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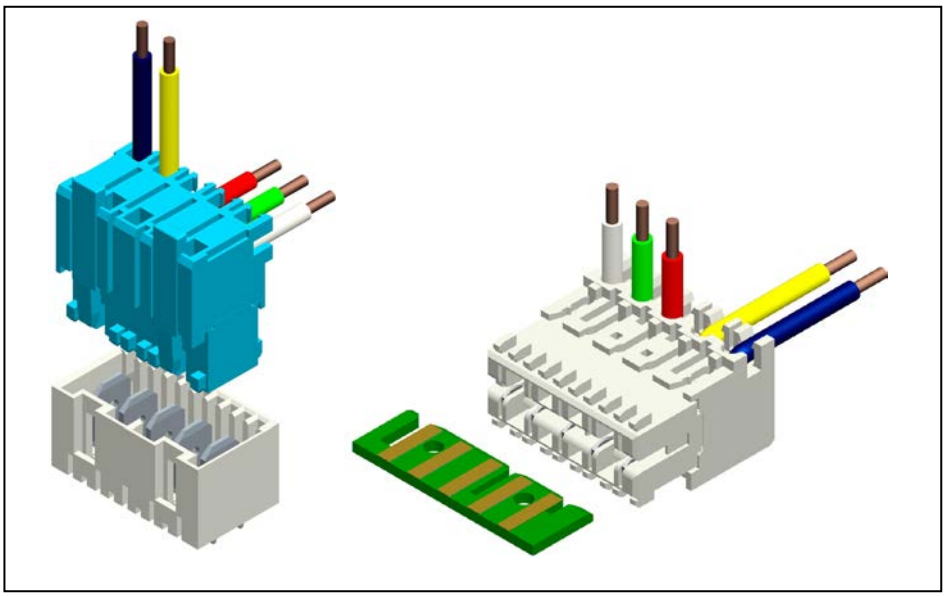


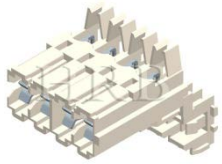
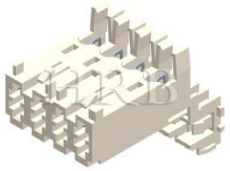
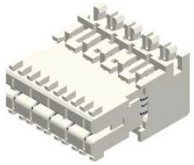
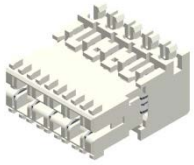
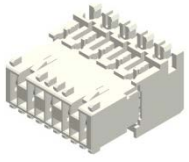
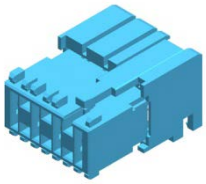
1.0 SCOPE

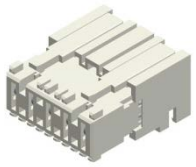
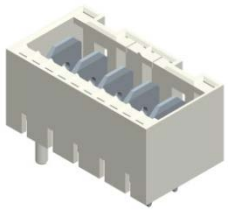
This specification defines the performance for the HRB RAST 5 APPLI-MATE family of connectors.

2.0 PRODUCT DESCRIPTION

5mm pitch Wire-to Board high current connector system, using insulation displacement technology (IDT).

2.1 Series No and description.

Series No.	Description	Mating interface	Picture
M5001	RAST 5 connector for direct mating, insulation displacement technology (IDT), with or without locking on printed circuit board, with or without keying rib and closed sides, consecutive placement without loss of pitch. Current Rating: 6A awg18-20,Insulation<=2.5mm	PCB	
M5002	RAST 5 connector for indirect mating, insulation displacement technology (IDT), with interior locking, consecutive placement without loss of pitch. Current rating: 10A AWG18#, 7A AWG 20, Insulation<=2.5mm	M9400 Series	
M5003	RAST 5 connector for direct mating, insulation displacement technology (IDT), without locking on printed circuit board, with or without keying rib and closed sides, consecutive placement without loss of pitch. Current Rating: 6A awg18-20,Insulation<=2.5mm	PCB	
M5004	RAST 5 connector for direct mating, insulation displacement technology (IDT), with locking on printed circuit board, with or without keying rib and closed sides, consecutive placement without loss of pitch. Current rating: 6A Awg18-20, Insulation<=2.5mm	PCB	
M5005	RAST 5 connector for indirect mating, insulation displacement technology (IDT), with interior locking, consecutive placement without loss of pitch. Current rating: 10A AWG18#, 7A AWG 20, Insulation<=2.5mm	M9400 Series	
M5006	RAST 5 connector for indirect mating, insulation displacement technology (IDT), with keying rib contact pitch 5.0 mm . Current rating: 10A for AWG 18, 7A for AWG 20, Insulation<=2.5mm	M9400 Series	

