

INCH-POUND

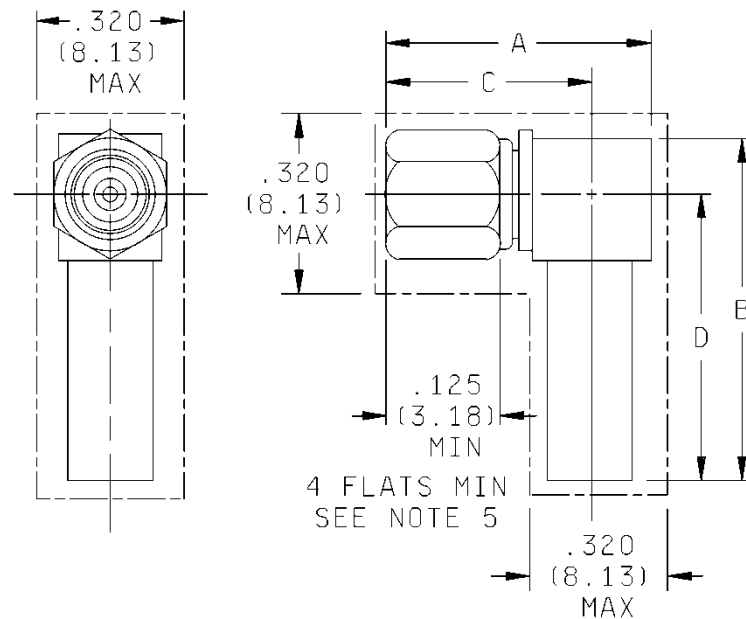
MIL-PRF-39012/75C
w/AMENDMENT 2
10 September 2021
SUPERSEDING
MIL-PRF-39012/75C
w/AMENDMENT 1
10 August 2016

PERFORMANCE SPECIFICATION SHEET

CONNECTORS, PLUGS, ELECTRICAL, COAXIAL, RADIO FREQUENCY,
SERIES SMC (CABLED, SOCKET CONTACT, RIGHT ANGLE, CLASS 2)

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-39012.



NOTES:

1. Dimensions are in inches.
2. Metric equivalents are in parentheses.
3. Metric equivalents are given for information only.
4. For dimensions A, B, C and D see table I.
5. Wrench flats are to accommodate standard wrench opening in accordance with FED-STD-H28, appendix 10.
6. Dimension B defines the overall length of the connector when assembled to the cable.
7. Maximum overall diameter of the connector is .320 inch (8.13 mm).
8. All undimensioned pictorial configurations are for reference purposes only.
9. Series SMC, socket 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 No. M39012/75-	# Applicable cable group from MIL-PRF-39012, appendix B M17/	Typical mating connector <u>1/</u>	Dimensions	Inches (millimeters) maximum <u>2/</u>
CATEGORY A – FIELD SERVICEABLE (NO SPECIAL TOOLS REQUIRED)				
0003 <u>3/ 4/</u>	Cable group I 93-RG178 * @ 169-00001 %	M39012/74-0003 M39012/76-0003	A B C D	.63 (16.00) .80 (20.32) .50 (12.70) .67 (17.02)
0004 <u>3/ 4/</u>	Cable group II 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/74-0004 M39012/76-0004		
0103 <u>3/</u>	Cable group I 93-RG178 * @ 169-00001 %	M39012/74-0103 M39012/76-0103		
0104 <u>3/</u>	Cable group II 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/74-0104 M39012/76-0104		
0105 <u>3/</u>	95-RG180 *	M39012/74-0105 M39012/76-0105		
4101 <u>3/</u>	Cable group I 93-RG178 * @ 169-00001 %	M39012/74-4101 M39012/76-4101		
4102 <u>3/</u>	Cable group II 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/74-4102 M39012/76-4102		

See notes at end of table.

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TABLE I. Dash numbers, cross-reference, and dimensions – Continued.

