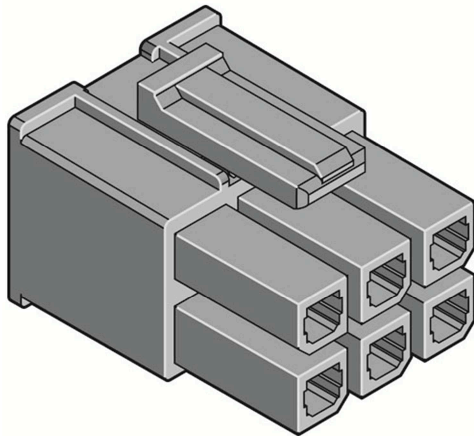
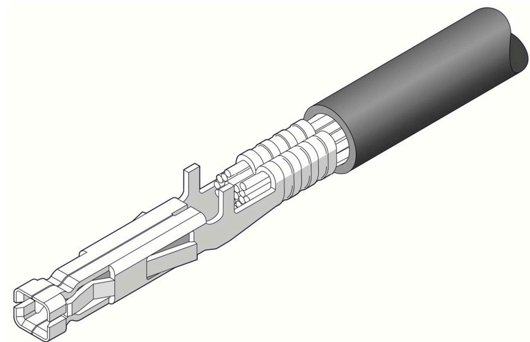
MEGA-FIT®

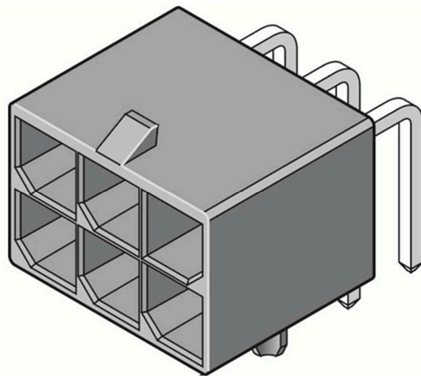
WIRE-TO-BOARD
CONNECTOR SYSTEM



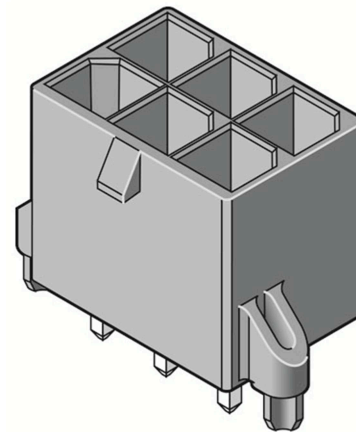
171692 / 170001
RECEPTACLE HOUSING



76823 / 172063
FEMALE TERMINAL



76825 / 172064
RIGHT ANGLE HEADER



76829 / 172065
VERTICAL HEADER

Table of Contents

1.0 SCOPE **3**

2.0 PRODUCT DESCRIPTION **3**
2.1 Product Name and Series Numbers 3
2.2 Dimensions, Materials, Plating and Markings 3
2.3 Safety Agency Approvals 3

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS **4**
3.1 Molex Documents 4
3.2 Industry Documents 4

4.0 ELECTRICAL PERFORMANCE RATINGS **4**
4.1 Voltage 4
4.2 Applicable Wires 5
4.3 Maximum Current Rating 5
4.4 Temperature 6
4.5 Durability 6
4.6 Current Interruption 7

5.0 QUALIFICATION **7**

6.0 PERFORMANCE **7**
6.1 Electrical Performance 7
6.2 Mechanical Performance 8
6.3 Environmental Performance 10

7.0 TEST SEQUENCE GROUPS **12**

8.0 SOLDER INFORMATION **14**
8.1 Solder Process Temperature 14
8.2 Reflow Solder Profile 14

PRODUCT SPECIFICATION

1.0 SCOPE

This product specification covers the performance requirements and test methods of Mega-fit® 5.70 mm pitch wire to board connector systems terminated with 16 to 12 awg stranded wire using crimp technology with tin or gold plating.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Table 1 – WIRE-TO-BOARD	
Description	Series Number
Female Crimp Terminal	76823 / 172063
Receptacle Housing	170001 / 171692
Vertical Header	76829 / 172065
Right Angle Header	76825 / 172064

2.2 DIMENSIONS, MATERIALS, PLATING AND MARKINGS

Dimensions & Plating: See individual sales drawings.
Material: RoHS compliant materials.

