

Molex 39-29-9183 PDF

深圳创唯电子有限公司

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PACKAGING TEST REPORT

1.0 PRODUCT DESCRIPTION

1.1 PROGRAM NAME:

Mini-Fit® Jr.

1.2 SERIES/FAMILY NUMBER(S) COVERED BY PACKAGING:

5566, 44472, 46015 Dual Row R/A Header

1.3 ACTUAL PRODUCT PART / SERIES NUMBER(S) TESTED:

39-29-9067, 5566-06A2-210

1.4 MATERIAL STATUS OF TESTED PARTS:

Production

1.5 MATERIAL STATUS OF PRIMARY PACKAGING:

Production

2.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

2.1 TESTING PROCEDURES AND SEQUENCES:

Drop Test Procedure ES-40000-7001 Section 5.2.1
Lab Procedure SAP Document 10000002317

2.2 PACKAGING SPECIFICATION :

PK-5566-001 Rev B

3.0 QUALIFICATION INFORMATION

3.1 PRE-INSPECTION RESULTS:

Pass

3.2 INSPECTION GAGES:

Gage number: N/A

3.3 DATE OF DROP TEST:

12/6/2006

3.4 WEIGHT OF FULLY LOADED DROP PACKAGE:

5.3 lbs / 2.4 kg

3.5 ASSURANCE LEVEL AND DROP HEIGHT:

Assurance Level = II
Drop Height = 24" / 609.6 mm

3.6 EQUIPMENT USED IN TESTING:

Manual drop test

<u>REVISION:</u> A	<u>ECR/ECN INFORMATION:</u> EC No: UCP2014-4406 DATE: 2014 / 05 / 01	<u>TITLE:</u> PACKAGING TEST REPORT FOR 5566 / 44472 / 46015 DUAL ROW	<u>SHEET No.</u> 1 of 2
<u>DOCUMENT NUMBER:</u> TS-5566-002	<u>TESTED BY:</u> Matt Kipper	<u>PRODUCT ENGINEER</u> Jeff Bell	<u>AQP:</u> Fran Smith



PACKAGING TEST REPORT

4.0 RESULTS

4.1 CARTON APPEARANCE:

OK

4.2 PRIMARY PACKAGING APPEARANCE:

Pass

4.3 POST-INSPECTION RESULTS:

Pass

4.4 TEST PROCESS OBSERVATIONS:

None

4.5 PACKAGING TEST PASS OR FAIL AND EXPLANATION:

Pass, zero damaged parts.

<u>REVISION:</u> A	<u>ECR/ECN INFORMATION:</u> EC No: UCP2014-4406 DATE: 2014 / 05 / 01	<u>TITLE:</u> PACKAGING TEST REPORT FOR 5566 / 44472 / 46015 DUAL ROW	<u>SHEET No.</u> 2 of 2
<u>DOCUMENT NUMBER:</u> TS-5566-002	<u>TESTED BY:</u> Matt Kipper	<u>PRODUCT ENGINEER</u> Jeff Bell	<u>AQP:</u> Fran Smith



TEST SUMMARY

MINI-FIT JR. CONNECTOR SYSTEM STANDARD AND BLIND MATE INTERFACE (BMI) (WIRE TO PCB AND WIRE TO WIRE)

1.0 SCOPE

This specification covers the 4.20 mm (.165 inch) centerline connector series terminated with 16 to 24 Awg wire using crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBERS:

Description	Series Number
BMI Right Angle Header	43810
BMI Vertical Header	44068
BMI Right Angle Header	42404
BMI Vertical Header	42440
BMI Plug Housing	42475
BMI Receptacle Header	42385
BMI Receptacle	44516
BMI Receptacle	42474
Mini-Fit Jr. Receptacle Housing	5557
Mini-Fit Jr Plug Housing	5559
Mini-Fit Jr Terminal-Male	5558
Mini-Fit Jr Terminal-Female	5556
Mini-Fit Jr Vertical Header	5566
Mini-Fit Jr Right Angle Header	5569

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.

2.3 PRODUCT SPECIFICATION TITLE AND DOCUMENT NUMBERS

Product Specification Title: Mini-Fit Jr BMI	Document Number: PS-5556-002
Product Specification Title: Mini-Fit Jr	Document Number: PS-5556-001
Product Specification Title: Mini-Fit BMI	Document Number: PS-44516-001
Product Specification Title: Mini-Fit BMI	Document Number: PS-43810-001

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

3.1 TESTING PROCEDURES AND SEQUENCES

None

3.2 OTHER DOCUMENTS

None

4.0 QUALIFICATIONS

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

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 1 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

