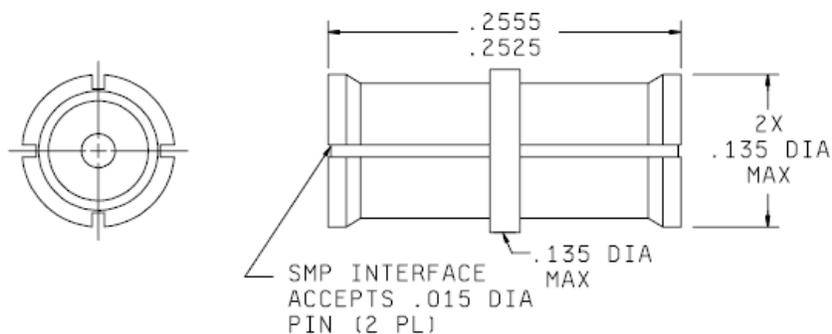


PERFORMANCE SPECIFICATION SHEET

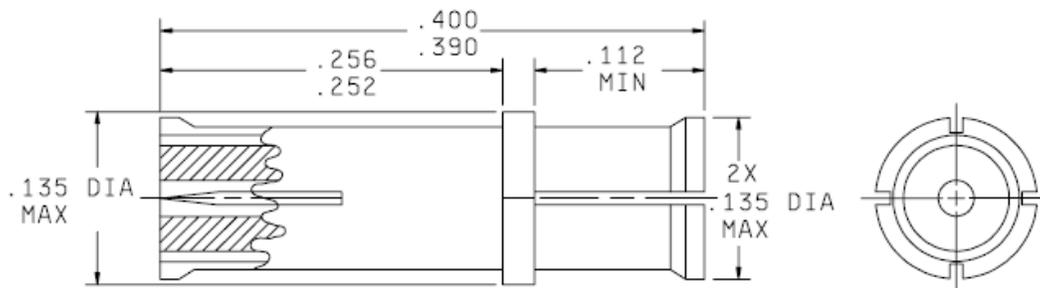
CONNECTOR, ELECTRICAL, COAXIAL, RADIO FREQUENCY,
SOCKET CONTACT, SERIES SMP TO SMP,
SHROUD, 2 HOLE FLANGE

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.



M31031/30-P4N01



M31031/30-P4N02

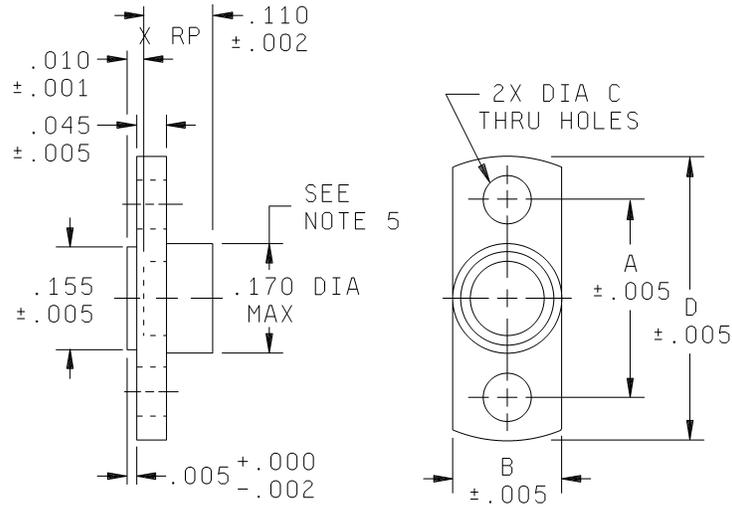
Inches	mm	Inches	mm
.015	0.38	.2555	6.490
.112	2.79	.256	6.50
.135	3.43	.390	9.91
.252	6.40	.400	10.16
.2525	6.414		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. All undimensioned pictorial configurations are for reference purposes only.
4. Special tools shall be required for assembly. Contact the manufacturer.
5. Interface in accordance with MIL-STD-348, series SMP socket contact.

