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Bulb Connector

1. Scope

1.1 Content

This specification defines the test method for Bulb connector, terminal and accessories.

1.2 Qualification

When testing the named products, the following specified specifications and standards shall be used.

All tests have to be done using the applicable inspection plan and product.

1.3 Applied Product

- 2005159 Cap assembly
- 2005163 Receptacle Terminal (LONG)
- 2005164 Ground Terminal
- 1897955 Seal for Ground Terminal
- 963293 Seal for Receptacle Terminal
- 828922 Cavity Plug

2. Applicable Documents

The following documents, if they are related, are sequent to this specification.

In case of conflict between the requirements of this specification and the product drawing or in conflict between the requirements of this specification and the referred documents, this specification has precedence

2.1 TE Connectivity Documents

- 109-1 General Requirements for Test Spec.
- 2005159 Customer Drawing (Cap assembly)
- 2005163 Customer Drawing (Receptacle Terminal)
- 2005164 Customer Drawing(Ground Terminal)
- 1897955 Customer Drawing (Seal for Ground Terminal)
- 963293 Customer Drawing (Seal for Receptacle Terminal)
- 828922 Customer Drawing (Cavity Plug)

2.2 HKMC specification

- ES-91500-00 HKMC Connector General Spec.
- SAE/USCAR Performance Specification for Automotive RF Connector System.

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3. Requirements

No.	Items	Characteristics	Remark
Sequence 1			
1	Bulb Insertion / Removal	Insertion Force : 45N Max Removal Force : 5N Min, 42N Max (Since no regulation exist about the W3, Classification W2 is adapted)	
2	Bulb Wobble	The Maximum allowable movement at the filament location in any direction 1.5mm	
3	Socket Insertion / Removal	The maximum rotational torque for fully installing a socket is 1.3N-M The minimum rotational torque to remove a socket is 0.7N-M The Maximum rotational torque to remove a socket is 2.5N-M	
5	Socket Strength	Visually inspect the socket for signs of functional damage, distortion, or component disassembly. The socket must be free of defects that could affect its electrical, mechanical, or long-term performance. Any signs of functional damage shall indicate failure. Minimum torque to go beyond stop position must exceed 6.0N-M	
6	Terminal Retention	Primary lock : 60N Min Before/After Moisture conditioning : 90N Min	
7	Fluid Resistance	There must be no visible degradation, swelling, cracking, or loss of mechanical function evident on any test sample, examined with the aid of a 10X magnifying glass.	
Sequence 2			
No.	Items	Characteristics	Remark
1	Outgassing	After the test, the socket must not be distorted	
Sequence 3			
No.	Items	Characteristics	Remark
1	Thermal Shock	The socket plate assembly shall show no evidence of visible fractures, warpage or deformation.	
2	Power Temperature Cycling	Samples shall operate normally during and at a conclusion of testing. The socket plate assembly shall show no evidence of visible fractures, warpage or deformation.	
3	Voltage drop	The Voltage Drop across each complete circuit (within each socket, and between wire harness and connector) Initial test : 10 mV/A Max After any other test : 50mV/A Max	
4	High Temperature Exposure	The socket plate assembly shall show no evidence of visible fractures, warpage or deformation.	
5	Vibration	Continuity : The mated socket assembly shall not experience any intermittence across the shunt exceeding 2ms The socket assembly with the bulb installed shall not exceed a maximum temperature of 120°C at the thermocouple location while vibrating.	
6	Mechanical Shock	The assembly shall not experience any circuit interruption greater than 2.0ms.	
7	Bulb Removal	The minimum required removal force : 3.7N (Since no regulation exist about the W3, Classification W2 is adapted)	
Sequence 4			

No.	Items	Characteristics	Remark
1	Temperature Rise	The measured temperature at all terminal interfaces shall not exceed the maximum allowable temperature rise of 50°C	
Sequence 5			
No.	Items	Characteristics	Remark
1	Ozone Resistance	Socket assembly must be free of visible damage or degradation (including labeling)	
2	Salt Spray	Visually inspect for functional damage, distortion and ensure that any labeling is still legible.	
3	Isolation Resistance	The resistance between every combination of any two adjacent terminals must exceed 20MΩ at 500VDC	
Sequence 6			
No.	Items	Characteristics	Remark
1	Temperature Humidity Cycling	This is a conditioning test that has no acceptance criteria and is intended to be run as part of test sequences.	
Sequence 7			
No.	Items	Characteristics	Remark
1	System Seal Integrity (submerged Socket test)	When Samples are subjected to positive pressure, no air bubbles shall break to the surfaces Remove socket from test fixture, and using ultraviolet light, confirm no evidence of water. Atmosphere condensation that develops on the inner surface of the individual test capsules in the form of a fine mist or fog is acceptable	
2	System Seal integrity (High Pressure Water Spray)	Remove socket from test fixture, and using ultraviolet light, confirm no evidence of water. When disconnecting the samples, use care not to allow any residual solution to enter the interior of the socket and/or mating connector Atmosphere condensation that develops on the inner surface of the individual test capsules in the form of a fine mist or fog is acceptable..	
3	Isolation Resistance	The resistance between every combination of any two adjacent terminals must exceed 20MΩ at 500VDC	
Sequence 8			
No.	Items	Characteristics	Remark
1	Voltage Drop	The Voltage Drop across each complete circuit (within each socket, and between wire harness and connector). Initial test : 10mV/A Max After any other test : 50mV/A Max	
2	1008 hour Current Cycle	Voltage Drop at any time during the test	
Sequence 9			
No.	Items	Characteristics	Remark
1	Conductor Crimp Pullout Force	AWG 20 : 75N Min AWG 18 : 90N Min	