QUALIFICATION TEST REPROT

501-60009 Rev. 0

Product Specification : 108-60038 Rev. O

Reference Test Report No. : TR-94062

Date : 20SEP04

Classification : Unrestricted

LTR	REVISION RECORD	DR	DATE
O	Released FB00-0268-04	C.W	20SEP 04

DIST

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TITLE

AMP Connector, CHAMP.050 Series I Connector Lead Free Version

1. Introduction

1.1 Purpose

Testing was performed on the CHAMP .050 Series (I) Connector to determine if it meets the requirements of AMP Specification, 108-60038. Rev.0

1.2 Scope

This report covers the electrical, mechanical and environmental performance requirements of the CHAMP .050 Series (I) Connector.

1.3 Conclusion

The CHAMP .050 Series (I) Connector meets the electrical, mechanical and environmental performance requirements of Product Specification, 108-60038, Rev. 0.

1.4 Product Description

CHAMP .050 Series (I) Connector has been designed for ultra-high density, board-to-board termination.

1.5 Test Samples

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

Part Number	Description
5175472	Plug Connector (Horizontal Type)
5175473	Plug Connector (Vertical Type)
5175474	Receptacle Connector (Horizontal Type)
5175475	Receptacle Connector (Vertical Type)
5175610	Plug Connector (Horizontal Type)
5175611	Plug Connector (Vertical Type)
5175612	Receptacle Connector (Horizontal Type)
5175613	Receptacle Connector (Vertical Type)
5176850	Receptacle Connector (Horizontal Type)
5176852	Plug Connector (Horizontal Type)
5176953	Receptacle Connector (Horizontal Type)

Fig. 1

2. Test Contents

No.	Test Items	Requirements	Judgement
2.1	Confirmation of Product	Inspect visually per applicable Quality Inspection Plan (QIP)	Acceptable
		Electrical Requirements	
2.2	Termination Resistance (Low Level)	Initial: 35mΩ Max. Final: 50mΩ Max.	Acceptable
2.3	Dielectric Strength	Initial/Final: 0.5KV AC, 1 minute No abnormality allowed	Acceptable
2.4	Insulation Resistance	Initial: 1000MΩ Min. Final: 100 MΩ Min.	Acceptable
2.5	Temperature Rising	30°C Max. Test Current: 1 A	Acceptable
		Physical Requirements	
2.6	Vibration (Low Frequency)	10~55~10 Hz/1 minutes. Amplitude: 1.52mm, X, Y& Z Axes: 2 hours. No electrical discontinuity greater than 1 μsec shall occur.	Acceptable

Fig. 2 (To be continued)

2.7	Physical Shock	No electrical discontinuity greater than 1 μsec allowed. 490 m/s²(50 G), Halfsine Wave.	Acceptable
2.8	Connector Mating Force	0.882 N/POSN (0.09 kgf/POSN) Max. Head Operating Speed:100 mm/minute	Acceptable
2.9	Connector Unmating Fore	0.147N/POSN(0.015 kgf/POSN) Min. Head Operating Speed: 100mm/minute	Acceptable
2.10	Durability(Repeated Mating/Unmating)	Repeated mating/unmating for 500 cycles at a rate of 40 cycles/minute.	Acceptable
2.11	Solderability	Solder Temperature:230°C, 5sec. More than 95% of tested area was covered with fresh, wet solder.	Acceptable
Environmental Requirements			
2.12	Resistance to Soldering Heat	Solder Temperature 260°C, 10sec. No abnormalities were found, Post retention force was met.	Acceptable
2.13	Thermal Shock	-55°C~+85°C, 5 cycles 50 mΩ Max.	Acceptable

Fig. 2 (To be continued)

2.14	Temperature Humidity Cycling	25°C~65°C, 90~95%RH, 240 Hrs. 50 mΩ Max.	Acceptable
2.15	Salt Spray	5%, 48 Hrs. 50 mΩ Max.	Acceptable
2.16	Industrial SO_2 Gas	10 ppm, 48 Hrs. 50 mΩ Max.	Acceptable
2.17	Temperature Life	85°C, 250 Hrs. 50 mΩ Max.	Acceptable

Fig. 2 (end)

