



HARWIN

Test Report Summary

HT02003

General Testing of
Datamate Mix-Tek Special Contacts

1. Introduction

1.1. Description and Purpose

The Harwin Datamate (M80 Series) connector is manufactured to the requirements of BS9525-F0033. The following tests were carried out to test the performance of the Datamate Mix-Tek series coaxial and power contacts, known collectively as Special contacts.

1.2. Conclusion

The following data has been collated from Harwin test report T70-07. The Mix-Tek contacts met the test requirements set out in section 2.3 of this test report summary – all electrical, mechanical and environmental requirements were fulfilled. These results are representative of all the Datamate Mix-Tek series coaxial and power contacts. Current vs. temperature rise information and derate curves are available on request – please contact technical@harwin.com.

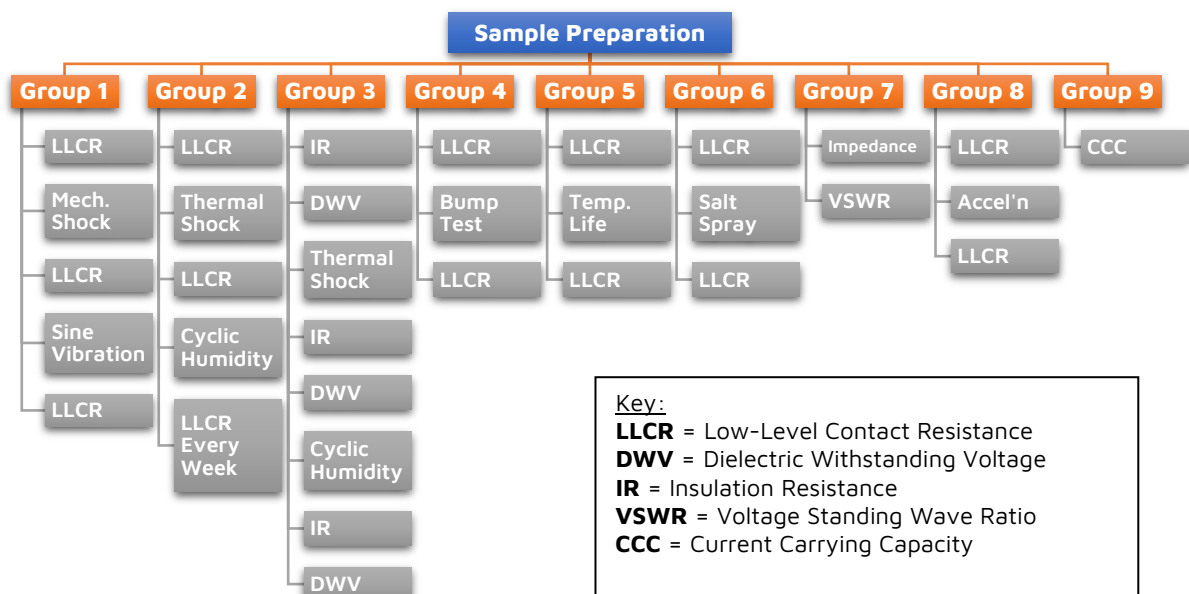
2. Test Method, Requirements and Results

2.1. List of Test Samples

- M80-4T110F1-03-301 – Female Vertical PC Tail with Coax
- M80-4C102F1-11-305 – Female Straight Crimp with Coax
- M80-5L110M4-03-313 – Male Horizontal PC Tail with Coax
- M80-5T102M2-11-311 – Male Vertical PC Tail with Coax
- M80-4T100F1-66-321 – Female Vertical PC Tail with Power
- M80-5T100M2-66-331 – Male Vertical PC Tail with Power

2.2. Testing Methods

Cable contacts were tested with the appropriate conductors crimped in place. PCB connectors were terminated to test boards, mated, and with a common buss wire across the cable connectors. Voltage and Current probes were attached to each end of the common buss, to minimize bulk resistance. Samples were allocated to the following test groups:



Mated test samples remained with each other throughout the test group/sequences for which they were designated. Individual samples were allocated in the following groups:

