

MHF® 4 Connector

Part No. Plug: 20611-001R Receptacle: 20449-001E-**

Test Report

Product Specification no. PRS-2530

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2	T19170	December 13, 2019	S.Kamada	S.Suzuki	Y.Shimada
1	T19022	April 4, 2019	S.Kamada		T.Hirakawa
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Rev.	ECN	Date	Prepared by	Checked by	Approved by

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MHF 4 Connector Test Report

1. Purpose

To evaluate the performance of MHF 4 connector in accordance with PRS-2530.

2. Specimen

(1) Plug: 20611-001R

(2) Receptacle: 20449-001E-**

3. Test Sequence

All the evaluations were performed in accordance with Table 1 Test Sequence.

4. Result

See Table 2, and from sheet 7. For the details of the testing conditions and requirements, see PRS-2530. The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2530.

Table 1 Test Sequence and Sample Quantity

	Group														
Test Item	Α	В	С	D	Е	F	G	Н	J	K	L	М	N	Р	Q
Contact Resistance					1, 3		1, 3	1, 3	1, 5	1, 5	1, 3	1, 3	1, 3		
Insulation Resistance									2, 6	2, 6					
D. W. Voltage	1								3, 7	3, 7					
VSWR		1													
Unmating Force			1												
Crimp strength				1											
Durability					2										
Cable Retention Force						1									
Vibration							2								
Shock								2							
Humidity (Steady State)									4						
Thermal Shock										4					
High Temperature Life											2				
H ₂ S Gas												2			
Salt Water Spray													2		
Solder ability														1	
Soldering Heat Resistance															1
Sample Quantity (pcs.)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

*Numbers indicate sequence in which tests are performed.

			Table 2-1	Test R	esult						
Group	Test ite	ms	Specification	_	Unit	AVE.	MAX.	MIN.	S	Judgement	
Group		Measurements	Specification	n	UIIIL	AVE.	IVIAA.	IVIIIN.	3	Judgement	
Α	Dielect	ric withstanding voltage									
		Spec : No creeping discharge,flashover,nor in	sulator breakdown s	hall occu	1.						
		After testing	No abnormality	10	-	No abnorma	ality			Pass	
В	VSWR	AR									
	Plug										
		0.1~3.0GHz	1.3 MAX.		-	1.239	1.25	1.22	0.013	Pass	
		3.0~6.0GHz	1.5 MAX.	10	-	1.377	1.38	1.37	0.009	Pass	
	Recept	acle				1				ı	
		0.1~3.0GHz	1.3 MAX.		-	1.138	1.14	1.14	0.002	Pass	
		3.0~6.0GHz	1.4 MAX.	10	-	1.123	1.14	1.11	0.017	Pass	
С	Llamati	ng force				1			I.	I .	
	Ullilau	Initial	4N MIN.			13.11	13.8	12.6	0.44	Pass	
		After testing	2N MIN.	10	N	8.48	9.3	7.7	0.59	Pass	
			ZIN IVIIIN.			0.40	9.5	1.1	0.59	F d 5 5	
D	Crimp :	strength									
		After testing	5N MIN.	10	N	7.04	7.60	6.35	0.37	Pass	
Е	Durability										
	Contact resistance of main contact										
		Initial	20mΩ MAX.			8.56	9.1	7.8	0.39	Pass	
		After testing	_	10	mΩ	8.67	10.3	7.2	0.80	-	
		⊿R	⊿20mΩ MAX.			0.11	1.6	-1.5	0.95	Pass	
	Contac	ontact resistance of Ground contact									
		Initial	20mΩ MAX.	10		5.86	6.9	5.2	0.50	Pass	
		After testing	-		mΩ	7.31	9.8	6.0	1.06	-	
		⊿R	⊿100mΩ MAX.			0.93	2.9	-2.6	1.42	Pass	
	Appear	rance									
		Spec: No abnormality adversely affecting the p	erformance shall occ	ur.							
		Initial	No abnormality	10		No abnorma	ality			Pass	
		After testing	140 abriormany	10		No abnorma	Pass				
F	Cable	retention force									
	Electric	al discontinuity									
		Spec: No electrical discontinuity grater than 1µ	s shall occur.								
		After testing - 10 - No discontinity								Pass	
	Appear	rance									
		Spec: No abnormality adversely affecting the p	erformance shall occ	ur.							
		Initial	No abnormality	10		No abnorma	ality			Pass	
		After testing	No abnormality	10	-	No abnorma	ality			Pass	