Dash No. M39012/75-	# Applicable cable group from MIL-PRF-39012, appendix B M17/	Typical mating connector <u>1/</u>	Dimensions	Inches (millimeters) maximum <u>2/</u>
CATEGORY C – FIELD REPLACEABLE (SAE-AS22520/5 BASIC CRIMP TOOL) <u>5/</u>				
0011 <u>3/</u> <u>4/</u>	Cable group I ~ 93-RG178 * @ 169-00001 %	M39012/74-0011 M39012/76-0011	A B C D	.63 (16.00) .80 (20.32) .50 (12.70) .67 (17.02)
0012 <u>3/</u> <u>4/</u>	Cable group IIa & 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/74-0012 M39012/76-0012		
0013 <u>3/</u>	95-RG180 *\$	M39012/74-0013 M39012/76-0013		
0017 <u>3/</u>	Cable group I ~ 93-RG178 * @ 169-00001 %	M39012/74-0017 M39012/76-0017		
0018 <u>3/</u>	Cable group IIa & 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/74-0018 M39012/76-0018		
4001 <u>3/</u>	Cable group I ~ 93-RG178 * @ 169-00001 %	M39012/74-4001 M39012/76-4001		
4002 <u>3/</u>	Cable group IIa & 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/74-4002 M39012/76-4002		

1/ Mating connector Part or Identifying Number (PIN) is for reference only. All mating connectors may not be listed.

2/ Dimensions are in inches. Metric equivalents are given for information only.

3/ These connectors have captivated center contacts.

4/ Connector bodies shall be gold plated in accordance with MIL-DTL-45204, type II, grade C, class 1.

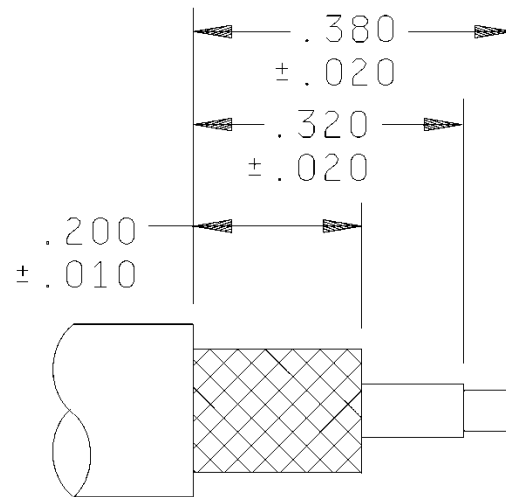
5/ Category C connectors are assembled by means of the applicable crimping tool in accordance with SAE-AS22520 to the specified cable stripped as specified on figure 2.

The latest version of each cable shall be applicable.

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TABLE I. Dash numbers, cross-reference, and dimensions – Continued.

- * Cable to be used when performing tests requiring cable except as in notes @ and ^.
- @ Cable to be used for the +200°C thermal shock tests.
- ^ These are not 50 ohm cables, therefore, when attached to the specified connectors, VSWR, RF leakage and insertion loss are not applicable.
- ~ M22520/5-33 closure B or M22520/5-03 closure B.
- & M22520/5-35 closure B or M22520/5-03 closure A.
- \$ M22520/5-41 closure B or M22520/5-05 closure B.
M22520/5-09 closure A.
- % Caution is directed to the application of this cable above 400 MHz. Attenuation is tested only at 400 MHz. SRL and power handling capabilities are not stipulated herein.



Inches	mm
.010	.254
.020	.508
.200	5.08
.320	8.13
.380	9.65

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.

FIGURE 2. Cable stripping dimensions for category C connectors.

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ENGINEERING DATA:

Nominal impedance: 50 ohms.

Frequency range: 0 to 10 GHz.

Voltage rating: The voltage rating shall be as specified in table II.

Temperature rating: -65°C to +165°C.

TABLE II. Voltage rating.

Cables	Voltage max. (sea level) V rms	Voltage max. at 70,000 ft. (4.437 kPa) V rms
Cable group I	250	60
Cable group II, IIa and M17/95-RG180	335	85

REQUIREMENTS:

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

Force to engage and disengage:

Longitudinal force: Not applicable.

Torque: 16 inch-ounces, maximum.

Coupling proof torque: 100 inch-ounces, minimum.

Inspection conditions:

Torque: 35 to 50 inch-ounces.

Mating characteristics: See MIL-STD-348.

Center contact (socket):

Oversize test pin: .0215 inch diameter minimum (nonclosed entry contacts only).

