TEST SUMMARY FOR MEGA-FIT WIRE TO BOARD CONNECTOR SYSTEM

1.0 SCOPE

This Test Summary covers Mega-fit® 5.70 mm pitch wire to board connector systems terminated with 16 to 12 awg or 1.5 to 4.0mm^2 stranded wire using crimp technology with tin or gold plating.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

Description	Series Number
Female Crimp Terminal	76823 / 172063
Receptacle Housing	170001 / 171692
Vertical Header	76829 / 172065 / 171597
Right Angle Header	76825 / 172064 / 171596

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Dimensions, Materials & Plating: See individual sales drawings.

2.3 PRODUCT SPECIFICATION TITLE AND DOCUMENT NUMBER

Product Specification for Mega-Fit Wire to Board Connector System: PS-76823-100

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 TESTING SEQUENCES

Reference Appendix A

3.2 OTHER DOCUMENTS AND SPECIFICATIONS

EIA-364-1000.01
SAE/USCAR-2

4.0 QUALIFICATION

Laboratory conditions and sample selection are in accordance with **EIA-364**.

5.0 PERFORMANCE

5.1 ELECTRICAL PERFORMANCE RESULTS

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
1	Contact Resistance (Low Level)	Initial (wire resistance removed) Tin	2 milliohm MAXIMUM	**0.35** mΩ	**0.29** mΩ	**0.43** mΩ
		Initial (wire resistance removed) 15µ" Gold	2 milliohm MAXIMUM	**0.47** mΩ	**0.36** mΩ	**0.61** mΩ
		After Durability [Item #9] Tin	2 milliohms MAXIMUM*	**0.04** mΩ	**-0.03** mΩ	**0.18** mΩ
		After Durability [Item #9] 15µ" Gold	2 milliohms MAXIMUM*	**0.08** mΩ	**-0.07** mΩ	**0.24** mΩ
		After Durability [Item #9] 30µ" Gold	2 milliohms MAXIMUM*	**0.04** mΩ	**-0.05** mΩ	**0.15** mΩ
		After Durability (preconditioning) [Item #10] Group I Tin	2 milliohms MAXIMUM*	**0.02** mΩ	**-0.02** mΩ	**0.08** mΩ
		After Durability (preconditioning) [Item #10] Group I 15µ" Gold	2 milliohms MAXIMUM*	**0.02** mΩ	**-0.08** mΩ	**0.17** mΩ
		After Durability (preconditioning) [Item #10] Group II Tin	2 milliohms MAXIMUM*	**0.04** mΩ	**-0.05** mΩ	**0.27** mΩ
		After Durability (preconditioning) [Item #10] Group II 15µ" Gold	2 milliohms MAXIMUM*	**0.02** mΩ	**-0.09** mΩ	**0.16** mΩ
		After Durability (preconditioning) [Item #10] Group III Tin	2 milliohms MAXIMUM*	**0.04** mΩ	**-0.02** mΩ	**0.16** mΩ
		After Durability (preconditioning) [Item #10] Group III 15µ" Gold	2 milliohms MAXIMUM*	**0.03** mΩ	**-0.09** mΩ	**0.16** mΩ
		After Durability (preconditioning) [Item #10] Group V Tin	2 milliohms MAXIMUM*	**0.03** mΩ	**-0.04** mΩ	**0.17** mΩ