2.3 SAFETY AGENCY APPROVALS

2.3.1 UL File Number: UL E29179

UL (fully loaded) NON-current interruption	Current interruption per UL1977 Applies when using 170001 Series Only
23 Amps @ 600V (12 AWG wire) 20 Amps @ 600V (14 AWG wire) 18 Amps @ 600V (16 AWG wire)	23 Amps @ 48V AC/DC (12 AWG wire)

2.3.2 IEC License Number per IEC / EN 61984: Pending Approval

IEC (fully loaded) NON-current interruption
23 Amps @ 600V (12 AWG wire)

2.3.3 **File Number*: LR-19980_A_000 CLASS 6233-01 and 6233-81**

CSA approval meets following standards/test procedures:

a) CSA std. C22.2 No. 182.3-M1987
b) UL-1977

** "C" and "US" mark adjacent to CSA signifies that the product has been evaluated to the applicable CSA and ANSI/UL standards, for use in Canada and US respectively.*

CSA (single circuit) NON-current interruption
23 Amps @ 600V (12 AWG wire)
20 Amps @ 600V (14 AWG wire)
18 Amps @ 600V (16 AWG wire)

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 MOLEX DOCUMENTS

See series specific sales drawings and the other sections of this specifications for the necessary referenced documents and specifications.

Mega Fit Test Summary TS-76823-100
Molex Solderability Specification SMES-152
Molex Heat Resistance Specification ES-40000-5013

3.2 INDUSTRY DOCUMENTS

EIA-364-1000.01
UL-60950-1
UL-1977
CSA STD. C22.2 NO. 182.3-M1987
IEC / EN 61984

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE *

600 Volts AC (RMS) or 600 Volts DC max.

* Maximum voltage allowed may vary dependent upon "End Use Application". Refer to UL-60950-1 for additional information on Voltage, Creepage and Clearance requirements.

4.2 APPLICABLE WIRES

Maximum Insulation Diameter and Applicable Wire Gauges	
	Stranded copper 16 AWG: 3.18 mm / .125 inches MAXIMUM
	Stranded copper 14 AWG: 3.66 mm / .144 inches MAXIMUM
	Stranded copper 12 AWG: 4.11 mm / .162 inches MAXIMUM

4.3 MAXIMUM CURRENT RATING

Current rating is application dependent and may be affected by the wire rating such as listed in UL-60950-1. Each application should be evaluated by the end user for compliance to specific safety agency requirements. The ratings listed in the chart below are per Molex test method based on a 30° C maximum temperature rise over ambient temperature and are provided as a guideline. Appropriate de-rating is required based on circuit size, ambient temperature, copper trace size on the PCB, gross heating from adjacent modules/components and other factors that influence connector performance. Wire size & stranding, tin coated or bare copper, wire length & crimp quality are other factors that influence current rating.

