

WIESON TECHNOLOGIES CO., LTD.

QUALIFICATION TEST REPORT

REPORT NO.: QTR-17T-095



TEST REPORT

Report No.	: QTR-17T-095
Applicant	: TRDC
Commodity	: FAKRA Connector
Model No.	: G2911-01/G2911-02
Quantity	: 24 pcs.
Date of Testing	: Aug. 7, 2017 ~ Sep. 21, 2017
Measure Environment	: Temp.: 25±5°C , R.H.: 55±25%
Test Item	: Refer to Paragraph 1, Test Items

- Note : 1.The report refers only to the specimen(s) submitted to testing.
2.The report shall not be reproduced, except in full, without prior written approval from laboratory.
3.The report is valid after signing and traceable to standards.

Approved by :	Tested by :
<i>C. H. Lin</i>	<i>Eason</i>

WIESON TECHNOLOGIES CO., LTD.

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Http://www.wieson.com

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QUALIFICATION TEST REPORT

REPORT NO.: QTR-17T-095

Test Product:

Plug(G2911-01)	Receptacle(G2911-02)
	

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Test Items:

No.	Test Description
1	Examination of Product
2	Contact Resistance
3	Isolation Resistance
4	Dielectric Withstanding Voltage
5	Gauge Mechanical Pull Test
6	Outer Contact Retention Force in Housing
7	Connector to Connector Mating Force
8	Connector to Connector Un-mating Force(w/o lock)
9	Connector to Connector Un-mating Force(w/ lock)
10	Connector Cycling
11	Connector Cycling (Preconditioning, 10 cycles)
12	Polarization Feature Effectiveness
13	Vibration
14	Thermal Shock
15	High Temperature
16	Temperature / Humidity Cycle
17	Stand Wave Ratio
18	Insertion Loss

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Test Group Process:

Test Item	Test Group							
	1	2	3	4	5	6	7	8
Examination of Product	1	1	1,3	1,3	1,3	1	1,5	1,3
Contact Resistance							2,4	
Gauge Mechanical Pull Test	2							
Center Contact Retention Force		2						
Outer Contact Retention Force in Housing			2					
Connector to Connector Mating Force				2				
Connector to Connector Un-mating Force(w/o lock)					2			
Connector to Connector Un-mating Force(w/ lock)						2		
Connector Cycling							3	
Polarization Feature Effectiveness								2
Sample Amount Per Test Group	2	2	2	2	2	2	2	2

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Test Item	Test Group				
	9	10	11	12	13
Examination of Product	1,7	1,7	1,7	1,9	1
Contact Resistance	2, 5	2, 5	2, 5	2,6	
Isolation Resistance				3,7	
Dielectric Withstanding Voltage	6	6	6	8	
Connector Cycling (Preconditioning, 10 cycles)	3	3	3	4	
Vibration	4				
Thermal Shock		4			
High Temperature			4		
Temperature / Humidity Cycle				5	
Stand Wave Ratio					2
Insertion Loss					3
Sample Amount Per Test Group	1	1	1	1	4

- Note: 1. Test specimen(s) shall be prepared in accordance with approval sheets and shall be selected at random.
2. In following all the Electrical Characteristics test parts. Every point shall be applied of the specimen.

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Test Result Summary:

Test Group	Test Result
Group 1	PASS
Group 2	PASS
Group 3	PASS
Group 4	PASS
Group 5	PASS
Group 6	PASS
Group 7	PASS
Group 8	PASS
Group 9	PASS
Group 10	PASS
Group 11	PASS
Group 12	PASS
Group 13	PASS

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1. Test Group 1:

1.1 Test Item & Test Method:

	Test Item	Test Method
1	Gauge Mechanical Pull Test	ISO 20860-1; ISO 20860-2

1.2 Test Condition:

1.2.1 Gauge Mechanical Pull Test:

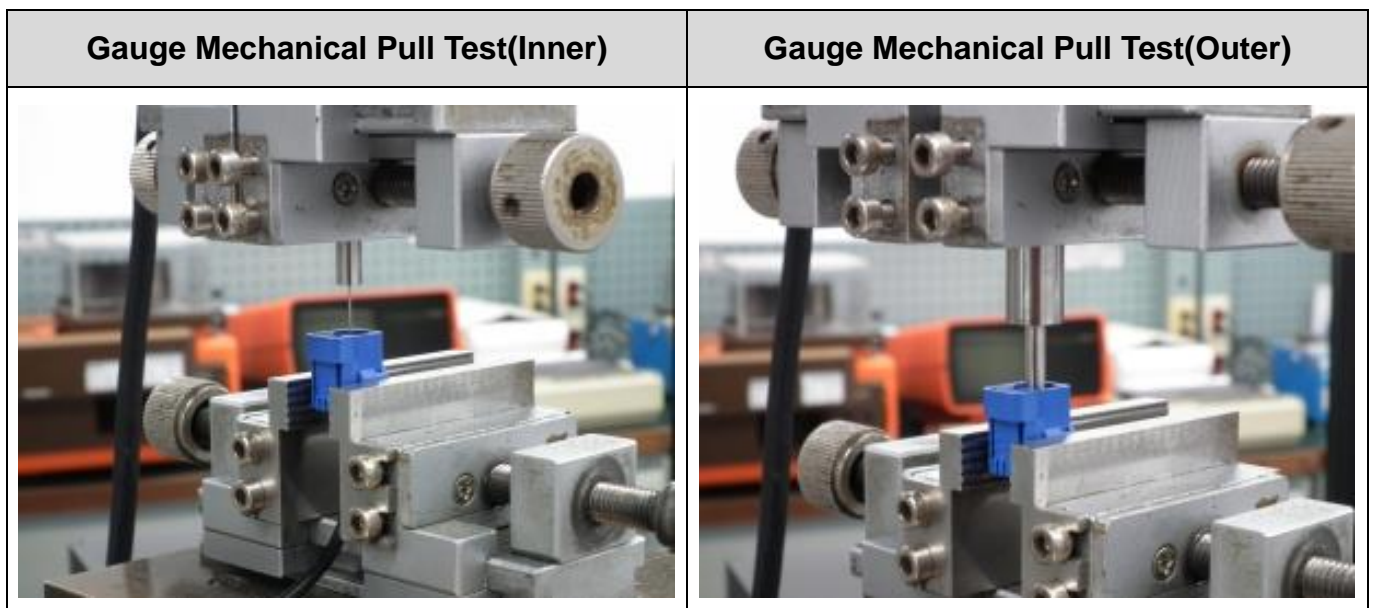
- (a) Gauge for the inner conductor in accordance with IEC 60169-10, weight 0.28 N (equating to a mass of 28.5 g).
Gauge for the outer conductor in accordance with IEC 60169-10, weight 2 N (equating to a mass of 204 g).
- (b) Mating 25 cycles.
- (c) The gauges shall be mated to each female connector for evaluation of the requirements.

