Mini Dynamic Halogen Free Connector

1 SCOPE

1.1 Content

This specification describes the design, the characteristics, the tests and the quality requirements of the Mini Dynamic Halogen Free Connector.
*Header: *-2834465-*, *-2834499-**
*Receptacle: *-2834627-*, *-2834628-**
Terminal: 2834464-5

1.2 Qualification

When testing the named products the following the specified specifications and standards shall be used. All tests have to be done using the applicable inspection plan and drawings.

2 APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. In the case of a conflict between this specification and the specified documents, this specification has priority.
For the listed documents is valid the specification at the date of the first release of this specification.

2.1 Standards

A.	DIN/IEC 60512	Electromechanical components for electronic equipments, basic testing procedures and measuring methods
B.	DIN EN 60068	Environmental tests
C.	DIN IEC 68	Electrical Engineering, basic environmental testing procedures
D.	LV214	Car Plug connectors – Test procedure
E.	USCAR	Performance Specification for Automotive Electrical Connector System
F.	EIA-364	Electrical Connector / Socket Test Procedures Including Environmental Classifications

2.2 DESCRIPTION

All design and construction data, such as dimensions, materials, wire sizes, etc., are shown in the product drawings.

3 PROPERTIES

3.1 General Requirements

The product must correspond with the drawing, concerning the design and the physical dimensions.

3.2 Technical Data - Ratings

Current carrying capacity	*3A(22AWG), 2A(24AWG),1A(26AWG)*
Maximum mating cycles	*30 cycles for tin-plated contacts*
Temperature range	*-40℃ to +125℃ for tin-plated contacts (including temperature rise)*

3.3 Materials

A. Contact:
Material: Copper Alloy
Finish: Tin plating over Nickel Plating
Contact Point: Tin plating
Soldering Point: Tin plating

B. Housing:
Material: PBT or HTN
Color: Black,

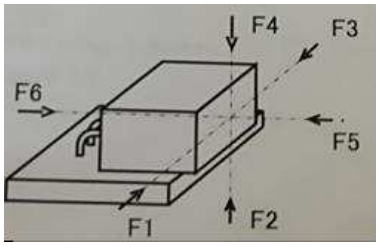
C. Retention Leg:
Material: Copper Alloy
Finish: Tin plating over Nickel Plating

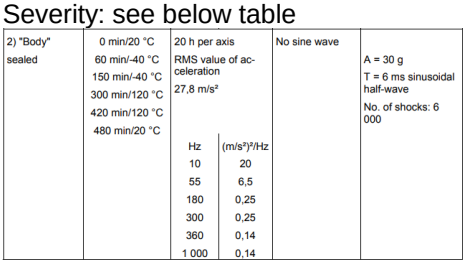
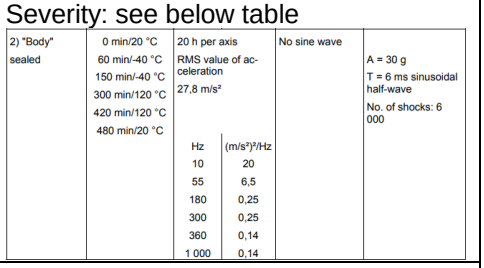
3.4 Performance

The product performs the electrical, mechanical and climatic requirements of Chapter 3.5

3.5 Electrical, Mechanical and Climatic requirements

Para.	Test items	Requirements	Procedures
MECHANICAL TEST			
3.5.1	Visual Inspection	No damage	Acc. DIN EN 60512-1-1
3.5.2	Terminal – Connector Insertion/Retention Force	Insertion force: 30N Max Retention Force: Primary Lock: 20N Min Primary + Second Lock: 40N Min	SAE/USCAR-2.6 5.4.1 Mate and un-mate the terminal-connector at rate of 50mm/min.
3.5.3	Connector-Connector Mating / Unmating / Retention Forces (non-assist)	Mating Force: 75N Max Unmating Force: 75N Max Retention Force: 110N Min	SAE/USCAR-2.6 5.4.2 Mate and un-mate the connectors at rate of 50mm/min.
3.5.4	Polarization Feature Effectiveness	without damage to the connector and no electrical contact shall be made between the male/female terminals.	SAE/USCAR-2.6 5.4.4 Insert the connector under Incorrect position with speed without exceeding 50mm/min with force 60 to 150N.
3.5.5	Miscellaneous Component Engage/Disengage Force	Engage force: 60N Max Disengage Force: 60N Max	SAE/USCAR-2.6 5.4.5 Mate and un-mate the Component at rate of 50mm/min.
3.5.6	Connector Drop Test	Components shall not be displaced from their intended shipping position.	SAE/USCAR-2.6 5.4.8 Drop the connector under following condition. Hight: 1m， Drop direction: ±X ±Y ±Z， Test time: each direction 3times.
3.5.7	Cavity Damage Susceptibility	TPA Can’t be seated or locked.	SAE/USCAR-2.6 5.4.10 Apply a load to TPA with terminal half mated under following condition. Test speed: Not exceed 50mm/min Load value: The minimum force is 80N for ≥1.5 nominal size terminals and 60N for <1.5 terminals.
3.5.8	Terminal/Cavity Polarization Test	Terminal shall not fit or lock into connector cavity.	SAE/USCAR-2.6 5.4.9 Insert the connector in Incorrect position with speed not exceeding 50mm/min with Load 15N.

