molex

PRODUCT SPECIFICATION

CP 6.5 mm PITCH

WIRE-TO-BOARD CONNECTOR SYSTEM

Receptacle Terminal	TPA
	
Series: 50597, 50598	Series: 51143

Receptacle Housing	Vertical Header
	
Series: 151049, 151207	Series: 151048

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
D1	EC No: 620445 DATE: 10/10/2019	PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	1 of 15

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-151048-0001	SMAHAJANSHET	NCSR	NCSR

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

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 Current Ratings & Applicable Wires	5
	4.3 Durability	5
5.0	**QUALIFICATION**	5
6.0	**PERFORMANCE**	6
	6.1 Electrical Performance	6
	6.2 Mechanical Performance	6
	6.3 Environmental Performance	8
7.0	**INSERTION / WITHDRAWL FORCES**	10
8.0	**TEST SEQUENCE GROUPS**	11
9.0	**SOLDER INFORMATION**	13
	9.1 Solder Process Temperature	13
10.0	**PACKAGING**	13
11.0	**CABLE TIE AND/OR WIRE TWIST LOCATION**	13
12.0	**POLARIZATION AND KEYING OPTIONS**	14

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

1.0 SCOPE

This Product Specification covers the performance requirements 6.5mm CENTER SPACING P.C. B. Connector series.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER (S)

WIRE-TO-BOARD			
Description		Series Number	Part Number
Receptacle Terminal	**Wire 16-22 AWG Φ3.3 -- Φ2.0 Insulation Outer Diameter**	50597	505978*00
	Wire 20-26 AWG Φ2.35 – Φ1.25 Insulation Outer Diameter	50598	505988*00
6.5 Mm Pitch Receptacle Housing		151049	151049-****
6.5 mm Pitch Glow Wire Receptacle Housing		151207	151207-****
6.5 mm Pitch Header Assembly		151048	151048-****
Retainer		51143	51143-****

2.2 DIMENSIONS, MATERIALS, PLATING AND MARKINGS

Dimensions & Plating: See Sales Drawing SD-151048-0001,1512070001-SD and SD-151049-0001 for information on dimensions, materials, plating's and markings.

Material: RoHS compliant materials *.
**Refer to the "Product Environmental Compliance" section in Molex.com to know the individual PN RoHS compliance status*

2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179
CSA File Number: 70056261 (LR 19980-479)
VDE File Number: 241628

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

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.

CP 6.5 Test Summary TS-151048-0001
Molex Quality Crimping Handbook Order No. 63800-0029
Molex Solderability Specification SMES-152
Molex Heat Resistance Specification AS-40000-5013
Molex Moisture Technical Advisory AS-45499-001
Molex Package Handling Specification 454990100-PK
ATS – Application Tooling Specification*

*Application Tooling Specification for terminals is not provided in this document. ATS for terminals can be available from respective terminal part number page in Molex.com

3.2 INDUSTRY DOCUMENTS

UL-1977
CSA STD. C22.2 NO. 182.3-M1987

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

600 Volts AC (RMS) or 600 Volts DC.

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

4.2 RATINGS & APPLICABLE WIRES

Item	Standard				
Rated Voltage (MAX.)	600 V				[AC (rms) / DC] Φ1.25 - Φ3.3mm Insulation O.D.
Rated Current (MAX.) and Applicable wires	CKT	2	4	6	
	AWG. #16	10 A	9A	9A	
	AWG. #18	9A	8A	8A	
	AWG. #20	7A	6A	6A	
	AWG. #22	5A	4A	4A	
	AWG. #24	4A	3A	3A	
	AWG. #26	3A	2A	2A	
Ambient Temperature Range	-40 ℃ - +105 ℃ *				

* Including terminal temperature rise .

Note : The Current ratings listed in the chart above are per Molex test method based on a 30°C maximum temperature rise over ambient temperature and are provided as a guideline.

