Molex 716612030 PDF

深圳创唯电子有限公司 http://www.molex-connect.com

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1.0 SCOPE

This specification covers the Molex EBBI 50D family of plug and receptacle connectors. This is an Economical Board to Board Interface system specific to the requirements set forth by Molex, Inc.

2.0 PRODUCT DESCRIPTION

2.1 CONNECTORS COVERED IN THIS SPECIFICATION

Description	Sales Drawing
Receptacle Connector, Vertical	SDA-71660-1***, -9***
Plug Connector, Vertical	SDA-71661-1***, -9***, SDA-71661 -15**
Plug Connector, Right Angle	SDA-71661-2***
Plug Connector, SMT	SD-74139-001, -002, -003, -004, -005, -006
Receptacle Connector, Blind Mate	SDA-71660-7***
Plug Connector, Blind Mate	SDA-71661-7***
Receptacle Connector, Vertical IDT	SDA-71660-3***

2.2 GENERAL DESCRIPTION

The Molex EBBI 50D interface is a cost effective, high density system. The connectors have a 0.050” (1.27 mm) contact centerline and use a “D” shaped mating face for polarization. Polarization on the blind mate connectors is achieved by two different size guiding posts. The products outlined here utilize a leaf system contact design that is duplex plated. This provides a gold plated interface for long-term reliability. The plug contact is fixed while the receptacle contact is compliant, allowing for variable mating depth.

2.3 PRODUCT FAMILY

The EBBI 50D connector family consists of a vertical plug and receptacle, a right angle plug, a vertical SMT plug, and a vertical blind mate plug. These are available in select circuit sizes from 30 to 130. The receptacle connector can also serve as a card edge connector. All are designed to be wave soldered on a standard .062" thick printed circuit board (PCB) using conventional industry methods.

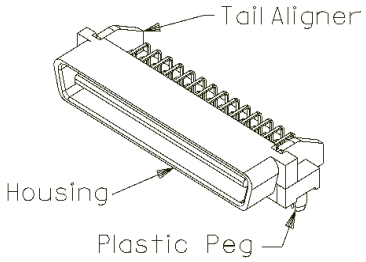
2.4 RIBBON CONNECTOR

The vertical IDT receptacle connector mates with the Molex plug connector series 71661. The applicable wire range for this connector is stated below.

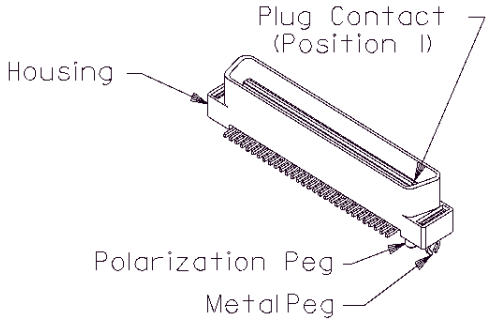
#30 AWG solid copper:
Conductor O.D. to be 0.010"
Insulation O.D. to be .024"± .002 (PVC or TPR insulation)

#30 AWG stranded (7/38) tinned copper:
Conductor O.D. to be 0.012".
Insulation O.D. to be .024" ± .002 (PVC or TPR insulation)