FIGURE 1. General configuration, bullet adapter.

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Inches	mm	Inches	mm	Inches	mm
.002	0.05	.155	3.94	.352	8.94
.005	0.13	.187	4.75	.400	10.16
.045	1.14	.223	5.66	.470	11.94
.073	1.85	.235	5.97	.480	12.19
.098	2.49	.282	7.16	.481	12.22
.102	2.59	.328	8.33	.625	15.88

Part or Identifying Number (PIN)	Dimension A	Dimension B	Dimension C	Dimension D	Shroud design ^{1/}
M31031/30-N3N01	.328	.187	.098	.480	Full detent
M31031/30-N3N02					Limited detent
M31031/30-N3N03					Smooth bore
M31031/30-N3N04	.481	.223	.102	.625	Full detent
M31031/30-N3N05					Limited detent
M31031/30-N3N06					Smooth bore
M31031/30-N3N07	.282	.165	.073	.400	Full detent
M31031/30-N3N08					Limited detent
M31031/30-N3N09					Smooth bore
M31031/30-N3N10	.352	.235	.073	.470	Catchers mitt

^{1/} See MIL-STD-348 for interface dimensions.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. All undimensioned pictorial configurations are for reference purposes only.
4. Special tools shall be required for assembly. Contact manufacturer.
5. Dimension to be .235 (5.79 mm) ±.005 (0.13 mm) when using M31031/30-N3N10.

FIGURE 2. General configuration, shroud.

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ENGINEERING DATA:

Nominal impedance: 50 ohms.

Frequency range: DC to 40 GHz.

RF leakage: -80 dB to 3 GHz; -65 dB from 3 to 26.5 GHz minimum.

Voltage rating: 335 V rms maximum at sea level.
65 V rms at 70,000 feet.

Operating temperature: -65°C to +165°C.

Typical force to engage:

Full detent: 10 pounds.

Limit detent: 8 pounds.

Smooth bore: 1 pounds.

REQUIREMENTS: (All electrical and mechanical requirements shall be maintained during radial misalignment.)

Dimensions and configurations: See figures 1 and 2.

Interface dimensions: In accordance with [MIL-STD-348](#).

Force to engage: Prior to performing the following tests a maximum of 3 engagements for conditioning are permitted. Use of the SMP gauges specified in DSCC drawing 06026 is required when performing these tests. The same connector shall not be used for each test. One connector to be used for the full detent gauges, one separate connector to be used with the limited detent gauges and one separate connector is to be tested with the smooth bore gauges.

Full detent: 15 pounds maximum.

Limited detent: 10 pounds maximum.

Smooth bore: 2 pounds maximum.

Force to disengage: When verified using the appropriate gauge and tests in accordance with DSCC drawing 06026:

Full detent: 5 pounds minimum.

Limited detent: 2 pounds minimum.

Smooth bore: .5 pound maximum.

Radial misalignment: Total radial misalignment between centerlines of connector shroud or mating planes, .010 inch (0.25 mm), min., .020 min (0.51 mm), total for M31031/30-N3N10.

Axial misalignment: .000/.010 (0.00/0.25 mm).

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Center contact inspection conditions (after heat treat)

Oversize test pin:

Test pin diameter: .0165 inch +.0001/-.0000 inch.

Insertion depth: .065 inch minimum, .070 inch maximum.

Number of insertions: 10.

Insertion force test:

Test pin diameter: .0160 inch +.0001/-.0000 inch.

Insertion force: 24 ounces, maximum.

Insertion depth: .055 inch minimum, .065 inch maximum.

Withdrawal force test:

Test pin diameter: .0140 +0000/-.0001 inch.

Withdrawal force: 0.5 ounce, minimum.

Insertion depth: .055 inch minimum, .065 inch maximum.

Coupling proof torque: Not applicable.

