

TEST SUMMARY FOR ULTRA-FIT WIRE TO BOARD CONNECTOR SYSTEM

1.0 SCOPE

This Test Summary covers Ultra-Fit® 3.50 mm pitch wire to board connector systems with gold and tin plating. Receptacles are terminated with 22 to 16 AWG wire using crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

Description	Series Number
Female Crimp Terminal	172253
Receptacle Housing	172256/172258
TPA	172264/172268
Vertical Header	17286/172287/172298/172299
Right Angle	172310/172316

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Dimensions, Materials & Plating: See individual sales drawings. (SD-172253-1000, SD-172256-0001, SD-172258-0001, SD-172264-0001, SD-172286-1000, SD-172287-1000, SD-172298-1000, SD-172299-1000, SD-172310-1000, SD-172316-1000, 1722532000, 1722560003, 1722580003, 1722640002)

2.3 PRODUCT SPECIFICATION TITLE AND DOCUMENT NUMBER

Product Specification for Ultra-Fit Wire to Board Connector System: PS-172323-0001,
Application Specification: AS-172323-0001; 1723230003

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 TESTING SEQUENCES

Reference Appendix A

3.2 OTHER DOCUMENTS AND SPECIFICATIONS

EIA-364-1000.01

4.0 QUALIFICATION

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

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5.0 ELECTRICAL PERFORMANCE

Group I Temp Life Sequence

Tin – 144 contacts

Results

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply a Max. voltage of 20mV and a current of 100mA (EIA-364-23) Remove wire and traces resistance value.	2 MAX	0.5	0.82	0.63
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	7 MAX Δ	-0.18	0.22	0.04
Thermal Aging [Δ mΩ from initial]	Mate connector, Tin: expose to 240 hours at 105°C. Gold: expose to 1000 hours at 120°C Per EIA-364-17 Method A	7 MAX Δ	0.17	1.37	0.62
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	7 MAX Δ	0.05	1.37	0.64

15 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply a Max. voltage of 20mV and a current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.47	1.9	1.61
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	3 MAX Δ	-0.15	0.24	0.03
Thermal Aging [Δ mΩ from initial]	Mate connector, Tin: expose to 240 hours at 105°C. Gold: expose to 1000 hours at 120°C Per EIA-364-17 Method A	3 MAX Δ	-0.2	0.17	-0.02
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	3 MAX Δ	0.04	1.88	0.62

Group I Continued

30 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
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molex® TEST SUMMARY

Low Level Contact Resistance [initial]	Mate connectors. Apply a Max. voltage of 20mV and a current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.55	1.87	1.66
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	3 MAX Δ	-0.2	0.17	-0.02
Thermal Aging [Δ mΩ from initial]	Mate connector, Tin: expose to 240 hours at 105°C. Gold: expose to 1000 hours at 120°C Per EIA-364-17 Method A	3 MAX Δ	0.08	1.27	0.64
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	3 MAX Δ	0.08	1.24	0.53

Group II Thermal Shock Sequence

Tin – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	2 MAX	0.51	0.76	0.6
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	7 MAX Δ	-0.04	0.2	0.07
Thermal Shock [Δ mΩ from initial]	Mate connector, expose to 10 cycles from -55°C to 85°C Per EIA-364-32 Method A, condition 1	7 MAX Δ	0.01	1.03	0.28
Cyclic Temperature and Humidity [Δ mΩ from initial]	Mate connectors; expose to 24 cycles from 25°C/ 80% RH to 65°C/ 50% RH Ramp time: 0.5hr Dwell time: 1hr Per EIA-364-31	7 MAX Δ	0.04	1.13	0.52
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	7 MAX Δ	0.08	1.28	0.49

Group II Thermal Shock Sequence continued.