3.5.9	Connector Mounting Feature Mechanical Strength		USCAR-2.6: 5.4.11 Apply load to the connector under following condition. Load direction: F1-F6 see figure Load value: F1- F5 50N Min F6 110N Min
3.5.10	Connector and/or Terminal Cycling	No damage	SAE/USCAR-2.6 5.1.7 Completely mate and un-mate each connector or terminal pair 10 times
Para.	Test items	Requirements	Procedures
ELECTRICAL TEST			
3.5.11	Dry Circuit Resistance	25mΩ max.	SAE/USCAR-2.6 5.3.1 Measure the contact resistance under following condition. Current: 1mA Voltage: 20mV MAX.
3.5.12	Voltage Drop	50mv max.	SAE/USCAR-2.6 5.3.2 Adjust the power supply to provide the required test current of 5A per square millimeter of conductor cross section for the conductor selected.
3.5.13	Insulation resistance	500 MΩ Min.	SAE/USCAR-2.6 5.5.1 Impressed voltage 500V DC. Test between adjacent circuits of mated connectors.
3.5.14	Dielectric withstanding Voltage	Neither creeping discharge nor flashover shall occur. Current leakage: 1 mA Max.	500V AC for 1 minute. Test between adjacent circuits of mated connectors. EIA 364-20
3.5.15	Thermal time constant	The graph "current over time" must be provided.	LV214 2010: PG14 DIN EN 60512-1-1 Loading of a contact with 1x/2x/3x/4x/5x rated current and simultaneous recording of the temperature curve over time until stabilization or until the max. permissible component temperature is reached.

Para.	Test items	Requirements	Procedures
ENVIROMENTAL TEST			
3.5.16	Vibration	No function-relevant damage must occur. Circuit interruption monitoring takes place during the test. Permissible circuit interruption <1000ns. The circuit considered interrupted when the contact resistance exceeds 7Ω. Interruptions are not permissible. 30 mΩ Max. (Final)	Acc. LV214 PG 17 E14.0 DIN EN 60068-2-6 Severity: see below table  2) "Body" sealed 0 min/20 °C 60 min/-40 °C 150 min/-40 °C 300 min/120 °C 420 min/120 °C 480 min/20 °C 20 h per axis RMS value of acceleration 27,8 m/s² Hz / (m/s²)²/Hz 10 / 20 55 / 6,5 180 / 0,25 300 / 0,25 360 / 0,14 1 000 / 0,14 No sine wave A = 30 g T = 6 ms sinusoidal half-wave No. of shocks: 6 000
3.5.17	Physical Shock	No function-relevant damage must occur. Circuit interruption monitoring takes place during the test. Permissible circuit interruption <1000ns. The circuit considered interrupted when the contact resistance exceeds 7Ω. Interruptions are not permissible. 30 mΩ Max. (Final)	Acc. LV214 PG 17 E14.0 DIN EN 60068-2-27 Severity: see below table  2) "Body" sealed 0 min/20 °C 60 min/-40 °C 150 min/-40 °C 300 min/120 °C 420 min/120 °C 480 min/20 °C 20 h per axis RMS value of acceleration 27,8 m/s² Hz / (m/s²)²/Hz 10 / 20 55 / 6,5 180 / 0,25 300 / 0,25 360 / 0,14 1 000 / 0,14 No sine wave A = 30 g T = 6 ms sinusoidal half-wave No. of shocks: 6 000
3. 5.18	Thermal Shock	No function-relevant damage must occur. Circuit interruption monitoring takes place during the test. Permissible circuit interruption <1us. The circuit considered interrupted when the contact resistance exceeds 7Ω. Interruptions are not permissible.	SAE/USCAR-2.6 5.6.1 Leave the connector under following condition High temperature: 125℃ / 30min Low temperature: -40℃ / 30min Test time: 100cycles
3.5.19	Temperature/Humidity Cycling	No function-relevant damage must occur.	SAE/USCAR-2.6 5.6.2 Temperature / humidity: See follow 1. 105℃ 7 Hours, then 40 cycles for following 2. -40±2℃, 2 Hours, 3. -40±2℃ to 60±2℃, within 0.5 Hour 4. 60±2℃, Humidity 80%-100%, 4 Hours, 5. 60±2℃ to 105℃, 0.5 Hour 6. 105±2℃, 1.5 Hours, 7. 105±2℃ to -40±2℃, within 1.5 Hours.
3.5.20	Dewing test	No function-relevant damage must occur.	ISO 16750-4:2010 Three steps in one cycle, 1. Temperature: 30 +/-3℃ / 60min 2. Temperature: 25 +/-3℃, Humidity: 90+/-5% RH, 60min, 3. Temperature: 25 +/-3℃, Humidity: 50% RH, 60min, Total48 cycles, Measure electrical performance at 1st, 24th,48th cycle.