*Change from Initial

5.1 ELECTRICAL PERFORMANCE RESULTS (continued)

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
1	Contact Resistance (Low Level)	After Durability (preconditioning) [Item #10] Group VI Tin	2 milliohms MAXIMUM*	**0.02** mΩ	**-0.01** mΩ	**0.08** mΩ
		After Durability 5 Cycles [Item #10] Group VIII 15µ" Gold	6 milliohms MAXIMUM*	**0.05** mΩ	**-0.04** mΩ	**0.19** mΩ
		After Durability 5 Cycles [Item #10] Group VIII 30µ" Gold	2 milliohms MAXIMUM*	**0.07** mΩ	**-0.03** mΩ	**0.20** mΩ
		After Durability 10 Cycles [Item #10] Group IX Tin	16.13 milliohms MAXIMUM (wire resistance removed)	**0.60** mΩ	**0.47** mΩ	**0.80** mΩ
		After Vibration (Random) [Item #11] Tin	2 milliohms MAXIMUM*	**0.14** mΩ	**-0.02** mΩ	**0.56** mΩ
			No Discontinuity	Discontinuity < 1 microsecond		
		After Vibration (Random) [Item #11] 15µ" Gold	2 milliohms MAXIMUM*	**0.12** mΩ	**-0.07** mΩ	**0.62** mΩ
		After Thermal Shock [Item #18] Tin	2 milliohms MAXIMUM*	**0.09** mΩ	**-0.04** mΩ	**0.67** mΩ
		After Thermal Shock [Item #18] 15µ" Gold	2 milliohms MAXIMUM*	**0.01** mΩ	**-0.15** mΩ	**0.18** mΩ
		After Thermal Disturbance [Item #19] Group VI Tin	2 milliohms MAXIMUM*	**0.04** mΩ	**-0.04** mΩ	**0.33** mΩ
		After Thermal Aging (240 hrs @ 105°C) [Item #20] Group I Tin	2 milliohms MAXIMUM*	**0.16** mΩ	**0.02** mΩ	**0.88** mΩ
		After Thermal Aging (240 hrs @ 105°C) [Item #20] Group I 15µ" Gold	2 milliohms MAXIMUM*	**0.01** mΩ	**-0.10** mΩ	**0.13** mΩ
		After Thermal Aging (preconditioning) [Item #21] Group III Tin	2 milliohms MAXIMUM*	**0.10** mΩ	**-0.01** mΩ	**0.45** mΩ

*Change from Initial

5.1 ELECTRICAL PERFORMANCE RESULTS (continued)

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
1	Contact Resistance (Low Level)	After Thermal Aging (preconditioning) [Item #21] Group III 15µ" Gold	2 milliohms MAXIMUM*	**0.02** mΩ	**-0.11** mΩ	**0.18** mΩ
		After Thermal Aging (preconditioning) [Item #21] Group V Tin	2 milliohms MAXIMUM*	**0.17** mΩ	**0.03** mΩ	**0.64** mΩ
		After Thermal Aging (250 hrs @ 120°C) [Item #20] Group VIII 15µ" Gold	6 milliohms MAXIMUM*	**0.06** mΩ	**-0.31** mΩ	**0.46** mΩ
		After Thermal Aging (250 hrs @ 120°C) [Item #20] Group VIII 30µ" Gold	2 milliohms MAXIMUM*	**0.00** mΩ	**-0.24** mΩ	**0.17** mΩ
		After Thermal Aging (500 hrs @ 120°C) [Item #20] Group VIII 15µ" Gold	6 milliohms MAXIMUM*	**0.02** mΩ	**-0.50** mΩ	**0.58** mΩ
		After Thermal Aging (500 hrs @ 120°C) [Item #20] Group VIII 30µ" Gold	2 milliohms MAXIMUM*	**-0.01** mΩ	**-0.27** mΩ	**0.23** mΩ
		After Thermal Aging (750 hrs @ 120°C) [Item #20] Group VIII 15µ" Gold	6 milliohms MAXIMUM*	**0.11** mΩ	**-0.55** mΩ	**0.83** mΩ
		After Thermal Aging (750 hrs @ 120°C) [Item #20] Group VIII 30µ" Gold	2 milliohms MAXIMUM*	**0.07** mΩ	**-0.25** mΩ	**0.56** mΩ
		After Thermal Aging (1000 hrs @ 120°C) [Item #20] Group VIII 15µ" Gold	6 milliohms MAXIMUM*	**0.18** mΩ	**-0.36** mΩ	**2.27** mΩ
		After Thermal Aging (1000 hrs @ 120°C) [Item #20] Group VIII 30µ" Gold	2 milliohms MAXIMUM*	**0.16** mΩ	**-0.18** mΩ	**0.91** mΩ
		Reseating [Item #22] Group I Tin	2 milliohms MAXIMUM*	**0.22** mΩ	**0.02** mΩ	**0.87** mΩ