2.5 NOMENCLATURE

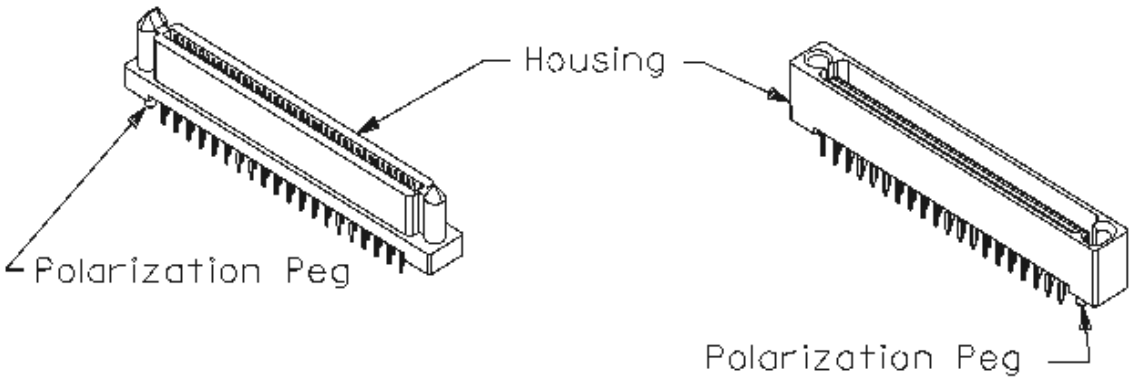


RIGHT ANGLE PLUG CONNECTOR
(71661-2***)



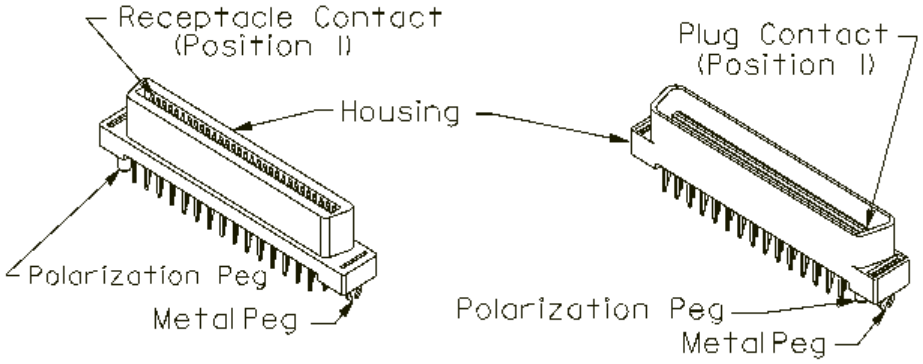
VERTICAL SMT PLUG CONNECTOR
(74139-00**, 74139 -5***)

2.5 NOMENCLATURE (CONT'D)



BLIND MATE RECEPTACLE CONNECTOR
(71660-7***)

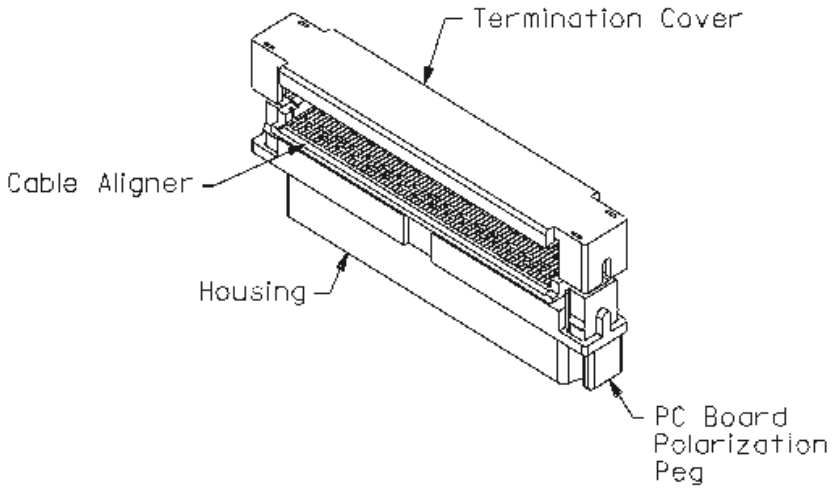
BLIND MATE PLUG CONNECTOR
(71661-7***)



VERTICAL RECEPTACLE CONNECTOR
(71660-1***, 71660-9***)

VERTICAL PLUG CONNECTOR
(71661-1***, 71661-9***, 71661-15**)

2.5 NOMENCLATURE (CONT'D)



VERTICAL IDT RECEPTACLE
(71660-3***)

