

MULTICAT™ MID POWER

Wire-To-Wire AND Wire-To-Board

CONNECTOR SYSTEM

Female Crimp Contact	Male Crimp Contact
	
Series: 202936	Series: 202935

Receptacle Housing	Plug Housing
	
Series: 205926	Series: 205925

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REVISION:	ECM INFORMATION: EC No: 321661 DATE: 31 / 7 / 2019	TITLE: PRODUCT SPECIFICATION FOR MULTICAT™ MID POWER CONNECTOR SYSTEM (WtW/WtB)				SHEET No. 1 of 19
DOCUMENT NUMBER: 2059250000-PS	DOC TYPE: PS	DOC PART: 000	CREATED / REVISED BY: Manohar R	CHECKED BY: Manohar R	APPROVED BY: Ishwar G	

Vertical Header	Backshell
	
Series: 205927	Series: 205929

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	CHECKED BY: Manohar R	APPROVED BY: Ishwar G	

1.0 SCOPE

This Product Specification covers the 3.60 mm (.141 inch) pitch (in both X and Y direction) connector series terminated with 20 to 28 AWG wire using crimp technology with gold plating.

This Product Specification also covers the 3.60 mm (.141 inch) pitch (in both X and Y direction) printed circuit board (PCB) connector series with gold plating.

2.0 PRODUCT DESCRIPTION

2.1 DESCRIPTION, SERIES NUMBER, AND LINKS

DESCRIPTION	SERIES NUMBER
MULTICAT MID POWER FEMALE CRIMP CONTACT 20-28 AWG	202936
MULTICAT MID POWER MALE CRIMP CONTACT 20-28 AWG	202935
MULTICAT MID POWER RECEPTACLE HOUSING 2X4 KEY A BLACK	205926
MULTICAT MID POWER RECEPTACLE HOUSING 2X4 KEY B NATURAL	
MULTICAT MID POWER RECEPTACLE HOUSING 2X10 KEY A BLACK	
MULTICAT MID POWER RECEPTACLE HOUSING 2X10 KEY B NATURAL	
MULTICAT MID POWER RECEPTACLE HOUSING WITH CPA 2X4 KEY A BLACK	
MULTICAT MID POWER RECEPTACLE HOUSING WITH CPA 2X4 KEY B NATURAL	
MULTICAT MID POWER RECEPTACLE HOUSING WITH CPA 2X10 KEY A BLACK	
MULTICAT MID POWER RECEPTACLE HOUSING WITH CPA 2X10 KEY B NATURAL	
MULTICAT MID POWER VERTICAL HEADER 2X4 KEY A BLACK	
MULTICAT MID POWER VERTICAL HEADER 2X4 KEY B NATURAL	
MULTICAT MID POWER VERTICAL HEADER 2X10 KEY A BLACK	
MULTICAT MID POWER VERTICAL HEADER 2X10 KEY B NATURAL	
MULTICAT MID POWER BACKSHELL 2X4 BLACK 20-28 AWG	205929
MULTICAT MID POWER BACKSHELL 2X4 NATURAL 20-28 AWG	
MULTICAT MID POWER BACKSHELL 2X10 BLACK 20-28 AWG	
MULTICAT MID POWER BACKSHELL 2X10 NATURAL 20-28 AWG	
MULTICAT MID POWER PLUG HOUSING 2X4 KEY A BLACK	205925
MULTICAT MID POWER PLUG HOUSING 2X4 KEY B NATURAL	
MULTICAT MID POWER PLUG HOUSING 2X10 KEY A BLACK	
MULTICAT MID POWER PLUG HOUSING 2X10 KEY B NATURAL	



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2.2 DIMENSIONS, MATERIALS, PLATINGS

Refer Sales Drawings 2059250000-SD, 2059260000-SD, 2059271070-SD, 2059290000-SD, 2029350000-SD and 2029360000-SD.

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 / cUL File Number: E29179

3.0 APPLICABLE DOCUMENTS AND SPECIFICATION

3.1 MOLEX DOCUMENTS

- [MultiCat In-Line Power Connector System Test summary 2059250000-TS-000](#)
- [MultiCat In-Line Power Connector System Application summary 2059250000-AS-000](#)
- [Molex Quality Crimping Handbook Order No. 63800-0029](#)
- [Molex Solderability Specification SMES-152](#)
- [Molex Heat Resistance Specification AS-40000-5013](#)
- [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

EIA-364-1000



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4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

500 Volts AC/DC

4.2 APPLICABLE WIRES

AWG	Nominal Insulation Diameter
20	1.60 mm
22	1.40 mm
24	1.20 mm
26	1.10 mm
28	0.90 mm

4.3 CURRENT RATING (MAXIMUM AMPERES)

Note: Ratings shown represent *MAXIMUM* current carrying capacity of a fully loaded connector with all circuits powered using **UL10086** stranded wire. Ratings are based on a 30°C maximum temperature rise limit over ambient (see section 6.1.4 for specifications). Current is dependent on connector size, ambient temperature, printed circuit board characteristics and related factors. Actual current rating is application dependent and should be evaluated for each use.

