Adaptor SMB to FAKRA

1. SCOPE

1.1. Content

This specification covers electrical, mechanical, environment performances requirements and test methods for TE Connectivity adaptor SMB to FAKRA.

1.2. Qualification

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

2. APPLICABLE DOCUMENTS

See drawings and other sections of this specification for the relevant reference documents. In Cases where the specification differs from the drawings, the drawings take precedence.

Standards and Specifications:
A. ISO20860-1
B. SAE/USCAR-2 Rev 6
C. SAE/USCAR-17 Rev 5
D. GMW3191-2012
E. DIN40050-9, 8.2
F. GB/T2423.17-2008
Electrical Connector Test Procedures including Environmental Classifications.

3. Requirements

3.1 Design and Construction:

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

3.2 Material:

A. Housing: Zinc Alloy
B. Seal Ring：VMQ
C. Center Pin: Copper Alloy
D. Dielectric: PBT
E. O-Ring：VMQ
F. Press Ring：Stainless Steel
G. Outer Conductor: Copper Alloy
H. Cap: PP

3.3 Ratings:

A. Operating Temperature: - 40°C to + 105°C
B. Operating Humidity Limit: 95% R.H max.
C. Characteristic Impedance: 50Ω
D. Frequency Range:0 to 6 GHz

3.4 Performance Requirements and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Table 1. All tests shall be performed in the room temperature, unless otherwise specified

4. Performance Requirements and Test Description:

The product shall be designed to meet the electrical, mechanical and environmental performance require Requirements specified in Table.1. All tests shall be specified performed in the room temperature, unless otherwise

4.1 Test Requirement and Procedures Summary:

Para.	Test Items	Requirements	Procedures
4.1.1	Examination of Product	Meets requirements of product drawing and application specification	SAE/USCAR-2 Rev 6, 5.1.8.3
4.1.2	Final Examination of Product	Meets visual requirements.	SAE/USCAR-2 Rev 6, 5.1.8.3
Electrical Requirements			
4.1.3	Insulation Resistance	≥ 500 MΩ	SAE/USCAR-2 Rev 6, 5.5.1
4.1.4	Contact Resistance	40mΩ maximum for signal and ground contacts.	SAE/USCAR-17 Rev 5, 4.3.1.2
4.1.5	Circuit Continuity Monitoring	No loss of electrical continuity for > 1μs	SAE/USCAR-2 Rev 6, 5.1.9.3
4.1.6	Dielectric Withstanding Voltage	≥ 800 V AC	SAE/USCAR-17 Rev 5, 4.3.2.2
4.1.7	Voltage Standing Wave Ratio (VSWR) (full mating)	≤ 1.40, 0 to 2 GHz ≤ 1.50, 2 to 3 GHz ≤ 1.60, 3 to 6 GHz	SAE/USCAR17 Rev 5, 4.4.2.2
4.1.8	Insert Loss (full mating)	≤ 0.3 dB, 0 to 3 GHz ≤ 0.45 dB, 3 to 6 GHz	SAE/USCAR17 Rev 5, 4.4.2.2
4.1.9	Return Loss (full mating)	≥ 15.56 dB, 0 to 2 GHz ≥ 13.98 dB, 2 to 3 GHz ≥ 12.74 dB, 3 to 6 GHz	SAE/USCAR17 Rev 5, 4.4.2.2
Mechanical Requirements			
4.1.10	Pin Retention Force	≥ 15 N	GMW3191-2012 4.2.5
4.1.11	Connector to Connector Engagement Force	≤ 40 N (SMB Side) ≤ 50 N (FAKRA Side)	GMW3191-2012 4.2.8
4.1.12	Locked Connector Disengagement Force	≥ 120 N (FAKRA Side), (SMB Side Unsuitable)	GMW3191-2012 4.2.18
4.1.13	Unlocked Connector Disengagement Force	≤ 40 N (SMB Side) ≤ 75 N (FAKRA Side)	GMW3191-2012 4.2.19
4.1.14	Mechanical Pull and Sideload	≥ 110 N (Axial) ≥ 75 N (Sideload)	SAE/USCAR-17 Rev 5, 4.2.1.2
4.1.15	Durability	≥ 25 mating cycles	ISO 20860-1, 6
4.1.16	Vibration	Vibration Class: V1	SAE/USCAR-2 Rev 6, 5.4.6.3
4.1.17	Mechanical Shock	Mechanical Shock: V1	SAE/USCAR-2 Rev 6, 5.4.6.3
Environment Requirements			
4.1.18	Thermal Shock	Cycle from -40°C to +105°C, 100 cycles (100 hours)	SAE/USCAR-17 Rev 5, 5.6.1.3
4.1.19	Humid /Heat Cycling	Cycle from -40°C to +105°C, 40 cycles (320 hours)	SAE/USCAR-2 Rev 6, 5.6.2.3

