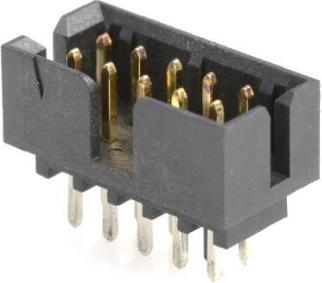
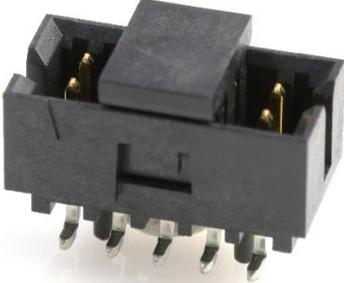
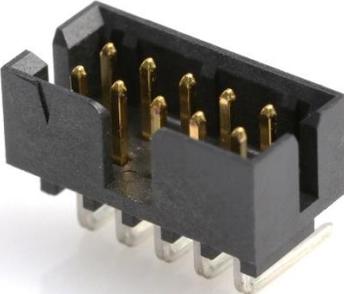


# MILLIGRID

## Wire to Board

### CONNECTOR SYSTEM

Vertical Header	Vertical Header, SMT
	
Series: <a href="#">87831</a>	Series: <a href="#">87832</a>

R/A Header

Series: <a href="#">87833</a>

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: 630301 DATE: 2020/01/10	TITLE: <b>PRODUCT SPECIFICATION</b> <b>2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>1 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
<small>TEMPLATE FILENAME: 1703070003 REV A</small>						

## Table of Contents

<u>ITEM</u>	<u>PAGE</u>
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 .....	5
4.1 VOLTAGE .....	5
4.2 CURRENT RATING (MAXIMUM AMPERES) .....	5
4.3 TEMPERATURE .....	6
4.4 DURABILITY .....	6
5.0 QUALIFICATION .....	6
6.0 PERFORMANCE .....	7
6.1 ELECTRICAL PERFORMANCE .....	7
6.2 MECHANICAL PERFORMANCE .....	8
6.3 ENVIRONMENTAL PERFORMANCE .....	9
7.0 TEST SEQUENCE GROUPS .....	10
8.0 SOLDER INFORMATION .....	11
8.1 SOLDER PROCESS TEMPERATURE .....	11
8.2 REFLOW SOLDERING PROFILE .....	11
9.0 PACKAGING .....	12
10.0 SPECIAL INSTRUCTIONS FOR HIGH-TEMPERATURE REFLOW PROCESSING ONLY .....	13
11.0 POLARIZATION AND KEYING OPTIONS .....	14

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>2 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 1.0 SCOPE

This specification covers the performance requirements for Milli-Grid 2 mm Dual Row Shrouded Headers.

## 2.0 PRODUCT DESCRIPTION

### 2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

DESCRIPTION	SERIES NUMBER
Vertical Header	<a href="#">87831</a>
Vertical Header (SMT)	<a href="#">87832</a>
R/A Header	<a href="#">87833</a>

These series mate with Molex:

- a. Milli-Grid 2 mm Grid Wire to Board Connector, Crimp Receptacle Housing, 51110 series and Crimp Terminal, 50394 series.
- b. 2 mm Milli-Grid Dual Row IDT, 87568 series.
- c. Milli-Grid 2 mm Grid Wire to Board Panel Mount Receptacle. (Up To 20 Circuit Only). Crimp Receptacle Housing, 151014 series and Crimp Terminal, 50394 series.

### 2.2 DIMENSIONS, MATERIALS, PLATINGS

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

### 2.3 ENVIRONMENTAL CONFORMANCE

To find product compliance information:

- a. [Go to molex.com](http://molex.com)
- b. Enter the part number in the search field.
- c. At the bottom of the page go to "Environmental" to see compliance status.

