AMP 2.5mm Pitch EMIX Economic Metric Interconnect Series Wire-To-Board System.

1. INTRODUCTION

1.1. Purpose

Testing was performed on the AMP 2.5mm Pitch EMIX, Economic Metric Interconnect Series, Wire-To-Board System connector to determine its conformance to the requirements of Product Specification 108-57175 Rev O.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of AMP 2.5mm Pitch EMIX, Economic Metric Interconnect Series, Wire-To-Board System manufactured by the Personal Computer Division.

1.3. Conclusion

AMP 2.5mm Pitch EMIX, Economic Metric Interconnect Series, Wire-To-Board System connector meets the electrical, mechanical, and environmental performance requirements of Product Specification 108-57175 Rev O.

1.4. Product Description

AMP 2.5mm Pitch EMIX, Economic Metric Interconnect Series, Wire-To-Board System connector is designed for printed circuit board applications. The contacts are copper alloy, Tin plating on the soldertail. The housing material is thermoplastic, UL94V-2.

1.5. Test Samples

The test samples were randomly selected from normal current production lots, and the following part numbers were used for test:

Product Part No.	Descriptions	
X- 1470222 -X	Receptacle CRIMP Housing,	2-18 Circuit Position
X- 1470223 -X	Receptacle CRIMP Contact,	Applicable wire: AWG#22-28
X- 1470224 -X	Post Header Vertical Type,	2-18 Circuit Position
X- 1470225 -X	Post Header Right-angle Type,	2-18 Circuit Position

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1.6. Qualification Test Sequence

Test of Examination	1	2	3	4
Examination of Product	1	1,8	1,7	1,4
Contact Resistance	4	4	2,4,6	
Insulation Resistance		2,6		
Dielectric Withstanding Voltage		3,7		
Mating Force	5			
Unmating Force	6			
Individual Insert-Extraction Force	3			
Tensile Strength of Wire Termination	2			
Contact Retention Force	7			
Post Retention Force	8			
Temperature Life			3	
Humidity, Steady State		5		
Salt Spray			5	
Solderability				2
Resistance to Soldering Heat				3

Figure 1.

NOTE: (a) The numbers indicate sequence in which tests were performed.

2. TEST CONTENT

NO	TEST ITEMS	REQUIREMENTS		JUDGEMENT
2.1.1	Conformity of Product physical requirements	Product shall conform to the requirements of applicable Product Drawing and Application Specification		Acceptable
ELECTRICAL PERFORMANCE REQUIREMENTS				
2.2.1	Contact Resistance	Initial	10m ohms max.	Acceptable
		Final	20m ohms max	
2.2.2	Insulation Resistance	1000M ohms min. (Initial) 500M ohms min. (Final)		Acceptable
2.2.3	Dielectric Strength	Connector must withstand test potential of 1000V AC for 1 min.		Acceptable
MECHANICAL PERFORMANCE REQUIREMENTS				
2.3.1	Mating/Unmating Force	Circuit Pos	Mating N (kgf max)	Unmating N (kgf min)	Acceptable
		2 pos	34.3N (3.5kgf)	5.39N (0.55kgf)	
		8 pos	76.4N (7.8kgf)	9.8N (1.0kgf)	
		15 pos	117.6N (12.0kgf)	16.66N (1.7kgf)	
		Mate and unmate to measure the force required to engage and disengage by a rate of 25mm a minute			
2.3.2	Single PIN Insertion and withdrawal force	Insertion Force standard 4.9N(0.5kgf) max Withdrawal force standard 0.784N(0.08kgf) min. At a rate of 25±3mm a minute.		Acceptable
2.3.3	Terminal / Housing Retention Force	Retention Force standard 14.7N(1.5kgf) min. Apply axial pull out force at the speed rate of 25±3mm/minute on the terminal assembled in the housing		Acceptable
2.3.4	Tensile Strength of Wire Termination	AWG#22-34.3N (3.5kgf) min AWG#24-29.4N (3.0kgf) min AWG#26-24.5N (2.5kgf) min AWG#28-19.6N (2.0kgf) min At a rate of 100mm a minute.		Acceptable
2.3.5	Pin Retention Force	standard 1.0kgf min		Acceptable
ENVIRONMENTAL PERFORMANCE REQUIREMENTS				
2.4.1	Temperature Life (Heat aging)	85℃± 2℃ for 240 hours. Termination resistance (low level) shall be met.		Acceptable
2.4.2	Humidity, Steady state	40±2℃ 90-95% R.H for 240 hours. Insulation Resistance(low level)shall be met. Dielectric strength shall be met. **Contact Resistance standard 20mΩ(max)** **Insulation Resistance standard 500MΩ(min)** Dielectric Strength standard 500V/AC		Acceptable
2.4.3	Salt Spray	Appearance no damage, **Contact resistance 20mΩ max.** 48±4 Hour exposure to a salt spray from the 5±1% solution at 35±2℃.		Acceptable

