



HARWIN

Datamate (M80 series)
Tests to EIA-364-108-2000(2007)
High Reliability 2mm Pitch Connectors

Datamate

www.harwin.com/

TEST REPORT SUMMARY Report 200

Datamate

Laboratory Testing Frequency Tests to EIA-364-108-2000(2007) M80 Series

Test Completion Date: 8th February 2010

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trimeriX Ltd

Test Report Summary: Report 200
Part Number(s): M80 Series
Description: Datamate Range – Frequency Testing

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TEST SEQUENCE 1

A] OVERVIEW

The M80 connector series was measured in accordance with EIA-364-108-2000(2007) to determine the Impedance, reflection coefficient, Return loss and VSWR measured in the frequency domain from 50MHz to 1GHz to determine the differential impedance.

B] TEST EQUIPMENT USED

Vector Network Analyser – Hewlett Packard 8753C
Last Calibration date – 29th January 2010
Next Calibration date – 28th January 2011

C] METHOD

Measurements were carried out in the frequency domain from 50MHz to 1GHz with the analyzer configured as 1% smoothing, 16 averages, 201 measurement points. The open and short method was used to determine the impedance characteristics with Reflection co-efficient, return loss and VSWR calculated against the USB 90 ohm requirements.

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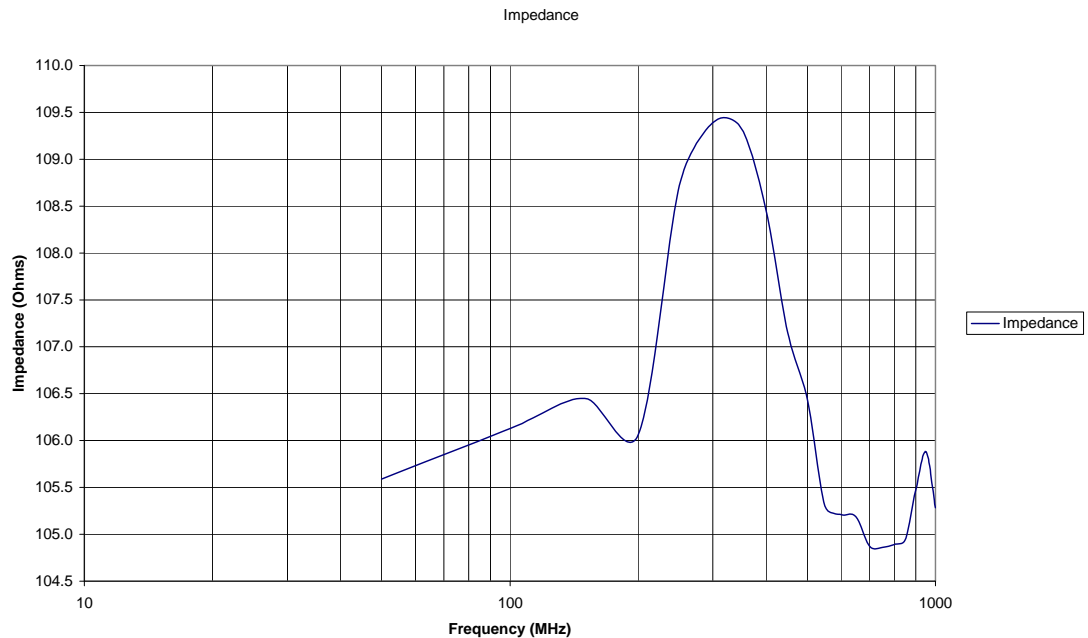
D] SUMMARY OF VALUES

The following table of values is an extract from the measurement result and is the average of the 5 connector pairs measured.

D.1. IMPEDANCE

Frequency (MHz)	Impedance (Ohms)
50	105.6
100	106.1
150	106.4
200	106.1
250	108.7
300	109.4
350	109.3
400	108.4
450	107.2
500	106.4

Frequency (MHz)	Impedance (Ohms)
550	105.3
600	105.2
650	105.2
700	104.9
750	104.9
800	104.9
850	104.9
900	105.5
950	105.9
1000	105.3



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D] SUMMARY OF VALUES (continued)

