Performance Test Report IAW MIL-DTL-810

1 SCOPE

1.1 Scope. This specification covers performance requirements for Glenair Series 80 Mighty Mouse miniature environment resistant circular connectors.

1.2 Description. Series 80 connectors with crimp, rear-release or non-removable printed circuit board contacts, environmental sealing, aluminum and corrosion resistant steel, threaded, bayonet and quick-disconnect coupling. Series 80 connectors with M39029 type contacts are intended for applications where standard MS circular connectors may be too large or too heavy. Interfacial seal and rear grommet provide environmental protection. Beryllium copper contact retention clips. Integral shield termination platform provides direct termination of cable shield to connector without the need for adapters.

Series 800	Threaded coupling, UNF fine threads, shell sizes 5 through 12
Series 801	Double-start stub ACME threaded coupling, shell sizes 5 through 21
Series 802	Threaded coupling, severe environment, dynamic o-ring seal, 316L stainless steel, shell sizes 5 through 21. Rated for continuous immersion at up to 3500 PSI.
Series 803	Bayonet coupling, light to medium duty, shell sizes 5 through 14.
Series 804	Quick-disconnect, shell sizes 5 through 15.
Series 805	Triple-start stub ACME threaded coupling, EMI spring, ratchet anti de-coupling mechanism, shell sizes 8 through 23.

2 APPLICABLE DOCUMENTS

2.1 Industrial Standards.

IAW MIL-DTL-810 or EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

IEC-60512	Electromechanical Components for Electronic Equipment; Basic Testing Procedures and Measuring Methods Part 1: General
IEC-60529	Degrees of protection Provided By Enclosures (IP Code)
IEC 60068	Environmental Testing Part 1: General and Guidance

2.2 Military Standards and Specifications

MIL-STD-810	Test Method Standard for Environmental Engineering Considerations and Laboratory Tests
MIL-DTL-38999	Connectors, Electrical, Circular, Miniature, High Density, Quick Disconnect (Bayonet, Threaded, AND breech Coupling), Environment Resistant, Removable Crimp and Hermetic Solder Contacts, General Specification For

2.3 Aerospace Standards

SAE AS39029	Contacts, Electrical Connector, General Specification For

3 REQUIREMENTS

3.1 Materials

COMPONENT	MATERIALS AND FINISHES
Shell, Barrel, Jam-nut and Coupling Nut	Aluminum Alloy 6061-T6 Code C: black anodize per MIL-A-8625 Code M: electroless nickel per ASTM B-733 Code MT: Nickel fluorocarbon polymer Code NF: Olive drab cadmium per SAE-AMS-QQ-P-416 over electroless nickel Code ZNU: Black zinc nickel over electroless nickel
Shell, Barrel Coupling and Jam-nut	Stainless steel per AMS-QQ-S-763, passivated per SAE-AMS-QQ-P-35
Insulators	High Grade Rigid Dielectric
Contact Retention Clip	Beryllium copper, heat-treated, unplated
Grommet, Peripheral Seal and Interfacial Seal	High performance silicone/fluorosilicone elastomer
Contacts	Copper alloy, 50 microinches gold plated per MIL-DTL-45204 over nickel underplating
Socket Contact Hood	Stainless steel, passivated per AMS-QQ-P-35
Adhesives	Silicone and epoxy
Potting Compound, PCB and Solder Cup Versions	Environmental Connectors: epoxy Waterblocked connectors (Glenair modification code 518): RTV silicone

3.2 Performance requirements.

<table>
<tr><th>DESCRIPTION</th><th>REQUIREMENT</th><th>PROCEDURE</th></tr>
<tr><td>Contact resistance, copper alloy contacts</td><td>SAE AS39029 Table 5
<table>
<tr><th>Wire Size</th><th>Test Current</th><th>Max Voltage Drop</th></tr>
<tr><td>8</td><td>46</td><td>26</td></tr>
<tr><td>10</td><td>33</td><td>33</td></tr>
<tr><td>12</td><td>23</td><td>42</td></tr>
<tr><td>14</td><td>17</td><td>40</td></tr>
<tr><td>16</td><td>13</td><td>49</td></tr>
<tr><td>20</td><td>7.5</td><td>55</td></tr>
<tr><td>22</td><td>5</td><td>73</td></tr>
<tr><td>24</td><td>3</td><td>45</td></tr>
<tr><td>26</td><td>2</td><td>52</td></tr>
<tr><td>28</td><td>1.5</td><td>54</td></tr>
</table></td><td>EIA-364-06
IEC 60512-2-1

Test current in Amperes. Voltage drop in millivolts. Silver-coated copper wire, +25°C.</td></tr>
<tr><td>Low level contact resistance</td><td>SAE AS39029 Table 4
<table>
<tr><th>Wire Size</th><th>Max. Milliohms</th></tr>
<tr><td>16</td><td>5</td></tr>
<tr><td>20</td><td>9</td></tr>
<tr><td>22</td><td>15</td></tr>
<tr><td>24</td><td>20</td></tr>
<tr><td>26</td><td>31</td></tr>
<tr><td>28</td><td>50</td></tr>
</table></td><td>EIA-364-23

