INCH-POUND

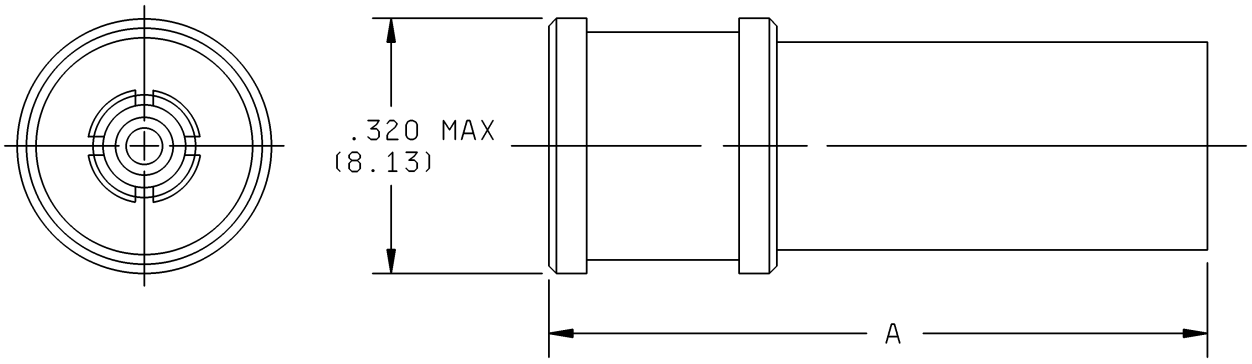
MIL-PRF-39012/67C
w/AMENDMENT 1
8 June 2016
SUPERSEDING
MIL-PRF-39012/67C
14 July 2011

PERFORMANCE SPECIFICATION SHEET

CONNECTORS, PLUGS, ELECTRICAL, COAXIAL, RADIO FREQUENCY, SERIES SMB (CABLED, SOCKET CONTACT, 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 dimension A, see table I.
5. Wrench flats are to accommodate standard wrench opening in accordance with FED-STD-H28, appendix 10.
6. Dimension A 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 SMB, socket contact interface in accordance with MIL-STD-348.

FIGURE 1. General configuration.

Downloaded from Arrow.com.

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

Dash No. M39012/67-	# Applicable cable group from MIL-PRF-39012, appendix B M17/	Typical mating Connector 1/	Dimensions	Inches (millimeters) Maximum 2/
CATEGORY A – FIELD SERVICEABLE (NO SPECIAL TOOLS REQUIRED)				
0003 3/ 4/	Cable group I 93-RG178 * @ 169-00001 %	M39012/68-0003 M39012/70-0003	A	.88 (22.35)
0004 3/ 4/	Cable group II 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/68-0004 M39012/70-0004		
0103 3/	Cable group I 93-RG178 * @ 169-00001 %	M39012/68-0103 M39012/70-0103		
0104 3/	Cable group II 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/68-0104 M39012/70-0104		
4101 3/	Cable group I 93-RG178 * @ 169-00001 %	M39012/68-4101 M39012/70-4101		
4102 3/	Cable group II 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/67-4102 M39012/69-4102		
CATEGORY C – FIELD REPLACEABLE (MIL-C-22520/5 BASIC CRIMP TOOL) 5/				
0011 3/ 4/	Cable group I ~ 93-RG178 * @ 169-00001 %	M39012/68-0011 M39012/70-0011	A	1.10 (27.94)
0012 3/ 4/	Cable group IIa & 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/68-0012 M39012/70-0012		

See notes at end of table.

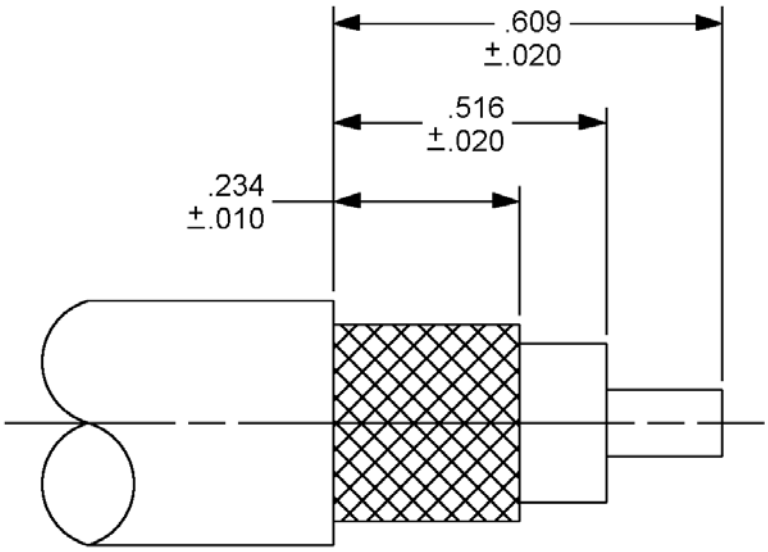
Downloaded from Arrow.com.

