QUALIFICATION TEST REPORT

Document No. TR-1029

Mechanical testing and environmental testing of I-PEX MHF series micro coaxial connector and HIROSE U.FL. Connector

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1.Purpose

To perform the mechanical testing and environmental testing of I-PEX MHF series micro coaxial connector and HIROSE U.FL connector

2.Conclusion

There are no abnormality at all combinations

3.Sample

(1) I-PEX connector

Plug : part No.20278-111R-13
Cable : AWG#32 coaxial cable (jacket diameter 1.13mm)
Receptacle : part No.20279-001E-01

(2) HIROSE connector

Plug : part No.U.FL-LP-040(01)
Cable : VSWR test AWG#32 coaxial cable (jacket diameter 1.13mm)
Cable : environmental test AWG#36 coaxial cable (jacket diameter 0.81mm)
Receptacle : part No.U.FL-R-SMT(10)

3.Method

Refer to product specfication,PRS-1176

4. Results

(1) Dielectric withstanding voltage

Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
Results	No abnormality	No abnormality	No abnormality	No abnormality
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.

(2) VSWR

	I-PEX plug AWG#32 coaxial cable length 995mm	HIROSE plug AWG#32 coaxial cable length 995mm	I-PEX receptacle	HIROSE receptacle
AVE.	1.185	results	1.120	1.141
MAX.	1.20	No.1 1.18	1.13	1.19
MIN.	1.17	No.2 1.17	1.11	1.08
Sample quantity	5 pcs.	2 pcs.	5 pcs.	5 pcs.

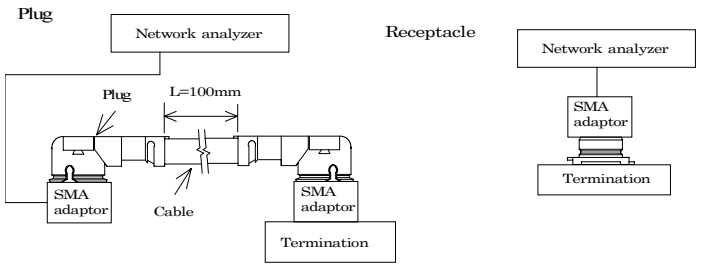
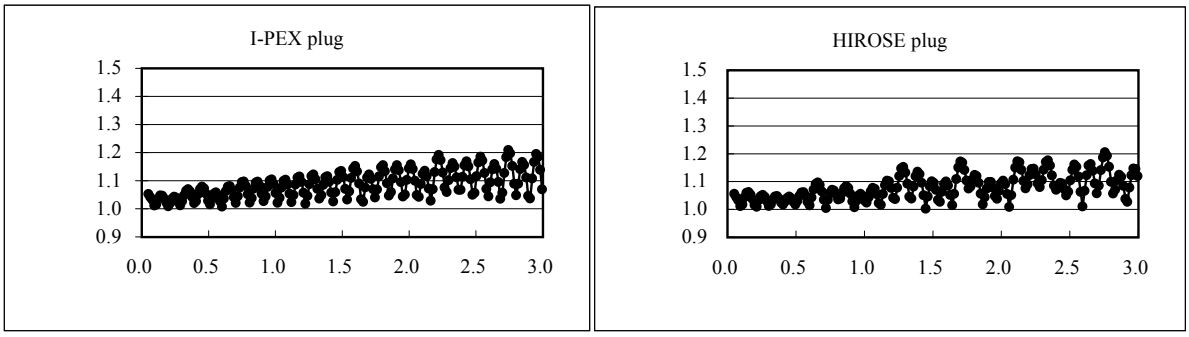