1.3 Test Request:

1.3.1 Gauge Mechanical Pull Test:

- Inner contact pull force > 0.28N.
- Outer contact pull force > 2N.

1.4 Test Picture:



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1.5 Test Value:

		Sample1	Sample2
Examination of Product		PASS	PASS
Gauge Mechanical Pull Test (N)	Inner	0.65	0.62
	Outer	2.98	3.06

1.6 Test Result:

Comment	PASS
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2. Test Group 2:

2.1 Test Item & Test Method:

	Test Item	Test Method
1	Center Contact Retention Force	USCAR-17

2.2 Test Condition:

2.2.1 Center Contact Retention Force:

(a) Measure the maximum force required to completely extract the center contact from the dielectric material.

(b) Test Speed : 12.5mm/min.

2.3 Test Request:

2.3.1 Center Contact Retention Force:

10 N minimum.

2.4 Test Picture:



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2.5 Test Value:

	Sample1	Sample2
Examination of Product	PASS	PASS
Center Contact Retention Force (N)	PASS	PASS
Examination of Product	PASS	PASS

2.6 Test Result:

Comment	PASS
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3. Test Group 3

3.1 Test Item & Test Method:

	Test Item	Test Method
1	Outer Contact Retention Force in Housing	ISO 20860-1

3.2 Test Condition:

3.2.1 Outer Contact Retention Force in Housing:

(a) Measure the maximum force required to completely extract the outer contact from the housing.

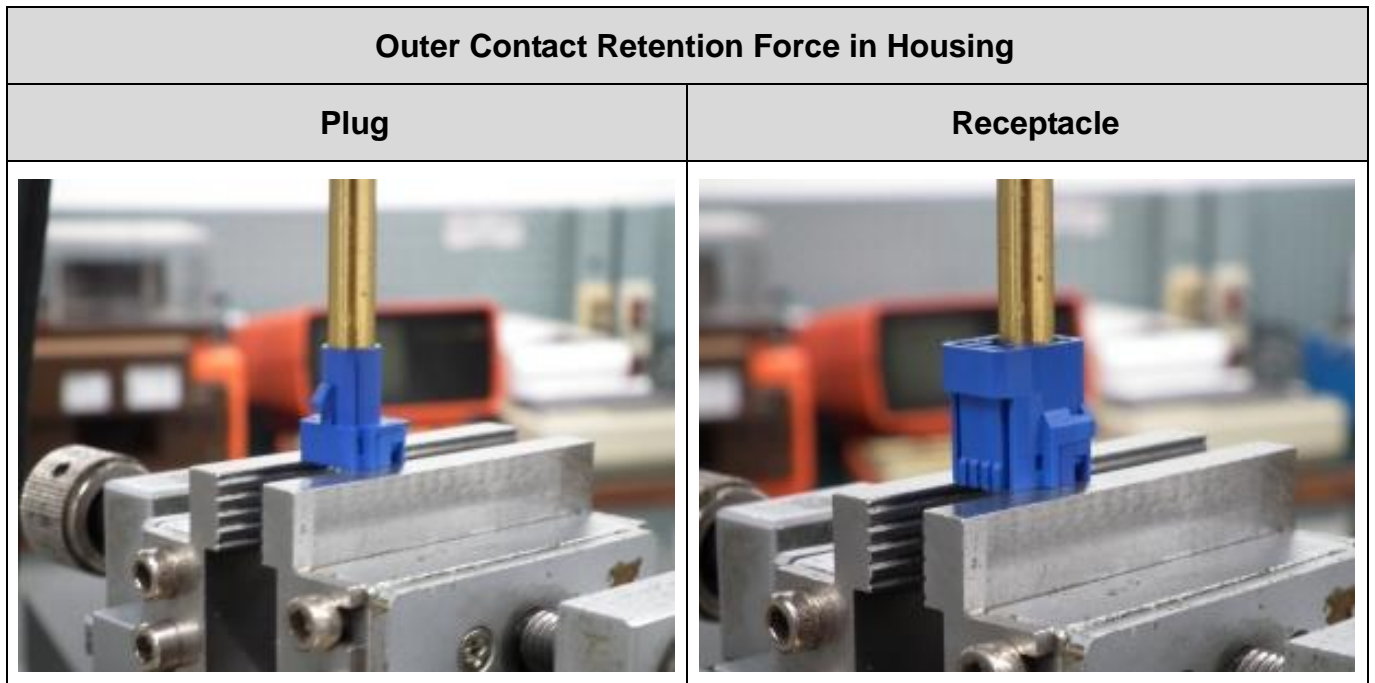
(b) Test Speed : 25.4mm/min.

