



PRODUCT SPECIFICATION

CKM PN: 3001 SERIES

3001 SERIES CONNECTOR

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REVISION HISTORY:

REV	REVISION DESCRIPTION	DATE	CREATED/REVISED
A	NEW RELEASE	2013/11/01	Devon Che
B	UPGRADED VERSION	2022/05/06	Rock
C	UPGRADED ITEM 2.2.2	2023/08/01	Rock

REVISION: C	ECR/ECN INFORMATION: EC No.: EC-23080154 DATE: 2023/08/01	TITLE: WIRE TO BOARD 3001 SERIES	SHEET No. 1 of 8
DOCUMENT NUMBER: PS-3001-001		CREATED/REVISED Rock	CHECKED BY Sun.Lee
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1.0 SCOPE

This specification defines the detailed requirements for the WIRE TO BOARD 3001 SERIES.

2.0 REQUIREMENTS

2.1 Materials

2.1.1 Insulator

High temperature thermoplastic, UL94V-0 rated.
Color-Option.

2.1.2 Pin Contacts

Copper Alloy.
Matte tin or gold plating, under nickel plating over all.

2.2 Ratings:

2.2.1 Voltage Rating: 250 Vrms maximum.

2.2.2 Current and Applicable Wires

AWG	Max. Outside Insulation Diameter
20	1.85 mm
22	1.85 mm
24	1.85 mm
26	1.27 mm
28	1.27 mm
30	1.27 mm

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CURRENT DERATING REFERENCE INFORMATION								
AWG	2 circuit		3-6 circuit		7-12 circuit		13-24 circuit	
	W-B	W-W	W-B	W-W	W-B	W-W	W-B	W-W
	Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps
20	7	6.5	*5.5	5	*5	4.5	4.5	*4
22	*6	5.5	*4.5	*4	*4	*3.5	*3.5	*3
24	5.5	5	*4.5	4	*3.5	3	*3	*2
26	4.5	4	*4	3	*3.5	2.5	2.5	*1.5
28	*4	3	*3	*2	*3	*2	*2	*1
30	3.5	3	*3	2	*2.5	2	1	*1

- 1) Values are for REFERENCE ONLY.
- 2) Current de-ratings are based on not exceeding 30°C temperature rise.
- 3) Testing conducted using tinned stranded copper wire and tin-plated terminals.
- 4) PCB trace design can greatly affect temperature rise results in wire-to-board applications.
- 5) Data is for all circuits powered.
- 6) *indicates interpolated information.
- 7) W-W: wire-to-wire W-B:wire-to-board.

**Current rating is application dependent and may be affected by the wire rating such as listed in UL-60950-1. Each application should be evaluated by the end user for compliance to specific safety agency requirements. The ratings listed in the chart above are per CKM test method based on a 30°C maximum temperature rise over ambient temperature and are provided as a guideline. Testing conducted with tinned copper conductor stranded wire. 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.

2.3 Operating Temperature: -40°C to +105°C

3.0 PACKAGING AND SHIPPING

Per CKM packing specification.

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4.0 PERFORMANCE REQUIREMENTS AND TEST DESCRIPTIONS

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in paragraph 5.0 . Unless otherwise specified, all tests are performed at ambient environmental conditions.

5.0 TEST REQUIREMENTS AND PROCEDURES SUMMARY

TEST ITEM		REQUIREMENT	PROCEDURE
1	Examination of Product	Meets requirements of product drawing. No physical damage.	Visual inspection
ELECTRICAL REQUIREMENT			
2	Low Level Contact Resistance	Initial - 10 milliohms maximum per mated pair Final - $\Delta R = 20$ milliohms maximum per mated pair	Per EIA-364-23 Subject mated contacts assembled in housing to closed circuit current of 100mA maximum at open circuit at 20 mV maximum.
3	Contact Resistance on Crimped Portion	5 milliohms MAXIMUM	Terminate the applicable wire to the terminal and measure wire using a voltage of 20 mV and a current of 100mA.
4	Insulation Resistance	1,000Megohms minimum	Per EIA-364-21 Unmate & unmount connectors: apply a voltage of 500 VDC between adjacent terminals and between terminals to ground.
5	Dielectric withstanding Voltage	no breakdown Current leakage < 5mA	Per EIA-364-20 Unmate connectors: apply a voltage of two times the rated voltage plus 1000 volts VAC for 1 minute between adjacent terminals and between terminals to ground.
6	Temperature Rise (Via Current Cycling)	Temperature rise: +30°C MAXIMUM	Mate connector: measure the temperature rise at the rate current after: 1) 96 hours (steady state) 2) 240 hours (45 minutes ON and 15 minutes OFF per hour) 3) 96 hours (steady state)