4.3 DURABILITY

Tin Plated: 30 Mating cycles

5.0 QUALIFICATION

Laboratory conditions and sample selection are in accordance with JIS / MIL – STD -002

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.0 PERFORMANCE

6.1 ELECTRICAL REQUIREMENTS

ITEM NO.	ITEM	TEST CONDITION	REQUIREMENT
1	**Low Level Contact Resistance (LLCR)**	Mate connectors with dry circuit (**20** mV Max., **10** mA) on mated connector. (JIS C5402 5.4)	**10 mΩ** MAX Value excludes bulk resistance of terminal
2	**Insulation Resistance**	Mate connectors apply a voltage of **500** V DC between adjacent terminal or ground (JIS C5402 5.2/MIL-STD-202 Method 302)	**1000 MΩ** MIN
3	**Dielectric Withstanding Voltage**	Mated connectors apply 1500V AC (rms) for **1** minute between adjacent terminal or ground. (JIS C5402 5.1/MIL-STD-202 Method 301)	No voltage breakdown
4	**Contact Resistance on Crimped Portion**	Crimp the applicable wire on to the terminal, measure by dry circuit, 20mV MAX., 10mA.	**5 mΩ** MAX

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.2 MECHANICAL REQUIREMENTS

ITEM NO.	ITEM	TEST CONDITION		REQUIREMENT
5	**Insertion and Withdrawal Force**	Insert and withdraw connectors at the speed rate of 25±3mm/minute.		Refer to 7.0
6	**Crimping Pull Out Force (Receptacle)**	Fix the crimped terminal, apply axial pull out force on the wire at the speed rate of 25±3mm/minute. (JIS C5402 6.8)	AWG. #16	**127.4** N MIN.
			AWG. #18	**107.8** N MIN.
			AWG. #20	**58.8** N MIN.
			AWG. #22	**39.2** N MIN.
			AWG. #24	**29.4** N MIN.
			AWG. #26	**14.7** N MIN.
7	**Terminal Insertion Force (Receptacle)**	Insert the crimped terminal to housing at the speed rate of 25±3mm/minute.		**39.2** N MAX.
8	**Terminal / Housing Retention Force (Receptacle)**	Apply axial pull out force at the speed rate of 25 ±3mm/minute on the terminal assembled in the housing.		**39.2** N MIN.
9	**Pin Retention Force (Header)**	Apply axial push force at the speed rate of 25± 3 mm/minute.		**19.6** N MIN.
10	**Lock Strength**	Mate connectors apply axial pull out force at the speed rate of 25±3mm/minute.		**49.0** N MIN.
11	**Retainer Insertion Force**	Insert a retainer into the housing at the speed rate of 25±3mm/minute.		**29.4** N MAX.

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

6.3 ENVIRONMENTAL REQUIREMENTS

ITEM NO.	ITEM	TEST CONDITION	REQUIREMENT
12	**Durability**	Mate and un-mate connectors with a rate of 10 cycles/minute. (a) Mate and un-mate connectors to 4 cycles (b) Mate and un-mate connectors to 23 cycles (c) Mate and un-mate connectors to 30 cycles	Contact resistance **20 mΩ** MAX
13	**Temperature Rise**	Mate connectors, carrying rated current load.	Temperature Rise 30°C MAX.
14	**Vibration**	Amplitude : 1.5mm P-P Sweep time: 10-55-10 Hz in 1-minute Duration : 2 hours in each X.Y.Z. axes. (MIL STD-202 Method 201)	Contact resistance **20 mΩ** MAX Discontinuity < 1 μs Visual: No damage
15	**Shock**	490m/s^2{50G}, 3 strokes in each X.Y.Z. axes. (JIS C60068-2-27/MIL-STD-202 Method 213)	Contact resistance **20 mΩ** MAX Discontinuity < 1 μs
16	**Heat Resistance**	Mate connectors and expose into 105±2°C for 96 hours. (expose to room temperature for 1~2hrs after pick up) (JIS C60068-2-2/MIL-STD-202 Method 108)	Contact resistance **20 mΩ** MAX Visual: No damage
17	**Cold Resistance**	Mate connectors and expose into -40±3°C for 96 hours. (expose to room temperature for 1~2hrs after pick up) (JIS C60068-2-1)	Contact resistance **20 mΩ** MAX Visual: No damage

