

INCH-POUND

NOTE: The document identifier and heading has been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

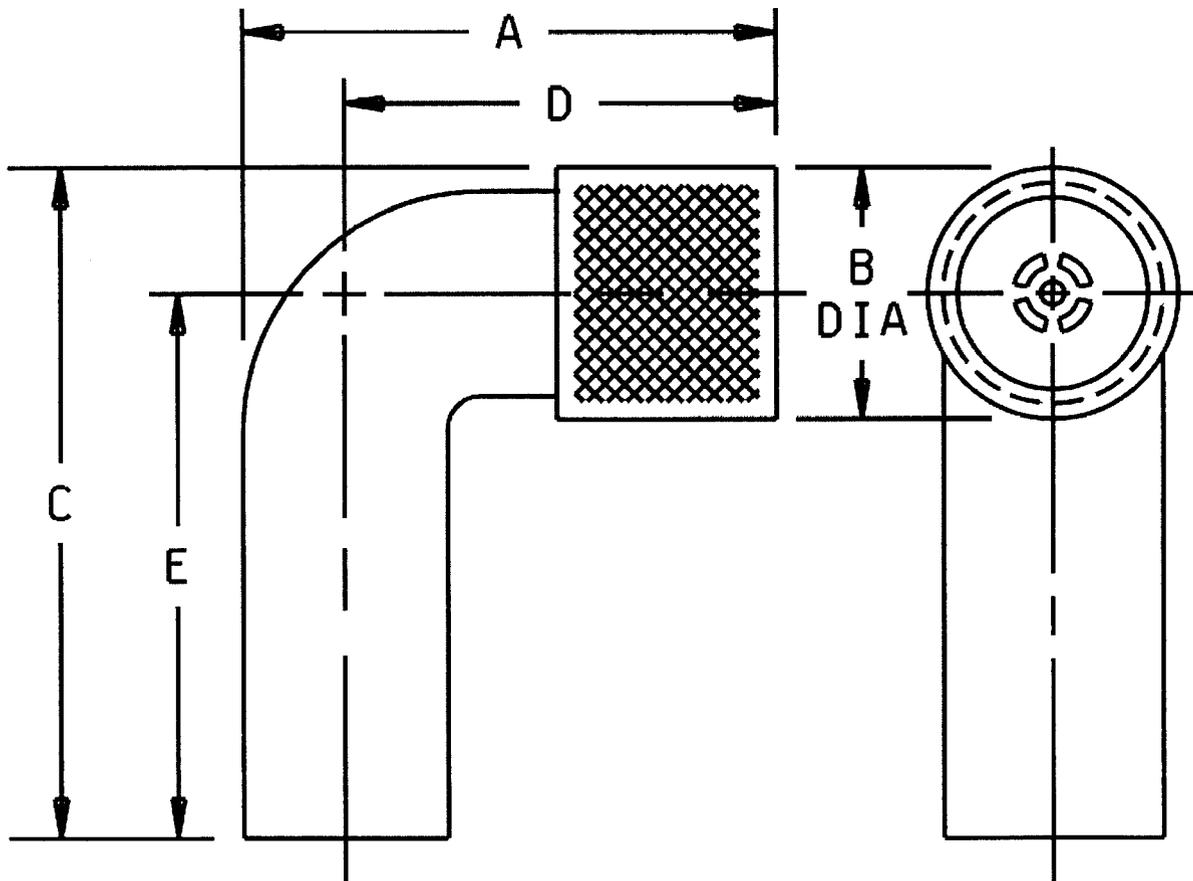
MIL-PRF-39012/5G
26 September 1994
SUPERSEDING
MIL-C-39012/5F
3 October 1986

PERFORMANCE SPECIFICATION SHEET

CONNECTORS, PLUG, ELECTRICAL, COAXIAL, RADIO FREQUENCY
(SERIES N (CABLED), RIGHT ANGLE, PIN 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 the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-PRF-39012.



NOTES:

1. For dimensions A, B, C, D, and E, see tables I and III.
2. Dimensions A, B, and C are the largest overall dimensions of the connector.
3. Wrench flats are to accommodate standard wrench opening in accordance with FED-STD-H28, appendix 10.
4. All undimensioned pictorial representations are for reference purposes only.
5. Dimension C defines the maximum length of the connector when assembled to the appropriate cable.
6. Series N, pin contact interface, in accordance with MIL-STD-348.

FIGURE 1. General configuration.