3.3 Test Request:

3.3.1 Outer Contact Retention Force in Housing:

100 N minimum.

3.4 Test Picture:



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3.5 Test Value:

		Sample1	Sample2
Examination of Product		PASS	PASS
Outer Contact Retention Force in Housing (N)	Plug	PASS	PASS
	Receptacle	PASS	PASS
Examination of Product		PASS	PASS

3.6 Test Result:

Comment	PASS
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4. Test Group 4:

4.1 Test Item & Test Method:

	Test Item	Test Method
1	Connector to Connector Mating Force	ISO 20860-1; ISO 20860-2

4.2 Test Condition:

4.2.1 Connector to Connector Mating Force:

(a) Record the mating force required to completely mate each set of connectors into their locked position.

(b) Test Speed : 25.4mm/min.

4.3 Test Request:

4.3.1 Connector to Connector Mating Force:

25 N maximum.

4.4 Test Picture:



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4.5 Test Value:

	Sample1	Sample2
Examination of Product	PASS	PASS
Connector to Connector Mating Force (N)	5.5	5.6
Examination of Product	PASS	PASS

4.6 Test Result:

Comment	PASS
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5. Test Group 5:

5.1 Test Item & Test Method:

	Test Item	Test Method
1	Connector to Connector Un-mating Force (w/o lock)	ISO 20860-1; ISO 20860-2

5.2 Test Condition:

5.2.1 Connector to Connector Un-mating Force (w/o lock):

- (a) Record the force required to completely separate the halves of the connector.
- (b) Test Speed : 25.4mm/min.

5.3 Test Request:

5.3.1 Connector to Connector Un-mating Force (w/o lock):

25 N maximum.

5.4 Test Picture:



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5.5 Test Value:

	Sample1	Sample2
Examination of Product	PASS	PASS
Connector to Connector Un-mating Force (w/o lock) (N)	5.8	5.5
Examination of Product	PASS	PASS

5.6 Test Result:

Comment	PASS
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6. Test Group 6:

6.1 Test Item & Test Method:

	Test Item	Test Method
1	Connector to Connector Un-mating Force (w/ lock)	ISO 20860-1

6.2 Test Condition:

6.2.1 Connector to Connector Un-mating Force (w/ lock):

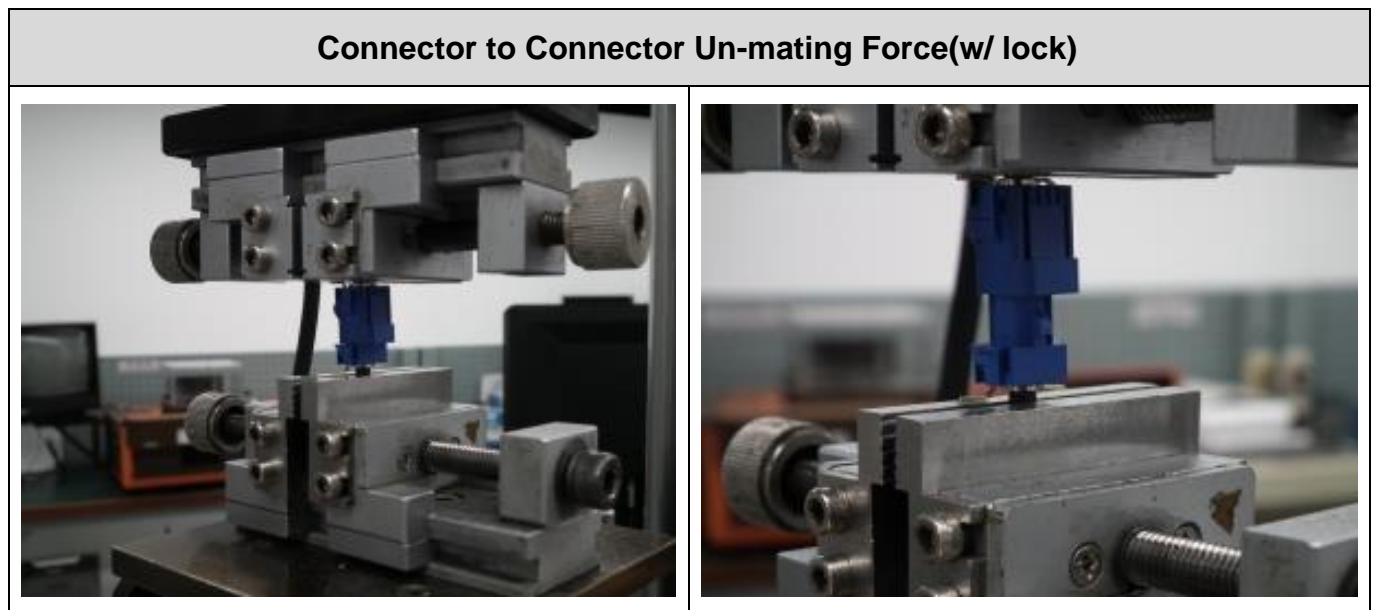
Increase the mating force at a uniform rate not exceeding 25.4 mm/min, until the required force is achieved.