Note: PCB trace design can greatly affect temperature rise results in Wire-to-Board applications.

	8 CIRCUIT		20 CIRCUIT	
	Wire-to-Wire	Wire-to-Board	Wire-to-Wire	Wire-to-Board
20 AWG	6.5 A	6.0A	6.0 A	4.5A
22 AWG	5.5 A [#]	5.0A [#]	5.0 A [#]	4.0A [#]
24 AWG	5.0 A	4.5A	4.5 A	3.0A
26 AWG	4.0 A [#]	4.0A [#]	3.5 A [#]	3.0A [#]
28 AWG	3.0 A	3.0A	2.5 A	2.5A

#Estimated

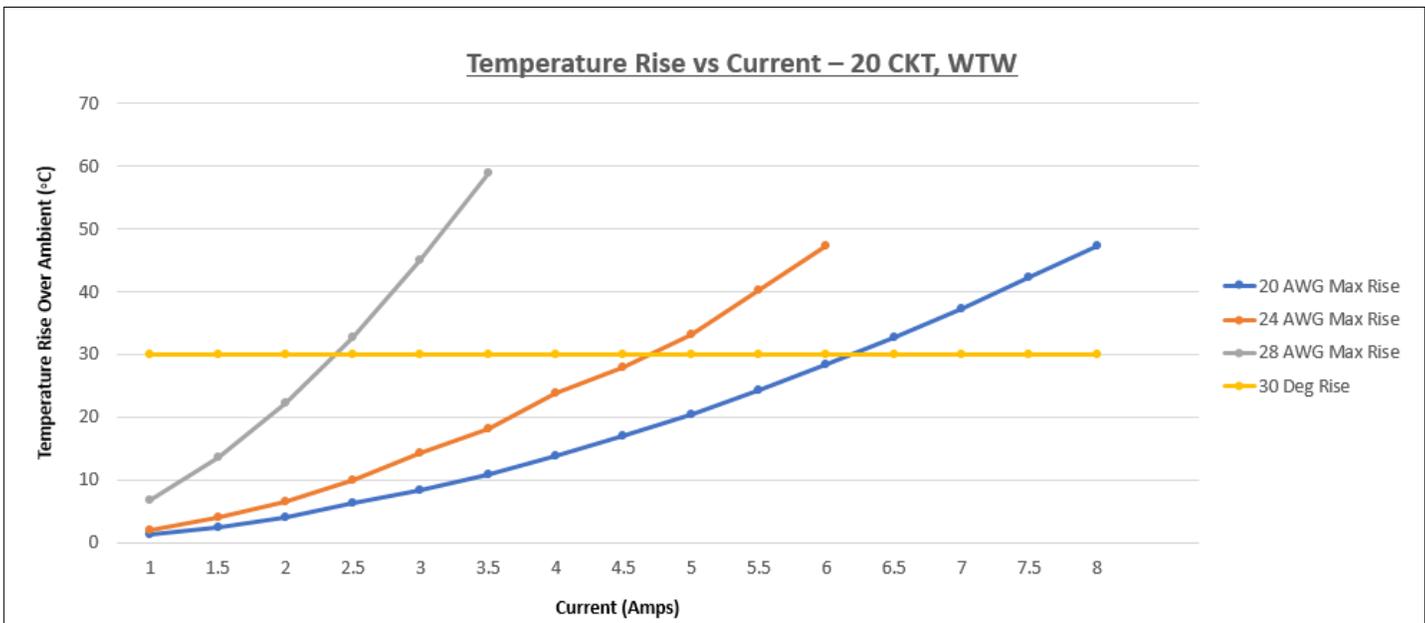
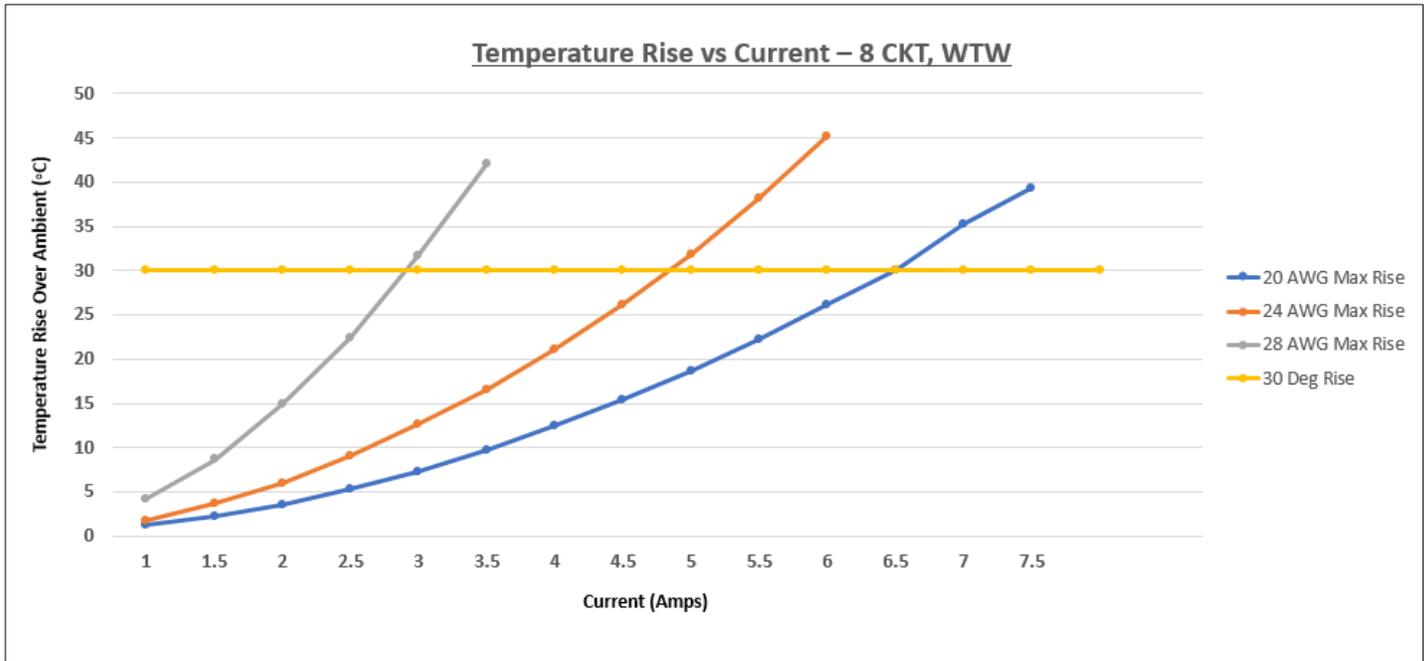