3.5.21	Temperature and Humidity	No function-relevant damage must occur. Circuit interruption monitoring takes place during the test. Permissible circuit interruption <1us. The circuit considered interrupted when the contact resistance exceeds 7Ω. Interruptions are not permissible.	GBT 2423.50-2012 Temperature: 85℃, Humidity: 85% RH, 1000H,
3.5.22	High Temperature Exposure	No function-relevant damage must occur.	SAE/USCAR-2.6 5.6.3 Temperature: 125℃ Duration: 1008h
3.5.23	High Pressure Spray	No function-relevant damage must occur.	SAE/USCAR-2.6 5.6.7 Subject mated connectors to 5±1% salt concentration for 96 hours. The measurement is held after remove the salt and dry up at indoor.

3.6 Product Qualification Test and Sequences

SAMPLE QUANTITIES										
Test or Examination	TEST GROUP									
	1	2	3	4	5	6	7	8	9	10
	Test Sequence									
3.5.1 Visual Inspection	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,7
3.5.2 Terminal –Connector Insertion/Retention Force	2									6
3.5.3 Connector-Connector Mating / Unmating / Retention Forces(non-assist)		2								
3.5.4 Polarization Feature Effectiveness			2							
3.5.5 Miscellaneous Component Engage/Disengage Force				2						
3.5.6 Connector Drop Test					2					
3.5.7 Cavity Damage Susceptibility						2				
3.5.8 Terminal/Cavity Polarization Test							2			
3.5.9 Connector Mounting Feature Mechanical Strength								2		
3.5.10 Connector and/or Terminal Cycling										
3.5.11 Dry Circuit Resistance										2,5
3.5.12 Voltage Drop										
3.5.13 Insulation resistance										
3.5.14 Dielectric withstanding Voltage										

3.5.15 Thermal time constant									2	
3.5.16 Vibration										3
3.5.17 Physical Shock										4
3.5.18 Thermal Shock										
3.5.19 Temperature/Humidity Cycling										
3.5.20 Dewing test										
3.5.21 Temperature and Humidity										
3.5.22 High Temperature Exposure										
3.5.23 High Pressure Spray										

SAMPLE QUANTITIES										
Test or Examination	TEST GROUP									
	11	12	13	14	15	16				
	Test Sequence									
3.5.1 Visual Inspection	1,10	1,11	1,10	1,10	1,11	1,0				
3.5.2 Terminal –Connector Insertion/Retention Force		10			10					
3.5.3 Connector-Connector Mating / Unmating / Retention Forces(non-assist)										
3.5.4 Polarization Feature Effectiveness										
3.5.5 Miscellaneous Component Engage/Disengage Force										
3.5.6 Connector Drop Test										
3.5.7 Cavity Damage Susceptibility										
3.5.8 Terminal/Cavity Polarization Test										
3.5.9 Connector Mounting Feature Mechanical Strength										
3.5.10 Connector and/or Terminal Cycling	2	2	2	2	2	2				
3.5.11 Dry Circuit Resistance	3,6	3,6	3,6	3,6	3,6	3,6				
3.5.12 Voltage Drop	8	8	8	8	8	8				
3.5.13 Insulation resistance	4,7	4,7	4,7	4,7	4,7	4,7				
3.5.14 Dielectric withstanding Voltage	9	9	9	9	9	9				
3.5.15 Thermal time constant										
3.5.16 Vibration										
3.5.17 Physical Shock										
3.5.18 Thermal Shock	5									
3.5.19 Temperature/Humidity Cycling		5								
3.5.20 Dewing test			5							
3.5.21 Temperature and Humidity				5						
3.5.22 High Temperature Exposure					5					
3.5.23 High Pressure Spray						5				