Table 2-2 Test Result

			I able 2-2	IESLIN	,							
Group	Test ite	ms	- Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgemen		
o. 0up		Measurements	орозново		0	/				- caagomon		
G	Vibratio	on										
	Contac	t resistance of main contact										
		Initial	20mΩ MAX.			7.73	8.7	6.4	0.76	Pass		
		After testing	-	10	mΩ	7.68	8.7	6.1	0.85	-		
		⊿R	⊿20mΩ MAX.			-0.05	0.7	-0.6	0.50	Pass		
	Contac	t resistance of Ground contact										
		Initial	20mΩ MAX.			5.39	5.8	4.8	0.32	Pass		
		After testing	-	10	mΩ	5.29	5.9	4.5	0.46	-		
		⊿R	⊿100mΩ MAX.			-0.10	0.8	-1.1	0.56	Pass		
	Electric	al discontinuity				•				•		
		Spec: No electrical discontinuity grater than 1µ	s shall occur.									
		After testing - 10 - No discontinity										
	Appear	rance					-					
		Spec: No abnormality adversely affecting the	performance shall occ	cur.								
		Initial				No abnorma	ality			Pass		
		After testing	 No abnormality 	10	-	No abnorma				Pass		
	l						,					
Н	Shock											
	Contac	t resistance of main contact	_		1	_						
		Initial	20mΩ MAX.			8.06	9.1	7.5	0.57	Pass		
		After testing	-	10	mΩ	8.59	11.1	7.5	1.02	-		
		⊿R	⊿20mΩ MAX.			0.53	2.0	-0.2	0.74	Pass		
	Contac	t resistance of Ground contact										
		Initial	20mΩ MAX.			5.08	5.6	4.6	0.29	Pass		
		After testing	-	10	mΩ	5.40	5.7	4.9	0.25	-		
		⊿R	⊿100mΩ MAX.			0.32	0.7	0.0	0.22	Pass		
	Electric	al discontinuity										
		Spec: No electrical discontinuity grater than 1µs shall occur.										
		After testing	-	10	-	No discontin	ity			Pass		
	Appear	earance										
		Spec: No abnormality adversely affecting the performance shall occur.										
		Initial No abnormality								Pass		
		After testing	 No abnormality 	10	-	Pass						
J	Llumidi	t (Chady Chh)	•							.1		
J	Humidity(Steady State) Contact resistance of main contact											
	Contac		20mΩ MAX.	1		T 0.00	10.5	7.1	0.00	T Dess		
		Initial	ZUMLI WAX.	40	0	8.69	10.5	7.1	0.82	Pass		
		After testing	-	10	mΩ	9.89	10.7	8.7	0.75	-		
		⊿R	⊿20mΩ MAX.			1.21	2.0	-0.3	0.75	Pass		
	Contac	t resistance of Ground contact		т —	1	1						
		Initial	20mΩ MAX.			6.40	6.9	5.3	0.50	Pass		
		After testing	-	10	mΩ	6.51	7.0	5.4	0.56	-		
		⊿R	⊿100mΩ MAX.			0.11	1.2	-1.4	0.68	Pass		
	Insulati	on residence	_		1					,		
		Initial	500MΩ MIN.	- 10	МΩ	10,000MΩ I				Pass		
		After testing	100MΩ MIN.	.,	2	10,000MΩ I	MIN.			Pass		
	Dielect	ric withstanding voltage										
		Spec: No creeping discharge, flashover, no in	sulator breakdown s	hall occur	:							
		After testing	-	10	-	No abnorma	ality			Pass		
	Appear	rance										
		Spec: No abnormality adversely affecting the p	performance shall occ	cur.								
		Initial	N	4.6		No abnorma	ality			Pass		
		After testing	 No abnormality 	10	-	No abnorma				Pass		
	L		ļ		l	1	•					

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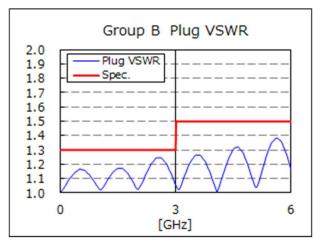
Table 2-3 Test Result