3.0 RECOGNIZED AGENCY APPROVAL

3.1 UNDERWRITERS LABORATORIES: FILE E29179

3.2 CANADIAN STANDARDS ASSOCIATION: LR19980-239A

4.0 RATINGS

4.1 VOLTAGE: 30 VAC Maximum

4.2 CURRENT: 1.0 AMPS at 20°C maximum temperature rise

4.3 AMBIENT TEMPERATURE RANGE: -40°C to 105°C

5.0 ELECTRICAL PERFORMANCE

TEST	PROCEDURE	CRITERIA	COMMENTS
Contact Interface Resistance		10 mΩ delta	Mate connectors, measure by dry circuit, 20 mV max., 10 mA
Dielectric Strength	MIL-STD-202, Method 302, Condition B	No breakdown	Mate connectors, apply 500 VRMS for 1 minute between adjacent terminals of ground
Insulation Resistance	MIL-STD-202, Method 302, Condition B	100 mΩ, min.	Mate connectors, apply 500 VDC for 1 minute between adjacent terminals or ground
Current Cycling		20 °C maximum rise	45 minutes on, 15 minutes off for 240 hours
Temperature Rise, Steady State		20 °C maximum rise	DC current for 96 hours

6.0 MECHANICAL PERFORMANCE

TEST	CRITERIA	COMMENTS
Connector Mating and Unmating Forces	Mating forces: 90 gf x N max. (N=number of circuits) Unmating forces: 15 gf x N min. (N=number of circuits)	Mate and unmate connectors at a rate of 1.0 ± .12" (25 ± 3 mm) per minute
Terminal Retention Force	1.00 lbs (0.45 kg) minimum	Apply axial pullout force at a rate of 1.0 ± .12" (25 ± 3 mm) per minute
Cable Bend Strain Test (Vertical IDT only)	No breakage of core wires	Bend cable 45° from center in each direction while applying a 1 kg load to free end

7.0 ENVIRONMENTAL PERFORMANCE

TEST	PROCEDURE	CRITERIA	COMMENTS
Mate/Unmate Cycling	2000 Mate/Unmate cycles followed by thermal shock, thermal aging, and cyclic humidity	Mate/Unmate forces and Contact Resistance measured initially; measurements taken at 250 cycle intervals: 10 mΩ change from initial	Mate/unmate connectors for 2000 cycles at a rate of 10 cycles per minute
Thermal Aging	MIL-STD-202, Method 108A, Condition A	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial.	Mated connectors subjected to 105 °C for 96 hours.
Vibration	MIL-STD-202, Method 201A	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial Discontinuity: 1 msecond maximum.	Mated connectors to be soldered to a PCB with a simple harmonic motion along the X, Y and Z axes, having an amplitude of .059" (1.5 mm) P-P. Each axis shall be subjected to the entire range of 10-55-10 Hz, traversed in one minute, Duration: 2 hours for each axis.
Mechanical Shock	MIL-STD-202 Method 213B, Condition A	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial. Discontinuity: 1 msecond maximum	Mated connectors to be soldered to a PCB with 50 grams of acceleration. 3 shocks along the X, Y and Z axes.
Thermal Shock		Appearance: No physical damage. Contact resistance: 10 mΩ change from initial	Mated connectors subjected to 105 °C to -40 °C with 30 minute dwell, 10 cycles
Steady State Humidity	MIL-STD-202 Method 103B, Condition B	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial Insulation Resistance: 100 mΩ min. Must pass dielectric strength	Mated connectors subjected to 60± 2 °C at 90-95% RH for 96 hours.

