

2.5mm BTB COMBINED CONNECTOR

501-5545

05Feb2009 Rev. B

1. Introduction

1.1 Testing was performed on the 2.5mm BTB Combined Connector to determine if it meets the requirements of Product Specification, 108-5957, Rev.B .

1.2 Scope

This report covers the electrical, mechanical and environmental performance requirements of the 2.5mm BTB Combined Connector.

The qualification testing was performed between 08-Oct-2007 and 22-Oct-2007.

1.3 Conclusion

2.5mm BTB Combined Connector meets the electrical, mechanical and environmental performance requirements of Product Specification, 108-5957, Rev.B .

1.4 Test Samples

Samples were taken randomly from current production. The following samples were used :

Part Number	Description
1-1746698-1	PLUG CONNECTOR 38Pos.
1-1746701-1	RECEPTACLE CONNECTOR 38Pos.
1-1746698-2	PLUG CONNECTOR 50Pos.
1-1746701-2	RECEPTACLE CONNECTOR 50Pos.
2-1746701-2	RECEPTACLE CONNECTOR 50Pos. WITHOUT LOCK
3-1746701-2	RECEPTACLE CONNECTOR 50Pos. WITHOUT LOCK WITH BEAD

Fig. 1

2. Test Contents

No.	Test Items	Requirements	Judgement
2.1	Examination of Product	Visual Inspection No physical damage	Acceptable
Electrical Requirements			
2.2	Termination Resistance (Low Level)	Signal Contact Initial ; 15 m Ω Max. Final ; 30 m Ω Max.	Acceptable
2.3	Dielectric withstanding Voltage	Initial/Final ; 500V AC, 1 minute No abnormality allowed. Current leakage : 1.0 mA Max.	Acceptable
2.4	Insulation Resistance	Initial ;500 M Ω Min. Final ;100 M Ω Min. Impressed voltage 500V DC.	Acceptable
2.5	Temperature Rising	30 Deg Max. on 12pos. Max under loaded rating current.	Acceptable

Fig. 2 (to be continued)

No.	Test Items	Requirements	Judgement
Mechanical Requirements			
2.6	Connector Mating Force	26 N (2.65 kgf) Max (38Pos Initial) 34 N (3.47kgf) Max (50Pos Initial) Operation Speed : 30 mm/min. (5 cycles/Min) Measure the force required to mate connectors.	Acceptable
2.7	Connector Unmating Force	With Lock 19.6N(2.0kgf) Min. (38Pos.Initial) 19.6N(2.0kgf) Min. (50Pos.Initial) Operation Speed : 100 mm/min. (5 cycles/Min) Measure the force required to mate connectors.	Acceptable
		Without Lock 3N(0.31kgf) Min. (38Pos.Initial) 4N(0.41kgf) Min. (50Pos.Initial) Operation Speed : 100 mm/min. (5 cycles/Min) Measure the force required to mate connectors.	Acceptable
2.8	Durability (Repeated Mate/ Unmating)	Operation Speed : 30 mm/min. (5 cycles/Min) Measure the force required to mate connectors. No. of Cycles: 50 cycles LLCR : 30 mΩ Max. (Final) Mating force : 26 N (2.65 kgf) Max (38Pos) 34 N (3.47kgf) Max (50Pos) Unmating force with lock : 19.6N(2.0kgf) Min.(38Pos) 19.6N(2.0kgf) Min. (50Pos) Unmating force without lock : 3N(0.31kgf) Min.(38Pos) 4N(0.41kgf) Min. (50Pos)	Acceptable

Fig. 2 (to be continued)

No.	Test Items	Requirements	Judgement
2.9	Vibration (Low Frequency)	10~55~10 Hz/1 minutes, Amplitude :1.52mm, X, Y & Z Axes : 2 hours each, 100mA applied. No electrical discontinuity greater than 1 μ sec shall occur. LLCR : 30 m Ω Max. (Final)	Acceptable
2.10	Physical Shock	No electrical discontinuity greater than 1 μ sec allowed. 490 m/s ² (50 G), Sawtooth/Halfsine Wave, 11msec. X,Y,Z \pm directions each 3 drops, Total 18 drops LLCR : 30 m Ω Max. (Final)	Acceptable
2.12	Solderability	Solder Temperature : 230 \pm 5 $^{\circ}$ C Immersion Duration : 3 \pm 0.5 seconds Flux : Alpha 100 Wet solder coverage : 95% Min.	Acceptable