Test pin finish: 16 microinches.

Insertion depth: .050 inch minimum.

Number of insertions: 1.

Insertion force test:

Steel test pin diameter: .021 inch, minimum.

Insertion depth: .050 inch, minimum.

Test pin finish: 16 microinches.

Insertion force: 2.5 pounds, maximum.

Withdrawal force test:

Steel test pin diameter: .019 inch, maximum.

Insertion depth: .050 inch, minimum.

Test pin finish: 16 microinches.

Withdrawal force: 1 ounce, minimum.

Hermetic seal: Not applicable.

Leakage (pressurized connectors): Not applicable.

Insulation resistance: In accordance with MIL-STD-202-302, test condition B, 1,000 megohms minimum.

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Center contact retention:

Axial force: 4 pounds minimum axial force. Applicable to captivated center contacts only.

Radial torque: Not applicable.

Resistance to test prod damage: Not applicable.

Salt atmosphere (corrosion): In accordance with MIL-STD-202-101, test condition B.

Voltage standing wave ratio (VSWR): From 500 MHz to 10 GHz, or approximately 80 percent of the upper cutoff frequency of the cable, whichever is lower.

<u>Cable group</u>	<u>VSWR</u>
I	1.25 + 0.04 (F) GHz
II, IIa,	1.20 + 0.04 (F) GHz

Swept frequency VSWR test setup:

Item 6: VSWR shall be less than 1.05 +.0025F (F in GHz).

Item 16: VSWR shall be less than 1.05 +.0025F (F in GHz).

Second step of VSWR checkout procedure – VSWR shall be less than 1.10 +.01F (F in GHz).

Group B inspection: VSWR shall be less than 1.08 +.017F (F in GHz).

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

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

Contact resistance: In milliohms, maximum.

	<u>Initial</u>	<u>After environment</u>
Center contact:	12.0	16.0
Outer contact:	1.0	Not applicable
Braid to body:	1	Not applicable

Dielectric withstanding voltage at sea level: In accordance with MIL-STD-202-301.

<u>Cable group</u>	<u>V rms (at sea level)</u>
I	750
II, IIa and M17/95-RG180	1,000

Vibration, high frequency: In accordance with MIL-STD-202-204, test condition D.

Shock: In accordance with MIL-STD-202-213, test condition C.

Thermal shock: In accordance with MIL-STD-202-107, test condition B, except test high temperature shall be +85°C. High temperature shall be +200°C for connectors using +200°C cables (see tables I and III).

Moisture resistance: Not applicable.

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Corona level:

Altitude: 70,000 feet (4.437 kPa).

<u>Cable group</u>	<u>Volts, min.</u>
I	185
II, IIa and M17/95-RG180	250

RF high potential withstanding voltage:

Voltage and frequency: Tested at a frequency from 5 to 7.5 MHz.

Leakage current: Not applicable.

<u>Cable group</u>	<u>Volts, rms min.</u>
I	500
II, IIa and M17/95-RG180	700

Cable retention force: The cable retention force shall be as specified in table III.

TABLE III. Cable retention force. 1/ 2/

Cable dielectric outer diameter	Pounds, min. (N)	
	Non-crimp Single braid	Crimp Single braid
	Center contact	Center contact
	Captive	Captive
<u>Inches, max. (mm)</u>		
.036 (0.91)	13 (57.83)	13 (57.83)
.066 (1.68)	25 (111.20)	25 (111.20)

1/ Dimensions are in inches.

2/ Metric equivalents are given for information only.

Coupling mechanism retention force: 35 pounds, minimum.

RF leakage: -60 dB minimum, tested at frequency between 2 and 3 GHz. This requirement may be met by qualifying the straight connector versions for the same cable under MIL-PRF-39012/73.

RF insertion loss: .5 dB maximum tested at 4 GHz.

PIN: M39012/75 (dash number in table I or IV as applicable).

Group qualification: See table V.

Cross reference of PIN: See table VI.

Maintenance replacements for category B: See table VII.

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TABLE IV. Category B – non-field replaceable (special tools may be required).