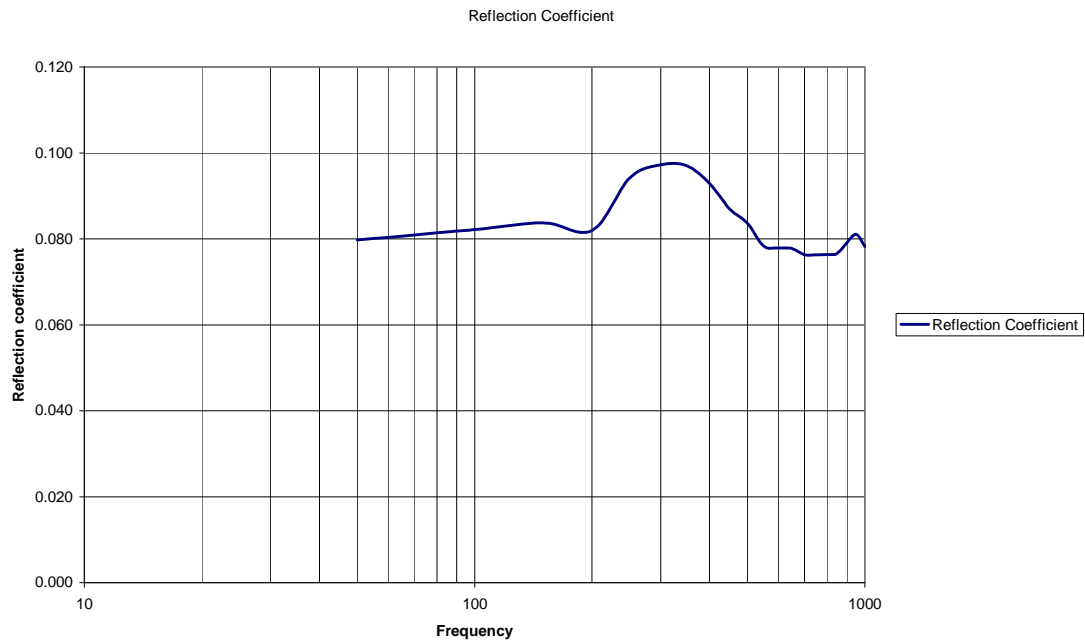
D.2. REFLECTION COEFFICIENT

The reflection coefficient is stated against a predetermined reference impedance and for the purpose of this report is 90 ohms as required by the USB standard.

This is calculated as $\frac{Z_l - Z_o}{Z_l + Z_o}$

Frequency (MHz)	Reflection Coefficient
50	0.080
100	0.082
150	0.084
200	0.082
250	0.094
300	0.097
350	0.097
400	0.093
450	0.087
500	0.084

Frequency (MHz)	Reflection Coefficient
550	0.078
600	0.078
650	0.078
700	0.076
750	0.076
800	0.076
850	0.077
900	0.079
950	0.081
1000	0.078



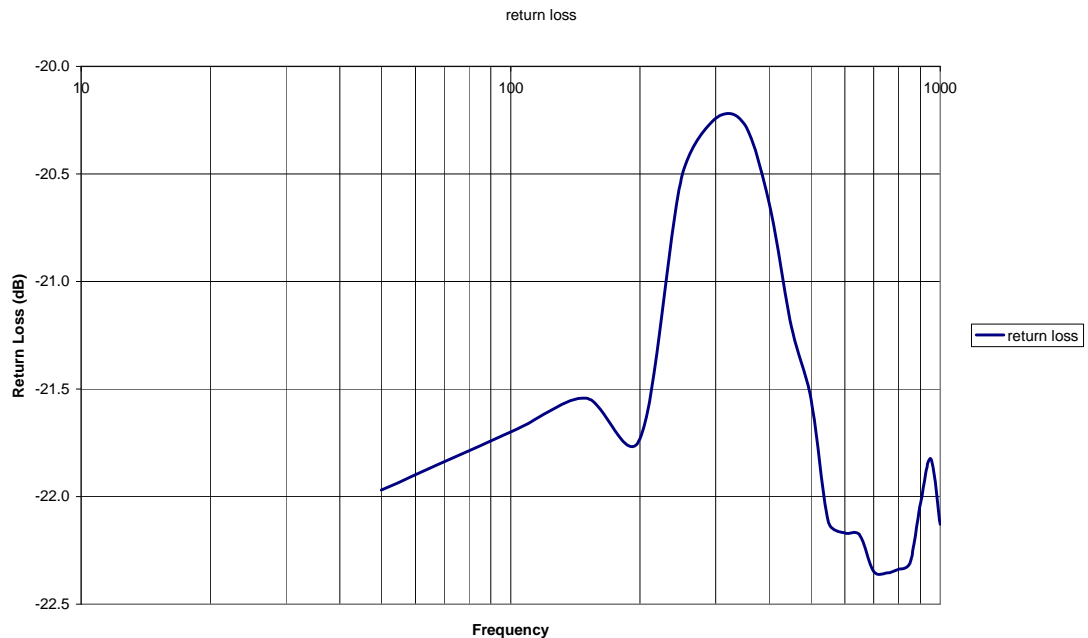
D] SUMMARY OF VALUES (continued)

