NICOMATIC R&D LABORATORY	QUALIFICATION TEST REPORT	QTR18009a
EMM SERIE ACCORDING TO MIL-DTL-83513G STANDARD		Page : 1 /14
		Qualification status : PASSED

Dielectric Withstanding Voltage (Initial)

According to MIL-DTL-83513G §3.5.4, 4.5.6 and EIA-364-20C test procedure

ISSUE	MODIFICATION	VISA	DATE
a	Original Issue	AJ	21/05/18
b			
c			

	Name	Duty	Date	Visa
Written by	A.JAGHMIM	Test & Measurement Manager	18/05/18	AJ
Test Operator(s)	A.JAGHMIM	Test & Measurement Manager	18/05/18	AJ
Checked by	J.RIGAT	Project Manager	18/05/18	JR
Approved by	C.CHIFFARD	Product Manager	18/05/18	CC
Requested by	J.RIGAT	Project Manager	18/05/18	JR

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1 Conclusion

The EMM connectors are **qualified** regarding Dielectric Withstanding Voltage (Initial) according to MIL-DTL-83513G standard.

2 Technical Features Proposal

Maximum Voltage for EMM Connectors:
- @ Sea Level (1013 mbar) : BV = 100 V RMS / DWV = 750 V RMS / RV = 250 VRMS
- @ 30 000 ft (301 mbar) : BV = 720 V RMS / DWV = 540 V RMS / RV = 180 VRMS
- @ 50 000 ft (116 mbar) : BV = 660 V RMS / DWV = 495 V RMS / RV = 165 VRMS
- @ 70 000 ft (44 mbar) : BV = 640 V RMS / DWV = 480 V RMS / RV = 160 VRMS
- @ 100 000 ft (11 mbar) : BV = 620 V RMS / DWV = 465 V RMS / RV = 155 VRMS

3 Connate Reports

R-ADE-PMN-17-300962-2 A DRAFT (1).pdf

4 Information about the tests

4.1 Object

The object of this test is to qualify the EMM connectors regarding Dielectric Withstanding Voltage at sea level according to MIL-DTL-83513G standard. 1st we will test Breakdown Voltage to define Withstanding Voltage value.

4.2 Reference documents/Qualification Plan

- MDC.P16020.a
- MIL-DTL-83513G
- EIA-364-20C

4.3 Tested Products

Designation	Article Reference*	Drawing issue*	Batch / DI*	Quantity
C18892-30 (Female, Straight on PCB, E60 guiding)	C18892-30	na	DI7576	20
C18900-30 (Female Straight on PCB, E50)	C18900-30	na	DI7577	20
C18891-30 (Male, Straight on PCB, E10)	C18891-30	na	DI7579	20
C18904-30 (Male, 90° on PCB, E11 guiding)	C18904-30	na	DI7578	20
C18893-30 (Female, 90° on PCB, E61 guiding)	C18893-30	na	DI7580	20
C18901-30 (Female, 90° on PCB, E51 jackscrew)	C18901-30	na	DI7581	20
C18981-30-0250 (Male, on cable AWG30, E01 jackscrew)	C18981-30-0250	na	DI7592	20
C18980-30-0250 (Male, on cable AWG28, E01 jackscrew)	C18980-30-025	na	DI7591	20
C18902-30-0250 (Male, on cable AWG26, E01 jackscrew)	C18902-30-0250	na	DI7588	20
C18979-30-0250 (Male, on cable AWG24, E01 jackscrew)	C18979-30-0250	na	DI7589	20
C18902-30-0250-BP (Male, on cable AWG26, E01 jackscrew BP)	C18902-30-0250-BP	na	DI7586	20
18224-AWG24	18224-AWG24	na	DI7594	25
18224-AWG26	18224-AWG26	na	DI7596	25
18240-AWG28	18240-AWG28	na	DI7597	25
18240-AWG30	18240-AWG30	na	DI7598	25

4.4 Persons present during the tests

Name	Duty
A.JAGHMIM	Test & Measurement Manager

4.5 Date and place of the tests

Adetests Lab. from 11/01/18 to 05/02/18

4.6 Environmental conditions

Ambient temperature: ambient
Pressure: test condition
Humidity: ambient

4.7 Incidents during the test

None

4.8 Test Equipments

Designation	Calibration Data	
DIELECTRIMETER CT54	**Last calibration date**	20/07/17
	Next calibration date	20/07/19

Designation	Calibration Data	
Recorder SEFRAM type DAS240 N°12710	**Last calibration date**	19/12/16
	Next calibration date	19/02/19

4.9 Test Tooling

Designation	Tooling reference

5 Requirements

Mated or unmated connectors shall show no evidence of breakdown or flashover when subjected to the test voltages and altitude in table I. Corona shall not be considered as specified in 4.5.6 (of MIL-STD-83513G standard).

TABLE I. Test voltage (rms 60 hertz ac volts). 1/

	All classes and types initial	After humidity types I and II	
		Class M	Class P
Sea level	600	360	100
70,000	150	---	---

1/ These are not working voltages.

