

INCH-POUND

MIL-PRF-31031/2A

12 April 2004

SUPERSEDING

MIL-PRF-31031/2

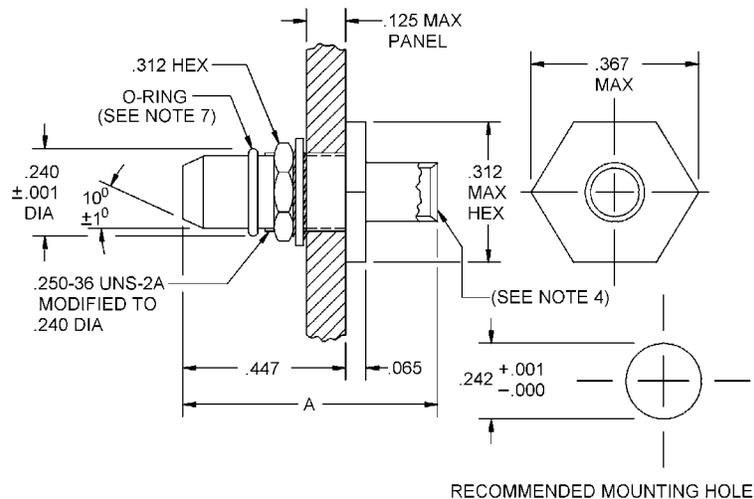
19 January 1995

### PERFORMANCE SPECIFICATION SHEET

## CONNECTOR, RECEPTACLE, ELECTRICAL, RADIO FREQUENCY, SERIES BMA, JAMNUT MOUNT, FOR FLEXIBLE CABLE, PIN CONTACT, HIGH RELIABILITY

This specification is approved for use by all Departments and Agencies of the Department of Defense

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-31031.



Inches	mm	Inches	mm
.000	0.00	.242	6.15
.001	0.03	.250	6.35
.065	1.65	.312	7.92
.126	3.18	.362	9.19
.240	6.10	.447	11.35

#### NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, all tolerances are  $\pm 0.005$  inch (0.13 mm).
4. See table I for cable accommodation.
5. For dimension A see table I.
6. Dimension A defines the overall length of the connector when assembled to the cable.
7. "O" rings are floursilicone in accordance with SAE-AMS-R-25988, class I, type I.

FIGURE 1. General configuration.

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TABLE I. Part or Identifying Number (PIN) cross-reference and dimensions.

PIN M31031/02 <u>1/</u>	Applicable cable and group <u>2/</u> M17/	Dimensions	Inches/millimeters maximum
Category A – Field serviceable (no special tools required).			
A**01	113-RG316 group II	A	1.375 (34.92 mm)
A**02	128-RG400 group VI	A	1.375 (34.92 mm)

1/ These connectors have captivated center contacts.

2/ The latest version of the cable is applicable.

TABLE II Cable retention force

Cable dielectric Outer diameter	Pounds (minimum)	
	Single braid	Double braid
Inches (maximum)		
.036	10	N/A
.067	20	N/A
.110	30	N/A
.122	40	45

TABLE III. Group qualification. 1/ 2/ 3/ 4/

Group	Submission and qualification of any of the following connectors	Qualifies the following connectors
I	M31031/02A**02	M31031/02A**01 M31031/02A**02

\* Options as defined in the PIN construction.

1/ Individual connectors other than those listed are self-qualifying.

2/ Qualification of connectors qualifies connectors of the same body materials only.

3/ Qualification of connectors qualifies connectors of the same environmental construction only.

4/ Changes in plating (body or center contact) shall require the corrosion and contact resistance tests be performed.

ENGINEERING DATA

Nominal impedance: 50 ohms.

Frequency range: 0 to 18 GHz (frequency limit is dependent on cable used).

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Voltage rating:

Cable group II: 250 V rms at sea level, 65 V rms at 70,000 feet.

Cable group VI: 335 V rms at sea level, 85 V rms at 70, 000 feet.

Temperature rating: 65°C to 125°C.

REQUIREMENTS:

The following tests assure connector integrity within the typical operating conditions and applications. Alternate methods shall be made known to the qualifying authority prior to performance of the test. The test methods described in the general specification and herein are proven methods and shall be the referee method in cases of dispute.

Dimensions and configuration: See figure 1 and MIL-STD-348.

Force to engage and disengage:

Longitudinal force: Not applicable.

Torque: Not applicable.