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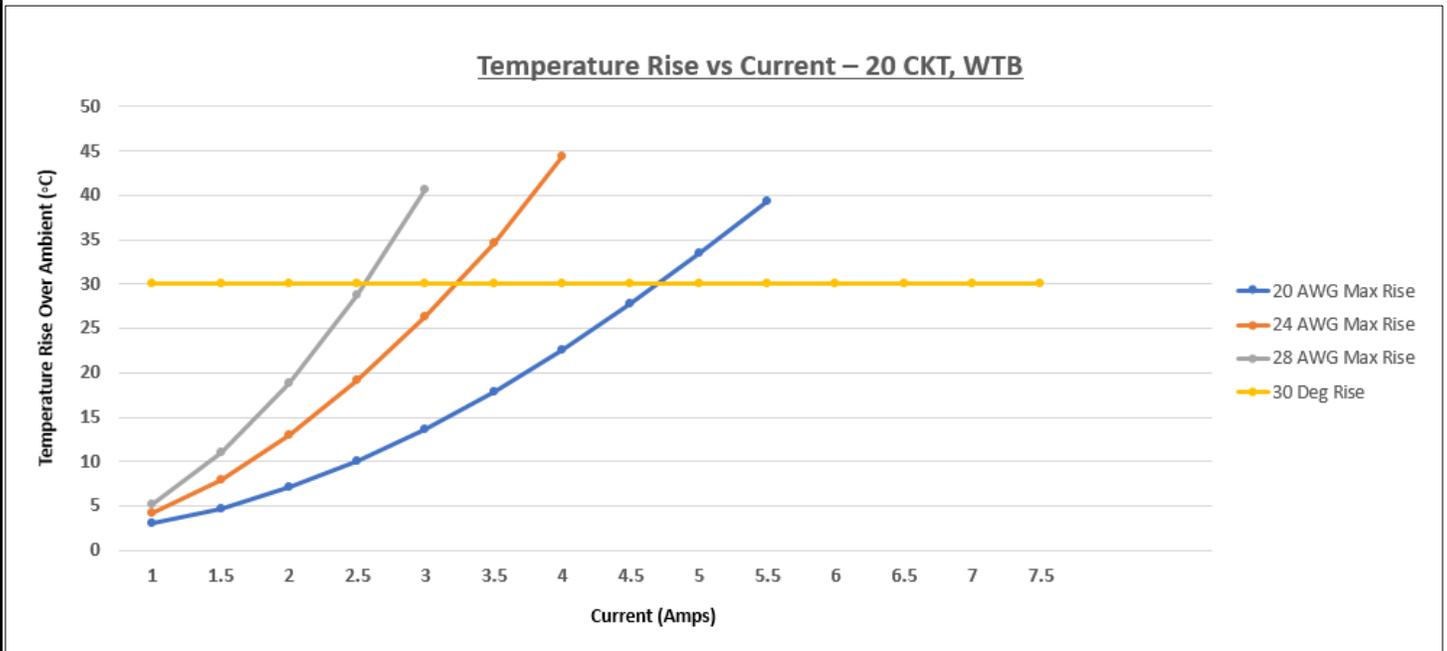
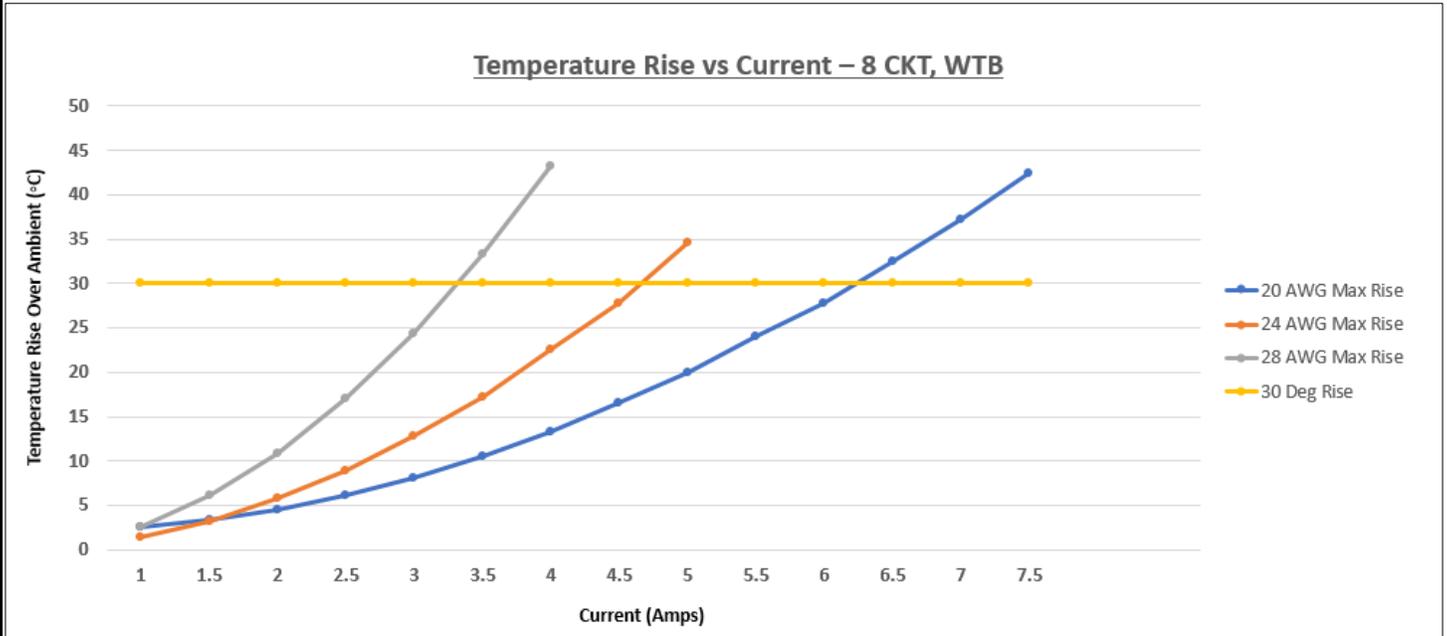
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4.4 TEMPERATURE