AMSC N/A

1 of 11

FSC 5935

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

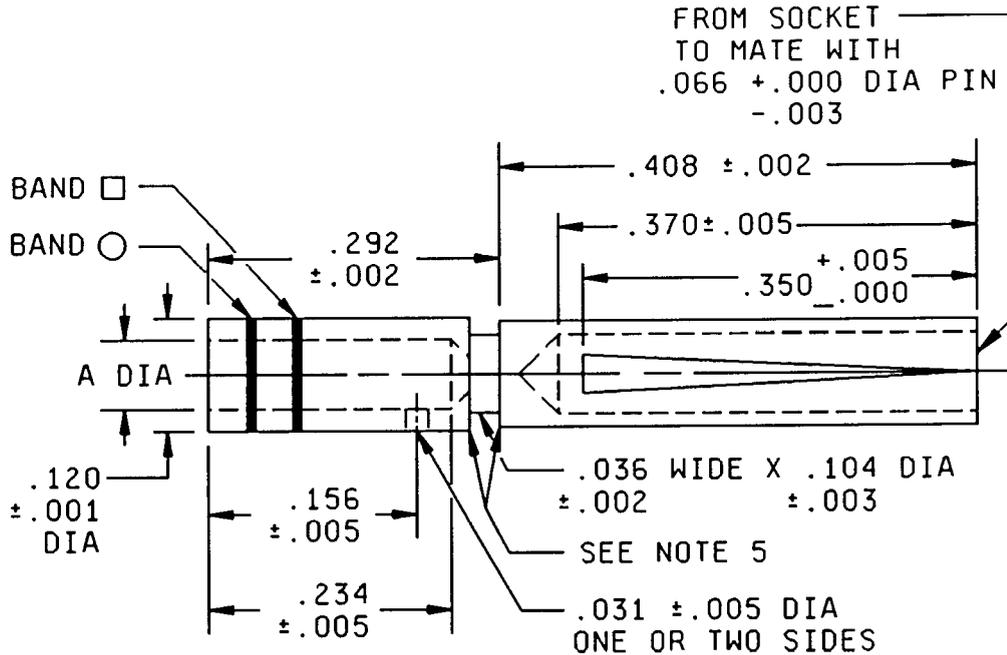
Dash number <u>1/</u>	Applicable cable <u>2/</u> M17/	Dimensions	Inches (millimeters)	
			Minimum	Maximum
Category A - Field serviceable (no special tools required) <u>3/</u>				
0006 Cable group VIII	2-RG006 <u>4/</u> 73-RG212 162-00001 180-00001 188-00001 199-00001 112-RG304 <u>5/</u> 171-00001	A B C	1.312 (33.32)	1.500 (38.10) .827 (21.01) 2.370 (58.42)
0104 Cable group XIV	79-RG218 <u>5/</u> 166-00001 193-00001			
0101 Cable group X	6-RG11 <u>4/</u> 181-00001 <u>4/</u> 62-RG144 <u>4/</u> 65-RG165 159-00001 74-RG213 189-00001 163-00001 75-RG214 190-00001 164-00001 86-00001 <u>6/</u> 127-RG393 <u>5/</u> 174-00001 77-RG216 <u>4/</u> 191-00001 <u>4/</u>			
0015 Cable group XII	78-RG217 <u>5/</u>			
0125 Cable group XI	74-RG215 <u>5/ 7/</u> 189-00002 <u>7/</u>			
Category C - Field replaceable (MIL-C-22520 crimp tool) See footnote next to applicable cable for crimp die <u>3/ 8/</u>				
0016 (Superseding -0013 <u>13/</u>) Cable group VIII	73-RG212 <u>9/</u> 162-00001 <u>9/</u> 2-RG006 <u>4/ 9/</u> 180-00001 <u>9/</u> 188-00001 <u>9/</u> 199-00001 <u>9/</u> 112-RG303 <u>5/ 9/</u> 171-00001 <u>9/</u>	A B C	1.312 (33.32)	1.513 (38.89) .827 (21.01) 2.375 (60.33)
0004 (Superseding -0015 <u>13/</u>) Cable group XA	74-RG213 <u>10/</u> 65-RG165 <u>5/ 6/ 10/</u> 159-00001 <u>10/</u> 189-00001 <u>10/</u> 163-00001 <u>10/</u>			
0005 (Superseding -0018 <u>13/</u>) Cable group XB	75-RG214 <u>10/</u> 190-00001 <u>10/</u> 164-00001 <u>10/</u> 86-00001 <u>6/ 10/</u> 127-RG393 <u>5/ 10/</u> 174-00001 <u>10/</u>			
0014 Cable group XC	6-RG11 <u>4/ 10/</u> 181-00001 <u>4/ 10/</u> 62-RG144 <u>4/ 5/ 6/ 10/</u>			
0017 Cable group XD	77-RG216 <u>4/ 5/ 6/ 10/</u> 191-00001 <u>10/</u>			

See footnotes at end of table.