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MECHANICAL REQUIREMENT

7	Insertion Force and Withdrawal Force	Insertion Force : 8.0 N maximum /per pin Withdrawal Force: 2.0 N minimum /per pin	Per EIA-364-13 Subject connector to mate and unmate to measure the mechanical forces required to engage and disengage at a rate of 25+/-6 mm per minute Record by using autograph.
8	Crimp Terminal Retention Force (in Housing)	24.5 N minimum.	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm per minute.
9	Crimp Terminal Insertion Force (into Housing)	14.7 N maximum.	Apply an axial insertion force on the terminal at a rate of 25+/-6 mm per minute.
10	Pin Retention Force (in Header)	13.7 N minimum pushout force.	Apply an axial extraction force to pin at a rate of 25+/-6mm per minute.
11	Wire Pullout Force (Axial) (Wire from Terminal)	minimum pullout force AWG#20 57.8 N AWG#22 35.6 N AWG#24 22.2 N AWG#26 13.3 N AWG#28 8.9 N AWG#30 6.6 N	Apply an axial pullout force on the wire at a rate of 25+/-6mm per minute.
12	Thumb Latch to Ramp Yield Strength	68.4 N minimum Yield Strength.	Full mate and then unmated the connector at a rate of 25+/-6mm per minute.
13	Durability	No evidence of damage The contact resistance: $\Delta R=20$ milliohms maximum (Final)	Per EIA-364-09 30 mating/ unmating cycles at a maximum rate of 10 cycles per minute.
14	Vibration (Random)	1) No discontinuities of 1 μ s or longer duration. 2) Contact resistance: $\Delta R=20$ milliohms maximum 3) No physical damage.	Mate connectors and vibrate per EIA 364-28, test condition VII, Letter D. Test Duration: 15minutes each axis.

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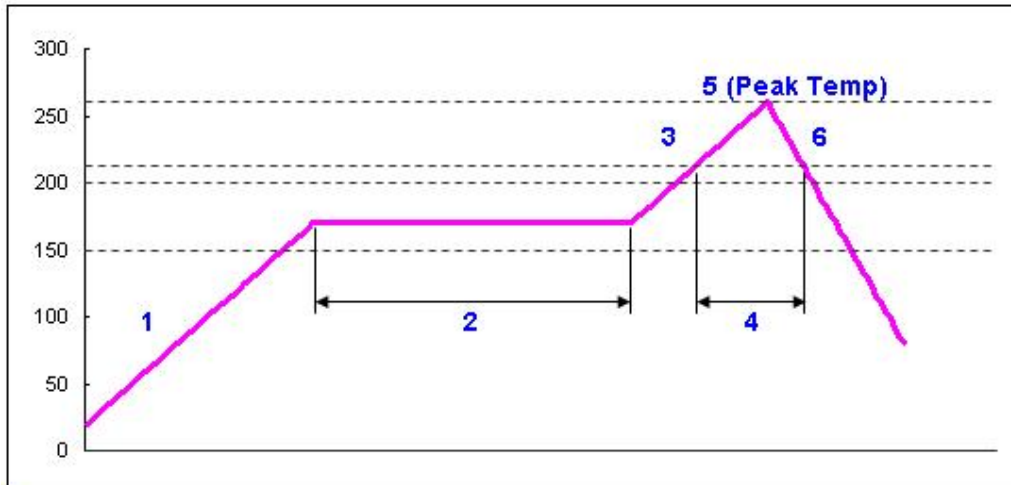
15	Shock (Mechanical)	1) No discontinuities of 1 μ s or longer duration. 2) Contact resistance: $\Delta R=20$ milliohms maximum 3) No physical damage.	Mate connectors and shock at 50 g's with $\frac{1}{2}$ sine wave (11 milliseconds) shocks in the $\pm X, \pm Y, \pm Z$ axes (18 shocks total). (Per EIA-364-27, Test Condition H)
ENVIRONMENTAL REQUIREMENTS			
16	Solderability	Continuous solder coating with a minimum 95% coverage.	Per EIA-364-52 Steam age 1hr. Solder time 5 ± 0.5 seconds. Solder Temperature: $245 \pm 5^{\circ}\text{C}$ Nonactivated flux.
17	Salt Spray	No evidence of damage. Contact resistance: $\Delta R=20$ milliohms maximum (Final)	Per EIA-364-26 test condition A Subject mated and unmated connectors should be tested according to the condition listed below: Temperature: $35 \pm 1.1^{\circ}\text{C}$ Humidity: 95~98% (R.H.) PH value: 6.5~7.2 Duration: 48 hours
18	Resistance to Soldering Heat	No evidence of damage. Verify components meet their specified electrical performance criteria and no physical damage has occurred.	Per EIA-364-56 Dip connector terminal tails in solder: Solder Duration: 10 ± 0.5 seconds; Solder temperature: $260 \pm 5^{\circ}\text{C}$
			(refer to FIGURE 1 IR reflow profile) IR reflow test condition: Peak temperature: $260+0 / -10^{\circ}\text{C}$ Preheating temperature: $150 - 200^{\circ}\text{C}$, 60 to 120 sec.
			Apply solder iron in solder tail Temperature: $350 \pm 10^{\circ}\text{C}$, 3~4 sec.
19	Thermal Aging	No evidence of damage. Contact resistance: $\Delta R=20$ milliohms maximum (Final)	Mate connectors: expose to: 240 hours at $105 \pm 2^{\circ}\text{C}$

