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Jameco Part Number 1301067

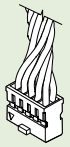
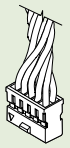
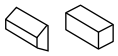
Milli-Grid™ 2.00mm (.079") Pitch Interconnection System

Wire-to-Board System

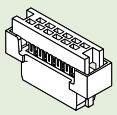
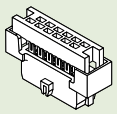
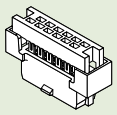
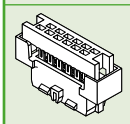
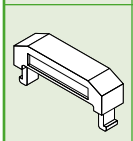
Early Entry System Terminals

	Order No.	Packaging	Plating
	50394-8053	Reel	Gold Flash
	50394-8300	Bag	Gold Flash
	50394-8051	Reel	15µ" min. Select Gold
	50394-8100	Bag	15µ" min. Select Gold
	50394-8052	Reel	30µ" min. Select Gold
	50394-8200	Bag	30µ" min. Select Gold

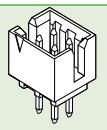
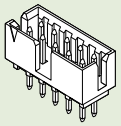
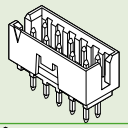
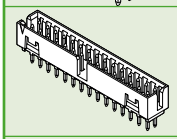
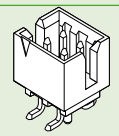
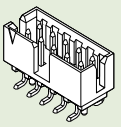
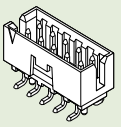
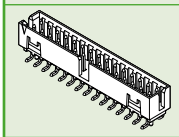
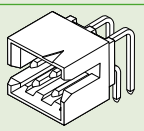
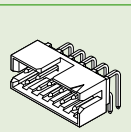
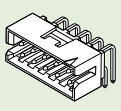
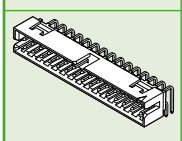
Crimp Housings

	Order No.	Circuits	Features
	51110-XX50	4 to 34	Plain
	51110-XX51	8 to 12	Center Polarization Key 
	51110-XX60	4 to 12	Center Polarization Ramp 
	51110-XX51	14 to 34	Locking Ramp and Polarization Key 

IDT Housings and Strain Relief

	87568-XX61	10, 12, 14, 16, 20, 22, 24, 26, 30, 34, 40, 44 and 50	Plain Front 15µ" Gold
	87568-XX62		Plain Front 30µ" Gold
	87568-XX41	14, 16, 20, 22, 24, 26, 30, 34, 40, 44 and 50	Center Polarization Ramp 30µ" Gold
	87568-XX42		Center Polarization Ramp 15µ" Gold
	87568-XX72	10 and 12	Center Locking Ramp 15µ" Gold
	87568-XX71		Center Locking Ramp 30µ" Gold
	87568-XX91	14, 16, 20, 22, 24, 26, 30, 34, 40, 44 and 50	Locking Ramp and Polarization Key 15µ" Gold
	87568-XX92		Locking Ramp and Polarization Key 30µ" Gold
	87569-10XX	10, 12, 14, 16, 20, 22, 24, 26, 30, 34, 40, 44 and 50	Strain Relief

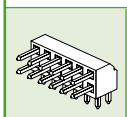
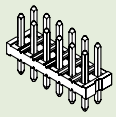
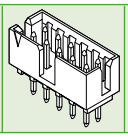
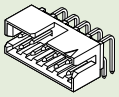
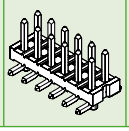
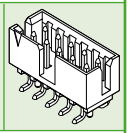
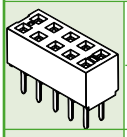
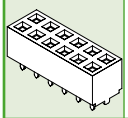
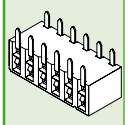
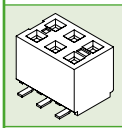
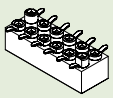
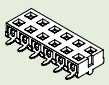
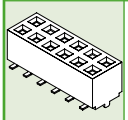
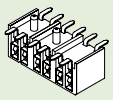
Shrouded Headers