M5007	RAST 5 connector for indirect mating, insulation displacement technology (IDT), with exterior locking, consecutive placement without loss of pitch. Current rating: 2-4 circuits16A , 5-8 circuits 12A. AWG 16, Insulation<=3.0mm	M9400 Series	
M9400	RAST 5 header, vertical or horizontal, 16A Max. 250V		

2.2 Materials

Part Name	Material and surface finished
Contact/ terminal	Phosphor bronze/ Brass, tin /silver/ selective gold plated
Housing	PA66,UL 94V-0, Glow wire test

2.3 Wire requirement

Wire type mm^2(AWG)	Number of single wire and max. diameter mm	Lay-length of the strands mm	Insulation material type	Shore hardness	Insulation diameter mm	Temperature resistance °C
0.5 (AWG20)	16x0.20	<20	PVC	90A±5	≤2.3	105
0.75 (AWG 18)	24x0.20	<20	PVC	90A±5	≤2.5	105
1.0 (AWG 17)	19x0.25	<20	PVC	90A±5	≤2.7	105
1.5 (AWG16)	30x0.26	<20	PVC	90A±5	≤3.0	105

3.0 ELECTRICAL PERFORMANCE

Item	Description	Test Condition	Requirements
3.1	Contact Resistance	Mated connector measured as per Appendix A with rated current	10 mΩ max. (single sided PCB or Header*)
3.2	Insulation resistance	Unmated connector with 500VDC between adjacent contacts for 1 minute.	>1000 MΩ
3.3	Dielectric Withstand Voltage	Unmated connector with rated Voltage eff./60sec	Rated Voltage = 2500V AC No Breakdown
3.4	Current Induced	Load all circuits with the rated	A maximum temperature rise of <

	Temperature Rise	current	30°C

4.0 MECHANICAL PERFORMANCE

Item	Description	Test Condition	Requirements
4.1	Mating Force	10 cycles. Force measured using a polished, steel pin with a thickness of 1.5mm ±0.05mm with a full radius at the leading edge	<= 4N per terminal for all 10 cycles
4.2	Unmating Force	10 cycles. Force measured using a polished, steel pin with a thickness of 1.5mm ±0.05mm with a full radius at the leading edge.	>= 0.5N per terminal for all 10 cycles
4.3	IDT Wire Retention Force	Apply a straight tensile force parallel and at 90° to the direction of the wire at a rate of 25-100mm per minute.	>= 50N wire to crimp and wire to IDT slot (0.5mm^2 wire)
4.4	Vibration	Frequency cycle: 5-500-5Hz Displacement: 7.5mm Acceleration : 2g 20 min sweep 3hrs per axis	Initial contact resistance as per 3.1. Final contact resistance <= twice the initial contact resistance. No discontinuities greater than 1.0 microsecond.
4.5	Drop Shock	1/2 sine, 50G, 11 milliseconds 3 shocks in each of 6 directions	Initial contact resistance as per 3.1. Final contact resistance <= twice the initial contact resistance. No discontinuities greater than 1.0 microsecond

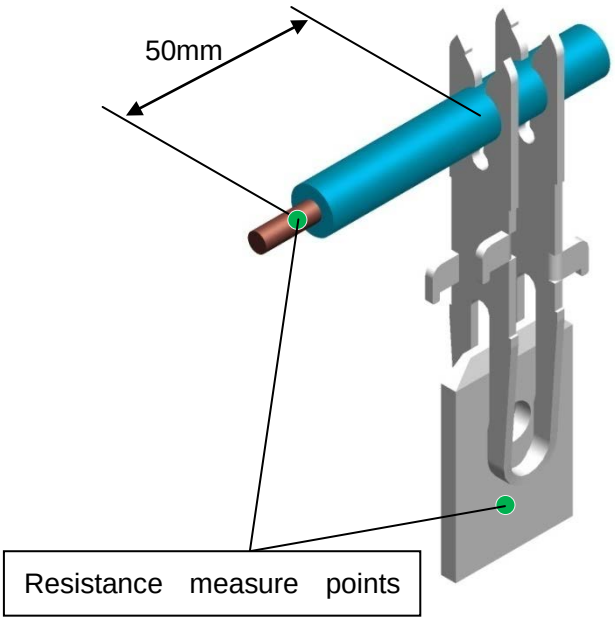
5.0 ENVIRONMENTAL PERFORMANCE

Item	Description	Test Condition	Requirements
5.1	Life test	See appendix E for information concerning: Temp / Time Profile., Current used, PCB structure, etc.	Direct to PCB: Initial contact resistance as per 3.1 Final contact resistance <=3 times the initial contact resistance Indirect Header: Initial contact resistance as per 3.1 Final contact resistance <=2 times the initial contact resistance
5.2	Vibration/ Climate test	300 cycles as temp/time profile Appendix B. Vibrate in chamber as per 4.4 for	Final contact resistance <= 2 times initial contact resistance as per 3.1. No Discontinuity greater than 1uSec

