

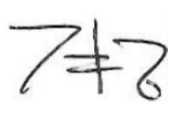


Validation Test Report

CLUSTER BLOCK 3P HSG

May 23, 2014.



Tested & Reported By	Reviewed By	Approved By	Test Date	From April 14, 2014 To May 15, 2014
			Classification	Unrestricted

● TE CONNECTIVITY RELIABILITY TEST REPORT

Test Name : Validation for CLUSTER BLOCK 3P HSG.

1. Introduction

1-1 Purpose

Testing was performed on the CLUSTER BLOCK 3P HSG to determine if it conformance to the requirements of Product Specification 108-61156 , Rev.C

1-2 Scope

This report covers the electrical, mechanical, environmental performance requirements of the CLUSTER BLOCK 3P HSG.

The testing was performed between April 14, 2014 and May 15, 2014.

1-3 Test Samples

The test samples were randomly selected from normal current production lots.

P/N	Description
2005820-1	CLUSTER BLOCK 3P CLIP HSG
1-2005820-1	CLUSTER BLOCK 3P CLIP HSG
2-2005820-9	CLUSTER BLOCK 3P CLIP HSG(GWT)
2108798-1	CLUSTER BLOCK 3P CLIP HSG TPA
5-170063-2	2.3 DIA CLUSTER PIN RECEPTACLE

1-4 Conclusion

The CLUSTER BLOCK 3P HSG meets the electrical, mechanical and environmental performance requirements of Product Specification 108-61156 , Rev.C

1-5 Attachment

- 1) Test Sequence
- 2) Requirements and Test Procedure
- 3) Test Result
- 4) Photograph of Test

1) Test Sequence

501-61082

Test or examination	Test Group							
	1	2	3	4	5	6	7	8
	Test Sequence: see note (a)							
Examination of product	1,3	1,3	1,7	1,3	1,3	1,3	1,3	1,5
Dielectric withstanding voltage	2							
Temperature Rising		2						
Connector Mating Force			3					
Connector Unmating Force			4					
Contact Insertion Force							2	
Contact Retention Force				2				
Contact Unmating Force					2			
Crimp Tensile Strength						2		
Termination Resistance (Low Level)			2,6					2,4
Durability(Repeated Mate/Unmating)			5					
Thermal Shock								3

2) Requirements and Test Procedure

Para.	Test Items	Requirements		Procedures
3.5.1	Examination of Product	Meets requirements of product drawing and TE Specification 114-5235		Visual inspection No Physical damage
Electrical Requirements				
3.5.2	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur.		2.7 kVAC for 1 second. Test between adjacent circuits of unmated connectors. Current leakage: 5 Ma Max MIL-STD 202-301
3.5.3	Termination Resistance	5m Ω Max. (Initial) 8m Ω Max. (Final)		Subject mated contacts assembled in housing to 20mV max. Open circuit at 10Ma. See Fig.4 TE Spec 109-5311-1
3.5.4	Temperature Rising	When subjected to test current of 10 amp d.c. mated connectors shall not show a temperature rise greater than 35℃.		According to test method specified in Fig.3 while increasing test potential by 5 amp d.c., measurement shall be done until the temperature rises up to 150℃. The applicable pin shall be the Fusite Pin of part No. 393-38
Mechanical Requirements				
3.5.5	Crimp Tensile Strength	Wire Size		Apply an axial pull-off load to crimped on a 150mm long wire of contact secured on the tester, Operation Speed: 100mm/min. TE Spec. 109-5205
		mm ²	(AWG)	
		0.50	20	
		0.75	18	
		1.25	16	
			Crimp Tensile (min)	
			N (Kgf)	
			78.4(8.0)	
			98.0(10.0)	
			147.0(15.0)	
3.5.6	Contact Retention Force	68.6 N (7Kgf) Min. without TPA 83.4 N (8.5kgf) Min with TPA		The contacts crimped on an approximately 150mm long wire and then assembled in the housing shall be set to a tensile tester, and an axial pull-off load shall be applied to the crimped wire. Operation Speed: 100mm/min. TE Spec. 108-5212

3.5.7	Connector Mating Force	3Pos: 134.4N(13.7kgf)Max.(Initial) 156.8N(16.0kgf)Max. (6 th)	Operation Speed: 100mm/min. Measure the force required to mate connectors. TE Spec. 109-5206 Condition The gauge pin shown in Fig.2 shall be used.
3.5.8	Connector Unmating Force	3Pos. : 37.3N(3.8kgf)Min.	Operation Speed: 100mm/min. Measure the force required to unmate connectors. TE Spec. 109-5206 Condition The gauge pin shown in Fig.2 shall be used.
3.5.9	Contact Unmating Force	12.1 N (1.23 kgf) Min.	Operation Speed: 100 mm/min. Measure the force required to unmate contact. TE Spec. 109-5206 Condition The applicable pin shown in Fig.4 shall be used.
3.5.10	Contact Insertion Force	14.7 N (1.5 kgf) Max.	Measure the force required to insert contact in housing. TE Spec. 109-5211
3.5.11	Durability (Repeated Mate/Unmating)	8m Ω Max	No. of Cycles: 6 cycles
Environmental Requirements			
3.5.12	Thermal Shock	8m Ω Max. (Final)	Mated connector -55 30min / 85 30min Making this a cycle, repeat 250 cycles. TE Spec. 109-5103 Condition A MIL-STD-202 Method 107-1 Condition A-1 The Measurement is held after being left indoor for 3 hours.