Through Hole	Order No.	Circuits	Features
	87331-XX20	4 to 6	Plain 15µ" Gold
	87331-XX21		Plain 30µ" Gold
	87331-XX20	8 to 12	Center Polarization Slot 15µ" Gold
	87331-XX21		Center Polarization Slot 30µ" Gold
	87331-XX41	4 to 12	Center Locking Window 15µ" Gold
	87331-XX42		Center Locking Window 30µ" Gold
	87331-XX20	14 to 50	Center Polarization Slot and Locking Window 15µ" Gold
	87331-XX21		Center Polarization Slot and Locking Window 30µ" Gold
SMT			
	87332-XX20	4 to 6	Plain 15µ" Gold
	87332-XX21		Plain 30µ" Gold
	87332-XX20	8 to 12	Center Polarization Slot 15µ" Gold
	87332-XX21		Center Polarization Slot 30µ" Gold
	87332-XX10	4 to 12	Center Locking Window 15µ" Gold
	87332-XX11		Center Locking Window 30µ" Gold
	87332-XX20	14 to 50	Center Polarization Slot and Locking Window 15µ" Gold
	87332-XX21		Center Polarization Slot and Locking Window 30µ" Gold
Right Angle			
	87333-XX20	4 to 6	Plain 15µ" Gold
	87333-XX21		Plain 30µ" Gold
	87333-XX20	8 to 12	Center Polarization Slot 15µ" Gold
	87333-XX21		Center Polarization Slot 30µ" Gold
	87333-XX31	4 to 12	Center Locking Window 15µ" Gold
	87333-XX32		Center Locking Window 30µ" Gold
	87333-XX20	14 to 50	Center Polarization Slot and Locking Window 15µ" Gold
	87333-XX21		Center Polarization Slot and Locking Window 30µ" Gold

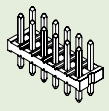
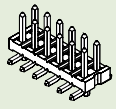
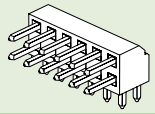
*Center Polarization Key mates with center polarization slot on headers.
**Center Locking Ramp mates with center polarization slot on headers and center locking window on headers.

Milli-Grid™ 2.00mm (.079") Pitch Interconnection System

Board-to-Board System

						Through Hole				SMT	
											
						Series / Description					
						87049 Right Angle	87089 Vertical	87331 Vertical	87333 Right Angle	87267 Vertical	87332 Vertical
	Series	Description	Contact Point	Overall Height	Circuits	Overall Mating Heights					
Through Hole											
	79107	Top Entry	1.50mm (.059")	4.44mm (.175)	4 to 50	8.44mm (.332")	5.94mm (.234")	6.94mm (.273")	6.94mm (.273")	7.14mm (.281")	8.14mm (.320")
	79108	FFC/FPC Top Entry									
	87380	FPC/PCB Top Entry	0.90mm (.035")	4.00mm (.157")	6 to 50	8.00mm (.314")	5.50mm (.216")	6.50mm (.256")	6.50mm (.265")	6.70mm (.264")	7.70mm (.303")
	87264	Side Entry	1.50mm (.059")	4.00 by 5.00mm (.157 by .197")	8 to 50	9.00mm (.354")	6.50mm (.256")			7.70mm (.303")	
SMT											
	79109	Top/Bottom Entry	1.50mm (.059")	4.65mm (.183")	4 to 50	8.65mm (.341")	6.15mm (.242")	7.15mm (.281")	7.15mm (.281")	7.35mm (.289")	8.35mm (.329")
	87263	Bottom Entry	1.30mm (.051")	2.80mm (.110")	4 to 44	8.38mm (.330")	5.88mm (.231")			7.08mm (.279")	
	87340	Top Entry	0.90mm (.035")	2.15mm (.085")	4 to 20	6.15mm (.242")	3.65mm (.144")			4.85mm (.191")	
	87381	Top Entry	1.70mm (.067")	4.50mm (.177")	6 to 50	8.50mm (.335")	6.00mm (.236")	7.00mm (.276")	7.00mm (.276")	7.20mm (.283")	8.20mm (.323")
	87368	Side Entry	1.50mm (.059")	4.90 by 5.00mm (.193 by .197")	8 t0 50	9.00mm (.354")	6.50mm (.256")			7.70mm (.303")	