5.0 PERFORMANCE

5.1.1 ELECTRICAL PERFORMANCE RESULTS (with Brass material and Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Contact Resistance (Low Level)	After Durability (Mated/Unmated Cycling)	20 Maximum (change from initial)	milliohm	3.09	2.85	3.39
	After Vibration	20 Maximum (change from initial)	milliohm	2.79	2.60	2.95
		Discontinuity	No Opens			
	After Thermal Shock	20 Maximum (change from initial)	milliohm	2.61	2.43	2.79
		Discontinuity	No Opens			
	After Mechanical Shock	20 Maximum (change from initial)	milliohm	2.70	2.54	2.89
		Appearance	No Damage			
	After Humidity (Steady State) 96 hours	20 Maximum (change from initial)	milliohm	2.54	2.44	2.67
		Appearance	No Damage			
	After Flowers of Sulfur	20 Maximum (change from initial)	milliohm	2.50	2.37	2.66
		Appearance	No Damage			
	After Ammonia Gas	20 Maximum (change from initial)	milliohm	2.56	2.44	2.66
		Appearance	No Damage			
	After Salt Spray	20 Maximum (change from initial)	milliohm	2.63	2.47	2.73
Appearance		No Damage				

5.1.2 ELECTRICAL PERFORMANCE RESULTS (with Phos Bronze material and Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Contact Resistance (Low Level)	After Durability (Mated/Unmated Cycling)	20 Maximum (change from initial)	milliohm	2.45	2.36	2.56
	After Vibration	20 Maximum (change from initial)	milliohm	2.32	2.04	2.58
		Discontinuity	No Opens			
	After Mechanical Shock	20 Maximum (change from initial)	milliohm	2.38	2.11	2.69
		Discontinuity	No Opens			
	After Temperature Cycling	20 Maximum (change from initial)	milliohm	2.21	2.01	2.49
Appearance		No Damage				

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 2 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

	After Humidity (Steady State)	20 Maximum (change from initial)	milliohm	2.26	2.05	2.42
		Appearance	No Damage			
	After Flowers of Sulfur	20 Maximum (change from initial)	milliohm	2.22	2.01	2.40
		Appearance	No Damage			
	After Ammonia Gas	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Salt Spray	20 Maximum (change from initial)	milliohm	2.32	2.07	2.55
		Appearance	No Damage			

5.1.3 ELECTRICAL PERFORMANCE RESULTS (with Brass material and Gold plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Contact Resistance (Low Level)	After Durability (Mated/Unmated Cycling)	20 Maximum (change from initial)	milliohm	2.62	2.24	3.35
	After Vibration	20 Maximum (change from initial)	milliohm	3.26	2.59	5.36
		Discontinuity	No Opens			
	After Mechanical Shock	20 Maximum (change from initial)	milliohm	2.98	2.47	3.69
		Discontinuity	No Opens			
	After Temperature Cycling	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Humidity (Steady State)	20 Maximum (change from initial)	milliohm	3.05	2.32	4.69
		Appearance	No Damage			
	After Flowers of Sulfur	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Ammonia Gas	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			
	After Salt Spray	20 Maximum (change from initial)	milliohm	-	-	-
		Appearance	No Damage			

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 3 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

5.2.1 MECHANICAL PERFORMANCE (Brass material with Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Connector Mate and Unmate Forces (per 2 cks) Values listed include 2 Circuits	Initial Mating	3.0 Maximum	Kgf	0.85	0.78	0.88
		(6.6) Maximum	(lbf)	(1.9)	(1.7)	(1.9)
	Final Mating (30 th)	3.0 Maximum	Kgf	0.39	0.38	0.41
		(6.6) Maximum	(lbf)	(0.86)	(0.84)	(0.90)
	Initial Unmating	0.1 Minimum	Kgf	0.44	0.41	0.47
		(0.22) Minimum	(lbf)	(0.97)	(0.90)	(1.04)
Final Unmating (30 th)	0.1 Minimum	Kgf	0.16	0.13	0.18	
	(0.22) Minimum	(lbf)	(0.35)	(0.29)	(0.40)	
Terminal Retention Force (to housing)	Initial-Male	3 (6.6)Minimum	Kgf (lbf)	11.5 (25)	10.5 (23)	12.5 (27)
	Initial-Female	3 (6.6) Minimum	Kgf (lbf)	13.8 (30)	12.0 (26)	15.7 (35)
Terminal Insertion Force (into housing)	Initial-Male	1.5(3.3) Maximum	Kgf (lbf)	0.38 (0.8)	0.23 (0.5)	0.54 (1.2)
	Initial-Female	1.5(3.3) Maximum	Kgf (lbf)	0.68 (1.5)	0.61 (1.3)	0.78 (1.7)
Wire Pullout Force (Wire to Terminal Retention)	18 Awg	9.0 Minimum	Kgf	11.70	10.40	12.60
		(19.9) Minimum	(lbf)	(25.80)	(22.90)	(27.80)
	20 Awg	6.0 Minimum	Kgf	12.60	10.30	13.40
		(13.2) Minimum	(lbf)	(27.80)	(22.70)	(29.50)
	22 Awg	4.0 Minimum	Kgf	7.80	6.00	8.70
		(8.8) Minimum	(lbf)	(17.20)	(13.20)	(19.20)
24 Awg	3.0 Minimum	Kgf	4.90	4.00	5.80	
	(6.6) Minimum	(lbf)	(10.80)	(8.80)	(12.80)	