			•									
Group	Test ite	ms	Specification	n	Unit	AVE.	MAX.	MIN.	S	Judgemen		
лоцр		Measurements	оросиновион		0	7=.				ouugoo		
K	Thermal shock Contact resistance of main contact											
	Contac	t resistance of main contact										
		Initial	20mΩ MAX.			6.99	9.4	5.1	1.19	Pass		
		After testing	-	10	mΩ	7.41	9.6	4.4	1.69	-		
		⊿R	⊿20mΩ MAX.			0.42	2.7	-5.0	2.05	Pass		
	Contac	t resistance of Ground contact										
		Initial	20mΩ MAX.			5.88	7.7	2.9	1.22	Pass		
		After testing	-	10	mΩ	8.34	11.5	6.5	1.68	-		
		⊿R	⊿100mΩ MAX.			2.46	5.5	1.1	1.38	Pass		
	Insulati	on residence					-			-		
		Initial	500MΩ MIN.	40		10,000ΜΩ	MIN.			Pass		
		After testing	100MΩ MIN.	- 10	ΜΩ	10,000ΜΩ	MIN.			Pass		
	Dielect	ielectric withstanding voltage										
		Spec: No creeping discharge, flashover, no insulator breakdown shall occur.										
		After testing	-	10	-	No abnorm	ality			Pass		
	Appea	rance		I	ı							
		Spec: No abnormality adversely affecting th	e performance shall occ	cur.								
		Initial				No abnorm	Pass					
		After testing	No abnormality	10	-	No abnorm	Pass					
L	High temperature life											
	Contac	t resistance of main contact	1	ı	ı							
		Initial	20mΩ MAX.			6.08	7.2	5.2	0.60	Pass		
		After testing	-	10	mΩ	7.16	7.7	6.0	0.62	-		
		⊿R	⊿20mΩ MAX.			1.08	1.9	0.5	0.43	Pass		
	Contac	et resistance of Ground contact					1	1				
		Initial	20mΩ MAX.			5.24	6.8	4.3	0.93	Pass		
		After testing	-	10	mΩ	11.03	24.9	5.8	5.66	-		
		⊿R	⊿100mΩ MAX.			5.79	18.3	-0.4	5.56	Pass		
	Appea	pearance										
		Spec: No abnormality adversely affecting the	e performance shall occ	cur.								
		Initial	No abnormality	10		No abnorm	Pass					
		After testing	TVO abnormality	10		No abnorm	ality			Pass		
M	H2S ga	as										
	_	et resistance of main contact										
	00	Initial	20mΩ MAX.			7.74	8.7	6.9	0.51	Pass		
		After testing	-	10	mΩ	10.88	18.4	8.5	2.82	-		
		⊿R	⊿ 20mΩ MAX.	10	11122	3.14	10.6	0.9	2.79	Pass		
	Contac	tresistance of Ground contact	Z 201182 WI V.			0.14	10.0	0.5	2.75	1 433		
	Joniac		20mΩ MAX.		1	5.61	6.6	5.0	0.44	Pass		
		After testing	ZUIIZ WAY.	10	m∩	8.40	9.7	7.0	0.44	1 455		
			4100~0 MAY		mΩ					Poss		
	An	⊿R	⊿100mΩ MAX.]	2.79	4.2	1.4	0.75	Pass		
	Appea											
		Spec: No abnormality adversely affecting th	e pertormance shall occ	cur.	1	In .	Р.					
		Initial	No abnormality	10	-	No abnorm				Pass		
		After testing	1		l	No abnorm	Pass					

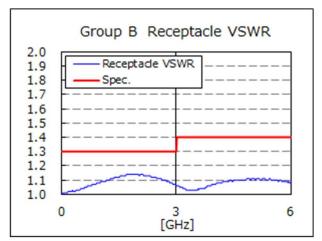
Pass

Table 2-4 Test Result

Group	Test items	0	n	Unit	AVE.	MAY	MIN.	S	luda a saa at		
Group	Measurements	Specification				MAX.			Judgement		
N	Saltwater spray										
	Contact resistance of main contact										
	Initial	20mΩ MAX.		mΩ	8.15	9.4	6.4	0.92	Pass		
	After testing	-	10		9.42	10.9	7.2	1.11	-		
	⊿R	⊿20mΩ MAX.			1.27	2.6	0.3	0.67	Pass		
	Contact resistance of Ground contact										
	Initial	20mΩ MAX.		mΩ	5.66	6.1	5.1	0.37	Pass		
	After testing	-	10		8.09	8.9	7.0	0.60	-		
	⊿R	⊿100mΩ MAX.			2.44	3.2	1.2	0.72	Pass		
	Appearance										
	Spec: No abnormality adversely affecting the	Spec: No abnormality adversely affecting the performance shall occur.									
	Initial	No abnormality	10	_	No abnorma	Pass					
	After testing	140 abriorriality	10	-	No abnorma	Pass					
Р	Solder ability										
	Spec: More than 95% of the dipped surface shall be evenly wet										
	After testing	-	10	-	No abnorma	Pass					
Q	Reflow soldering heat resistance										
	Appearance										
	Spec: No abnormality adversely affecting the	e performance shall oc	cur.								