Unshrouded Headers

	Order No.	Circuits	Features	Mating Length	Tail Length
	87089-XX16	4 to 50	15µ" Gold	4.00mm (.158")	2.60mm (.102")
	87089-XX17		30µ" Gold		
	87267-XX50	8 to 50	With Pegs 15µ" Gold	3.80mm (.150")	1.20mm (.047")
	87267-XX51		With Pegs 30µ" Gold		
	87267-XX14	4 to 50	Without Pegs 15µ" Gold		
	87267-XX15		Without Pegs 30µ" Gold		
	87049-XX16	4 to 50	15µ" Gold	4.00mm (.158")	2.60mm (.102")
	87049-XX17		30µ" Gold		

Milli-Grid™ 2.00mm (.079") Pitch Interconnection System

Features and Benefits

Milli-Grid Interconnection System

- Offers a 40% savings in PCB real estate as compared to the standard 2.54mm (.100") pitch connector system

Milli-Grid, IDT

- Early entry system terminals for long pin wipe
- Optional polarization key and friction locking ramps provide strong retention force to the header
- Strain relief adds greater retention to cable
- Designed for 1.00mm (.039") pitch 28 AWG stranded flat ribbon cable
- Replaces old 87259 Series

Reference Information

UL File No.: E29179
CSA File No.: LR19980-182
Mates with: 0.50mm (.020") square pin headers
Use with: IDT—87569 Strain relief
24500 Stranded flat ribbon cable

Electrical

Voltage: 125V AC
Current: 1.0 to 2.0A
Contact Resistance: 15 to 25mΩ max.
Dielectric Withstanding Voltage: 500V AC (rms)
Insulation Resistance: 1000 MΩ min.

Mechanical

Mating Pin Length: 2.50 to 4.20mm (.098 to .165")