Operating Temperature Range: - 40°C to + 150°C

4.5 DURABILITY

Plating Type	Number of Cycles
Gold Plated	500

As tested in accordance with EIA-364-1000 test method (see sec 6.2.11 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.



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	CHECKED BY: Manohar R	APPROVED BY: Ishwar G	

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.1.1	Low Level Contact Resistance (LLCR)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100 mA. EIA-364-23B	10 mΩ MAXIMUM [initial]
6.1.2	Insulation Resistance	Mate connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground. EIA-364-21D	1000 MΩ MINIMUM
6.1.3	Dielectric Withstanding Voltage (DWV)	Mate connectors: apply a voltage of 2000 VAC for 1 minute between adjacent terminals and between terminals to ground. EIA-364-20E, Method B	No breakdown; current leakage < 5 mA
6.1.4	Temperature Rise versus current (Step Profiling)	Mate connectors: measure the temperature rise at the rated current. EIA-364-70B, Method 2	Temperature rise: +30 °C MAXIMUM [over ambient]
6.1.5	Temperature Rise versus current (18-day Stability)	Mate connectors: measure the temperature rise at the rated current, 2 measurements per day, test method 3 (30 Min on & 15 Min off) per EIA-364-55 Test condition A	Temperature rise: +30 °C MAXIMUM [over ambient]