	Part Number	Description			Group allocation	
Group 1	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	1-1 to 1-4	
	M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail		
	M80-4C102F1-11-305	Receptacle / Female	Vertical	Crimp	1-5 to 1-8	
	M80-5T102M2-11-311	Plug / Male	Vertical	PC Tail		
	M80-4T100F1-66-321	Receptacle / Female	Vertical	PC Tail	1-9 to 1-12	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
Group 2	M80-4C100F1-66-327	Receptacle / Female	Vertical	Solder	1-13 to 1-16	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	2-1 to 2-4	
	M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail		
	M80-4C102F1-11-305	Receptacle / Female	Vertical	Crimp	2-5 to 2-8	
	M80-5T102M2-11-311	Plug / Male	Vertical	PC Tail		
Group 3	M80-4T100F1-66-321	Receptacle / Female	Vertical	PC Tail	2-9 to 2-12	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	M80-4C100F1-66-327	Receptacle / Female	Vertical	Solder	2-13 to 2-16	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	Group 4	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	3-1 to 3-4
		M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail	
M80-4C102F1-11-305		Receptacle / Female	Vertical	Crimp	3-5 to 3-8	
M80-5T102M2-11-311		Plug / Male	Vertical	PC Tail		
Group 5	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	4-1 to 4-4	
	M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail		
	M80-4C102F1-11-305	Receptacle / Female	Vertical	Crimp	4-5 to 4-8	
	M80-5T102M2-11-311	Plug / Male	Vertical	PC Tail		
	M80-4T100F1-66-321	Receptacle / Female	Vertical	PC Tail	4-9 to 4-12	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
Group 6	M80-4C100F1-66-327	Receptacle / Female	Vertical	Solder	4-13 to 4-16	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	5-1 to 5-4	
	M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail		
	M80-4C102F1-11-305	Receptacle / Female	Vertical	Crimp	5-5 to 5-8	
	M80-5T102M2-11-311	Plug / Male	Vertical	PC Tail		
Group 7	M80-4T100F1-66-321	Receptacle / Female	Vertical	PC Tail	5-9 to 5-12	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	M80-4C100F1-66-327	Receptacle / Female	Vertical	Solder	5-13 to 5-16	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	Group 8	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	6-1 to 6-4
		M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail	
M80-4C102F1-11-305		Receptacle / Female	Vertical	Crimp	6-5 to 6-8	
M80-5T102M2-11-311		Plug / Male	Vertical	PC Tail		
M80-4T100F1-66-321		Receptacle / Female	Vertical	PC Tail	6-9 to 6-12	
M80-5T100M2-66-331		Plug / Male	Horizontal	PC Tail		
Group 9	M80-4C100F1-66-327	Receptacle / Female	Vertical	Crimp	6-13 to 6-16	
	M80-5T100M2-66-331	Plug / Male	Vertical	PC Tail		
	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	7-1 to 7-4	
	M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail		
	M80-4C102F1-11-305	Receptacle / Female	Vertical	Solder	7-5 to 7-8	
	M80-5T102M2-11-311	Plug / Male	Horizontal	PC Tail		
Group 10	M80-4T110F1-03-301	Receptacle / Female	Vertical	PC Tail	8-1 to 8-4	
	M80-5L110M4-03-313	Plug / Male	Horizontal	PC Tail		
	M80-4C102F1-11-305	Receptacle / Female	Vertical	Crimp	8-5 to 8-8	
	M80-5T102M2-11-311	Plug / Male	Vertical	PC Tail		
	M80-4T100F1-66-321	Receptacle / Female	Vertical	PC Tail	8-9 to 8-12	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
Group 11	M80-4C100F1-66-327	Receptacle / Female	Vertical	Solder	8-13 to 8-16	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
	M80-4T100F1-66-321	Receptacle / Female	Vertical	PC Tail	9-1	
	M80-5T100M2-66-331	Plug / Male	Horizontal	PC Tail		
Group 12	M80-4C100F1-66-327	Receptacle / Female	Vertical	Crimp	9-2	
	M80-5T100M2-66-331	Plug / Male	Vertical	PC Tail		

2.3. Test Requirements and Results.

2.3.1. Group 1 – Shock, Vibration

Test, Product	Requirement	Result
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.9mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.6mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	4.4mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	4.9mΩ max.
Mechanical Shock		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.8mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.9mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	4.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	4.0mΩ max.
M80-321/M80-331	6.0mΩ max.	0.9mΩ max.
M80-327/M80-331	6.0mΩ max.	5.0mΩ max.
Sine Vibration		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.6mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.8mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.6mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	4.3mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	5.2mΩ max.