25° C</td></tr>
</table>

Mighty Mouse Connectors and Cables

Performance Test Report IAW MIL-DTL-810

<table>
<tr><th>DESCRIPTION</th><th>REQUIREMENT</th><th>PROCEDURE</th></tr>
<tr><td>Insulation resistance</td><td>5000 megohms minimum</td><td>EIA-364-21
IEC-60512-3-1
500 volts DC ± 50 volts. Test between adjacent contacts and contacts to shell.</td></tr>
<tr><td>Dielectric withstanding voltage, sea level

(See 809-099 for combo insert test voltages)</td><td>No breakdown or flashover

#23 contacts 750 volts
#20HD contacts 1000 volts
#16 contacts 1800 volts
#12 contacts 1800 volts</td><td>EIA-364-20
IEC-60512-4-1
AC rms 60 Hz. 2 Sec min. dwell.

Unmated or mated</td></tr>
<tr><td>Dielectric withstanding voltage, 40,000 feet altitude

(See 809-099 for combo insert test voltages)</td><td>No breakdown or flashover

#23 contacts 400 volts
#20HD contacts 400 volts
#16 contacts 1000 volts
#12 contacts 1000 volts</td><td>EIA-364-20
IEC-60512-4-1
AC rms 60 Hz. 2 Sec min. dwell.

mated condition</td></tr>
<tr><td>Current carrying capacity</td><td><table><tr><th>Contact Size</th><th>Current (Amps)</th></tr><tr><td>12</td><td>23</td></tr><tr><td>16</td><td>13</td></tr><tr><td>20</td><td>7.5</td></tr><tr><td>23</td><td>5</td></tr></table></td><td>EIA-364-70 Method 1
IEC-60512-5 Test 9b</td></tr>
<tr><td>Shell-to-shell conductivity, Initial</td><td>The maximum voltage drop across a mated pair shall not exceed the values shown.<table><tr><th>Series</th><th>Voltage Drop (mV)</th></tr><tr><td>800</td><td>5</td></tr><tr><td>801</td><td>5</td></tr><tr><td>802</td><td>5</td></tr><tr><td>804</td><td>2.5</td></tr><tr><td>805</td><td>2.5</td></tr></table></td><td>EIA-364-83
IEC-60512-2-6

Electroless nickel plated connectors.</td></tr>
<tr><td>Shell-to-shell conductivity, after conditioning (48 hours salt spray)</td><td>The maximum voltage drop across a mated pair shall not exceed the values shown.<table><tr><th>Series</th><th>Voltage Drop (mV)</th></tr><tr><td>800</td><td>10</td></tr><tr><td>801</td><td>10</td></tr><tr><td>802</td><td>10</td></tr><tr><td>804</td><td>5</td></tr><tr><td>805</td><td>5</td></tr></table></td><td>EIA-364-83
IEC-60512-2-6

Electroless nickel plated connectors.</td></tr>
</table>

Performance Test Report IAW MIL-DTL-810

DESCRIPTION	REQUIREMENT	PROCEDURE
Shielding effectiveness, low frequency (100MHz-1000 MHz)	**Series 800, 801, 804, 805** Frequency / Min. dB Attenuation 100 MHz 75 200 MHz 70 300 MHz 65 400 MHz 63 800 MHz 58 1000 MHz 55	MIL-DTL-38999 para. 4.5.28.1 Electroless nickel plated connectors
Shielding effectiveness, high frequency (1Ghz-10GHz)	**Series 800, 801, 804** Frequency / Min. dB Attenuation 1 GHz 55 3 GHz 50 6 GHz 45 10 GHz 40 **Series 805** Frequency / Min. dB Attenuation 1 GHz 85 3 GHz 69 6 GHz 66 10 GHz 65	EIA-364-66 IEC-60512-23-3 Electroless nickel plated connectors
Vibration, sine Series 800, 801, 803, 804, 805	No discontinuity of greater than 1 microseconds, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle.	MIL-DTL-38999 30 g's, 3 axes, 4 hours per axis
Vibration, random Series 800, 801, 803, 804, 805	No discontinuity of greater than 1 microseconds, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle.	EIA-364-28 Test Condition V Letter I IEC-60512-6-4 100 milliamp test current 50- 2,000 Hz 37.80 g rms
Gunfire vibration Series 800, 801, 803, 804, 805	No discontinuity of greater than 1 microseconds, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle.	MIL-STD-810 Method 519
Mechanical shock Series 800, 801, 803, 804, 805	No discontinuity of greater than 1 microsecond, no cracking, breaking or loosening of parts, plug shall not become disengaged from receptacle.	EIA-364-27 Condition D IEC-60512-6-3 3 shocks X 3 axes X 2 directions = 18 shocks 2941 m/s2 (300 g's), 3 ms, half-sine

Mighty Mouse Connectors and Cables

Performance Test Report IAW MIL-DTL-810

<table>
<tr><th>DESCRIPTION</th><th>REQUIREMENT</th><th>PROCEDURE</th></tr>
<tr><td>Mechanical durability, at ambient temperature</td><td>No mechanical or electrical defects detrimental to the operation of the connector after the specified number of cycles of mating and unmating.

