

KAG-Identnummer 11061749
H17696, 10.08.22, Ra.



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Part Number: [0511100660](#)
Status: **Active**
Overview: [Milli-Grid Connector System](#)
Description: 2.00mm Pitch, Milli-Grid Receptacle Housing, 6 Circuits, without Center Polarization Key, with Locking Ramp, Lead-Free

Documents:

3D Model	Application Specification 503940001-AS-000 (PDF)
Drawing (PDF)	Packaging Specification PK-51110-300-001 (PDF)
3D Model (PDF)	Brochure (PDF)
Product Specification PS-51110-001-001 (PDF)	RoHS Certificate of Compliance (PDF)

Agency Certification

CSA	LR19980
UL	E29179

Application tooling part link

Application Tooling Part Link	63824-2800
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General

Product Family	Crimp Housings
Series	51110
Application	Signal, Wire-to-Board
Comments	Applicable Wire Ranges: 24-30 AWG (series 50394 terminal) and 22-28 AWG (series 87396 terminal)
Overview	Milli-Grid Connector System
Product Name	Milli-Grid
UPC	800753758520

Physical

Circuits (maximum)	6
Color - Resin	Black
Flammability	94V-0
Gender	Receptacle
Glow-Wire Capable	No
Keying to Mating Part	None
Lock to Mating Part	Yes
Material - Resin	Polyester
Net Weight	0.124/g
Number of Rows	2
Packaging Type	Bag
Panel Mount	No
Pitch - Mating Interface	2.00mm
Pitch - Termination Interface	2.00mm
Polarized to Mating Part	Yes
Stackable	No
Temperature Range - Operating	-40° to +105°C

Solder Process Data

Lead-freeProcess Capability	N/A
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Material Info

Reference - Drawing Numbers

Application Specification	503940001-AS-000
Packaging Specification	PK-51110-300-001
Product Specification	PS-51110-001-001
Sales Drawing	SD-51110-XX60-001



Series image - Reference only

EU ELV

Not Relevant

EU RoHS

Compliant

REACH SVHC

Not Contained Per -
D(2022)4187-DC (10
June 2022)

Halogen-Free

Status

Not Low-Halogen

For more information, please visit [Contact US](#)

China ROHS

ELV

RoHS Phthalates

China RoHS

Green Image

Not Relevant

Not Contained

Search Parts in this Series

[51110 Series](#)

Mates With

Milli-Grid Headers [87758](#) , [87759](#) , [87760](#)
, [87831](#) , [87832](#)
Milli-Grid BMI Header
[151013](#)
Milli-Grid Low-Halogen Headers
[151117](#) , [151118](#) , [151119](#) , [151120](#)

Use With

Milli-Grid Crimp Terminals [50394](#) , [87396](#)

 Milli-Grid Pre-Crimped Leads
[797581095](#) , [797581096](#)

Application Tooling | FAQ

Tooling specifications and manuals are found by selecting the products below. Crimp Height Specifications are then contained in the Application Tooling Specification document.

Global

Description

Product #

Extractor Tool for Milli-Grid 2.0 Housings	<u>638242800</u>
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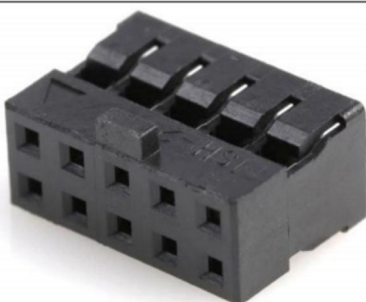
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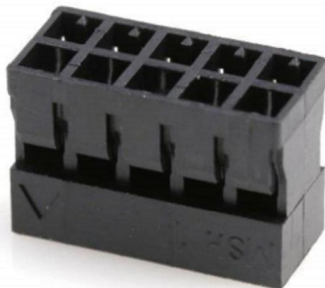
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MILLIGRID

Wire to Board

CONNECTOR SYSTEM

Crimp Terminal	Crimp Receptacle Housing with Polarization
	
Series: 50394	Series: 51110

Crimp Receptacle Housing w/o Polarization

Series: 51110

[Milli-Grid Connector System Web Page](#)
[TABLE OF CONTENTS](#)


REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				1 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003 REV A						

Table of Contents

ITEM	PAGE
1.0 SCOPE	3
2.0 PRODUCT DESCRIPTION	3
2.1 DESCRIPTION, SERIES NUMBER, AND LINKS	3
2.2 DIMENSIONS, MATERIALS, PLATINGS	3
2.3 ENVIRONMENTAL CONFORMANCE	3
2.4 SAFETY AGENCY LISTINGS	3
3.0 APPLICABLE DOCUMENTS AND SPECIFICATION	4
3.1 MOLEX DOCUMENTS	4
3.2 INDUSTRY DOCUMENTS	4
4.0 ELECTRICAL PERFORMANCE RATINGS	4
4.1 VOLTAGE	4
4.2 APPLICABLE WIRES	4
4.3 CURRENT RATING (MAXIMUM AMPERES)	5
4.4 TEMPERATURE	5
5.0 QUALIFICATION	5
6.0 PERFORMANCE	6
6.1 ELECTRICAL PERFORMANCE	6
6.2 MECHANICAL PERFORMANCE	7
6.3 ENVIRONMENTAL PERFORMANCE	8
7.0 PACKAGING	11
8.0 CABLE TIE AND / OR TWIST TIE LOCATION	11
9.0 POLARIZATION AND KEYING OPTIONS	12

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				2 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
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1.0 SCOPE

This Product Specification covers the performance requirement for the Milli-Grid 2 mm Grid Wire to Board Connector terminated with 24 to 30 AWG wire using Crimp technology.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

DESCRIPTION	SERIES NUMBER
Crimp Terminal	50394
Crimp Receptacle Housing	51110

2.2 DIMENSIONS, MATERIALS, PLATINGS

See sales drawings for details on dimensions, materials and platings.

2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:

- [Go to molex.com](#)
- Enter the part number in the search field.
- At the bottom of the page go to "Environmental" to see compliance status.