### 2.4 SAFETY AGENCY LISTINGS

UL Number: E29179  
CSA Number: LR19980



CSA approval meets following standards/test procedures:

- a) CSA std. C22.2 No. 182.3-M1987
- b) 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 87831, 87832, 87833, rated 2.0 A, 125 V

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>	SHEET No. <b>3 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>
		CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>
TEMPLATE FILENAME: 1703070003 REV A			

## 3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

### 3.1 MOLEX DOCUMENTS

[MilliGrid Dual Row Shrouded Connectors Test Summary TS](#)  
[MilliGrid Dual Row Shrouded Connectors Application Specification 50394001-AS](#)  
[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](#)

In the event of conflict between the requirements of this specification and reference documents, this specification shall take the precedence.

MIL-STD-202	Test Methods for Electrical and Electronic Component Parts.
MIL-STD-1344	Test Methods of Electrical Connector
EIA-364-1000	Industry Standard

#### Reference Product Specifications

PS-51110-001	Milli-Grid 2 mm Grid Wire to Board Connector
PS-87568-004	2 mm Milli-Grid Dual Row IDT Receptacle
PS-151014-0001	2 mm Milli-Grid Panel Mount Receptacle

### 3.2 INDUSTRY DOCUMENTS

EIA-364-1000  
 UL-60950-1  
 UL-1977  
 CSA STD. C22.2 NO. 182.3-M1987

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>4 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 4.0 ELECTRICAL PERFORMANCE RATINGS

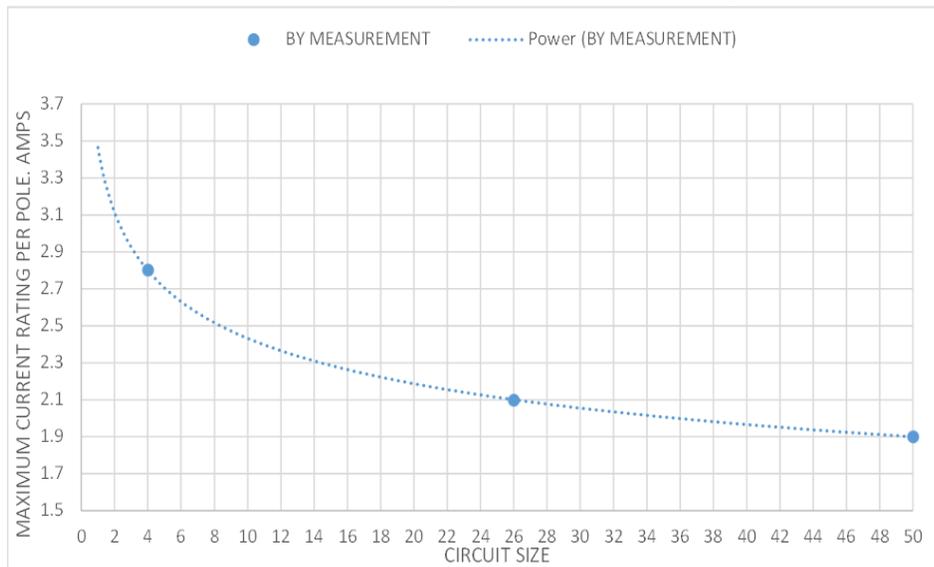
### 4.1 VOLTAGE

125 V

### 4.2 CURRENT RATING (MAXIMUM AMPERES)

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, AWG WIRE, 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.

Board to IDT (87831\* & 87568 Series)



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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>5 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

### 4.3 TEMPERATURE

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

### 4.4 DURABILITY

Plating Type	Number of Cycles
Gold Plated	50

*As tested in accordance with EIA-364-1000 test method (see Sec. 6.2 item 3 of this specification).  
 Durability per EIA-364-09.*

### 5.0 QUALIFICATION

Laboratory condition, sample selection and test sequences are in accordance with EIA-364-1000.

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>6 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 6.0 PERFORMANCE

### 6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Insulation Resistance	Apply 500 VDC for 1 minute per MIL-STD-1344A, METHOD 3003.1	1000 Megohms Minimum
6.1.2	Dielectric Strength	1000 VAC(rms) for 1 minute between Adjacent terminals.	No breakdown
6.1.3	Contact Resistance (Low Level) For Series: 151014	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA Per EIA-364-23	40 milliohms Max.

