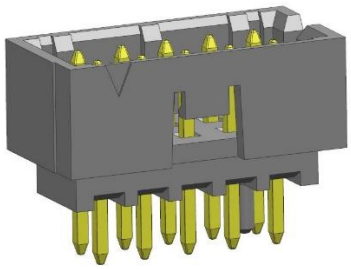
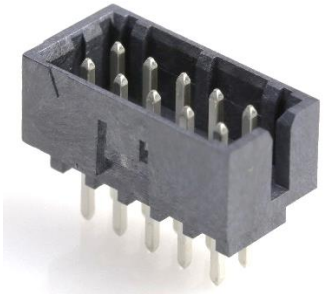
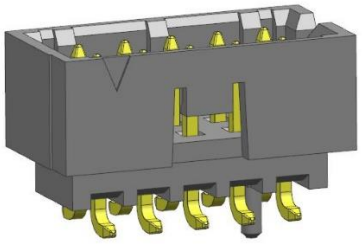
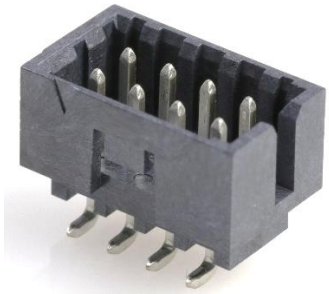
molex **PRODUCT SPECIFICATION**

MILLIGRID

Wire to Board

CONNECTOR SYSTEM

Vertical Header, TH with PEG	Vertical Header, TH without PEG
	
Series: 151117	Series: 151117

Vertical Header, SMT with PEG	Vertical Header, SMT without PEG
	
Series: 151118	Series: 151118

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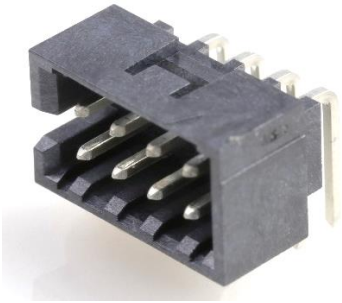
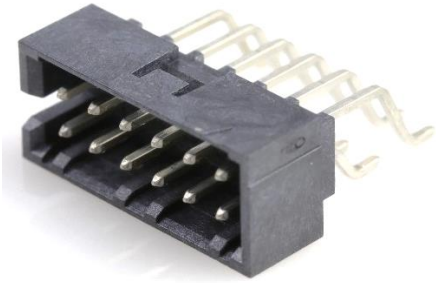
REVISION:	ECM INFORMATION:	TITLE:	SHEET No.
B	EC No: 630301 DATE: 2020/01/10	MILLIGRID 2MM DUAL ROW SHROUDED HEADERS	1 of 16

DOCUMENT NUMBER:	DOC TYPE:	DOC PART:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-151117-0001	PS	001	ABABUPS	MRAMAKRISHNA	MRAMAKRISHNA

RA Header, TH w/o Peg	RA Header, SMT w/o Peg
	
Series: 151119	Series: 151120

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1.0 SCOPE

This Product 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, TH	151117
Vertical Header, SMT	151118
RA Header, TH	151119
RA Header, SMT	151120

These series mate with Molex :
- Milli-Grid 2 mm Grid Wire to Board Connector,
  Crimp Receptacle Housing, 51110 series and Crimp Terminal, 50394 series.
- Receptacle : 78787, 78788, 79107, 79109 and 151192 series

2.2 DIMENSIONS, MATERIALS, PLATINGS

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

2.3 ENVIRONMENTAL CONFORMANCE

To fine product compliance information:
a. Go to 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: 1696372 (LR19980-182)

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.

CSA (50ckt Fully loaded) NON-current interruption
2 Amps @ 125 V

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

Dual Row MilliGrid Shrouded Header Connectors Test Summary TS
Dual Row MilliGrid Shrouded Header Connectors Application Specification 503940002-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 addition, in event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

Reference Product Specifications

PS-51110-001	Milli-Grid 2 mm Grid Wire to Board Connector
PS-78787-001	2 mm Dual Row Vertical Through Hole Receptacle
PS-78788-001	2 mm Dual Row Vertical SMT Receptacle Milli grid
PS-79107	2 mm Dual Row Vertical Receptacle
PS-151192-0001	2 mm Milli-Grid Receptacle WTB connector