2.4 SAFETY AGENCY LISTINGS

UL Number: E29179

CSA Number: 1585720 (LR19980)



CSA approval meets following standards/test procedures:

- CSA std. C22.2 No. 182.3-M1987
- UL-1977

* "C" and "US" mark adjacent to CSA signifies that the product has been evaluated to the applicable CSA and ANSI/UL standards, for use in Canada and US respectively.

Series 51110, rated 2.0 A (No. 24 AWG), 125 V

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				3 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003_REV A						



PRODUCT SPECIFICATION

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

MilliGrid W-T-B Connectors Test Summary TS
[MilliGrid W-T-B Connectors Application Specification 503940001-AS](#)
[Molex Quality Crimping Handbook Order No. 63800-0029](#)
[Molex Moisture Technical Advisory AS-45499-001](#)
[Molex Package Handling Specification 454990100-PK](#)
ATS-Application Tooling Specification *

**Application tooling Specification differs with Terminals. ATS shall be available in the respective Terminal part number page.*

3.2 INDUSTRY DOCUMENTS

UL-60950-1
UL-1977
CSA STD. C22.2 NO. 182.3-M1987

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

125 V AC (rms) / DC

4.2 APPLICABLE WIRES

Wire Gage(Stranded copper)	Insulation O.D.
AWG#24 – AWG#30	1.4 mm dia. Max.

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				4 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003_REV A						

TEMPLATE FILENAME: 1703070003 REV A

4.3 CURRENT RATING (MAXIMUM AMPERES)

AWG	Single Ckt	Fully Loaded (50 Ckts)
#24	6.00 A	2.40 A
#26	5.40 A	2.20 A
#28	5.00 A	2.00 A
#30	4.40 A	1.80 A

Current rating is application dependent and each application should be evaluated by the end user for compliance to specific safety agency requirements. The ratings listed in the chart below are 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, insulation thickness, stranding, tin coated or bare copper, wire length & crimp quality are other factors that influence current rating.

4.4 TEMPERATURE

Operating Temperature Range : - 40 °C to + 105 °C
Non-Operating Temperature Range: : - 55 °C to + 105 °C

Note: Temperature life test duration (section 6.3. item 1) is based on the assumption that the contact spends its entire life at the rated field maximum temperature (based on EIA-364-1000, table 8).

5.0 QUALIFICATION

Laboratory condition, sample selection and test sequences are in accordance with MIL-STD-202.

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				5 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003_REV_A						

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Contact Resistance	Mate connectors, measure by dry circuit, 20 mV MAX., 10 mA (based upon JIS C5402 5.4).	40 mohm MAX.
6.1.2	Insulation Resistance	Mate connectors, apply 500 V (rms) AC for 1 minute between adjacent terminal or ground (based upon JIS C5402 5.1/ MIL-STD-202 Method 301).	1000 Mohms Min.
6.1.3	Dielectric Strength	Mate connectors, apply 500 V(rms) AC for 1 minute between adjacent terminal or ground (based upon JIS C5402 5.1/ MIL-STD-202 Method 301).	No breakdown
6.1.4	Contact Resistance on Crimped Portion	Crimp the applicable wire onto the terminal, measure by dry circuit, 20 mV MAX., 10 mA.	5 mohm MAX.
6.1.5	Temperature Rise	Mate connectors and measure the temperature rise of contact when the maximum DC rated current is passed.	Temperature: 30 °C Max.

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				6 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003 REV A						

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Mating and Unmating Force	Mating and Unmating connectors at a rate of 25 +/- 3 mm/min.	Mating force: 1.96 N / CKT MAX. Unmating force: 0.392 N / CKT Min.
6.2.2	Crimp Terminal Insertion Force	Insertion the crimped terminal into the housing.	9.8 N MAX.
6.2.3	Crimp Terminal Housing Retention Force	Apply axial pull out force at a rate of 25 mm/min. on the terminal assembled in the housing.	9.8 N MIN.
6.2.4	Crimping Pull Out Force	Fix the crimped terminal, Apply axial pull out force on the Wire at the speed rate of 25 mm/min. (based on JIS C5402 6.8)	AWG#24 = 29.4 MIN. AWG#26 = 19.6 MIN. AWG#28 = 9.8 MIN. AWG#30 = 4.9 MIN. (all in Newtons)
6.2.5	Repeated Mate / Unmate	When Mate / unmate up to 50 cycles repeatedly at a rate of 10 cycles / min.	Contact Resistance: 60 mohms Max.
6.2.6	Vibration	Mate connectors and subject to the following vibration conditions, for a period of two hours in each 3 mutually perpendicular axis, passing DC 1 mA current during the test. Amplitude: 1.5 mm p-p Frequency: 10-55-10 Hz. Shall be transversed on 1 minute (based on MIL-STD-202 Method 201A)	Appearance: No damage Contact resistance: 60 mohm Max. Discontinuity: 1.0 μ s MAX.
6.2.7	Shock	Mate connectors and subject to the following shock conditions, 3 shocks shall be applied along 3 mutually perpendicular axis, passing DC 1 mA current during the test. (Total of 18 shocks) Test pulse : Half Sine Peak value: 490 m/s sq. (50G) Duration : 11 ms (based on JIS C0041 MIL-STD-202 Method 213B Cond. A)	Appearance: No damage. Contact Resistance: 60 mohm Max. Discontinuity: 1.0 μ s Max.

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				7 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003_REV A						

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Heat Resistance	Mate connector and expose to 85+/-2 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (based on JIS C0021 / MIL-STD-202 Method 108A Cond. A)	Appearance: No damage. Contact Resistance: 60 mohm Max.
6.3.2	Cold Resistance	Mate connector and expose to -55+/-3 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed (based on JIS C0020)	Appearance: No damage. Contact Resistance: 60 mohm Max.
6.3.3	Humidity	Mate connector and expose to 60+/-2 °C, relative humidity 90-95% for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (based on JIS C0022 / MIL-STD-202 Method 103B Cond. B).	Appearance: No damage. Contact Resistance: 60 mohm Max. Dielectric Strength: Must meet 6.1.3 Insulation Resistance: 100 Mohm Min.
6.3.4	Temperature Cycling	Mate connectors and subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. 1 cycle: a) -55+/-3 °C 30 min. b) +105+/-2 °C 30 min. (Transit time shall be within 5 minutes; JIS C0025)	Appearance: No damage. Contact Resistance: 60 mohm Max.