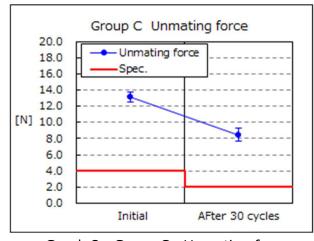


After testing

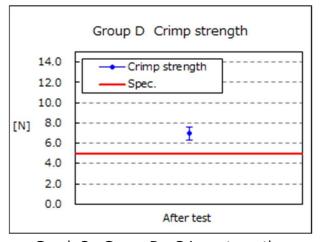


No abnormality

Graph 1 Group B VSWR

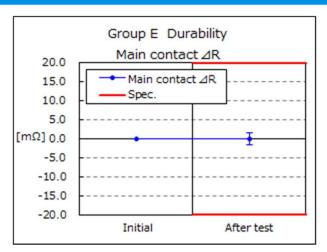


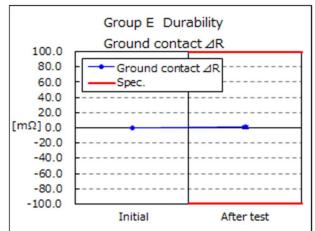




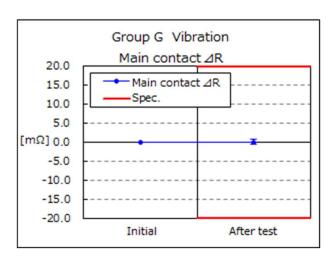
Graph 3 Group D Crimp strength

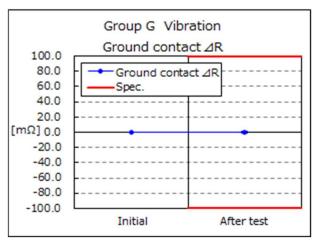
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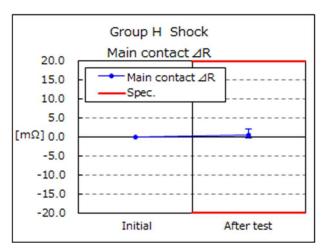


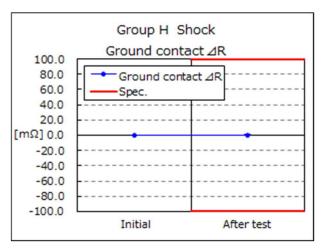
Graph 4 Group E Durability



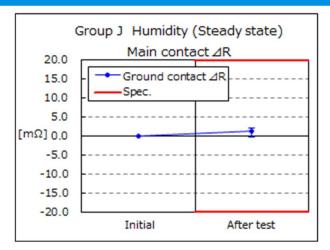


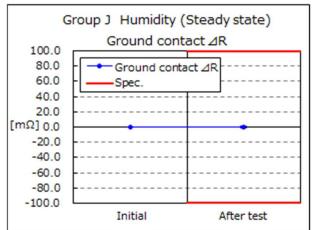
Graph 5 Group G Vibration



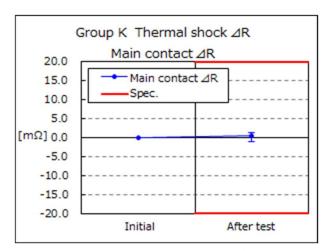


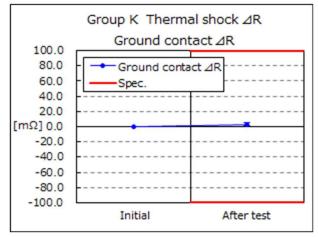
Graph 6 Group H Shock



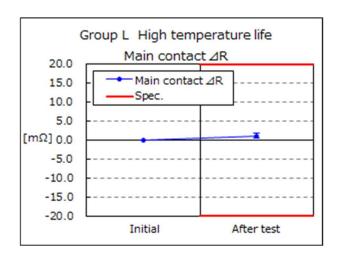


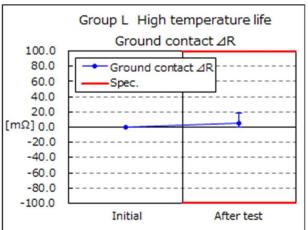
Graph 7 Group J Humidity (Steady state)



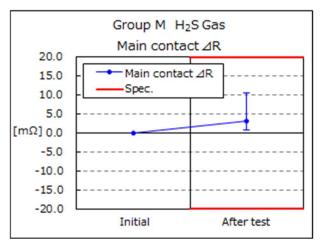


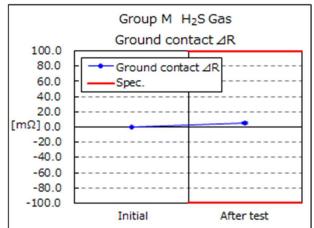
Graph 8 Group K Thermal shock



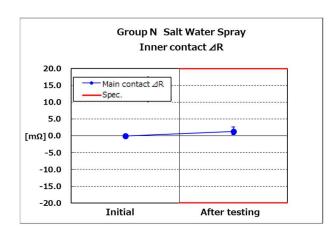


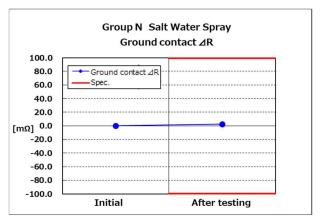
Graph 9 Group L High temperature life





Graph 10 Group M H₂S Gas





Graph 11 Group N Salt water spray