



PRODUCT SPECIFICATION

CKM PN: 4203 SERIES

**WIRE TO BOARD / WIRE TO WIRE
4.2mm PITCH CONNECTOR**

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REVISION HISTORY:

REV	REVISION DESCRIPTION	DATE	CREATED/REVISED
A	NEW RELEASE	2013/12/19	GuoXiang Jiang
B	UPDATE	2015/01/01	GuoXiang Jiang
C	UPDATE	2018/06/08	GuoXiang Jiang
D	ADD INDEX / UPDATE	2018/09/07	Jimmy Wang
E	ADD Pin Retention Force	2020/09/15	GuoXiang Jiang

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DOCUMENT NUMBER: PS-4203 SERIES		CREATED/REVISED Guoxiang Jiang	CHECKED BY Jimmy Wang
		APPROVED BY Angus Chen	



1.0 SCOPE

This product specification covers performances requirements for the 4.20mm (.165 inch) centerline (pitch) printed circuit board (PCB) connector series with Tin or Gold plating, and The connector series terminated with 16 to 28 AWG wire using Crimp technology with Tin or Gold plating.

2.0 PRODUCT DESCRIPTION

2.1 Product name and series number(s)

Product Name	Type	Part No.
Housing (Single Row)	Wire to Board	CKM4203HW-XX-X-X
	Wire to Wire	CKM4203HFJ-XX-X-X
	Wire to Wire	CKM4203HFK-XX-X-X
Housing (Dual Row)	Wire to Board	CKM4203HM-XX-X-X
	Wire to Wire	CKM4203HFS-XX-X
	Wire to Wire	CKM4203HFDXX-X
Terminal	Wire to Board	CKM4203-TBX-X-X
	Wire to Wire	CKM4203-TAX-X-X
Wafer (Single Row)	Vertical	CKM4203-WVU-XX-X-X-X-X
	Vertical	CKM4203-WVY-XX-X-X-X-X
	Right Angle	CKM4203-WRD-XX-X-X-XX
Wafer (Dual Row)	Vertical	CKM4203-WVI-XX-X-X-X
	Vertical	CKM4203-WVD-XXXX-X-X-X-X
	Right Angle	CKM4203-WRC-XXXX-X-X-X-X
	Right Angle	CKM4203-WRP-XXXX-X-X-X-X

*Part No.: Can be CKM4203 Series or 4203 Series

2.2 Dimensions, materials, platings and marking

See the appropriate sales drawings for the information on dimensions, materials, platings and markings.

2.3 Safety agency approvals

UL File
CSA Certificate
TUV Certificate

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and the other sections of this specification for the necessary referenced documents and specifications.

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4.0 RATINGS

600 Volts AC (RMS) (or 600 Volts DC)

4.1 Current and applicable wires

Maximum Insulation Diameter and Applicable Wire Gauges	16 AWG: 3.10 / .122 Maximum
	18-24 AWG: 3.10 / .122 Maximum
	22-28 AWG: 1.80 / .071 Maximum

4.2 Current and applicable wires (continued)

MAXIMUM CURRENT RATING(Amperes) Wire to Board and Wire to Wire									
Brass					Phosphor Bronze				
Ckt. Size Wire	2 & 3	4 - 6	7 - 10	12 - 24	Ckt. Size Wire	2 & 3	4 - 6	7 - 10	12 - 24
AWG #16	9	8	7	6	AWG #16	8	7	6	5
AWG #18	9	8	7	6	AWG #18	8	7	6	5
AWG #20	7	6	5	5	AWG #20	6	5	4	4
AWG #22	5	4	4	4	AWG #22	4	3	3	3
AWG #24	4	3	3	3	AWG #24	3	2	2	2
AWG #26	3	2	2	2	AWG #26	2	1	1	1
AWG #28	2	1	1	1	AWG #28	1	1	1	1

High Conductivity Copper (Wire-to-Board)						
Ckt. Size Wire	2	4	6-8	10-12	14-18	20-24
AWG #16	12.5A	11.5A	10A	9A	8.5A	8A
AWG #18	10.5A	9.5A	8.5A	8A	7.5A	7A
AWG #20	9A	8A	7A	6.5A	6A	5.5A

High Conductivity Copper (Wire-to- Wire)						
Ckt. Size Wire	2	4	6-8	10-12	14-18	20-24
AWG #16	13A	12A	11A	10.5A	10A	9.5A
AWG #18	11A	10A	9A	8.5A	8A	7.5A
AWG #20	9.5A	8.5A	8A	7.5A	7A	6.5A