5.2.2 MECHANICAL PERFORMANCE (Phos Bronze material with Tin plating)

TEST CONDITION	TREATMENT	REQUIREMENT	UNIT	Mean	Min	Max
Connector Mate and Unmate Forces (per 2 cks) Values listed include 2 Circuits	Initial Mating	3.0 Maximum	Kgf	1.15	1.00	1.26
		(6.6) Maximum	(lbf)	(2.5)	(2.2)	(2.8)
	Final Mating (30 th)	3.0 Maximum	Kgf	2.03	1.88	2.24
		(6.6) Maximum	(lbf)	(4.5)	(4.1)	(4.9)
	Initial Unmating	0.1 Minimum	Kgf	0.68	0.65	0.71
		(0.22) Minimum	(lbf)	(1.5)	(1.4)	(1.6)
Final Unmating (30 th)	0.1 Minimum	Kgf	1.00	0.84	1.14	
	(0.22) Minimum	(lbf)	(2.2)	(1.85)	(2.5)	
Terminal Retention Force (to housing)	Initial-Male	3 (6.6)Minimum	Kgf (lbf)	- (-)	- (-)	- (-)
	Initial-Female	3 (6.6) Minimum	Kgf (lbf)	11.43 (25.2)	10.3 (22.7)	13.80 (30.4)
Terminal Insertion Force (into housing)	Initial-Male	1.5(3.3) Maximum	Kgf (lbf)	- (-)	- (-)	- (-)

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DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



TEST SUMMARY

	Initial-Female	1.5(3.3) Maximum	Kgf (lbf)	0.81 (1.8)	0.67 (1.5)	1.06 (2.3)
Wire Pullout Force (Wire to Terminal Retention)	18 Awg	9.0 Minimum	Kgf	16.8	15.7	18.4
		(19.9) Minimum	(lbf)	(37.0)	(34.6)	(40.6)
	20 Awg	6.0 Minimum	Kgf	13.4	12.7	14.3
		(13.2) Minimum	(lbf)	(26.5)	(28.0)	(31.5)
	22 Awg	4.0 Minimum	Kgf	8.3	7.7	8.6
		(8.8) Minimum	(lbf)	(18.3)	(17.0)	(19.0)
24 Awg	3.0 Minimum	Kgf	4.9	4.2	5.9	
	(6.6) Minimum	(lbf)	(10.8)	(9.3)	(13.0)	

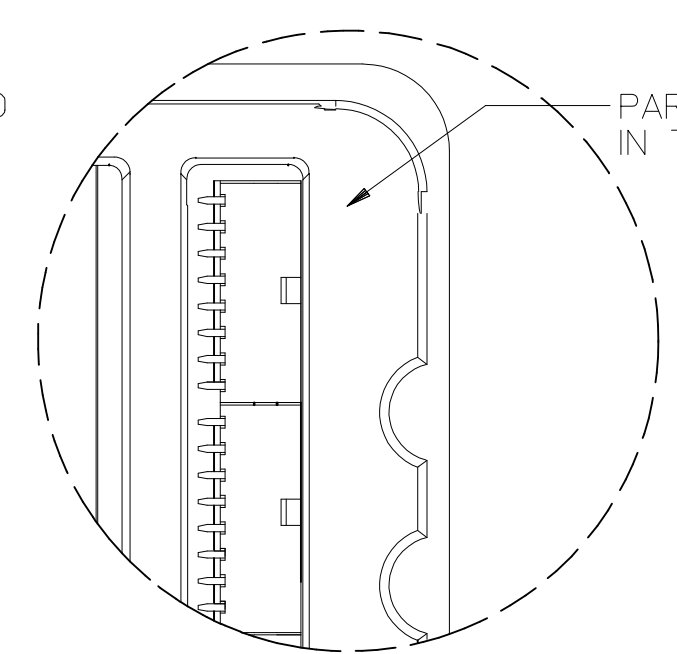
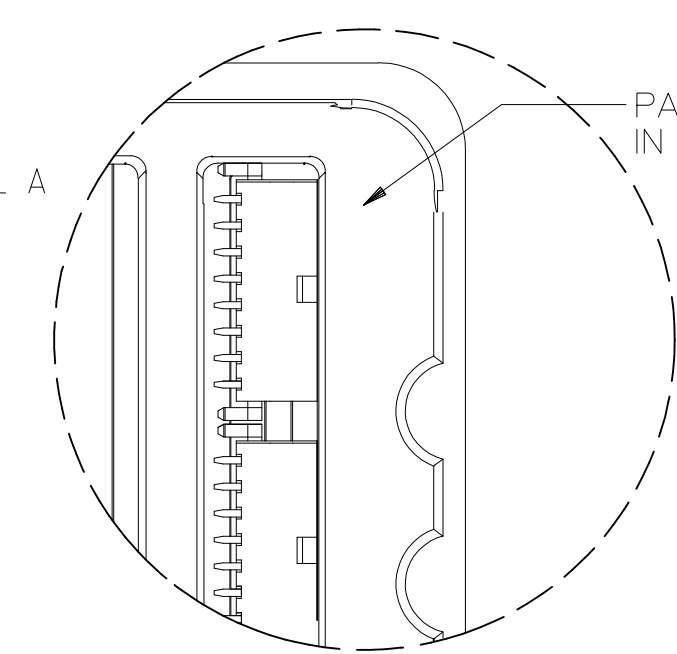
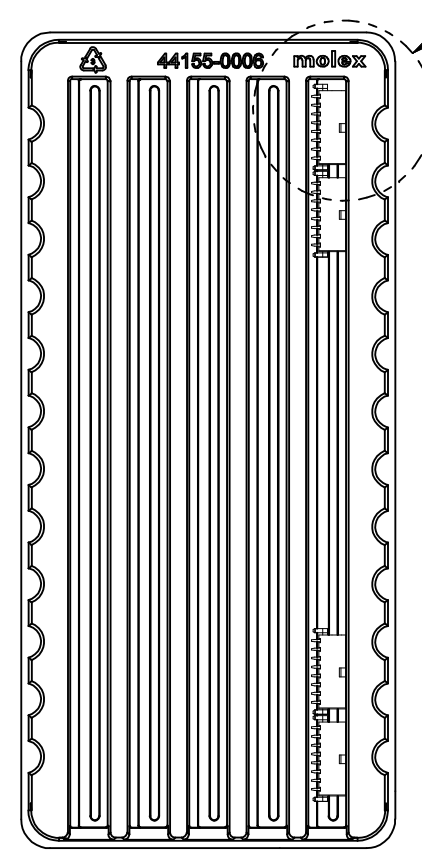
5.3.1 ENVIRONMENTAL PERFORMANCE (with Brass Material and Tin plating)