7.0 ENVIRONMENTAL PERFORMANCE (CONTINUED)

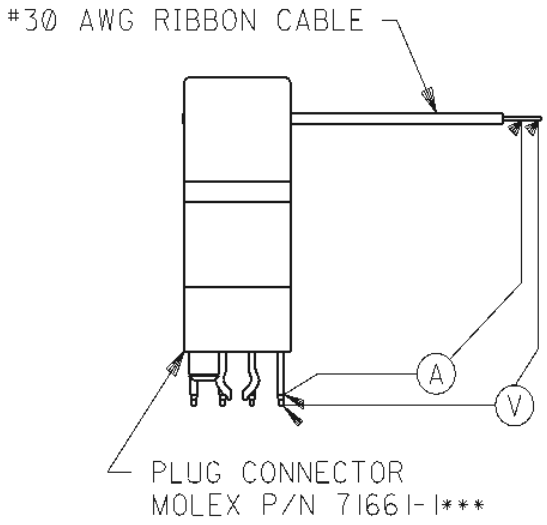
TEST	PROCEDURE	CRITERIA	COMMENTS
Cyclic Humidity	MIL-STD-202 Method 106D	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial Insulation Resistance: 100 mΩ min. Must pass dielectric strength	Mated connectors subjected to 25°C - 65 °C at 90-95% RH for 240 hours
Mixed Flowing Gas Test	Battelle Class II	Appearance: No physical damage Contact resistance: 10 mΩ change from initial	Subject mated connector to a mixed gas for 10 days at 30° C. Linear flow rate to be 305 mm/second.
Solderability		95% of immersed area must show no voids or pin holes.	Test Parameters: Soldering time to be 3 ± 0.5 seconds. Solder temperature to be 230 ± 5 °C

8.0 TEST SEQUENCE

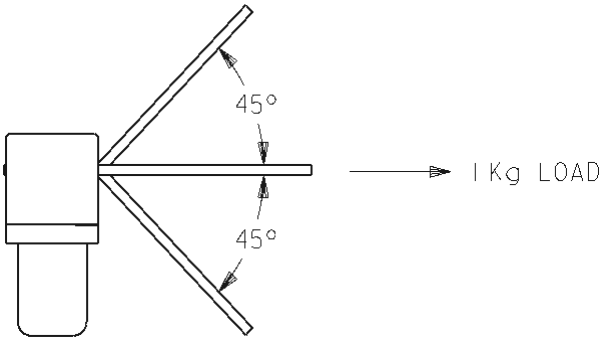
TEST OR EXAMINATION	TEST SEQUENCE							
	1	2	3	4	5	6	7	8*
EXAMINATION OF PRODUCT	1	1	1	1	1	1	1	1
MEASURE CONTACT RESISTANCE	2,4,6,8	2,4,6,8,10	2,4,6,8	2,4,6,8,10			2,4,6	2,4,6,8
MEASURE TEMPERATURE					2,4,6,8,10	2,4,6,8,10,12		
THERMAL SHOCK	3	5						
MATE/UNMATE CYCLING		3		3		3		
THERMAL AGING	5	7						
CYCLIC HUMIDITY	7	9						
STEADY STATE HUMIDITY			3	5	3	5		
MIXED FLOWING GAS							3	3
VIBRATION			7	9				7
MECHANICAL SHOCK			5	7				
CURRENT CYCLING					7	9		
TEMPERATURE RISE-STEADY STATE					5,9	7,11		
MATE/UNMATE CYCLING							5	
CABLE BEND (VERTICAL IDT ONLY)								5

*Vertical IDT receptacle connector only

9.0 TEST SETUP – VERTICAL IDT RECEPTACLE CONNECTOR



MEASURING METHOD OF CONTACT RESISTANCE
NOTE: VALUE OF WIRE RESISTANCE CALL BE DEDUCTED



TEST SETUP FOR CABLE BEND RESISTANCE

10.0 PROCESSING GUIDELINES

PROCESSING STEP	RECOMMENDATION	COMMENTS
Picking and Placing SMT Plug Connectors using the Pick and Place Caps/Clips	Acceleration Limits (in ft/sec^2) Circuit Size / Vertical Move / Horizontal Move 30 / 39.5 / 49.7 40 / 32.4 / 40.8 50 / 27.5 / 34.6 60 / 24.0 / 30.2 68 / 21.6 / 27.1 80 / 18.9 / 23.7 100 / 15.7 / 19.7	These limits prevent the Connector from moving in relationship to the vacuum cap/clip during the transfer from the connector packaging to the printed circuit board.
Resistance to Soldering Heat	Peak soldering temperature to be 265 degrees C. Maximum time within 5 degrees of peak temperature to be 40 seconds. Note: 71661-2***; 71661-5*** and 71661-7*** must be dried for 1 hour @100°C prior to processing at temperatures over 245°C.	Appearance: No physical damage.