15 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
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Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.53	1.87	1.65
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	3 MAX Δ	-0.14	0.2	0.03
Thermal Shock [Δ mΩ from initial]	Mate connector, expose to 10 cycles from -55°C to 85°C Per EIA-364-32 Method A, condition 1	3 MAX Δ	-0.08	0.53	0.17
Cyclic Temperature and Humidity [Δ mΩ from initial]	Mate connectors; expose to 24 cycles from 25°C/ 80% RH to 65°C/ 50% RH Ramp time: 0.5hr Dwell time: 1hr Per EIA-364-31	3 MAX Δ	-0.08	0.37	0.17
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	3 MAX Δ	-0.07	0.37	0.15

30 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.54	2.08	1.66
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	3 MAX Δ	-0.45	0.15	0.01
Thermal Shock [Δ mΩ from initial]	Mate connector, expose to 10 cycles from -55°C to 85°C Per EIA-364-32 Method A, condition 1	3 MAX Δ	-0.44	0.42	0.09
Cyclic Temperature and Humidity [Δ mΩ from initial]	Mate connectors; expose to 24 cycles from 25°C/ 80% RH to 65°C/ 50% RH Ramp time: 0.5hr Dwell time: 1hr Per EIA-364-31	3 MAX Δ	-0.33	0.36	0.1
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	3 MAX Δ	-0.38	0.36	0.09

Group III Vibration Sequence

Tin – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
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Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	2 MAX	0.51	0.76	0.6
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	7 MAX Δ	1.49	1.96	1.64
Thermal Aging (Preconditioning) [Δ mΩ from initial]	Mate connector, Tin: expose to 120 hours at 105°C. Gold: expose to 120 hours at 105°C Per EIA-364-17 Method A	7 MAX Δ	-0.36	0.3	0.05
Random Vibration [Δ mΩ from initial]	Mate connectors and vibrate per EIA-364-28 Test condition VII-D Tin: 15min each axis. Gold: 1.5hours each axis.	7 MAX Δ	0.16	1.76	0.78

15 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.49	1.91	1.65
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	3 MAX Δ	-0.11	0.35	0.11
Thermal Aging (Preconditioning) [Δ mΩ from initial]	Mate connector, Tin: expose to 120 hours at 105°C. Gold: expose to 120 hours at 105°C Per EIA-364-17 Method A	3 MAX Δ	0.07	0.91	0.5
Random Vibration [Δ mΩ from initial]	Mate connectors and vibrate per EIA-364-28 Test condition VII-D Tin: 15min each axis. Gold: 1.5hours each axis.	3 MAX Δ	0	0.81	0.35

Continued Group III Vibration Sequence

30 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.49	1.96	1.64

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Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connectors 5 cycles for tin plated and 20 cycles for gold plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	3 MAX Δ	-0.36	0.3	0.05
Thermal Aging (Preconditioning) [Δ mΩ from initial]	Mate connector, Tin: expose to 120 hours at 105°C. Gold: expose to 120 hours at 105°C Per EIA-364-17 Method A	3 MAX Δ	-0.01	0.74	0.33
Random Vibration [Δ mΩ from initial]	Mate connectors and vibrate per EIA-364-28 Test condition VII-D Tin: 15min each axis. Gold: 1.5hours each axis.	3 MAX Δ	-0.03	0.71	0.3

Group V Thermal Cycling for Fretting

Tin – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	0.52	0.79	0.62
Durability with Environment (Preconditioning) [Δ mΩ from initial]	Mate connector at 5 cycles for tin plated connectors at a maximum rate of 10cycles per min. Per EIA-364-09, test method per Sec. 7	7 MAX Δ	-2.04	0.22	0.04
Thermal Aging (Preconditioning) [Δ mΩ from initial]	Mate connector, Tin: expose to 120 hours at 105°C. Per EIA-364-17 Method A	7 MAX Δ	0.14	3.94	0.74
Thermal Cycling [Δ mΩ from initial]	Mate connector, cycle between 15±3°C and 85±3°C as measured on the part. Ramps: 2°C/min Min. Dwell time should insure contacts reach temperature extremes with 5mins Min. Humidity is not controlled. Performed 500 cycles.	7 MAX Δ	0.07	3.88	1.14
Reseating [Δ mΩ from initial]	Unmate/Mate connectors by hand three cycles	7 MAX Δ	0.09	3.37	0.88

Group VII Durability – Measure Dielectric Withstand Voltage

Tin – 48 contacts;