TEST CONDITION	Wire Awg	Amps	REQUIREMENT	Max Temp Rise Degrees C
Temperature Rise & Current Cycling	18	2A	30 Deg C max temp rise	2.6
	18	4A	30 Deg C max temp rise	9.7
	18	6A	30 Deg C max temp rise	21.1
	18	7.5A	30 Deg C max temp rise	32.2
	20	1A	30 Deg C max temp rise	1.1
	20	3A	30 Deg C max temp rise	9.2
	20	5A	30 Deg C max temp rise	23.6
	20	6A	30 Deg C max temp rise	33
	22	2A	30 Deg C max temp rise	5.2
	22	3A	30 Deg C max temp rise	11.4
	22	4A	30 Deg C max temp rise	19.5
	22	5A	30 Deg C max temp rise	30.4
	24	1A	30 Deg C max temp rise	2.2
	24	2A	30 Deg C max temp rise	8.1
	24	3A	30 Deg C max temp rise	17.6
24	4A	30 Deg C max temp rise	30.2	

5.3.2 ENVIRONMENTAL PERFORMANCE (with Phos Bronze Material and Tin plating)

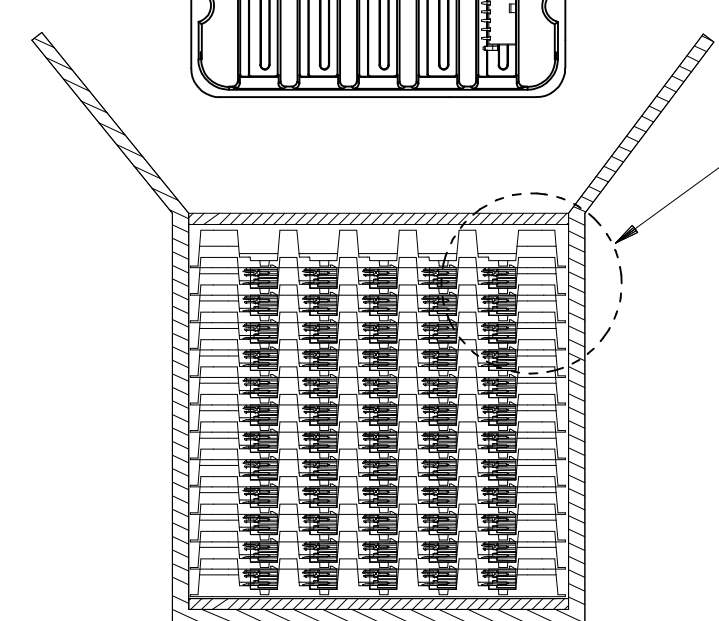
TEST CONDITION	Wire Awg	Amps	REQUIREMENT	Max Temp Rise Degrees C
Temperature Rise & Current Cycling	22	1A	30 Deg C max temp rise	1.6
	22	2A	30 Deg C max temp rise	6.7
	22	3A	30 Deg C max temp rise	13.4
	22	4A	30 Deg C max temp rise	21.4
	22	5A	30 Deg C max temp rise	31.8
	24	1A	30 Deg C max temp rise	2.3
	24	2A	30 Deg C max temp rise	8.5
	24	3A	30 Deg C max temp rise	18.2
	24	4A	30 Deg C max temp rise	30.2

REVISION: C2	ECR/ECN INFORMATION: EC No: UCP2015-4546 DATE: 2015/05/01	TITLE: TEST SUMMARY FOR MINI-FIT JR. STANDARD AND BLIND MATE INTERFACE (BMI)	SHEET No. 5 of 5
DOCUMENT NUMBER: TS-5556-002	CREATED / REVISED BY: GES	CHECKED BY: JBELL	APPROVED BY: FSMITH