Fig.3



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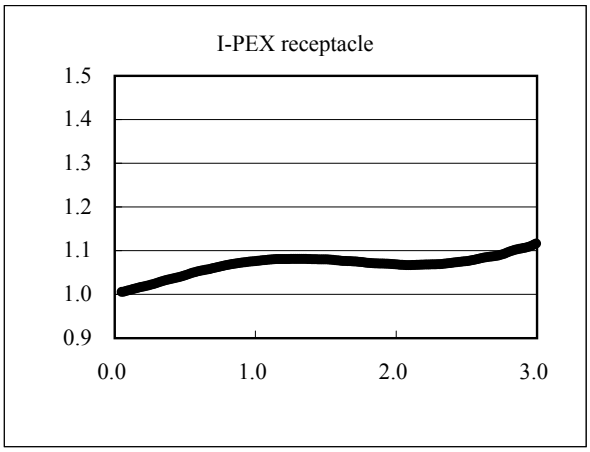
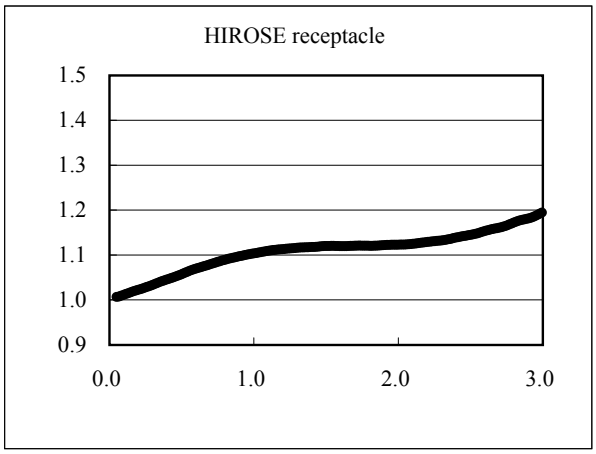


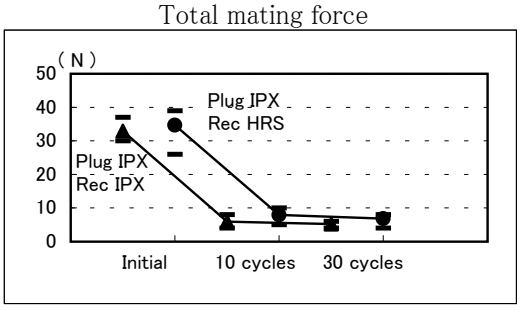


(3) Mating & un-mating force

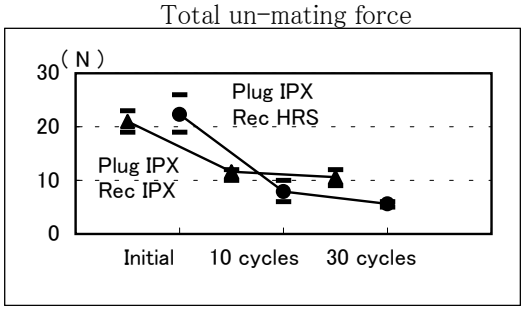
Total mating force	Initial		After 10 cycles		After 30 cycles	
Plug	I-PEX	I-PEX	I-PEX	I-PEX	I-PEX	I-PEX
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	32.9	34.7	5.9	7.9	5.2	6.8
MAX.	37	39	8	10	6	8
MIN.	30	26	4	5	4	4
S	1.2		1.0		0.5	
Units	N	N	N	N	N	N
Sample quantity	10pcs.	5pcs.	10pcs.	10pcs.	5pcs.	5pcs

Total un-mating force	Initial		After 10 cycles		After 30 cycles	
Plug	I-PEX	I-PEX	I-PEX	I-PEX	I-PEX	I-PEX
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	21.0	22.3	11.6	7.9	10.6	5.6
MAX.	23	26	12	10	12	6
MIN.	19	19	10	6	9	5
S	0.8		0.5		0.6	
Units	N	N	N	N	N	N
Sample quantity	10pcs.	5pcs.	10pcs.	10pcs.	5pcs.	5pcs.

Total mating force



Total un-mating force



Un-mating force of inner contact

	Initial		After 30 cycles	
Plug	I-PEX	I-PEX	I-PEX	I-PEX
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	0.372	0.400	0.233	0.274
MAX.	0.39	0.43	0.25	0.32
MIN.	0.35	0.36	0.22	0.25
S	0.015		0.012	
Units	N	N	N	N
Sample quantity	10pcs.	5pcs.	10pcs.	5pcs.