3.2 INDUSTRY DOCUMENTS

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

4.0 ELECTRICAL PERFORMANCE RATINGS

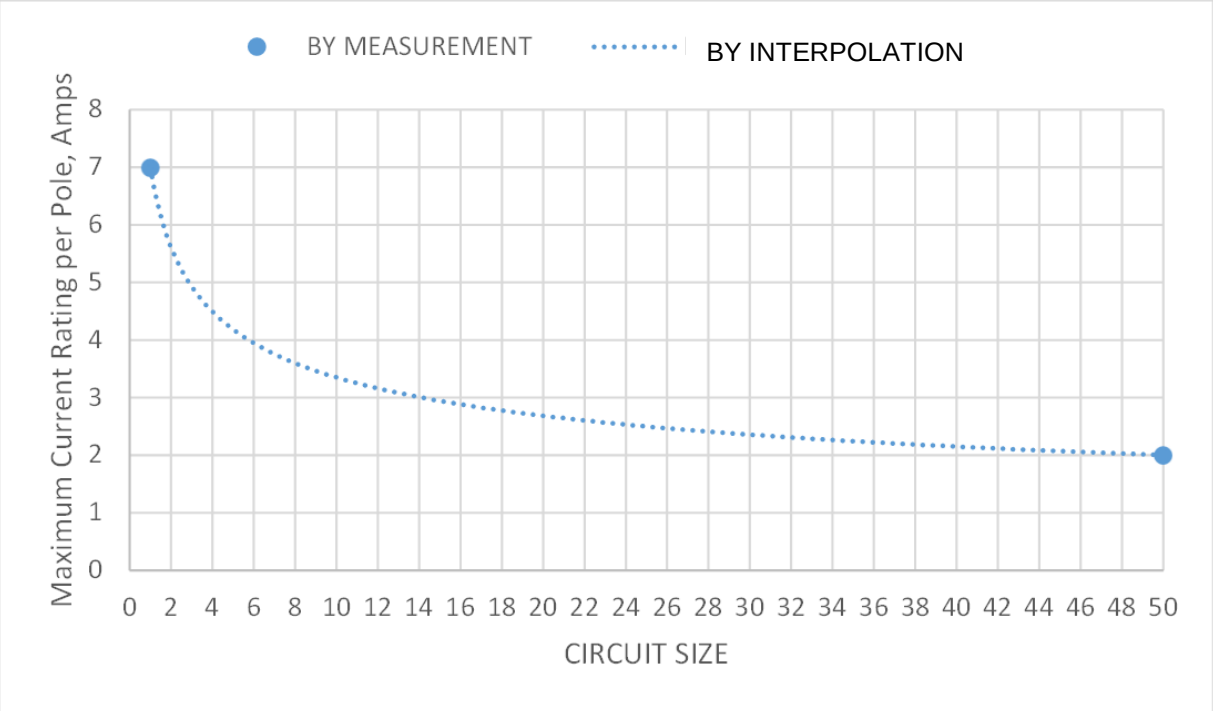
4.1 VOLTAGE

125 V Max.

4.2 CURRENT RATING (MAXIMUM AMPERES)

Refer to PS-151192-0001 for detailed Wire-to-Board Rating
Refer below for Board-to-Board Rating
7 A (single ckt contact powered up)
2 A (maximum 50 ckts contact powered up)

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 & stranding, tin coated or bare copper, wire length & crimp quality are other factors that influence current rating.



4.3 TEMPERATURE

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

4.4 GLOW WIRE SERIES

The following series are glow wire capable: 151117, 151118, 151119 and 151120. Representative samples were tested and found compatible with EN 60695-2-11-2001 / IEC 60695-2-11- 2000 Glow Wire Test Methods for End-Products. These were additionally investigated for compatibility with EN 60335-1 / IEC 60335-1 750C/2 sec with no flaming. VDE Test report available upon request.

5.0 QUALIFICATION

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

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Insulation Resistance	Subject a voltage of 500 VDC for 1 minute, measure the insulation resistance between adjacent terminals of the unmated connector assemblies. (EIA 364-21)	1000 Megohms [MINIMUM]
6.1.2	Dielectric Strength	Subject a voltage of 500 VAC for 1 minute between adjacent terminals of the unmated connector at sea level. (EIA 364-20 Method B)	No breakdown
6.1.3	Temperature Rise	In Mated Condition, measure the temperature rise of contact when the maximum DC rated current is passed. Receptacle: Test using Molex 78788 receptacle in Sn plating. (EIA-364-70 Method 1)	30 °C maximum temperature rise above ambient.

