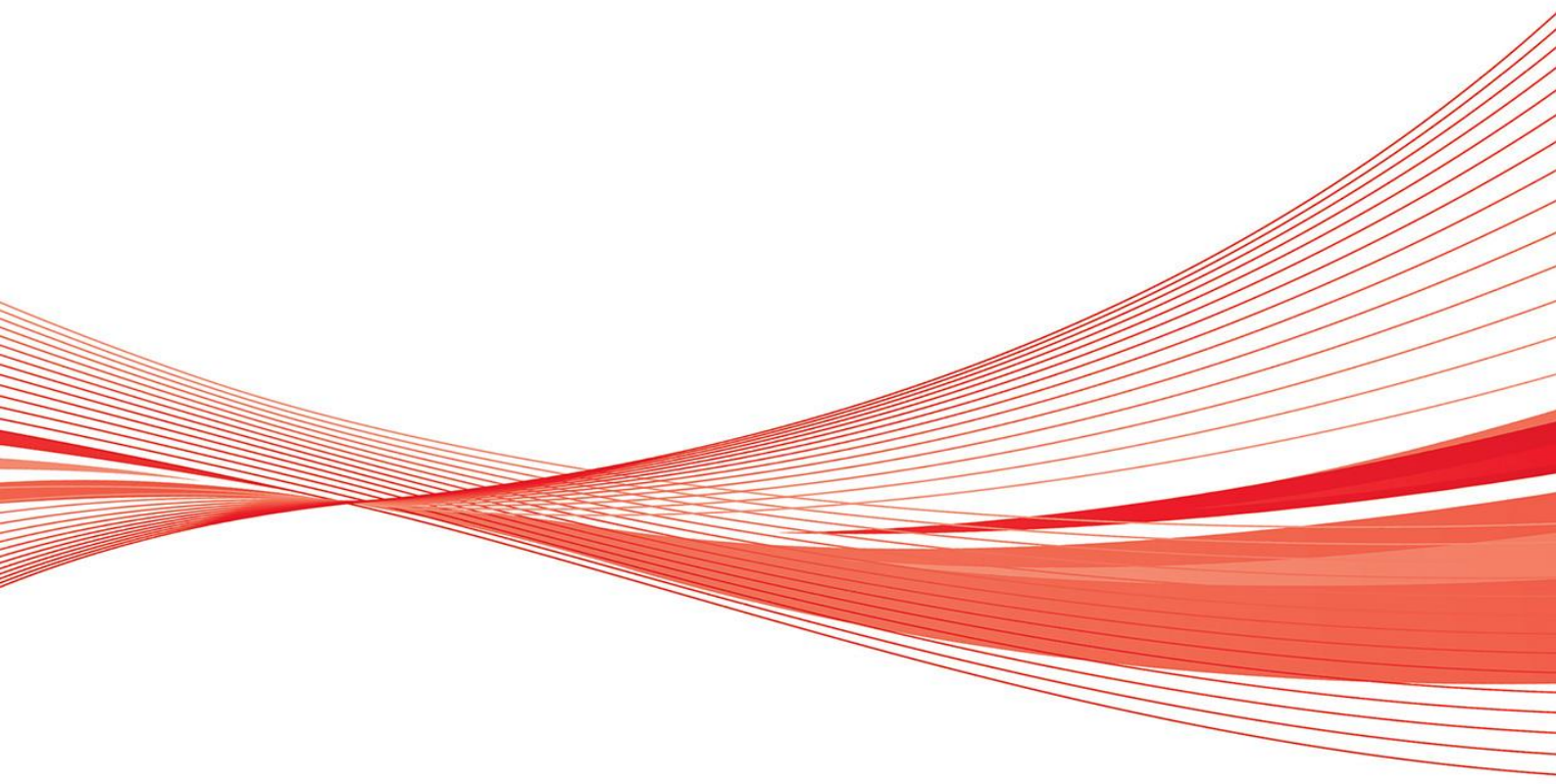
HARWiN

Harwin Test Report Summary

HT04001

General Testing of Datamate
40A Power Contacts

Datamate



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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 40A power contacts, an addition to the range known collectively as Special contacts.

1.2. Conclusion.

The following data has been collated from Harwin test report 947. The 40A power 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 40A power contacts. Further information available on request – please contact technical@harwin.com.