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

Dash number <u>1/</u>	Applicable cable <u>2/</u> M17/	Dimensions	Inches (millimeters)	
			Minimum	Maximum
Category D - Field replaceable - Defined piece part <u>3/ 8/ 11/ 12/</u>				
0501 Cable group XB	75-RG214 190-00001 164-00001 86-00001 127-RG393 <u>5/</u> 174-00001	A B C D E	1.312 (33.32)	1.406 (35.72) .827 (21.01) 2.218 (56.36) 1.078 (27.38) 1.812 (46.04)
0502 Cable group XA	74-RG213 65-RG165 <u>5/</u> 159-00001 189-00001 163-00001			
0503 Cable group VIB	60-RG142 <u>6/</u> 158-00001 84-RG223 167-00001 194-00001 200-00001 128-RG400 <u>5/</u> 175-00001			
0504 Cable group VIA	28-RG058 155-00001 183-00001 197-00001 111-RG303 <u>5/</u> 170-00001			

- 1/ For cross-reference of dash number to superseded PIN or type designation, see table IV.
- 2/ The latest version of each cable shall be applicable.
- 3/ These connectors have captivated center contacts.
- 4/ These are not 50-ohm cables; therefore, when attached to the specified connectors, VSWR, RF leakage and insertion loss are not applicable.
- 5/ Cable to be used when performing tests requiring cable except as in 4/ and 6/.
- 6/ Cable to be used for the +200°C temperature cycling tests.
- 7/ Armored cable.
- 8/ These connectors are assembled using the applicable crimp tool, to the specified cables stripped as shown on figure 4.
- 9/ M22520/5-35 closure A or M22520/5-55 closure A.
- 10/ M22520/5-61.
- 11/ Complete connector assembly shall consist of a body, center contact, ferrule and assembly instructions.
- 12/ Not to be used in army equipment.
- 13/ The superseding dash numbers are acceptable for government use until stock is purged or 3 years from the date of this specification whichever is earlier.



CENTER CONTACT

Inches	mm	Inches	mm	Inches	mm	Inches	mm
.001	0.03	.043	1.09	.250	6.35	.492	12.50
.002	0.05	.066	1.68	.292	7.42	.500	12.70
.003	0.08	.098	2.49	.350	8.89	.600	15.24
.005	0.13	.104	2.64	.370	9.40		
.015	0.38	.156	3.96	.408	10.36		
.031	0.79	.220	5.59	.418	10.62		
.036	0.91	.234	5.94	.438	11.13		

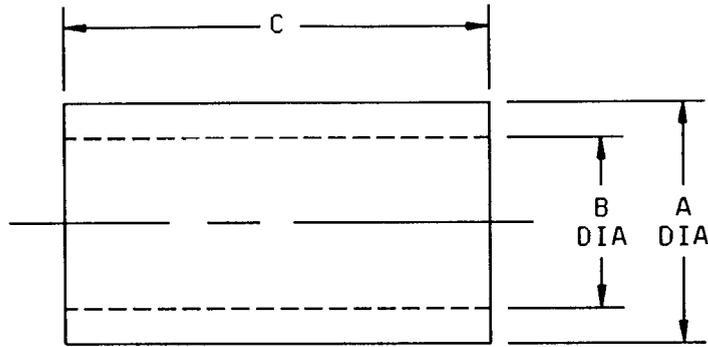
Dash no.	Contact no. 1/	Dimension A	Basic crimp tool 2/ M2252071	Crimp die or positioner M22520/1 3/	Crimp tensile minimum (pounds)	Color band □	Color band ○
0501 0502	5-10	.098 ±.002	-01	-13	60	Red	Orange
0503 0504	5-11	.043 +.001 -.002	-01	-13	20	Blue	Orange

- 1/ Contact numbers are for identification only.
- 2/ Class 2 tool may be used by OEM (see MIL-C-22520).
- 3/ Optional tool: M22520/5-01 with M22520/5-25 closure B die.

NOTES:

- 1. Dimensions are in inches.
- 2. Metric equivalents are given for information only.
- 3. Crimp tensile test shall be in accordance with MIL-C-39029.
- 4. Copyright notice: All information disclosed in these specification sheet which is or may be copyrighted is reproduced herein with the express permission of the copyright owner.
- 5. Maximum break of .003 inch (0.08 mm).
- 6. Color bands shall be positioned such that no coloring material enters the inspection hole.

