

Serial ATA Connector

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Tyco Electronics Serial ATA connector to determine its conformance to the requirements of Product Specification 108-57896, Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the Serial ATA connector.

1.3. Conclusion

The Serial ATA connector listed in paragraph 1.5. conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-57896, Revision A.

1.4. Product Description

The Serial ATA connector is a high-speed serial link replacement for the parallel ATA attachment of mass storage devices.

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	5 ea.	2041435-1	SATA 22P RCPT 9.2CH RA SMT w/ 2 Nuts
A, B, C, D, E, F, G	5 ea.	2041456-1	SATA 22P RCPT 8.2CH RA SMT w/ 2 Nuts
A, B, C, D, E, F, G	5 ea.	2041457-1	Slimline SATA 13P RCPT 5.85CH RA SMT

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)						
	A	B	C	D	E	F	G
	Test Sequence (b)						
Examination of product.	1, 5	1, 8	1, 8	1, 8	1, 5	1, 3	1, 3
Low level contact resistance.	2, 4	3, 6	2, 4, 6		2, 4		
Dielectric withstanding voltage.				3, 7			
Insulation resistance.				2, 6			
Contact current rating. (Power segment)			7				
Mating force.		2					
Unmating force.		7					
Contact retention force.						4	
Durability.	3						
Vibration, random.		4 (c)					
Mechanical shock.		5					
Reseating			5				
Thermal shock.				4			
Humidity, steady state.				5			
Temperature life.			3				
Solderability.							2
Resistance to reflow soldering heat.						2	
Salt spray.					3		

- NOTE**
- (a) See paragraph 1.5.
 - (b) Numbers indicate sequence in which test are performed.
 - (c) Durability preconditioning only 50 cycles required.

Figure 1

2. TEST RESULT

2.1. Part number 2041435-1:

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.	30 mΩ max. initial.	29.14	21.7	22.58	0.84	Accepted
	Durability.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	5.99	-7.01	0.26	1.17	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
B	Examination of product.	Meets product drawing.	PASSED				Accepted
	Mating force.	20 N max.	14.5	13.13	13.74	0.5	Accepted
	Low level contact resistance.	30 mΩ max. initial.	25.94	21.76	22.98	0.75	Accepted
	Vibration, random.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted
	Mechanical shock.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	6.84	-2.47	1.63	1.86	Accepted
	Unmating force.	4 N minimum.	5.59	4.51	4.98	0.4	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
C	Examination of product.	Meets product drawing.	PASSED				Accepted
	Low level contact resistance.	30 mΩ max. initial.	24.64	21.38	22.56	0.68	Accepted
	Temperature life.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	2.27	-2.11	0.05	0.94	Accepted
	Reseating	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	2.06	-2.46	-0.09	0.74	Accepted
	Contact current rating. (Power segment)	Less than 30°C temp rise.	25	14	19.8	4.66	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
D	Examination of product.	Meets product drawing.	PASSED				Accepted
	Insulation resistance.	1000 MΩ minimum.	PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted
	Thermal shock.	No damage.	PASSED				Accepted
	Humidity, steady state.	No damage.	PASSED				Accepted
	Insulation resistance.	1000 MΩ minimum.	PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
E	Examination of product.	Meets product drawing.	PASSED				Accepted
	Low level contact resistance.	30 mΩ max. initial.	24.81	21.41	22.77	0.69	Accepted
	Salt spray.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	6.33	-1.35	0.87	1.54	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
F	Examination of product.	Meets product drawing.	PASSED				Accepted
	Resistance to reflow soldering heat.	95% solder coverage min.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
	Contact retention force.	3 N per contact minimum.	7.9	4.8	6.18	0.66	Accepted
G	Examination of product.	Meets product drawing.	PASSED				Accepted
	Solderability.	No damage.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted

Figure 2

2.2. Part number 2041456-1:

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.	30 mΩ max. initial.	25.85	19.99	22.4	1.21	Accepted
	Durability.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	4.49	-2.68	0.35	1.38	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
B	Examination of product.	Meets product drawing.	PASSED				Accepted
	Mating force.	20 N max.	15.58	12.45	13.88	1.22	Accepted
	Low level contact resistance.	30 mΩ max. initial.	27.58	20.5	22.43	1.26	Accepted
	Vibration, random.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted
	Mechanical shock.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	8.38	-1.88	2.39	2.45	Accepted
	Unmating force.	4 N minimum.	6.17	4.51	5.21	0.71	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
C	Examination of product.	Meets product drawing.	PASSED				Accepted
	Low level contact resistance.	30 mΩ max. initial.	28.03	20.36	22.72	1.53	Accepted
	Temperature life.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	3.25	-5.07	-0.12	1.48	Accepted
	Reseating	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	2.95	-2.73	0.07	0.98	Accepted
	Contact current rating. (Power segment)	Less than 30°C temp rise.	19	16	17.4	1.14	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
D	Examination of product.	Meets product drawing.	PASSED				Accepted
	Insulation resistance.	1000 MΩ minimum.	PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted
	Thermal shock.	No damage.	PASSED				Accepted
	Humidity, steady state.	No damage.	PASSED				Accepted
	Insulation resistance.	1000 MΩ minimum.	PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
E	Examination of product.	Meets product drawing.	PASSED				Accepted
	Low level contact resistance.	30 mΩ max. initial.	29.07	20.48	22.64	1.19	Accepted
	Salt spray.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	3.12	-6.89	-0.32	1.46	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
F	Examination of product.	Meets product drawing.	PASSED				Accepted
	Resistance to reflow soldering heat.	95% solder coverage min.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
	Contact retention force.	3 N per contact minimum.	7.03	3.37	4.94	0.99	Accepted
G	Examination of product.	Meets product drawing.	PASSED				Accepted
	Solderability.	No damage.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted

Figure 3

2.3. Part number 2041457-1:

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.	30 mΩ max. initial.	23.89	18.7	20.29	0.96	Accepted
	Durability.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	9.56	-4.2	0.59	1.76	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
B	Examination of product.	Meets product drawing.	PASSED				Accepted
	Mating force.	20 N max.	4.8	4.12	4.53	0.27	Accepted
	Low level contact resistance.	30 mΩ max. initial.	24.55	19.12	20.48	0.87	Accepted
	Vibration, random.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted
	Mechanical shock.	No discontinuities of 1 μs or longer duration.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	9.77	-4.4	3.1	2.77	Accepted
	Unmating force.	2.5 N minimum.	4.31	3.04	3.67	0.5	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
C	Examination of product.	Meets product drawing.	PASSED				Accepted
	Low level contact resistance.	30 mΩ max. initial.	25.7	18.15	20.17	1.26	Accepted
	Temperature life.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	7.19	-2.95	1.83	1.63	Accepted
	Reseating	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	4.33	-7.13	0.58	1.75	Accepted
	Contact current rating. (Power segment)	Less than 30°C temp rise.	20	16	17.6	1.52	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
D	Examination of product.	Meets product drawing.	PASSED				Accepted
	Insulation resistance.	1000 MΩ minimum.	PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted
	Thermal shock.	No damage.	PASSED				Accepted
	Humidity, steady state.	No damage.	PASSED				Accepted
	Insulation resistance.	1000 MΩ minimum.	PASSED				Accepted
	Dielectric withstanding voltage.	No breakdown or flashover.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
E	Examination of product.	Meets product drawing.	PASSED				Accepted
	Low level contact resistance.	30 mΩ max. initial.	25.51	18.13	20.15	1.19	Accepted
	Salt spray.	No damage.	PASSED				Accepted
	Low level contact resistance.	ΔR15 mΩ max. increase.	7.73	-1.86	1.63	2.04	Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
F	Examination of product.	Meets product drawing.	PASSED				Accepted
	Resistance to reflow soldering heat.	95% solder coverage min.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted
	Contact retention force.	3 N per contact minimum.	4.84	3.47	4.04	0.41	Accepted
G	Examination of product.	Meets product drawing.	PASSED				Accepted
	Solderability.	No damage.	PASSED				Accepted
	Examination of product.	Meets product drawing.	PASSED				Accepted

Figure 4