ENGINEERING REPORT		REPORT NO. **C1-1168**	
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Amphenol Corporation	Amphenol Aerospace Operations	Sidney, New York 13838-1395	
TITLE: **R-VME64x QUALIFICATION**		REPORT TYPE: Qualification	

Introduction: R-VME64x QUALIFICATION BACKPLANE/MODULE CONNECTORS TO BS-VME64x-AA rev. PA8 SPECIFICATION.

MODULE CONNECTOR: 10-509400-001
BACKPLANE CONNECTOR: 10-509412-0( )
Previously L-39887-373

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REFERENCES

1) Amphenol Engineering Report Qualification VME64X #ER-8737
2) Amphenol BS-VME64x-AA Rev. PA7 Amphenol Rugged VME64x Connector Specification
3) VITA ANSI/VITA 1.1-1997 VME64x Specification
4) ANSI/EIA-364 Test Methods For Electronics And Electrical Components Parts
5) MIL-STD-1344A Test Methods For Electrical Connectors
6) MIL-C-55302E General Specification For Printed Circuit Subassemblies And Accessories Connectors
7) MIL-STD-202G Test Methods For Electronics and Electrical Component Parts
8) 10-509400-001 Standard VME64x Configuration Omits Row Z of P0 Bay and has ESD Protection
9) 10-509410-0( ) Standard VME64x Configuration Omits Row Z of J0 Bay uses Hyperboloid Contact
10) L-39887-373 Standard VME64x Configuration Omits Row Z of J0 Bay uses Skeeter Contact
11) Amphenol Lab Book ECL 0769 pages 15 to 23 and 25 to 36

1.0 PURPOSE

This testing was done to qualify two piece printed circuit board type rectangular connectors with pin and socket contacts. The connectors are compatible with the standard VME64x footprint, as described in **VITA ANSI/VITA 1.1-1997 VME64x Specification.**

2.0 BACKGROUND

Each sample is made up of a mated pair of connectors (Module and Backplane) mounted on test circuit boards. The Module connectors contain male contacts with printed circuit board stud terminals positioned 90? to the engagement axis. These connectors mount directly to printed circuit boards and are intermateable with Backplane connectors. Backplane connectors contain female contacts with round printed circuit board studs. These connectors mount directly to printed circuit boards and are intermateable with the Module series connectors.

3.0 CONCLUSIONS

The module connector and backplane connector successfully met the qualification requirements of the BS-VME64x-AA rev. PA8 connector specification. Table 1 provides an overview of the requirements that were met.

3.0 CONCLUSIONS – cont.

Table 1 Summary of Connector Qualification test results

Sample	Test/Inspection	Pass/Fail	R-VME64x Requirement
Group 1	Visual and Mechanical Inspection 10X	Pass	
	Low Level Contact Resistance	Pass	20 mO max.
	Contact Resistance	Pass	20 mO max.
	Dielectric Withstanding Voltage at Sea Level	Pass	100 V.AC. @ 60 Hz
	Insulation Resistance	Pass	1 Gig ohm
	Electrostatic Discharge (ESD) 25,000V	Pass	Atten. to <40V
	Mating and Unmating Forces	Pass	0.25 pound/contact Max. 0.04 pound/contact Min.
Group 2	Dielectric Withstanding Voltage at 70,000 ft	Pass	100 V.AC. @ 60 Hz
	Contact Life	Pass	500 mating cycles
	Mating and Unmating Forces	Pass	0.25 pound/contact Max. 0.04 pound/contact Min.
	Low Level Contact Resistance	Pass	20 mO max.
	Vibration 15 g peak max.	Pass	No elec. discont. > 1 µs
	Shock 100 g max.	Pass	No elec. discont. > 1 µs
	Low Level Contact Resistance	Pass	20 mO max.
	Contact Resistance	Pass	20 mO max.
	Mating and Unmating Forces	Pass	0.25 pound/contact Max. 0.04 pound/contact Min.
	Salt Atmosphere 500 hours	Pass	
	Low Level Contact Resistance	Pass	20 mO max.
	Contact Resistance	Pass	20 mO max.
	Visual and Mechanical Inspection 10X	Pass	
Group 3	Temperature Cycling	Pass	
	Mating and Unmating Forces	Pass	0.25 pound/contact Max. 0.04 pound/contact Min.
	Humidity	Pass	1 Gig ohm
	Low Level Contact Resistance	Pass	20 mO max.
	Visual and Mechanical Inspection 10X	Pass	
	Temperature Difference	Pass	20 C below ambient, 40 C above ambient
Group 4	Solderability	Pass	95% coverage
	Resistance to Soldering Heat	Pass	260 C wave for 20 sec.
	Visual and Mechanical Inspection 10X	Pass	
	Interchangeability	Pass	
	Mating and Unmating Forces	Pass	0.25 pound/contact Max. 0.04 pound/contact Min.