2. Test Method, Requirements and Results.

2.1. List of Test Samples.

a) M80-4000000F1-02-PF5-00-000 - Female 2 Position Solder Cup
b) M80-400000000-03-PF5-00-000 - Female 3 Position Solder Cup
c) M80-4000000F1-04-PF5-00-000 - Female 4 Position Solder Cup
d) M80-4000000F1-06-PF5-00-000 - Female 6 Position Solder Cup
e) M80-400000000-10-PF5-00-000 - Female 10 Position Solder Cup
f) M80-5000000M1-02-PM1-00-000 – Male 2 Position Vertical PC Tail
g) M80-5000000M5-02-PM3-00-000 – Male 2 Position Horizontal PC Tail
h) M80-500000000-02-PM5-00-000 – Male 2 Position Solder Cup
i) M80-500000000-03-PM5-00-000 – Male 3 Position Solder Cup
j) M80-500000000-04-PM5-00-000 – Male 4 Position Solder Cup
k) M80-5000000M1-06-PM1-00-000 – Male 6 Position Vertical PC Tail
l) M80-5000000M5-06-PM3-00-000 – Male 6 Position Horizontal PC Tail
m) M80-5000000M1-10-PM1-00-000 – Male 10 Position Vertical PC Tail
n) M80-5000000M5-10-PM3-00-000 – Male 10 Position Horizontal PC Tail
o) M80-500000000-10-PM5-00-000 – Male 10 Position Solder Cup

2.2. Specification Parameters.

Tests were carried out in accordance with EIA 364 standards for the following specifications:

Testing Standard	Description of Test	Page No.
EIA-364-17B: 1999	Temperature Life, Method A, Cond. 150°C for 850 Hours	3
EIA-364-06C: 2006	Contact Resistance	3, 5
EIA-364-70A: 1998	Temperature Rise versus Current Method 2	3
EIA-364-09C: 1999	Durability (Mechanical Operations)	5
EIA-364-13C: 2006	Mating and Un-Mating Forces Method B	5

2.3. Test Method and Results.

All testing was carried out using standard parts. Parts provided with Jackscrews, had the Female Jackscrews removed, when the test required mating forces to be measured.

a) Temperature Life, Method A, Condition 150°C for 850 hours in to EIA-364-17B and Contact Resistance to EIA-364-06C

3x samples of 3 Position Solder Cup connectors were visually inspected for cracking or crazing. Then had a 50cm minimum of 10 AWG wire, soldered to all solder cups, mated 3 times to condition parts and placed in a test chamber stabilised at 150±5°C. Suspended vertically by one set of wires, no stress other than gravity placed on the other set. Samples remained in test chamber for in excess of 850 hours stabilised at 150±5°C. Removed, measured for contact resistance and visually inspected for cracking, crazing, fusing, seizure or delamination of components or finishes.

Connector Sample	Requirement (mΩ MAX)	Results (mΩ)	Visual Inspection
Sample 1 M80-400000000-03-PF5-00-000 M80-500000000-03-PM5-00-000 *3 Position Solder Cup Mated Pair*	6	3 1 2	Passed
Sample 2 M80-400000000-03-PF5-00-000 M80-500000000-03-PM5-00-000 *3 Position Solder Cup Mated Pair*	6	1 1 4	Passed
Sample 3 M80-400000000-03-PF5-00-000 M80-500000000-03-PM5-00-000 *3 Position Solder Cup Mated Pair*	6	4 2 3	Passed

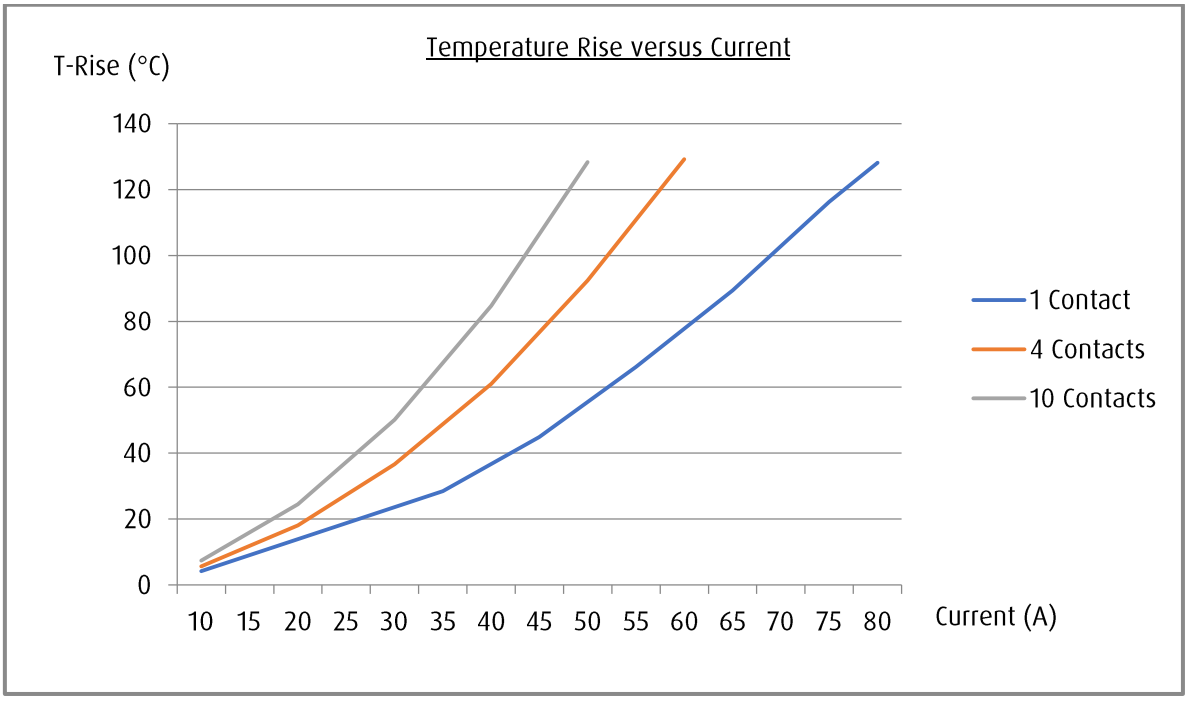
b) Temperature Rise versus Current, Method 2 to EIA-364-70A