Hermetic seal: Not applicable.

Leakage (pressurized connectors): Not applicable.

Center contact retention: 1.5 pounds minimum axial force (socket contact only).

Radial torque: Not applicable.

Voltage standing wave ratio:

DC to 23 gigahertz: 1.10:1 maximum.

23 to 26.5 gigahertz: 1.15:1 maximum.

26.5 to 40 gigahertz: 1.7:1 maximum.

VSWR procedure.

The VSWR shall be measured in accordance with the following procedure or a method acceptable to the Government.

Part should be tested using a Network Analyzer with the Time Domain (TDR) option installed. This is essential to allow the effect of the adapters to be "gated" out. The recommended network analyzer systems include Hewlett Packard HP 8510, Wiltron 360 or equivalent. The printer/plotter and the computer should be any unit compatible to the system.

The device under test (DUT) shall consist of M31031/30-N4N01 or M31031/30-N4N02 mated at both ends with adapters capable of performing to 40 GHz.

Calibration of the system should be performed using the manufacturer's calibration kits and the recommended calibration procedures. The frequency range shall be DC to 40 GHz. The VSWR calibration test setup shall be verified using the manufacturer's verification kits. The calibrated system VSWR shall be less than $1.02 + .001F$ (F in GHz).

The VSWR of the DUT shall be measured using the procedures described in the manufacturer's operating instructions. The time domain shall then be used to remove the effects of the test adapter.

The output shall be generated using the appropriate printer/plotter.

Moisture resistance: [MIL-STD-202, method 106](#), except step 7b shall be omitted. Resistance shall be 1,000 megohms within 5 minutes after removal from humidity (socket contact only).

Contact resistance (in milliohms, maximum):

	<u>Initial</u>
Center contact	6.0
Outer contact	2.0

Dielectric withstanding voltage at sea level (socket contact only): 500 V rms minimum. 125 V rms at 70,000 feet.

Vibration, high frequency: [MIL-STD-202, method 204](#), test condition D.

Vibration, random: [MIL-STD-202, method 214](#), test condition F.

Corona level (socket contact only):

Altitude: 70,000 feet.

190 V rms, minimum.

Insulation resistance (socket contact only): 5,000 megohms minimum when tested in accordance with MIL-PRF-31031.

Altitude: Sea level to 70,000 feet.

Solderability (when applicable): Not applicable.

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Shock (specified pulse, socket contact only): MIL-STD-202, method 213, test condition I.

Thermal shock: MIL-STD-202, method 107, test condition B (except high temperature to be +165°C).

RF high potential withstanding voltage:

325 V rms minimum at sea level.

Frequency: 5 MHz.

Leakage current: Not applicable.

Cable retention: Not applicable.

Coupling mechanism retention force: Not applicable.

Durability:

Full detent: 100 cycles.

Limited detent: 500 cycles.

Smooth bore: 1,000 cycles.

RF insertion loss: $.10 \sqrt{\text{Frequency (GHz)}}$ dB

Part or Identifying Number (PIN): M31031/30-P4N01, 02 (see figure 1) and M31031/30-N3N01 thru 10 (see figure 2).

Group qualification: See table I.

TABLE I. Group qualification. 1/ 2/ 3/

Group	Submission and qualification of any of the following connectors	Qualified the following connectors
I	M31031/30-P4N01	M31031/30-P4N01 M31031/30-P4N02

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.

This specification supersedes DSCC drawing 94007 once a qualified source is obtained.

Referenced documents. In addition to MIL-PRF-31031, this document references the following:

- MIL-STD-202
- MIL-STD-348
- DSCC drawing 06026

MIL-PRF-31031/30

CONCLUDING MATERIAL

Custodians:

Army - CR
Navy - EC
Air Force - 85
NASA - NA
DLA - CC

Preparing activity:
DLA - CC

(Project 5935-2005-052)

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://assist.daps.dla.mil>.