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6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.1	Connector Mate and Unmate Forces [Initial cycle] <i>Latch disabled</i>	Mate and unmate connector (male to female) at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. EIA-364-13E, Method A	3.4 N Max (0.76 lbf) MAXIMUM mate force per CKT and 0.2 N (0.044 lbf) MINIMUM unmate force per CKT
6.2.2	Crimp Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1 ± ¼ inch). EIA-364-05B	35.0 N (7.86 lbf) MAXIMUM insertion force
6.2.3	Crimp Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. EIA-364-29C, Method C	50 N (11.24 lbf) MINIMUM retention force
			after High Temperature exposure (see item 6.3.24) 50 N (11.24 lbf) MINIMUM retention force
6.2.4	Terminal Push Force From Vertical header)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm (1 ± ¼ inch) per minute. EIA-364-29C, Method C	40 N (8.99 lbf) MINIMUM retention force
6.2.5	Housing Locking Mechanism Strength (Initial)	Exert an axial force at a rate of 13 mm per minute (0.5 inch per minute) to separate the housing halves. EIA-364-98	150 N (33.72 lbf) MINIMUM retention force
6.2.6	Housing Locking Mechanism Strength (after 500 Cycles)	Exert an axial force at a rate of 13 mm per minute (0.5 inch per minute) to separate the housing halves. EIA-364-98	150 N (33.72 lbf) MINIMUM retention force
6.2.7	Connector Audible Feedback	The connector lock must provide audible feedback during connector mating. USCAR-2, Rev 6, Paragraph 5.4.7	7 dB over Ambient
6.2.8	Connector Position Assurance (CPA) Insertion Force	The force to insert the CPA from the preload (as shipped) position to the final position at a rate of 50 ± 6 mm (2 ± ¼ inch) per minute.	22 N (4.94 lbf) MAXIMUM insertion force

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		CHECKED BY: Manohar R	APPROVED BY: Ishwar G

6.2 MECHANICAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.2.9	Connector Position Assurance (CPA) Extraction Force	The force to extract the CPA from the final position to the preload position at a rate of 50 ± 6 mm ($2 \pm \frac{1}{4}$ inch) per minute.	30 N (6.74 lbf) Maximum Extraction Force	
6.2.10	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch). EIA-364-08B	AWG	MINIMUM pullout force
			20	80 N (17.98 lbf)
			22	60 N (13.48 lbf)
			24	35 N (7.86 lbf)
			26	15 N (3.37 lbf)
28	11 N (2.47 lbf)			
6.2.11	Durability EIA-364-1000 Test Group 7 (See section 7.0)	Mate and unmate connectors up to 500 cycles at a rate of 300 cycles per hour. Actuate housing latch mechanism for each cycle. EIA-364-09	10 mΩ MAXIMUM (change from initial) & Visual: No Damage	



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6.2 MECHANICAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.12	Vibration (Random) & Shock (Mechanical) EIA-364-1000 Test Group 3 (see section 7.0)	Mate connectors and vibrate per EIA 364-28, test condition VII. (Acceleration 3.1 g) Mate connectors and shock at 50 g's with ½ sine wave (11 milliseconds) shocks in the ±x, ±y, ±z axes (18 shocks total). EIA-364-27C, Test Condition A	10mΩ MAXIMUM (change from initial for 20 & 22 AWG) & Discontinuity < 1 microsecond
			20mΩ MAXIMUM (change from initial for 24, 26 & 28 AWG) & Discontinuity < 1 microsecond
			10mΩ MAXIMUM (change from Initial for 24, 26 & 28 AWG) & Discontinuity < 1 microsecond [With Backshell]

MECHANICAL PERFORMANCE - BackShell			
ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.2.13	Backshell Latch retention (Initial)	The force to separate the backshell halves at 25.4 mm/min	150 N (33.72 lbf) MINIMUM retention force
6.2.14	Backshell Latch Insertion	Mate the backshell halves at 25.4 mm/min	20 N (4.49 lbf) MAXIMUM insertion force
6.2.15	Backshell Latch Cycling	Engage and disengage the latches 9 times. Record backshell latch insertion & retention forces for 10 th cycle.	20 N (4.49 lbf) MAXIMUM insertion force
			100 N (22.48 lbf) MINIMUM retention force
6.2.16	Wire Pullout Force (Up/Side Direction)	Apply a force on the wire at 25.4 mm/min	70 N (15.74 lbf) MAXIMUM Pullout force



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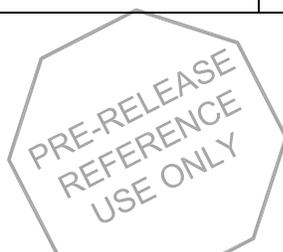
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	CHECKED BY: Manohar R	APPROVED BY: Ishwar G	

