INCH-POUND

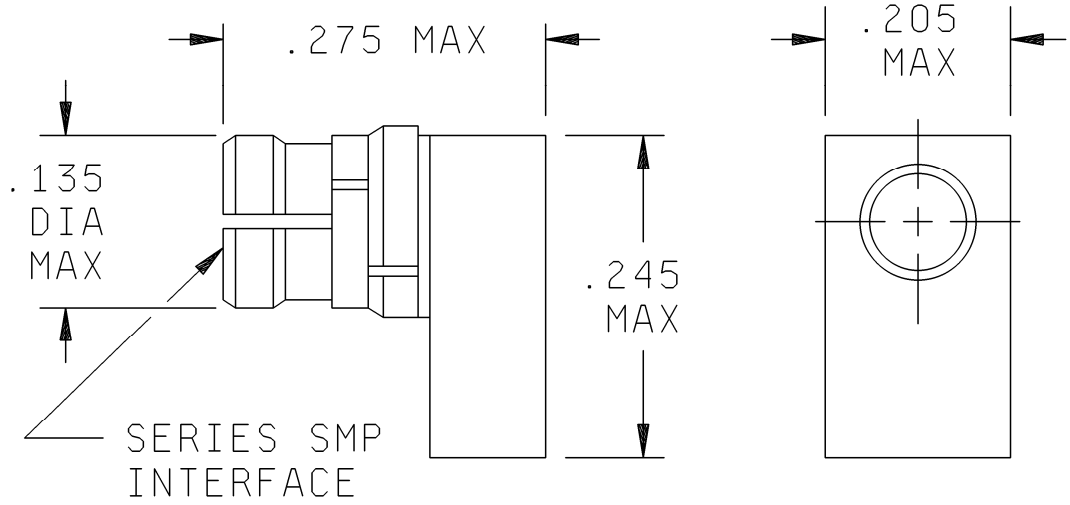
MIL-PRF-31031/32
2 July 2009

PERFORMANCE SPECIFICATION SHEET

CONNECTOR, ELECTRICAL, COAXIAL, RADIO FREQUENCY, SOCKET CONTACT, SERIES SMP, FOR .047 AND .086 SEMIRIGID CABLE, RIGHT ANGLE

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.



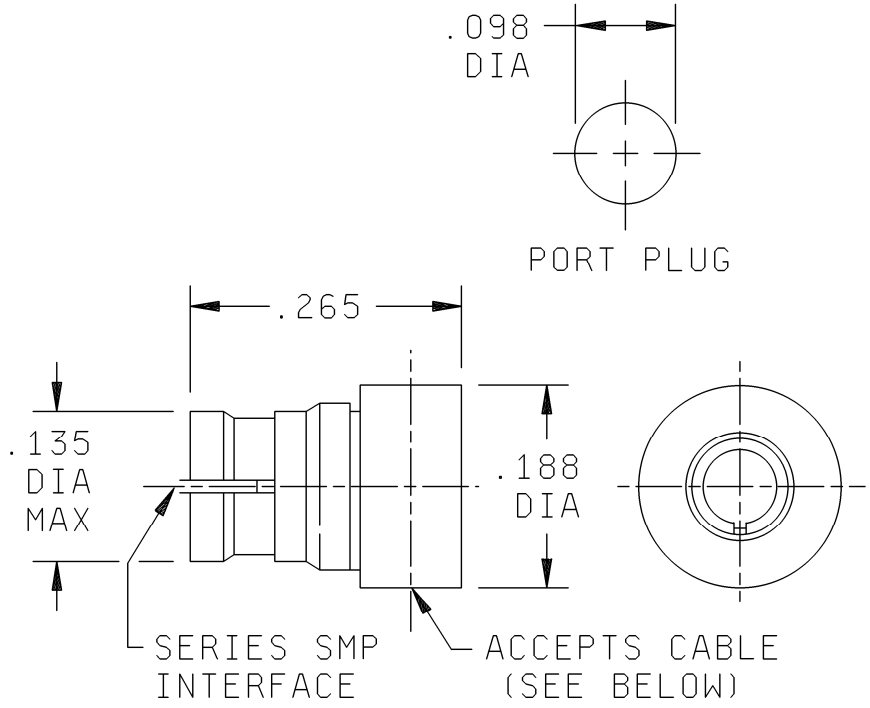
Inches	mm
.135	3.43
.205	5.21
.245	6.22
.275	6.99

PIN	Cable accommodation	Cable overall diameter
M31031/32-E4N01	M17/133-RG405 1/	.086 inch
M31031/32-E4N02	M17/151-00001 1/	.047 inch

1/ These connectors accept all cables listed on the cited specification sheet.