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

ENVIRONMENTAL REQUIREMENTS (contd.)			
ITEM NO.	**ITEM**	**TEST CONDITION**	**REQUIREMENT**
18	**Humidity**	Mate connectors and expose into 60±2℃ and 90-95% Relative Humidity for 96 hours. (expose to room temperature for 1~2hrs after pick up) (JIS C60068-2-3/MIL-STD-202 Method 103)	Contact resistance **20 mΩ** MAX Insulation resistance **1000 MΩ** MIN Dielectric Strength No voltage breakdown Visual: No damage
19	**Temperature Cycling**	Mate connectors and expose into below condition 5 cycle of: a) – 55℃ 30 minutes b) +105℃ 30 minutes c) 3minutes transit time Expose to room temperature for 1~2hrs after pick up. (JIS C0025)	Contact resistance **20 mΩ** MAX Visual: No damage
20	**Salt Spray**	Mate connectors and expose into a salt spray from the 5±1% solution at 35±2 ℃ for 48±4 hours. Wash b water and dry after pick up. (JIS C60068-2-11/MIL-STD-202 Method 101)	Contact resistance **20 mΩ** MAX Visual: No damage
21	**SO_2 Gas**	Mate connectors, and 24 hours expose to 50±5ppm SO_2 gas at 40±2℃.	Contact resistance **20 mΩ** MAX Visual: No damage
22	**NH_3 Gas**	Mate connectors, and exposure into NH_3 gas evaporating from 28% Ammonia solution for 40mins. (25milli liter in 1 liter)	Contact resistance **20 mΩ** MAX Visual: No damage

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

ENVIRONMENTAL REQUIREMENTS (contd.)			
ITEM NO.	**ITEM**	**TEST CONDITION**	**REQUIREMENT**
23	**Solderability**	**Soldering Time**: 3±0.5 sec. **Solder Temperature**: 260±3℃ Immerse 1.2mm from the tip of terminal Steam Aging: 8 hours	Solder coverage = 95%
24	**Resistance to Soldering Heat**	Soldering Time: 5±0.5 sec. Solder Temperature: 260±5°C Dip terminal into flux and immerse the area up to 1.20mm for the bottom of the housing into solder molten	No damage in appearance of the connector

7.0 INSERTION/WITHDRAWAL FORCE

For Receptacle Housing Series: 151049

No. of ckt.	Unit	Insertion Force (MAX.)			Withdrawal Force (MIN.)		
		1st	6th	30th	1st	6th	30th
2	N	19.6	18.6	18.6	1.2	1.2	1.0
4		24.5	22.5	22.5	2.4	2.4	2.0
6		29.4	26.4	26.4	3.6	3.6	3.0

For Glow wire Receptacle Housing Series: 151207

No. of ckt.	Unit	Insertion Force (MAX.)			Withdrawal Force (MIN.)		
		1st	6th	30th	1st	6th	30th
2	N	19.6	18.6	18.6	1.2	1.2	1.0
4		24.5	22.5	22.5	2.4	2.4	2.0
6		29.4	26.4	29.8	3.6	3.6	3.0

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

8.0 TEST SEQUENCE GROUPS

Test Group →	Full Qualification Test									
	Grp 1	Grp 2	Grp 3	Grp 4	Grp 5	Grp 6	Grp 7	Grp 8	Grp 9	Grp 10
Test or Examination ↓										
Examination of connector	1,7	1,4	1,7	1,7	1,9	1,7	1,5	1,5	1,5	1,5
Contact Resistance (LLCR)			2,4,6	2,4,6	2,4,6,8	2,4,6	2,4	2,4	2,4	2,4
Insulation Resistance	2,5									
Dielectric Withstanding Voltage	3,6									
Contact resistance on crimped portion										
Insertion Force										
Withdrawal Force										
Crimping Pull Out Force										
Terminal Insertion Force										
Terminal/Housing Retention Force										
Pin Retention Force										
Lock Strength										
Retainer Insertion Force										
Durability		2(c)	3(c)	3(c)	3(c)	3(c)				
Temperature Rise		3								
Vibration					5					
Shock					7					
Heat Resistance			5							
Cold Resistance						5				
Humidity	4									3
Temperature Cycling				5						
Salt Spray							3			
SO_2 Gas								3		
NH_3 Gas									3	
Solderability										
Resistance to Soldering Heat										

