Micro-D Specifications

Micro-D Standard Materials and Finishes

Connector Shell, Metal	**Aluminum Alloy 6061 In Accordance With SAE AMS-QQ-A-250/11:** Plating code 1: cadmium with yellow chromate conversion coating in accordance with SAE-AMS-QQ-P-416, Type II, Class 3 Plating code 2: electroless nickel in accordance with ASTM B733 Plating code 4: black anodize in accordance with MIL-A-8625 Type II Class 2 Plating code 5: gold plated in accordance with ASTM B488 over electroless nickel in accordance with ASTM B733-90. Plating code 6: chem film in accordance with MIL-C-5541 Class 3 Plating code 33: nickel-ptfe in accordance with M83513. **Stainless Steel, 300 Series:** Plating Code 3: Passivated In Accordance With SAE AMS 2700
Connector Shell, Plastic	Liquid crystal polymer, 30% glass-filled or polyphenyl sulfide, 40% glass-filled in accordance with MIL-M-24519
Terminal Block, PCB (LCP & PPS)	Liquid crystal polymer, 30% glass-filled or polyphenyl sulfide, 40% glass-filled in accordance with MIL-M-24519
Interfacial Seal	Fluorosilicone rubber in accordance with MIL-R-25988
Pin Contact (TwistPin)	Beryllium copper, gold plated in accordance with ASTM B 488 Type II Class 1.27 (50 Microinches minimum) Code C, over nickel underplate in accordance with SAE AMS-QQ-N-290, class 2, (50-150 microinches).
Socket Contact	Phos bronze in accordance with ASTM 139 gold plated in accordance with ASTM B 488 Type II Class 1.27 (50 Microinches minimum) Code C, over nickel underplate in accordance with SAE-AMS-QQ-N-290, Class 2, (50-150 microinches).
Encapsulant (Potting)	Epoxy resin, hysol EE4215/HD3561
Jackscrews, Jackposts, Float Mounts	Stainless steel, 300 series, passivated in accordance with SAE AMS 2700
Pigtail Wire, Insulated Hookup	Wire Type E: silver-coated copper wire, Extruded PTFE insulation, 600 volts rms, 200°c., In accordance with NEMA HP3 (Replaces MIL-W-16878/4) with SAE AS 22759/11 Wire Type K: Silver-Coated Copper Wire, Extruded PTFE insulation, 60 volts RMS, 200° C., in accordance with SAE AS 22759/11 Wire Type J: high-strength silver-coated copper alloy wire, crosslinked modified ETFE insulation, 600 volts rms, 200° c., In accordance with SAE AS 22759/33
Pigtail Wire, Uninsulated	Wire Finish Code 3: solid copper wire in accordance with A-A-59551, gold-plated, solder dipped in 60/40 tin-lead Wire Finish Code 4: solid copper wire in accordance with A-A-59551, gold-plated

Micro-D Performance Specifications

1 SCOPE

1.1 **Scope.** This specification covers performance requirements for Glenair Micro-D connectors manufactured in accordance with MIL-DTL-83513.

1.2 **Description.** MWDL plastic and MWDM metal shell Micro-D connectors on .050 inch (1.27 mm) centers, with TwistPin contacts.

2 ORDER OF PRECEDENCE

2.1 **Order of precedence.** In the event of a conflict between the requirements of this specification and the references cited herein, this document takes precedence.The requirements set forth in customer specifications and Glenair detail drawings shall take precedence over this document.

3 REQUIREMENTS

3.1 ***Electrical Performance Requirements.***

3.1.1 **Insulation resistance.** 5,000 megohms minimum between any pair of contacts and any contact and the shell when tested in accordance with EIA-364 Procedure 21, which specifies 500 volts DC.

3.1.2 **Dielectric withstanding voltage.**

3.1.2.1 **Dielectric withstanding voltage (sea level).** 600 volts ac, rms 60 Hz. Connectors shall show no evidence of breakdown or flashover when subjected to the DWV test of EIA-364 Procedure 20.

3.1.2.2 **Dielectric withstanding voltage (70,000 feet).** 150 volts ac, rms 60 Hz. Connectors shall show no evidence of breakdown or flashover when subjected to the DWV test of EIA-364 Procedure 20.