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				8 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003_REV A						

6.3 ENVIRONMENTAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.5	Salt Spray	Mate connectors and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dipped in the running water, after which the specified measurements shall be performed. NaCl solution concentration: 5+/-1% Spray time: 48+/-4 hours Ambient Temperature: 35 +/- 2 °C (based on JIS C5028 / MIL-STD-202 Method 101D Condition B).	Appearance: No damage. Contact Resistance: 60 mohm Max.
6.3.6	S02 Gas	Mate connectors and expose to 50+/-5 ppm S0 ₂ gas, ambient temperature 40+/-2 °C for 24 hours.	Appearance: No damage. Contact Resistance: 60 mohms Max.

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



REVISION:	ECM INFORMATION:	TITLE:				SHEET No.
B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				9 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003_REV A						



PRODUCT SPECIFICATION

Individual Tests

Mating & Unmating Force

Crimp Terminal Insertion Force

Crimp Terminal Retention Force

Crimping Pull Out Force

Repeated Mate / Unmate

[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)

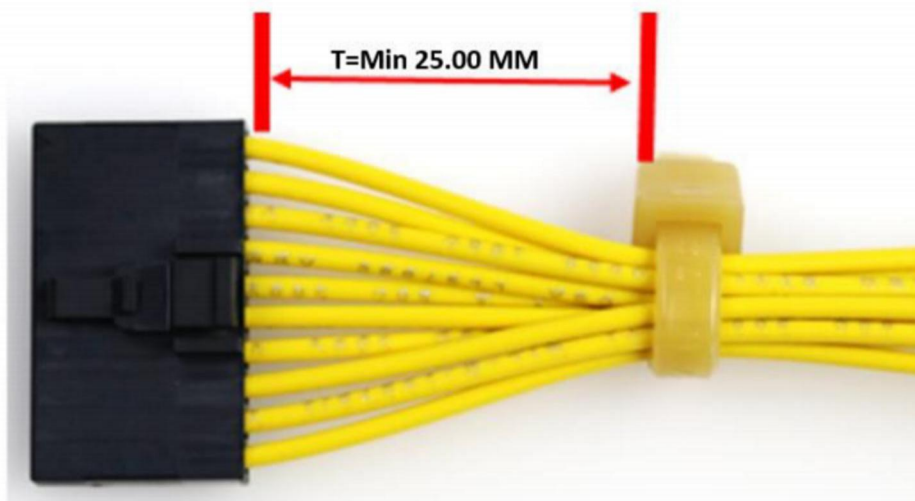


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B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				10 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001		PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003.REV.A						

TEMPLATE FILENAME: 1703070003 REV A

7.0 PACKAGING

Parts shall be packaged to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item

8.0 CABLE TIE AND / OR TWIST TIE LOCATION


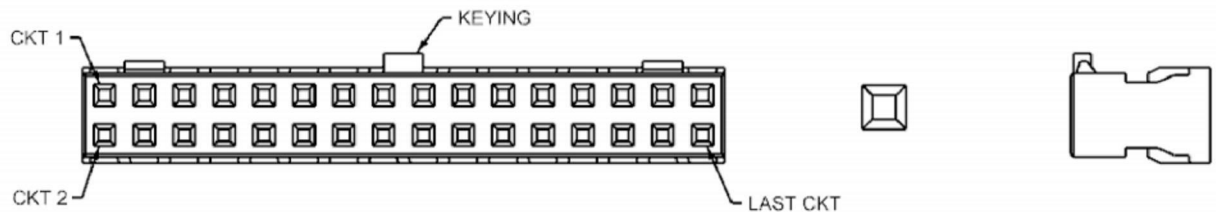
The "T" dimension defines a "free" length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter 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.

[Milli-Grid Connector System Web Page](#)
[TABLE OF CONTENTS](#)


REVISION:	ECM INFORMATION:	TITLE:	SHEET No.		
B	EC No: 630301 DATE: 2020/01/10	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR	11 of 12		
DOCUMENT NUMBER:	DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-51110-001	PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA
TEMPLATE FILENAME: 1703070003 REV A					

9.0 POLARIZATION AND KEYING OPTIONS

9.1 RECEPTACLE HOUSING (Series: [51110](#))



[Milli-Grid Connector System Web Page](#)

[TABLE OF CONTENTS](#)



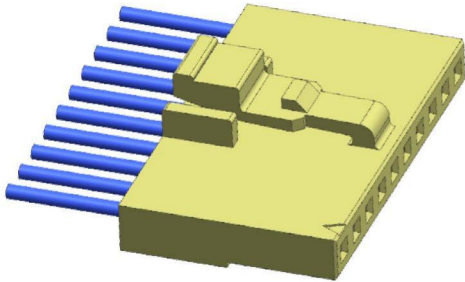
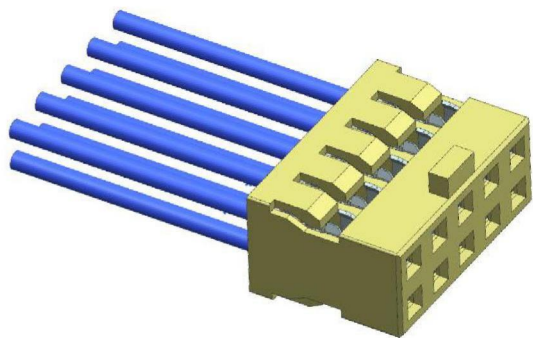
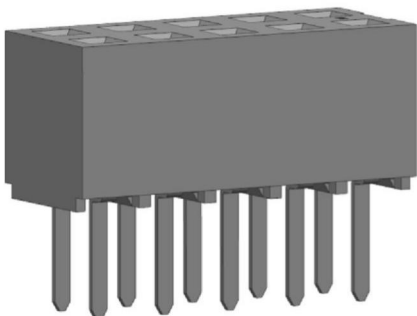
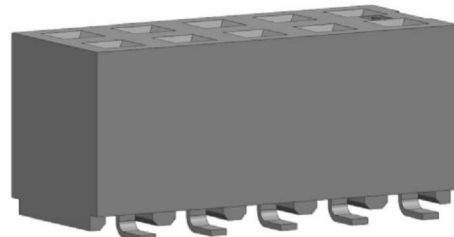
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B	EC No: 630301	PRODUCT SPECIFICATION MGRID, 2MM GRID WIRE TO BOARD CONNECTOR				12 of 12
	DATE: 2020/01/10					
DOCUMENT NUMBER:		DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
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5Milli-Grid Connector System