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

Dash No. M39012/67-	# Applicable cable group from MIL-PRF-39012, appendix B M17/	Typical mating connector 1/	Dimensions	Inches 2/ (millimeters) maximum
CATEGORY C – FIELD REPLACEABLE (MIL-C-22520/5 BASIC CRIMP TOOL) 5/				
0016 3/	Cable group I ~ 93-RG178 * @ 169-00001 %	M39012/68-0016 M39012/70-0016	A	1.10 (27.94)
0017 3/	Cable group IIa & 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/68-0017 M39012/70-0017		
4001 3/	Cable group I ~ 93-RG178 * @ 169-00001 %	M39012/68-4001 M39012/70-4001		
4002 3/	Cable group IIa & 113-RG316 * @ 172-00001 % 94-RG179 ^	M39012/68-4002 M39012/70-4002		

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 ASTM B488, type II, code C, class 1.27.
5/ Category C connectors are assembled by means of the applicable crimping tool in accordance with MIL-DTL-22520 to the specified cable stripped as specified on figure 2.
The latest version of each cable shall be applicable.
* 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.
% 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.

Downloaded from Arrow.com.

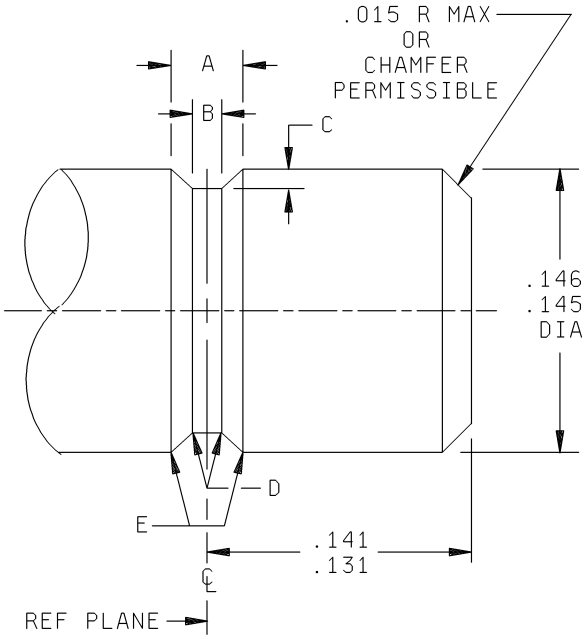


Inches	mm
.010	0.25
.020	0.51
.234	5.94
.516	13.11
.609	15.47

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

FIGURE 2. Cable stripping dimensions for category C connectors.

Downloaded from Arrow.com.



Inches	mm	Inches	mm
.002	0.05	.015	0.38
.005	0.13	.027	0.69
.006	0.15	.028	0.71
.007	0.18	.036	0.91
.009	0.23	.037	0.94
.010	0.25	.131	3.33
.011	0.28	.141	3.58
.012	0.30	.145	3.68
.014	0.36	.146	3.71

	A	B	C	D	E
GAUGE #1	.037 .036	.015 .014	.010 .009	.005 Max. Rad.	.006 .002 Rad.
GAUGE #2	.028 .027	.012 .011	.007 .006		

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Gauge #1 to be used for longitudinal force initial engagement, and maximum engagement requirement after 500 cycles.
4. Gauge #2 to be used for minimum disengagement requirement after 500 cycles of mating and unmating.
5. Material – steel with a 16 microinch finish.

FIGURE 3. Test gage for force to engage and disengage test.

Downloaded from Arrow.com.

ENGINEERING DATA:

Nominal impedance: 50 ohms.
Frequency range: 0 to 4 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,	335	85

REQUIREMENTS:

Dimensions and configuration: See figure 1 and MIL-STD-348.
Force to engage and disengage: See figure 3 for test gage.
Longitudinal force: 14 pounds, maximum.
Torque: Not applicable.
Coupling proof torque: Not applicable.
Inspection conditions: Torque not applicable.
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.
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.

Downloaded from Arrow.com.

Voltage standing wave ratio (VSWR): From 500 MHz to 4 GHz, or approximately 80 percent of the upper cutoff frequency of the cable, whichever is lower.

Cable group	VSWR
I	1.30 + 0.04 (F) GHz
II, IIa,	1.25 + 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.