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>7 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Pin/ Terminal Retention Force (in Housing)	Apply an axial load on the terminal in the housing to dislodge the terminals from the connector at a rate of 0.50 inch per minute	Retention Force: 850 g Min per pin. (Before heat soldering)
6.2.2	Mating and Unmating Force For Series: 151014	Mating and Unmating connectors at a rate of 25 +/- 3 mm / min.	Mating force: 1.9 N / CKT MAX. Unmating force: 0.35 N / CKT Min.
6.2.3	Durability For Series: 151014	Mate / unmate up to 50 cycles repeatedly at a rate of 10 cycles / min Per EIA-364-09	Contact Resistance: 60 milliohms Max.
6.2.4	Vibration For Series: 151014	Mate connectors : Test Condition per EIA 364-28, test condition VII, test condition letter D (15 min. in each of 3 mutual perpendicular directions. Both mating halves should be rigidly fixed so as not to contribute to the relative motion of one contact against other)	10 milliohms Max. (change from initial) & Discontinuity < 1 microsecond
6.2.5	Mechanical Shock For Series: 151014	Mate connectors and shock at 50 g's with 1/2 sine wave (11 milliseconds) shocks in the ± X, ± Y, ± Z axes (18 shocks total).	10 milliohms Max. (change from initial) & Discontinuity < 1 microsecond

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>	SHEET No. <b>8 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>
		CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>
TEMPLATE FILENAME: 1703070003 REV A			

## 6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Solderability	Solder Time: 5 +/-0.5 secs. Solder Temperature: 260 ± 5 °C	95% of the immersed area must show no voids, pin holes.
6.3.2	Resistance to Soldering Heat (Through Hole)	Solder tail to be dipped in flux as per MIL-STD-202F method 210 condition B. Solder Temperature: 260 ± 5 °C Solder Time: 10 +/- 1 secs	No damage in appearance of the connector.
6.3.3	Resistance to IR reflow heat (SMT)	Pass product through IR machine for 3 cycles of the following reflow profile:	No damage in appearance of the connector

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: 630301 DATE: 2020/01/10	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>9 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 7.0 TEST SEQUENCE GROUPS

Test Group $\Rightarrow$	A	B	C	D	E
Test or Examination $\downarrow$					
Examination of the connector(s)	1	1	1	1	1
Contact Resistance (Low Level) (LLCR)	4,8		3,5,7,9		
Insulation Resistance		3			
Dielectric Withstanding Voltage		4			
Pin Retention Force (in housing) (Header)					2
Mate Force	3,7				
Unmate Force	5,9				
Durability	6		4		
Vibration			6		
Mechanical Shock			8		
Crimp Wire Pullout Force (Axial) (Receptacle)					
Resistance to Soldering Heat (Header)	2	2	2		
Solderability (Header)				2	

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>	SHEET No. <b>10 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>
		CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>
TEMPLATE FILENAME: 1703070003 REV A			

## 8.0 SOLDER INFORMATION

Per SMES-152 and AS-40000-5013

\*These specifications establish standard solderability test methods used to evaluate a products ability to accept molten solder. Solder Process Temperatures and Reflow Solder Profiles will vary based on application, equipment, solder paste, PCB thickness, etc.

### 8.1 SOLDER PROCESS TEMPERATURE

Wave Solder: 260 °C Max.

Reflow Solder: 260 °C Max.