DETAIL A

HEADER WITH PEGS			
NO. OF CKTS	PARTS PER TRAY	PARTS PER BOX	QUANTITY PER MASTER CARTON
2	140	1680	6720
4	100	1200	4800
6	80	960	3840
8	65	780	3120
10	55	660	2640
12	50	600	2400
14	45	540	2160
16	40	480	1920
18	35	420	1680
20	30	360	1440
22	30	360	1440
24	25	300	1200



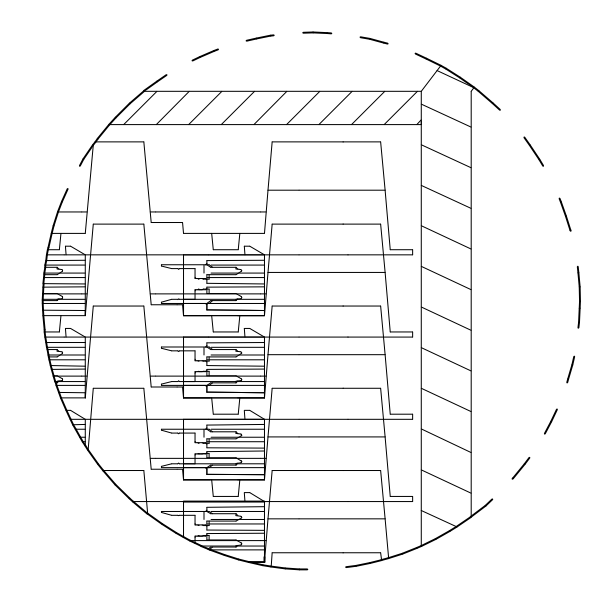
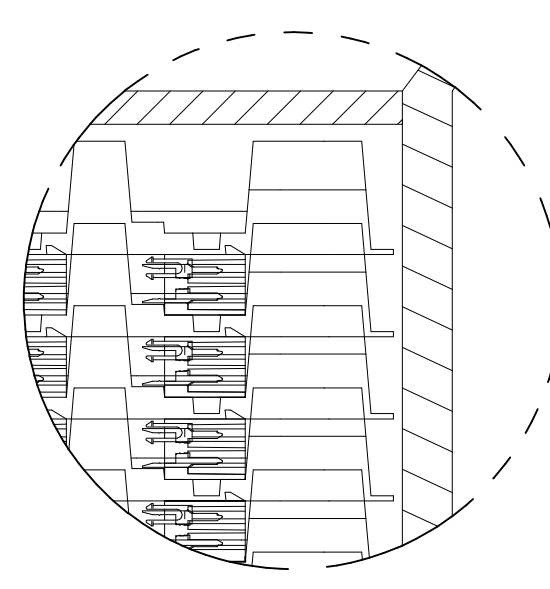
FOAM NO.:
96720-0001 (QTY:2)
OR EQUIVALENT

TRAY 44155-0006 (QTY: 13)
(12 WITH PARTS AND 1 EMPTY)

BOX: 96707-0001
(QTY: 1)

BOX: 96707-0001
(QTY: 4)

MASTER CARTON:
96708-0008 (QTY: 1)



DETAIL B

HEADER WITHOUT PEGS			
NO. OF CKTS	PARTS PER TRAY	PARTS PER BOX	QUANTITY PER MASTER CARTON
2	280	3360	13440
4	160	1920	7680
6	115	1380	5520
8	85	1020	4080
10	70	840	3360
12	60	720	2880
14	50	600	2400
16	45	540	2160
18	40	480	1920
20	35	420	1680
22	30	360	1440
24	30	360	1440

NOTES:
1. THIS PACKAGING SPECIFICATION IS FOR DUAL ROW ASSEMBLIES ONLY.
SERIES #5566, 44472, 46015, 172675, 172447, 42382, 43588, 43460, 46216.

CHANGE FOAM P/N EC NO: UCP2017-1294 DRWN:CSLAFTER 2016/12/08 CHKD:JBELL 2016/12/08 APPR:FSMITH 2016/12/20	DESCRIPTION	QUALITY SYMBOLS
D2		$\nabla \nabla = 0$ $\nabla \nabla = 0$ $\nabla \nabla = 0$

GENERAL TOLERANCES (UNLESS SPECIFIED)		
	mm	INCH
4 PLACES	± ---	± ---
3 PLACES	± ---	± ---
2 PLACES	± ---	± ---
1 PLACE	± ---	± ---
0 PLACE	± ---	± ---
ANGULAR ±1/2°		
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		

DIMENSION STYLE	
IN/MM	
DRAWN BY	DATE
ADRNOL	2005/09/20
CHECKED BY	DATE
GPOLGAR	2005/09/20
APPROVED BY	DATE
FSMITH	2016/12/20
MATERIAL NO.	

SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION
	INCH	
TITLE		
PACKAGING SPECIFICATION		
MINI-FIT JR DUAL ROW		
5566 SERIES		
molex		
DOCUMENT NO.	SHEET NO.	
PK-5566-001	1 OF 1	
THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION		

MINI-FIT JR.