15 μi Au – 48 contacts

30 μi Au – 48 contacts

Description	Test Condition	Requirement [mΩ]	Results [mΩ]
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Insulation Resistance	Unmated connectors. Apply 500 VDC between adjacent terminals or ground. Per EIA-364-21	IR > 1000	IR > 1000
Dielectric Withstanding Voltage	Unmated connectors. Apply 2200 VAC for 1 min. between adjacent terminals. Per EIA-364-20	No breakdown Current leakage < 5 mA	PASS

Group VII Durability – Measure Low Level Contact Resistance

Tin – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	2 MAX	0.5	0.79	0.62
Durability [Δ mΩ from initial]	Manual mate/unmate connector with latch: 25 cycles for tin plated and 200 cycles for gold plated at a maximum rate of 10cycles per min. Per EIA-364-09	7 MAX Δ	-0.06	0.37	0.12

15 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.44	1.81	1.62
Durability [Δ mΩ from initial]	Manual mate/unmate connector with latch: 25 cycles for tin plated and 200 cycles for gold plated at a maximum rate of 10cycles per min. Per EIA-364-09	3 MAX Δ	-0.81	0.45	0.15

Group VII Continued.

30 μi Au – 144 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Low Level Contact Resistance [initial]	Mate connectors. Apply Max. voltage of 20mV and current of 100mA (EIA-364-23) Remove wire and traces resistance value.	3 MAX	1.51	1.86	1.65
Durability [Δ mΩ from initial]	Manual mate/unmate connector with latch: 25 cycles for tin plated and 200 cycles for gold plated at a maximum rate of 10cycles per min. Per EIA-364-09	3 MAX Δ	-0.1	0.37	0.13

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6.0 MECHANICAL PERFORMANCE

6.1 Connector Mate/Unmate without latch

Tin 160 Circuits

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Connector Mating Force without Latches	Mate connectors at a rate of 25.4 ±6mm per min. Per EIA-364-37	4.5 MAX per Circuit	3.71	4.23	3.91
Connector Unmate Force (Latch Disabled)	Un-mate connectors with latch disabled at a rate of 25.4 ±6mm per min. Per EIA-364-37	4 MAX per Circuit	2.98	3.19	3.08

15 µi Au 160 Circuits

Description	Test Condition	Req. [N]	Min [N]	Max [N]	Avg [N]
Connector Mating Force without Latches	Mate connectors at a rate of 25.4 ±6mm per min. Per EIA-364-37	2.8 MAX per Circuit	1.64	2.23	1.93
Connector Unmate Force (Latch Disabled)	Un-mate connectors with latch disabled at a rate of 25.4 ±6mm per min. Per EIA-364-37	2.3 MAX per Circuit	1.52	1.97	1.69

30 µi Au 160 Circuits

Description	Test Condition	Req. [N]	Min [N]	Max [N]	Avg [N]
Connector Mating Force without Latches	Mate connectors at a rate of 25.4 ±6mm per min. Per EIA-364-37	2.8 MAX per Circuit	1.84	2.05	1.93
Connector Unmate Force (Latch Disabled)	Un-mate connectors with latch disabled at a rate of 25.4 ±6mm per min. Per EIA-364-37	2.3 MAX per Circuit	1.55	1.82	1.66

6.2 Connector Mate/Unmate with latch without terminals: 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Connector Mating Force with Latches and without Terminal	Mate connectors at a rate of 25.4 ±6mm per min. Per EIA-364-37	8 MAX per Connector	4.70	6.52	5.63

USCAR vibration, class V1, S1,T2 gold 5 Connectors

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Vibration per USCAR-2 Class V1, S1, T2	Mate connectors, mounted and vibrate as per USCAR-2 Rev6: 5.4.6 Class V1, S1, T2. Random Duration: 8hrs/axis	3 MAX	1.80	1.95	1.88

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6.3 Header Pin Retention Force in the housing

6.3.1 Header Pin Retention Force in the housing, push from mating side: 10 Pins

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Header Pin Retention Force in the housing Push from mating side	Push at a rate of 25.4 ±6mm per min. Per EIA-364-37	50 MIN per Pin	63.28	84.70	77.84

6.3.2 Header Pin Retention Force in the housing, push from PCB side: 10 Pins

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Header Pin Retention Force in the housing Push from PCB side	Push at a rate of 25.4 ±6mm per min. Per EIA-364-37	10 MIN per Pin	14.60	30.65	21.33