*Change from Initial

5.1 ELECTRICAL PERFORMANCE RESULTS (continued)

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
1	Contact Resistance (Low Level)	Reseating [Item #22] Group I 15µ" Gold	2 milliohms MAXIMUM*	**0.03** mΩ	**-0.15** mΩ	**0.14** mΩ
		Reseating [Item #22] Group II Tin	2 milliohms MAXIMUM*	**0.19** mΩ	**0.00** mΩ	**0.91** mΩ
		Reseating [Item #22] Group II 15µ" Gold	2 milliohms MAXIMUM*	**0.00** mΩ	**-0.11** mΩ	**0.24** mΩ
		Reseating [Item #22] Group V Tin	10 milliohms MAXIMUM*	**0.73** mΩ	**0.13** mΩ	**3.55** mΩ
		Reseating [Item #22] Group VI Tin	2 milliohms MAXIMUM*	**0.03** mΩ	**-0.05** mΩ	**0.50** mΩ
		After Temperature and Humidity (Cyclic) [Item #23] Tin	2 milliohms MAXIMUM*	**0.18** mΩ	**-0.02** mΩ	**0.78** mΩ
		After Temperature and Humidity (Cyclic) [Item #23] 15µ" Gold	2 milliohms MAXIMUM*	**0.00** mΩ	**-0.10** mΩ	**0.16** mΩ
		After Thermal Cycling [Items #28] Tin	10 milliohms MAXIMUM*	**2.93** mΩ	**0.40** mΩ	**8.80** mΩ
		After Dust [Items #27] Tin	2 milliohms MAXIMUM*	**0.02** mΩ	**-0.05** mΩ	**0.29** mΩ
		Before Shock & Vibration USCAR [Items #17] Tin	16.13 milliohms MAXIMUM (wire resistance removed)	**0.56** mΩ	**0.44** mΩ	**0.78** mΩ
		After Shock & Vibration USCAR [Items #17] Tin	16.13 milliohms MAXIMUM (wire resistance removed)	**0.86** mΩ	**0.54** mΩ	**1.92** mΩ
			No Discontinuity	No discontinuity of 7 Ω or more for 1 microsecond Max.		