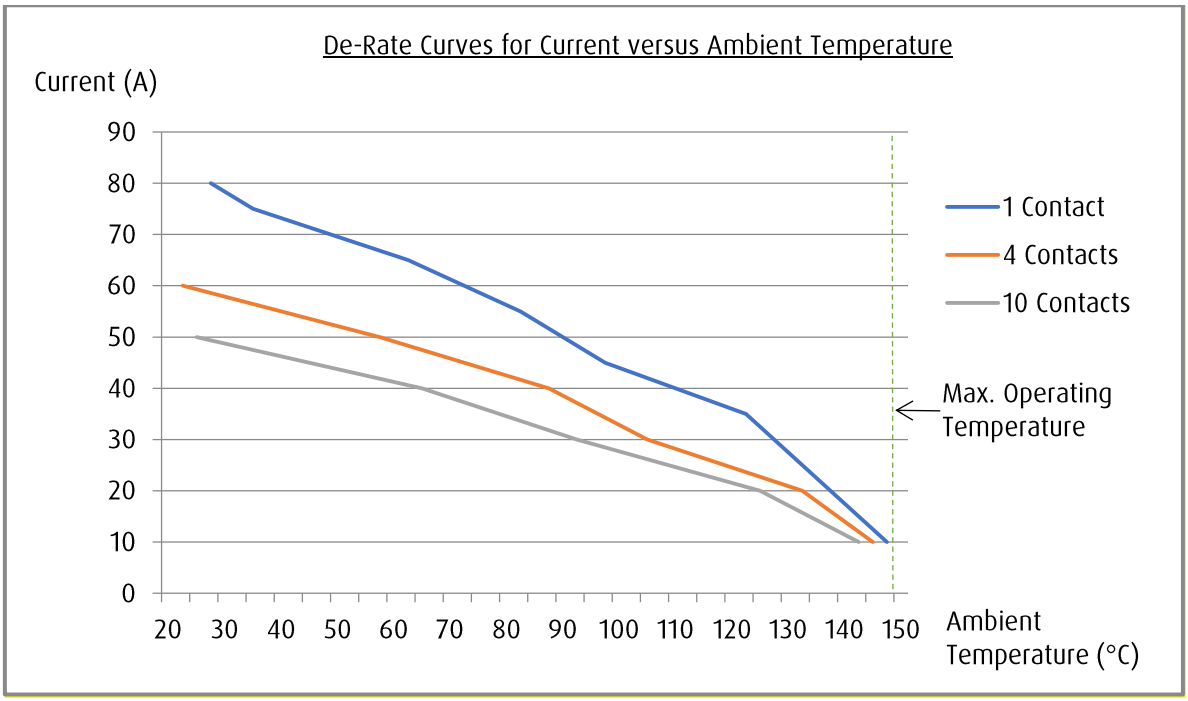
Multiple samples of Solder Cup connectors in 2, 6 and 10 Position configurations were prepared with a minimum of 50cm of wire for single contact connections and 100cm of wire for series links between contacts. Current was passed through contacts and increased until a stable temperature rise of approximately 5 to 10°C was achieved. Temperature and test current were recorded and this method was repeated for every rise of approximately 25 to 30°C, until the maximum operating temperature of 150°C was reached.

