area lighting applications.

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

1.3. Qualification Test Results

Successful qualification testing on the subject product line has not been completed. The Qualification Test Report number will be issued upon successful qualification testing.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 114-133074: Application Specification
- 501-134069: Qualification Test Report
- 109-197 Test Specification (TE Test Specification vs EIA and IEC Test Methods)

2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC-60512-11-6: Connectors for Electronic Equipment - Corrosion, salt mist
- IEC-60529: Degrees of Protection Provided by Enclosures (IP Code)
- IEC 62262: Degrees of Protection Provided by Enclosures Against External Mechanical Impacts

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

3.2. Ratings

Voltage	Current	Temperature
30 volts DC	1.5A	-40 to 90°C

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3.3. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Initial examination of product	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	Δ25 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 4.
Insulation Resistance.	100 mega ohms minimum initial. 10 mega ohms minimum final.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Withstanding Voltage – Internal.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1100 volts AC at sea level. Test performed between adjacent contacts of mated specimens.
Temperature Rise vs Current.	30°C maximum temperature rise at specified current (100% energized). Refer to section 3.2 for current value.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.
Withstand voltage – External.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 10,000 volts AC at sea level. Test performed between contacts and receptacle mounting plate of mated specimens.
MECHANICAL		
Random Vibration.	No discontinuities of 1 microsecond or longer duration. See Note (a).	EIA-364-28, Test Condition VII, Test Condition Letter E. Subject mated specimens to 20 to 500 Hz random levels at 4.9g. 90 minutes in each of 3 mutually perpendicular planes.
Mechanical Shock.	No discontinuities of 1 microsecond or longer duration. See Note (a).	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Wire Retention Force	**Min Force** / **Wire Size** / **Stranding**: 25N / 16AWG/1.5mm^2 / Solid 20N / 18AWG/0.75mm^2 / Solid 15N / 18AWG/0.75mm^2 / Tin Dipped Stranded 13N / 20AWG/0.50mm^2 / Solid, Tin Dipped Stranded	EIA-364-8. Measure force necessary to remove wire from poke-in contact specimens at a maximum rate of 12.7 mm per minute.

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Connector Mating/Un-Mating Torque	4.0 N-m maximum	EIA-364-13 With a 55.6N compression force applied to the PCB module or sealing cap, measure torque necessary to mate or un-mate a fully populated connector assembly.
Receptacle Mounting Torque Resistance	30 degree rotation maximum	EIA-364-13. With a 55.6N compression force applied to the PCB module or sealing cap, apply a 5.0 N-m torque to receptacle and mating part, then evaluate the amount of rotation the receptacle exhibits relative to the original mounting location.
Durability.	See Note (a)	EIA-364-9. Mate and un-mate specimens for 10 cycles at a maximum rate of 360 cycles per hour.
Impact	See Note (a)	IEC 62262. Subject receptacle and mating part to IK09 (10J) impact.
ENVIRONMENTAL		
Thermal Shock.	See Note (a)	EIA-364-32. Subject mated specimens to 150 cycles between -40 and 90°C with 30 minute dwells at temperature extremes and 1 minute transition between temperatures.
Humidity/Temperature Cycling.	See Note (a)	EIA-364-31, Method IV. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH
Temperature Life.	See Note (a)	EIA-364-17, Method A. Subject mated specimens to 100°C for 500 hours.
Temperature Life - IP	See Note (a)	EIA-364-17, Method A. Subject mated specimens to 90°C for 240 hours.
Humidity Freeze	See Note (a)	IEC 61215: 10.12.3, Subject mated specimens to 10 cycles between -40 and 90°C 85% RH
Ingress Protection (IP 65).	No ingress of water or dust allowed within any sealed area of the connector.	IEC-60529, IP65
Ingress Protection (IP 66).	No ingress of water or dust allowed within any sealed area of the connector.	IEC-60529, IP66
Salt Spray	No ingress of salt spray allowed within any sealed area of the connector.	IEC 60512-11-6 Exposure time is 240 hours. Test receptacle mated to a sealing cap.