3) Test Result
- Test Group 1

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result									Judgment
					Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP	-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final				OK	OK	OK	OK	OK	-	-	-	OK
2	Dielectric withstanding Voltage	Initial	No creeping discharge nor flashover shall occur.	-	-	OK	OK	OK	OK	OK	-	-	-	OK

- Test Group 2

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result									Judgment
					Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP	-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final				OK	OK	OK	OK	OK	-	-	-	OK
2	Temperature Rising	Initial	Δ 35 °C Max. AWG16 : 10A AWG18 : 7A AWG20 : 5A	°C	#16	23.70	21.68	21.15	22.65	22.13	21.15	23.70	22.26	OK
					#18	15.71	16.13	15.43	15.74	15.69	15.43	16.13	15.74	OK
					#20	7.27	7.73	8.15	7.88	7.68	7.27	8.15	7.74	OK

– Test Group 3

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result									Judgment
					Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP	-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final				OK	OK	OK	OK	OK	-	-	-	OK
2	Termination Resistance (Low Level)	Initial	5 mΩ Max.	mΩ	-	4.62	4.50	4.64	4.62	4.35	4.35	4.64	4.55	OK
		After Durability	8 mΩ Max.			4.65	4.51	4.66	4.63	4.40	4.40	4.66	4.57	OK
3	Connector Mating Force	Initial	13.7 kgf Max.	kgf	-	9.69	9.88	10.14	10.24	9.83	9.69	10.24	9.96	OK
		After Durability	16 kgf Max.			8.65	8.53	8.84	8.60	8.79	8.53	8.84	8.68	OK
4	Connector Un-Mating Force	Initial	3.8 kgf Min.			8.88	9.40	9.52	8.97	9.38	8.88	9.52	9.23	OK

– Test Group 4

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result									Judgment
					Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP	-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final				OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Insertion Force	Initial	1.5 kgf Min.	kgf	-	1.07	1.08	1.13	1.12	1.20	1.07	1.20	1.12	OK

– Test Group 5

NO	Test Items	Test Condition	Acceptance criteria		Unit	Test Result									Judgment
						Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP		-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final					OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Retention Force	Initial	Without TPA	7 kgf Min.	kgf	-	15.20	14.74	14.19	15.05	14.95	14.19	15.20	14.83	OK
			With TPA	8.5 kgf Min.			22.00	20.69	22.67	20.19	21.48	20.19	22.67	21.41	OK

– Test Group 6

NO	Test Items	Test Condition	Acceptance criteria		Unit	Test Result									Judgment
						Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP		-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final					OK	OK	OK	OK	OK	-	-	-	OK
2	Contact Unmating Force	Initial	1.23 kgf Min.		kgf	-	2.52	2.79	2.65	2.23	2.43	2.23	2.79	2.52	OK

– Test Group 7






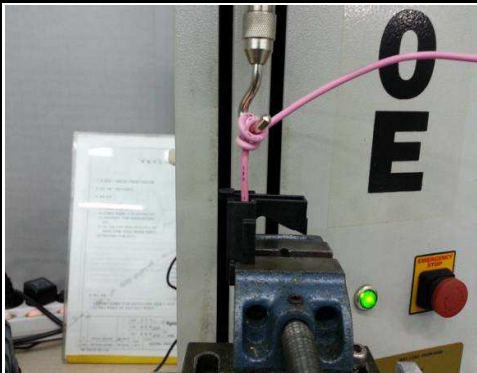
NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result									Judgment
					Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP	-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final				OK	OK	OK	OK	OK	-	-	-	OK
2	Crimp Tensile Strength	Initial	15 kgf Min.	kgf	#16	30.87	32.62	27.5	28.23	29.12	27.50	32.62	29.67	OK
			10 kgf Min.		#18	22.22	21.76	22.76	23.41	22.84	21.76	23.41	22.60	OK
			8 kgf Min.		#20	12.40	12.18	12.25	12.48	12.30	12.18	12.48	12.32	OK


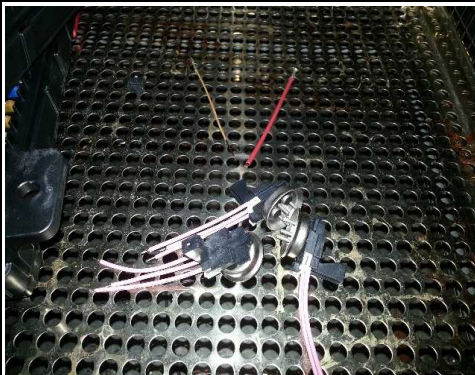


– Test Group 8

NO	Test Items	Test Condition	Acceptance criteria	Unit	Test Result									Judgment
					Wire (AWG)	S1	S2	S3	S4	S5	Min.	Max.	Avg.	
1	Examination of Product	Initial	Meets requirements of product drawing and AMP	-	-	OK	OK	OK	OK	OK	-	-	-	OK
		Final				OK	OK	OK	OK	OK	-	-	-	OK
2	Termination Resistance (Low Level)	Initial	5 mΩ Max.	mΩ	-	4.54	4.47	4.52	4.60	4.39	4.39	4.60	4.50	OK
		After Thermal Shock	8 mΩ Max.		-	4.87	4.79	4.85	4.77	4.72	4.72	4.87	4.80	OK

4) Photograph of Test

501-61082

NO.	Test Items	Photograph	Remark	NO.	Test Items	Photograph	Remark
1	Termination Resistance (Low Level)		-	4	Connector Mating Force		-
2	Dielectric Withstanding Voltage		-	5	Connector Unmating Force		-
3	Temperature Rising		-	6	Contact Retention Force		-

NO.	Test Items	Photograph	Remark	NO.	Test Items	Photograph	Remark
7	Contact Unamting Force		-	10	Thermal Shock		-
8	Crimp Tensile Strength		-	11	-	-	-
9	Contact Insertion Force		-	12	-	-	-