3.0 CONCLUSIONS – cont.

Table 1 Summary of Connector Qualification test results- cont.

Sample	Test/Inspection	Pass/ Fail	R-VME64x Requirement	A	B	C	D	E
Group 5	Capacitance @100MHz	Pass	+/- 0.5 pF	2.8	2.9	3.2	3.4	3.4
	Inductance @100MHz	Pass	+/- 1.5 nH	6.8	8	9.5	10.3	11.2
	Characteristic Impedance	Pass	+/- 3 ohms	51	53	53	53	56
	Propagation Delay	Pass	+/- 7 ps	130	140	150	155	170
	Signal Skew, adjacent row	Pass	+/- 3 ps	---	15	8	8	15
			50 ps maximum					
	Crosstalk @ 100 MHz	Pass	DB max.	← 57 → (A–C)				
						← 53 → (C–E)		
	Reflection Factor @ 100MHz	Pass	max.	0.02	0.02	0.03	0.05	0.065
	VSWR @ 100 MHz	Pass	max.	1.04	1.04	1.06	1.12	1.14
	Reflection Loss @ 100 MHz	Pass	dB max.	34	34	30.5	28	24

4.0 SAMPLES

Sample connectors M1 through M7 were mounted to test boards L-39887-444DB (Module) and L-39887-444MB (Backplane) with the contacts soldered. These boards were configured so that, when mated, the contacts in a row of each bay formed a continuous series circuit out to two test points. Group 5 sample set M8 and was mounted to specially designed test boards, L-39887-441DB (Module) and L-39887-441MB (Backplane), to facilitate the measurement of the electrical requirements of the P0/J0 bay.

Table 2 Samples

Sample	Module Connector	Backplane Connector	Group 1	Group 2	Group 3	Group 4	Group 5
M1	**10-509400-001**	**L-39887-373**	**X**	**X**			
M2	**10-509400-001**	**L-39887-373**	**X**	**X**			
M3	**10-509400-001**	**L-39887-373**	**X**		**X**		
M4	**10-509400-001**	**L-39887-373**	**X**		**X**		
M5	**10-509400-001**	**L-39887-373**	**X**				
M6	**10-509400-001**	**L-39887-373**	**X**				
M7	**10-509400-001**	**L-39887-373**	**X**				
M8	**10-509400-001**	**L-39887-373**					**X**
MK	**10-509400-001**	**L-39887-373**				**X**	