NOTE (a) *Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

Figure 1

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3.4. Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (b)									
	A	B	C	D(e)	E	F	G(e)	H	J(e)	K
	TEST SEQUENCE (c)									
Initial examination of product	1	1	1	1	1	1	1	1	1	1
LLCR	2,6	2,5,7	2, 8							
Insulation Resistance			3,9							
Withstanding Voltage - Internal			4,10							
Temperature Rise vs Current		3								
Random Vibration	4									
Mechanical Shock	5									
Wire Retention Force						2				
Impact							2			
Mating Torque								2		
Un-Mating Torque								3		
Receptacle Mounting Torque Resistance										2
Humidity Freeze									2	
Durability	3									
Thermal Shock			6							
Humidity/Temperature Cycling		4(d)	7							
Temperature Life		6								
Temperature Life – IP				2						
Ingress Protection (IP-65)				3					3	
Ingress Protection (IP-66)				4			3		4	
Withstand Voltage - External			5, 11							
Salt Spray					2					
Final examination of product	7	8	12	5	3	3	4	4	5	3

NOTES

(a) Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.

(b) See paragraph 4.1.A

(c) Numbers indicate sequence in which tests are performed.

(d) Precondition with 2 durability cycles.

(e) Groups D, G, and J: (5) specimens subjected to IP6X dust exposure and (5) specimens subjected to IPX5 and/or IPX6 jet spray exposure.

Figure 2

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4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Minimum specimen quantities are shown in Figure 3.

Specimen Description	Test Group Quantity (Minimum)									
	A	B	C	D	E	F	G	H	J	K
2213858-1	8	8	6	5	5	50	10	5	5	5
2213795-1				5	5		10		5	5
2213837-1	8(a)			5(a)	5(a)		5(a)	5	5(a)	
2306986-1	4(a)			5(a)	5(a)		5(a)		5(a)	
2213831-1	8	8	6	5(a)	5(a)		5(a)		5	
2306987-1	4(a)			5(a)	5(a)		5(a)		5(a)	
Simulated Module Weight (~45 grams)	8									
16AWG/1.5 mm^2 Solid Copper Wire	16	16	24			40				
18AWG/0.75mm^2 Solid Copper Wire						40				
20AWG/0.5mm^2 Solid Copper Wire	16	16				40				
18AWG/0.75mm^2 Tin Dipped Stranded Copper Wire						40				
20AWG/0.5mm^2 Tin Dipped Stranded Copper Wire						40				

NOTE

(a) Module base and cover part numbers will be tested in combination with the mating receptacle upon release of approved cover production tooling.

Figure 3

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

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4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

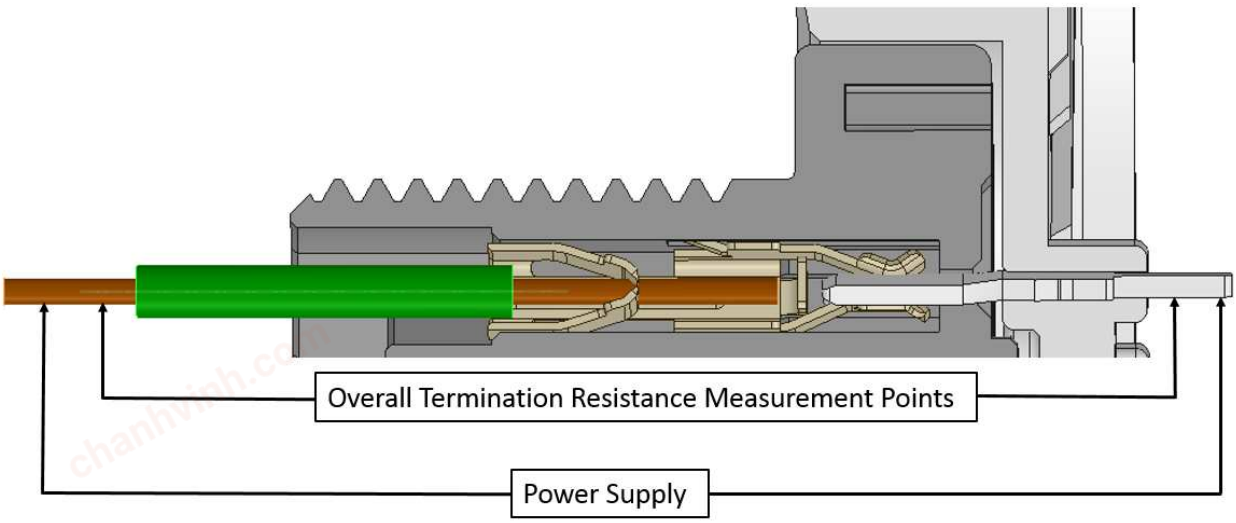


Figure 4
LLCR Measurement Points