Series 800, 801, 804
2000 Cycles

805
500 cycles

Series 803
Aluminum alloy 100 cycles
Stainless steel 250 cycles</td><td>EIA-364-09
IEC-60512-5 Test 9a</td></tr>
<tr><td>Solderability, PC tail contacts</td><td>95% solder coverage. Smooth, bright and even finish.</td><td>EIA-364-52 Category 3
IEC-60512-12-1
IEC-68-2-20</td></tr>
<tr><td>Contact retention</td><td><table><tr><th>Contact Size</th><th>Min. Pounds</th><th>Min. Newtons</th></tr><tr><td>23</td><td>6</td><td>27</td></tr><tr><td>20</td><td>15</td><td>67</td></tr><tr><td>20HD</td><td>9</td><td>40</td></tr><tr><td>16</td><td>25</td><td>111</td></tr><tr><td>12</td><td>25</td><td>111</td></tr></table></td><td>EIA-364-29</td></tr>
<tr><td>Contact engaging and separation force</td><td>SAE AS39029 Table 9</td><td>EIA-364-37</td></tr>
<tr><td>Demating force (Series 804)</td><td>Series 804 quick-disconnect connectors<table><tr><th>Contact Arrangement</th><th>Pounds</th></tr><tr><td>5-3</td><td>11</td></tr><tr><td>6-4</td><td>11</td></tr><tr><td>6-7</td><td>12</td></tr><tr><td>7-10</td><td>12</td></tr><tr><td>8-13</td><td>13</td></tr><tr><td>9-19</td><td>14</td></tr><tr><td>10-26</td><td>16</td></tr></table></td><td></td></tr>
</table>

Performance Test Report IAW MIL-DTL-810

DESCRIPTION	REQUIREMENT	PROCEDURE
Insert retention	Unmated connectors shall retain their inserts in their proper location in the shell and there shall be no evidence of cracking, breaking, separation from the shell, or loosening of parts.	EIA-364-35
Residual magnetism	2 µ maximum.	EIA-364-54
ENVIRONMENTAL		
Operating temperature	-65° to +175°C -65° to +200°C Hermetic	
Water immersion, mated	No evidence of water penetration into mated connectors.	MIL-STD-810F Method 512.4 1 meter immersion 1 hour
Ingress protection, open face panel mount receptacles with non-removable printed circuit board or solder cup contacts, with Glenair Modification Code 518 sealing process	IP67	IEC 60529
Humidity	No deterioration which will adversely affect the connector.	MIL-DTL-38999 4.5.26

Shell Size

Series 800 803 804	Series 801	Series 805	Minimum Force in Pounds
5	5		25
6	6	8	25
7	7	9	25
8	8	10	25
9	9	11	25
10	10	12	25
12	13	15	25
14	16	18	40
15	17	19	50
21	23	80	

Performance Test Report IAW MIL-DTL-810

DESCRIPTION	REQUIREMENT	PROCEDURE
Temperature cycling	No mechanical damage or loosening of parts. Following thermal shock, connector shall meet contact resistance, DWV, insulation resistance and shell-to-shell resistance requirements.	EIA-364-32 Test Condition IV IEC-60512-11-4. 5 cycles consisting of -65° C 30 minutes, +25° C 5 minutes max., +150° C 30 minutes, +25° C 5 minutes max.
Salt Spray	No exposure of base metal.	EIA-364-26 IEC 60512-11-6 Code M: 48 hours Code MT: 500 hours Code NF: 500 hours Code ZN: 500 hours Code ZNU: 500 hours
Sand and dust	Mated connectors shall withstand the effects of blowing sand and dust	MIL-STD-810, Method 510
Fungus	Connector materials shall be fungus inert.	MIL-STD-810, Method 508
Fluid immersion	No visible damage from immersion in various fuels and oils. Connector shall meet coupling torque and dielectric withstanding voltage requirements.	EIA-364-10
Altitude immersion	No evidence of moisture on connector interface or contacts. Connector shall meet dielectric withstanding voltage and insulation resistance	EIA-364-03 40,000 feet simulated altitude with additional supplemental potting for all series except 805
Outgassing	ASTM E595 1.0% maximum Total Mass Loss 0.1% maximum Total Collected Volatile Material (Special oven bake or thermal vacuum outgassing is required)	ASTM-E595