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

Test Group →	Screen Test							
	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18
Test or Examination ↓								
Examination of connector	1,4	1,3	1,4	1,3	1,12	1,4	1,3	1,3
Contact Resistance (LLCR)					3,11			
Insulation Resistance								
Dielectric Withstanding Voltage								
Contact resistance on crimped portion			2					
Insertion Force					2, 6, 9			
Withdrawal Force					4, 7, 10			
Crimping Pull Out Force			3					
Terminal Insertion Force	2							
Terminal/Housing Retention Force	3							
Pin Retention Force		2						
Lock Strength						3		
Retainer Insertion Force							2	
Durability					5[a], 8[b]	2[c]		
Temperature Rise								
Vibration								
Shock								
Heat Resistance								
Cold Resistance								
Humidity								
Temperature Cycling								
Salt Spray								
SO_2 Gas								
NH_3 Gas								
Solderability				2				
Resistance to Soldering Heat								2

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

9.0 SOLDER INFORMATION

Molex Solderability Specification SMES-152
(Click Here)

9.1 SOLDER PROCESS TEMPERATURES

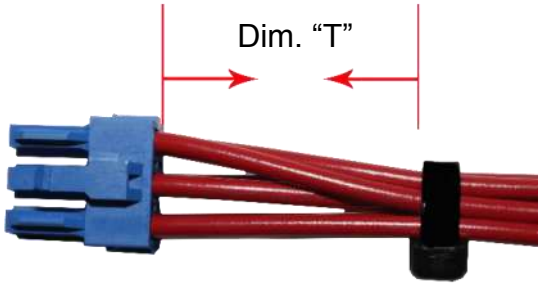
Wave Solder: 260°C Max

10.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. For details, kindly refer to Packaging Specification PK-151048-0001/ PK-151048-0002/PK-151049-0001 and Sale drawing SD-151048-0001/SD-151049-0001.

11.0 CABLE TIE AND/OR WIRE TWIST LOCATION

Circuit Sizes			Dimension T Minimum
2	4	6	0.50" (12.7mm)



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 general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

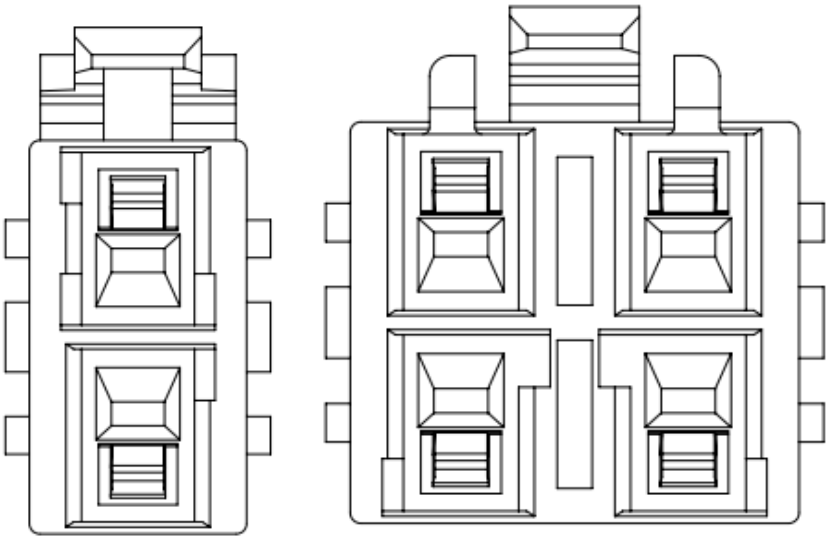
MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