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Plug Connector, SMT	SD-74139-001, -002, -003, -004, -005, -006
Receptacle Connector, Blind Mate	SDA-71660-7***
Plug Connector, Blind Mate	SDA-71661-7***
Receptacle Connector, Vertical IDT	SDA-71660-3***

2.2 GENERAL DESCRIPTION

The Molex EBBI 50D interface is a cost effective, high density system. The connectors have a 0.050” (1.27 mm) contact centerline and use a “D” shaped mating face for polarization. Polarization on the blind mate connectors is achieved by two different size guiding posts. The products outlined here utilize a leaf system contact design that is duplex plated. This provides a gold plated interface for long-term reliability. The plug contact is fixed while the receptacle contact is compliant, allowing for variable mating depth.

2.3 PRODUCT FAMILY

The EBBI 50D connector family consists of a vertical plug and receptacle, a right angle plug, a vertical SMT plug, and a vertical blind mate plug. These are available in select circuit sizes from 30 to 130. The receptacle connector can also serve as a card edge connector. All are designed to be wave soldered on a standard .062" thick printed circuit board (PCB) using conventional industry methods.

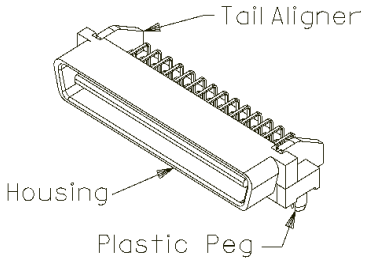
2.4 RIBBON CONNECTOR

The vertical IDT receptacle connector mates with the Molex plug connector series 71661. The applicable wire range for this connector is stated below.

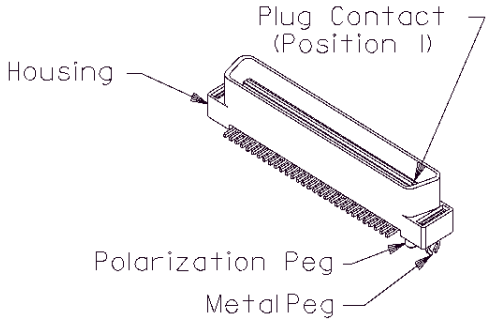
#30 AWG solid copper:
Conductor O.D. to be 0.010"
Insulation O.D. to be .024"± .002 (PVC or TPR insulation)

#30 AWG stranded (7/38) tinned copper:
Conductor O.D. to be 0.012".
Insulation O.D. to be .024" ± .002 (PVC or TPR insulation)

2.5 NOMENCLATURE

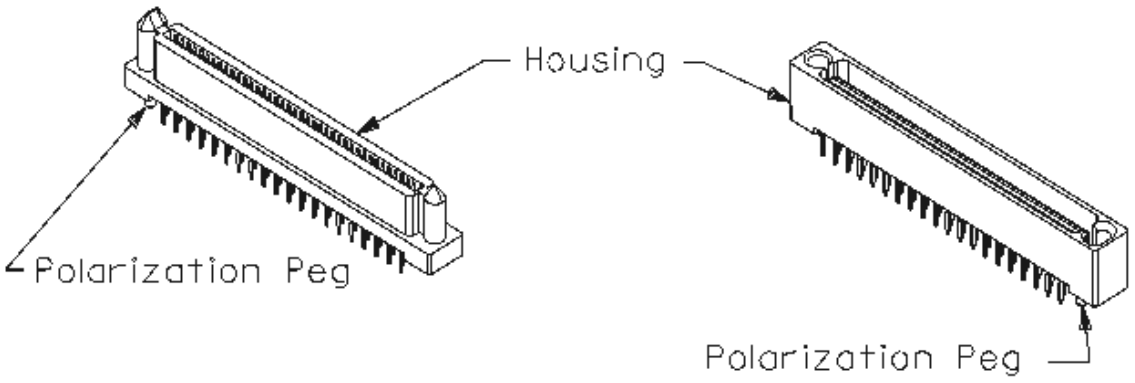


RIGHT ANGLE PLUG CONNECTOR
(71661-2***)