4.3 Temperature

Operating:* - 40°C to + 105°C

No operating: - 40°C to + 105°C

*Including 30°C terminal temperature at rated current

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5.0 PERFORMANCE

5.1 Electrical requirements

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 100mA. Wire resistance shall be removed from the measured value.	Per EIA-364-23 10 milliohms Maximum [initial]
2	Contact Resistance @Rated Current	Mate connectors: apply a maximum voltage of 20 mV at rated current.	Per EIA-364-23 10 milliohms Maximum [initial]
3	Contact Resistance of Wire Termination (Low Level)	Terminate the applicable wire to the terminal and measure wire using a voltage of 20mV and a current of 100mA.	Per EIA-364-23 5 milliohms Maximum [initial]
4	Insulation Resistance	Mate connectors: apply a voltage of 500VDC between adjacent terminals and between terminals to ground.	Per EIA-364-21 1000 Megohms Minimum
5	Dielectric Withstanding Voltage	Mate connectors: apply a voltage of 2200VAC for 1 minute between adjacent terminals and between terminals to ground.	Per EIA-364-20 No breakdown. Current leakage<5mA
6	Temperature Rise (via Current Cycling)	Mate connectors. Measure the temperature rise at the rated current after 96 hours, during current cycling (45 minutes ON and 15minutes OFF per hour) for 240 hours, and after final 96-hour steady state.	Per UL 1977 Temperature rise: +30°C Maximum

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5.2 Mechanical requirements

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Terminal Mate and Unmated Forces	Insert and withdraw terminal (male to female) at a rate of 25±6mm (1±1/4 inch) per minute.	Per EIA-364-13 14.7 N (3.30 lbf) Maximum insertion force & 1.0N (0.02 lbf) Minimum withdrawal force
2	Crimp Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25±6mm (1±1/4 inch) per minute.	30 N (6.74 lbf) Minimum retention force
3	Crimp Terminal Retention Force (in Housing With TPA Key)	Axial pullout force on the terminal in the housing at a rate of 25±6mm (1±1/4 inch) per minute.	Section 5.2.7
4	Durability	Mate connectors up to 30cycles at a maximum rate of 10 cycles per minute prior to Environmental Tests.	Per EIA-364-09 20 milliohms Maximum
5	Vibration (Random)	Mate connectors and vibrate per EIA 364-28, test condition VII.	Per EIA-364-28 10 milliohms Maximum (change from initial) & Discontinuity < 1 microsecond
6	Shock (Mechanical)	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).	20 milliohms Maximum & Discontinuity < 1 microsecond
7	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm (1±1/4 inch)	16 Awg = 88.0N (19.8 lbf) Min. 18 Awg = 88.0N (19.8 lbf) Min. 20 Awg = 59.0N (13.3 lbf) Min. 22 Awg = 39.0N (8.78 lbf) Min. 24 Awg = 29.0N (6.52 lbf) Min. 26 Awg = 19.0N (4.27 lbf) Min. 28 Awg = 9.80N (2.20 lbf) Min.
8	Crimp Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm (1±1/4 inch).	15.0 N (3.37 lbf) Maximum insertion force

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9	Normal Force	Apply a perpendicular force	0.49 N (50 grams) Minimum [Gold (noble) plating] OR 1.47 N (150 grams) Minimum [Tin (non-noble) Plating]
10	PCB Engagement and Separation Forces	Engage and separate a connector at a rate of 25 ± 6 mm ($1 \pm 1/4$ inch) per minute	0.49N (11.0 lbf) Minimum insertion & 10.0 N (2.24 lbf) Minimum withdrawal force
11	Panel Insertion and Withdrawl Forces	Insert and withdraw a connector at a rate of 25 ± 6 mm ($1 \pm 1/4$ inch) per minute. (Applies only to plugs with panel retention feature)	225 N (50.7 lbf) MAXIMUM insertion force and 157 N (35.3 lbf) MINIMUM withdrawl force
12	Receptacle Thumb Latch Strength	Mate connectors. Pull connectors apart at a rate of 25 ± 6 mm ($1 \pm 1/4$ inch) per minute.	68N (15.3 lbf)
13	Pin Retention Force	Apply axial push force at the speed rate of 25 ± 3 mm/minute.	9.81 N (2.20 lbf) MINIMUM Retention Force

5.3 Environmental requirements

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Thermal Shock	Mate connectors: exposé for 5 cycles between temperatures -55 and 105°C ; dwell 0.5 hours at each temperature	20 milliohms Maximum Visual : No Damage Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4
2	Thermal Aging	Mate connectors; expose to: 96 hours at $105 \pm 2^{\circ}\text{C}$	20 milliohms Maximum & Visual : No Damage
3	Humidity (Steady State)	Mate connectors: expose to a temperature of $60 \pm 2^{\circ}\text{C}$ with a relative humidity of 90-95% for 96 hours.	20 milliohms Maximum Dielectric Strength per 5.1.5 Insulation Resistance per 5.1.4 Visual : No Damage