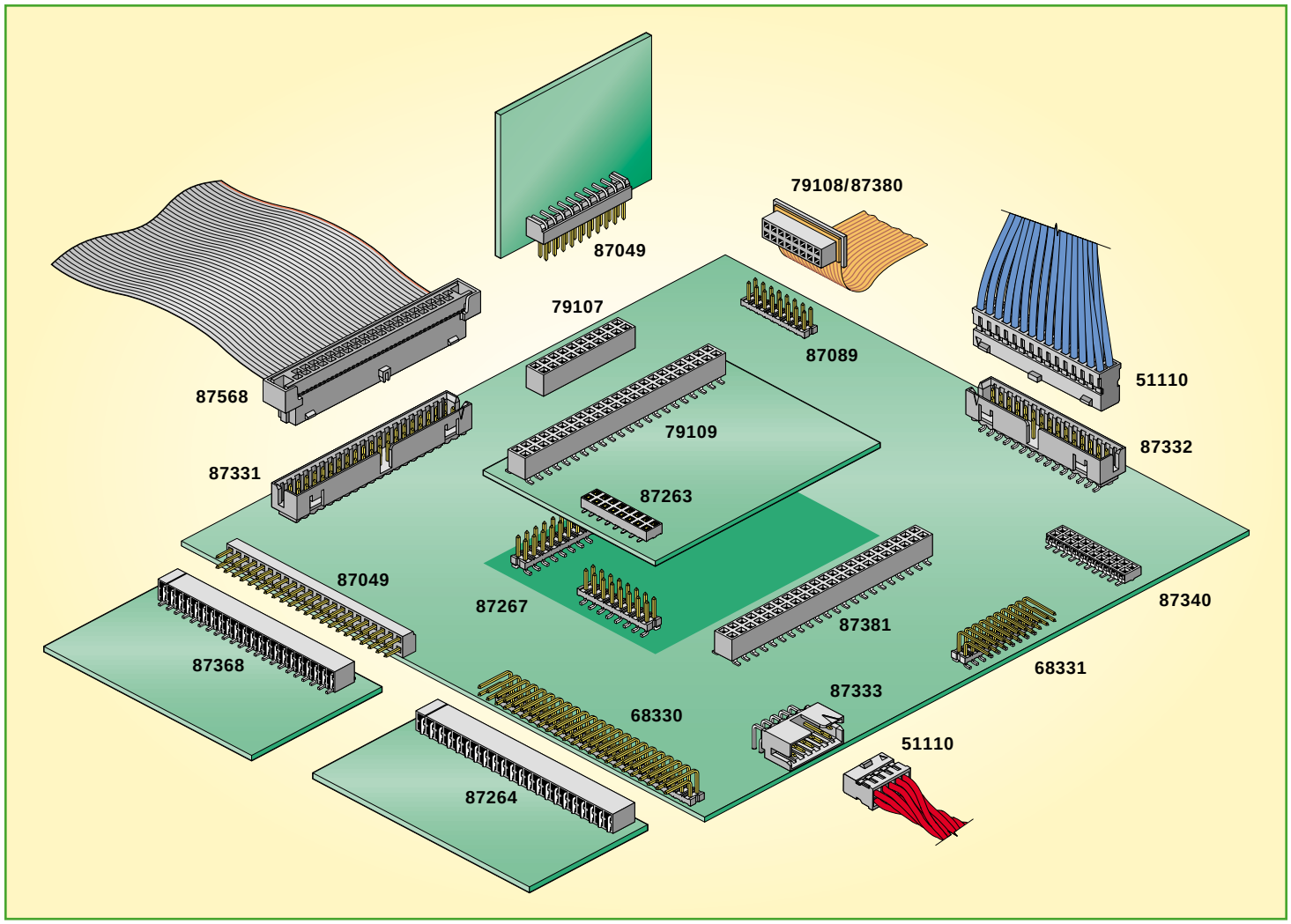
Physical

Housing: Black high-temperature, UL 94V-0
Contacts: Phosphor Bronze
Operating Temperature: -55 to +105°C
Soldering Temperature: +245±5°C for 5±0.5 seconds
Infra-red Heat: +260±5°C for 12±2 seconds

APPLICATION TOOLING

Crimp Tooling			IDT Tooling		
Description	**Order No.**	**Wire Gauge**	**Description**	**Order No.**	**Wire Gauge**
Hand Tool	11-01-0204	24, 26, 28 and 30 AWG	Hand Tool Module	62100-2000	1.00mm (.039") 28 AWG Flat Ribbon Cable
FineAdjust Applicator	83820-7500		Pistol Grip	63600-0478	
FineAdjust Spare Tool Kit	68320-7570		Ribbon Cable Power Adapter	11-31-3337	
TM-42 Press and Die	11-04-0771		Manual Press Tool Kit Only	62100-3200	
TM-42 Terminator Die	11-40-2278		Standard Manual Press	11-31-6356	
TM-42 Spare Tool Kit	11-40-3279				
Extraction Tool	11-26-0100				

Milli-Grid™ 2.00mm (.079") Pitch Interconnection System



APPLICATION EXAMPLES

Office Machines
- Printers
- Fax Machines
- Scanners
- Copiers

Computers / Peripherals
- Disk Drives
- Storage
- Servers
- Modems
- Motherboards
- Monitors

Measuring / Analyzing Equipment
- Security Systems / Alarms
- Medical Monitoring
- Lab Equipment

Entertainment
- Set-top Boxes
- Car Radios
- Video / DVD Products

Other Applications
- Vending Machines
- Gaming Machines
- Pagers
- Exercise Equipment

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Order No. USA-131

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1.0 SCOPE

This Product Specification covers the 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

The Milli-Grid 2mm Grid Wire to Board Connector comprises of the Crimp Receptacle Housing (51110) and the Crimp Terminal (50394).

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See Sales Drawing and the necessary referenced Documents and Specifications.

4.0 RATINGS AND APPLICABLE WIRE

Item	Standard		
Rated Voltage (max.)	125V		AC (rms) / DC
Rated Current (max.) and applicable wires.	AWG #24 AWG #26 AWG #28 AWG #30	2.0A 1.5A 1.0A 0.5A	Crimp Terminal (AWG#24-AWG#30) Insulation O.D. 1.4mm dia. max.
Ambient Temp. Range	-40 deg.c -- +105 deg.c *1		

*1: Including terminal temperature rise.