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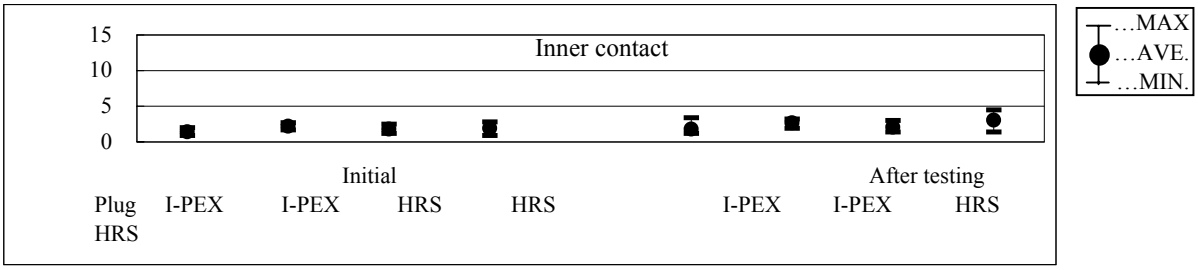
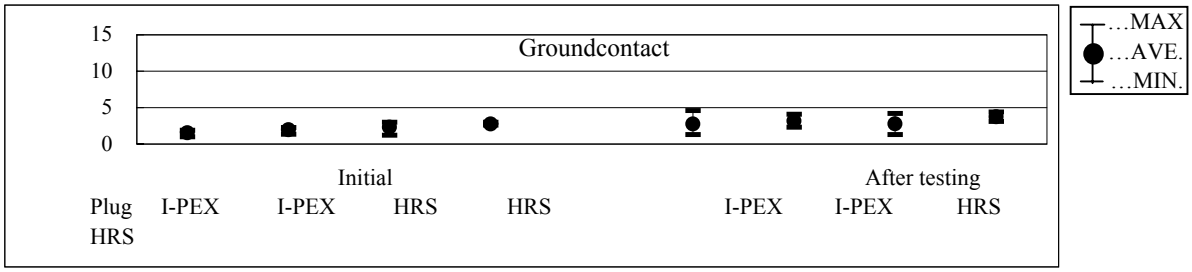
(4) Durability

Contact resistance of inner contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.42	2.21	1.80	2.06
MAX.	2.0	2.7	2.5	3.0
MIN.	0.9	1.7	1.2	1.4
S	0.36			
	After 30 cycles			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.80	2.68	2.06	3.06
MAX.	3.4	3.2	3.0	4.5
MIN.	1.2	1.9	1.4	1.4
S	0.68			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



Contact resistance of ground contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.54	1.95	2.32	2.76
MAX.	1.9	2.3	3.0	3.0
MIN.	1.0	1.3	1.2	2.6
S	0.31			
	After 30 cycles			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	2.74	3.16	2.78	3.74
MAX.	4.6	4.1	4.2	4.4
MIN.	1.3	2.3	1.3	3.1
S	1.07			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



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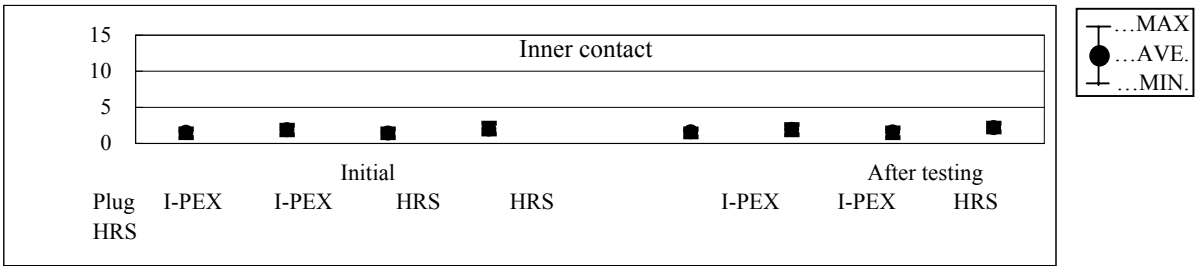
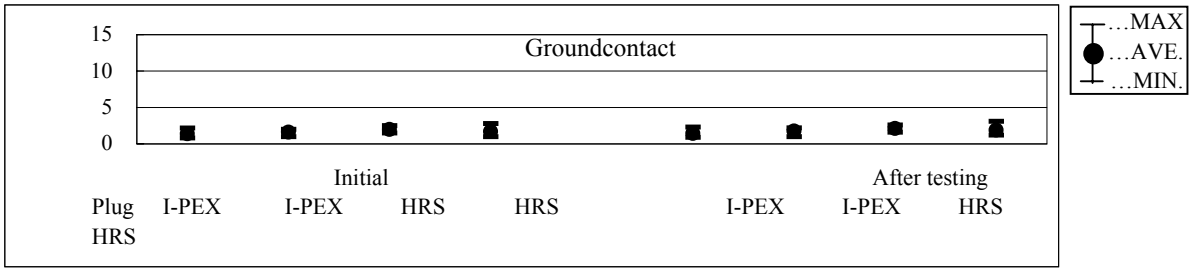
(5) Vibration Electrical discontinuity : no abnormality at all combinations.