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REVISION: E9	ECR/ECN INFORMATION: ER No: 600132 DATE: 2019/04/05	TITLE: PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM	SHEET No. 1 of 11
DOCUMENT NUMBER: PS-5556-001	CREATED / REVISED BY: AZAHIROVIC	CHECKED BY: DSTEIER	APPROVED BY: FSMITH

1.0 SCOPE

This Product Specification covers performance requirements for the MINI-FIT JR. 4.20 mm (.165 inch) centerline (pitch) wire to board and wire to wire connector system terminated with 16 to 28 AWG standard, copper wire using Crimp technology with Tin or 30µ” Gold plating.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

Table 1 – WIRE-TO-WIRE				
Description	Series Number	UL(600V)	CSA(600V)	IEC(250V)
Female Crimp Terminal	5556	n/a	n/a	Yes
Receptacle Housing	5557	Yes	Yes	Yes
Male Crimp Terminal	5558	n/a	n/a	Yes
Plug Housing	5559	Yes	Yes	Yes
Plug Housing	45776	Yes	Yes	Yes
Receptacle Housing	46992/46994	Yes	Yes	Yes
Plug housing	46993/172646	Yes	Yes	Yes

Table 2 – WIRE-TO-BOARD				
Description	Series Number	UL(600V)	CSA(600V)	IEC(250V)
Female Crimp Terminal	5556	n/a	n/a	Yes
Receptacle Housing	5557	Yes	Yes	Yes
Vertical Header	5566	Yes	Yes	Yes
Right Angle Header	5569	Yes	Yes	Yes
Receptacle Housing	46992/46994	Yes	Yes	Yes
Vertical Header	172447/172647	Yes	Yes	Yes
Right Angle Header	172448/172648	Yes	Yes	Yes

Other products conforming to this specification are noted on the individual drawing

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.

2.3 SAFETY AGENCY APPROVALS

UL File: E29179

CSA Certificate: LR 19980

IEC 61984 Certification : Tested to and found in compliance with IEC 61984. NRTL type examination certificate available upon request. Contact Molex Safety team for questions regarding certification on specific part numbers.

REVISION: E9	ECR/ECN INFORMATION: ER No: 600132 DATE: 2019/04/05	TITLE: PRODUCT SPECIFICATION MINI-FIT JR. CONNECTOR SYSTEM	SHEET No. 2 of 11
DOCUMENT NUMBER: PS-5556-001	CREATED / REVISED BY: AZAHIROVIC	CHECKED BY: DSTEIER	APPROVED BY: FSMITH

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

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

Application Specification: AS-45499-001 (moisturizing nylon parts)

Test Summary: TS-5556-002

Molex Solderability Specification: SMES-152

EIA-364-1000.01

4.0 RATINGS

4.1 VOLTAGE

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

*Voltage rating based on UL 1977. Maximum voltage allowed may vary dependent upon "End Use Application". Refer to the applicable end use standard for additional information on Voltage, Creepage and Clearance requirements.

4.2 APPLICABLE WIRES

Maximum Insulation Diameter and Applicable Wire Gauges	16 AWG Stranded, Copper: 3.15 mm / .124 inches MAXIMUM
	18-24 AWG Stranded, Copper: 3.10 mm / .122 inches MAXIMUM
	22-28 AWG Stranded, Copper: 1.80 mm / .071 inches MAXIMUM

4.3 MAXIMUM CURRENT RATING (Amperes)**

Table 3 - MAXIMUM CURRENT RATING (Amperes) Wire-to-Wire and Wire-to-Board										
Brass					Phosphor Bronze					
Wire \ Ckt. Size	2 & 3	4 - 6	7 - 10	12 - 24	Wire \ Ckt. Size	2 & 3	4 - 6	7 - 10	12 - 24	
AWG #16	9	8	7	6	AWG #16	8	7	6	5	
AWG #18	9	8	7	6	AWG #18	8	7	6	5	
AWG #20	7	6	5	5	AWG #20	6	5	4	4	
AWG #22	5	4	4	4	AWG #22	4	3	3	3	
AWG #24	4	3	3	3	AWG #24	3	2	2	2	
AWG #26	3	2	2	2	AWG #26	2	1	1	1	
AWG #28	2	1	1	1	AWG #28	1	1	1	1	

Note: PCB trace design may greatly affect temperature rise results in Wire-to-Board Applications.

** 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 above represents the MAXIMUM current carrying capacity of a fully loaded connector with all circuits powered using tinned copper conductor stranded wire 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, wire length & crimp quality are other factors that influence current rating.

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4.4 TEMPERATURE

	Terminal Type		
	Formed Brass	Solid Brass	Phos Bronze
Operating: *	- 40°C to + 80°C	- 40°C to + 105°C	- 40°C to + 105°C
Nonoperating:	- 40°C to + 80°C	- 40°C to + 105°C	- 40°C to + 105°C

**Including 30°C terminal temperature at rated current*

4.5 MAXIMUM WAVE SOLDER PROCESS TEMPERATURE

Header Type	Plating Type		
	Matte Tin over Nickel	Bright Tin over Nickel	Tin over Copper
Pegs	240°C	240°C	240°C
No Pegs	260°C	240°C	240°C
Glow Wire with Pegs Series: 172447, 172447, 172448, 172648	220°C	N/A	N/A

For Headers: Matte tin over Nickel plating is recommended for new applications.