*Change from Initial

5.1 ELECTRICAL PERFORMANCE RESULTS (continued)

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
2	Contact Resistance @Rated Current	Tinned 12 AWG, 6ckt, 2 oz traces, 18 Amps (tin plated contacts)	5 milliohms MAXIMUM for gold plated contacts	**2.99** mΩ	**2.89** mΩ	**3.17** mΩ
3	Insulation Resistance	Tin, After 25 cycles	1000 Megohms MINIMUM	Pass		
		15µ" Gold, After 250 cycles	1000 Megohms MINIMUM	Pass		
4	Dielectric Withstanding Voltage	After Durability [Item #9] Tin	2200 Volts AC MINIMUM	Pass		
			Current Leakage: 5 milliamps MAXIMUM	**0.00** mA	**0.00** mA	**0.00** mA
		After Durability [Item #9] 15µ" Gold	2200 Volts AC MINIMUM	Pass		
			Current Leakage: 5 milliamps MAXIMUM	**0.00** mA	**0.00** mA	**0.00** mA
		After Durability [Item #9] 30µ" Gold	2200 Volts AC MINIMUM	Pass		
			Current Leakage: 5 milliamps MAXIMUM	**0.00** mA	**0.00** mA	**0.00** mA
5	Temperature Rise (via Current Profiling) [+30ºC] Tin Plated Contacts	Tinned 12 AWG, 2ckt, 2 oz traces, 23 Amps	+30 °C MAXIMUM RISE	**27.7** °C	**26.6** °C	**29.1** °C
		Tinned 14 AWG, 2ckt, 2 oz traces, 21 Amps	+30 °C MAXIMUM RISE	**28.8** °C	**27.7** °C	**30.0** °C
		Tinned 16 AWG, 2ckt, 2 oz traces, 17 Amps	+30 °C MAXIMUM RISE	**26.5** °C	**25.5** °C	**27.7** °C
		Tinned 12 AWG, 12ckt, 2 oz traces, 16 Amps	+30 °C MAXIMUM RISE	**29.5** °C	**28.8** °C	**29.9** °C
		Tinned 14 AWG, 12ckt, 2 oz traces, 13 Amps	+30 °C MAXIMUM RISE	**26.5** °C	**25.2** °C	**27.2** °C
		Tinned 16 AWG, 12ckt, 2 oz traces, 12 Amps	+30 °C MAXIMUM RISE	**28.8** °C	**26.6** °C	**29.8** °C
		Tinned 12 AWG, 6ckt, 2 oz traces, 18 Amps	+30 °C MAXIMUM RISE	**28.6** °C	**27.7** °C	**29.4** °C
		Bare 12 AWG, 2ckt, 2 oz traces, 21 Amps	+30 °C MAXIMUM RISE	**28.8** °C	**28.3** °C	**29.4** °C
		Bare 12 AWG, 12ckt, 2 oz traces, 14 Amps	+30 °C MAXIMUM RISE	**29.1** °C	**28.3** °C	**30.0** °C

5.2 MECHANICAL PERFORMANCE RESULTS

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
6	Connector Mate Forces (per circuit)	Initial Mating 12ckt, 171692 series, Tin	**6.8** N MAXIMUM per circuit	**2.90** N	**2.46** N	**3.13** N
		Initial Mating 12ckt, 171692 series, 30µ" Gold	**6.0** N MAXIMUM per circuit	**4.10** N	**2.47** N	**5.33** N
		5th Mating 12ckt, 171692 series, 30µ" Gold	**6.0** N MAXIMUM per circuit	**3.77** N	**2.73** N	**4.89** N
7	Connector Unmate Forces (latch disabled) (per circuit)	Initial Unmating 12ckt, 171692 series, Tin	**6.5** N MAXIMUM per circuit	**1.65** N	**1.46** N	**1.74** N
		Initial Unmating 12ckt, 171692 series, 30µ" Gold	**5.6** N MAXIMUM per circuit	**3.51** N	**2.25** N	**4.50** N
		5th Unmating 12ckt, 171692 series, 30µ" Gold	**5.6** N MAXIMUM per circuit	**3.30** N	**2.49** N	**4.27** N
8	Crimp Terminal Retention Force (in Housing)	Initial, 171692 series, 15µ" Gold	**30** N MINIMUM	**47.9** N	**39.4** N	**56.1** N
		After 1000 hrs @ 120°C, 171692 series, 15µ" Gold	**30** N MINIMUM	**46.1** N	**39.1** N	**50.3** N
9	Durability	See ITEM 1 [TREATMENT: After Durability]				
10	Durability	See ITEM 1 [TREATMENT: After Durability] "with environment" (preconditioning)				
11	Vibration (Random)	See ITEM 1 [TREATMENT: After Vibration] Discontinuity was not checked during vibration for gold due to test fixture setup.				
12	Wire Pullout Force from terminal (Axial)	**12** AWG - 638257100 crimp tooling	**220** N MINIMUM	**391** N	**341** N	**428** N
		14 AWG - 638257100 crimp tooling	**220** N MINIMUM	**328** N	**303** N	**350** N
		16 AWG - 638257100 crimp tooling	**200** N MINIMUM	**306** N	**263** N	**323** N
		12 AWG - 639023400 crimp tooling	**220** N MINIMUM	**351** N	**306** N	**385** N
		14 AWG - 639023300 crimp tooling	**220** N MINIMUM	**313** N	**285** N	**337** N
		16 AWG - 639023300 crimp tooling	**200** N MINIMUM	**281** N	**254** N	**301** N
		4.0 mm^2 - 639023400 crimp tooling	**220** N MINIMUM	**335** N	**319** N	**354** N