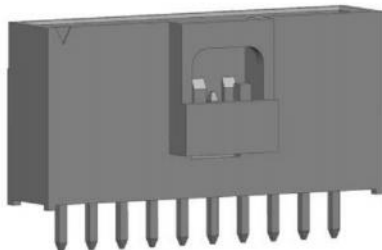
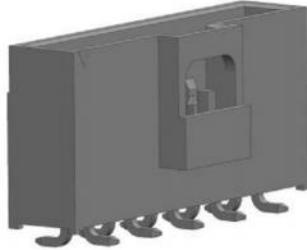
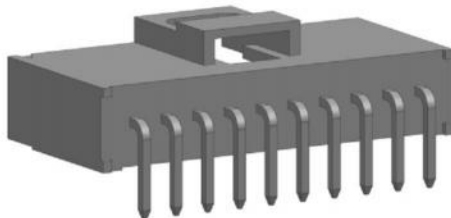
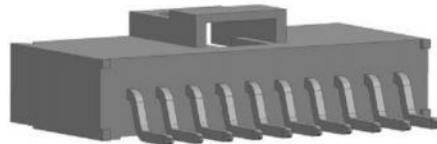
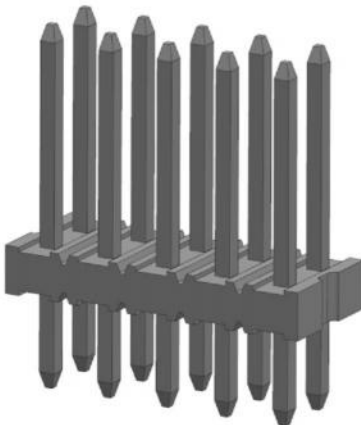
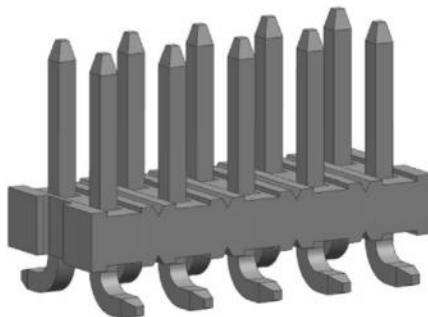
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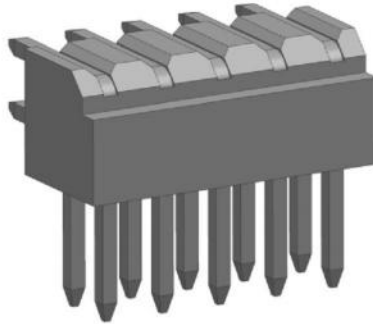
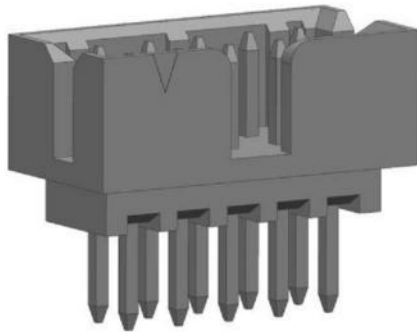
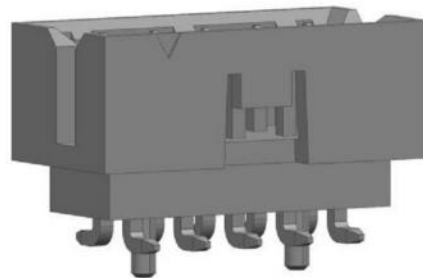
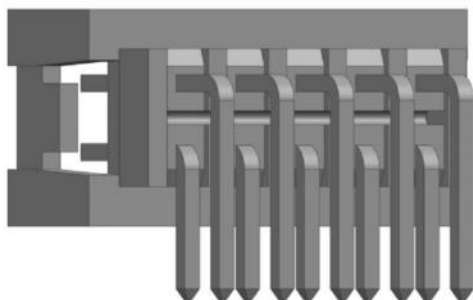
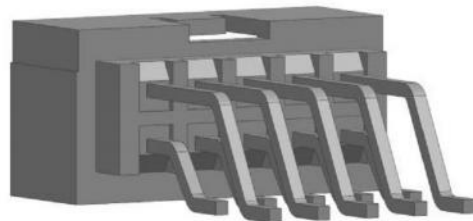
This document contains information pertaining to application requirements of the Milli Grid Connector System.

2.0 PRODUCT DESCRIPTION

SINGLE ROW RECEPTACLE (WTB)	DUAL ROW RECEPTACLE (WTB)
	
DUAL ROW RECEPTACLE (BTB) TROUGH HOLE	DUAL ROW RECEPTACLE (BTB) SMT
	

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	1 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar

SINGLE ROW VERTICAL TROUGH HOLE		SINGLE ROW VERTICAL SMT	
			
SINGLE ROW RIGHT ANGLE TROUGH HOLE		SINGLE ROW RIGHT ANGLE SMT	
			
DUAL ROW UNSHROUDED VERTICAL TROUGH HOLE		DUAL ROW UNSHROUDED VERTICAL SMT	
			
REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	2 of 13
DOCUMENT NUMBER:		CREATED / REVISED BY:	CHECKED BY:
503940001-AS		Akhil	Manohar
		APPROVED BY:	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

DUAL ROW UNSHROUDED RIGHT ANGLE TROUGH HOLE

DUAL ROW SHROUDED VERTICAL TROUGH HOLE

DUAL ROW SHROUDED VERTICAL SMT

DUAL ROW SHROUDED RIGHT ANGLE TROUGH HOLE

DUAL ROW SHROUDED RIGHT ANGLE SMT


REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	3 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar

SEE APPROPRIATE SALES DRAWINGS AND PRODUCT SPECIFICATIONS FOR INFORMATION ON SPECIFIC PART NUMBERS.