5.0 PERFORMANCE

5.1 Electrical Performance

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.1.1	Contact Resistance	Mate connectors, measure by dry circuit, 20 mV MAX., 10 mA (based upon JIS C5402 5.4).	**40** mohm MAX.
5.1.2	Insulation Resistance	Mate connectors, apply 500V (rms) AC for 1 minute between adjacent terminal or ground (based upon JIS C5402 5.1/ MIL-STD-202 Method 301).	**1000** Mohms Min.
5.1.3	Dielectric Strength	Mate connectors, apply 500V (rms) AC for 1 minute between adjacent terminal or ground (based upon JIS C5402 5.1/ MIL-STD-202 Method 301).	No breakdown
5.1.4	Contact Resistance on Crimped Portion	Crimp the applicable wire onto the terminal, measure by dry circuit, 20mV MAX., 10mA.	**5** mohm MAX.

5.2 Mechanical Performance

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.2.1	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.
5.2.2	Crimp Terminal Insertion Force	Insertion the crimped terminal into the housing.	**9.8** N MAX.
5.2.3	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 MAX.
5.2.4	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)

5.3 Environment Performance

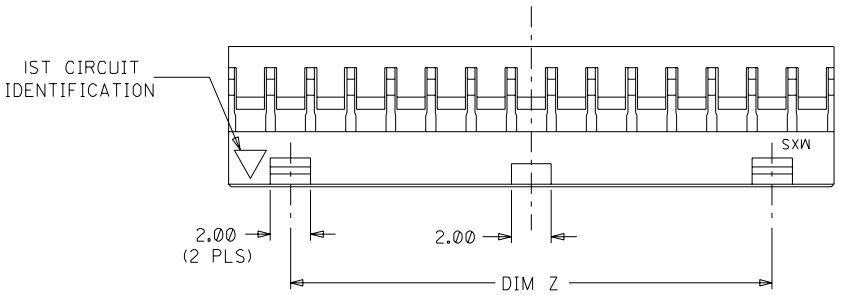
ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.3.1	Repeated Mate / Unmate	When Mate / unmate up to 50 cycles repeatedly at a rate of 10 cycles / min.	Contact Resistance: **60** mohms Max.
5.3.2	Temperature Rise	Mate connectors and measure the temperature rise of contact when the maximum AC rated current is passed (UL 498)	Temperature: **30** deg. c Max.
5.3.3	Vibration	Mate connectors and subject to the following vibration conditions, for a period of two hours in each 3 mutually perpendicular axis, passing DC 1mA 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 change Contact resistance: **60** mohm Max. Discontinuity: **0.1** μs MAX.
5.3.4	Shock	Mate connectors and subject to the following shock conditions, 3 shocks shall be applied along 3 mutually perpendicular axis, passing DC 1mA 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: **0.1** μs Max.
5.3.5	Heat Resistance	Mate connector and expose to 85+/-2 deg. 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.
5.3.6	Cold Resistance	Mate connector and expose to –55+/-3 deg. 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.

5.3 Environment Performance (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
5.3.7	Humidity	Mate connector and expose to 60+/-2 deg. 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 **4.1.3** Insulation Resistance: **100** Mohm Min.
5.3.8	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 deg C 30 min. b) +105+/-2 deg C 30 min. (Transit time shall be within 5 minutes; JIS C0025)	Appearance: No damage. Contact Resistance: **60** mohm Max.
5.3.9	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 deg. C (based on JIS C5028 / MIL-STD-202 Method 101D Condition B).	Appearance: No damage. Contact Resistance: **60** mohm Max.
5.3.10	S02 Gas	Mate connectors and expose to 50+/-5 ppm S02 gas, ambient temperature 40+/-2 deg. C for 24 hours.	Appearance: No damage. Contact Resistance: **60** mohm Max.