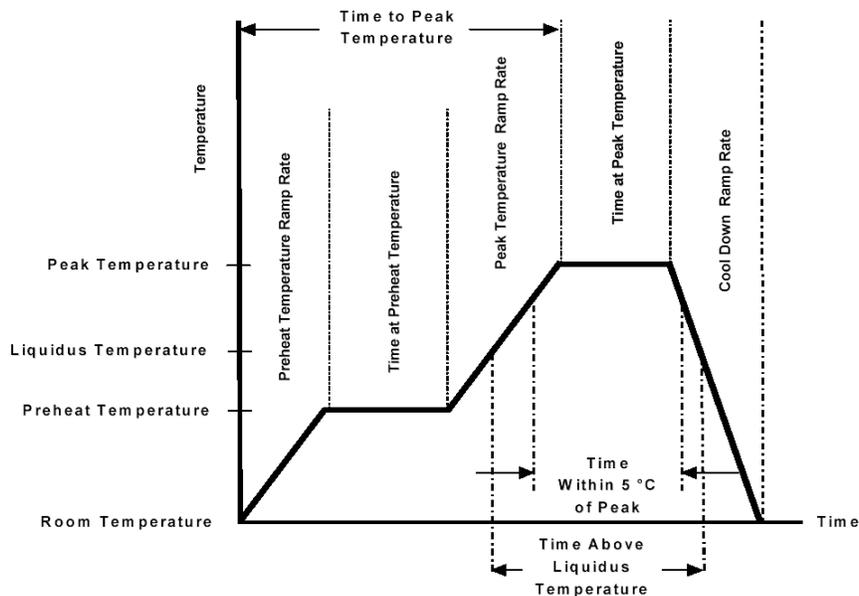
### 8.2 REFLOW SOLDERING PROFILE

(This profile is per AS-40000-5013 and is provided as a guideline only. Please see notes for additional information)

[Molex Connector Heat Resistance Specification](#)

[AS-40000-5013](#)

[\(Click Here\)](#)



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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>	SHEET No. <b>11 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>
		CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>
TEMPLATE FILENAME: 1703070003 REV A			

Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquidus (217°C)	60 to 150 sec
Peak Temperature	260 +0/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max

## 9.0 PACKAGING

Parts shall be packed in either Tube or Tape & Reel and protected against damage during handling, transportation and storage. Refer Molex.com specific part number webpage to get the exact packaging document for that item

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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>12 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 10.0 SPECIAL INSTRUCTIONS FOR HIGH-TEMPERATURE REFLOW PROCESSING ONLY

### Background

The products covered in this specification are molded with a high-temperature thermoplastic resin that can withstand the effects of elevated temperatures as seen in today's reflow soldering processes. This high temperature resin, like many used in the electronics industry, is hygroscopic in nature, meaning it can absorb/desorb moisture readily.

Depending on the degree of elevated ambient temperature and relative humidity, the connectors may absorb an increased percentage of moisture. This increase in percentage of absorption is also dependent on the exposure time once connectors are removed from the sealed moisture barrier bags. Higher levels of moisture absorption are typically non-detrimental in most situations but when combined with the elevated peak temperatures and dwell times seen in reflow solder processes trapped gasses and moisture can sometimes result in blistering of the plastic housing.

### Floor Life

In view of the hygroscopic nature of the resin, proper handling and storage are required if connectors will be processed or exposed to the higher temperatures of reflow soldering. Storage exposure time begins once connectors have been removed from sealed moisture barrier bags. Greater exposure time, storage and processing temperatures, ambient humidity and part geometry are influencing factors. As such, if connectors are used in a reflow soldering environment, it is recommended that upon removal from the moisture barrier bag, they should be consumed within 48 hours with a temperature and humidity level of not more than 30 °C and 60% RH respectively. For unused quantity, it is recommended to repack within 24 hours into the moisture barrier bag and vacuum sealed prior to storage for future use.

### Precautions and Remedy

To minimize moisture absorption, connectors are supplied in sealed moisture barrier bags with desiccant pouches. It is recommended that the connectors remain sealed in moisture barrier bags until they are ready to be consumed, following the above storage guideline. However, in the event the connectors are removed from the moisture barrier bag and have been exposed to conditions beyond the storage guideline, it is recommended that the connectors to be baked to remove moisture. Exposed connectors may be baked at 125 °C for 3 to 5 hours and thereafter, they should be good for reflow soldering.