3.0 GENERAL NOTES

Appearance: Parts confirm to class “B” requirements of the cosmetic specification PS-45499-002. Refer notes in sales drawing.

1. ASSEMBLY INSTRUCTIONS

Wire to Board

Contact/terminal insertion into Receptacle housing

Use only *female* terminals with receptacle housing. Align the terminal to the receptacle housing cavity axis. Continue inserting until it stops and locks up. Orientation needed to insert terminal in housing as shown in the fig 1. Terminal will lock's up as shown in the **Detail A** view. Pull the terminal back gently to ensure terminal is seated properly.

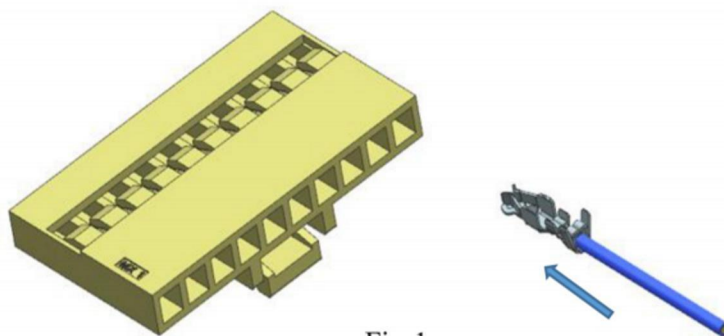


Fig-1

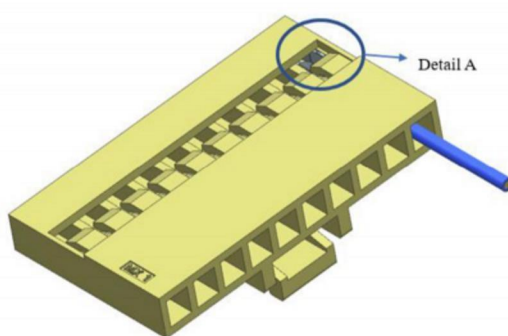
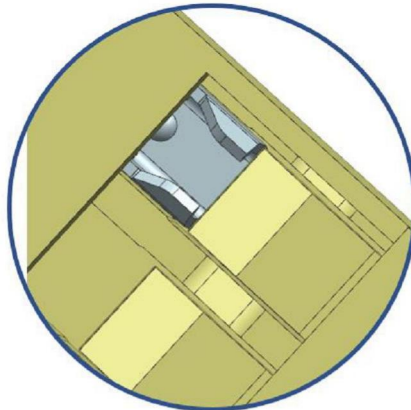


Fig-2

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	4 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			



Detail A

Insert the terminals into all circuits and complete the insertion as shown in in Fig 3 and Carry out the visual inspection of the terminal

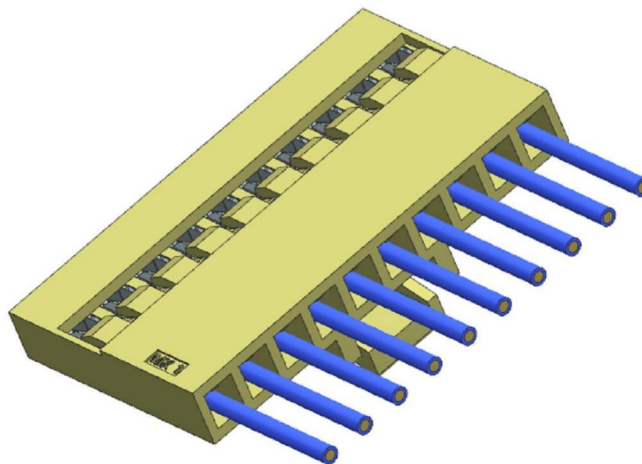


Fig-3

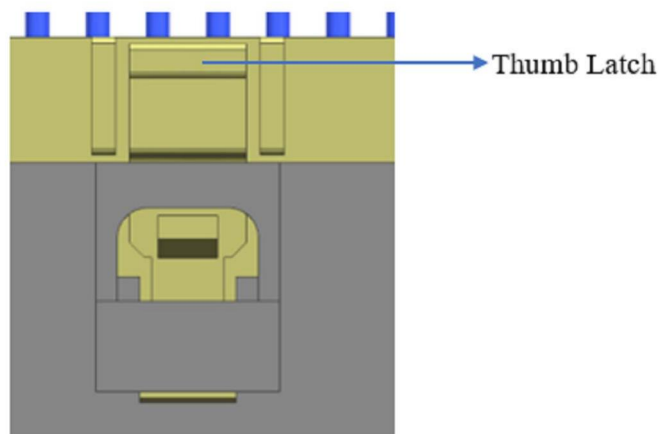
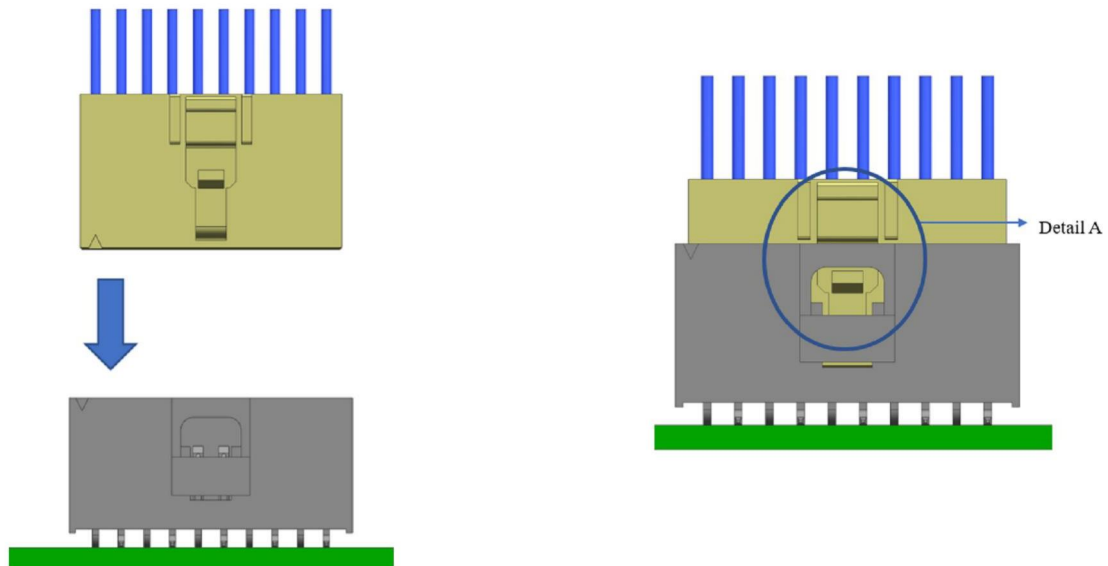
No Servicing Tool available for terminal extraction.