6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Pin/ Terminal Retention Force (in Housing)	Apply axial pull out force on terminal in the housing at a rate of 25.4 mm per minute.	Retention Force: 8.5 N Min per pin. (Before and after heat reflow)

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Solderability	a) Through Hole : Steam Aging : 8 hrs ± 15 mins Solder Time: 5 ± 0.5 secs. Solder Temperature: 260 ± 5 °C Flux type : ROL0 flux QF2036L (Lead free) (JDS-STD-002) b) SMT: Solder paste is deposited on a ceramic plate via stencil. The connectors are placed on the solder paste print. The substrate is processed through a forced hot convection oven. Inspect the connector after removal from ceramic plate. (JDS-STD-002)	95% minimum solder coverage.
6.3.2	Thermal Shock	In unmated condition. Subject connector to 10 cycles between -55 °C to +105 °C. (EIA 364-32D Method A, condition VII)	No cracks No loose pin
6.3.3	Cyclic Temperature & Humidity	In unmated condition. Without conditioning, initial measurements, cold shock and vibration. Subject connector to temperature -25 ± 3 °C at 80% ± 3% RH and 65 °C ± 3 °C 50% ± 3% RH. Ramp times should be 0.5 hr and dwell times should be 1.0 hr. Dwell times start when temperature and humidity stabilized within specified levels. Perform 24 such cycles. (EIA 364-31 Method III)	Insulation Resistance 1000 Megohms Minimum [Initial & after test] Dielectric Withstanding Voltage No breakdown
6.3.4	Resistance to IR reflow heat (SMT)	Connector with cap: -1X reflow with cap -2X reflow without cap Connector without cap: -3X reflow Pass Connector through IR machine reference to the following reflow profile: Refer section 8.2	-No damage in appearance of the connector. -No cracks -No loose pin

7.0 TEST SEQUENCE GROUPS

Test Group → / Test or Examination ↓	A	B	C	D	E
Examination of the connector(s)	1	1	1		1
Insulation Resistance	2, 6				
Dielectric Withstanding Voltage	3, 7				
Cyclic Temperature and Humidity	5				
Thermal Shock	4				
Resistance to Soldering Heat			2		
Terminal Retention Force		2	3		
Solderability				1a, 1b	
Temperature Rise Test					2

Note : a) Test as per J-STD-002D for through hole version
b) Test as per J-STD-002D for SMT version

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.

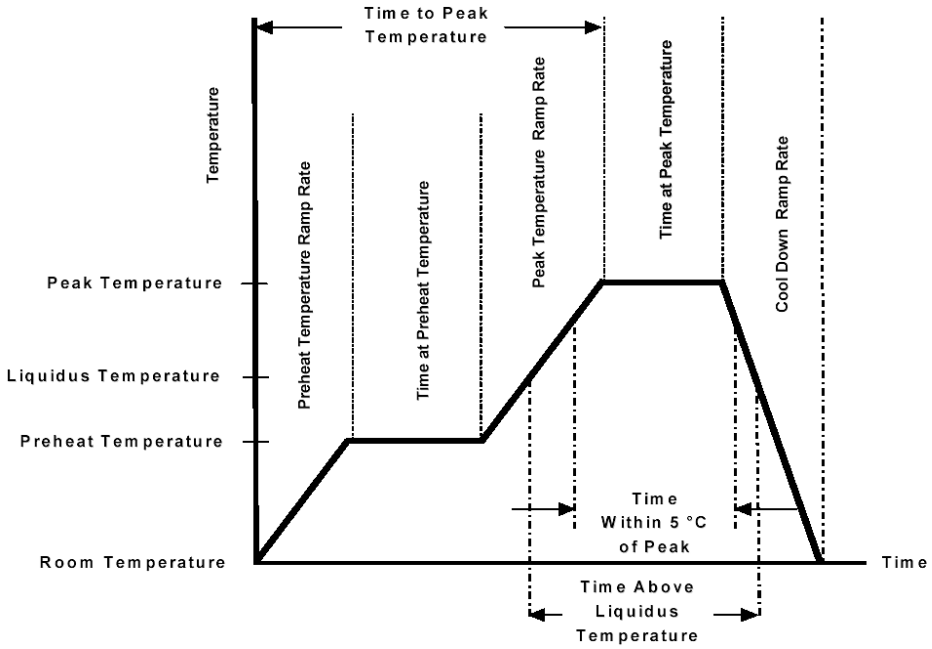
8.1 SOLDER PROCESS TEMPERATURE

Wave Solder Temperature: 245 °C Max. for Through Hole Soldering

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)



