

INCH-POUND

MIL-DTL-17/129E

26 July 2006

SUPERSEDING

MIL-C-17/129D

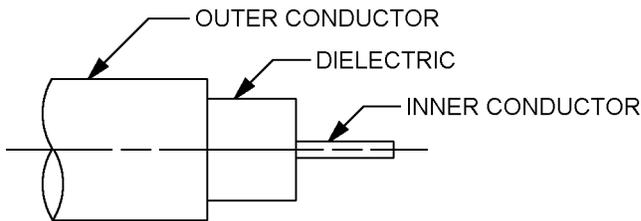
17 January 1992

DETAIL SPECIFICATION SHEET

CABLES, RADIO FREQUENCY, COAXIAL, 0.250 (6.35 mm) DIAMETER, SEMIRIGID, 50 OHMS, M17/129-RG401 AND M17/129-00001

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-DTL-17.



Inches	mm
.001	0.03
.002	0.05
.0641	1.682
.209	5.31
.250	6.35

\* Metric conversions for table I

FIGURE 1. Configuration.

TABLE I. Description.

Part or Identifying Number (PIN)	Inner conductor	Dielectric core	Outer conductor <u>1/</u>
M17/129-RG401	Solid, silver-coated copper wire diameter, .0641 inch $\pm$ .0010	Type F-1 Diameter, .209 inch $\pm$ .002	Copper tubing diameter, .250 inch $\pm$ .001
M17/129-00001	Same as above	Same as above	Copper tubing diameter, .250 inch $\pm$ .002, -.001 Tin plated in accordance with ASTM B545, .0003 minimum inch thick <u>2/</u>

1/ Welded outer conductor in accordance with ASTM B447 and MIL-DTL-17 is optional.

2/ The outer diameter dimensions is after plating.

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Engineering information:

Continuous working voltage: 3,000 V rms, maximum.

Operating frequency: 18 GHz, maximum.

Velocity of propagation: 69.5 percent, nominal.

Power rating: See figure 2.

Operating temperature range: -40°C to + 90°C.

Inner conductor properties:

DC resistance (maximum at 20°C): .257 ohms per 100 feet.

Elongation: 25 percent, minimum, per 10-inch specimen.

Engineering notes: This cable is generally useful in critical RF performance applications (see connector series TNC in accordance with MIL-PRF-39012). This cable is generally manufactured in 20-foot lengths. Different lengths are available.

REQUIREMENTS:

Dimensions, configuration, and descriptions: See figure 1 and table I.

Environmental and mechanical:

Eccentricity: 7.5 percent, maximum.

Adhesion of conductors:

Inner conductor to core: 4 pounds minimum; 100 pounds, maximum.

Outer conductor to core: 4 pounds minimum.

Aging stability: Not applicable.

Stress crack resistance: Not applicable.

Outer conductor integrity: Four specimens, approximately 2 feet long, shall be cut from the sample unit. The specimens shall be suspended in a heat chamber without touching one another or the walls of the chamber and conditioned for 1 hour 30 minutes minimum at the specified maximum operating temperature  $\pm 5^\circ$  C. Heated air shall be circulated so as to maintain a uniform test temperature. After the conditioning period, the specimens shall be removed from the heat chamber and conditioned at room ambient temperature for 4 hours minimum. The specimen shall then have one end immersed into molten solder to a depth of 0.5 inch minimum for 15 seconds minimum. The molten solder temperature shall be +230°C minimum. After the conditioning period, the specimens shall be removed from the molten solder and conditioned at room ambient temperature for 1 hour minimum. Examine the specimens for cracks, flaws, or other damage in the outer conductor material.

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Cold bend: Not applicable.

Dimensional stability:  $+125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

Core from jacket: .015 inch, maximum.

Contamination: Not applicable.

Bendability: Mandrel diameter .75 inch, maximum.

Flammability: Not applicable.