NOTE: Terminal insertion into receptacle housing of dual row also same as single row housing.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	5 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

Connector mating (Shrouded Single row header)

Align connector system latch and begin the mating process along the same axis, slide the connector assemblies into each other until latch locks with the header as shown below.

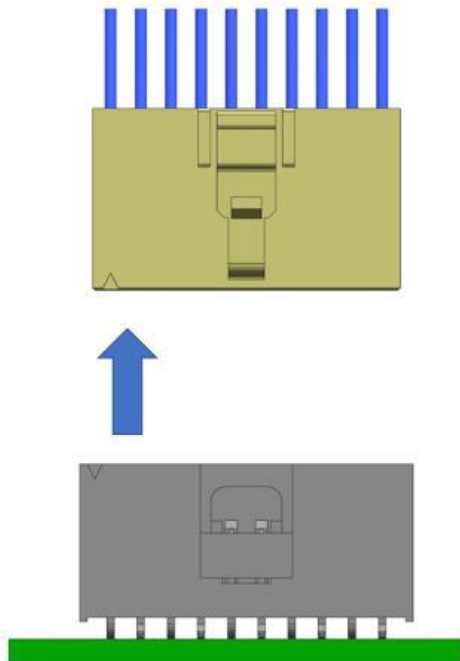


Detail A

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	6 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

Connector unmating

To unmate the connectors press the latch lever on receptacle assembly to disengage the pull the assembly by applying force on thumb latch as shown in Detail view A.



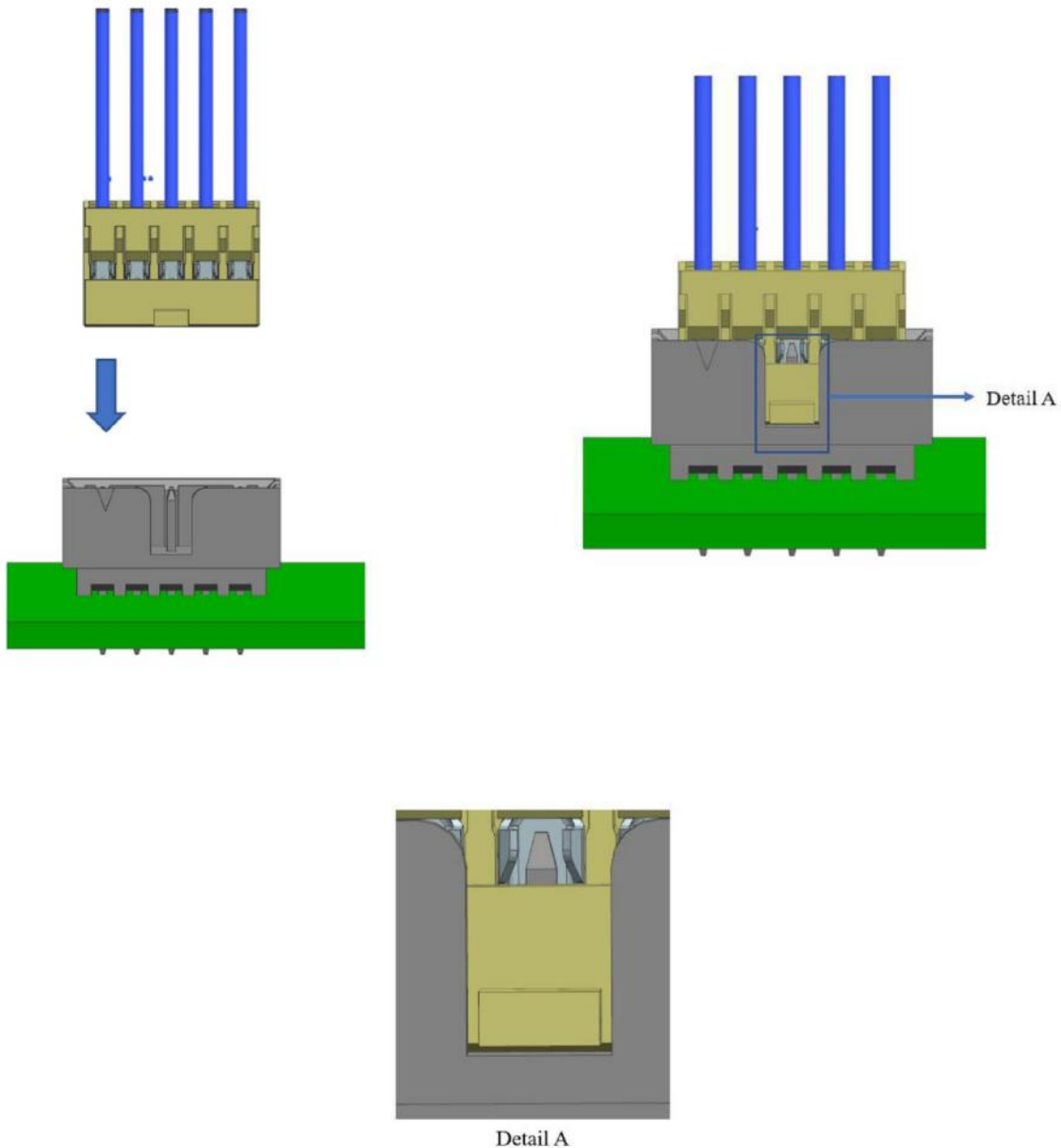
NOTE: Mating and Unmating mechanism remains same irrespective of the termination style of the header.
(Single row through hole and Single row Surface mount termination)