5.2. MECHANICAL PERFORMANCE RESULTS (continued)

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
12	Wire Pullout Force from terminal (Axial) (continued)	**2.5** mm^2 - 639023400 crimp tooling	**220** N MINIMUM	**368** N	**353** N	**384** N
		1.5 mm^2 - 639023300 crimp tooling	**220** N MINIMUM	**304** N	**292** N	**320** N
13	Thumb Latch Yield Strength	Initial 171692 series	**68** N MINIMUM	**119.8** N	**95.9** N	**167.9** N
		After 200 cycles 171692 series	**68** N MINIMUM	**106.5** N	**87.5** N	**130.1** N
		Initial 170001 series	**68** N MINIMUM	**92.3** N	**91.8** N	**92.9** N
		After 200 cycles 170001 series	**68** N MINIMUM	**94.7** N	**86.0** N	**103.4** N
14	PCB Engagement Forces	Initial Insertion 12ckt Vertical	**85** N MAXIMUM	**20.8** N	**17.3** N	**25.0** N
		Initial Insertion 12ckt Right Angle	**85** N MAXIMUM	**36.7** N	**33.9** N	**43.3** N
15	Header Pin Retention Force in Housing Vertical Header (Mating side)	Initial, Tin	**89** N MINIMUM	**139.0** N	**130.8** N	**147.5** N
		Initial, 15µ" Gold	**89** N MINIMUM	**156.0** N	**140.9** N	**178.3** N
16	Header Pin Retention Force in Housing Right Angle Header (Mating side)	Initial, Tin	**9.81** N MINIMUM	**50.6** N	**45.7** N	**59.4** N
		Initial, 30µ" Gold	**9.81** N MINIMUM	**39.6** N	**24.8** N	**57.1** N
17	Shock & Vibration (USCAR)	See ITEM 1 [TREATMENT: After Shock & Vibration USCAR]				

5.3 ENVIRONMENTAL PERFORMANCE RESULTS

ITEM	DESCRIPTION	TREATMENT	REQUIREMENT	MEAN	MINIMUM	MAXIMUM
18	Thermal Shock	See ITEM 1 [TREATMENT: After Thermal Shock]				
19	Thermal Disturbance	See ITEM 1 [TREATMENT: After Thermal Disturbance]				
20	Thermal Aging	See ITEM 1 [TREATMENT: After Thermal Aging]				
21	Thermal Aging	See ITEM 1 [TREATMENT: After Thermal Aging (preconditioning)]				
22	Reseating	See ITEM 1 [TREATMENT: After Reseating]				
23	Temperature and Humidity (Cyclic)	See ITEM 1 [TREATMENT: After Temperature and Humidity (Cyclic)]				
24	Solderability	Final, Tin	95% Coverage MINIMUM	Pass, Coverage > 95%		
		Final, 15µ" Gold	95% Coverage MINIMUM	Pass, Coverage > 95%		
25	Wave Solder Resistance	Final, Tin	No Damage	No Visual Damage		
		Final, 15µ" Gold	No Damage	No Visual Damage		
26	Reflow Soldering Resistance	Final, Tin	No Damage	No Visual Damage		
		Final, 15µ" Gold	No Damage	No Visual Damage		
27	Dust	See ITEM 1 [TREATMENT: After Dust]				
28	Thermal Cycling	See ITEM 1 [TREATMENT: After Thermal Cycling]				