We will use :
- BV = Breakdown Voltage
- DWV = Dielectric Withstanding Voltage
- RV = Rated Voltage

We will also use EIA-364-20 calculation rules do determine DWV from BV and RV form DWV

Annex A

A Normative

A.1 The test consists of the application of a voltage higher than rated voltage for a specific time between mutually insulated portions of a connector or between insulated portions and ground. For purposes of standardization, the withstanding voltage shall be established as 75% of the minimum breakdown voltage of the connector, and it is suggested that the operating rated voltage of the connector be established as 1/3 of the withstanding voltage.

DWV = 0.75 * BV
RV = DWV / 3

6 Test Procedure

6.1 Test procedure according to MIL-DTL-83513G

6.1.1 Sea level

Mated or unmated connectors shall be tested in accordance with test procedure EIA-364-20. The applicable test voltage specified in table I shall be applied between all adjacent contacts and between the shell and each peripheral contact of type M only. Requirements shall be as specified in 3.5.4 (of MIL-STD-83513G standard). For group A inspection testing, voltage shall be applied for a minimum of 10 seconds.

6.1.2 Altitude

The connectors shall be tested in accordance with test procedure EIA-364-20, with altitude pressure of 35.5 torr, at the simulated altitude of 70,000 feet. All other requirements are specified in 6.1.1

6.2 Test procedure according to EIA-364-20C

6.2.1 Barometric pressure (at sea level)

Sea level. Mated or unmated connectors shall be tested in accordance with test procedure EIA-364-20. The applicable test voltage specified in table I shall be applied between all adjacent contacts and between the shell and each peripheral contact of type M only. Requirements shall be as specified in 3.5.4. For group A inspection testing, voltage shall be applied for a minimum of 10 seconds.

6.2.2 Reduced barometric pressure

The connectors or coaxial contacts shall be mounted in the test chamber as specified and the pressure reduced to the value indicated in one of the test conditions in table 1, as specified. While the connectors or coaxial contacts are maintained at the specified pressure, and after sufficient time has been allowed for all entrapped air in the chamber to escape, the connectors or the coaxial contacts shall be subjected to the specified tests.

Table 1 - Test conditions

Test conditions	Barometric pressure		Altitude [1]	
	Inches of mercury	mm of mercury	Feet	Meters
I	27 to 31	685 to 785	Sea level	Sea level
II	8.90 maximum	226 maximum	30,000	9,144
III	3.44 maximum	87 maximum	50,000	15,240
IV	1.31 maximum	33 maximum	70,000	21,336
V	0.315 maximum	8 maximum	100,000	30,480
VI	5.11×10^{-8} maximum	1.3×10^{-6} maximum	656,000	199,949
VII	17.3 maximum	439 maximum	15,000	4,572
VIII	0.043 maximum	1.09 maximum	150,000	45,720

NOTE

1) Altitude is given as a reference only and should not be specified without barometric pressure as a test requirement.

6.2.3

Specimens shall be subjected to a test voltage of the magnitude and nature (ac or dc) specified.

6.2.4 Rate of application

The test voltage shall be raised from zero to the specified value as uniformly as possible, at a rate of approximately 500 volts (rms or dc) per second, unless otherwise specified. At the option of the manufacturer, the test voltage may be applied instantaneously during inplant quality conformance testing.

6.2.5 Duration of application

Unless otherwise specified, the test voltage shall be maintained at the specified value for a period of 60 seconds. Unless otherwise specified, for inplant quality conformance testing the time may be reduced to 5 seconds minimum. Upon completion of the test, the test voltage shall be gradually reduced to avoid voltage surges. At the option of the manufacturer, the test voltage may be removed instantaneously during inplant conformance testing.

6.2.6 Calculation rules

For purposes of standardization, the withstanding voltage shall be established as 75% of the minimum breakdown voltage of the connector, and it is suggested that the operating rated voltage of the connector be established as 1/3 of the withstanding voltage.

7 Test setup

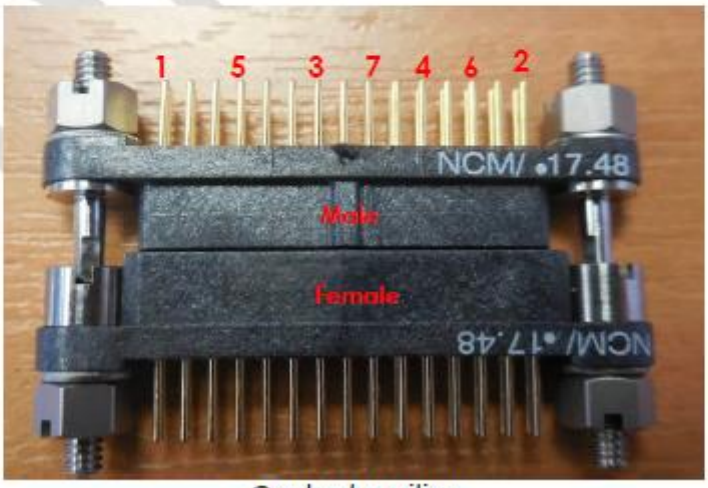
Tests are done by ADETESTS (See test report R-ADE-PMN-17-300962-2 A DRAFT (1).pdf)

The connectors are placed in the vacuum enclosure and voltage is increase on each contact couple tested until the breakdown voltage is reached.