M80-4000000F1-02-PF5-00-00 / M80-500000000-02-PM5-00-000 2 Position Solder Cup Mated Pair – Average results of 3 samples 1 contact pair only energised		
Current (A)	Ambient Temperature (°C)	Temperature Rise (°C)
10	Start = 21.2 Finish = 24.5 Start = 21.2 Finish = 24.5	4.2
35		28.5
45		44.9
55		66.2
65		89.4
75		116.3
80		128.1

M80-4000000F1-04-PF5-00-00 / M80-500000000-04-PM5-00-000 4 Position Solder Cup Mated Pair – Average results of 3 samples All contacts energised		
Current (A)	Ambient Temperature (°C)	Temperature Rise (°C)
10	Start = 20.9 Finish = 24.6	5.6
20		18.1
30		36.6
40		61.0
50		92.4
60		129.2

M80-400000000-10-PF5-00-00 / M80-500000000-10-PM5-00-000 10 Position Solder Cup Mated Pair – Average results of 3 samples All contacts energised		
Current (A)	Ambient Temperature (°C)	Temperature Rise (°C)
10	Start = 20.7 Finish = 23.6	7.4
20		24.5
30		50.1
40		84.7
50		128.3





c) Durability to EIA-364-09C and Contact Resistance to EIA-364-06C

3x Samples of Female 2 Position Solder Cup and Male Vertical PC Tail connectors were measured and recorded for Contact Resistance, Insulation Resistance, Dielectric withstanding voltage, mating and un-mating forces prior to cycling. Then at specified intervals during cycling connectors were clamped in holding fixture with one half allowed to float; Then cycled by fully mating and unmating at 25.4mm/minute for 500 cycles. Visual inspection also took place at specified intervals. After this test was completed and recorded Contact retention in housing was also measured and recorded. All contacts passed the requirement of 10N minimum contact retention in housing.

M80-4000000F1-02-PF5-00-00 / M80-500000000-02-PM1-00-000 2 Position Female Solder Cup / Male Vertical PC Tail															
Cycles	Mating Force (N)			Unmating Force (N)			Contact Resistance (6mΩ max)			Other Electrical Tests P/F			Visual Inspection P/F		
	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
0	-	-	-	-	-	-	1	0	0	P	P	P	P	P	P
10	14.1	15.7	15.0	12.1	8.6	13.7	1	0	0	P	P	P	P	P	P
30	13.4	18.1	15.4	12.7	13.5	13.8	1	1	0	P	P	P	P	P	P
50	15.8	18.2	19.4	14.6	16.1	20.1	1	0	0	P	P	P	P	P	P
100	18.6	19.5	20.4	16.2	17.9	18.1	0	0	0	P	P	P	P	P	P
200	22.1	20.3	19.1	18.2	19.0	18.1	0	0	0	P	P	P	P	P	P
300	19.8	23.6	22.2	18.2	19.2	18.0	1	1	0	P	P	P	P	P	P
400	23.5	20.9	21.9	21.9	18.9	19.0	1	0	0	P	P	P	P	P	P
500	24.9	23.25	24.0	24.5	18.1	21.8	2	0	0	P	P	P	P	P	P

d) Mating and Unmating Forces, Method B to EIA-364-13C

3x Samples of 2, 6 and 10 Position connectors in various configurations of Female Solder Cup to Male Solder Cup, Vertical PC Tail and Horizontal PC Tail were clamped in holding fixture with one half allowed to float; then fully mated and un-mating at 25.4mm/minute. Peak forces were measured and recorded.

M80-500000000-02-PMX-00-000 2 Position Male	M80-400000000-02-PF5-00-000 2 Position Female Solder Cup	
	Mating Force (N)	Unmating Force (N)
PM1 Vertical PC Tail	12.63	11.85
PM3 Horizontal PC Tail	8.06	12.7
PM5 Solder Cup	8.9	9.3

M80-500000000-06-PMX-00-000 6 Position Male	M80-400000000-06-PF5-00-000 6 Position Female Solder Cup	
	Mating Force (N)	Unmating Force (N)
PM1 Vertical PC Tail	26.7	26.1
PM3 Horizontal PC Tail	32.56	16.0
PM5 Solder Cup	26.7	22.8

M80-500000000-10-PM5-00-000 10-Position Male Solder Cup	M80-400000000-10-PF5-00-000 10 Position Female Solder Cup	
	Mating Force (N)	Unmating Force (N)
Sample 1	38.0	31.7
Sample 2	43.5	32.0
Sample 3	40.2	32.6