3.1.3 **Contact resistance**

3.1.3.1 **Contact resistance (M83513 Group C qualification).** The voltage drop of a mated pair of contacts attached to wires shall not exceed the values shown when tested in accordance with MIL-DTL-83513F Paragraph 4.5.8, using 2.5 amps test current.

Wire	Voltage Drop (mV)
M22759/11-26	65 Maximum
M22759/33-26	75 Maximum
A-A-59551 25 gage	60 Maximum

3.1.3.2 **Contact resistance (lot acceptance testing).** The voltage drop across a mated pair of contacts shall not exceed 8 millivolts when tested in accordance with EIA-364-06, using a test current of one ampere ± 2%. If the connector under test is wired, the calculated resistance across the contacts shall not exceed 8 milliohms when the maximum specified wire resistance per foot is subtracted from the total resistance.

3.1.4 **Low signal level contact resistance.** When tested with a micro-ohmeter using a test current of 100 milliamperes maximum and 20 millivolts open circuit maximum, the resistance of a mated pair of contacts shall be 32

milliohms maximum. Test procedure shall be in accordance with EIA-364-23.

3.1.5 **Contact current capability.** Contacts shall be capable of carrying 3.0 amperes in continuous duty operation from -55° C. to +150° C. when tested in accordance with EIA-364-70.

3.1.6 **Shell-to-shell conductivity.** A mated pair of nickel-plated metal shell Micro-D connectors fitted with an optional grounding spring on the plug shell mating face, shall not exceed 10 millivolts maximum voltage drop when tested in accordance with EIA-364-83.

3.1.7 **Shielding effectiveness.** A mated pair of metal shell Micro-D connectors fitted with an optional grounding spring on the plug shell mating face shall meet a requirement of 65 dB minimum attenuation when tested in accordance with EIA-364-66.

3.1.8 **Magnetic permeability.** Magnetic permeability, when tested in accordance with EIA-364-54, shall not exceed 2 mu.

3.2 ***Mechanical Requirements***

3.2.1 **Contact engaging and separation force.** Maximum engaging force shall be 6.0 ounces when tested in accordance with EIA-364-37, except with a .0221 ± .0001 diameter sleeve with a 6-10 microfinish. Minimum separation force shall be 0.5 ounces when tested in accordance with EIA-364-37, except with a .0230 ± .0001 diameter sleeve with a 6-10 microfinish.

3.2.2 **Connector mating and unmating force.** The maximum mating and unmating force shall not exceed a value equal to 10 ounces times the number of contacts, when tested per EIA-364-13. Mate connectors three times before initial measurements are taken.

3.2.3 **Contact retention.** Contacts, when tested in accordance with EIA-364-29, shall withstand a 5 pound axial load for a minimum of 5 seconds, with a maximum allowable displacement of .005 inch.

3.2.4 **Crimp tensile strength.** Wire shall not break or pull out of crimp joints at less than the specified force when tested in accordance with EIA-364-08.

Wire	Gage	Force in Pounds
M22759/11	24	8
M22759/11	26	5
M22759/11	28	4
M22759/33	24	12
M22759/33	26	10
M22759/33	28	6
M22759/33	30	4

3.2.5 **Insert retention.** Inserts shall not be dislodged or moved from their original position when subjected to an axial load of 50 pounds per square inch when tested in accordance with EIA-364-35

3.2.6 **Resistance to soldering heat.** Connectors with solder cup contacts shall not be damaged following soldering with a 360° C. solder iron for at least 4 seconds in accordance with EIA-364-56 Procedure 1. Connectors with printed circuit board terminations shall withstand immersion in a solder bath for 9-11 seconds at 260° C. when

tested in accordance with EIA-364-56 Procedure 3 Test Condition B. Connectors, after cooling, shall not exhibit damage or warpage when examined at 10X magnification. .

3.2.7 **Solderability.** Solder cup and printed circuit terminals shall meet the solderability requirements of MIL-STD-202 Method 208.

3.2.8 **Durability.** Micro-D connectors shall be capable of 500 cycles of mating with no damage or degradation to electrical performance. Engaging and separation force and mating forces shall not exceed the requirements of 3.2.1 and 3.2.2.

3.3 ***Environmental Requirements***

3.3.1 **Salt spray (corrosion).** Connectors shall show no exposure of base metal due to corrosion when subjected to the salt spray test of EIA-364-26. In addition, connectors shall meet contact resistane, lw circuit level contact resistance and mating force requirements.

