

Board-To-Board Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics Board-To-Board connector to determine its conformance to the requirements of Product Specification 108-57849, Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Board-To-Board connector.

1.3. Conclusion

The Board-To-Board connector listed in paragraph 1.5. conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-57849, Revision A.

1.4. Product Description

The Board-To-Board connector is designed for printed circuit board applications.

1.5. Test Specimens

Test specimens were representative of normal production lots. The following specimens were used for test.

Test Group	Quantity	Part number	Description
A, B, C, D, E, F, G, H	5 ea.	2041300-1	0.5 Pitch BTB, 3.0 MH, 22 Position, Receptacle
A, B, C, D, E, F, G, H	5 ea.	2041301-1	0.5 Pitch BTB, 3.0 MH, 22 Position, Plug
A, B, C, D, E, F, G, H	5 ea.	2041302-1	0.8 Pitch BTB, 8.8 MH, 12 Position, Plug
A, B, C, D, E, F, G, H	5 ea.	2041314-1	0.5 Pitch BTB, 3.0 MH, 60 Position, Plug
A, B, C, D, E, F, G, H	5 ea.	2041315-1	0.5 Pitch BTB, 3.0 MH, 60 Position, Receptacle
A, B, C, D, E, F, G, H	5 ea.	1-1734054-2	0.8 Pitch BTB, 3.5 MH, 12 Position, Plug

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)							
	A	B	C	D	E	F	G	H
	Test Sequence (b)							
Examination of product.	1, 6	1, 4	1, 3	1, 5	1, 3	1, 8	1, 5	1, 3
Low level contact resistance.	2, 5			2, 4		2, 7	2, 4	
Insulation resistance.	3					3, 6		
Dielectric withstanding voltage.	4					4		
Mating force.		2						
Unmating force.		3						
Contact retention force.			2					
Durability.				3				
Vibration, sinusoidal.					2			
Solderability.								2
Humidity-temperature cycling.						5		
Resistance to reflow soldering heat.							3	

NOTE (a) See paragraph 1.5.
(b) Numbers indicate sequence in which test are performed.

Figure 1

2. TEST RESULT

2.1. 2041300-1

Test Group	Test Description	Requirement	Test Result				Judgment	
			Max.	Min.	Ave.	Std. Dev.		
A	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	20.5	18.7	19.62	0.54	Accepted	
	Insulation resistance.	100 MΩ minimum.	PASSED				Accepted	
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	29.9	20.9	25.19	2.7	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
B	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Mating force.	150 gf per contact maximum.	22P	1382	1283	1317	42	Accepted
	Unmating force.	20 gf per contact minimum.	22P	542	461	500	29.29	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted	
C	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Contact retention force.	200 gf per contact minimum.	368	300	332.5	19.93	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
D	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	20.7	19.2	19.9	0.49	Accepted	
	Durability.	No damage.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	29.7	21.2	25.5	1.66	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
E	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Vibration, sinusoidal.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
F	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	20.4	18.8	19.55	0.44	Accepted	
	Insulation resistance.	100 MΩ minimum.	PASSED				Accepted	
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted	
	Humidity-temperature cycling.	No damage.	PASSED				Accepted	
	Insulation resistance.	50 MΩ minimum.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	29.8	20.9	25.43	2.7	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
G	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	20.7	18.8	19.86	0.57	Accepted	
	Resistance to reflow soldering heat.	No damage.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	29.9	21.2	25.42	2.41	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
H	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Solderability.	95% solder coverage min.	PASSED				Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	

Figure 2

2.2. 2041301-1

Test Group	Test Description	Requirement	Test Result				Judgment	
			Max.	Min.	Ave.	Std. Dev.		
A	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	21.5	19.7	20.75	0.5	Accepted	
	Insulation resistance.	100 MΩ minimum.	PASSED				Accepted	
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	31.7	21.6	26.71	3.06	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
B	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Mating force.	150 gf per contact maximum.	22P	1364	1246	1301	48.25	Accepted
	Unmating force.	20 gf per contact minimum.	22P	512	468	495	19.88	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted	
C	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Contact retention force.	200 gf per contact minimum.	455	365	409.2	26.12	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
D	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	21.5	19.0	20.2	0.77	Accepted	
	Durability.	No damage.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	31.9	21.6	26.5	3.04	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
E	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Vibration, sinusoidal.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
F	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	21.5	19.0	20.26	0.72	Accepted	
	Insulation resistance.	100 MΩ minimum.	PASSED				Accepted	
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted	
	Humidity-temperature cycling.	No damage.	PASSED				Accepted	
	Insulation resistance.	50 MΩ minimum.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	31.6	21.6	26.52	3.14	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
G	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Low level contact resistance.	40 mΩ maximum initial.	21.5	19.0	20.32	0.74	Accepted	
	Resistance to reflow soldering heat.	No damage.	PASSED				Accepted	
	Low level contact resistance.	60 mΩ maximum final.	31.8	21.6	26.63	3.10	Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	
H	Examination of product.	Meets product drawing.	PASSED				Accepted	
	Solderability.	95% solder coverage min.	PASSED				Accepted	
	Examination of product.	Meets product drawing.	PASSED				Accepted	