6.4 Header Insertion/Retention into the PCB (Vertical Header with kinked pins 16 circuit, PTH)

Min. hole size 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Header Insertion into the PCB (Vertical Header)	Insert a header at a rate of 25.4±6 mm/min.	35 MAX	16.21	33.91	21.89
Header Retention from the PCB (Vertical Header)	Pull a header at a rate of 25.4±6 mm/min.	1 N MIN	9.14	20.71	13.81

Max. hole size 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Header Insertion into the PCB (Vertical Header with kinked pins)	Insert/Pull a header at a rate of 25.4±6 mm/min.	35 MAX	12.40	19.83	15.47
Header Retention from the PCB (Vertical Header with kinked pins)	Pull a header at a rate of 25.4±6 mm/min.	1 N MIN	7.58	11.53	9.34

6.5 Header Insertion/Retention into the PCB (Vertical Header with solder clip)

Min. hole size 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
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Header Insertion into the PCB (Vertical Header with solder clip)	Insert a header at a rate of 25.4±6 mm/min.	25 MAX	14.70	20.00	17.18
Header Retention from the PCB (Vertical Header with solder clip)	Pull a header at a rate of 25.4±6 mm/min.	1 MIN	6.08	10.07	7.89

Max. hole size 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Header Insertion into the PCB (Vertical Header with solder clip)	Insert a header at a rate of 25.4±6 mm/min.	25 MAX	14.50	18.31	16.38
Header Retention from the PCB (Vertical Header with solder clip)	Pull a header at a rate of 25.4±6 mm/min.	1 MIN	5.15	9.58	7.60

6.6 R/A Header Insertion/Retention into the PCB (2 crush peg, no terminals)

Min. hole size 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
R/A Header Insertion into the PCB (crush pegs)Header with solder clip)	Insert a header at a rate of 25.4±6 mm/min.	35 MAX	10.54	21.23	18.07
R/A Header Retention from the PCB (crush pegs)Header with solder clip)	Pull a header at a rate of 25.4±6 mm/min.	1N MIN	5.05	13.43	9.76

Max. hole size 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
R/A Header Insertion into the PCB (crush pegs)	Insert a header at a rate of 25.4±6 mm/min.	35 MAX	0.51	1.52	1.15
R/A Header Retention into the PCB (crush pegs)	Insert/Pull a header at a rate of 25.4±6 mm/min.	0.2N MIN	0.41	1.91	1.05

6.7 Receptacle Terminal retention force into the housing 10 Terminals / 10 Connectors

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
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Receptacle Terminal retention force into the housing	Axial pull at a rate of 25.4±6 mm/min.	27 MIN	31.70	36.90	33.70
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6.8 Crimped terminal retention force into the housing with TPA 6 Terminals

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Crimped terminal retention force into the housing with TPA	Axial pullout force on the terminal in the housing at a rate of 25±6 mm per min. Per EIA-364-29	27 MIN	33.44	50.19	43.07

6.9 Solderability Dip Test 10 Connectors

Description	Test Condition	Requirement	Results
Solderability Dip Test	Per Molex test method: SMES-152	Solder area shall have Min. of 95% solder coverage	PASS

6.10 Solder Clip retention force into the housing: 10 Connectors with 2 Solder Clips each.

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Solder Clip retention into the housing	Axial pullout force on the solder clip at a rate of 25±6 mm per min. Per EIA-364-29	1 MIN	22.99	48.76	33.00

6.11 Receptacle latch retention force: 10 Connectors (16 circuits housing)

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
Receptacle latch retention force. Thumb latch yield/strength	Axial pullout force at a rate of 25±6 mm per min. Per EIA-364-29	89 MIN (Locking Tang Option)	102.39	117.10	111.52
		60 MIN (Tangles Option)	70.52	81.53	76.21

6.12 Receptacle latch retention force after durability x200 cycles

Description	Test Condition	Requirement [N]	Min [N]	Max [N]	Avg [N]
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Receptacle latch retention force	Axial pullout force at a rate of 25±6 mm per min. Per EIA-364-29	89 MIN (Locking Tang Option)	104.71	119.02	110.93
		60 MIN (Tangles Option)	68.93	80.42	74.66