2.4.4	Solderability	245±5°C for 3sec The contact solder tails should be covered by a continuous new solder coating for 95% minimum of affected area.	Acceptable
2.4.5	Resistance to Soldering Heat	245±5℃ for 5±0.5seconds (Flow soldering) 350±5℃ for 3±1 seconds (Manual soldering) No physical damage shall occur.	Acceptable

3. TEST RESULT

NO	Test Items			Unit	Result					Spec.	Judgement
					N	Max	Min	Ave.	S		
1	Dielectric Strength		Initial	Volt	10	Tested samples withstood test potential of 1000V AC for 1 minutes, and showed no evidence of abnormalities in appearance.				No abnormalities	Acceptable
			After Humidity	Volt	10	Tested samples withstood test potential of 500V AC for 1 minutes, and showed no evidence of abnormalities in appearance.				No abnormalities	
2	Insulation Resistance		Initial	Ohm	10	All samples 1000M ohm min				1000M ohm min	Acceptable
			After Humidity	Ohm	10	All samples 500M ohm min				500M ohm min	
3	Mating Force	2 pos	1st mating	Kgf	10	1.3	1.0	1.162	0.104	3.6kgf Max	Acceptable
		8 pos	1st mating	Kgf	20	2.98	2.56	2.757	0.1001	7.8kgf Max	Acceptable
		15 pos	1st mating	Kgf	30	4.38	3.6	3.878	0.217	12.0kgf Max	Acceptable
	Unmating Force	2 pos	1st unmating	Kgf	10	1	0.82	0.92	0.066	0.55kgf Min	Acceptable
		8 pos	1st unmating	Kgf	20	2.14	1.76	1.85	0.089	1.0kgf Min	Acceptable
		15 pos	1st unmating	Kgf	30	3.18	2.74	2.885	0.113	1.70kgf Min	Acceptable
4	Tensile Strength of Wire Termination		AWG#22	Kgf	10	5.9	5.6	5.777	0.113	3.5kgf Min	Acceptable
			AWG#24	Kgf	10	4.9	4.2	4.589	0.224	3.0kgf Min	Acceptable
			AWG#26	Kgf	10	3.8	3.4	3.6	0.149	2.5kgf Min	Acceptable
			AWG#28	Kgf	10	3.12	2.2	2.74	0.326	1.0kgf Min	Acceptable
5	Terminal/Housing Retention Force		2 pos	Kgf	6	3.51	3.32	3.39	0.067	1.5kgf Min	Acceptable
			8 pos	Kgf	24	3.59	2.98	3.28	0.086		Acceptable
			15 pos	Kgf	45	3.58	3.10	3.21	0.078		Acceptable
NO	Test Items			Unit	Result					Spec.	Judgement
					N	Max	Min	Ave.	S		
6	PIN Retention Force		2 pos-wv	Kgf	6	2.64	1.49	2.21	0.455	1.0kgf Min	Acceptable
			8 pos-wv	Kgf	24	2.47	1.63	2.138	0.239		Acceptable
			15pos-wv	Kgf	45	3.52	2.39	2.904	0.228		Acceptable
			2 pos-wr	Kgf	6	2.26	1.74	2.025	0.199		Acceptable
			8 pos-wr	Kgf	24	2.29	1.71	2.00	0.170		Acceptable

		15 pos-wr	Kgf	45	2.45	1.68	2.12	0.268		Acceptable
7	Single PIN Insertion and Withdrawal Force	Insertion	kgf	20	0.22	0.12	0.164	0.026	0.5kgf Min	Acceptable
		Withdrawal	kgf	20	0.23	0.11	0.155	0.048	0.08kgf Min	Acceptable
8	High temperature test	Initial	Milli-ohm	20	5.2	4.1	4.739	0.279	**10mΩ** Max	Acceptable
		Final		20	7.2	5.2	6.7	0.254	**20mΩ** Max	Acceptable
9	Humidity, Steady State	Initial	Milli-ohm	20	5.4	4.2	4.789	0.385	10 milliohm max	Acceptable
		Final		20	6.7	5.2	5.9	0.241	20 milliohm max	Acceptable
10	Solderability			More than 95% of tested area was covered with fresh wet solder.					Coverage 95%min	Acceptable
11	Resistance to Soldering Heat			All tested samples proved acceptable. Tested samples showed on evidence of effects such as deformation etc. that are detrimental to connector function.					No physical Damage shall occur	Acceptable
12	Salt Spray	Initial	Milli-ohm	20	5.7	4.4	5.039	0.397	10 milliohm max	Acceptable
		Final		20	6.8	5.8	6.4	0.348	20 milliohm max	Acceptable