FIGURE 3. Contact and ferrule dimensions for category D only.

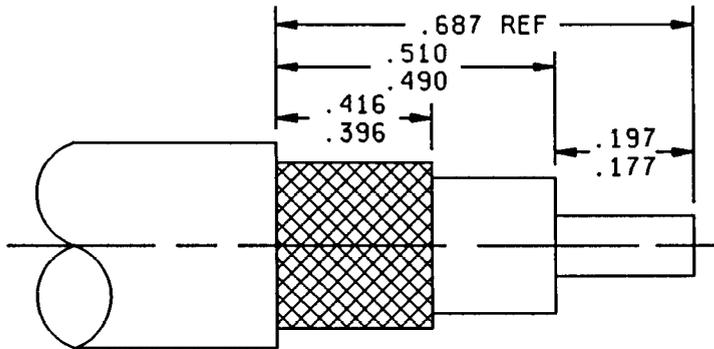


Dash number	Ferrule number ^{1/}	A ±.003	B ±.003	C ±.015	Basic crimp tool ^{2/}	Crimp die or positioner M22520/5-
0501	5-50	.492	.438	.600	M22520/5-01	25 Closure A or 61
0502	5-51	.492	.418	.600		5, 11, 57 Closure A or 19 Closure B
0503	5-52	.250	.220	.500		
0504	5-53	.245	.206	.500		

^{1/} Ferrule numbers are for identification only.

^{2/} Class 2 tools may be used by OEM (see MIL-C-22520).

FIGURE 3. Contact and ferrule dimensions for category D only - Continued.



Inches	mm
.177	4.50
.197	5.00
.396	10.06
.416	10.57
.490	12.45
.510	12.95
.687	17.45

NOTES:

- Dimensions are in inches.
- Metric equivalents are given for information only.

FIGURE 4. Cable stripping dimensions for field replaceable connectors.

ENGINEERING DATA:

Nominal impedance: 50 ohms.

Frequency range: 0 to 11,000 MHz.

Voltage rating:

1,000 volts rms maximum working voltage at sea level.

250 volts rms maximum at 70,000 feet.

Temperature rating: -65°C to +165°C.

REQUIREMENTS:

Design and configuration: See figure 1.

Force to engage and disengage:

Longitudinal force: Not applicable.

Torque: 6 inch-pounds maximum.

Coupling proof torque: 15 inch-pounds minimum.

Inspection conditions: Coupling torque: 6 to 10 inch-pounds.

Mating characteristics: See figure 2 and MIL-STD-348 for dimensions.

Outer contact:

test ring ID: .316 maximum, 16 microinch finish.

Insertion force: 25 pounds maximum when inserted a minimum of .093.

Contacts with slotted members: Shall contact a .324 minimum diameter ring within .031 of their tip ends.

Hermetic seal: Not applicable.

Leakage (pressurized connectors): Not applicable.

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

Center contact retention: (Applicable to captivated-center-contact connectors only.) 15 pounds minimum axial force for all cables except RG400 and RG142; 6 pounds minimum for RG400 and RG142.

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

Voltage standing wave ratio (VSWR): From 500 to 11,000 MHz, or approximately 80 percent of upper cutoff frequency of the cable, whichever is lower.

From 500 to 9,000 MHz: 1.35 maximum.

From 9,000 to 11,000: 1.50 maximum.

Swept frequency VSWR test setup:

Item 6: VSWR shall be less than $1.008 + .002 F$ (F in GHz).

Item 16: VSWR shall be less than $1.008 + .002 F$ (F in GHz).

Second step of VSWR checkout procedure - VSWR shall be less than $1.012 + .004 F$ (F in GHz).

Group B inspection - VSWR shall be less than $1.024 + .007 F$ (F in GHz).

Qualification and group C inspection - VSWR shall not exceed 1.08.

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

Contact resistance: In milliohms maximum.

	<u>Initial</u>	<u>After environment</u>
Center contact	2.5	3.0
Outer contact	.2	Not applicable
Braid to body	.05	Not applicable

Dielectric withstanding voltage: Method 301 of MIL-STD-202. 2,500 volts rms minimum at sea level for connectors using other than RG400 and RG142; 1,500 volts rms minimum for connectors using RG400 and RG142.

Vibration, high frequency: Method 204 of MIL-STD-202, test condition B. No discontinuity permitted.

Shock: Method 213 of MIL-STD-202, test condition I. No discontinuity permitted.