5.0 TEST SEQUENCE AND METHODS

5.1 Equipment Used

Table 3 Equipment Used

ID	Cal. In	Cal. Out	Description	Manufacturer	Model
IC 3891	N/A	N/A	Thermal Chamber		
N/A	N/A	N/A	Thermal Chamber	Thermotron	S-1.2C-B
IC 4176	8-8-01	3-1-02	Thermal Shock Chamber	Blue M	
	N/A	N/A	ESD Pulse Gun	EST	930C
IC 3720	12-20-01	12-7-02	Digital Oscilloscope	HP	54512B
	N/A	N/A	Voltage Probe	HP	
F 2569	5-20-02	11-22-02	Humidity Chamber	Blue M	
IC 3773	5-20-02	11-22-02	Chart Recorder	Blue M	
F 1849	4-18-02	1-16-03	Megaohmeter	Megger	
44-94553	N/A	N/A	Switch Box	AAO	
F-1224	8-23-01	8-22-02	AC Supply		
IC 4074	12-5-01	7-18-02	Micro-ohmmeter	Keithley	580
IC 3994	12-5-01	7-18-02	Multimeter	Keithley	2000
IC 3991	1-24-02	7-7-02	Power Supply	HP	6038A
PG-2539	8-13-02	2-12-03	Tensile Tester	Instron	
IC 1998	8-22-01	8-21-02	Pressure Gauge		
E-5564	N/A	N/A	Linear Cycling Machine	AAO	
F-2591	5-28-02	8-28-02	Circuit Monitor	Bendix	L-34122-51
F-2558	N/A	N/A	Shock Machine (Mech.)	AVCO	SM110-MP
F-2686	7-24-02	7-23-03	Oscilloscope, Digital	Tektronics	TDS644
F-2035	3-15-02	9-13-02	Filter, Bandpass	Krohn-Hite	3700
F-1444	5-22-02	11-20-02	Monitor Charge Amplifier	Kistler	504
F-2561	6-25-02	11-12-02	Monitor Accelerometer	Endevco	2252
F-1910	5-21-02	9-06-02	Vibration Shaker	Ling	A-395
F-1910	5-21-02	9-06-02	Power Amplifier	Ling	8008
IC-4105	7-15-02	1-13-02	Digital Vibration Controller	Spect. Dyn.	Puma
F-2376	5-28-02	8-27-02	Circuit Monitor	Bendix	L-34122-51
IC-4158pos	6-25-02	12-23-02	Control Charge Amplifier	U-D	CVA-4
F-2655	6-25-02	11-12-02	Control Accelerometer	Endevco	2271AM20
IC-3833	3-05-02	9-13-02	Salt Spray Chamber		
IC-1180C	5-24-02	5-20-03	Oscilloscope	Tek	1180C
IC-3727	2-12-02	2-13-03	TDR Sampling Head	Tek	SD-24
F-2615	3-15-02	2-14-03	Network Analyzer	HP	4193A

5.2 Testing

Table 4 Summary of the Tests Performed

Group #	Description	R-VME64x Req. ¶	R-VME64x Method ¶	Other Spec.
Group 1	Visual and Mechanical Inspection 10X	3.4-3.4.13	4.4.2	**---**
	Interchangeability	3.4.14	4.4.3	**---**
	Low Level Contact Resistance	3.6.4	4.6.6	**MIL-STD-1344A Method 3002.1**
	Contact Resistance	3.6.1	4.6.3	**MIL-STD-1344A Method 3004.1**
	Contact Retention	3.5.2	4.6.2	**Not Applicable, See 6.1.5**
	Dielectric Withstanding Voltage at Sea Level	3.6.2	4.6.4	**MIL-STD-1344A Method 3001**
	Insulation Resistance	3.6.3	4.6.5	**MIL-STD-1344A Method 3003.1**
	Electrostatic Discharge (ESD) 25,000 VDC	3.6.5	4.6.7	**---**
	Mating and Unmating Forces	3.5.1	4.6.1	**---**
Group 2	Dielectric Withstanding Voltage at 70,000 ft	3.6.2	4.6.4	**MIL-STD-1344A Method 3001**
	Contact Life	3.7.1	4.6.9	**---**
	Mating and Unmating Forces	3.5.1	4.6.1	**---**
	Low Level Contact Resistance	3.6.4	4.6.6	**MIL-STD-1344A Method 2005.1**
	Vibration 15 g peak max.	3.7.2	4.6.10	**MIL-STD-1344A Method 2004.1 Test Condition G**
	Shock 100 g max.	3.7.5	4.6.13	**MIL-STD-1344A Method 3002.1**
	Low Level Contact Resistance	3.6.4	4.6.6	**MIL-STD-1344A Method 3002.1**
	Contact Resistance	3.6.1	4.6.3	**MIL-STD-1344A Method 3004.1**
	Mating and Unmating Forces	3.5.1	4.6.1	**---**
	Salt Atmosphere 500 hours	3.7.3	4.6.11	**MIL-STD-1344A Method 1001**
	Low Level Contact Resistance	3.6.4	4.6.6	**MIL-STD-1344A Method 3002.1**
	Contact Resistance	3.6.1	4.6.3	**MIL-STD-1344A Method 3004.1**
	Visual and Mechanical Inspection 10X	3.4-3.4.13	4.4.2	**---**
Group 3	Temperature Cycling	3.7.4	4.6.12	**MIL-STD-1344A Method 1003**
	Mating and Unmating Forces	3.5.1	4.6.1	**---**
	Humidity	3.7.6	4.6.14	**MIL-STD-1344A Method1002Type II**
	Low Level Contact Resistance	3.6.4	4.6.6	**MIL-STD-1344A Method 3002.1**
	Visual and Mechanical Inspection 10X	3.4-3.4.13	4.4.2	**---**
	Temperature Difference	3.7.9	4.6.17	**---**
Group 4	Solderability	3.7.7	4.6.15	**MIL-STD-202 Method 208**
	Resistance to Soldering Heat	3.7.8	4.6.16	**MIL-STD-202 Method 210 Condition C**
	Visual and Mechanical Inspection 10X	3.4-3.4.13	4.4.2	**---**
	Interchangeability	3.4.14	4.4.3	**---**
	Mating and Unmating Forces	3.5.1	4.6.1	**---**
Group 5	Capacitance @100MHz	3.6.6	4.6.8.1	**EIA-364-108 TP-108**
	Inductance @100MHz	3.6.6	4.6.8.2	**EIA-364-108 TP-108**
	Characteristic Impedance	3.6.6	4.6.8.3	**EIA-364-108 TP-108**
	Propagation Delay	3.6.6	4.6.8.4	**EIA-364-103 TP-103**
	Signal Skew, adjacent row	3.6.6	4.6.8.4	**EIA-364-103 TP-103**
	Crosstalk	3.6.6	4.6.8.5	**EIA-364-190 TP-90**
	Reflection Factor	3.6.6	4.6.8.3	**EIA-364-108 TP-108**
	VSWR	3.6.6	4.6.8.3	**EIA-364-108 TP-108**
	Reflection Loss	3.6.6	4.6.8.3	**EIA-364-108 TP-108**