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Dash No. <u>1/</u> M39012/75	# Applicable cable group from MIL-PRF-39012, appendix B M17/	Typical mating connector <u>2/</u>	Dimensions	Inches (millimeters) maximum <u>3/</u>
B0008 <u>4/ 5/</u>	93-RG178 * @ 169-00001 %	M39012/74B0008 M39012/76B0008	A B C D	.75 (19.05) .94 (23.88) .61 (15.49) .82 (20.83)
B0009 <u>4/ 5/</u>	113-RG316 * @ 172-00001 % 119-RG174 173-00001 %	M39012/74B0009 M39012/76B0009		
B0010 <u>4/ 5/</u>	94-RG179 * @ ^	M39012/74B0010 M39012/76B0010		
B0014 <u>4/</u>	93-RG178 * @ 169-00001 %	M39012/74B0014 M39012/76B0014		
B0015 <u>4/</u>	113-RG316 * @ 172-00001 % 119-RG174 173-00001 %	M39012/74B0015 M39012/76B0015		
B0016 <u>4/</u>	94-RG179 ^ @ *	M39012/74B0016 M39012/76B0016		

1/ For cross-reference of dash number to superseded PIN or type designation, see table VI.

2/ Mating connector PIN are for reference only. All mating connectors may not be listed.

3/ Dimensions are in inches. Metric equivalents are given for information only.

4/ These connectors have captive center contacts.

5/ Connector bodies shall be gold plated in accordance with MIL-DTL-45204, type II, grade C, class 1.

The latest version of each cable shall be applicable.

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

@ Cable to be used for the +200°C thermal shock tests.

% Caution is directed to the application of this cable above 400 MHz. Attenuation is tested only at 400 MHz. SRL and power handling capabilities are not stipulated herein.

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

NOTE: Connectors mate with connectors of the same material only; Example: M39012/73-3001 mates with M39012/74-3001, and M39012/73-4001 mates with M39012/74-4001.

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TABLE V. Group qualification and retention testing.

Group	Submission and retention of qualification of any of the following connectors <u>1/</u> M39012/	Qualifies the following connectors M39012/
I	75-0003	75-0003 75-0103 <u>2/</u>
II	75-0004	75-0004 75-0104 <u>2/</u>
III	75B0008	75B0008 75B0014 <u>2/</u>
IV	75B0009	75B0009 75B0010 75B0015 <u>2/</u> 75B0016 <u>2/</u>
V	75B0010	75B0010 75B0016 <u>2/</u>
VI	75-0011	75-0011 75-0017 <u>2/</u>
VII	75-0012	75-0012 75-0018 <u>2/</u>
VIII	75-0013	75-0013
IX	75-0105	75-0105

1/ 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.

2/ Corrosion and contact resistance test data must be submitted to DSCC-VQ before qualification approval may be granted.

NOTE: If a connector manufacturer produces a connector which meets all the requirements for two or more connector PINs (within the same series), the manufacturer may receive qualification approval for two or more connector PINs by 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 PIN. For group qualification, the connectors must be of similar design. Qualification of connectors qualifies connectors of the same material and finish only.

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TABLE VI. Cross reference of PIN.

Preferred PIN M39012/75	Substitute for PIN Or type designation
-0003	M39012/75-0001
-0004	M39012/75-0002
B0008	M39012/75-0008, M39012/75-0005
B0009	M39012/75-0009, M39012/75-0006
B0010	M39012/75-0010, M39012/75-0007

TABLE VII. Maintenance replacements for category B.

Category B number 1/	Category C dash number	Category A dash number
B0008	0011	0003
B0009	0012	0004
B0010	0012	0004
B0014	0017	0103
B0015	0018	0104
B0016	0018	0104

1/ Category B connectors are for original installation only. They will not be stocked or procured by the government.

Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

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

FED-STD-H28	MIL-STD-202-213	SAE-AS22520
MIL-STD-202-101	MIL-STD-202-301	SAE-AS22520/5
MIL-STD-202-107	MIL-STD-202-302	MIL-PRF-39012/73
MIL-STD-202-204	MIL-STD-348	MIL-DTL-45204

CONCLUDING MATERIAL

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

Preparing activity:
DLA - CC

(Project 5935-2021-101)

Review activities:
Army - AT, CR4, EA
Navy - AS, MC, OS, SA
Air Force - 19

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