7.0 Vibration test per USCAR 5.9.6 Class V1, S1, T2

Tin – 160 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
Initial		2 MAX	0.5	0.86	0.62
Connector and/or Terminal Cycling USCAR-2 Rev6: 5.1.7 [Δ mΩ from initial]	Mate and unmate connectors 10 times.	7 MAX Δ	-0.12	0.33	0.08
Voltage Drop USCAR-2 Rev6: 5.3.2	Cable length 75±3mm. Mate connectors. Apply DC current 5A per mm2 of conductor cross section. Measure overall voltage drop across. Substrate measured voltage drop across 150mm length of cable.	NA Conditioning only	NA Conditioning only	NA Conditioning only	NA Conditioning only
Vibration USCAR-2 Rev6: 5.4.6	Mounting: conductor attachment 100±10mm from the connector body. Conductor sag 10±5mm relative to the plane of attachment points. Mate connectors, mounted and vibrate as per USCAR-2 Rev6: 5.4.6 Class V1, S1, T2. Random Duration: 8hrs/axis	No Discontinuity	No Discontinuity*		
Mechanical Shock USCAR-2 Rev6: 5.4.6 [Δ mΩ from initial]	Mounting: conductor attachment 100±10mm from the connector body. Conductor sag 10±5mm relative to the plane of attachment points. Mate connectors, mounted and subject to shock in each of the 3 axes. 10 shocks per axis, Half Sine Wave, only positive direction, 5~10 ms duration, acceleration 35g.	7 MAX Δ	0.02*	1.53	0.46

15 μi Au – 60 contacts

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avg [mΩ]
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Initial		3 MAX	1.52	1.94	1.72
Connector and/or Terminal Cycling USCAR-2 Rev6: 5.1.7 [Δ mΩ from initial]	Mate and unmate connectors 10 times.	3 MAX Δ	-0.2	0.42	0.04
Voltage Drop USCAR-2 Rev6: 5.3.2	Cable length 75±3mm. Mate connectors. Apply DC current 5A per mm2 of conductor cross section. Measure overall voltage drop across. Substrate measured voltage drop across 150mm length of cable.	NA Conditioning only	NA Conditioning only	NA Conditioning only	NA Conditioning only
Vibration USCAR-2 Rev6: 5.4.6	Mounting: conductor attachment 100±10mm from the connector body. Conductor sag 10±5mm relative to the plane of attachment points. Mate connectors, mounted and vibrate as per USCAR-2 Rev6: 5.4.6 Class V1, S1, T2. Random Duration: 8hrs/axis	3 MAX Δ No Discontinuity	No Discontinuity*		
Mechanical Shock USCAR-2 Rev6: 5.4.6 [Δ mΩ from initial]	Mounting: conductor attachment 100±10mm from the connector body. Conductor sag 10±5mm relative to the plane of attachment points. Mate connectors, mounted and subject to shock in each of the 3 axes. 10 shocks per axis, Half Sine Wave, only positive direction, 5~10 ms duration, acceleration 35g.	3 MAX Δ No Discontinuity	-0.23*	0.65*	0.14*

*Event detector showed no discontinuity (@ 1 micro-seconds) during vibration and shock.

8.0 Wire-to-Terminal retention force (30 samples, tinned stranded insulated wire)

Description	Test Condition	Requirement Min [N]	Min Tested [N]
16 AWG Wire-to-terminal retention force	Axial pullout force at a rate of 25±6 mm per min. Per EIA-364-29	68.4N	97.2N
18 AWG Wire-to-terminal retention force	Axial pullout force at a rate of 25±6 mm per min. Per EIA-364-29	68.4N	118.0N

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20 AWG Wire-to-terminal retention force	Axial pullout force at a rate of 25±6 mm per min. Per EIA-364-29	57.9N	92.8N
22 AWG Wire-to-terminal retention force	Axial pullout force at a rate of 25±6 mm per min. Per EIA-364-29	35.6N	73.2N

Group S1 – Temperature Rise, tested with UL1061 tinned wire and PCB with 2oz. Copper Traces of 1.8mm width and 3.5mm length.