		100 hrs in each X,Y,Z directions	
5.3	Damp Heat Test	14 days at 40°C and 93% R.H. No current flow during exposure.	Final contact resistance <= 2 times initial contact resistance as per 3.1
5.4	Thermal Cycling	14 cycles: one cycle consists of 16 hours at 80 °C followed by 8 hours at 20 °C maximum	Final contact resistance <= 2 times initial contact resistance as per 3.1
5.5	SO_2	Tamb = +40oC SO2 = 0.2 liter H2O = 2 liter 8 hours exposure time 16 hours recovery time	Final contact resistance <= 2 times initial contact resistance as per 3.1
5.6	Salt Mist Spray	Tamb = 35°C Rel. Humidity = 95% NaCl concentrate =50g/ltr Duration 72 Hrs	Final contact resistance <= 2 times initial contact resistance as per 3.1 No internal corrosion traces. Insulation resistance @ 500V as per 3.2
5.7	Cold Exposure	2 hours at –40°C	Final contact resistance <= 2 times initial contact resistance as per 3. 1 No physical damage
5.8	Dry Heat	120°C for 96 hours	Final contact resistance < =2 times initial contact resistance as per 3.1
5.9	Ball Pressure Test	Test for 1 hour at+125°C	Diameter of footprint not to exceed 2 mm^2
5.10	Glow Wire Test	Connector subject to rated temp glow wire for 30 seconds on X, Y & Z axis. See appendix C.	Glow wire temp = 750°C. Suitable for > or = 0.2Amps

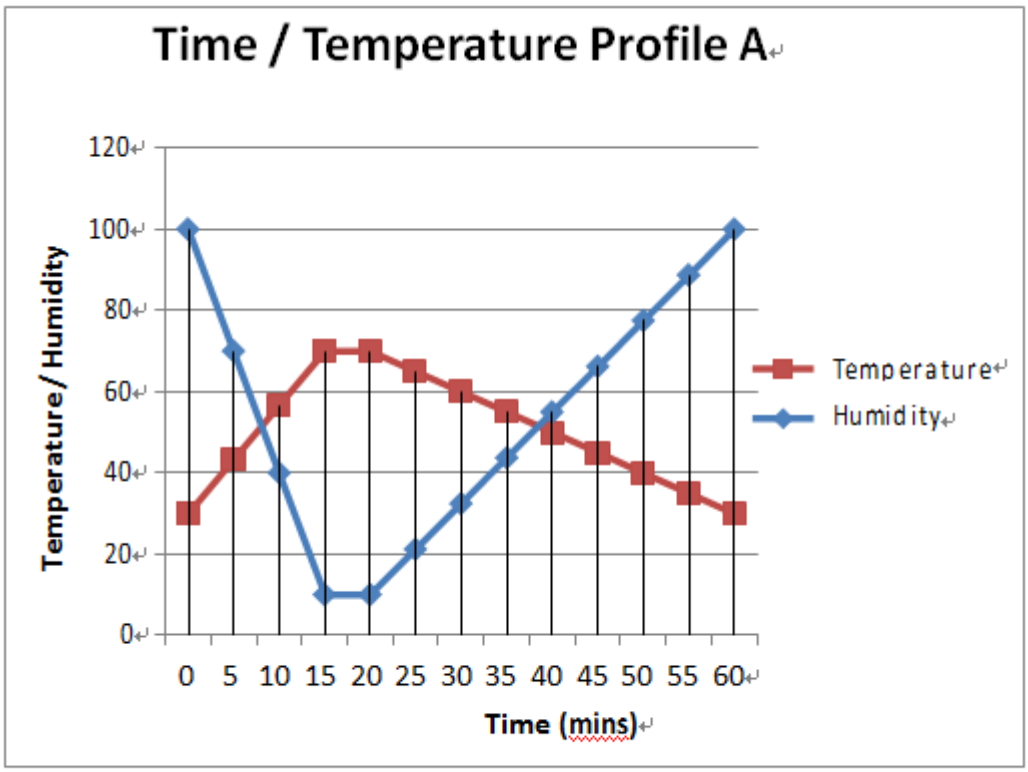
APPENDIX A

CONTACT RESISTANCE MEASUREMENT



Contact resistance= R0-Resistance of 50mm wire

APPENDIX B



LIFE TEST- TEMPERATURE – TIME PROFILE A

During the 6,000 hours life test, all test specimens must undergo the following:

• Power on at rated current for 0-20 mins, Power Off for 20-60mins

• Contact Resistance Measurements: as per IEC 512, Part 2 Every 100 hours of the life- test. Up to 1000 hr and every 200 hrs of life test for remainder

APPENDIX C

Glow wire test points