4.1.20	High Temperature Exposure	Hold at +105°C, 1008 Hours	SAE/USCAR-2 Rev 6, 5.6.3.3
4.1.21	Pressure / Vacuum Leak	Air Pressure 200±10Kpa, Charge 5s, Keep Balance 10s, Test 15s, Leakage Rate ≤ 0.1 ml/min	(Refer to SAE/USCAR-2 Rev 6, 5.6.6.3)
4.1.22	Submersion	Immersion up to 1 meter for 30 min	DIN40050-9, 8.2
4.1.23	High Pressure Spray	1.Turntable Speed = 5±1 rpm, Position Angle of (0, 30, 60, 90) ±5°, Distance of (100 to 150) mm 2. Water Flow:14 to 16L/min 3. Water Pressure: Approx. 8,000 to 10,000 KPa 4. Water temperature: 80±5 °C 5. Exposure Time: 30sec / position of spray angle	SAE/USCAR-2 Rev 6, 5.6.7.3
4.1.24	Salt Spray	GB/T 2323.17-2008. 3.1 requirement: The concentration of the salt solution： (5±1)% Temperature: 35℃±2℃ PH value: 6.5~7.2 Time: 96 hours	GB/T 2423.17-2008
4.1.25	Chemical Submersion	Chemical Reagent / Test temperature (°C) / Duration (min) Lubricating oil: 85±2 / 60 Mineral hydraulic fluid: 85±2 / 60 Brake fluid: 85±2 / 60 Battery acid: 23±5 / 1 Antifreeze: 118±5 / 60 Window washing agent: 50±2 / 60 Gasoline: 23±5 / 60 Diesel: 23±5 / 60	(Refer to USCAR-2 Rev6, 5.6.4.3)

Table.1 (END)

5. Product Qualification Test Sequence

Test Examination	Test Group																	
	A	B	C	D	E[c]	F[c]	G[c]	H[c]	I[c]	J[c]	K	L	M	N	O	P	Q	R[d]
	(a)																	
4.1.1 Examination of Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4.1.2 Final Examination of Product	3	3	3	3	10	11	15	13	14	13	10	10	10	12	12	12		5
4.1.3 Insulation Resistance							12	10	5,12	10	2,6,8	2,6,8	2,6,8	2,6,8,10	2,6,8,10	2,6,8,10		3
4.1.4 Contact Resistance						5,10	5,14	5,12	6,13	5,12								
4.1.5 Circuit Continuity Monitoring					6		8											
4.1.6 Dielectric Withstanding Voltage							13	11	11	11	9	9	9	11	11	11	2,4	4
4.1.7 Voltage Standing Wave Ratio					2,7	2,7	2,9	2,7	2,8	2,7								
4.1.8 Insert Loss					3,8	3,8	3,10	3,8	3,9	3,8								
4.1.9 Return Loss					4,9	4,9	4,11	4,9	4,10	4,9								
4.1.10 Pin Retention Force	2																	

4.1.11 Connector to Connector Engagement Force		2															
4.1.12 Locked Connector Disengagement Force			2														
4.1.13 Unlocked Connector Disengagement Force				2													
4.1.14 Mechanical Pull and Sideload					5												
4.1.15 Durability						6											
4.1.16 Vibration							6										
4.1.17 Mechanical Shock							7										
4.1.18 Thermal Shock								6			4			4			
4.1.19 Humid /Heat Cycling									7			4			4		
4.1.20 High Temperature Exposure										6			4			4	
4.1.21 Pressure / Vacuum Leak											3, 5	3, 5	3, 5	3, 5	3, 5	3, 5	
4.1.22 Submersion											7	7	7	7	7	7	
4.1.23 High Pressure Spray														9	9	9	
4.1.24 Salt Spray																	3
4.1.25 Chemical Submersion																	2
Samples size	10	10	10	10	10	10	15	10	10	10	10	10	10	10	10	10	5	24

Note

(a) Connector housings and contacts shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. Test groups A-F and H-P shall have 10 samples, group G shall have 15 samples, group Q shall have 5 samples, group R shall have 24 samples.

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

(c) For Group E-J, contact resistance and RF test split the test group in two with 5 samples going to contact resistance and the others to RF test.

(d) For Group R, samples be divided into 8 groups going to submerse in 8 kinds of chemical.