Initial: 14 pounds, maximum.
Final: 14 pounds maximum engage and disengage; 2 pounds minimum disengagement.

Contact resistance: In milliohms, maximum.

	Initial	After environment
Center contact:	6.0	8.0
Outer contact:	1.0	1.5
Braid to body:	1	Not applicable

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

Cable group	V rms (at sea level)
I	750
II, IIa	1,000

Vibration, high frequency: In accordance with MIL-STD-202-204, test condition B.
Shock: In accordance with MIL-STD-202-213, test condition B.
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.

Corona level:

Altitude: 70,000 feet (4.437 kPa).

Cable group	Volts, min.
I	185
II, IIa	250

Downloaded from Arrow.com.

RF high potential withstanding voltage:
Voltage and frequency: Tested at a frequency from 5 to 7.5 MHz.
Leakage current: Not applicable.

Cable group	Volts, rms min.
I	500
II, IIa	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
Inches, max. (mm)		
.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: Not applicable.
RF leakage: -55 dB minimum, tested at frequency between 2 and 3 GHz..
RF insertion loss: .30 dB maximum tested at 4 GHz.

PIN: M39012/67 (dash number in table I or IV as applicable).

Group qualification: See table V.

Cross reference of PIN: See table VI.

Downloaded from Arrow.com.

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

NOT FOR ARMY, NAVY, OR AIR FORCE USE. FOR OEM USE ONLY

Dash No. 1/ M39012/67	# Applicable cable group from MIL-PRF-39012, appendix B M17/	Typical mating connector 2/	Dimensions	Inches (millimeters) maximum 5/ 6/
B0008 3/ 4/	93-RG178 * @ 169-00001 %	M39012/68B0008 M39012/70B0008	A	1.10 (27.94)
B0009 3/ 4/	113-RG316 * @ 172-00001 % 119-RG174 173-00001 %	M39012/68B0009 M39012/70B0009		
B0010 3/ 4/	94-RG179 * @ ^	M39012/68B0010 M39012/70B0010		
B0013 3/	93-RG178 * @ 169-00001 %	M39012/68B0013 M39012/70B0013		
B0014 3/	113-RG316 * @ 172-00001 % 119-RG174 173-00001 %	M39012/68B0014 M39012/70B0014		
B0015 3/	94-RG179 ^ @ *	M39012/68B0015 M39012/70B0015		

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/ These connectors have captive center contacts.
4/ Connector bodies shall be gold plated in accordance with ASTM B488, type II, code C, class 1.27.
5/ Dimensions are in inches.
6/ Metric equivalents are given for information only.
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: M39012/67-3001 mates with M39012/68-3001, and M39012/67-4001 mates with M39012/68-4001.

Downloaded from Arrow.com.

TABLE V. Group qualification and retention testing.

Group	Submission and retention of Qualification of any of the following connectors 1/ M39012/	Qualifies the following connectors M39012/
I	67-0003	67-0003 67-0103 2/
II	67-0004	67-0004 67-0104 2/
III	67B0008	67B0008 67B0013 2/
IV	67B0009	67B0009 67B0010 67B0014 2/ 67B0015 2/
V	67B0010	67B0010 67B0015 2/
VI	67-0011	67-0011 67-0016 2/
VII	67-0012	67-0012 67-0017 2/

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.

TABLE VI. Supersession data.

Preferred PIN M39012/67 1/	Superseded PIN Or type designation
-0003	M39012/67-0001
-0004	M39012/67-0002
B0008	M39012/67-0008, M39012/67-0005
B0009	M39012/67-0009, M39012/67-0006
B0010	M39012/67-0010, M39012/67-0007

1/ The “B” PIN is required marking for connectors manufactured after 24 March 1987. The connectors that are in stock or distribution that were previously qualified and marked with the old PIN shall also be considered acceptable for Government use until stock is purged. (Applies to category “B” P/N change only; M39012/XXBXXXX).

Downloaded from Arrow.com.

TABLE VII. Maintenance replacements for category B.

Category B number 1/	Category C dash number	Category A dash number
B0008	-------	0003
B0009	-------	-------
B0010	-------	-------
B0013	-------	0103
B0014	-------	-------
B0015	-------	-------

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-202-204	MIL-STD-348
MIL-STD-202-101	MIL-STD-202-213	MIL-DTL-22520
MIL-STD-202-107	MIL-STD-202-301	MIL-C-22520/5
	MIL-STD-202-302	ASTM B488

CONCLUDING MATERIAL

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

Preparing activity:
DLA - CC

(Project 5935-2016-064)

Review activities:
Army - AT, AV, EA, MI
Navy - AS, MC, OS, SA, 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 .

Downloaded from Arrow.com.