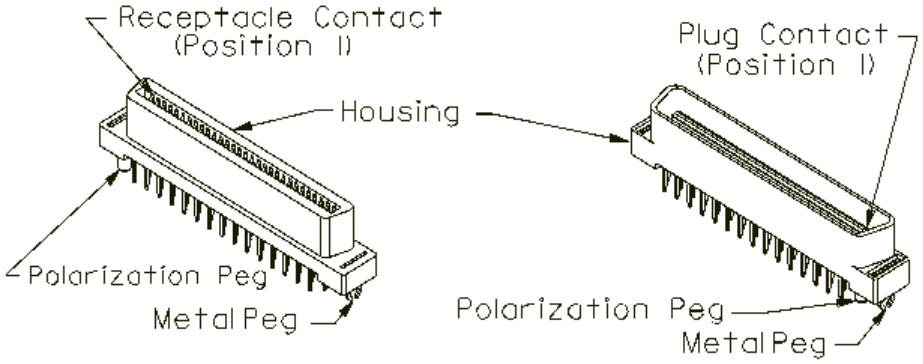
VERTICAL SMT PLUG CONNECTOR
(74139-00**, 74139 -5***)

2.5 NOMENCLATURE (CONT'D)



BLIND MATE RECEPTACLE CONNECTOR
(71660-7***)

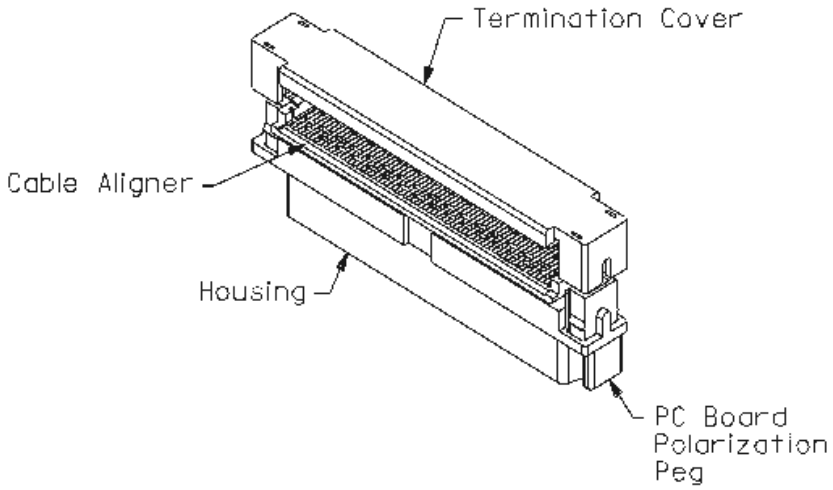
BLIND MATE PLUG CONNECTOR
(71661-7***)



VERTICAL RECEPTACLE CONNECTOR
(71660-1***, 71660-9***)

VERTICAL PLUG CONNECTOR
(71661-1***, 71661-9***, 71661-15**)

2.5 NOMENCLATURE (CONT'D)



VERTICAL IDT RECEPTACLE
(71660-3***)