D.3. RETURN LOSS

Return loss of the connector is given by the equation $20\log(abs(\Gamma))$ where Γ is the reflection coefficient.

Frequency (MHz)	Return Loss (dB)
50	-22.0
100	-21.7
150	-21.5
200	-21.7
250	-20.5
300	-20.2
350	-20.3
400	-20.6
450	-21.2
500	-21.5

Frequency (MHz)	Return Loss (dB)
550	-22.1
600	-22.2
650	-22.3
700	-22.2
750	-22.4
800	-22.3
850	-22.3
900	-22.0
950	-21.8
1000	-22.1



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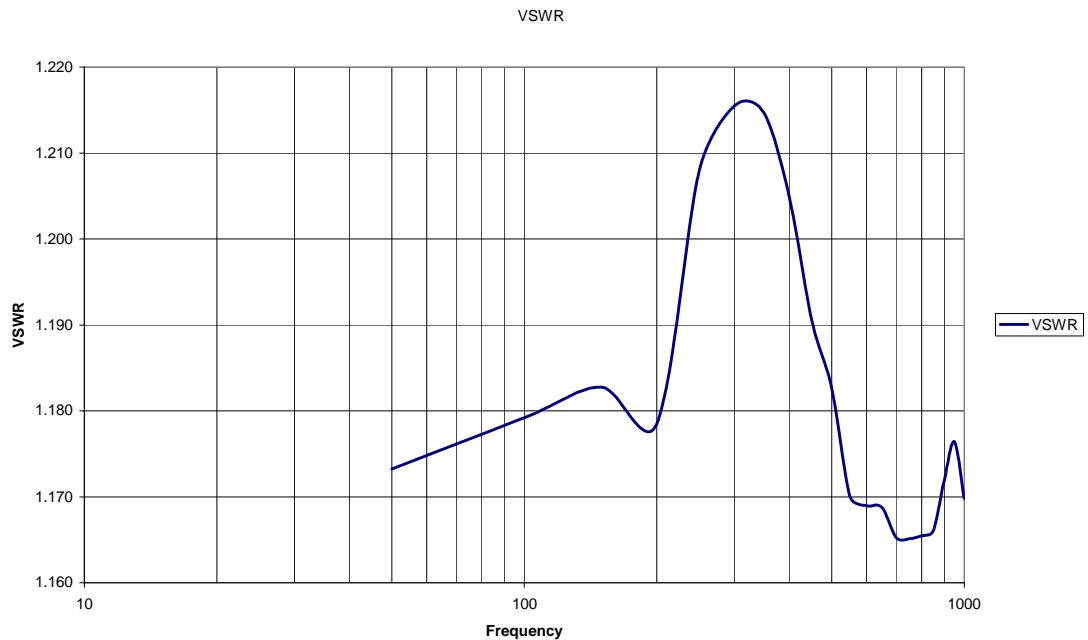
D] SUMMARY OF VALUES (continued)

D.4. VSWR

The VSWR is given by $\frac{(1 + (abs(\Gamma)))}{(1 - (abs(\Gamma)))}$

Frequency (MHz)	VSWR
50	1.173
100	1.179
150	1.183
200	1.178
250	1.208
300	1.215
350	1.215
400	1.205
450	1.191
500	1.183

Frequency (MHz)	VSWR
550	1.170
600	1.169
650	1.169
700	1.165
750	1.165
800	1.165
850	1.166
900	1.172
950	1.176
1000	1.170