Wire to Board Current Rating (Amp Max.) (Tested with TIN plated terminals)														
Connector fully loaded with all circuits powered														
AWG Wire Size	Circuit Size (Single Row)							Circuit Size (Dual Row)						
	2	3	4	5	6	7	8	4	6	8	10	12	14	16
16	14						11	12						10
18														
20														
22	9						7	8						5

Wire to Board Current Rating (Amp Max.) (Tested with GOLD plated terminals)														
Connector fully loaded with all circuits powered														
AWG Wire Size	Circuit Size (Single Row)							Circuit Size (Dual Row)						
	2	3	4	5	6	7	8	4	6	8	10	12	14	16
16	12		11				10	11		9				7
18														
20														
22	8						6	6						5

Group S2 – 18 Day Stability at Current test Resistance (Calculated form Voltage Drop)

Description	Test Condition	Requirement [mΩ]	Min [mΩ]	Max [mΩ]	Avrg [mΩ]
Tin, 16 AWG, 10 samples, 1 thermocouple and 1 voltage drop on each sample	Sequence will be 96 hours @ 12A - 240 hrs with 45 min ON and 15 min OFF - 96 hours @ 12A [total 18 days]	5 MAX	3.42	3.85	3.52
15u Au, 16 AWG, 10 samples, 1 thermocouple and 1 voltage drop on each sample	Sequence will be 96 hours @ 12A - 240 hrs with 45 min ON and 15 min OFF - 96 hours @ 12A [total 18 days]	7 MAX	4.37	4.70	4.74

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molex® TEST SUMMARY

Appendix A -Test Sequences

Group I Temperature Life 144 contacts tin 144 contacts gold	Group II Thermal Shock 144 contacts tin 144 contacts gold	Group III Vibration 144 contacts tin 144 contacts gold	Group V Thermal Cycling 144 contacts tin (tin plated only)	Group VII Durability 144 contacts tin 144 contacts gold
Initial Contact Resistance EIA-364-23	Initial Contact Resistance EIA-364-23	Initial Contact Resistance EIA-364-23	Initial Contact Resistance EIA-364-23	DWV EIA-364-20
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	Initial Contact Resistance EIA-364-23
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	Durability Tin plated: 25 cycles Gold plated: 200 cycles EIA-364-09
Thermal Aging TIN 105°C, 240 hrs GOLD 120°C, 1000 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 GOLD 120°C, 1000 hrs 10 Yrs @ 65°C EIA-364-17	Thermal Aging 105°C, 120 hours GOLD 120°C, 1000 hrs 10 Yrs @ 65°C EIA-364-17	Contact Resistance
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	DWV EIA-364-20
Reseating 3 cycles	Cyclic Temperature and Humidity EIA-364-31	Random Vibration EIA-364-28 Condition VIID	Thermal Cycling EIA-364-1000.01	Latch Retention
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	
	Reseating 3 cycles		Reseating 3 cycles	
	Contact Resistance		Contact Resistance	

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6.0 Individual Tests

6.1 Connector
Mating / Unmating Force

6.2 Connector
Mating / Unmating with latch
without terminals

6.3 Header Pin Retention
Force in the Housing

6.4 Header Insertion/Retention
into the PCB (Vertical Header
with kinked pins 16 circuit,
PTH)

6.5 Header Insertion/Retention
into the PCB (Vertical Header
with solder clip)

6.6 R/A Header
Insertion/Retention into the
PCB (crush pegs)

6.7 Receptacle Terminal
retention force into the housing
20 Terminals / 4 Connectors

6.8 Crimped terminal retention
force into the housing with TPA

6.9 Solderability Dip Test

6.10 Solder Clip retention force
into the housing

6.11 Receptacle latch retention
force

6.12 Receptacle latch retention
force after durability x200
cycles

7.0 USCAR Vibration

Initial Contact Resistance
USCAR 5.9.6 Class V1, S1, T2



Connector and/or Terminal
Cycling
USCAR-2 Rev6: 5.1.7



Voltage Drop
USCAR-2 Rev6: 5.3.2



Vibration
USCAR-2 Rev6: 5.4.6



Mechanical Shock USCAR-2
Rev6: 5.4.6



Dry Circuit Resistance

8.0 Wire-to-Terminal
retention force

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