Wire to Board Current Rating (Amp Max.)
*(As tested with **tinned** awg copper wire and tin or gold plated terminals)*

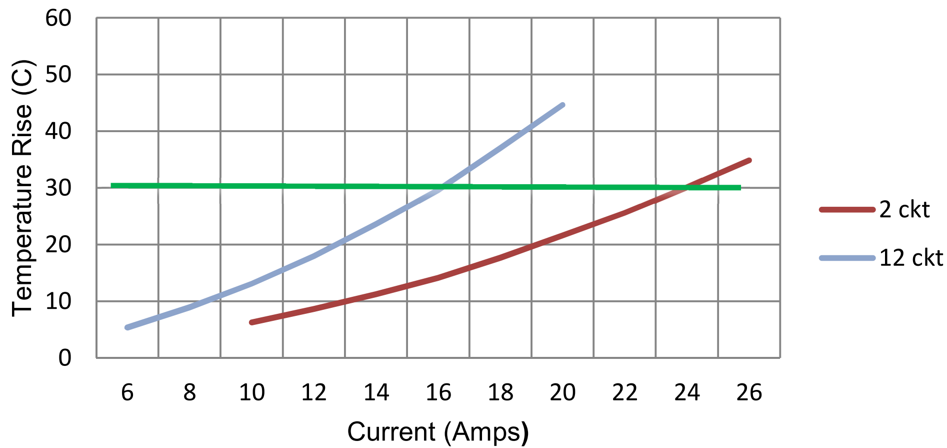
Connector fully loaded with all circuits powered

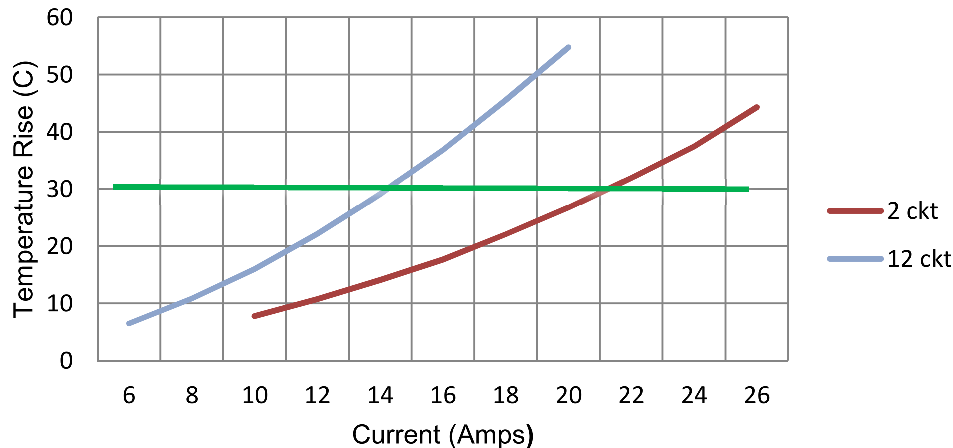
Ckt. Size / AWG Wire Size	2	4	6	8-12
12 AWG	23	20	18	16
14 AWG	21	17	15	13
16 AWG	17	15	13	12

Wire to Board Current Rating (Amp Max.)
*(As tested with **bare** awg copper wire and tin or gold plated terminals)*

Connector fully loaded with all circuits powered

Ckt. Size / AWG Wire Size	2	4	6	8-12
12 AWG	21	18	16	14
14 AWG	19	15	13	11
16 AWG	15	13	11	10





4.4 TEMPERATURE

Max. operating temperature range (including T-rise from applied current) is -40°C to 105°C.
Field temperatures and field life: Tested per EIA 364-1000.01 to meet field temperature of 65°C for 10 years life per table-8.

4.5 DURABILITY

Tin plated: TBD mate/unmates
Gold plated: 200 mate/unmates

As tested in accordance with EIA-364-1000.01 test method (see Sec. 7.0 of this specification). Durability per EIA-364-09.

4.6 CURRENT INTERRUPTION (Applies when using 170001 Series ONLY)

48 Volt AC/DC @ 23 Amp

Tested 250 cycles at 48 volt DC with a test current of 34.5 Amp hot-plug test conducted with all circuits powered with 12 awg wire per UL1977 with tin plated contacts.

