

IEEE P1394.B MODIFIED AND ENHANCED CONNECTOR TEST DATA

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- **Testing was performed on the FCI/Berg receptacle to verify that the modified geometry of the contact blades does not detract from performance as defined by the IEEE 1394-1995 standard.**
- **Enhanced electrical performance by this interconnect has been shown by previous presentations.**
- **The charts that follow are abbreviated test results. All testing was done per the IEEE 1394-1995 specification.**



PERFORMANCE GROUP A - BASIC MECHANICAL, DIMENSIONAL, CONFORMANCE, AND ELECTRICAL FUNCTIONALITY WHEN SUBJECTED TO MECHANICAL SHOCK AND VIBRATION				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
A1	VISUAL AND DIMENSIONAL INSPECTION		No defects that would impair normal operations. No deviations from dimensional tolerances	No defects (note exclusion of the R 0.5 +/-0.1 dimensions in Fig 4-7)
A2	PLATING THICKNESS MEASUREMENT		0.05 um min. Au, over 0.76um min. Pd/Ni, over 1.27um Ni	Acceptable production quality meeting specification
A3		LLCR	30 mOhm maximum initial / mated pair	Max initial measured was 24.9 mOhms
A4	VIBRATION	CONTINUITY	No discontinuities >= 1.0us	No discontinuities >= 1.0us
A5		LLCR	30 mOhm maximum change from init./ mated contact	Max change was 2.4 mOhms
A6	MECH. SHOCK	CONTINUITY	No discontinuities >= 1.0us	No discontinuities >= 1.0us
A7		LLCR	30 mOhm maximum change from init./ mated contact	Max change was 2.4 mOhms



PERFORMANCE GROUP B - LOW LEVEL CONTACT RESISTANCE WHEN SUBJECTED TO				
THERMAL SHOCK AND HUMIDITY STRESS				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
B1		LLCR	30 mOhm maximum / mated contact	Max initial measured was 24.9 mOhms
B2	THERMAL SHOCK	LLCR	30 mOhm maximum change from init./ mated contact	Max change was 2.8 mOhms
B3	HUMIDITY	LLCR	30 mOhm maximum change from init./ mated contact	Max change was 2.8 mOhms



PERFORMANCE GROUP C - INSULATOR INTEGRITY WHEN SUBJECTED TO THERMAL SHOCK AND HUMIDITY STRESS				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
C1	WITHSTANDING VOLTAGE	DWV	No flashover, no sparkover, no excess leakage, no breakdown	No evidence of failure
C2	THERMAL SHOCK	DWV	No flashover, no sparkover, no excess leakage, no breakdown	No evidence of failure
C3	INS. RES.	INS. RES.	100 MOhm min between adjacent contacts and/or shell	> 50,000 Mohms
C4	HUMIDITY	INS. RES.	100 MOhm min	>10,000 Mohms



PERFORMANCE GROUP D - CONTACT LIFE AND DURABILITY WHEN SUBJECTED TO MECHANICAL CYCLING AND CORROSIVE GAS EXPOSURE				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
D1		LLCR	30 mOhm maximum / mated contact	Max initial measured was 24.9 mOhms
D2	CONTINUITY-HOUSING (SHELL)	CONTACT RESISTANCE, BRAID TO SOCKET SHELL	50 mOhm max initial from braid to socket shell at 100 mA, 5VDC open circuit max.	1.6 mOhms initial maximum measured
D3	DURABILITY		5 cycles and 750 cycles	
D4		LLCR	30 mOhm maximum / mated contact	Max change was 3.60 mOhms
D5	CONTINUITY-HOUSING (SHELL)		50 mOhm max change from initial from braid to socket shell at 100 mA, 5VDC open circuit max.	Max change was 0.80 mOhms
D6	MIXED FLOWING GAS	LLCR	30 Mohm maximum change from initial / mated contact	Max change was 3.60 mOhms
D7	DURABILITY		5 cycles and 750 cycles	
D8	MIXED FLOWING GAS	LLCR AT END OF EXPOSURE	30 Mohm maximum change from initial / mated contact	Max change was 3.60 mOhms
D9	CONTINUITY-HOUSING (SHELL)	CONTACT RESISTANCE	50 mOhm max initial from initial from braid to socket shell at 100 mA, 5VDC open circuit max.	Max change was 0.80 mOhms; None were over 2.4 mOhms