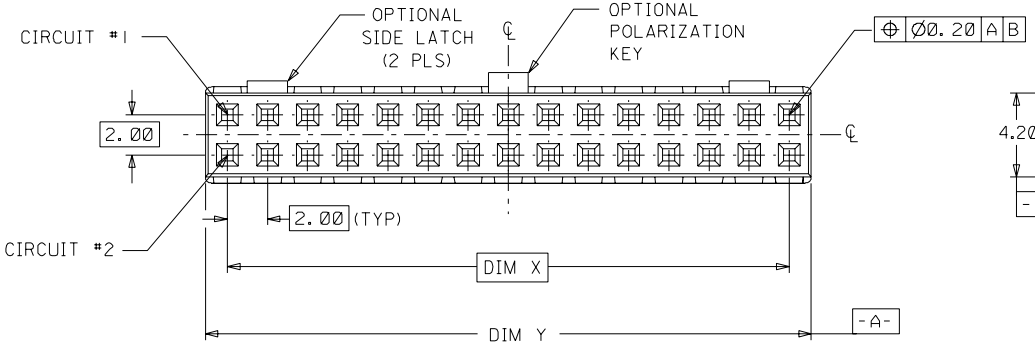
PART NO.	CKT SIZE	DIM X	DIM Y	DIM Z
51110-045*	4	2.00	4.20	NA
51110-065*	6	4.00	6.20	NA
51110-085*	8	6.00	8.20	NA
51110-105*	10	8.00	10.20	NA
51110-125*	12	10.00	12.20	NA
51110-145*	14	12.00	14.20	8.00
51110-165*	16	14.00	16.20	10.00
51110-185*	18	16.00	18.20	12.00
51110-205*	20	18.00	20.20	14.00
51110-225*	22	20.00	22.20	16.00
51110-245*	24	22.00	24.20	18.00
51110-265*	26	24.00	26.20	20.00
51110-285*	28	26.00	28.20	22.00
51110-305*	30	28.00	30.20	24.00
51110-325*	32	30.00	32.20	26.00

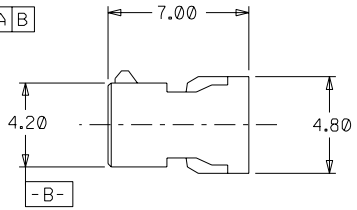
PLS REFER TO PART 51110-**60 FOR CENTER LATCH OPTION.

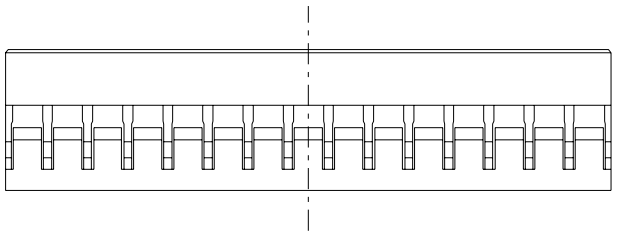


NOTES:

1. MATERIAL: GLASS-FILLED POLYESTER UL RATED 94V-0
   COLOR: BLACK.
2. PART TO BE USED WITH CRIMP TERMINAL PART NUMBER 50394-8***.
3. APPLICABLE WIRE RANGE : AWG #24 - #30.
4. WIRE INSULATION RANGE : DIAMETER 1.40MM MAXIMUM.
5. 30 CKT SHOWN FOR ILLUSTRATION ONLY.







PART NUMBER LEGEND:

51110- * * 5 *

CIRCUIT SIZE

0 - WITHOUT CENTER POLARIZATION KEY AND SIDE LATCH.

1 - WITH CENTER POLARIZATION KEY AND SIDE LATCH.
(14 TO 32 CIRCUITS ONLY)
WITH CENTER POLAR. KEY ONLY.
(8 TO 12 CIRCUITS ONLY)

EC NO. S2001-0365
DRWN: G.R. XIE 010613
CH'K:
APPR:
DESCRIPTION
B3
REV

QUALITY SYMBOLS
MAJOR ▼ = 0
CRITICAL ▽ = 0

GENERAL TOLERANCES: (UNLESS SPECIFIED)

	mm	INCH
4 PLACES	±0.--	±.
3 PLACES	±0.--	±.
2 PLACES	±0.20	±.
1 PLACE	±0.--	±.
ANGULAR: ± 3 °		

SCALE NTS
DESIGN UNITS [X] mm [ ] INCH
THIRD ANGLE PROJECTION
DIMENSIONS: [ ] mm/INCH [ ] INCH/mm [X] mm ONLY
SHT REV
REVISE ON CAD ONLY

DRAWN BY & DATE S.K.TOH 931026
CHECKED BY & DATE EDPOH 931026
APPROVED BY & DATE JM CHAN 931026
CAD FILENAME

TITLE: 2 MM GRID, WIRE-TO-BOARD CONNECTOR, CRIMP RECEPTACLE HOUSING

MOLEX INCORPORATED

MATERIAL NO. SEE NOTES
DRAWING NO. SD-51110-**5*
SHEET NO. 1 OF 1

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SIZE A3

WBORD_A.BOR REV A
97/05/14 LEVEL 4