Shell material, finish (code)	EIA-364-26 test condition	Duration (hours)
Aluminum, cadmium plating (01)	A	96 (48 for M83513)
Aluminum, electroless nickel plating (02)	B	48
Aluminum, black anodize (04)	B	48
Aluminum, chem film (06)	B	48
Aluminum, gold (05)	B	48
Stainless steel, passivated (03)	D	1000 (48 for M83513)
Nickel, PTFE (33)	T	500 (48 for M83513)

3.3.2 **Fluid immersion.** Connectors shall meet mating force requirements following 20 hours immersion in synthetic lubricating oil and 1 hour immersion in coolanol 25, when tested in accordance with MIL-DTL-83513F paragraph 4.5.18.

3.3.3 **Thermal vacuum outgassing.** The assembled connector mass excluding metallic parts shall not exceed 1.0% total mass loss (TML) or 0.1% total volatile condensible materials (CVCM) when tested in accordance with ASTM E595. **NOTE: the interfacial seal on metal shell MWDM receptacle connectors slightly exceeds the allowable CVCM unless it is specially processed. This is acceptable per MIL-DTL-83513 but may not be permissible for specific space programs.**

Micro-D Performance Specifications

Outgassing properties of Micro-D conponents

Component	Material	Brand Name	%Toatal Mass Loss (TML)	%Collected Volatile Condensable material (CVCM)	Test Report
Thermoplastic Insulators and, PCB Trays	Liquid Crystal Polymer or Polyphenyl Sulfide	Vectra® C-130	0.03	0.00	NASA Test #GSC174 78
Potting Compound	Epoxy	Hysol C9-4215	0.48	0.01	Glenair Test
Interfacial Seal "as received"	Fluorosilicone	(none)	0.99	0.13	Glenair Test
Interfacial Seal with Oven Bakeout 8 hrs. 400° F.	Fluorosilicone	(none)	0.03	0.01	Glenair Test
Interfacial Seal with Thermal Vacuum Bakeout24 hrs. 125° C.	Fluorosilicone	(none)	0.08	0.02	Glenair Test
Wire	Tefzel®	Tefzel®	0.22	0.01	NASA Test #GSC19998

3.3.4 **Thermal shock.** Unmated connectors shall withstand 5 cycles of thermal shock with a minimum temperature of -65° C. and a maximum temperature of 150° C. when tested in accordance with EIA-364-32, Condition IV. Connectors shall not exhibit any detrimental damage or degradation of electrical performance.

3.3.5 ***Humidity***

3.3.5.1 **Humidity, MWDM connectors with interfacial seals.** Wired, mated connectors shall be subjected to humidity conditioning in accordance with EIA-364-31, Test Condition IV. After a minimum of 3 hours of step 7a of the final cycle, and while the connectors are still subjected to high humidity, the insulation resistance shall be measured when the chamber temperature reaches 20° ± 5° C. Insulation resistance shall not be less than 100 megohms, and connectors shall pass a DWV test of 360 volts (rms 60 hertz ac).

3.3.5.2 **Humidity, MWDL plastic connectors without interfacial seals.** Wired, mated connectors shall be subjected to humidity conditioning in accordance with EIA-364-31, Test Condition IV. On completion of step 6 of the final cycle, connectors shall be removed from the chamber, unmated and surface moisture removed. Connectors shall meet 1 megohm minimum and shall pass a DWV test of 100 volts (rms 60 hertz ac).

3.3.6 **Vibration (sine).** Connectors, when mated, wired in series and fixtured in accordance with MIL-DTL-83513F, shall not exhibit any discontinuity longer than 1 microsecond when tested in accordance with EIA-364-28 Test Condition IV, which specifies 12 hour duration, 10 Hz to 2000 Hz, and amplitude of 20 g_n peak. Connectors shall not be damaged and no loosening of parts shall occur.

3.3.7 **Shock.** Connectors, when mated, wired in series and fixtured in accordance with MIL-DTL-83513F, shall not exhibit any discontinuity longer than 1 microsecond when tested in accordance with EIA-364-27, Test Condition E, which specifies an amplitude of 50 g peak. Connectors shall not be damaged and no loosening of parts shall occur.

3.3.8 **Marking Permanency.** Connector marking shall meet the requirements of MIL-STD-202 Method 215.

3.3.9 **Fungus resistance.** Connector materials shall meet the requirements of MIL-STD-810 Method 508.5.