4.6 Glow Wire

The following series are glow capable: 46992, 46993, 46994, 172646, 172447, 172448, 172648, 45776. Representative samples were tested and found compliant with EN 60695-2-11-2001 / IEC 60695-2-11-2000 Glow Wire Test Methods for End-Products. These were additionally investigated for compliance with EN 60335-1 / IEC 60335-1 750C / 2 sec with no flaming. VDE Test report available upon request.

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	Insulation Resistance	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	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
4	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 MAXIMUM

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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 with latch disabled.	14.7 N (3.30 lbf) MAXIMUM insertion force and 0.5 N (0.11 lbf) MINIMUM withdrawal force
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.	30 N (6.74 lbf) MINIMUM retention force
3	Durability	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute Based on mated pairs of 30µ" Au or 100µ" tin at the contact interface.	20 milliohms maximum (change from initial)
4	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII, letter D. Test Duration: 15 minutes in each axis.	20 milliohms MAXIMUM (change from initial) and 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 (change from initial) and 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) per minute without influence from the insulation crimp. Wire pullout force is applicator dependent. Refer to relevant Molex Applicator Tooling specification.	16 Awg = 68.4 N (15.4 lbf) Min. 18 Awg = 88.0 N (19.8 lbf) Min. 20 Awg = 58.7 N (13.2 lbf) Min. 22 Awg = 39.1 N (8.8 lbf) Min. 24 Awg = 29.3 N (6.6 lbf) Min. 26 Awg = 19.6 N (4.4 lbf) Min. 28 Awg = 9.8 N (2.2 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) per minute.	15.0 N (3.37 lbf) MAXIMUM insertion force

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5.2 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
8	Normal Force	Apply a perpendicular force to contacts.	Sn	1.47 N (150 grams) MINIMUM
			Au	0.49 N (50 grams) MINIMUM
9	Panel Insertion and Withdrawl Forces (5559, 46993, 172646 Series)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. Applies only to plugs with panel retention features.	225 N (50.7 lbf) MAXIMUM insertion force and Dual Row: 157 N (35.3 lbf) Single Row: 133 N (29.9 lbf) MINIMUM withdrawl force	
10	Panel Insertion and Withdrawl Forces (45776 Series)	Insert and withdraw a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	225 N (50.7 lbf) MAXIMUM insertion force and 133 N (29.9 lbf) MINIMUM withdrawl force	
11	Thumb latch Operation Force	Depress latch at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	22.2 N (5.0 lbf) MAXIMUM	
12	Thumb latch Yield Strength	Mate loaded connectors fully. Pull connectors apart at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (after 1 st mate)	68 N (15.3 lbf) MINIMUM	

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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 (change from initial) Visual: No Damage Dielectric Strength per 5.1.3 except 1500VAC test voltage Insulation Resistance per 5.1.2
2	Thermal Aging	Mate connectors; expose to: 96 hours at $105 \pm 2^{\circ}\text{C}$	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
3	Humidity (Steady State)	Mate connectors: expose to a temperature of $60 \pm 2^{\circ}\text{C}$ with a relative humidity of 90-95% for 96 hours. Remove surface moisture and air dry for 1 hour prior to measurements.	20 milliohms MAXIMUM Visual: No Damage Dielectric Strength per 5.1.3 except 1500VAC test voltage Insulation Resistance per 5.1.2
4	Cold Resistance	Mate connectors: Duration: 96 hours; Temperature: $-40 \pm 3^{\circ}\text{C}$	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
5	Mixed Flowing Gas	EIA-364-65 with Class IIa Gas concentrations 10 days mated (30 μ " Gold plated only)	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
6	Cyclic Temperature And Humidity	Mate connectors: expose to 24 cycles from $25^{\circ}\text{C} / 80\% \text{RH}$ to $65^{\circ}\text{C} / 50\% \text{RH}$ ramp time: 0.5hr dwell time: 1hr Per EIA-364-1000.01	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

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6.0 WIRE-TO-BOARD PERFORMANCE

6.1 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	Insulation Resistance	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.	1000 Megohms MINIMUM
3	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
4	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 MAXIMUM

6.2 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 with latch disabled.	14.7 N (3.30 lbf) MAXIMUM insertion force and 0.5 N (0.11 lbf) MINIMUM withdrawal force
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.	30 N (6.74 lbf) MINIMUM retention force
3	Durability	Mate connectors up to 30 cycles at a maximum rate of 10 cycles per minute Based on mated pairs of 30µ" Au or 50µ" tin at the contact interface	20 milliohms maximum (change from initial)
4	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII, letter D. Test Duration: 15 minutes in each axis.	20 milliohms MAXIMUM (change from initial) and Discontinuity < 1 microsecond

