

Materials and Finishes Performance Specification

HIGH-SPEED MICRO-D PERFORMANCE SPECIFICATION

GLENAIR HIGH-SPEED MICRO-D MATERIALS AND FINISHES	
Connector Shell	Aluminum alloy 6061 in accordance with SAE AMS-QQ-A-200/8 or SAE-AMS4027 • Plating code 2: electroless nickel in accordance with ASTM B733 or SAE-AMS2404 • Plating code 5: gold plated in accordance with ASTM B488 over electroless nickel in accordance with ASTM B733-90
Insulator	Unfilled polyphenylene sulfide (PPS) Fortron 1200L1 or equivalent
Flange Seal	Fluorosilicone rubber in accordance with MIL-R-25988
Pin contact	Suitable copper alloy, gold plated in accordance with ASTM B488, Type II, Class 1.27 (50 micro inches minimum), Code C, over nickel underplate in accordance with SAE AMS-QQ-N-290, class2 (50-150 micro inches)
Socket Contacts	Suitable copper alloy, gold plated in accordance with ASTM B488, Type II, Class 1.27 (50 micro inches minimum), Code C, over nickel underplate in accordance with SAE AMS-QQ-N-290, class2 (50-150 micro inches)
Ground Spring	Stainless steel, gold plated
Hardware	Stainless steel, 300 series, passivated in accordance with SAE-AMS2700
Encapsulant	Epoxy Resin Hysol EE4215/HD3561 and Stycast 2850FT/Catalyst 11
Pigtail Wire, Uninsulated	Suitable copper alloy, gold-plated, solder dipped in 60/40 tin-lead
Pigtail Wire, Insulated Hookup	• Wire Type K: Silver-coated copper wire, extruded PTFE insulation, 600 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
High-Speed Cable	High-strength silver-coated copper alloy wire, PFA and FEP insulation, 600 volts RMS, 150° C, 90 and 100 ohm impedance matched

GLENAIR HIGH-SPEED MICRO-D PERFORMANCE SPECIFICATIONS

1. Scope

- 1.1. **Scope:** This specification covers performance requirements for Glenair High-Speed Micro-D connectors manufactured in accordance with MIL-DTL-83513 and MIL-DTL-32139.
- 1.2. **Description:** Metal shell High-Speed Micro-D connectors on .050-inch (1.27 mm) centers, with Nano 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. Wiring harnesses shall be 500 megohms minimum.

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.

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3.1.3. Contact Resistance:

- 3.1.3.1. **Contact Resistance:** The voltage drop of a mated pair of contacts attached to wires shall not exceed 71 millivolt drop maximum using a 1 ampere test current, when tested in accordance with EIA-364-06, using any catalog supported wire types.
- 3.1.3.2. **Low Level Contact Resistance:** When tested with a micro-ohmmeter using a test current of 10 milliamperes maximum, the resistance of a mated pair of contacts shall be 71 milliohms maximum using any catalog supported wire types. Test procedure in accordance with EIA-364-23.
- 3.1.4. **Contact Current Capability:** Contacts shall be capable of carrying 1 ampere in continuous duty operation from -55° to 150° C when tested in accordance with EIA-364-70.
- 3.1.5. **Shell-to-Shell Conductivity:** A mated pair shall not exceed 10 millivolts maximum voltage drop when tested in accordance with EIA-364-83.
- 3.1.6. **Shielding Effectiveness:** A mated pair shall meet a requirement of 65 dB minimum attenuation when tested in accordance with EIA-364-66.
- 3.1.7. **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 5 ounces when tested in accordance with MIL-DTL-32139. Minimum separation force shall be 0.4 ounces.
- 3.2.2. **Connector Mating and Unmating Force:** The maximum mating and unmating force shall be 7 ounces times the number of contacts when tested per MIL-DTL-32139. Mate connectors three times before taking initial measurements.
- 3.2.3. **Contact Retention:** Contacts, when tested in accordance with EIA-364-29, shall withstand a 2 pound axial load for a minimum of 5 seconds.
- 3.2.4. **Crimp Tensile Strength:** Wire shall not pull out of crimp joints at an applied force of less than 3 pounds (1.5 pound for 30 AWG wire) when tested in accordance with IPC-620D, Section 19.7.2. Wire breakage other than at the crimp shall not constitute a failure.
- 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 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:** Printed circuit terminals shall meet the solderability requirements of MIL-STD-202 Method 208.
- 3.2.8. **Durability:** High Speed 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.