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

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

Corona level:

Voltage: 500 volts rms minimum.

Altitude: 70,000 feet.

RF high potential withstanding voltage:

Voltage and frequency: 1,500 volts rms tested at a frequency from 5 to 7.5 MHz.

Leakage current: Not applicable.

Cable retention force:

Noncrimp assemblies: 75 pounds minimum.

Crimp assemblies:

50 lbs minimum for cables .155-.189 OD.

60 lbs minimum for cables .190-.229 OD.

75 lbs minimum for cables .230-.249 OD.

90 lbs minimum for cables .250 OD and larger.

Coupling mechanism retention force: 100 pounds minimum.

RF leakage: -90 dB minimum, tested at a frequency between 2 and 3 GHz. This requirement may be met by qualifying the straight connector version for the same cable under MIL-C-39012/1.

Insertion loss: .30 dB maximum at 10 GHz.

Part or Identifying Number (PIN): M39012/05- (dash number from table I or "B" number from table III).

TABLE II. Group qualification. 1/

Group	Submission and qualification of any of the following connectors <u>2/</u> M39012/05	Qualifies the following connectors M39012/05
I	-0101	-0101
II	-0006	-0006
III	B0002 B0003	B0002 B0003
IV	-0004 -0005 -0015 -0016 -0018	-0004 -0005 -0015 -0016 -0018
V	-0013 -0014 -0017	-0013 -0014 -0017
VI	B0007 B0008 B0011	B0007 B0008 B0011
VII	B0009 B0010 B0012	B0009 B0010 B0012
VIII	-0501 -0502	-0501 -0502 -0503
IX	-0503	-0503
X	-0504	-0504

- 1/ If a connector manufacturer produces a connector which meets all the requirements for two or more connector PIN's (within the same series), the manufacturer may receive qualification approval for two or more connector PIN's 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.
- 2/ 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. The part does not necessarily have to be the part initially qualified.

TABLE III. CATEGORY B - NONFIELD REPLACEABLE (SPECIAL TOOLS MAY BE REQUIRED). 1/

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

PIN 2/ M39012/05B	Applicable cable 3/ M17/	Dimensions	Inches (millimeters)	
			Minimum	Maximum
0002 4/	074-RG213 5/	A B C	1.312 (33.32)	1.531 (38.89) .827 (21.01) 2.375 (60.33)
0003 4/	75-RG213 5/			
0007 6/	2-RG6 7/			
0008 6/	6-RG11 7/ 62-RG144 5/ 7/ 8/			
0009 6/	065-RG165 5/ 8/			
0010 6/	073-RG212 5/ RG-222/U			
0011 6/	77-RG216 5/ 7/			
0012 6/	RG225/U 5/ 8/			

1/ For maintenance replacements for category B, see table V.

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

3/ The latest version of each cable shall be applicable.

4/ Inactive for new design.

5/ Cable to be used when performing tests requiring cable except as in 7/ and 8/.

6/ These connectors have captivated center contacts.

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

8/ Cable to be used for the +200°C temperature cycling tests.

TABLE IV. Cross-reference of PIN's. 1/

Preferred PIN M39012/05	Substitute for PIN or type designation 2/
-0101	UG-594/U, M39012/053-0001
B0002	UG-11707/U, M39012/053-0002
B0003	UG-1707/U, M39012/05-0003,
-0004	
-0005	
-0006	
B0007	M39012/05-0007
B0008	M39012/05-0008
B0009	M39012/05-0009
B0010	M39012/05-0010
B0011	M39012/05-0011
B0012	M39012/05-0012
-0013	
-0014	
-0015	
-0016	
-0017	
-0018	
-0501	
-0502	
-0503	
-0504	

- 1/ The superseded PIN or the type designation is for cross-reference only. Where a superseded PIN or type designation is not given, none was assigned or will be assigned. The PIN M39012/05-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.

TABLE V. Maintenance replacements for category B.

Category B number 1/	Category C dash number	Category A dash number	Category D dash number
B0002	0004	0101	0502
B0003	0005	0101	0501
B0007	0013	0006	---
B0008	0014	0101	---
B0009	0015	0101	---
B0010	0016	0006	---
B0011	0017	0101	---
B0012	0018	0101	0501

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

MIL-C-39012/5G

Revision letters are not used to denote changes due to the extensiveness of the changes.

CONCLUDING MATERIAL

Custodians:

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

Preparing activity:

DLA - ES

Review activities:

Army - AR, AT, EA, MI
Navy - AS, MC, OS, SH
Air Force - 11, 19, 99

(Project 5935-3932-05)