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	7 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

DUAL Row

Connector mating (Shrouded Dual row header)

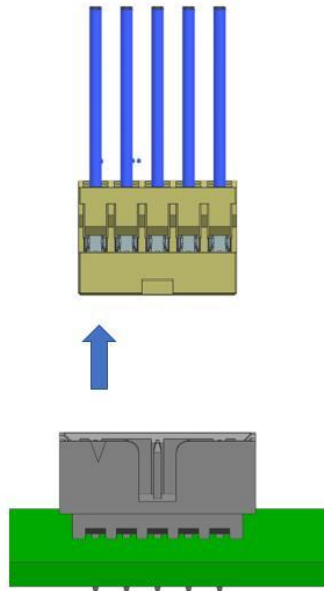
Align the receptacle to the header by arranging the polarization mechanism in axis and slide the connector assemblies into each other until the bottom and they lock due to friction.



REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	8 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar

Connector unmating

To unmate the connectors, just pull back each other until they separate from each other.

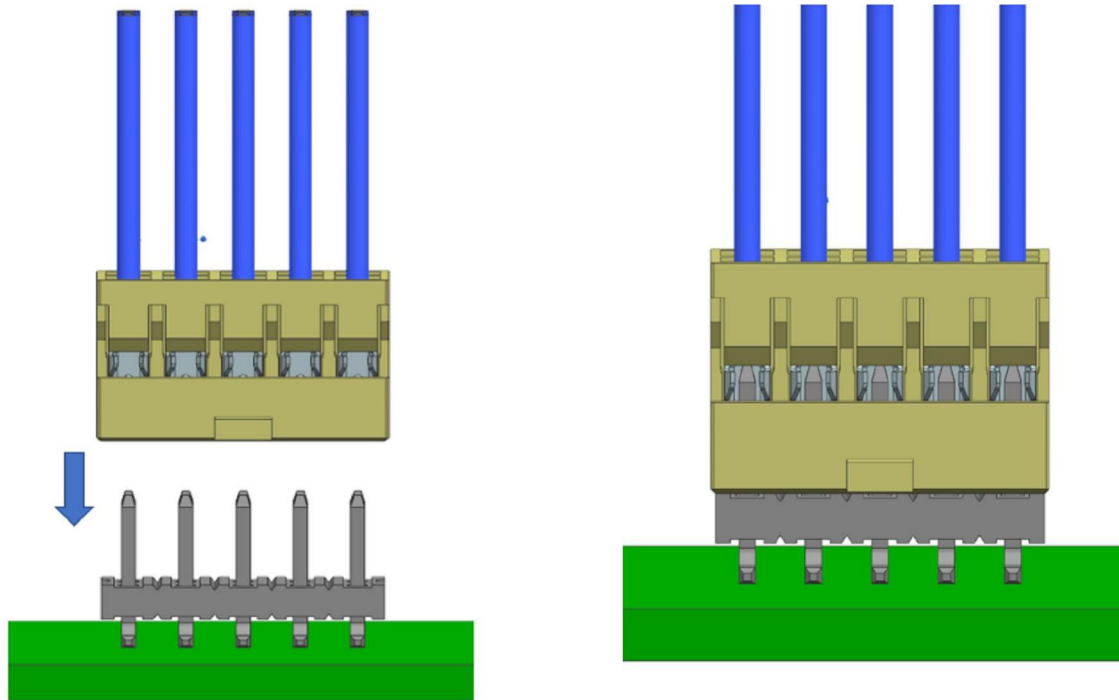


NOTE: Mating and unmating of the above combination remains same irrespective of their termination style.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	9 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

Connector mating (Unshrouded Dual row header)

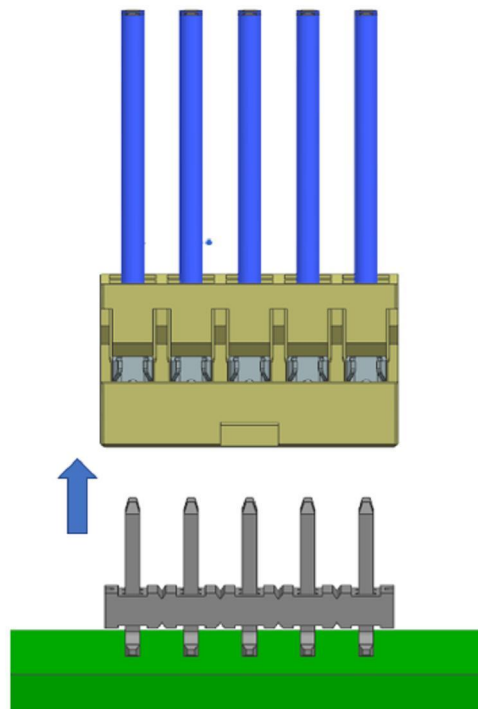
Align the receptacle to the header axis and move the receptacle until the bottom stops.



REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	10 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

Connector unmating

To unmate the connectors, gently pull back each other until they separate from each other