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

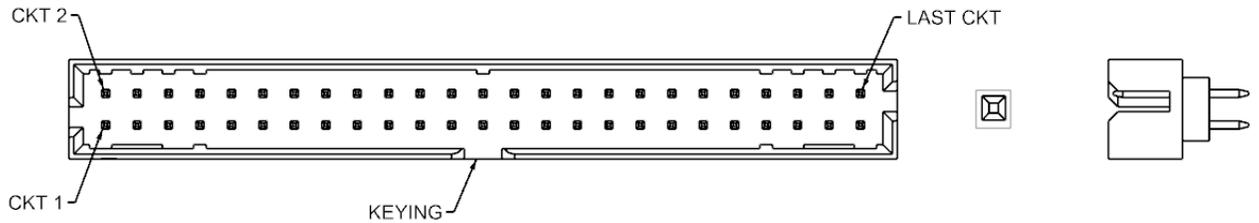
[TABLE OF CONTENTS](#)



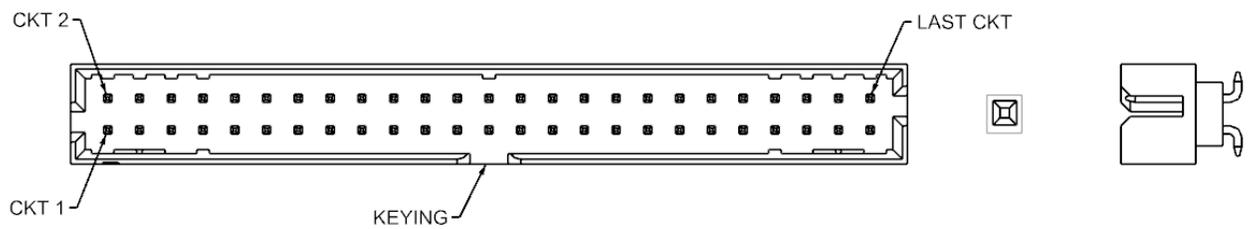
REVISION: <b>B</b>	ECM INFORMATION: EC No: <b>630301</b> DATE: <b>2020/01/10</b>	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>13 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						

## 11.0 POLARIZATION AND KEYING OPTIONS

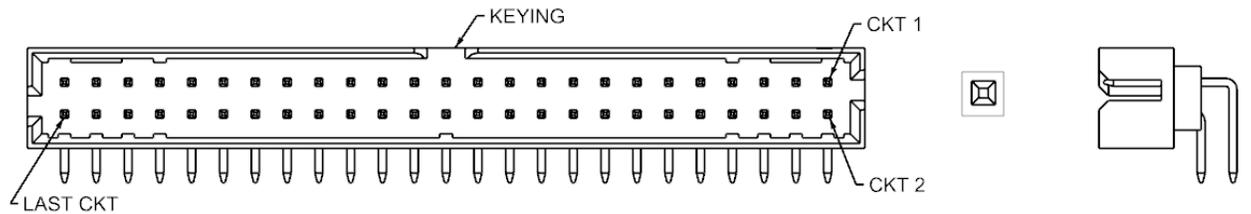
### 11.1 VERTICAL HEADER (Series: [87831](#))



### 11.2 SMT HEADER (Series: [87832](#))



### 11.3 R / A HEADER (Series: [87833](#))



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

[TABLE OF CONTENTS](#)



REVISION: <b>B</b>	ECM INFORMATION: EC No: 630301 DATE: 2020/01/10	TITLE: <b>PRODUCT SPECIFICATION 2MM WIRE-TO-BOARD CONNECTOR SYSTEM</b>				SHEET No. <b>14 of 14</b>
DOCUMENT NUMBER: <b>PS-87831-027</b>	DOC TYPE: <b>PS</b>	DOC PART: <b>001</b>	CREATED / REVISED BY: <b>ABABUPS</b>	CHECKED BY: <b>MRAMAKRISHNA</b>	APPROVED BY: <b>MRAMAKRISHNA</b>	
TEMPLATE FILENAME: 1703070003 REV A						