Figure 3

2.3. 2041302-1

Test Group	Test Description	Requirement		Test Result				Judgment
				Max.	Min.	Ave.	Std. Dev.	
A	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		21.8	19.4	20.64	0.77	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34	22.2	28.23	3.19	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
B	Examination of product.	Meets product drawing.		PASSED				Accepted
	Mating force.	150 gf per contact maximum.	12P	944	893	927	20.35	Accepted
	Unmating force.	20 gf per contact minimum.	12P	612	513	563.6	35.87	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
C	Examination of product.	Meets product drawing.		PASSED				Accepted
	Contact retention force.	200 gf per contact minimum.		635	494	566.6	40.66	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
D	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		21.2	19.2	20.2	0.59	Accepted
	Durability.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		35.7	22.5	28.4	3.56	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
E	Examination of product.	Meets product drawing.		PASSED				Accepted
	Vibration, sinusoidal.	No discontinuities of 1 μs or longer duration.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
F	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		21.1	18.9	19.84	0.61	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Humidity-temperature cycling.	No damage.		PASSED				Accepted
	Insulation resistance.	50 MΩ minimum.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		35.2	22.7	29.18	4.19	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
G	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22.4	19.3	20.67	0.92	Accepted
	Resistance to reflow soldering heat.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		36.9	23	30.27	4.05	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
H	Examination of product.	Meets product drawing.		PASSED				Accepted
	Solderability.	95% solder coverage min.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted

Figure 4

2.4. 2041314-1

Test Group	Test Description	Requirement		Test Result				Judgment
				Max.	Min.	Ave.	Std. Dev.	
A	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22	18.9	20.46	0.9	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.8	22.2	28.75	3.76	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
B	Examination of product.	Meets product drawing.		PASSED				Accepted
	Mating force.	150 gf per contact maximum.	60P	3864	3349	3533	200.5	Accepted
	Unmating force.	20 gf per contact minimum.	60P	1735	1436	1563	117	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
C	Examination of product.	Meets product drawing.		PASSED				Accepted
	Contact retention force.	200 gf per contact minimum.		452	328	390	36.69	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
D	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22	19.3	20.7	0.77	Accepted
	Durability.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.7	22.9	28.5	3.5	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
E	Examination of product.	Meets product drawing.		PASSED				Accepted
	Vibration, sinusoidal.	No discontinuities of 1 μs or longer duration.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
F	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		21.7	19.6	20.68	0.59	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Humidity-temperature cycling.	No damage.		PASSED				Accepted
	Insulation resistance.	50 MΩ minimum.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.4	22.3	28.08	3.57	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
G	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		21.8	19.9	20.85	0.55	Accepted
	Resistance to reflow soldering heat.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.9	22.3	28.82	3.61	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
H	Examination of product.	Meets product drawing.		PASSED				Accepted
	Solderability.	95% solder coverage min.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted

Figure 5

2.5. 2041315-1

Test Group	Test Description	Requirement		Test Result				Judgment
				Max.	Min.	Ave.	Std. Dev.	
A	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22.8	20	21.44	0.86	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.1	22.9	28.5	3.15	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
B	Examination of product.	Meets product drawing.		PASSED				Accepted
	Mating force.	150 gf per contact maximum.	60P	3864	3349	3533	200.5	Accepted
	Unmating force.	20 gf per contact minimum.	60P	1735	1436	1563	117	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
C	Examination of product.	Meets product drawing.		PASSED				Accepted
	Contact retention force.	200 gf per contact minimum.		453	337	396.2	34.69	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
D	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22.9	20	21.3	0.8	Accepted
	Durability.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.5	23	29	346	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
E	Examination of product.	Meets product drawing.		PASSED				Accepted
	Vibration, sinusoidal.	No discontinuities of 1 μs or longer duration.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
F	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		23	19.9	21.46	0.88	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Humidity-temperature cycling.	No damage.		PASSED				Accepted
	Insulation resistance.	50 MΩ minimum.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.7	23	28.93	3.36	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
G	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		23	18.9	21	1.2	Accepted
	Resistance to reflow soldering heat.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		34.8	23.1	38.71	3.3	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
H	Examination of product.	Meets product drawing.		PASSED				Accepted
	Solderability.	95% solder coverage min.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted

Figure 6

2.6. 1-1734054-2

Test Group	Test Description	Requirement		Test Result				Judgment
				Max.	Min.	Ave.	Std. Dev.	
A	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		24.1	15.6	20.56	2.01	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		27.9	18.5	23.83	2.11	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
B	Examination of product.	Meets product drawing.		PASSED				Accepted
	Mating force.	150 gf per contact maximum.	12P	920	870	900	24.49	Accepted
	Unmating force.	20 gf per contact minimum.	12P	530	470	496	24.08	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
C	Examination of product.	Meets product drawing.		PASSED				Accepted
	Contact retention force.	200 gf per contact minimum.		367	303	329.9	12.55	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
D	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		23.1	17.2	20	1.56	Accepted
	Durability.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		26.7	20.4	23.6	1.66	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
E	Examination of product.	Meets product drawing.		PASSED				Accepted
	Vibration, sinusoidal.	No discontinuities of 1 μs or longer duration.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
F	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22.4	17.3	19.84	1.36	Accepted
	Insulation resistance.	100 MΩ minimum.		PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.		PASSED				Accepted
	Humidity-temperature cycling.	No damage.		PASSED				Accepted
	Insulation resistance.	50 MΩ minimum.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		26.4	20.2	23.3	1.78	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
G	Examination of product.	Meets product drawing.		PASSED				Accepted
	Low level contact resistance.	40 mΩ maximum initial.		22.6	17.3	19.75	1.45	Accepted
	Resistance to reflow soldering heat.	No damage.		PASSED				Accepted
	Low level contact resistance.	60 mΩ maximum final.		26.7	19.9	23.26	1.76	Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted
H	Examination of product.	Meets product drawing.		PASSED				Accepted
	Solderability.	95% solder coverage min.		PASSED				Accepted
	Examination of product.	Meets product drawing.		PASSED				Accepted

Figure 7