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
6.3.1	Thermal Shock	Mate connectors; expose to 5 cycles of: <u>Temperature °C</u> <u>Duration (Minutes)</u> -40 + 0/-3 30 +25 ± 10 5 MAXIMUM +150 + 3/-0 30 +25 ± 10 5 MAXIMUM EIA-364-32F, Method A, Test condition IV	10mΩ MAXIMUM (change from initial) & Visual: No Damage
	Cyclic Temperature & Humidity EIA-364-1000 Test Group 2A & 2B (See section 7.0)	Mate connectors: cycle per EIA-364-31: 24 cycles at temperature 25 ± 3 °C at 80 ± 5% relative humidity and 65 ± 3 °C at 50 ± 5% relative humidity; dwell time of 1.0 hour; ramp time of 0.5 hours.	10mΩ MAXIMUM (change from initial) & Visual: No Damage
6.3.2	Corrosive Atmosphere: Mixed Flow Gas (MFG) EIA-364-1000 Test Group 4 (See section 7.0)	Mate connectors: Test per EIA-364-65, Class 2A	10mΩ MAXIMUM (change from initial) & Visual: No Damage
	Note: Highly recommended to use 1.3Mirometer Au Plating thickness for the MFG application		
6.3.3	High Temperature Exposure As per USCAR- 5.6.3 Refer to table 5.9.6 (See section 7.0)	Mate connectors per durability and expose to 1008 hours at 150 ± 2 °C USCAR-2, Class T4	10mΩ MAXIMUM (change from initial) Visual: No Damage
6.3.4	Solderability	Per JEDEC	Solder coverage: 95% MINIMUM
6.3.5	Solder Resistance- Reflow Soldering	Refer to Section 8.0 for soldering profile	Visual: No Damage to insulator material



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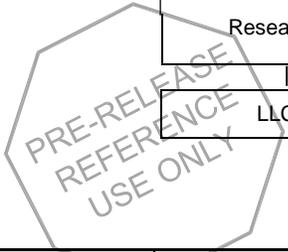
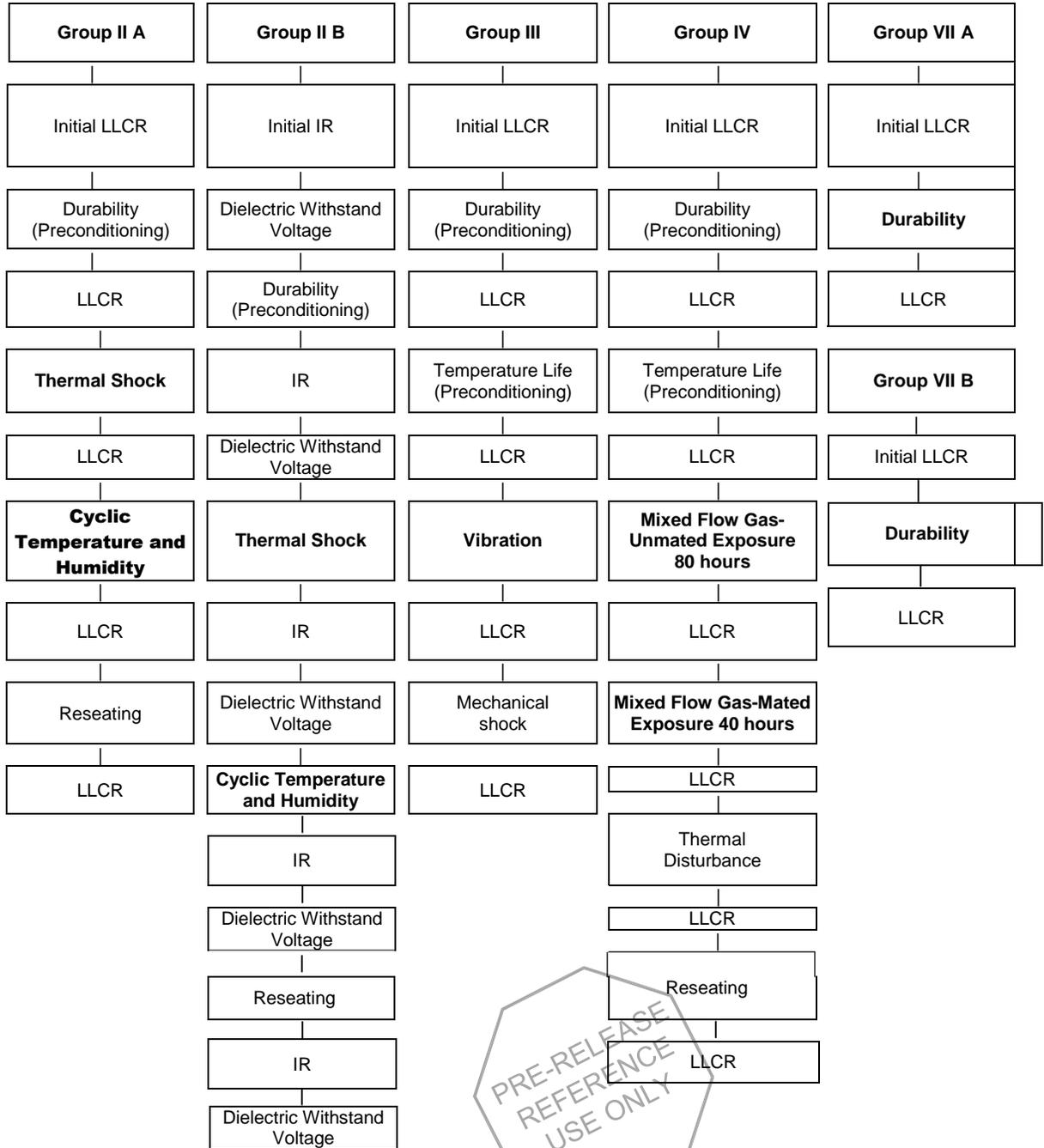
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7.0 TEST SEQUENCE GROUPS