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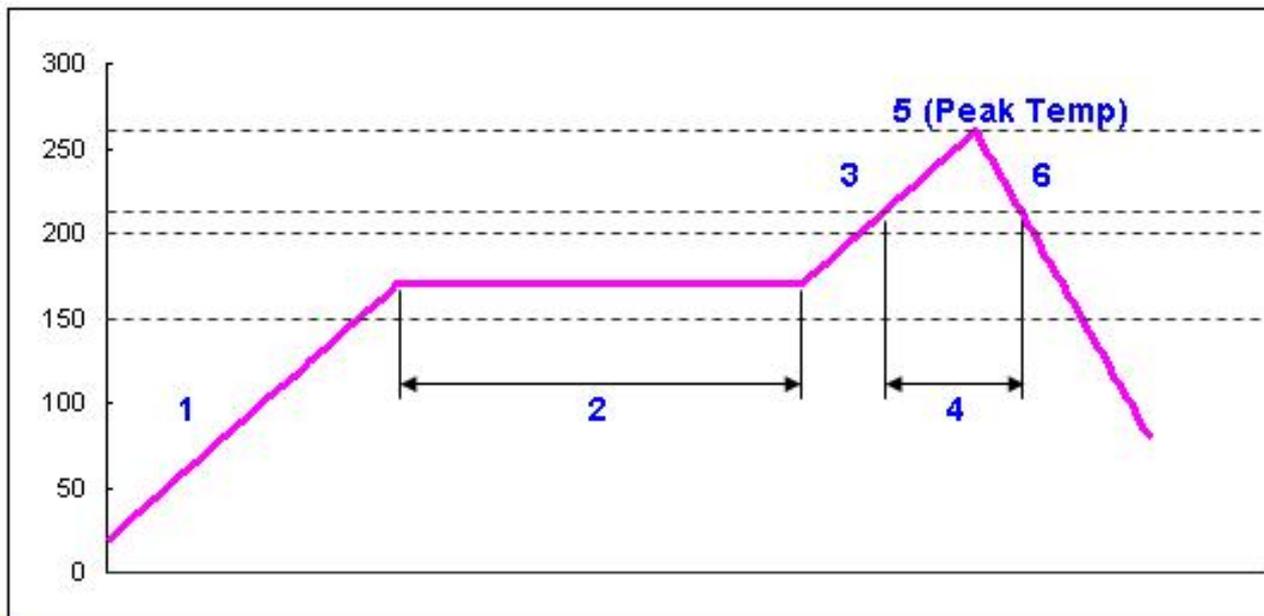


4	Solderability	Solder Wetting 95% of immersed area must show no voids, Pin holes.	Dip solder tails into the moisten solder(hold at $245\pm 5^{\circ}\text{C}$) up to 0.5mm from the tip of tails for 5 ± 0.5 sec.
5	Solder Resistance	Dip connector terminal tails in solder: Solder Duration : 5 ± 0.5 seconds; Solder Temperature : $260 \pm 5^{\circ}\text{C}$	Visual: No Damage to insulator material
6	Cold Resistance	Mate connectors: Duration : 96 hours; Temperature : $-40 \pm 3^{\circ}\text{C}$	20 milliohms Maximum Visual : No damage
7	Corrosive Atmosphere: Sulfur Dioxide Gas (SO₂)	Mate connectors: Duration: 24 hours exposure. Atmosphere: 50 parts per million (ppm) SO ₂ Gas. Temperature : $40 \pm 3^{\circ}\text{C}$	20 milliohms Maximum Visual : No damage
8	Slat Spray	Appearance No Damage	Mate connector and exposed to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed. NaCl concentration: $5 \pm 1 \%$ Spray time: 48 hours Ambient temperature: $35 \pm 2^{\circ}\text{C}$

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6.0 Temperature Profile.



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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7.0 PRODUCT QUALIFICATION AND REQUALIFICATION TEST Sequence

Test or Examination	Test Group												
	A	B	C	D	E	F	G	H	I	J	K	L	M
	Test Sequence (a)												
Examination of Product	1,7	1,11	1,5	1,3	1,3	1	1	1	1	1	1	1	1,5
Low Level Contact Resistance	2,6	2,6,8 10	2,4										2,4
Insulation Resistance		3,11											
Dielectric Withstanding Voltage		4,12											
Temperature Rise (Via Current Cycling)			3										
Terminal Mate and Unmated Forces	3,5												
Crimp Terminal Insertion Force (into Housing)									2				
Crimp Terminal Retention Force (in Housing)									3				
Normal Force								2					
Pin Retention Force							2						
Wire Pullout Force (Axial) (Wire from Terminal)										2			
Panel Insertion and Withdrawl Forces												2	
Receptacle Thumb Latch Strength											2		
Durability	4												
Solderability					2								
Salt Spray						2							
Solder Resistance				2									
Thermal Shock		5											
Thermal Aging		7											
Humidity (Steady State)		9											
Cold Resistance													3
Sample Size per Test Group	5	5	5	5	5	5	5	5	5	5	5	5	5

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主旨: 2.5mm 4 Pitch 4 Circuit Battery Conn.
作者: Daniel Shen
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