2.3.2. Group 1 – Thermal Shock, Humidity

Test, Product	Requirement	Result
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	4.7mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.6mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.2mΩ max.
M80-321/M80-331	6.0mΩ max.	0.9mΩ max.
M80-327/M80-331	6.0mΩ max.	3.3mΩ max.
Thermal Shock: 5 Cycles, -50°C to +125°C. 30 Minutes at each temperature (EIA 364, Test Procedure 32).		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	4.5mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.7mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.8mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.1mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	3.9mΩ max.
Cyclic Humidity: 90-95% Relative Humidity, Temperature 25°C to 65°C, 56 days (EIA 364, Test Procedure 31).		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.2mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.7mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.8mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.2mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	4.8mΩ max.
Low-Level Contact Resistance @ 336 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.0mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.7mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	1.9mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	4.7mΩ max.
Low-Level Contact Resistance @ 504 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	3.9mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	3.2mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	3.9mΩ max.
Low-Level Contact Resistance @ 672 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	4.8mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	2.6mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.0mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	4.4mΩ max.



Group 2 continued – Thermal Shock, Humidity

Test, Product	Requirement	Result
Low-Level Contact Resistance @ 840 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.9mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.5mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	6.0mΩ max.
Low-Level Contact Resistance @ 1008 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.2mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.7mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.1mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	5.3mΩ max.
Low-Level Contact Resistance @ 1176 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.8mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.4mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	5.4mΩ max.
Low-Level Contact Resistance @ 1344 hours		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.6mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	2.0mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	2.2mΩ max.
M80-321/M80-331	6.0mΩ max.	0.9mΩ max.
M80-327/M80-331	6.0mΩ max.	5.4mΩ max.



2.3.3. Group 3 – Insulation Resistance, Dielectric Withstanding Voltage, Thermal Shock, Humidity

Test, Product	Requirement	Result
Insulation Resistance		
M80-301/M80-313	>10 ⁶ MΩ	Passed
M80-305/M80-311	>10 ⁶ MΩ	Passed
Dielectric Withstanding Voltage		
M80-301/M80-313	No breakdown, arc, etc.	Passed
M80-305/M80-311	No breakdown, arc, etc.	Passed
Thermal Shock: 5 Cycles, -50°C to +125°C. 30 Minutes at each temperature (EIA 364, Test Procedure 32).		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Insulation Resistance		
M80-301/M80-313	>10 ⁶ MΩ	Passed
M80-305/M80-311	>10 ⁶ MΩ	Passed
Dielectric Withstanding Voltage		
M80-301/M80-313	No breakdown, arc, etc.	Passed
M80-305/M80-311	No breakdown, arc, etc.	Passed
Cyclic Humidity: 90-95% Relative Humidity, Temperature 25°C to 65°C for 56 days (EIA 364, Test Procedure 31).		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Insulation Resistance		
M80-301/M80-313	>10 ⁶ MΩ	Passed
M80-305/M80-311	>10 ⁶ MΩ	Passed
Dielectric Withstanding Voltage		
M80-301/M80-313	No breakdown, arc, etc.	Passed
M80-305/M80-311	No breakdown, arc, etc.	Passed

2.3.4. Group 4 – Bump

Test, Product	Requirement	Result
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.5mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.8mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.1mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	4.9mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	5.9mΩ max.
Bump Test		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.5mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	2.3mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.8mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.0mΩ max.
M80-321/M80-331	6.0mΩ max.	0.9mΩ max.
M80-327/M80-331	6.0mΩ max.	6.0mΩ max.

2.3.5. Group 5 – Temperature Life

Test, Product	Requirement	Result
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.7mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	2.0mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.6mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.5mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	5.9mΩ max.
Temperature Life		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.6mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.4mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.2mΩ max.
M80-321/M80-331	6.0mΩ max.	1.0mΩ max.
M80-327/M80-331	6.0mΩ max.	5.3mΩ max.