Test Items	Test Group										
	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence										
Confirmation of Product	1, 7	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, 5				
Dielectric Strength								3, 6			
Insulation Resistance								2, 5			
Temperature Rising									2		
Vibration (Low Frequency)							3				
Physical Shock							4				
Connector Mating Force	3										
Connector Unmating Force	4										
Durability (Repeated Mating/Unmating)	5										
Solderability											2
Resistance to Soldering Heat										2	
Thermal Shock			3								
Temperature-Humidity Cycling		3						4			
Salt Spray						3					
Industrial SO2 Gas					3						
Temperature Life (Heat aging)				3							

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

5-1 Termination Resistance (Low Level) Unit: m Ω

TEST GROUP	MRASURED TIME	CIRCUIT	N	MAX.	MIN.	X	S
Ⅰ Repeated Mating/Unmating (500 th.)	INITIAL	1~50	250	20.09	15.34	16.87	1.09
		51~100	250	17.42	15.42	16.44	0.48
	FINAL	1~50	250	17.98	15.42	16.68	0.77
		51~100	250	17.76	15.32	16.24	0.46
Humidity per MIL-STD-202-106D (10 Cycles) Ⅱ	INITIAL	1~50	150	19.67	15.61	17.10	0.85
		51~100	150	17.38	15.70	16.49	0.30
	FINAL	1~50	150	24.04	15.92	17.69	1.23
		51~100	150	24.04	16.01	17.53	1.25
Thermal Shock – 55+85°C 5 Cycles Ⅲ	INITIAL	1~50	150	19.64	15.40	17.01	1.09
		51~100	150	17.63	15.47	16.53	0.43
	FINAL	1~50	150	18.44	15.46	16.94	0.89
		51~100	150	17.56	15.54	16.55	0.49
Temperature Life 85°C 250 Hours Ⅳ	INITIAL	1~50	150	18.71	15.69	17.04	0.77
		51~100	150	20.08	15.34	16.86	0.65
	FINAL	1~50	150	18.44	15.81	17.17	0.79
		51~100	150	20.13	15.54	16.97	0.55

5-1 Termination Resistance (Low Level) (Continued) Unit: m Ω

TEST GROUP	MEASURRD TIME	CIRCUIT	N	MAX.	MIN.	X	S
Sulfurous Acid Gas 10 p. p. m. 48 Hours Ⅴ	INITIAL	1~50	250	18.61	15.54	16.97	0.70
		51~100	250	17.62	15.74	16.76	0.48
	FINAL	1~50	250	21.00	15.53	17.14	1.09
		51~100	250	23.13	15.70	17.11	1.23
Salt Spray 5% 48 Hours Ⅵ	INITIAL	1~50	150	18.31	15.72	17.02	0.78
		51~100	150	17.61	15.51	16.88	0.52
	FINAL	1~50	150	22.51	15.63	17.12	1.18
		51~100	150	19.37	15.11	17.01	0.99
Vibration, Physical Shock Ⅶ	INITIAL	1~50	150	19.84	16.11	17.42	0.78
		51~100	150	17.64	13.79	16.60	0.71
	FINAL	1~50	150	19.71	17.09	18.02	0.72
		51~100	150	17.28	15.05	16.31	0.69

Sample No.	Insulation Resistance		Dielectric Strength	
	Initial	Humidity	Initial	Humidity
1	$0.625X10^{10}$	$0.837X10^{9}$		
2	$0.890X10^{10}$	$0.735X10^{9}$		
3	$0.735X10^{10}$	$0.823X10^{9}$		

5-3 Connector Repeated Mting/Unmating) Unit:g/Pin

	MEASURED TIME	N	MAX	MIN	X
Mating	Initial	5	41.5	32.5	36.1
	500th	5	50.5	33.0	42.2
Unmating	Initial	5	19.5	16.5	17.7
	500th	5	29.5	37.5	33.7

5-4 Vibration and Physical Shock:

During the test, no electrical discontinuity greater than 1 microsecond took place in the test circuit.