6.0 Test Results

6.1 Group 1 Results

6.1.1 Visual and Mechanical Examination

Group 1 samples were inspected at 10X and met the requirements of BS-VME64x-AA rev. PA8 sections 3.4 to 3.4.13, No defects were found.

6.1.2 Interchangeability

Mating samples were picked at random. Through qualification process no samples exhibited any degradation of performance due to being non-interchangeable. No failures of visual and mechanical inspection were seen.

6.1.3 Low Level Contact Resistance

All samples were tested on millivolt drop bench, which is a computer controlled test system comprised of a power supply, a micro-ohmmeter, a multimeter and a switch box. The switch box connects the four probe Kelvin clips to either the micro-ohmmeter or the multimeter as well as reverses the polarity of the applied currents. Kelvin clips were held by hand to the solder tail of each of seven contacts per bay per sample. The test current was 100 milliamps with an open circuit voltage of 20 mVDC. All of the samples of Group 1 exhibited less than the specified maximum 20 milliohms of resistance.

6.1.4 Contact Resistance

The test setup was the same as that described in 6.1.3. The test current was 2.5 amps with an open circuit voltage of 1.5 VDC when testing bays P1/J1 and P2/J2. The test current was 1 amp with an open circuit voltage of 1.5 VDC when testing bay P0/J0. All of the samples of Group 1 exhibited less than the specified maximum 20 milliohms of resistance.

6.1.5 Contact Retention

Per BS-VME64x-AA rev. PA8 section 4.6.2 condition d, contact retention was not performed on these samples as their thru hole solder terminations do not require this testing.

6.1.6 Dielectric Withstanding Voltage At Sea Level

Samples were tested on a bench in open air in the mated condition. A high voltage AC supply and a switch box were used. The test boards were designed such that, when mated, the contacts in a row formed a series circuit. Because of this, the test was performed between each row and all other rows, including those in other bays. The shell was tied to ground via alligator clip to a mounting screw head on the module side. The test voltage was 100 VAC 60 Hz for a duration of 60 seconds. All samples showed no fluctuation in readings and no other signs of electrical breakdown such as flashover, buzzing, or leakage current greater than 1 mA on any circuit.

