PRODUCT SPECIFICATION

MINI-FIT H2O – SEALED CONNECTOR SYSTEM

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1.0 SCOPE

This Product Specification covers performance requirements for the MINI-FIT H2O Sealed Connector system. The mated system is Single Row, Wire to Wire. The circuit pitch (center to center) is 4.20 mm (.165 inch). The mated system is designed to meet IP67 sealing requirements (suspended dust and submersible in one meter of water). The terminals are available in Gold or Tin plating. Contact Molex for availability of tooled circuit sizes and wire gauges.

2.0 PRODUCT DESCRIPTION

2.1 NAMES AND SERIES NUMBER(S)

Table 1 – WIRE-TO-WIRE

Description	Series Number	RoHS	UL	CSA	TUV
Female Crimp Terminal	46055	Yes	n/a	n/a	n/a
Receptacle Assembly	46064	Yes	Yes	Yes	TBD
Male Crimp Terminal	46056	Yes	n/a	n/a	n/a
Plug Assembly	46065	Yes	Yes	Yes	TBD

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See sales drawings for connector dimensions, specific crimp dimensions for each wire size, materials, plating, lubrication (if applicable) and markings.

NOTE: WHEN USING OVERALL TIN PLATED TERMINALS-
FOR APPLICATIONS INVOLVING VIBRATION AND/OR THERMAL CYCLING, MOLEX STRONGLY RECOMMENDS THE USE OF NYE LUBRICANT, NYOGEL 760G ON THE MATING END (SEPARABLE CONTACT INTERFACE) OF THE TERMINALS.

2.3 SAFETY AGENCY APPROVALS

UL File: E29179, Vol.10
CSA Certificate: 1068385 (LR 19980-115)
TUV Certificate: TBD

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and Section 6.0 (Test Sequences) of this document.
Application Tooling Specifications:

ATS-639001700 FineAdjust Applicator
ATS-639101700 T2 Terminator Tooling
ATS-638191800 Hand Crimp Tool

4.0 RATINGS

4.1 VOLTAGE

600 Volts AC (RMS)

4.2 APPLICABLE WIRES

WIRE GA. / STYLE	TABLE 2 WIRE DIAMETERS ARE IN MM TOLERANCE = +/- 0.10 MATTE SEAL COLOR DESIGNATES WIRE DIAMETER				
	16	**18**	**20**	**22**	**24**
UL 1007 UL 1569	2.30 GREEN	1.95 BLUE	1.72 BLUE	1.56 BLUE	1.41 BLUE
UL 1015	3.10 ORANGE	2.80 ORANGE	2.55 ORANGE	2.40 GREEN	2.20 GREEN

4.3 MAXIMUM CURRENT RATING (Amperes)

Table 3 – WIRE-TO-WIRE (Single Row)			
Recommended Wire = Tinned / Stranded Copper			
Wire \ Ckt. Size	2	3	4
AWG #16	TBD	TBD	TBD
AWG #18	9	TBD	TBD
AWG #20	9	TBD	TBD
AWG #22	TBD	TBD	TBD
AWG #24	TBD	TBD	TBD

4.4 TEMPERATURE

Operating: * - 40°C to + 105°C
Nonoperating: - 40°C to + 105°C
**Including 30°C terminal average temperature rise at rated current*

5.0 WIRE-TO-WIRE PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Contact Resistance (Low Level)**	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. Wire resistance shall be removed from the measured value.	10 milliohms MAXIMUM [initial]
2	**Contact Resistance @ Rated Current**	Mate connectors: apply a maximum voltage of 20 mV at rated current.	10 milliohms MAXIMUM [initial]
3	**Contact Resistance of Wire Termination (Low Level)**	Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100 mA.	5 milliohms MAXIMUM [initial]
4	**Insulation Resistance**	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
5	**Dielectric Withstanding Voltage**	Mate connectors: apply a voltage of 2200 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown. Current leakage < 5 mA
6	**Temperature Rise (via Current Cycling)**	Mate connectors. Measure the temperature rise at the rated current after 96 hours, during current cycling (45 minutes ON and 15 minutes OFF per hour) for 240 hours, and after final 96-hour steady state.	Temperature rise: +30°C Max.

5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
1	**Terminal Mate and Unmate Forces Per Circuit**	Insert and withdraw terminal (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	Sn	14.7 N (3.30 lbf) MAXIMUM insertion force & 1.0 N (0.22 lbf) MINIMUM withdrawal force
			Au	14.7 N (3.30 lbf) MAXIMUM insertion force & 0.75 N (0.17 lbf) MINIMUM withdrawal force

5.2 MECHANICAL REQUIREMENTS (continued)

2	**Crimp Terminal Retention Force (in Housing)**	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	20 N (4.50 lbf) MINIMUM retention force
3	**Durability**	Mate connectors up to 75 (Sn) or 100 (Au) cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	20 milliohms MAXIMUM
4	**Vibration (Random)**	Mate connectors and vibrate per EIA 364-28, test condition VII.	10 milliohms MAXIMUM (change from initial) & Discontinuity < 1 microsecond
5	**Shock (Mechanical)**	Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±X, ±Y, ±Z axes, (18 shocks total).	20 milliohms MAXIMUM & Discontinuity < 1 microsecond
6	**Wire Pullout Force (Axial)**	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1 ± ¼ inch).	18 Awg = 88.0 N (19.8 lbf) Min. 20 Awg = 59.0 N (13.3 lbf) Min.
7	**Crimp Terminal Insertion Force (into Housing)**	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch).	15.0 N (3.37 lbf) MAXIMUM insertion force
8	**Thumb Latch Operation Force**	Depress latch at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	16.67 N (3.75 LBF) MAX.
9	**Thumb Latch Yield Strength**	Mate loaded connectors fully. Pull connectors apart at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	68 N (15.29 LBF) MIN.
10	**Connector Mate and Unmate Forces**	Mate and unmate connector (male and female) at a rate of 50 ± 6mm (2 ±¼ inch) per minute.	75 Newtons MAXIMUM

5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Thermal Shock**	Mate connectors: expose for 5 cycles Between temperatures –55 and 105° C; Dwell 0.5 hours at each temperature.	20 milliohms MAXIMUM Visual: No Damage Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4
2	**Thermal Aging**	Mate connectors; expose to: 96 hours at 105 ± 2°C	20 milliohms MAXIMUM & Visual: No Damage
3	**Humidity (Steady State)**	Mate connectors: expose to a temperature of 60 ± 2°C with a relative humidity of 90-95% for 96 hours.	20 milliohms MAXIMUM Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4 Visual: No Damage
4	**IP67**	IP6X – Expose connectors to suspended dust under pressure. IPX7 - Submerge mated connector under water 1 meter minimum for 30 minutes minimum duration.	No dielectric breakdown: Current leakage < 5 mA & Visual: No dust or water

6.0 TEST SEQUENCES

Testing sequences to be performed in accordance with EIA-364-1000.01
IP67 rating testing to be performed per specification IEC 60529.
Connector Mate and Unmate to be performed per USCAR-2

7.0 PACKAGING

Parts shall be packaged to protect against damage during normal handling, transit and storage.