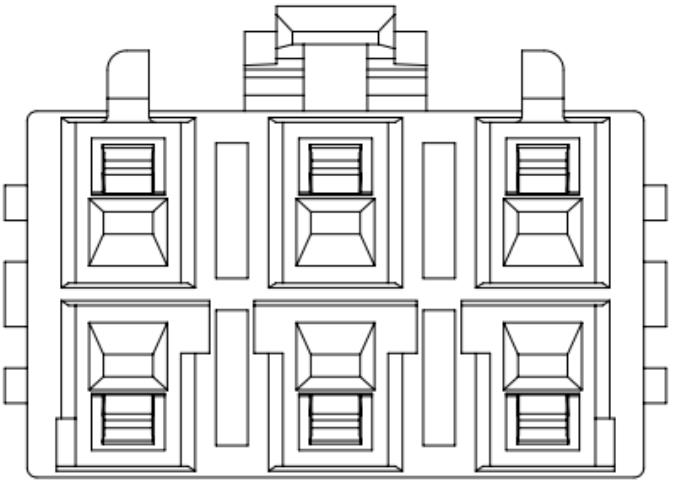
Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

12.0 POLARIZATION AND KEYING OPTIONS

12.1 Receptacle Housing Dual Row (Series:151049 , 151207)



2 CKT 4 CKT



6 CKT

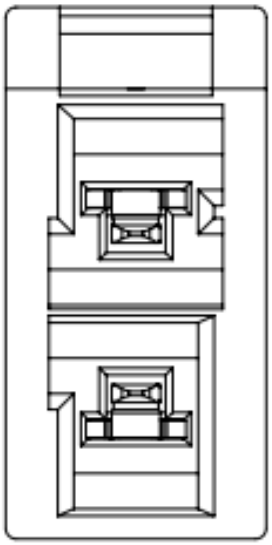
Note* : For different colors, Keying and Polarization Feature will vary .Please refer individual sales drawing for Features.

MOLEX CP 6.5 WEB PAGE

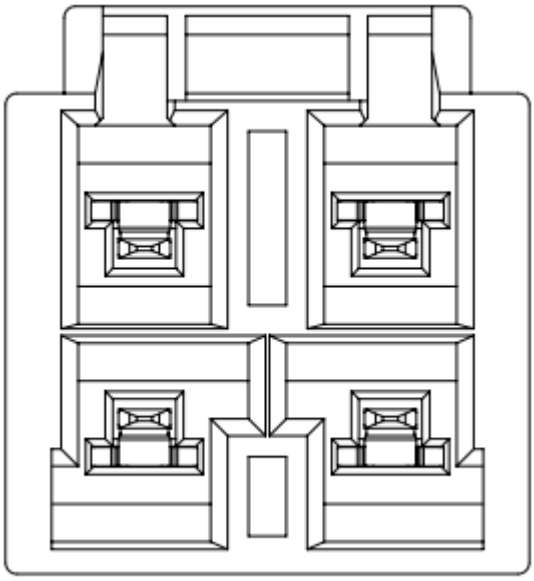
TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.

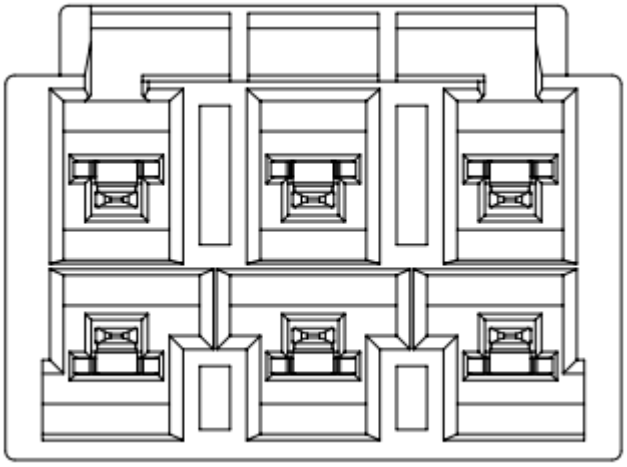
12.2 Dual Row Header (Series: 151048)



2 CKT



4 CKT



6 CKT

Note* : For different colors , Keying and Polarization Feature will vary .Please refer individual sales drawing for Features.

MOLEX CP 6.5 WEB PAGE

TABLE OF CONTENTSTOC

Molex is a registered trademark of Molex, LLC in the United States of America and may be registered in other countries; all other trademarks listed herein belong to their respective owners.