6.1.7 Insulation Resistance

Samples were tested in a like manner to 6.1.6 only using a mega ohmmeter with a switch box. Applied voltage was 100 VDC. All samples exhibited insulation resistance values higher than the required 1 Gig ohm.

6.1.8 Electrostatic Discharge Protection

An electrostatic discharge gun was used to induce electrical discharges into the module side contacts. Test voltages ranged from 500 to 25,000 VDC. The charging capacitor was 100 pF and the resistance probe was 1500 ohms following the human body model. Charge was placed on the probe and then moved toward the module under test until a discharge into the pin being monitored occurred. All samples attenuated the discharge to less than 40 V.

6.1.9 Mating and Unmating Forces

Mating and unmating forces were measured using an Instron tensile tester. Mating forces for Group 1 samples were less than the required 0.25-pound maximum per contact. Unmating forces for Group 1 samples were greater than the required 0.04-pound minimum per contact.

6.2 Group 2 Results

6.2.1 Dielectric Withstanding Voltage At 70,000 Feet

Samples were tested as in 6.1.6 only the samples were in a Plexiglas chamber in which the pressure had been reduced. A vacuum was maintained in the chamber between 20 and 30 mmHg using a vacuum pump and reservoir tank. Parts were presoaked in vacuum for one hour before test voltage was applied. All group 2 samples showed no indication of breakdown such as supply meter fluctuation, buzzing, flashover, or breakdown current greater than 1 mA.

6.2.2 Contact Life

Group 2 samples were fixtured in a linear cycling machine. The backplane side was mounted first. Then the module side was mounted to the fixed bar after alignment to the backplane module. The fixed bar was then adjusted along with the throw adjustment to ensure a full mate/unmate cycle. Full mate and unmate cycle was verified visually and by continuity check. Speed was set to 500 cycles/hr. A 10x visual inspection revealed some minor plating burnishing, which was considered typical and acceptable.

6.2.3 Mating and Unmating Forces

Mating and unmating forces were measured using an Instron tensile tester. Mating forces for Group 2 (Post contact life) samples were less than the required 0.25-pound maximum per contact. Unmating forces for Group 2 samples were greater than the required 0.04-pound minimum per contact.

6.2.4 Low Level Contact Resistance

Low level contact resistance was performed as in 6.1.3. All samples showed almost no change in resistance and all were well below the 20 milliohm maximum.

6.2.5 Vibration

Both the module and backplane test boards were cut down in size to facilitate a better fit into the vibration fixture and to cut down on side loading. Twenty gauge wire was soldered in the test vias of the module test boards so that the rows of the sample formed a large series circuit for discontinuity monitoring. The discontinuity monitor trip level was set for one microsecond. In summary, all Group 2 samples met the requirements of BS-VME64x-AA rev. PA8. There were no discontinuities greater than one microsecond. There was no disengagement or loosening of any parts during the test. Post visual inspection at 10X showed no physical damage to the connector body or the contacts that would be detrimental to performance.

6.2.6 Shock

Group 2 samples were attached to the mechanical shock tester by the same fixtures as for the vibration testing of 6.2.5. The same discontinuity monitor was used with it's trip level set to 1 microsecond. In summary, all Group 2 samples met the requirements. There were no discontinuities greater than one microsecond. There was no disengagement or loosening of any parts during the test. Post visual inspection at 10X showed no physical damage to the connector body or the contacts that would be detrimental to performance.

6.2.7 Low Level Contact Resistance

Low level contact resistance was performed as in 6.1.3. All samples showed almost no change in resistance and all were well below the 20 milliohm maximum.

6.2.8 Contact Resistance

Contact resistance was performed as in 6.1.3. All samples showed almost no change in resistance and all were well below the 20 milliohm maximum.