Reliability Test Sequences per EIA-364-1000

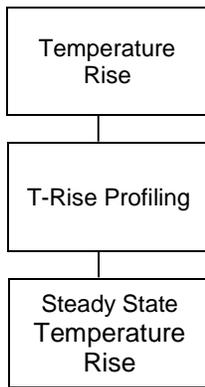
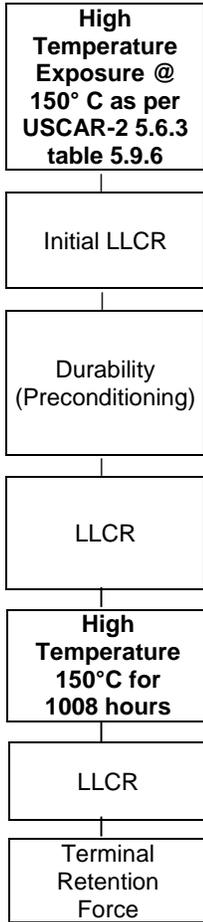


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- ### Individual Tests
- Connector Mate / Un-mate Force
 - Crimp Terminal Insertion force
 - Crimp Terminal Retention force
 - Terminal Push Force
 - Wire Pullout force (Axial)
 - Housing Locking mechanism Strength
 - Connector Audible Feedback
 - Connector Position Assurance (CPA) Insertion force
 - Connector Position Assurance (CPA) Extraction force
 - Backshell Latch Retention
 - Backshell Latch Insertion
 - Backshell Latch Cycling
 - Wire Pullout force (Up/Side direction)



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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.

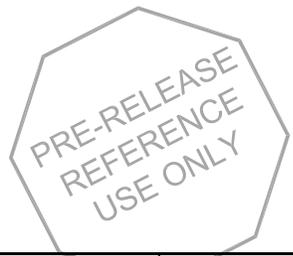
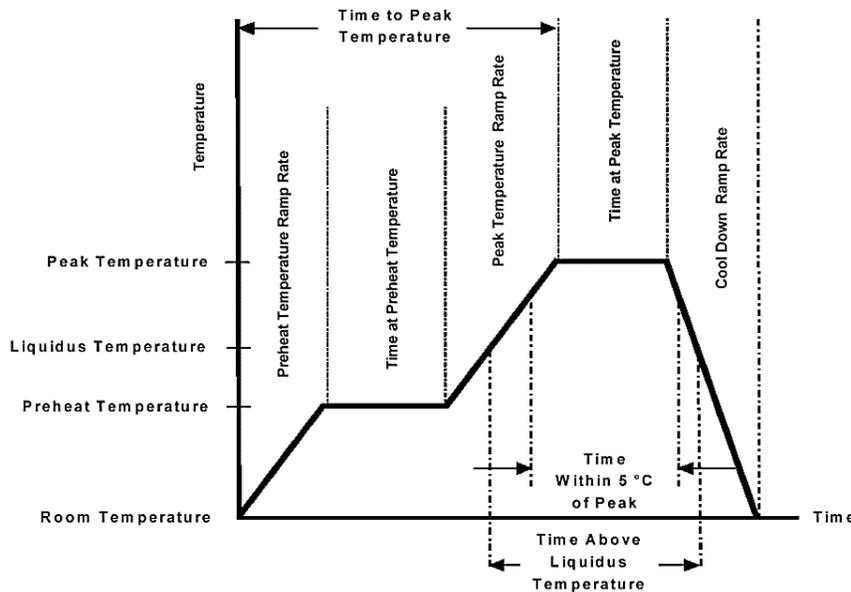
8.1 SOLDER PROCESS TEMPERATURES *

Reflow Solder Temperature: 260°C Maximum

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

8.2 REFLOW SOLDERING PROFILE *

[Molex Connector Heat Resistance Specification AS-40000-5013 \(Click Here\)](#)



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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 +/-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 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.