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.



Inches	mm
.098	2.49
.135	3.43
.188	4.77
.265	6.73

PIN	Cable accommodation	Cable overall diameter
M31031/32-E4N03	M17/133-RG405 1/	.086 inch
M31031/32-E4N04	M17/151-00001 1/	.047 inch

1/ These connectors accept all cables listed on the reference specification sheet.

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 2. General configuration.

ENGINEERING DATA

Nominal impedance: 50 ohms

Frequency range:

DC to 26.5 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.

REQUIREMENTS (after assembly):

Dimensions and configuration: See figures 1 and 2.

Mating interface: 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. 15 pounds, maximum, full detent shroud, 10 pounds, maximum, limited detent and 2 pounds, maximum, for the smooth bore, in accordance with MIL-PRF-31031/30. When fully engaged the anti rock ring shall perform its intended function.

Force to disengage when using the appropriate gauge and tests in accordance with DSCC drawing 06026: 5 pounds, minimum, full detent shroud, 2 pounds, minimum, limited detent, and .5 pounds, minimum, for smooth bore in accordance with MIL-PRF-31031/30.

Radial misalignment: Not applicable.

Axial misalignment: Not applicable.

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.

Radial torque: Not applicable.

Voltage standing wave ratio:

DC to 18 gigahertz: 1.20:1 maximum.
18 to 26.5 gigahertz: 1.35:1 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. 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.

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 26.5 GHz for M31031/32-E4N01 through M31031/32-E4N04. 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 device under test (DUT) shall be attached to the appropriate cable. An adapter capable of performing to 40 GHz shall be attached to the calibrated test port of the analyzer. The DUT shall be mated to the test adapter.

The VSWR of the DUT shall be measured using the procedures described in the manufacturer's operating instructions. The time domain shall 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.
Contact resistance (in milliohms, maximum):

	Initial
Center contact	6.0
Outer contact	2.0
Outer conductor to connector body	0.5

Dielectric withstanding voltage at sea level: 500 V rms minimum. 125 V rms at 70,000 feet.

Vibration, high frequency (When mated with full detent shroud in accordance with MIL-PRF-31031/30): MIL-STD-202, method 204, test condition D.

Vibration, random (When mated with full detent shroud in accordance with MIL-PRF-31031/30): MIL-STD-202, method 214, test condition F.

Corona level:

Altitude: 70,000 feet.
190 V rms, minimum.

Insulation resistance: 5,000 megohms minimum when tested in accordance with MIL-PRF-31031.

Altitude: Sea level to 70,000 feet.

Solderability (when applicable): Applicable.

Shock (specified pulse): MIL-STD-202, method 213, test condition I. (When mated with full detent shroud in accordance with MIL-PRF-31031/30).

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

RF high potential withstanding voltage:

325 V rms minimum at sea level.
Frequency: 5 MHz.
Leakage current: Not applicable.

Cable retention:

30 pounds minimum: 16 inch ounces torque, applicable (M31031/32-E4N01 and M31031/32-E4N03).
20 pounds minimum: torque, not applicable (M31031/32-E4N02 and M31031/32-E4N04).

Coupling mechanism retention force: Not applicable.

Durability: 100 cycles.

RF insertion loss: $0.12 \times \sqrt{\text{Frequency (GHz)}}$ dB

Part or Identifying Number (PIN): M31031/32-E4N** (See figures 1 and 2).

Supersession: This specification supersedes DSCC drawing 94008 when a QPL source becomes available.

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

MIL-STD-202
MIL-STD-348
MIL-PRF-31031/30
DSCC drawing 06026

CONCLUDING MATERIAL

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

Preparing activity:
DLA - CC

(Project 5935-2005-054)

Review activities:
Amy - 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.