molex® TEST SUMMARY

Appendix A -Test Sequences

Group I	Group II	Group III	Group V
Temperature Life 144 contacts tin 144 contacts 15µ" gold 12ckt 171692 mated to 76829/172065	Thermal Shock 144 contacts tin 144 contacts 15µ" gold 12ckt 171692 mated to 76829/172065	Vibration 144 contacts tin 144 contacts 15µ" gold 12ckt 171692 mated to 76829/172065	Thermal Cycling 144 contacts tin (tin plated only) 12ckt 171692 mated to 76829
Initial Contact Resistance EIA-364-23	Initial Contact Resistance EIA-364-23	Initial Contact Resistance EIA-364-23	Initial Contact Resistance EIA-364-23
Durability Tin plated: 5 cycles Gold plated: 20 cycles EIA-364-09	Durability Tin plated: 5 cycles Gold plated: 20 cycles EIA-364-09	Durability Tin plated: 5 cycles Gold plated: 20 cycles EIA-364-09	Durability 5 cycles EIA-364-09
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance
Thermal Aging 105°C, 240 hrs 10 Yrs @ 65°C EIA-364-17	Thermal Shock 10 cycles -55°C and +85°C EIA-364-32	Thermal Aging 105°C, 120 hours 10 Yrs @ 65°C EIA-364-17	Thermal Aging 105°C, 120 hours 10 Yrs @ 65°C EIA-364-17
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance
Reseating 3 cycles	Cyclic Temperature and Humidity EIA-364-31	Random Vibration EIA-364-28 Condition VIID Tin: 15 min Gold: 1.5 hours each axis	Thermal Cycling EIA-364-1000.01
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance
	Reseating 3 cycles		Reseating 3 cycles
	Contact Resistance		Contact Resistance

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Group VI Dust 144 contacts tin (tin plated only) 12ckt 171692 mated to 76829	Group VII Durability 144 contacts tin 144 contacts 15µ" gold 12ckt 171692 mated to 76829/172065	Group VIII Temperature Life 144 contacts 15µ" & 30µ" gold 12ckt 171692 mated to 172065	Group IX Uscar-2 Vibration and Shock 144 contacts tin (tin plated only) 12ckt 171692 mated to 76829	Individual Tests
Initial Contact Resistance EIA-364-23	DWV EIA-364-20	Initial Contact Resistance EIA-364-23	Visual Inspection / Initial Contact Resistance EIA-364-23	Connector Mating / Unmating Force
Durability 5 cycles EIA-364-09	Initial Contact Resistance EIA-364-23	Durability 5 cycles EIA-364-09	Durability 10 cycles	PCB Peg Engagement Forces
Dust EIA-364-91	Durability Tin plated: 25 cycles Gold plated: 200 cycles EIA-364-09	Contact Resistance	Contact Resistance	Temperature Rise / Voltage Drop
Contact Resistance	Contact Resistance	Thermal Aging 120°C, 250 hrs EIA-364-17	Mechanical shock w/ continuity monitoring, V1	Header Pin Retention in Housing
Thermal Disturbance EIA-364-1000.01	DWV EIA-364-20	Contact Resistance	Random vibration w/ continuity monitoring, V1	Insulation Resistance
Contact Resistance		Thermal Aging 120°C, 250 hrs EIA-364-17	Contact Resistance	Wave / Reflow Solder Resistance
Reseating 3 cycles		Contact Resistance	Voltage drop was not conducted due to test setup	Thumb Latch yield strength
Contact Resistance		Thermal Aging 120°C, 250 hrs EIA-364-17		Wire pullout force from terminal (axial)
		Contact Resistance		Solderability
		Thermal Aging 120°C, 250 hrs EIA-364-17		Crimped Terminal Retention Force in Housing
		Contact Resistance		
		Crimped terminal retention force in housing		

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