5.0 QUALIFICATION

Laboratory conditions and sample selection are in accordance with EIA-364-1000.01

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

DESCRIPTION	TEST CONDITION	REQUIREMENT
Initial Contact Resistance (Low Level) Resistance Measure Points	Mate connectors, apply a maximum voltage of 20 mV and a current of 100 mA (measurement locations shown) Per EIA-364-23 Wire resistance and traces shall be removed from the measured value.	Maximum (Initial): Tin: TBD 15μ” & 30μ” Gold: 2 mΩ
Contact Resistance @Rated Current (Voltage Drop)	Mate connectors; apply the rated current. Per EIA-364-70	Maximum: Tin: TBD 15μ” & 30μ” Gold: 5 mΩ
Insulation Resistance	Apply 500 VDC between adjacent terminals or ground. Per EIA-364-21	1,000 M Ω minimum
Dielectric Withstanding Voltage	Apply 2200 VAC for 1 minute between adjacent terminals. Per EIA-364-20	No breakdown Current leakage <5mA
Temperature Rise	Mate connectors, measure T- Rise @ Rated Current After 96 Hours. Per EIA-364-70	Temperature rise: 30° C maximum

6.2 MECHANICAL PERFORMANCE

ITEM	TEST CONDITION	REQUIREMENT
Connector Mating Force	Mate connectors at a rate of 25.4 +/- 6 mm per minute. Per EIA-364-37	Tin plated: TBD N MAX. initial mate force per circuit 15µ" & 30µ" Gold plated: 5.6 N MAX. per circuit
Connector Un-mating Force (latch disabled)	Un-mate connectors with latch disabled at a rate of 25.4 +/- 6 mm per minute. Per EIA-364-37	Tin plated: TBD N MIN. initial un-mate force per circuit 15µ" & 30µ" Gold plated: 5.6 N MIN. per circuit
Thumb Latch Yield Strength	Mate loaded connectors fully. Pull connectors apart at a rate of 25.4 +/- 6 mm per minute.	68 N MIN.
Durability	Mate connectors TBD cycles for tin plated and 200 cycles for gold plated connectors at a maximum rate of 10 cycles per minute. Per EIA-364-09	Maximum change from initial: Tin: TBD 15µ" & 30µ" Gold: 2 mΩ
Durability with Environment (Preconditioning)	Mate connectors TBD cycles for tin plated and 20 cycles for gold plated connecters at a maximum rate of 10 cycles per minute. Per EIA-364-09, test method per Sec. 7	Maximum change from initial: Tin: TBD 15µ" & 30µ" Gold: 2 mΩ
Header Pin Retention Force in Housing Vertical Header	Axial pull force on the vertical header housing away from the PCB at a rate of 25.4 +/- 6 mm per minute.	89 N min per pin
Header Pin Retention Force in Housing Right Angle Header	Axial push force on the pin in the housing at a rate of 25.4 +/- 6 mm per minute.	9.81 N min per pin

6.2 MECHANICAL PERFORMANCE (CONT.)

ITEM	TEST CONDITION	REQUIREMENT
PCB Peg Engagement Force (Nominal PCB hole diameter & location)	Insert a header at a rate of 25.4±6 mm/minute. (Applies to parts with PCB retention pegs only)	Header with 2 pegs: 85 N max insertion force Headers with 1 peg: 45 N max insertion force
Crimp Terminal Retention Force (in housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm per minute. Per EIA-364-29	30 N MINIMUM retention force
Wire Pull Out Force From Terminal (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm per minute.	12 Awg = 220 N Min. 14 Awg = 220 N Min. 16 Awg = 200 N Min. Reference Molex Application Tooling Specification for Molex crimp tooling being used.
Vibration (Random)	Mate connectors and vibrate per EIA-364-28 test condition VII-D Tin: 15 minutes each axis. Gold: 1.5 hours each axis.	Maximum Change from Initial: Tin: TBD 15µ” & 30µ” Gold: 2 mΩ Discontinuity < 1 microsecond
Reseating	Unmate/Mate connectors by hand three cycles	Maximum Change from Initial: Tin: TBD mΩ 15µ” & 30µ” Gold: 2 mΩ Except for After Mixed Flowing Gas: 15µ” Gold: 6 mΩ 30µ” Gold: 3 mΩ