Fig. 2 (to be continued)

No.	Test Items	Requirements	Judgement
Environmental Requirements			
2.13	Thermal Shock	-55°C / 30min., 85°C / 30min. Making this a cycle, repeat 5 cycles. LLCR : 30 mΩ Max. (Final)	Acceptable
2.14	Humidity-Temperature Cycling	25~65°C、90~95% R.H.、10 cycles MIL-STD-202-106 Method 106 LLCR : 30 mΩ Max. (Final) Insulation resistance : 100 MΩ Min.(Final)	Acceptable
2.15	Salt Spray	Salt concentration : 5%、35°C、24Hrs. LLCR : 30 mΩ Max. (Final)	Acceptable
2.16	Industrial Gas (SO ₂)	10 ppm、25°C、95% R.H.、24 Hrs. LLCR : 30 mΩ Max. (Final)	Acceptable
2.17	Temperature Life (Heat Aging)	85°C、96 hours LLCR : 30 mΩ Max. (Final)	Acceptable
2.18	Resistance to Soldering Heat	<u>Case of Manual Soldering</u> Temperature : 390±10°C for 3±1 sec. To be no deformation by the top of ironat soldering tines. Tested housing shall show no evidence of deformation or fusion of housing and no physical damage.	Acceptable
2.19	Resistance to flow Soldering Heat	Test connector on PCB. Pre-Heat 100°C : 40 - 60sec. Heat Peak 240+5/-0°C : 8sec. Max Tested housing shall show no evidence of deformation or fusion of housing and no physical damage.	Acceptable

Fig. 2 (End)

3. Product Qualification Test Sequence

Test Examination	Test Group												
	1	2	3	4	5	6	7	8(b)	9	10	11	12	
	Test Sequence (a)												
Examination of Product	1,3	1,7	1,5	1,5	1,5	1,5	1,5	1,5	1,6	1,7	1,3	1,3	1,3
Termination Resistance (Low Level)		2,6	2,4	2,4	2,4	2,4	2,4	2,4	2,5				
Dielectric withstanding Voltage										2,5			
Insulation Resistance										3,6			
Temperature Rising	2												
Vibration (Low Frequency)									3				
Physical Shock									4				
Connector Mating Force		3											
Connector Unmating Force		4											
Durability (Repeated Mate/Unmating)		5											
Solderability											2		
Humidity-Temperature Cycling			3							4			
Thermal Shock				3									
Salt Spray								3					
Industrial SO ₂ Gas							3						
Temperature Life (Heat Aging)					3								
Resistance to Soldering Heat												2	
Resistance to wave Soldering Heat													2

(a) Numbers indicate sequence in which the tests are performed.

(b) Discontinuities shall not take place in this test group, during tests.

4. TEST RESULT

Conditions	Measure Item	n	Unit	Results				Requirement	Judgement	
				MAX.	MIN.	AVE.	SIG.			
Test Group 1										
Temperature Rising	DC 1.0 A	10	°C	3.0	—	—	—	—	—	
	DC 2.0 A	10	°C	9.4	—	—	—	—	—	
	DC 3.0A	10	°C	19.6	—	—	—	30 °C Max.	Acceptable	
Test Group 2										
Initial		Termination Resistance	250	mΩ	11.1	7.60	8.95	0.993	15 mΩ Max	Acceptable
Mating Force	With lock	1 c/y	5	N	12.2	9.45	10.51	0.804	26N Max.	Acceptable
		50c/y	5	N	8.8	6.32	7.33	0.962	26N Max.	Acceptable
	Without lock	1 c/y	5	N	19.0	16.04	17.51	0.859	34N Max.	Acceptable
		50c/y	5	N	18.06	15.56	17.05	0.921	34N Max.	Acceptable
Unmating Force	With lock	1 c/y	5	N	92.3	65.6	79.3	0.788	19.6N Min	Acceptable
		50c/y	5	N	55.7	29.8	39.5	0.646	19.6N Min	Acceptable
	Without lock	1 c/y	5	N	20.6	15.8	17.8	0.991	4N Min	Acceptable
		50c/y	5	N	18.23	15.24	16.2	0.838	4N Min	Acceptable
After Durability (Repeated Mate/Unmating)		Termination Resistance	250	mΩ	10.88	7.24	8.51	0.906	30 mΩ Max	Acceptable
		Δ R	250	mΩ	1.43	-1.54	-0.44	0.351	—	—
Test Group 3										
Initial		Termination Resistance	250	mΩ	11.59	7.59	8.93	0.948	15 mΩ Max	Acceptable
After Humidity Temperature Cycling		Termination Resistance	250	mΩ	12.65	7.51	9.10	0.933	30 mΩ Max	Acceptable
		Δ R	250	mΩ	4.28	-1.71	0.16	0.662	—	—