Radial misalignment: Not applicable.

Axial misalignment: Not applicable.

Coupling proof torque: Not applicable.

Mating characteristics:

Reference: MIL-STD-348 for dimensions.

Hermetic seal: Not applicable.

Permeability: Applicable.

Leakage (pressurized connectors): Not applicable.

Insulation resistance: Test procedure 021 of EIA 364, 5, 000 megohms minimum.

Center contact retention: 6 pounds minimum axial force.

Radial torque: Not applicable.

Corrosion (salt spray): Test procedure 026 of EIA 364 condition B.

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Voltage standing wave ratio (VSWR): From 500 to 18 GHz or approximately 80 percent of upper cutoff frequency of the cable, whichever is lower.

Cable group II: 1.15 + 02 F (GHz)

Cable group VI: 1.15 01 F (GHz)

Connector durability 500 cycles minimum, at 12 cycles per minute maximum. The connector shall meet the mating characteristics and force to engage and disengage requirements

Contact resistance in milliohms maximum:

	<u>Initial</u>	<u>After environment</u>
Center contact	3 0	4 0
Outer contact	2 0	Not applicable
Braid to body	0 5	Not applicable

Dielectric withstanding voltage: Test procedure 020 of EIA 364 condition I.

Cable group II: 750 volts rms at 60 Hz at sea level.

Cable group VI: 1 000 volts rms at 60 Hz at sea level.

Vibration high frequency: Test procedure 028 of EIA 364 condition III. No discontinuity permitted. This test needs to be performed only during initial qualification so long as the qualifying design does not change.

Shock: Test procedure 027 of EIA 364 condition F. No discontinuity permitted. This test needs to be performed only during initial qualification so long as the qualifying design does not change.

Temperature cycling: Test procedure 032 of EIA 364 condition I, 5 cycles, except test high temperature shall be 200°C for connectors using 200°C cables (see table I) Low test temperature shall be -65°C.

Moisture resistance: Test procedure 031 of EIA 364 condition B. No measurements at high humidity. Insulation resistance shall be at least 200 megohms within 5 minutes after removal from humidity.

Corona level (at 70,000 feet): This test needs to be performed only during initial qualification so long as the qualifying design does not change.

Cable group II: 190 volts rms minimum.

Cable group VI: 250 volts rms minimum.

RF high potential withstanding voltage: This test needs to be performed only during initial qualification so long as the qualifying design does not change.

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Voltage and frequency (at a frequency from 5 to 7.5 MHz):

Leakage current: Not applicable.

Cable group II: 500 volts rms minimum.

Cable group VI: 670 volts rms minimum.

Cable retention force: See table II.

Coupling mechanism retention force: Not applicable.

Shielding effectiveness: Test procedure 066 of EIA 364, .85 dB minimum.

RF transmission loss (dB maximum): This test needs to be performed only during initial qualification so long as the qualifying design does not change.  $\sqrt{03}$  /frequency 6Hz test at a frequency between 9 end 12.4 GHz.

Porosity: Applicable.

Thermal vacuum outgassing: Applicable to space grade connectors only.

Flammability: Applicable to space grade connectors only.

Odor: Applicable to space grade connectors only.

Toxicity (offgassing): Applicable to space grade connectors only.

Safety wire hole pullout: Not applicable.

Part or Identifying Number (PIN): M31031/02 (see table I)

Group qualification: See table III.

NOTES

- 1 If a connector manufacturer produces a connector that meets all the requirements for two or more connector PIN s (within the same series and of the same environmental grade) the manufacturer may receive qualification approval for two or more connector PIN's qualifying the one connector. It is not necessary that such connectors be in the same group each connector however must be marked with its own PIN for group qualification the connectors must be of similar design.
- 2 For qualification retention where more than one part is listed in a group in this column data may be supplied on any of those parts in order to retain qualification for those parts in the corresponding right hand column. The part does not necessarily have to be the part initially qualified.

Supersession: This specification supersedes DSCC drawing 85074 when a QPL source becomes available.

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In addition to MIL-PRF-31031, this specification sheet references the following documents:

MIL-STD-348  
EIA 364  
SAE-AMS-R-25988

CONCLUDING MATERIAL

Custodians:

Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC

(Project 5935-4619-002)

Review activities:

Army - AT, AV, EA, MI  
Navy - AS, MC, OS, SH  
Air Force - 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://www.dodssp.daps.mil>.