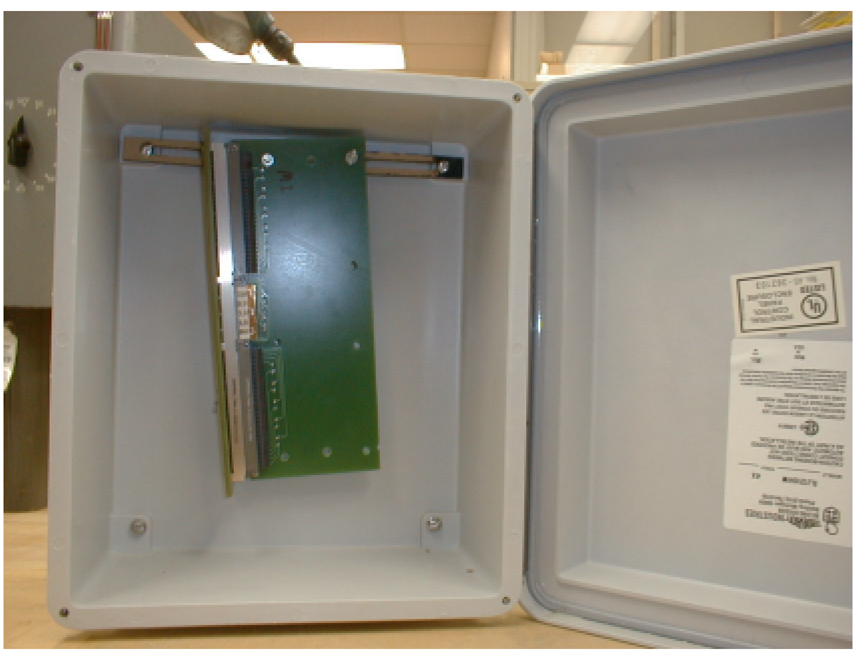
6.2.9 Mating and Unmating Forces

Mating and unmating forces were measured using an Instron tensile tester. Mating forces for Group 2 (post vibration / shock) samples were less than the required 0.25-pound maximum per contact. Unmating forces for Group 2 samples were greater than the required 0.04-pound minimum per contact.

6.2.10 Salt Atmosphere

Samples were each suspended in a NEMA Type 4X electrical enclosure that was 10"wide, 12 " tall and 6" deep. Enclosures had 2, 1/8" diameter holes drilled into the bottom to simulate a typical avionics box environment. After 500 hours suspended in salt atmosphere, enclosures were removed and samples examined. Condensed water droplets and salt deposits were found on each sample. Samples were rinsed in warm tap water and salt deposits were brushed off the circuit boards with a soft bristle brush. The connectors were not unmated. After baking dry in an oven at 50C for one hour, boards were tested for Low Level Contact Resistance, Contact Resistance, and visually inspected.

FIGURE 6 NEMA TYPE 4X ENCLOSURE USED FOR SALT ATMOSPHERE TESTING



6.2.11 Low Level Contact Resistance

Low level contact resistance was performed as in 6.1.3. All samples showed almost no change in resistance and all were well below the 20 milliohm maximum.

6.2.12 Contact Resistance

Contact resistance was performed as in 6.1.3. All samples showed almost no change in resistance and all were well below the 20 milliohm maximum.

6.2.13 Visual and Mechanical Examination

No deformed parts, scratches, corrosion, or other defects other than what was described in section 6.2.2 Contact Life were noted. Parts mated and unmated without difficulty.

6.3 Group 3 Results

6.3.1 Temperature Cycling

Group three samples were placed into the basket of the Thermal Cycling Chamber in the mated condition. Samples were exposed to –65 C to + 125C with less than 5 minute transfer time and one hour dwells for 5 cycles. The samples were not mated and unmated at the temperature extremes during the fifth cycle. Instead a sixth cycle was run where the samples were individually brought down to –65C in the unmated state, then mated and unmated. The samples were then individually brought up to 125 C in the unmated state and again mated and unmated. No difficulties were had performing these mates and unmates. Although not required by the test specification, Low Level Contact Resistance as in section 6.1.3 and Contact Resistance as in section 6.1.4 was performed. All samples were below the requirement of 20 milliohms. No physical damage to the contact was observed.

6.3.2 Mating and Unmating Forces

Mating and unmating forces were measured using an Instron tensile tester. Mating forces for Group 3 samples were less than the required 0.25-pound maximum per contact. Unmating forces for Group 3 samples were greater than the required 0.04-pound minimum per contact.