Example of connector installation

The measurement is performed for the contact couple 1 to 7.



Contact position

8 Measurements results

Tests are done by ADETESTS (See test report R-ADE-PMN-17-300962-2 A DRAFT (1).pdf)

8.1 Resume

Minimum Value Measured	@ Sea Level (1013 mbar)	@30 000 ft (301 mbar)	@50 000 ft (116 mbar)	@ 70 000 ft (44 mbar)	@ 100 000 ft (11 mbar)
Breakdown Voltage	1010	720	730	690	680
Dielectric Withstanding Voltage	757.5	540	547.5	517.5	510
Rated Voltage	252.5	180	182.5	172.5	170

8.2 C18891-30 + C18892-30

C18891-30 + C18892-30					
Between Contact N°	Breakdown Voltage (V RMS)				
	@ Sea Level (1013 mbar)	@30 000 ft (301 mbar)	@50 000 ft (116 mbar)	@ 70 000 ft (44 mbar)	@ 100 000 ft (11 mbar)
1-16	1100	-*	-*	-*	-*
5-20	1360	-*	870	760	870
7-22	1420	720	840	-*	-*
9-24	1290	-*	820	800	860
11-26	1290	750	840	780	840
13-28	1380	740	830	780	820
15-30	1280	730	740	770	840
Min	**1100**	**720**	**740**	**760**	**820**
Max	1420	750	870	800	870
Average	1303	735	823	778	846

-* Means that the measure was done between contacts already used, that create a leakage current @ a lower value.

8.3 C18891-30 + C18893-30

C18891-30 + C18893-30					
Between Contact N°	Breakdown Voltage (V RMS)				
	@ Sea Level (1013 mbar)	@30 000 ft (301 mbar)	@50 000 ft (116 mbar)	@ 70 000 ft (44 mbar)	@ 100 000 ft (11 mbar)
1-16	1010	1540	890	800	860
5-20	1150	1520	880	800	880
7-22	1530	1500	880	790	840
9-24	1320	1500	870	800	860
11-26	1400	1470	900	800	860
13-28	1400	1530	890	820	870
15-30	1310	1540	900	810	860
Min	**1010**	**1470**	**870**	**790**	**840**
Max	1530	1540	900	820	880
Average	1303	1514	887	803	861

8.4 C18904-30 + C18893-30

C18904-30 + C18893-30					
Between Contact N°	Breakdown Voltage (V RMS)				
	@ Sea Level (1013 mbar)	@30 000 ft (301 mbar)	@50 000 ft (116 mbar)	@ 70 000 ft (44 mbar)	@ 100 000 ft (11 mbar)
1-16	1350	940	850	800	880
5-20	1250	940	850	790	880
7-22	1450	900	820	780	870
9-24	1240	950	870	800	880
11-26	1280	890	870	780	870
13-28	1250	930	850	800	840
15-30	1390	950	860	780	860
Min	**1240**	**890**	**820**	**780**	**840**
Max	1450	950	870	800	880
Average	1316	929	853	790	869

8.5 C18901-30 + C18979-30-0250

C18901-30 + C18979-30-0250					
Between Contact N°	Breakdown Voltage (V RMS)				
	@ Sea Level (1013 mbar)	@30 000 ft (301 mbar)	@50 000 ft (116 mbar)	@ 70 000 ft (44 mbar)	@ 100 000 ft (11 mbar)
1-16	1140	800	750	710	830
5-20	1120	940	730	710	820
7-22	1250	800	760	710	820
9-24	1230	820	760	720	820
11-26	1210	790	820	710	810
13-28	1030	780	740	790	810
15-30	1150	750	730	710	800
Min	**1030**	**750**	**730**	**710**	**800**
Max	1250	940	820	790	830
Average	1161	811	756	723	816

8.6 C18900-30 + C18979-30-0250

C18900-30 + C18979-30-0250					
Between Contact N°	Breakdown Voltage (V RMS)				
	@ Sea Level (1013 mbar)	@30 000 ft (301 mbar)	@50 000 ft (116 mbar)	@ 70 000 ft (44 mbar)	@ 100 000 ft (11 mbar)
1-16	1120	810	750	710	830
5-20	-*	770	730	760	680
7-22	1210	790	740	720	810
9-24	1210	820	810	710	810
11-26	1130	730	790	770	810
13-28	-*	-	800	690	800
15-30	1080	750	740	710	800
Min	**1080**	**730**	**730**	**690**	**680**
Max	1210	820	810	770	830
Average	1150	778	766	724	791

-* Means that the measure was done between contacts already used, that create a leakage current @ a lower value.

9 Visual Inspection

Required by the applicable standard ?			
YES		NO	☐

**********END OF REPORT**********

10 APPENDIX

Internal use only ?			
YES	☒	NO	☐

10.1 The Laboratory Advice

10.2 Pictures

**********END OF APPENDIX**********