2.3.6. Group 6 – Salt Spray

Test, Product	Requirement	Result
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.8mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	5.0mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.9mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	5.1mΩ max.
Salt Spray		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.8mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.9mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.8mΩ max.
M80-321/M80-331	6.0mΩ max.	0.9mΩ max.
M80-327/M80-331	6.0mΩ max.	5.9mΩ max.

**2.3.7. Group 7 – Impedance, Voltage Standing Wave Ratio (VSWR)**

Test, Product	Requirement	Result
Impedance		
M80-301/M80-313 @ 1.0GHz	Record	55.1Ω max.
M80-301/M80-313 @ 3.0GHz	Record	70.6Ω max.
M80-301/M80-313 @ 6.0GHz	Record	75.6Ω max.
M80-305/M80-311 @ 1.0GHz	Record	59.6Ω max.
M80-305/M80-311 @ 3.0GHz	Record	91.8Ω max.
M80-305/M80-311 @ 6.0GHz	Record	85.0Ω max.
Voltage Standing Wave Ratio		
M80-301/M80-313 @ 1.0GHz	Record	1.18 max.
M80-301/M80-313 @ 3.0GHz	Record	1.43 max.
M80-301/M80-313 @ 6.0GHz	Record	1.62 max.
M80-305/M80-311 @ 1.0GHz	Record	1.30 max.
M80-305/M80-311 @ 3.0GHz	Record	1.96 max.
M80-305/M80-311 @ 6.0GHz	Record	1.94 max.

2.3.8. Group 8 – Acceleration

Test, Product	Requirement	Result
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	6.0mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	2.0mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.0mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.9mΩ max.
M80-321/M80-331	6.0mΩ max.	0.8mΩ max.
M80-327/M80-331	6.0mΩ max.	5.1mΩ max.
Acceleration		
M80-301/M80-313	No Damage	Passed
M80-305/M80-311	No Damage	Passed
M80-321/M80-331	No Damage	Passed
M80-327/M80-331	No Damage	Passed
Low-Level Contact Resistance		
M80-301/M80-313 Inner Contact	6.0mΩ max.	5.4mΩ max.
M80-301/M80-313 Outer Contact	6.0mΩ max.	1.7mΩ max.
M80-305/M80-311 Inner Contact	6.0mΩ max.	5.5mΩ max.
M80-305/M80-311 Outer Contact	6.0mΩ max.	5.8mΩ max.
M80-321/M80-331	6.0mΩ max.	0.7mΩ max.
M80-327/M80-331	6.0mΩ max.	5.0mΩ max.





2.3.9. Group 9 – Current

Test. Product	Requirement	Result
M80-327/M80-331: No. of contacts		
1 Contact	20A or +30°C	25A, +24.7°C
2 Contacts	20A or +30°C	20A, +29.6°C
3 Contacts	20A or +30°C	20A, +40.8°C
4 Contacts	20A or +30°C	20A, +32.1°C
5 Contacts	20A or +30°C	20A, +31.3°C
6 Contacts	20A or +30°C	20A, +35.1°C
7 Contacts	20A or +30°C	20A, +50.2°C
8 Contacts	20A or +30°C	20A, +49.1°C
9 Contacts	20A or +30°C	20A, +62.2°C
10 Contacts	20A or +30°C	20A, +71.5°C
11 Contacts	20A or +30°C	20A, +79.5°C
12 Contacts	20A or +30°C	20A, +87.3°C
M80-321/M80-331: No. of contacts		
1 Contact	20A or +30°C	25A, +39.0°C
2 Contacts	20A or +30°C	20A, +29.7°C
3 Contacts	20A or +30°C	20A, +34.6°C
4 Contacts	20A or +30°C	20A, +53.4°C
5 Contacts	20A or +30°C	20A, +59.2°C
6 Contacts	20A or +30°C	20A, +66.6°C
7 Contacts	20A or +30°C	20A, +67.5°C
8 Contacts	20A or +30°C	20A, +80.7°C
9 Contacts	20A or +30°C	20A, +72.1°C
10 Contacts	20A or +30°C	20A, +93.7°C
11 Contacts	20A or +30°C	20A, +100.6°C
12 Contacts	20A or +30°C	20A, +104.1°C