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

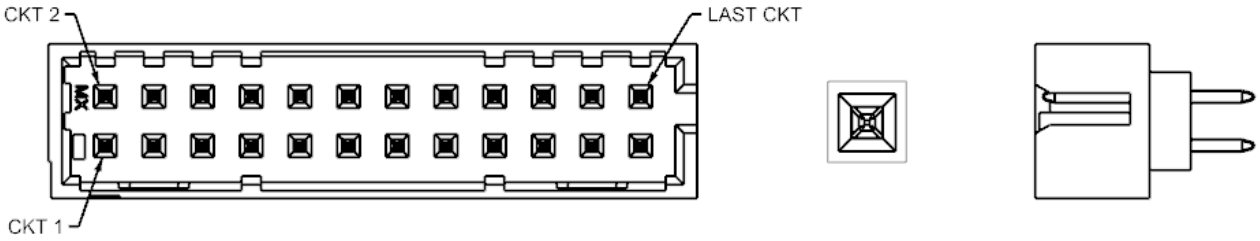
There is no influence in the product performance though discoloration might be seen in the soldering tail after the reflow.

9.0 PACKAGING

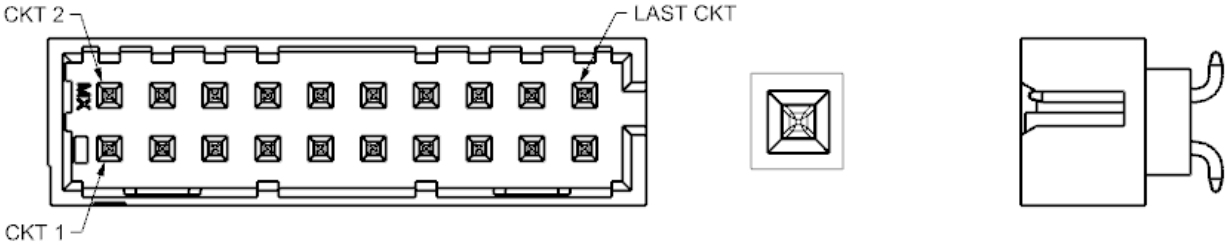
Parts shall be packaging to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item.

10.0 POLARIZATION AND KEYING OPTIONS

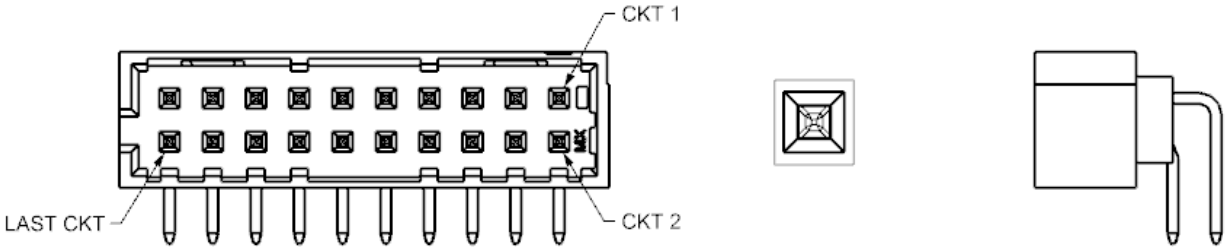
10.1 VERTICAL HEADER, TH (Series: 151117)



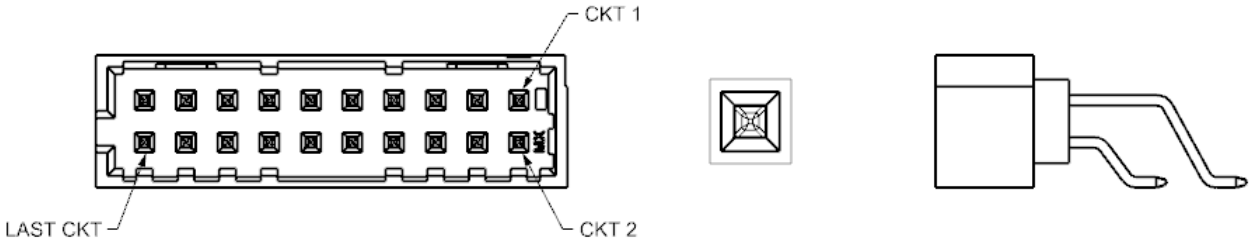
10.2 VERTICAL HEADER, SMT (Series: 151118)



10.3 RA HEADER, TH (Series: 151119)



10.4 RA HEADER, SMT (Series: 151120)



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