3.0 RECOGNIZED AGENCY APPROVAL

3.1 UNDERWRITERS LABORATORIES: FILE E29179

3.2 CANADIAN STANDARDS ASSOCIATION: LR19980-239A

4.0 RATINGS

4.1 VOLTAGE: 30 VAC Maximum

4.2 CURRENT: 1.0 AMPS at 20°C maximum temperature rise

4.3 AMBIENT TEMPERATURE RANGE: -40°C to 105°C

5.0 ELECTRICAL PERFORMANCE

TEST	PROCEDURE	CRITERIA	COMMENTS
Contact Interface Resistance		10 mΩ delta	Mate connectors, measure by dry circuit, 20 mV max., 10 mA
Dielectric Strength	MIL-STD-202, Method 302, Condition B	No breakdown	Mate connectors, apply 500 VRMS for 1 minute between adjacent terminals of ground
Insulation Resistance	MIL-STD-202, Method 302, Condition B	100 mΩ, min.	Mate connectors, apply 500 VDC for 1 minute between adjacent terminals or ground
Current Cycling		20 °C maximum rise	45 minutes on, 15 minutes off for 240 hours
Temperature Rise, Steady State		20 °C maximum rise	DC current for 96 hours

6.0 MECHANICAL PERFORMANCE

TEST	CRITERIA	COMMENTS
Connector Mating and Unmating Forces	Mating forces: 90 gf x N max. (N=number of circuits) Unmating forces: 15 gf x N min. (N=number of circuits)	Mate and unmate connectors at a rate of 1.0 ± .12" (25 ± 3 mm) per minute
Terminal Retention Force	1.00 lbs (0.45 kg) minimum	Apply axial pullout force at a rate of 1.0 ± .12" (25 ± 3 mm) per minute
Cable Bend Strain Test (Vertical IDT only)	No breakage of core wires	Bend cable 45° from center in each direction while applying a 1 kg load to free end

7.0 ENVIRONMENTAL PERFORMANCE

TEST	PROCEDURE	CRITERIA	COMMENTS
Mate/Unmate Cycling	2000 Mate/Unmate cycles followed by thermal shock, thermal aging, and cyclic humidity	Mate/Unmate forces and Contact Resistance measured initially; measurements taken at 250 cycle intervals: 10 mΩ change from initial	Mate/unmate connectors for 2000 cycles at a rate of 10 cycles per minute
Thermal Aging	MIL-STD-202, Method 108A, Condition A	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial.	Mated connectors subjected to 105 °C for 96 hours.
Vibration	MIL-STD-202, Method 201A	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial Discontinuity: 1 msecond maximum.	Mated connectors to be soldered to a PCB with a simple harmonic motion along the X, Y and Z axes, having an amplitude of .059" (1.5 mm) P-P. Each axis shall be subjected to the entire range of 10-55-10 Hz, traversed in one minute, Duration: 2 hours for each axis.
Mechanical Shock	MIL-STD-202 Method 213B, Condition A	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial. Discontinuity: 1 msecond maximum	Mated connectors to be soldered to a PCB with 50 grams of acceleration. 3 shocks along the X, Y and Z axes.
Thermal Shock		Appearance: No physical damage. Contact resistance: 10 mΩ change from initial	Mated connectors subjected to 105 °C to -40 °C with 30 minute dwell, 10 cycles
Steady State Humidity	MIL-STD-202 Method 103B, Condition B	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial Insulation Resistance: 100 mΩ min. Must pass dielectric strength	Mated connectors subjected to 60± 2 °C at 90-95% RH for 96 hours.

7.0 ENVIRONMENTAL PERFORMANCE (CONTINUED)

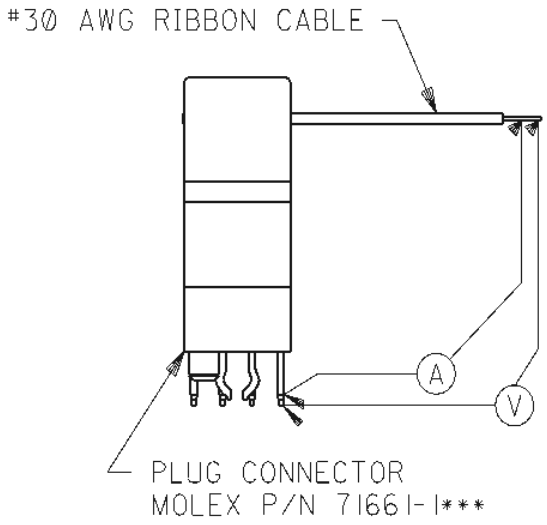
TEST	PROCEDURE	CRITERIA	COMMENTS
Cyclic Humidity	MIL-STD-202 Method 106D	Appearance: No physical damage. Contact resistance: 10 mΩ change from initial Insulation Resistance: 100 mΩ min. Must pass dielectric strength	Mated connectors subjected to 25°C - 65 °C at 90-95% RH for 240 hours
Mixed Flowing Gas Test	Battelle Class II	Appearance: No physical damage Contact resistance: 10 mΩ change from initial	Subject mated connector to a mixed gas for 10 days at 30° C. Linear flow rate to be 305 mm/second.
Solderability		95% of immersed area must show no voids or pin holes.	Test Parameters: Soldering time to be 3 ± 0.5 seconds. Solder temperature to be 230 ± 5 °C

