

INCH-POUND

MIL-PRF-39012/15D
w/AMENDMENT 1
04 May 2019
SUPERSEDING
MIL-C-39012/15D
3 October 1986

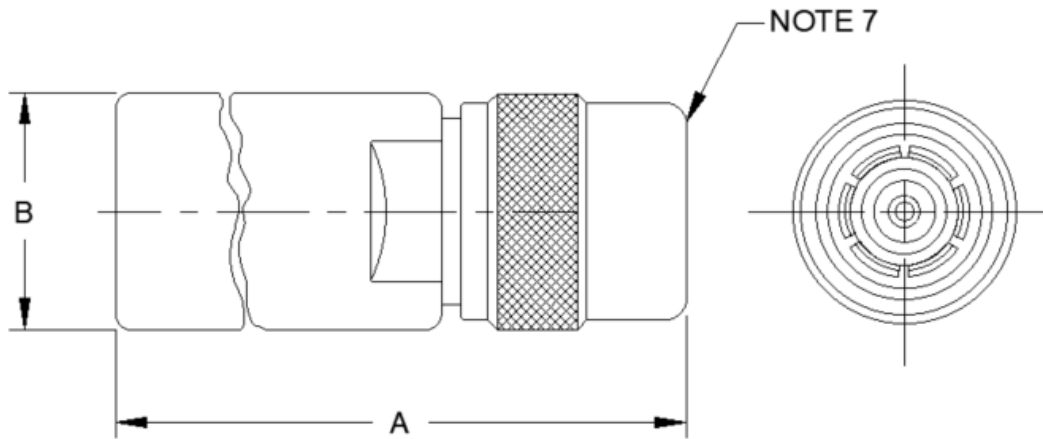
MILITARY SPECIFICATION SHEET

CONNECTORS, PLUG, ELECTRICAL, COAXIAL, RADIO FREQUENCY,
(SERIES C, (CABLED), MALE, CLASS 2)

INACTIVE FOR NEW DESIGN AFTER
26 Mar 71

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

The requirements for acquiring the connectors described herein shall consist of this specification and the latest issue of MIL-PRF-39012.



NOTES:

1. Dimensions are in inches. Metric equivalents are given for general information only.
2. For dimension A and B, see table I.
3. Dimension B is the largest overall diameter of the connector.
4. Wrench flats are to accommodate standard wrench in accordance with FED-STD-H28, appendix 10.
5. Dimension A defines the maximum length of the connector when assembled to the appropriate cable.
6. All undimensioned pictorial representations are for reference purposes only.
7. Series C, pin contact interface in accordance with MIL-STD-348.

FIGURE 1. General configuration.



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TABLE I. Dash numbers, cross reference, and dimensions.

Dash number <u>2/</u>	Applicable cable M17/#	Typical mating connector 39012/9- (optional hardware) <u>1/</u>	Dimensions	Inches (millimeters) maximum
Category A – Field serviceable (no special tools required)				
0001	29-RG59*	M39012/9-0001	A	1.468 (37.29)
	030-RG062Δ 90-RG71Δ		B	.781 (19.94)
0002	028-RG058	M39012/9-0002	A	1.500 (38.10)
	084-RG223*		B	.781 (19.84)

1/ Optional hardware M39012/25-0001.

2/ For cross reference of dash number to superseded part number or type designation, see table III.

The latest version of each cable shall be applicable.

* Cable to be used when performing tests requiring cable except as in note Δ.

Δ These are not 50 ohm cables; therefore, when attached to specified connectors, VSWR, RF leakage, and insertion loss are not applicable.

ENGINEERING DATA:

Nominal impedance: 50 ohms.

Frequency range: 0 to 4,000 MHz.

Voltage rating:

500 volts rms, maximum working voltage at sea level.

125 volts rms, maximum at 70,000 feet.

Temperature rating: -65°C to +165°C.

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Force to engage and disengage:

Longitudinal force: 4-1/2 pounds, maximum.

Torque: 4 inch pounds, maximum.

Coupling proof torque: Not applicable.

Inspection conditions: Coupling torque not applicable.

Mating characteristics:

Reference MIL-STD-348.

Outer contact:

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Test ring ID: .411 maximum, 16 microinch finish.

Insertion force: 7 pounds, maximum when inserted a minimum of .125.

Contacts with slotted members: Shall contact a .419 minimum diameter ring within .031 of their tip ends.

Hermetic seal: Not applicable.

Leakage (pressurized connectors): Not applicable.

Insulation resistance: MIL-STD-202-302, test condition B, 5,000 megohms, minimum.

Center contact retention: Not applicable.

Corrosion (salt spray): MIL-STD-202-101, test condition B.

Voltage standing wave ratio (VSWR): From .5 to 4 GHz, or approximately 80 percent of upper cutoff frequency of the cable, whichever is lower; 1.35, maximum.

