QUALIFICATION TEST SUMMARY REPORT
ESR-9413
Qualification Type Testing of
Amphenol Corporation's 2M803 Series Connector

PREPARED BY: Patrick Cole
Design Engineer

AMPHENOL CORPORATION
Aerospace Operation
40-60 Delaware Avenue
Sidney, New York 13838-1395

REV. B
29 July 2013

TABLE OF CONTENTS

		PAGE
1.	PURPOSE OF TEST	3
2.	CONCLUSION	3
3.	TEST AGENCY	3
4.	STANDARD TEST CONDITIONS	3
5.	TEST SAMPLES	4
6.	TEST SEQUENCES	5-7
7.	SAMPLE PREPARATION	7-9
8.	TEST COMPARISON MATRIX	10

1. PURPOSE OF TEST:

The purpose of this test summary is to define the test samples, test sequences and test methods required to verify that Amphenol 2M803 Series of connectors meet the applicable internal Amphenol requirements.

2. CONCLUSION:

All following test groups of Amphenol 2M803 series connectors satisfactorily completed the qualification tests outlined in L-40991-242 Rev E.

3. TEST AGENCY:

All tests and inspections were performed at and by the Amphenol Corporation, 40-60 Delaware Avenue, Sidney, NY 13838.

4. STANDARD TEST CONDITIONS:

Ambient Temperature: $20 \pm 5°C$

Ambient Humidity: $50 \pm 30\%$

5. TEST SAMPLES:

The following connector samples, wire, sealing plugs, and contacts were provided for qualification testing.

Amphenol Part Number	Description	Size	Coded Number	Total	Group			Spares
					1	2	3	
F2-678821-07P	Plug	6	2M803-002-06ZNU6-7PN	11	3	3	3	2
F2-678851-07S	Receptacle	6	2M803-004-02ZNU6-7SN	11	3	3	3	2
*803-002-06ZNU6-7PN	Plug	6	N/A	4	1	1	1	1
*803-004-02ZNU6-7SN	Receptacle	6	N/A	4	1	1	1	1
F2-696904-006	Backshell	6	2M620MS064ZNU06	14	4	4	4	2
2M809-001	Pin	23	N/A	77				
2M809-002	Socket	23	N/A	77				
F9-678824-19S	Plug	9	2M803-002-06NF9-19SN	11	3	3	3	2
F9-678854-19P	Receptacle	9	2M803-004-02NF9-19PN	11	3	3	3	2
*803-002-06NF9-19SN	Plug	9	N/A	4	1	1	1	1
*803-004-02NF9-19PN	Receptacle	9	N/A	4	1	1	1	1
F9-696904-009	Backshell	9	2M620MS064NF09	14	4	4	4	2
2M809-001	Pin	23	N/A	209				
2M809-002	Socket	23	N/A	209				
F7-678827-55S	Plug	14	2M803-002-06MT14-55SN	11	3	3	3	2
F7-678857-55P	Receptacle	14	2M803-004-02MT14-55PN	11	3	3	3	2
*803-002-06MT14-55SN	Plug	14	N/A	4	1	1	1	1
*803-004-02MT14-55PN	Receptacle	14	N/A	4	1	1	1	1
F7-696904-014	Backshell	14	2M620MS064MT14	14	4	4	4	2
2M809-001	Pin	23	N/A	605				
2M809-002	Socket	23	N/A	605				
AS22759/11-24	Wire	24	N/A	AN				
AS22759/22-24	Wire (High Strength)	24	N/A	AN				

AN= As Needed

*Competitor Part Numbers

6. TEST SEQUENCES:
The samples shall be subjected to tests in order specified.

Qualification Test Sequences

Test Group 1		
TEST	MIL-DTL-38999 Requirement Paragraph	MIL-DTL-38999 Test Paragraph
Visual and mechanical examination **6X optical inspection**	3.1, 3.3, 3.4, 3.5, 3.52 and 3.53	4.5.1
Insulation resistance at ambient temperature **5000 MΩ @ 500 VDC**	3.14.1	4.5.10.1
Dielectric withstanding voltage at sea level **Less than 2 milli-amperes @ 500 VAC**	3.15	4.5.11.1
Shell-to-shell conductivity **Less than 100 millivolt drop at 1 amp**	3.29	4.5.25
Salt spray (Static test) **48 hr exposure, unmated**	3.17	4.5.13.1
Shell-to-shell conductivity **Less than 100 millivolt drop at 1 amp**	3.29	4.5.25
Low Level Contact Resistance **20 milli-ohms Max (20mV max and 100mA max)**	See EIA-364-13B	
Contact Resistance **45mV Max voltage drop @ 3A**	See EIA-364-06	
Post test examination **6X optical inspection**	3.52 and 3.53	4.5.49