6.3 Test Request:

6.3.1 Connector to Connector Un-mating Force (w/ lock):

80 N minimum.

6.4 Test Picture:



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6.5 Test Value:

	Sample1	Sample2
Examination of Product	PASS	PASS
Connector to Connector Un-mating Force(w/ lock) (N)	88.8	84.8

6.6 Test Result:

Comment	PASS
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7. Test Group 7:

7.1 Test Item & Test Method:

	Test Item	Test Method
1	Contact Resistance	USCAR-17
2	Connector Cycling	ISO 20860-1

7.2 Test Condition:

7.2.1 Contact Resistance:

Subject mated contacts assembled in housing to closed circuit current of 100 mA maximum at open circuit at 20 mV maximum.

7.2.2 Connector Cycling:

- (a) Test Speed: 50 mm/min.
- (b) Mating Cycles: 25 times.

7.3 Test Request:

7.3.1 Contact Resistance:

Inner Conductor: ≤ 40 m Ω
Outer Conductor: ≤ 40 m Ω

7.3.2 Connector Cycling:

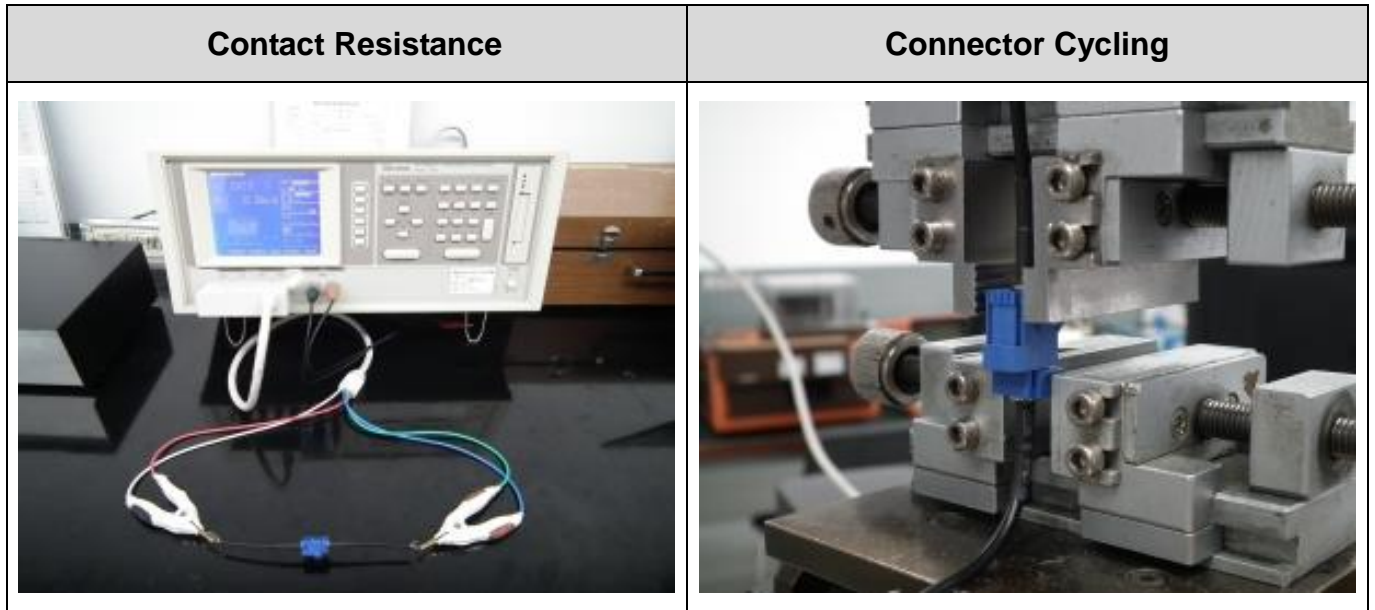
No evidence of damage.

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7.4 Test Picture:



7.5 Test Value:

		Sample1	Sample2
Examination of Product		PASS	PASS
Contact Resistance (mΩ)	Inner	3.7	3.2
	Outer	2.1	1.8
Connector Cycling		PASS	PASS
Contact Resistance (mΩ)	Inner	4.2	5.2
	Outer	2.3	2.4
Examination of Product		PASS	PASS

7.6 Test Result:

Comment	PASS
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8. Test Group 8:

8.1 Test Item & Test Method:

	Test Item	Test Method
1	Polarization Feature Effectiveness	USCAR-17

8.2 Test Condition:

8.2.1 Polarization Feature Effectiveness:

Combine the ends of the connector at a speed of 50 mm / min until the specified maximum force is applied add up. Before the end of the test, the male and female terminals(center conductor) shall not have any electrical connection.

8.3 Test Request:

8.3.1 Polarization Feature Effectiveness:

80 N minimum.

8.4 Test Picture:



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8.5 Test Value:

	Sample1	Sample2
Examination of Product	PASS	PASS
Polarization Feature Effectiveness	PASS	PASS
Examination of Product	PASS	PASS

8.6 Test Result:

Comment	PASS
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9. Test Group 9:

9.1 Test Item & Test Method:

	Test Item	Test Method
1	Contact Resistance	USCAR-17
2	Dielectric Withstanding Voltage	USCAR-17
3	Connector Cycling (Preconditioning, 10 cycles)	-
4	Vibration	USCAR-17

9.2 Test Condition:

9.2.1 Contact Resistance:

Subject mated contacts assembled in housing to closed circuit current of 100 mA maximum at open circuit at 20 mV maximum.

9.2.2 Dielectric Withstanding Voltage:

(a) Test Voltage: 800 Vac.

(b) Test Duration: 60 s

9.2.3 Durability (preconditioning):

10 insertion / extraction cycles at a maximum rate of 50 mm/min.

9.2.4 Vibration:

(a) Vibration Type: Random vibration.

(b) Frequency Range : 5 ~ 1000Hz.