Contact resistance of inner contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.53	1.88	1.42	1.98
MAX.	2.0	2.5	2.0	2.8
MIN.	0.8	1.2	0.8	1.3
S	0.42			
	After 30 cycles			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.61	1.94	1.57	2.18
MAX.	2.0	2.6	2.1	2.8
MIN.	0.9	1.2	0.8	1.6
S	0.38			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



Contact resistance of ground contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.38	1.60	1.98	1.70
MAX.	2.2	2.0	2.5	2.8
MIN.	0.8	1.0	1.5	1.0
S	0.47			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.44	1.76	2.11	1.90
MAX.	2.3	2.2	2.6	3.1
MIN.	0.9	1.0	1.6	1.2
S	0.47			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



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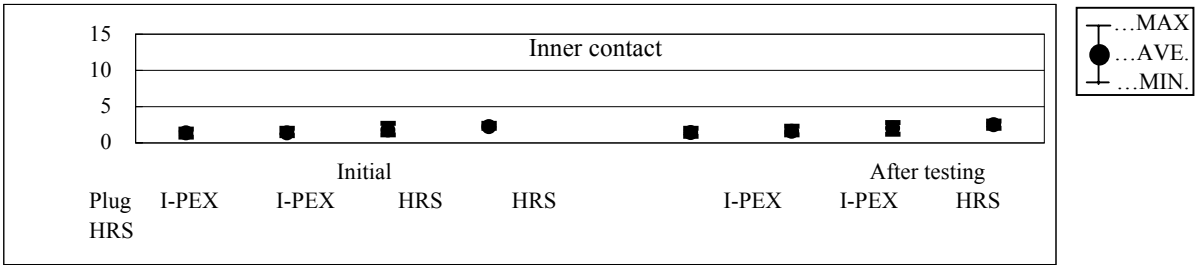
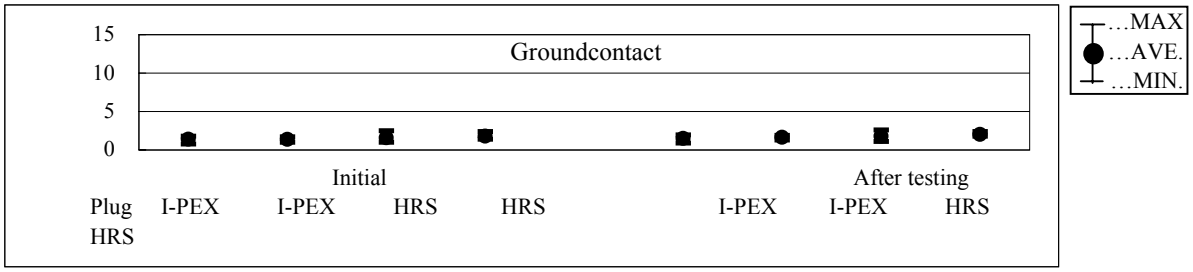
(6) Shock Electrical discontinuity : no abnormality at all combinations.

Contact resistance of inner contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.38	1.38	1.76	2.24
MAX.	1.9	2.0	2.7	2.7
MIN.	0.8	1.0	1.1	2.0
S	0.35			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.42	1.58	2.04	2.50
MAX.	2.0	2.3	2.8	3.0
MIN.	0.9	1.1	1.2	2.0
S	0.38			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



Contact resistance of ground contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.40	1.38	1.58	1.80
MAX.	1.8	1.7	2.5	2.4
MIN.	0.8	1.0	1.0	1.4
S	0.32			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.51	1.64	1.80	2.02
MAX.	2.0	1.9	2.6	2.4
MIN.	0.9	1.3	1.1	1.8
S	0.34			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