Swept frequency VSWR test setup:

VSWR shall be less than $1.015 + .005 F$ (F in GHz).

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Second step of VSWR checkout procedure: VSWR shall be less than $1.045 + .015 F$ (F in GHz).

Group B inspection: VSWR shall be less than $1.10 + .01 F$ (F in GHz).

Qualification and group C inspection: VSWR shall not exceed 1.15.

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 suitable equipment with NIST traceability or equivalent. All gating will be completed in accordance with the procedures stated by the network analyzer manufacturer with the following time domain settings:

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TABLE I. Suggested Time Domain Settings.

Transform Mode <u>1/</u>	Gate Type	Gate Shape <u>2/</u>	Start Gate Time (ps)	Stop Gate Time (ps)
Low-pass	Bandpass	Minimum, Normal, Wide	End of Adapter <u>3/</u> – Rise Time of Gate <u>4/</u>	End of Device Under Test + Rise Time of Gate

1/ The low-pass mode will have a higher resolution than the band-pass mode.

2/ Each shape specified will not be smaller than the minimum gate span to ensure the response has the correct start and stop times.

3/ "Port Extension" is also used for detection to move the measurement plane after calibration is complete.

4/ The minimum window is used for best resolution.

5/ The maximum window is used for best dynamic range.

The printer/plotter and the computer should be any unit compatible to the system. The test adapters will utilize the following frequency bands:

Frequency	VSWR
500 MHz	1.055
1 GHz	1.055
5 GHz	1.075
10 GHz	1.100
15 GHz	1.125
18 GHz	1.140
26 GHz	1.180
40 GHz	1.25
50 GHz	1.30
65 GHz	1.375

50-ohm precision air lines may also be used on both sides of the device under test.

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 65 GHz. The VSWR calibration test setup shall be verified using the manufacturers 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 with the recommended settings as mentioned above.

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

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:

	Initial	After environment
Center contact	1.0	1.5
Outer contact	.35	Not applicable
Braid to body	.05	Not applicable

Dielectric withstanding voltage: MIL-STD-202-301, 1,500 volts rms at sea level.

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Vibration, high frequency: MIL-STD-202-204, test condition B.

Shock: MIL-STD-202-213, test condition I.

Thermal shock: MIL-STD-202-107, test condition B, except test high temperature shall be +85°C.

Moisture resistance: MIL-STD-202-106. No measurements at high humidity. Insulation resistance shall be at least 200 megohms within 5 minutes after removal from humidity.

Corona level:

Altitude: 70,000 feet.

Voltage: 375 volts rms, minimum.

RF high potential withstanding voltage:

Voltage and frequency: 1,000 volts rms at 5 to 7.5 MHz.

Leakage current: Not applicable.

Cable retention force:

Noncrimp assemblies: 40 pounds, minimum.

Crimp assemblies:

50 pounds, minimum for cables .155 - .189 OD.

60 pounds, minimum for cables .190 - .229 OD.

75 pounds, minimum for cables .230 - .249 OD.

90 pounds, minimum for cables .250 OD and larger.

Coupling mechanism retention force: 100 pounds, minimum.

RF leakage: -55 dB minimum, tested at a frequency between 2 and 3 GHz.

Insertion loss:

.10- dB maximum tested at 4 GHz.

.05 $\sqrt{F(\text{GHz})}$ dB maximum tested at 3 GHz.

Part number: M39012/15- (dash number from table I).

TABLE II. Group qualification.

Group	Submission and qualification of any of the following connectors M39012/15	Qualifies the following connectors M39012/15
I	-0002	-0001
II	-0001	-0001

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NOTE: If a connector manufacturer produces a connector which meets all the requirements for two or more connector part numbers (within the same series), the manufacturer may receive qualification approval for two or more connector part numbers 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 appropriate part number. For group qualification, the connectors must be of similar design.

TABLE III. Cross reference of part numbers.

Preferred part number M39012/15-	Substitute for part number or type designation <u>1/</u> <u>2/</u> UG-
0001	627/U
0002	709/U, 1779/U, 1780/U, M39012/15-0003, M39012/15-0004

1/ The superseded part number or the type designation is for cross reference only. The part number M39012/15-XXXX shall be used in all cases for marking and identifying the connector.

2/ The basic type designation includes all letter versions of the specified number, e.g., UG-18/U includes UG-18A/U, UG-18B/U, etc.

Marginal notations are not used in this amendment to identify changes with respect to the previous issue due to the extent of the changes.

Referenced documents. In addition to MIL-PRF-39012, this document references the following:

FED-STD-H28	MIL-STD-202-213
MIL-STD-202-101	MIL-STD-202-301
MIL-STD-202-106	MIL-STD-202-302
MIL-STD-202-107	MIL-STD-348
MIL-STD-202-204	

CONCLUDING MATERIAL

Custodians:

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

Preparing activity:

DLA - CC

(Project 5935-2019-069)

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 <https://assist.dla.mil>.