PERFORMANCE GROUP E - CONTACT RESISTANCE AND UNMATING FORCE WHEN				
SUBJECTED TO TEMPERATURE LIFE STRESS				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
E1	MATING AND UNMATING FORCES	MATE BY HAND - MEASURE UNMATING FORCE	Unmating force: 9.8N min, 39.2N max	Max mating force = 34.0N, Min mating force = 22.6N; Max unmating force = 32.8N, Min unmating force = 21.5N
E2		LLCR	30 mOhm maximum / mated contact	Max initial measured was 24.9 mOhms
E3	CONTINUITY-HOUSING (SHELL)	CONTACT RESISTANCE	50 mOhm max initial from braid to socket shell at 100 mA, 5VDC open circuit max.	1.6 mOhms initial maximum measured
E4	TEMPERATURE LIFE	LLCR	30 Mohm maximum change from initial / mated contact	Max change was 5.5 mOhms
E5	CONTINUITY-HOUSING (SHELL)	CONTACT RESISTANCE	50 mOhm max initial from braid to socket shell at 100 mA, 5VDC open circuit max.	Max change was 0.80 mOhms
E6	MATING AND UNMATING FORCES	UNMATING FORCE ONLY	Unmating force: 9.8N min, 39.2N max	Max mating force = 18.0N, Min mating force = 16.8N; Max unmating force = 16.5N, Min unmating force = 15.1N



PERFORMANCE GROUP F - MECHANICAL RETENTION AND DURABILITY				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
F1	MATING AND UNMATING FORCES	MATING FORCE ONLY	Not Specified	Max mating force = 34.0N, Min mating force = 22.6N; Max unmating force = 32.8N, Min unmating force = 21.5N
F2	MATING AND UNMATING FORCES	UNMATING FORCE ONLY	Unmating force: 9.8N min, 39.2N max	Max mating force = 18.4N, Min mating force = 13.4N; Max unmating force = 17.9N, Min unmating force = 10.1N
F3	DURABILITY	UNMATING FORCE ONLY	Unmating force: 9.8N min, 39.2N max after durability cycling	Max mating force = 18.4N, Min mating force = 13.4N; Max unmating force = 17.9N, Min unmating force = 10.1N



PERFORMANCE GROUP G - GENERAL TESTS				
PHASE	TEST TITLE	MEASUREMENT PERFORMED	REQUIREMENT	MODIFIED CONNECTOR RESULT
G1	ELECTROSTATIC DISCHARGE	EVIDENCE OF DISCHARGE	No evidence of discharge to any of the 6 contacts; discharge to the shield is acceptable	No evidence of discharge to any of the 6 contacts
G2	N/A (CABLE AXIAL PULL)			
G3	N/A (CABLE FLEXING)			



Ref. IEEE 1394-1995

4.2.1.1.1 Connectors

(Paragraph 2, Sentence 2)

“Features of connector plugs and sockets that do not affect intermatability are not specified and may vary at the option of the manufacturer.”

Figure 4-4 shows cylindrical sections on the receptacle contact blades which are not necessary

Figure 4-7 dimensions the cylindrical sections on the receptacle contact blades. These cylindrical sections are not necessary to assure intermatability.

Furthermore, testing shows that they do not necessarily improve reliability!



Recommendations:

- 1. Only specify blade contact point spacing in figure 4-7**
- 2. Show narrow flat blades as an alternative, particularly for use in high speed capable receptacles.**