(c) Duration: 8 hours in each of X, Y, Z axis.

(d) PSD:

Frequency (hz)	Power Spectral Density (g ² /hz)
5.0	0.00200
12.5	0.24800
77.5	0.00320
145.0	0.00200
200.0	0.01180
230.0	0.00032
1000.0	0.00002
Grms = 1.81	

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9.3 Test Request:

9.3.1 Contact Resistance:

Inner Conductor: $\leq 40 \text{ m}\Omega$

Outer Conductor: $\leq 40 \text{ m}\Omega$

9.3.2 Dielectric Withstanding Voltage:

There must be no dielectric breakdowns.

9.3.3 Durability (preconditioning):

No evidence of damage.

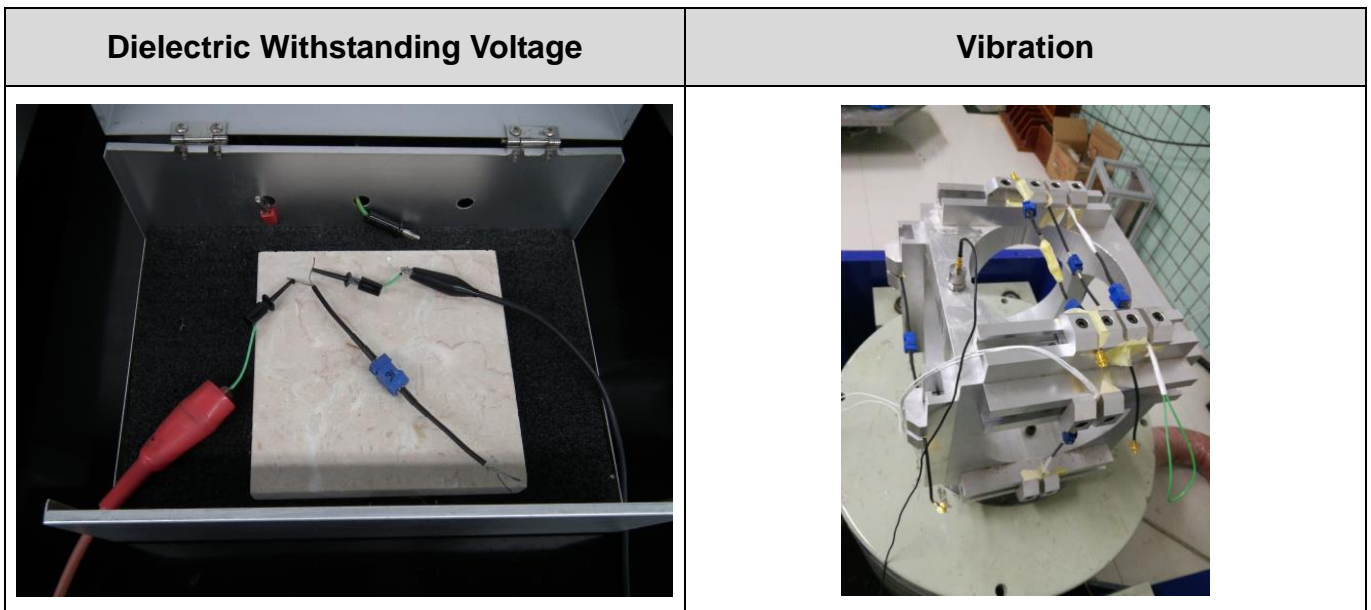
9.3.4 Vibration:

(a) No discontinuities of $1\mu\text{s}$ or longer duration.

(b) No evidence of damage.

(c) The electrical performances should meet the spec. specified.

9.5 Test Picture:



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9.5 Test Value:

		Sample1
Examination of Product		PASS
Contact Resistance (mΩ)	Inner	2.9
	Outer	1.3
Durability (preconditioning)		PASS
Vibration		PASS
Contact Resistance (mΩ)	Inner	3.8
	Outer	3.9
Dielectric Withstanding Voltage		PASS
Examination of Product		PASS

9.6 Test Result:

Comment	PASS
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10. Test Group 10:

10.1 Test Item & Test Method:

	Test Item	Test Method
1	Contact Resistance	USCAR-17
2	Dielectric Withstanding Voltage	USCAR-17
3	Connector Cycling (Preconditioning, 10 cycles)	-
4	Thermal Shock	USCAR-17

10.2 Test Condition:

10.2.1 Contact Resistance:

Subject mated contacts assembled in housing to closed circuit current of 100 mA maximum at open circuit at 20 mV maximum.

10.2.2 Dielectric Withstanding Voltage:

(a) Test Voltage: 800 Vac.

(b) Test Duration: 60 s

10.2.3 Durability (preconditioning):

10 insertion / extraction cycles at a maximum rate of 50 mm/min.

10.2.4 Thermal Shock:

(a) Temperature : -40 ~ 105°C.

(b) Duration : Exposure time at temperature extreme 30 minutes, 100 cycles.

10.3 Test Request:

10.3.1 Contact Resistance:

Inner Conductor: ≤ 40 m Ω

Outer Conductor: ≤ 40 m Ω

10.3.2 Dielectric Withstanding Voltage:

There must be no dielectric breakdowns.

10.3.3 Durability (preconditioning):

No evidence of damage.