[MultiCat Power Connectors Web Page](#)

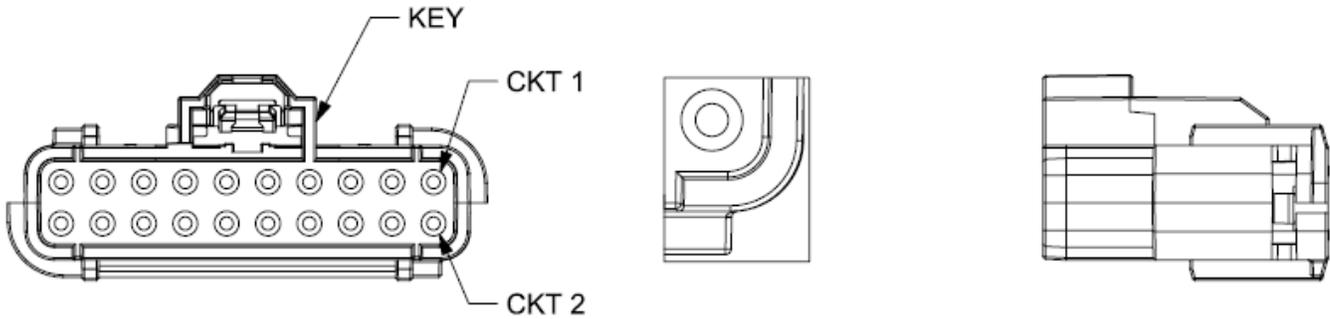
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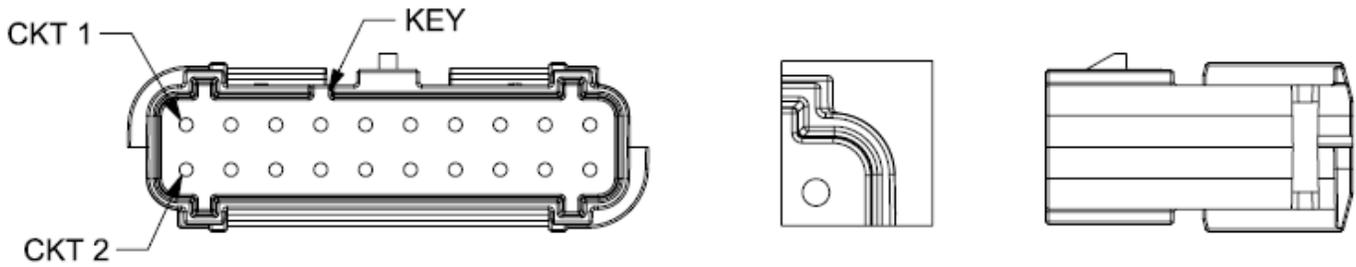
REVISION:	ECM INFORMATION: EC No: 321661 DATE: 31 / 7 / 2019	TITLE: PRODUCT SPECIFICATION FOR MULTICAT™ MID POWER CONNECTOR SYSTEM (WtW/WtB)	SHEET No. 18 of 19
DOCUMENT NUMBER: 2059250000-PS	DOC TYPE: PS	DOC PART: 000	CREATED / REVISED BY: Manohar R
	CHECKED BY: Manohar R	APPROVED BY: Ishwar G	

10.0 POLARIZATION AND KEYING OPTIONS

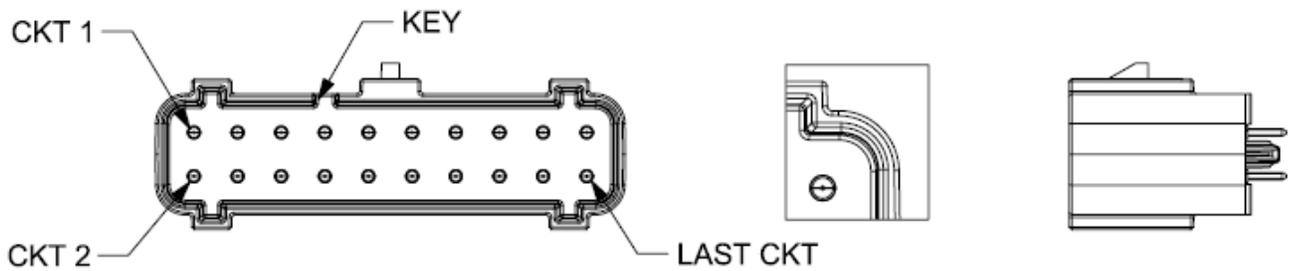
10.1 Receptacle Housing with CPA, w/o CPA(Series: [205926](#))



10.2 Plug Housing (Series: [205925](#))



10.3 Vertical Header (Series: [205927](#))



PRE-RELEASE
REFERENCE
USE ONLY

[MultiCat Power Connectors Web Page](#)

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DOCUMENT NUMBER: 2059250000-PS	DOC TYPE: PS	DOC PART: 000	CREATED / REVISED BY: Manohar R	CHECKED BY: Manohar R	APPROVED BY: Ishwar G	