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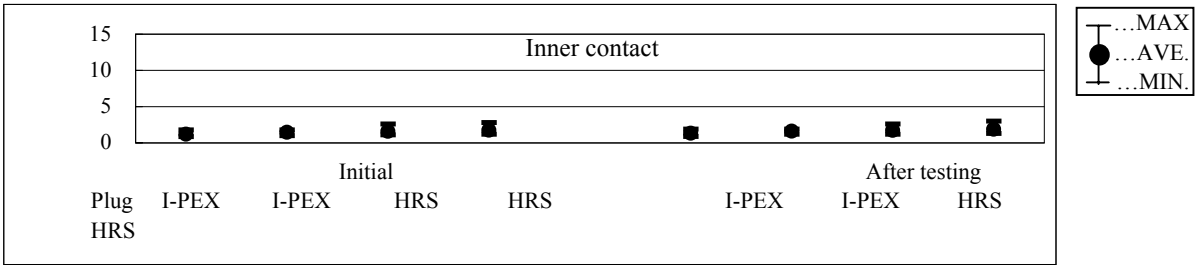
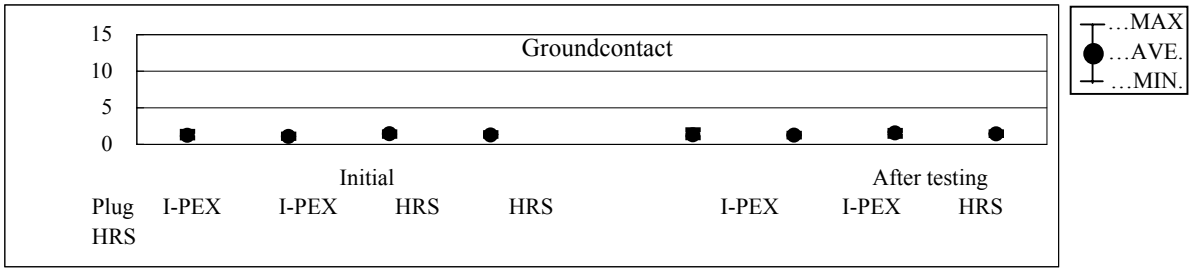
(7) Thermal shock

Contact resistance of inner contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.20	1.20	1.20	1.20
MAX.	1.8	1.8	1.8	1.8
MIN.	0.9	0.9	0.9	0.9
S	0.28			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.32	1.62	1.72	1.88
MAX.	1.9	1.9	2.6	3.0
MIN.	0.9	1.2	1.2	1.3
S	0.32			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



Contact resistance of ground contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.22	1.08	1.44	1.28
MAX.	1.8	1.4	1.7	1.6
MIN.	0.9	0.8	1.1	1.1
S	0.35			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.29	1.24	1.56	1.42
MAX.	2.0	1.5	1.9	1.7
MIN.	0.9	1.0	1.1	1.2
S	0.37			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



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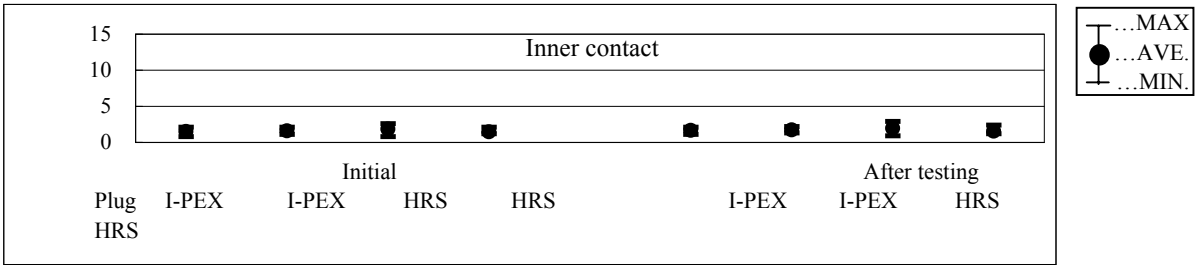
(8) Humidity

Contact resistance of inner contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.51	1.60	1.84	1.46
MAX.	2.1	2.1	2.6	2.1
MIN.	0.8	1.1	0.8	1.2
S	0.41			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.66	1.74	1.96	1.56
MAX.	2.1	2.2	2.9	2.4
MIN.	1.1	1.3	0.9	1.2
S	0.34			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.



Contact resistance of ground contact				
	Initial			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.44	1.52	1.20	1.96
MAX.	1.8	1.7	1.7	2.8
MIN.	1.0	1.3	0.8	0.7
S	0.25			
	After testing			
Plug	I-PEX	I-PEX	HIROSE	HIROSE
Receptacle	I-PEX	HIROSE	I-PEX	HIROSE
AVE.	1.55	1.66	1.30	2.06
MAX.	1.9	2.0	1.8	2.9
MIN.	1.2	1.4	0.9	1.0
S	0.25			
Units	mille-ohm	mille-ohm	mille-ohm	mille-ohm
Sample quantity	10pcs.	5pcs.	5pcs.	5pcs.