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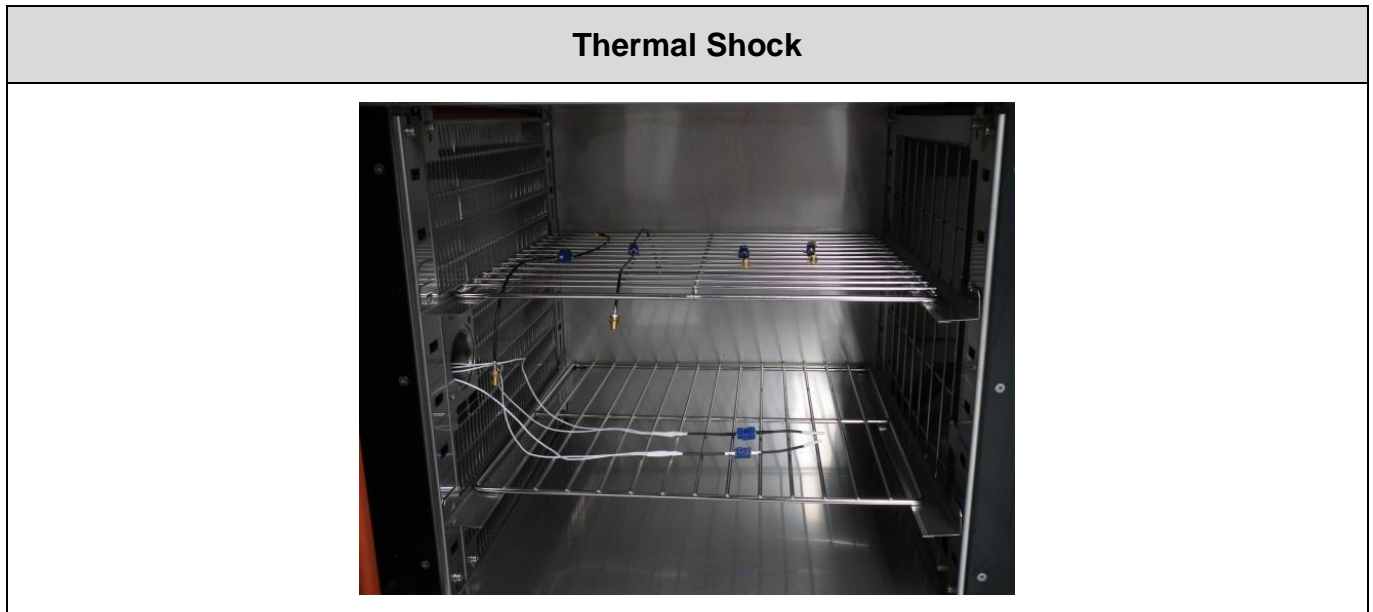
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10.3.4 Thermal Shock:

- (a) No discontinuities of 1 μ s or longer duration.
- (b) No evidence of damage.
- (c) The electrical performances should meet the spec. specified.

10.5 Test Picture:



10.5 Test Value:

		Sample1
Examination of Product		PASS
Contact Resistance (m Ω)	Inner	3.3
	Outer	1.6
Durability (preconditioning)		PASS
Thermal Shock		PASS
Contact Resistance (m Ω)	Inner	4.3
	Outer	2.8
Dielectric Withstanding Voltage		PASS
Examination of Product		PASS

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10.6 Test Result:

Comment	PASS
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11. Test Group 11:

11.1 Test Item & Test Method:

	Test Item	Test Method
1	Contact Resistance	USCAR-17
2	Dielectric Withstanding Voltage	USCAR-17
3	Connector Cycling (Preconditioning, 10 cycles)	-
4	High Temperature	USCAR-17

11.2 Test Condition:

11.2.1 Contact Resistance:

Subject mated contacts assembled in housing to closed circuit current of 100 mA maximum at open circuit at 20 mV maximum.

11.2.2 Dielectric Withstanding Voltage:

(a) Test Voltage: 800 Vac.

(b) Test Duration: 60 s.

11.2.3 Durability (preconditioning):

10 insertion / extraction cycles at a maximum rate of 50 mm/min.

11.2.4 High Temperature:

(a) Temperature : 105°C.

(b) Duration : 1008 hours.

11.3 Test Request:

11.3.1 Contact Resistance:

Inner Conductor: ≤ 40 m Ω

Outer Conductor: ≤ 40 m Ω

11.3.2 Dielectric Withstanding Voltage:

There must be no dielectric breakdowns.

11.3.3 Durability (preconditioning):

No evidence of damage.

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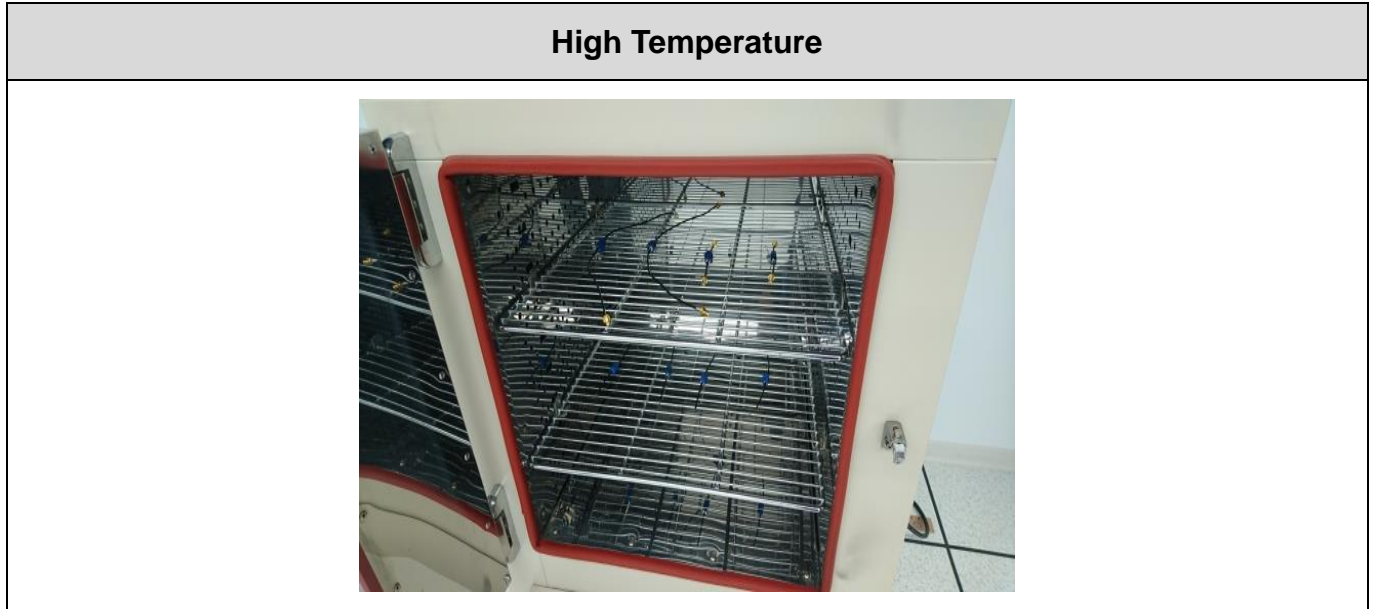
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11.3.4 High Temperature:

- (a) No evidence of damage.
- (b) The electrical performances should meet the spec. specified.

11.4 Test Picture:



11.5 Test Value:

		Sample1
Examination of Product		PASS
Contact Resistance (mΩ)	Inner	3.1
	Outer	1.4
Durability (preconditioning)		PASS
High Temperature		PASS
Contact Resistance (mΩ)	Inner	19.8
	Outer	5.9
Dielectric Withstanding Voltage		PASS
Examination of Product		PASS

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11.6 Test Result:

Comment	PASS
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12. Test Group 12:

12.1 Test Item & Test Method:

	Test Item	Test Method
1	Contact Resistance	USCAR-17
2	Isolation Resistance	USCAR-17
3	Dielectric Withstanding Voltage	USCAR-17
4	Connector Cycling (Preconditioning, 10 cycles)	-
5	Temperature / Humidity Cycle	USCAR-17

12.2 Test Condition:

12.2.1 Contact Resistance:

Subject mated contacts assembled in housing to closed circuit current of 100 mA maximum at open circuit at 20 mV maximum.

12.2.2 Isolation Resistance:

(a) Test Voltage : 500 Vdc.

12.2.3 Dielectric Withstanding Voltage:

(a) Test Voltage: 800 Vac.

(b) Test Duration: 60 s

12.2.4 Durability (preconditioning):

10 insertion / extraction cycles at a maximum rate of 50 mm/min.

12.2.5 Temperature / Humidity Cycle:

(a) Temperature : -40~100°C

(b) Relative Humidity : 80~100%

(b) Duration : 40 cycles(total 320 hours).

12.3 Test Request:

12.3.1 Contact Resistance:

Inner Conductor: ≤ 40 m Ω

Outer Conductor: ≤ 40 m Ω

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12.3.2 Isolation Resistance:

$\geq 100 \text{ M}\Omega$

12.3.3 Dielectric Withstanding Voltage:

There must be no dielectric breakdowns.

12.3.4 Durability (preconditioning):

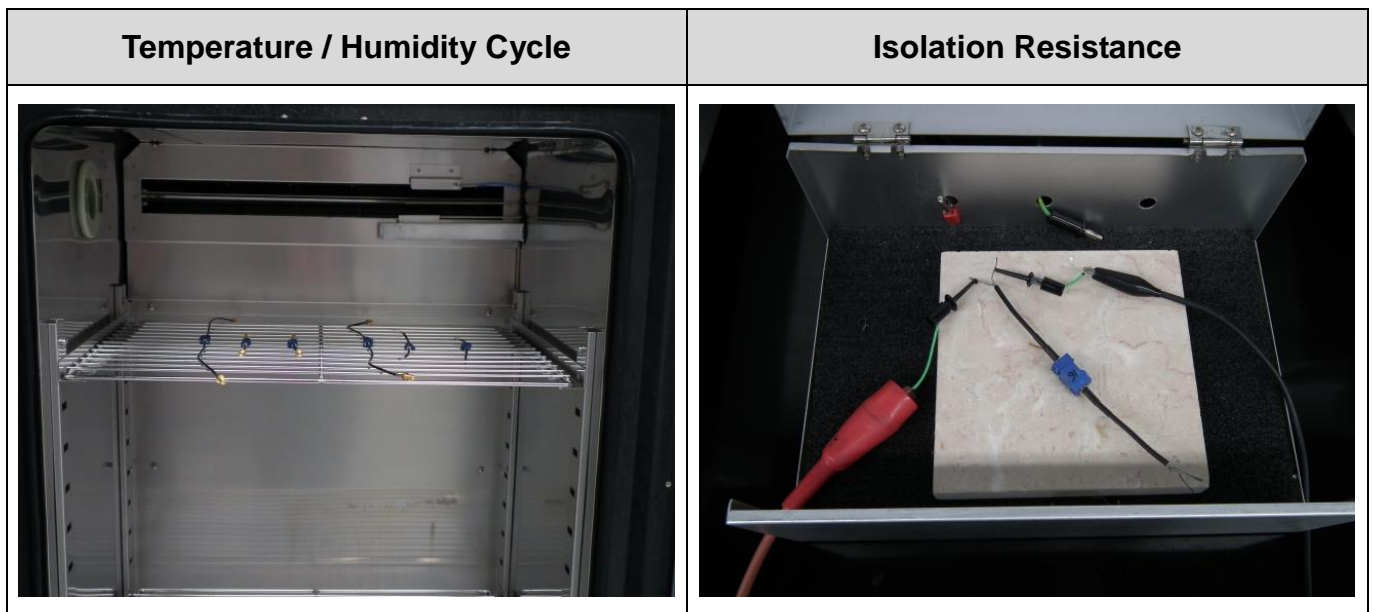
No evidence of damage.