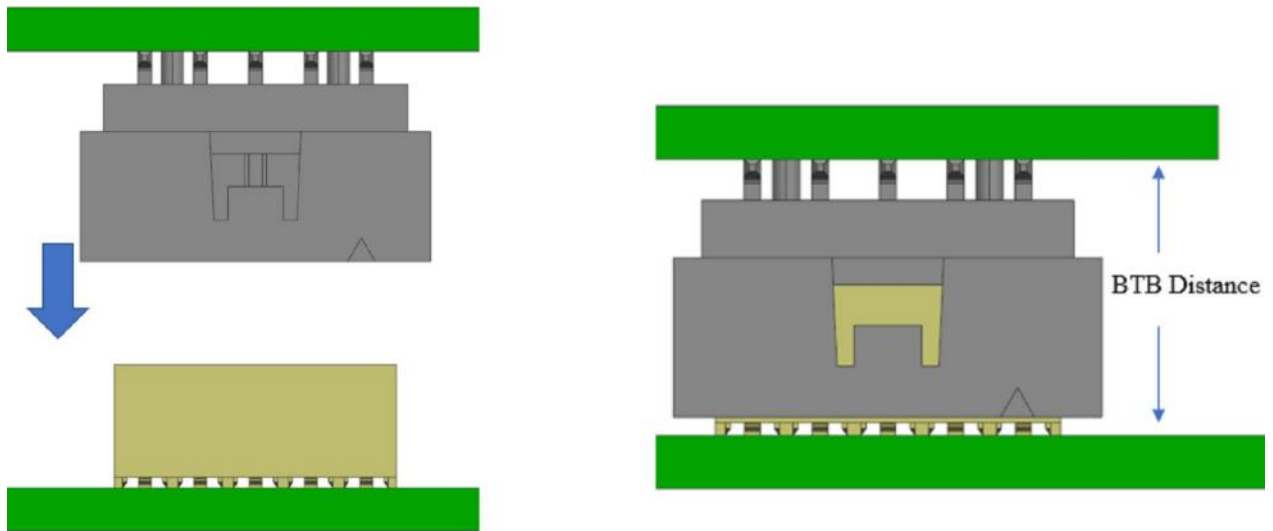
NOTE: Mating and unmating of the above combination remains same irrespective of their termination style

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	11 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

Board to Board

Connector mating (Shrouded Dual row header)

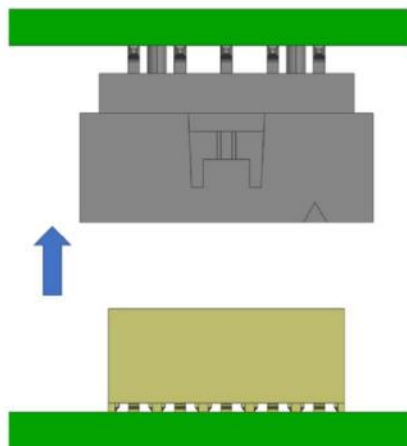
Align the receptacle to the axis of the header and slide the connector assemblies into each other until it bottoms and stops



❖ Please Find the Board-To-Board distance of the Combination in Respective sales drawings.

Connector unmating

To unmate the connectors, gently pull back each other until they separate from each other.

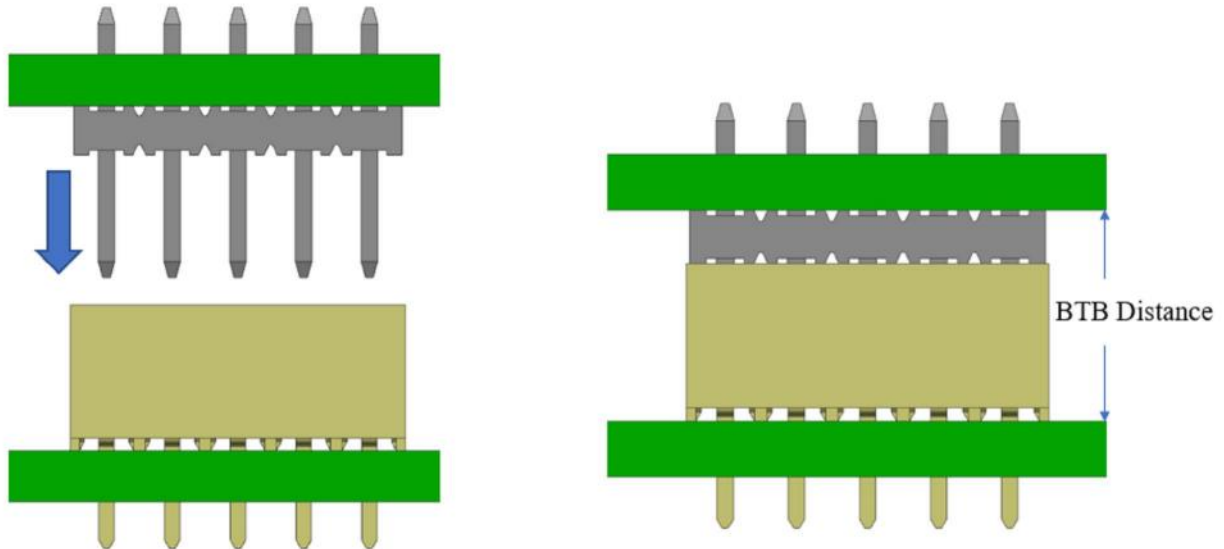


NOTE: Mating and unmating of the above combination remains same irrespective of their termination style.

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	12 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

Connector mating (Unshrouded Dual row header)

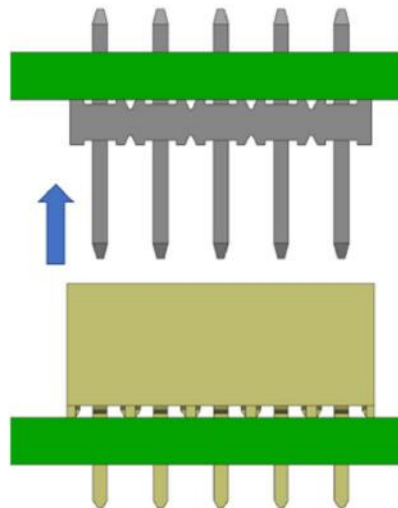
Align the receptacle to the axis of the header and slide the connector assemblies into each other until it bottoms and stops.



❖ Please Find the Board-To-Board distance of the Combination in Respective sales drawings.

Connector unmating

To unmate the connectors, gently pull back each other until they separate from each other.



NOTE: Mating and unmating of the above combination remains same irrespective of their termination style

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
A2	EC No: 628516 DATE: 2019 / 11 / 03	APPLICATION SPECIFICATION FOR MILLI-GRID CONNECTOR SYSTEM (WTW/WTB)	13 of 13
DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
503940001-AS	Akhil	Manohar	Manohar
TEMPLATE FILENAME: APPLICATION_SPEC[SIZE_A4](V.2).DOC			