8.0 TEST SEQUENCE

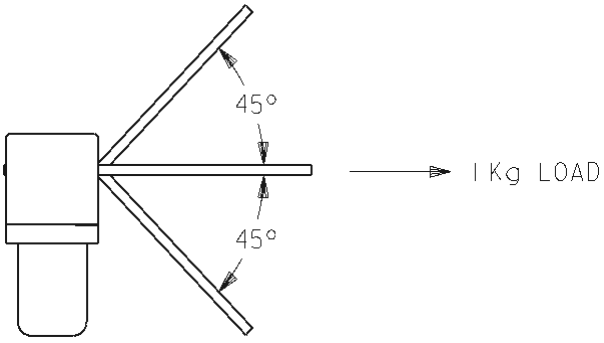
TEST OR EXAMINATION	TEST SEQUENCE							
	1	2	3	4	5	6	7	8*
EXAMINATION OF PRODUCT	1	1	1	1	1	1	1	1
MEASURE CONTACT RESISTANCE	2,4,6,8	2,4,6,8,10	2,4,6,8	2,4,6,8,10			2,4,6	2,4,6,8
MEASURE TEMPERATURE					2,4,6,8,10	2,4,6,8,10,12		
THERMAL SHOCK	3	5						
MATE/UNMATE CYCLING		3		3		3		
THERMAL AGING	5	7						
CYCLIC HUMIDITY	7	9						
STEADY STATE HUMIDITY			3	5	3	5		
MIXED FLOWING GAS							3	3
VIBRATION			7	9				7
MECHANICAL SHOCK			5	7				
CURRENT CYCLING					7	9		
TEMPERATURE RISE-STEADY STATE					5,9	7,11		
MATE/UNMATE CYCLING							5	
CABLE BEND (VERTICAL IDT ONLY)								5

*Vertical IDT receptacle connector only

9.0 TEST SETUP – VERTICAL IDT RECEPTACLE CONNECTOR



MEASURING METHOD OF CONTACT RESISTANCE
NOTE: VALUE OF WIRE RESISTANCE CALL BE DEDUCTED



TEST SETUP FOR CABLE BEND RESISTANCE

10.0 PROCESSING GUIDELINES

PROCESSING STEP	RECOMMENDATION	COMMENTS
Picking and Placing SMT Plug Connectors using the Pick and Place Caps/Clips	Acceleration Limits (in ft/sec^2) Circuit Size / Vertical Move / Horizontal Move 30 / 39.5 / 49.7 40 / 32.4 / 40.8 50 / 27.5 / 34.6 60 / 24.0 / 30.2 68 / 21.6 / 27.1 80 / 18.9 / 23.7 100 / 15.7 / 19.7	These limits prevent the Connector from moving in relationship to the vacuum cap/clip during the transfer from the connector packaging to the printed circuit board.
Resistance to Soldering Heat	Peak soldering temperature to be 265 degrees C. Maximum time within 5 degrees of peak temperature to be 40 seconds. Note: 71661-2***; 71661-5*** and 71661-7*** must be dried for 1 hour @100°C prior to processing at temperatures over 245°C.	Appearance: No physical damage.