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20	Humidity (Steady State)	1) $\Delta R=20$ milliohms maximum (Final) 2) Dielectric Withstanding Voltage: No Breakdown at 500 VAC 3) Insulation Resistance: 1000 Megohms Minimum.	Mate connectors: expose to a temperature of $40 \pm 2^\circ\text{C}$ with a relative humidity of 90-95% for 96 hours. Note: Remove surface moisture and air dry for 1 hour prior to measurements.
21	Cold Resistance	$\Delta R=20$ milliohms maximum (Final)	Mate connectors: Duration: 96 hours, Temperature: $-40 \pm 3^\circ\text{C}$

NOTE: Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the test sequence in paragraph 6.0.



1	Average ramp rate	3°C per second max.
2	Pre-heat temp.(minimum)	150°C
	Pre-heat temp.(maximum)	200°C
	Pre-heat time	60 to 120 seconds
3	Ramp to peak	3°C per second max.
4	Time over liquidus(217°C)	60 to 150 seconds
5	Peak temp.	260 +0/-10°C
	Time within 5°C of peak	10 seconds max.
6	Ramp- cool down	6°C per second max.
	Time 25°C to peak	8 minutes max.

FIGURE 1

RESISTANCE TO REFLOW SOLDERING HEAT

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6.0 RODUCT QUALIFICATION AND REQUALIFICATION TEST SEQUENCE

	A	B	C	D	E	F	G	H	I	J	K
Examination of Product	1,7	1,11	1,7	1,5	1,3	1	1	1	1	1	1,5
Low Level Contact Resistance	2,6	2,6, 10	2,4,6	2,4							2,4
Contact Resistance on Crimped Portion									2		
Insulation Resistance		3,8									
Dielectric Withstanding Voltage		4,9									
Temperature Rise				3							
Insertion Force and Withdrawal Force	3,5										
Crimp Terminal Retention Force (in Housing)								3			
Crimp Terminal Insertion Force (into Housing)								2			
Pin Retention Force (in Header)							3				
Wire Pullout Force (Axial) (Wire from Terminal)									3		
Thumb Latch to Ramp Yield Strength										2	
Durability	4										
Vibration (Random)			3								
Shock (Mechanical)			5								
Solderability					2						
Salt Spray						2					
Resistance to Soldering Heat							2				
Thermal Aging		5									
Humidity (Steady State)		7									
Cold Resistance											3
Sample Size per Test Group	5	5	5	5	5	5	5	5	5	5	5

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