Test Group 2		
TEST	MIL-DTL-38999 Requirement Paragraph	MIL-DTL-38999 Test Paragraph
Visual and mechanical examination **6X optical inspection**	3.1, 3.3, 3.4, 3.5, 3.52 and 3.53	4.5.1
Temperature Cycling (Shock) **-65C to +150C, 5 cycles**	3.8	4.5.4
Insulation resistance at Elevated temperature **1,000 MΩ @ 500VDC & 150C**	See EIA-364-21	
Dielectric withstanding voltage at altitude **Less than 2 milli-amperes@100VAC & 40,000ft**	See EIA-364-20	
Durability **50 Cycles**	3.12	4.5.8
Vibration **37.8g RMS , 30g Sine**	3.27	4.5.23.2
Shock **300 G half-sine, 3 millisecond duration, 3 pulses in each direction of 3 axes (18 pulses), no discontinuities greater than1 micro-second.**	3.28	4.5.24.1
Humidity **10 days of 100% humidity cycles**	3.30	4.5.26
Insulation resistance at ambient temperature **5000 MΩ @ 500 VDC**	3.14.1	4.5.10.1
Dielectric withstanding voltage at sea level **Less than 2 milli-amperes @ 500 VAC**	3.15	4.5.11.1
Low Level Contact Resistance **20 milli-ohms Max (20mV max and 100mA max)**	See EIA-364-13B	
Contact Resistance **45mV Max voltage drop @ 3A**	See EIA-364-06	
Post test examination **6X optical inspection**	3.52 and 3.53	4.5.49

Tested and passed to 500 cycles on separate test plan

Test Group 3		
TEST	MIL-DTL-38999 Requirement Paragraph	MIL-DTL-38999 Test Paragraph
Visual and mechanical examination **6X optical inspection**	3.1, 3.3, 3.4, 3.5, 3.52 and 3.53	4.5.1
Sand and Dust **MIL- STD-810F, Method 510.4**	See MIL-STD-810F	
Post test examination **6X optical inspection**	3.52 and 3.53	4.5.49

7.0 SAMPLE PREPARATION/DEFINITION:

7.1 Group 1-Sample Breakdown

Two mated pairs of each connector size shall be prepared with two foot lengths of AS22759/11-24 wire.
Two mated pairs of Amphenol/Competitor Connectors, each connector size shall be prepared with two foot lengths of AS22759/11-24 wire. (Amphenol Plug-Competitor Receptacle, Amphenol Receptacle-Competitor Plug)

Part Number	Description	QTY	Size
F2-678821-07P	Plug	3	6
F2-678851-07S	Receptacle	3	6
F9-678824-19S	Plug	3	9
F9-678854-19P	Receptacle	3	9
F7-678827-55S	Plug	3	14
F7-678857-55P	Receptacle	3	14
803-002-06ZNU6-7PN	Plug	1	6
803-004-02ZNU6-7SN	Receptacle	1	6
803-002-06NF9-19SN	Plug	1	9
803-004-02NF9-19PN	Receptacle	1	9
803-002-06MT14-55SN	Plug	1	14
803-004-02MT14-55PN	Receptacle	1	14
F2-696904-006	Backshell	4	6
F9-696904-009	Backshell	4	9
F7-696904-014	Backshell	4	14
2M809-002	Socket	243	23
2M809-001	Pin	243	23
AS22759/11-24	Wire	AN	24
*AFM8 or similar	Crimp Tool	N/A	N/A
*K1461	Crimp Positioner	N/A	23

AN=As needed
*Crimp tool and crimp positioner are Daniels part numbers

7.2 Group 2-Sample Breakdown

Two mated pairs of each connector size shall be prepared with four foot lengths of AS22759/22-24 wire.
Two mated pairs of Amphenol/Competitor Connectors, each connector size shall be prepared with four foot lengths of AS22759/22-24 wire. (Amphenol Plug-Competitor Receptacle, Amphenol Receptacle-Competitor Plug)

*Samples in this group must use high strength wire only.