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6.2 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
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 (change from initial) and 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) per minute without influence from the insulation crimp. Wire pullout force is applicator dependent. Refer to relevant Molex Applicator Tooling specification.	16 Awg = 68.4 N (15.4 lbf) Min. 18 Awg = 88.0 N (19.8 lbf) Min. 20 Awg = 58.7 N (13.2 lbf) Min. 22 Awg = 39.1 N (8.8 lbf) Min. 24 Awg = 29.3 N (6.6 lbf) Min. 26 Awg = 19.6 N (4.4 lbf) Min. 28 Awg = 9.8 N (2.2 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) per minute.	15.0 N (3.37 lbf) MAXIMUM insertion force
8	Normal Force	Apply a perpendicular force to contacts.	Sn 1.47 N (150 grams) MINIMUM
			Au 0.49 N (50 grams) MINIMUM
9	PCB Engagement Forces	Engage a connector at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. Applies to parts with PCB retention features only with PCB holes at nominal diameter and location. Values will vary with PCB material & PCB fabrication and peg type.	For 5569, 172448, 172648: 26.7 to 66.7 N (6.0 to 15.0 lbf) For 5566, 172447, 172647: 4.4 to 44.5 N (1.0 TO 10.0 lbf) Typical insertion force per peg. For Reference ONLY
10	Solid PC Tail Header Pin Retention Force (in housing) (5569, 172448, 172648 Series)	Apply axial push force on the terminal in the housing at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	9.81 N (2.20 lbf) MINIMUM RETENTION FORCE
11	Stamped PC Tail Terminal Retention Force (in housing) (5566, 172447, 172647 Series)	Apply axial push force on the terminal in the housing at a rate of 25 ± 6mm (1 ± ¼ inch) per minute.	9.81 N (2.20 lbf) MINIMUM RETENTION FORCE
12	Thumb latch Operation Force	Depress latch at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute.	22.2 N (5.0 lbf) MAXIMUM
13	Thumb latch Yield Strength	Mate loaded connectors fully. Pull connectors apart at a speed rate of 25 ± 6 mm (1 ± ¼ inch) per minute. (after 1 st mate)	68 N (15.3 lbf) MINIMUM

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6.3 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 (change from initial) Visual: No Damage Dielectric Strength per 6.1.3 except 1500VAC test voltage Insulation Resistance per 6.1.2
2	Thermal Aging	Mate connectors; expose to: 96 hours at 105 ± 2°C	20 milliohms MAXIMUM (change from initial) and 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. Remove surface moisture and air dry for 1 hour prior to measurements.	20 milliohms MAXIMUM (change from initial) Visual: No Damage Dielectric Strength per 6.1.3 except 1500VAC test voltage Insulation Resistance per 6.1.2
4	Solderability Dip Test	Per Molex Test Method: SMES-152	Solder area shall have minimum of 95% solder coverage
5	Wave Solder Resistance	Dip connector terminals tail in solder: Solder Duration: 5 ± 0.5 seconds; Solder Temperature: Use maximum solder temperature from Section 4.5	Visual: No Damage to insulator housing material
6	Cold Resistance	Mate connectors: Duration; 96 hours; Temperature: -40 ± 3°C	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
7	Mixed Flowing Gas	EIA-364-65 with Class IIa Gas concentrations 10 days mated (30µ" Gold plated only)	20 milliohms MAXIMUM (change from initial) and Visual: No Damage
8	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-364-1000.01	20 milliohms MAXIMUM (change from initial) and Visual: No Damage

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7.0 TEST SEQUENCES

Testing sequences are based on EIA-364-1000.01

8.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. Nylon parts should remain in their original packaging until ready for use to prevent moisture loss or gain. Nylon will absorb moisture which causes dimensions to increase. Excess moisture gain can result in dimensions exceeding specification. For details, refer to the packaging specification called out on the applicable product sales drawing.

9.0 OTHER INFORMATION

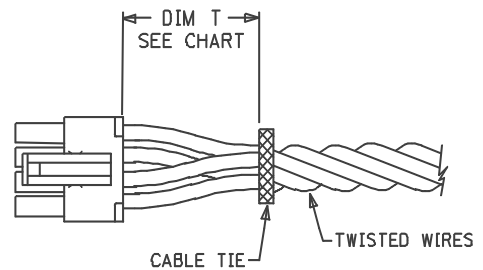
9.1 GAGES AND FIXTURES

It is recommended that test plugs (Series 44281) be used for continuity testing of receptacles. Standard mating parts should not be used for harness testing.

NOTE: The use of unauthorized testing devices and/or probes with a Molex product may cause damage to and affect functionality of the Molex product, and such use may void any and all warranties, expressed or implied.

9.2 CABLE TIE AND OR WIRE TWIST LOCATION

Circuit Sizes		Dim T Min.
Dual Row	Single Row	
2-6	2-3	.50" (12.7 mm)
8	4	.75" (19.1 mm)
10-12	5-6	1.00" (25.4 mm)
14-16	7-8	1.25" (31.75 mm)
18-20	9-10	1.50" (38.09 mm)
22-24	11-12	1.75" (44.45 mm)



The "T" dimension defines a "free" length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter the housing. Wires are to be dressed in such a manner to allow the terminals to float freely in the pocket. This dimension is a general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

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