Conditions	Measure Item	n	Unit	Results				Requirement	Judgement
				MAX.	MIN.	AVE.	SIG.		
Test Group 4									
Initial	Termination Resistance	250	mΩ	12.65	7.67	9.03	0.946	15 mΩ Max	Acceptable
After Thermal Shock	Termination Resistance	250	mΩ	11.01	7.85	9.31	0.878	30 mΩ Max	Acceptable
	Δ R	250	mΩ	2.89	-2.71	0.28	0.437	—	—
Test Group 5									
Initial	Termination Resistance	250	mΩ	10.90	7.37	8.90	0.902	15 mΩ Max	Acceptable
After Temperature life (Heat Aging)	Termination Resistance	250	mΩ	10.55	7.51	8.88	0.811	30 mΩ Max	Acceptable
	Δ R	250	mΩ	0.72	-0.79	-0.02	0.269	—	—
Test Group 6									
Initial	Termination Resistance	250	mΩ	10.91	7.43	8.94	0.997	15 mΩ Max	Acceptable
Industrial SO ₂ Gas	Termination Resistance	250	mΩ	12.61	7.54	9.47	1.053	30 mΩ Max	Acceptable
	Δ R	250	mΩ	4.26	-1.12	0.53	0.826	—	—
Test Group 7									
Initial	Termination Resistance	250	mΩ	11.63	7.72	9.04	0.955	15 mΩ Max	Acceptable
After Salt Spray	Termination Resistance	250	mΩ	11.85	7.47	9.05	0.903	30 mΩ Max	Acceptable
	Δ R	250	mΩ	2.35	-1.78	0.01	0.695	—	—

Conditions	Measure Item	n	Unit	Results				Requirement	Judgement
				MAX.	MIN.	AVE.	SIG.		

Test Group 8									
Initial	Termination Resistance	250	mΩ	11.84	7.52	9.00	1.011	15 mΩ Max	Acceptable
Vibration (Low Frequency) During test	Circuit Continuity	250	μS	No discontinuity				1 μS Max.	Acceptable
Physical Shock During test	Circuit Continuity	250	μS	No discontinuity				1 μS Max.	Acceptable
After Test	Termination Resistance	250	mΩ	11.53	7.71	9.00	0.900	30 mΩ Max	Acceptable
	ΔR	250	mΩ	0.72	-1.22	0.00	0.255	—	—

Test Group 9									
Initial	Dielectric Strength	30 Point	—	No abnormalities				No Abnormalities	Acceptable
After Humidity-Temperature Cycling	Dielectric Strength	30 Point	—	No abnormalities				No Abnormalities	Acceptable
Initial	Insulation Resistance	30 Point	Ω	1 × 10 ¹³ Ω Min.				500 MΩ Min.	Acceptable
After Humidity-Temperature Cycling	Insulation Resistance	30 Point	Ω	1 × 10 ¹³ Ω Min.				100 MΩ Min.	Acceptable

Conditions	Measure Item	n	Unit	Results				Requirement	Judgement
				MAX.	MIN.	AVE.	SIG.		
Test Group 10									
Solderability	Appearance	5	set	More than 95% of tested area was covered with fresh, wet solder.				95 % Min.	Acceptable
Test Group 11									
After Resistance to Soldering Heat	Appearance	5	set	After Testing, no physical damage was evident.				No abnormalities	Acceptable
Test Group 12									
After Resistance to flow Soldering Heat	Appearance	5	set	After Testing, no physical damage was evident.				No abnormalities	Acceptable