12.3.5 Temperature / Humidity Cycle:

(a) No evidence of damage.

(b) The electrical performances should meet the spec. specified.

12.4 Test Picture:



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12.5 Test Value:

		Sample1
Examination of Product		PASS
Contact Resistance (mΩ)	Inner	4.3
	Outer	1.7
Isolation Resistance		PASS
Durability (preconditioning)		PASS
Temperature / Humidity Cycle		PASS
Contact Resistance (mΩ)	Inner	7.8
	Outer	4.2
Isolation Resistance		PASS
Dielectric Withstanding Voltage		PASS
Examination of Product		PASS

12.6 Test Result:

Comment	PASS
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13. Test Group 13:

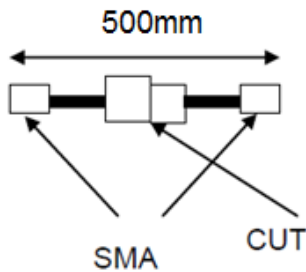
13.1 Test Item & Test Method:

	Test Item	Test Method
1	Stand Wave Ratio	USCAR-17
2	Insertion Loss	USCAR-17

13.2 Test Condition:

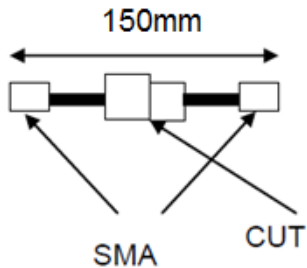
13.2.1 Stand Wave Ratio:

Prepare samples with SMA connectors to the preferred length.



13.2.2 Insertion Loss:

Prepare samples with SMA connectors to the preferred length.



13.3 Test Request:

13.3.1 Stand Wave Ratio:

1.4 (0.1~2 GHz) ; 1.5 (2~3 GHz)

13.3.2 Insertion Loss:


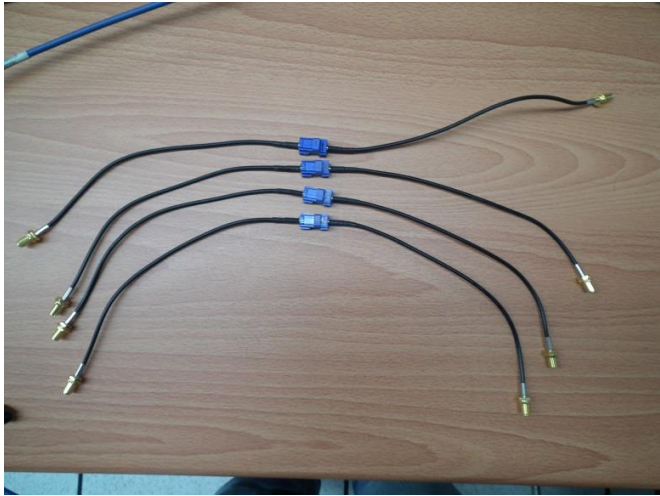
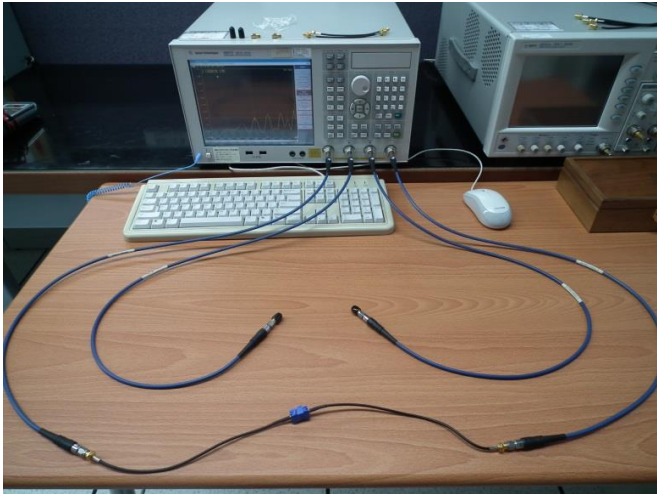
0.3dB (0.1~3 GHz)

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13.4 Test Picture:

Fakra In-Line Connector(Insertion Loss)	Fakra In-Line Connector(S.W.R)
	
Stand Wave Ratio & Insertion Loss	
	

13.5 Test Value:

		Sample 1	Sample 2	Sample 3	Sample 4
Examination of Product		PASS	PASS	PASS	PASS
Stand Wave Ratio	0.1~2 GHz	1.303	1.196	1.241	1.213
	2~3 GHz	1.374	1.260	1.331	1.358
Insertion Loss		0.278	0.251	0.179	0.223

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13.6 Test Result:

Comment	PASS
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Testing Equipment:

Instrument	Model
Automatic Component Analyzer	Chroma 3302
AC/DC/IR/SC HIPOT Tester	Chroma 19053
Insert-Pull out Load Meter	SE / 1220S
Forced Convection Oven	GIANT FORCE / GPO-125
Thermal Shock Test Chamber	HITACHI / ES-107L
Temperature and Humidity Chamber	HITACHI / EC-36LHP
Vibration Tester	ZHONG ZHENG/DC-600-5
Vector Network Analyzer	Agilent / E5071C

UNDER BLANK