

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 CONTENTS](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 1 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

Table of Contents

1.0	SCOPE	<u>3</u>
2.0	PRODUCT DESCRIPTION	<u>3</u>
2.1	Product Name and Series Numbers	<u>3</u>
2.2	Dimensions, Materials, Plating and Markings	<u>3</u>
2.3	Safety Agency Approvals	<u>3</u>
3.0	APPLICABLE DOCUMENTS AND SPECIFICATIONS	<u>4</u>
3.1	Molex Documents	<u>4</u>
3.2	Industry Documents	<u>4</u>
4.0	ELECTRICAL PERFORMANCE RATINGS	<u>4</u>
4.1	Voltage	<u>4</u>
4.2	Current Ratings & Applicable Wires	<u>5</u>
4.3	Durability	<u>5</u>
5.0	QUALIFICATION	<u>5</u>
6.0	PERFORMANCE	<u>6</u>
6.1	Electrical Performance	<u>6</u>
6.2	Mechanical Performance	<u>6</u>
6.3	Environmental Performance	<u>8</u>
7.0	INSERTION / WITHDRAWL FORCES	<u>10</u>
8.0	TEST SEQUENCE GROUPS	<u>11</u>
9.0	SOLDER INFORMATION	<u>13</u>
9.1	Solder Process Temperature	<u>13</u>
10.0	PACKAGING	<u>13</u>
11.0	CABLE TIE AND/OR WIRE TWIST LOCATION	<u>13</u>
12.0	POLARIZATION AND KEYING OPTIONS	<u>14</u>

[MOLEX CP 6.5 WEB PAGE](#)



TABLE OF CONTENTS TOC

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 2 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 3 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS TOC](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 4 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

4.2 RATINGS & APPLICABLE WIRES

Item	Standard			
Rated Voltage (MAX.)	600 V			
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 °C - +105 °C *			

[AC (rms) / DC]
 Φ1.25 - Φ3.3mm
 Insulation O.D.

* 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 CONTENTS TOC](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 5 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 6 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 ± 3 mm/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 ± 3 mm/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 ± 3 mm/minute.		39.2 N MAX.
8	Terminal / Housing Retention Force (Receptacle)	Apply axial pull out force at the speed rate of 25 ± 3 mm/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 ± 3 mm/minute.		49.0 N MIN.
11	Retainer Insertion Force	Insert a retainer into the housing at the speed rate of 25 ± 3 mm/minute.		29.4 N MAX.

[MOLEX CP 6.5 WEB PAGE](#)



TABLE OF CONTENTS

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 7 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 8 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

ENVIRONMENTAL REQUIREMENTS (contd.)

ITEM NO.	ITEM	TEST CONDITION	REQUIREMENT
18	Humidity	Mate connectors and expose into 60±2°C 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°C 30 minutes b) +105°C 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 °C 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°C.	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 CONTENTS TOC

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 9 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

ENVIRONMENTAL REQUIREMENTS (contd.)			
ITEM NO.	ITEM	TEST CONDITION	REQUIREMENT
23	Solderability	Soldering Time: 3 ± 0.5 sec. Solder Temperature: $260 \pm 3^\circ\text{C}$ 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: $260 \pm 5^\circ\text{C}$ 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 CONTENTS TOC](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 10 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS TOC](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 11 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS TOC](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 12 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

9.0 SOLDER INFORMATION

[Molex Solderability Specification SMES-152](#)
(Click Here)

9.1 SOLDER PROCESS TEMPERATURES

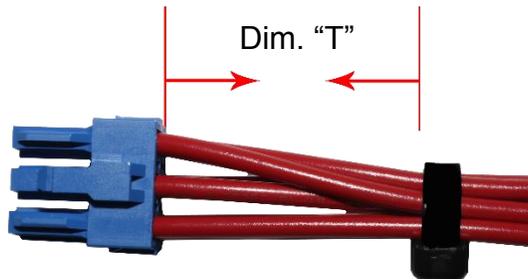
Wave Solder: 260°C Max

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](#)

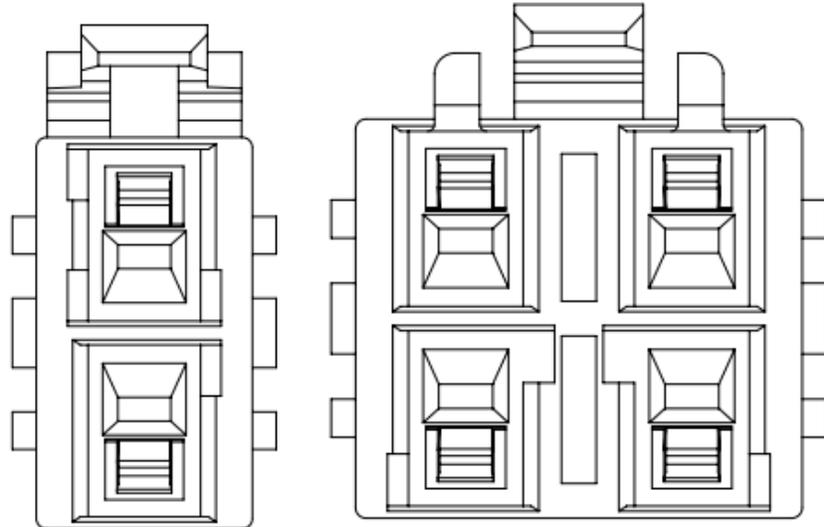


[TABLE OF CONTENTS](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 13 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