6.3 ENVIRONMENTAL PERFORMANCE*

ITEM	TEST CONDITION	REQUIREMENT
Thermal Shock	Mate connectors, expose to 10 cycles from -55°C to 85°C Per EIA-364-32 method A, condition 1	Maximum Change from Initial: Tin: TBD mΩ 15μ” & 30μ” Gold: 2 mΩ
Thermal Aging	Mate Connectors, expose to 240 hours at 105°C Per EIA-364-17 Method A	Maximum Change from Initial: Tin: TBD mΩ 15μ” & 30μ” Gold: 2 mΩ
Thermal Aging (Preconditioning)	Mate Connectors, expose to 120 hours at 105°C Per EIA-364-17 Method A	Maximum Change from Initial: Tin: TBD mΩ 15μ” & 30μ” Gold: 2 mΩ
Cyclic Temperature And Humidity	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	Maximum Change from Initial: Tin: TBD mΩ 15μ” & 30μ” Gold: 2 mΩ
Mixed Flowing Gas Gold Plated Only	240 hours un-mated, 96 hours mated, Per EIA-364-65 Class II-A	Maximum Change from Initial: 15μ” Gold: 6 mΩ 30μ” Gold: 3 mΩ
Thermal Disturbance Gold Plated Only	Per EIA-364-1000.01 test group 4, cycle mated connector between 15°C and 85°C for 10 cycles at a rate of 2°C / min. Humidity is not controlled.	Maximum Change from Initial: 15μ” Gold: 6 mΩ 30μ” Gold: 3 mΩ
Solderability Dip Test	Per Molex test method: SMES-152	Solder area shall have MIN. of 95% solder coverage
Reflow Solder Resistance	Convection reflow solder process 260°C Max per ES-40000-5013	Visual: No damage
Wave Solder Resistance	Dip header terminal tails in solder: Duration: 5±0.5 seconds Solder temperature: 260±5° C Per ES-40000-5013	Visual: No damage

6.3 ENVIRONMENTAL PERFORMANCE (CONT.)*		
ITEM	**ITEM**	**ITEM**
Thermal Cycling Tin Plated Only	Per EIA-364-1000.01 Test Group 5: Cycle mated connector between 15°C±3°C and 85°C±3°C as measured on the part. Ramps should be a minimum of 2°C per minute, and dwell times should insure contacts reach the temperature extremes (minimum of 5 minutes). Humidity is not controlled. Perform 500 cycles.	Maximum Change from Initial: Tin: TBD mΩ

**Environmental tests have been performed per EIA-364-100.01 except where noted.*

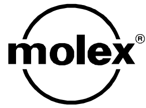
7.0 TEST SEQUENCE GROUPS

Reliability Test Sequences Per 364-1000 .01

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 IV** Mixed Flowing Gas 1000 contacts gold (gold plated only)	**Group V** Thermal Cycling 144 contacts tin (tin plated only)	**Group VI** 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	Initial Contact Resistance EIA-364-23	DWV EIA-364-20
Durability Tin plated: TBD cycles Gold plated: 20 cycles EIA-364-09	Durability Tin plated: TBD cycles Gold plated: 20 cycles EIA-364-09	Durability Tin plated: TBD cycles Gold plated: 20 cycles EIA-364-09	Durability 20 cycles EIA-364-09	Durability TBD cycles EIA-364-09	Initial Contact Resistance EIA-364-23
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	Durability Tin plated: TBD cycles Gold plated: 200 cycles EIA-364-09
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	Thermal Aging 105°C, 120 hours 10 Yrs @ 65°C EIA-364-17	
Contact Resistance	Contact Resistance	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	Flowing Mixed Gas 10 days unmated EIA-364-65	Thermal Cycling EIA-364-1000.01	DWV EIA-364-20
Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	Contact Resistance	
	Reseating 3 cycles		Flowing Mixed Gas 4 days mated EIA-364-65	Reseating 3 cycles	
	Contact Resistance		Contact Resistance	Contact Resistance	
			Thermal Disturbance EIA-364-1000.01		
			Contact Resistance		
			Reseating 3 cycles		
			Contact Resistance		