6.3.3 Humidity

Samples were placed into the humidity chamber in the mated condition with extra long test leads coming out of the chamber. The parts were cycled though the humidity profile called out in section 4.6.14 of the test specification. Initial readings of IR were taken in chamber and then a 100 VDC voltage was applied to every other row with the remaining rows tied to ground. Insulation resistance values met the test specification of 1 gig ohm.

6.3.4 Low Level Contact Resistance / Contact Resistance

The test current was 100 milliamps with an open circuit voltage of 20 mVDC. The samples exhibited less than the required 20 milliohms of resistance. No physical damage to the contact was observed.

6.3.5 Visual and Mechanical Examination

No blistered plating or other corrosion type defects were seen. The inserts were not swelled and the parts mated and unmated without difficulty.

6.3.6 Temperature Difference

The backplane side test boards were mounted to the mating fixture and placed in a temperature chamber where they were cooled 20C below ambient temperature. The backplane samples were then taken out of the chamber and mated to their respective module test sample that was at room ambient. For all samples in Group 3, there was no difficulty in mating and unmating the samples and no observable damage occurred. The backplane side of the samples were mounted to the mating fixture then placed back into the chamber and heated to 40C above ambient. The backplanes were then removed from the chamber and mated to their respective module test sample that was at room ambient. For all samples in Group 3, there was no difficulty in mating and unmating the samples and no observable damage occurred.

6.4 Group 4 Results

6.4.1 Solderability

Solderability samples were subjected to eight hours of steam age, dried, fluxed in R type rosin flux and dipped in Sn/Pb (63/37) solder. The solder pot temperature was maintained at 473°F and the dipping and dwell time was 5 seconds. Solderability of leads on the module and backplane connectors revealed acceptable solderability with solder coverage exceeding 95 percent of the solder area meeting the requirements of MIL-STD-202G, method 208.

6.4.2 Resistance to Soldering Heat

Samples were soldered to test boards per MIL-STD-202G, method 210, test condition C as called out in BS-VME64x-AA rev. PA8. No mechanical damage to the materials making up the connectors was found at 10x magnification.

6.4.3 Visual and Mechanical Examination

No mechanical damage to the materials making up the connectors was found at 10x magnification.

6.4.4 Interchangeability

There was no visual or mechanical damage upon mating and unmating connectors after soldering heat.

6.4.5 Mating and Unmating Forces

Post resistance to soldering heat samples were under than the required 0.25-pound maximum per contact. Unmating forces were greater than the required 0.04-pound minimum per contact..

6.5 Group 5 Results

Group 5 samples were tested at room ambient conditions. Time domain reflectometry techniques were utilized to measure most parameters. In addition, a network analyzer was used to measure the frequency domain parameters. Both samples met test specification requirements. See Appendix A for exact performance.

APPENDIX A

GROUP 5 TEST REPORT

Amphenol Ruggedized P0 Bay High Speed Electrical Characteristics Testing

The subject connector was tested to the high speed electrical characteristics requirements of Amphenol Specification BS-VME64x-AA, rev. PA8.

Results are as follows:

Backplane Connector and Module Connector (L-39887-373 & 10-509400-001):

PARAMETER	CONNECTOR PIN ROW				
	a	**b**	**c**	**d**	**e**
capacitance C (f = 100 MHz)	2.55E-12	2.64E-12	2.78E-12	2.91E-12	2.95E-12
inductance L (f = 100 MHz)	7.16E-09	7.97E-09	8.10E-09	8.80E-09	9.86E-09
characteristic impedance Zo	53.0	54.9	54.0	55.0	57.8
propagation delay	1.35122E-10	1.45054E-10	1.5006E-10	1.60025E-10	1.70549E-10
signal slew		9.93E-12	5.01E-12	9.97E-12	1.05E-11
			maximum 45 ps		
crosstalk (f = 100 MHz))	←	59 dB	→		
			←	54 dB	→
vswr	1.014	1.011	1.04	1.1	1.134
Rho	0.007	0.005	0.02	0.048	0.063
Reflection Loss (dB)	-35.9	-46.1	-35.9	-29.1	-28.9

Notes:

	a to b	**b to c**	**c to d**	**d to e**
Additional Crosstalk Data:	50 dB	50 dB	48 dB	47 dB