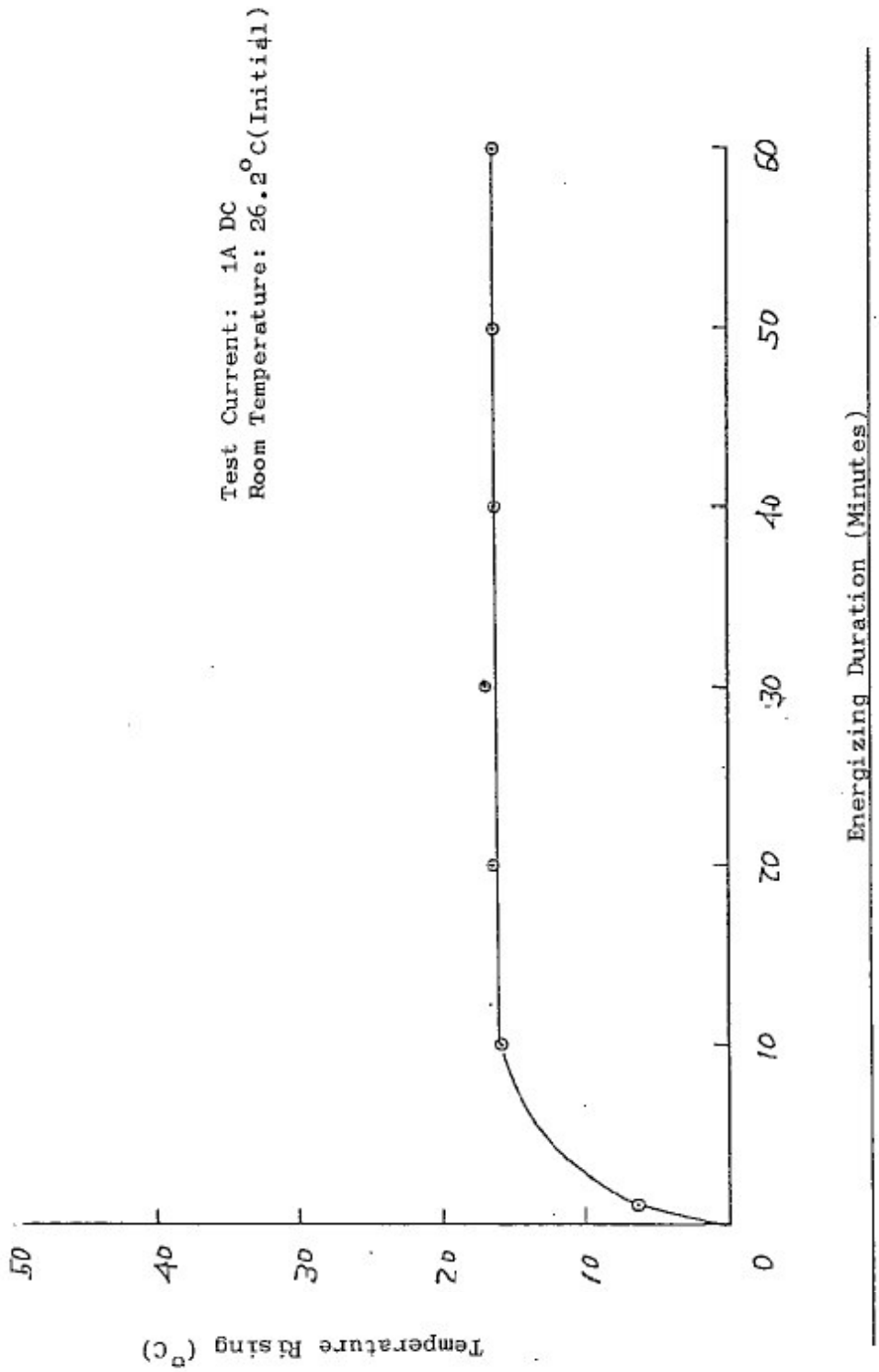
5-5 Resistance to Soldering Heat:

After testing no physical abnormalities such as rattling of contact, housing cracks and Deformation of housing, were evident.

5-6 Solderability:

More than 95% of the tested area appeared in fresh, wet solder.

5-7 Temperature Rising:


Test Current: 1A DC
Room Temperature: 26.2°C(Initial)
Temperature Rising (°C)
0
10
20
30
40
50
Energizing Duration (Minutes)
0
10
20
30
40
50
60