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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, condition B, with a 48 hour duration. In addition, connectors shall meet contact resistance, low level contact resistance, and mating force requirements.

3.3.2. Fluid Immersion: Connectors shall meet mating force requirements following 20 hours immersion in synthetic lubricating oil MIL-PRF-7808, 2 hours in Perchloroethylene cleaning solvent ASTM D4376, and 1 hour immersion in coolant MIL-PRF-87252, when tested in accordance with MIL-DTL-32139. There shall be no degradation of the plastic, bonding adhesives, or elastomers.

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 condensable materials (CVCM) when tested in accordance with ASTM E595. NOTE: the face seal gasket on plug connectors exceeds the allowable TML/CVCM unless it is specially processed. This is acceptable per MIL-DTL-83513 but may not be permissible for specific space programs.

Outgassing Properties of GHSM Connectors					
Component	Material	Brand Name	% Total Mass Loss (TML)	% Collected Volatile Condensable Material (CVCM)	Test Report
Molded Insulator	Unfilled PPS	Fortron1200L1	0.09	<0.01	Glenair Test #TR75613-1
Machined Insulator	Unfilled PPS	Techtron 1000	0.08	0.00	NASA Test #GSFC24653
Organizer (HBR only)	40% Glass-filled PPS	Ryton R4-02XT	0.09	0.00	NASA Test #GSFC06826
Potting Compound	Epoxy	Hysol EE-4215	0.55	<0.01	Glenair Test #TR59899-3
(PC Tail Only)	Epoxy	Stycast 2850FT/11	0.47	0.01	NASA Test #GSFC06569
Face Seal Gasket "as received"	Fluorosilicone	None	1.28	0.25	Glenair Test #TR75613-1
Face Seal Gasket with Oven Bakeout 8hr @ 400°F	Fluorosilicone	None	0.08	0.01	Glenair Test TBD
Face Seal Gasket with Vacuum Bakeout 24hr @ 125°C	Fluorosilicone	None	0.07	0.02	Glenair Test TBD

3.3.4. Thermal Shock: Unmated connectors shall withstand 5 cycles of thermal shock with a minimum temperature of -55° C and a maximum temperature of 150° C when tested in accordance with EIA-364-32, Condition I. Connectors shall not exhibit any detrimental damage or degradation of electrical performance.

3.3.5. Humidity: Wired, mated connectors shall be subjected to humidity conditioning in accordance with EIA-364-31, Method IV (excluding steps 7a and 7b). On completion of step 6 of the final cycle, connectors shall be removed from the chamber, unmated and surface moisture removed. Connectors shall pass a DWV test of 360 volts (RMS 60 Hertz AC). Within 1 to 2 hours after removal of surface moisture, connectors shall meet 1 megohm insulation resistance. Following 24 hour conditioning, connectors shall meet 1000 megohm insulation resistance (500 megohm for cable harnesses).

3.3.6. Vibration (sine): Connectors, when mated, wired in series, and fixtured in accordance with MIL-DTL-32139, shall exhibit no disruption of continuity, which lasts longer than 1 microsecond, in accordance with test procedure EIA-364-28, Condition IV. Connectors shall not be damaged and no loosening of parts shall occur. Peak level 20 g.

3.3.7. Shock: Connectors, when mated, wired in series, and fixtured in accordance with MIL-DTL-32139, shall not exhibit any discontinuity longer than 1 microsecond when tested in accordance with EIA-364-27, Test Condition G with 100+/-20 milliampere test current. Connectors shall not be damaged and no loosening of parts shall occur. Peak acceleration 100 g.

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.