Individual Tests

- Connector Mating / Unmating Force
- Temperature Rise / Voltage Drop
- Wire pullout force from terminal (axial)
- Header Pin Retention in Housing
- Crimped Terminal Retention Force in Housing
- Wave / Reflow Solder Resistance
- Solderability
- Insulation Resistance
- PCB Peg Engagement Forces
- Thumb Latch yield strength



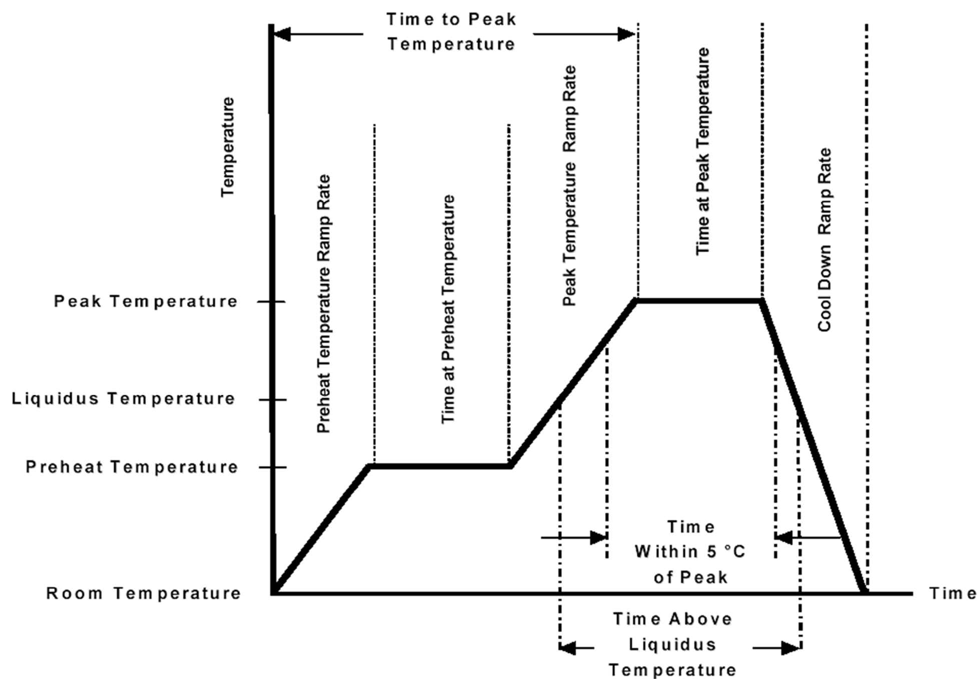
8.0 SOLDER INFORMATION

8.1 SOLDER PROCESS TEMPERATURES

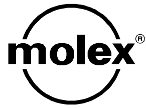
Wave Solder: 265°C Max
Reflow Solder: 260°C Max

8.2 REFLOW SOLDERING PROFILE

(This profile is per JEDEC J-STD-020D.1 and is provided as a guideline only. Please see notes for additional information)



Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquidus (217°C)	60 to 150 sec
Peak Temperature	260 +0/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max



Notes:

1. Temperature indicated refers to the PCB surface temperature at solder tail area.
2. Connector can withstand 1 reflow cycle.
3. Actual reflow profile also depends on equipment, solder paste, PCB thickness, and other components on the board. Please consult your solder paste & reflow equipment manufacturer for their recommendations to adopt a suitable process.