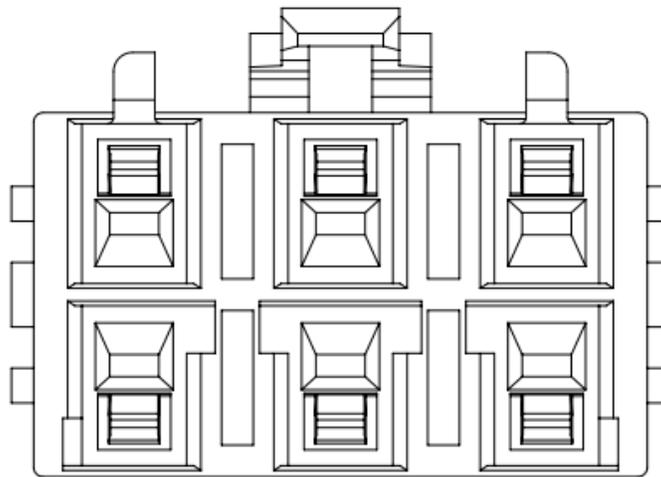
12.0 POLARIZATION AND KEYING OPTIONS

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.

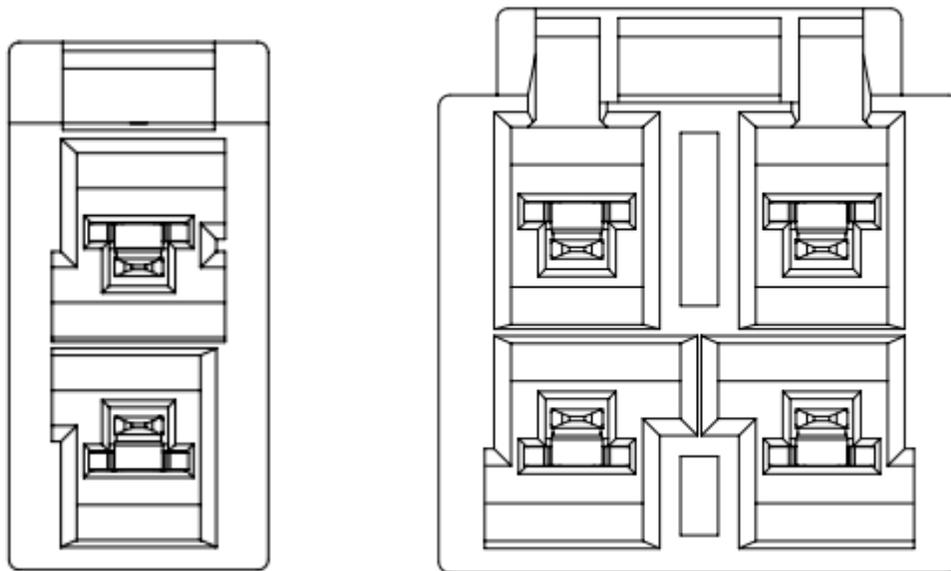
[MOLEX CP 6.5 WEB PAGE](#)



[TABLE OF CONTENTS TOC](#)

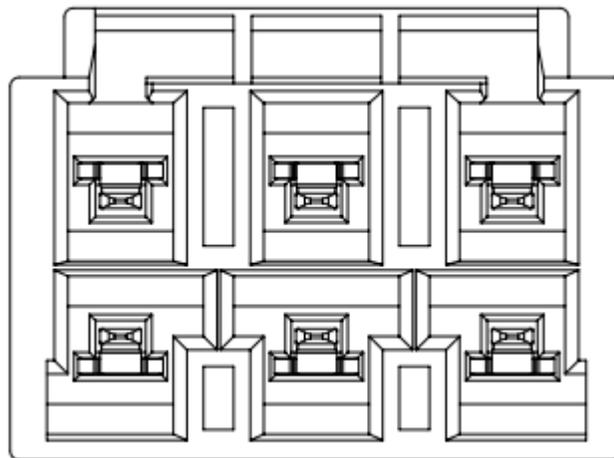
REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 14 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR

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 CONTENTS TOC](#)

REVISION: D1	ECR/ECN INFORMATION: EC No: 620445 DATE: 10/10/2019	TITLE: PRODUCT SPECIFICATION FOR CP 6.5 mm WIRE TO BOARD CONNECTOR SYSTEM	SHEET No. 15 of 15
DOCUMENT NUMBER: PS-151048-0001	CREATED / REVISED BY: SMAHAJANSHET	CHECKED BY: NCSR	APPROVED BY: NCSR