Part Number	Description	QTY	Size
F2-678821-07P	Plug	3	6
F2-678851-07S	Receptacle	3	6
F9-678824-19S	Plug	3	9
F9-678854-19P	Receptacle	3	9
F7-678827-55S	Plug	3	14
F7-678857-55P	Receptacle	3	14
803-002-06ZNU6-7PN	Plug	1	6
803-004-02ZNU6-7SN	Receptacle	1	6
803-002-06NF9-19SN	Plug	1	9
803-004-02NF9-19PN	Receptacle	1	9
803-002-06MT14-55SN	Plug	1	14
803-004-02MT14-55PN	Receptacle	1	14
F2-696904-006	Backshell	4	6
F9-696904-009	Backshell	4	9
F7-696904-014	Backshell	4	14
2M809-001	Pin	243	23
2M809-002	Socket	243	23
AS22759/22-24	HS Wire	AN	24
*AFM8 or similar	Crimp Tool	N/A	N/A
*K1461	Crimp Positioner	N/A	23

AN=As needed
*Crimp tool and crimp positioner are Daniels part numbers

7.3 Group 3-Sample Breakdown

Two mated pairs of each connector size shall be prepared with two foot lengths of AS22759/11-24 wire.
Two mated pairs of Amphenol/Competitor Connectors, each connector size shall be prepared with two foot lengths of AS22759/11-24 wire. (Amphenol Plug-Competitor Receptacle, Amphenol Receptacle-Competitor Plug)

Part Number	Description	QTY	Size
F2-678821-07P	Plug	3	6
F2-678851-07S	Receptacle	3	6
F9-678824-19S	Plug	3	9
F9-678854-19P	Receptacle	3	9
F7-678827-55S	Plug	3	14
F7-678857-55P	Receptacle	3	14
803-002-06ZNU6-7PN	Plug	1	6
803-004-02ZNU6-7SN	Receptacle	1	6
803-002-06NF9-19SN	Plug	1	9
803-004-02NF9-19PN	Receptacle	1	9
803-002-06MT14-55SN	Plug	1	14
803-004-02MT14-55PN	Receptacle	1	14
F2-696904-006	Backshell	4	6
F9-696904-009	Backshell	4	9
F7-696904-014	Backshell	4	14
2M809-001	Pin	243	23
2M809-002	Socket	243	23
AS22759/22-24	HS Wire	AN	24
*AFM8 or similar	Crimp Tool	N/A	N/A
*K1461	Crimp Positioner	N/A	23

AN=As needed
*Crimp tool and crimp positioner are Daniels part numbers

8.0 Testing Matrix

Amphenol or Competitor Test Plan Part Number	**Competitor Test Plan 91906188**			**Amphenol QTP L-40991-242 Rev E**		
Product	**Competitor 803 Series**			**Amphenol 2M803 Series**		
	Test Group			**Test Group**		
	1	**2**	**3**	**1**	**2**	**3**
Test Group Summary	**Salt Spray**	**Vibe, Shock**	**Sand & Dust**	**Salt Spray**	**Vibe, Shock**	**Sand & Dust**
	+Test Sequence			**+Test Sequence**		
Visual and Mechanical Examination	1	1	1	1	1	1
Insulation resistance at ambient temperature	2	3		2	9	
Dielectric withstanding voltage at sea level	3	4		3	10	
Durability (50 cycles)		5			5	
Shell to shell conductivity	4,6			4,6		
Electrical Engagement	7					
Salt Spray	5			5		
Temperature Cycling		2			2	
***Insulation Resistance at Elevated Temperature**					3	
***Dielectric Withstanding Voltage at Sea Level**					4	
Vibration		6			6	
Shock		7			7	
Humidity		8			8	
***Low Level Contact Resistance**				7	11	
***Contact Resistance**				8	12	
Sand and Dust			2			2
Post Test Examination	8	9	3	9	13	3
Results or Scheduled Completion Date	**N/A**	**N/A**	**N/A**	**Passed**	**Passed**	**Passed**

***Testing not completed in Competitor's Test Plan**

+Numbers shown in Test Sequence detail the order in which tests were completed in each group.