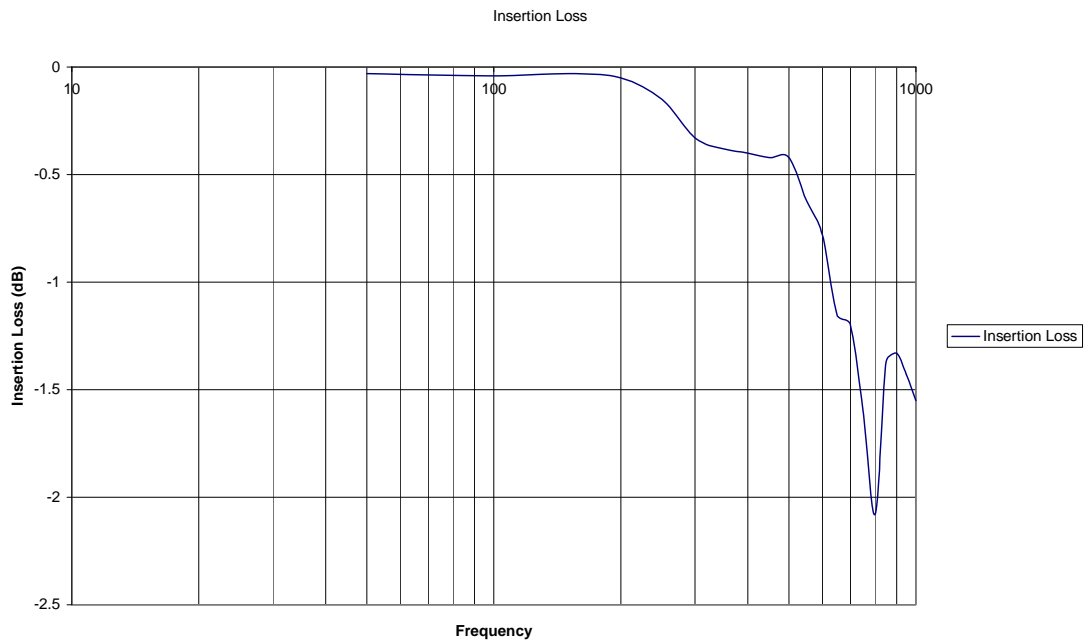
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D] SUMMARY OF VALUES (continued)

D.4. INSERTION LOSS

Frequency (MHz)	Insertion Loss
50	-0.03
100	-0.04
150	-0.03
200	-0.05
250	-0.15
300	-0.33
350	-0.38
400	-0.4
450	-0.42
500	-0.42

Frequency (MHz)	Insertion Loss
550	-0.62
600	-0.78
650	-1.15
700	-1.2
750	-1.6
800	-2.08
850	-1.37
900	-1.33
950	-1.43
1000	-1.55



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TEST SEQUENCE 2

A] OVERVIEW

The M80 connector series was measured in accordance with EIA-364-108-2000(2007) to determine the insertion loss between 50MHz and 2GHz.

B] TEST EQUIPMENT USED

Vector Network Analyser – Hewlett Packard 8753C
Last Calibration date – 29th January 2010
Next Calibration date – 28th January 2011

C] METHOD

Measurements were carried out in the frequency domain from 50MHz to 2GHz with the analyzer configured as 1% smoothing, 16 averages, 201 measurement points. Insertion loss was measured using the S21 capabilities of the network analyzer.

D] SUMMARY OF VALUES

D.1. INSERTION LOSS

The measured -3dB point of the connector was between 1750 and 1800MHz.

Frequency (MHz)	Insertion Loss (dB)
50	-0.03
100	-0.04
150	-0.03
200	-0.05
250	-0.15
300	-0.33
350	-0.38
400	-0.4
450	-0.42
500	-0.42
550	-0.62
600	-0.78
650	-1.15
700	-1.2

Frequency (MHz)	Insertion Loss (dB)
750	-1.6
800	-2.08
850	-1.37
900	-1.33
950	-1.43
1000	-1.55
1050	-1.76
1100	-1.76
1150	-2.52
1200	-2.52
1250	-2.52
1300	-2.36
1350	-2.36
1400	-2.22

Frequency (MHz)	Insertion Loss (dB)
1450	-2.22
1500	-2.22
1550	-2.69
1600	-2.69
1650	-2.06
1700	-2.06
1750	-2.06
1800	-4.36
1850	-4.36
1900	-3.82
1950	-3.82
2000	-4.26