Weight: 10.5 pounds per 100 feet, maximum (M17/129-RG401).  
10.6 pounds per 100 feet, maximum (M17/129-00001).

Electrical:

Test frequency: 400 MHz to 18 GHz.

Spark test: Not applicable.

Voltage withstanding: 7,500 V rms, minimum.

Insulation resistance: Not applicable.

Corona extinction voltage: 3,000 V rms, minimum.

Characteristic impedance: 50 ohms  $\pm 0.5$ .

Attenuation: See figure 2.

Structural return loss: See figure 3.

Capacitance: 29.6 pF per foot, maximum.

Capacitance stability: Not applicable.

Capacitance unbalance: Not applicable.

Transmission unbalance: Not applicable.

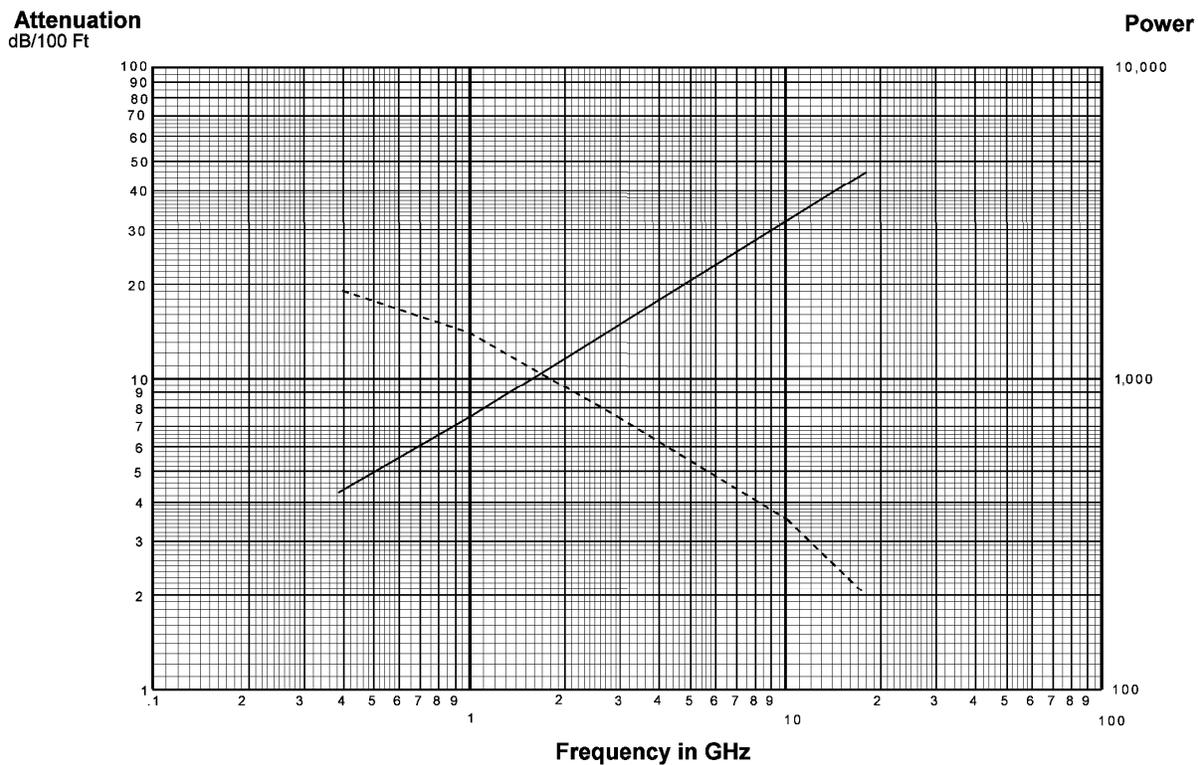
Mechanically induced noise voltage: Not applicable.

Time delay: Not applicable.

PIN: See table I.

Supersession data: See table II.

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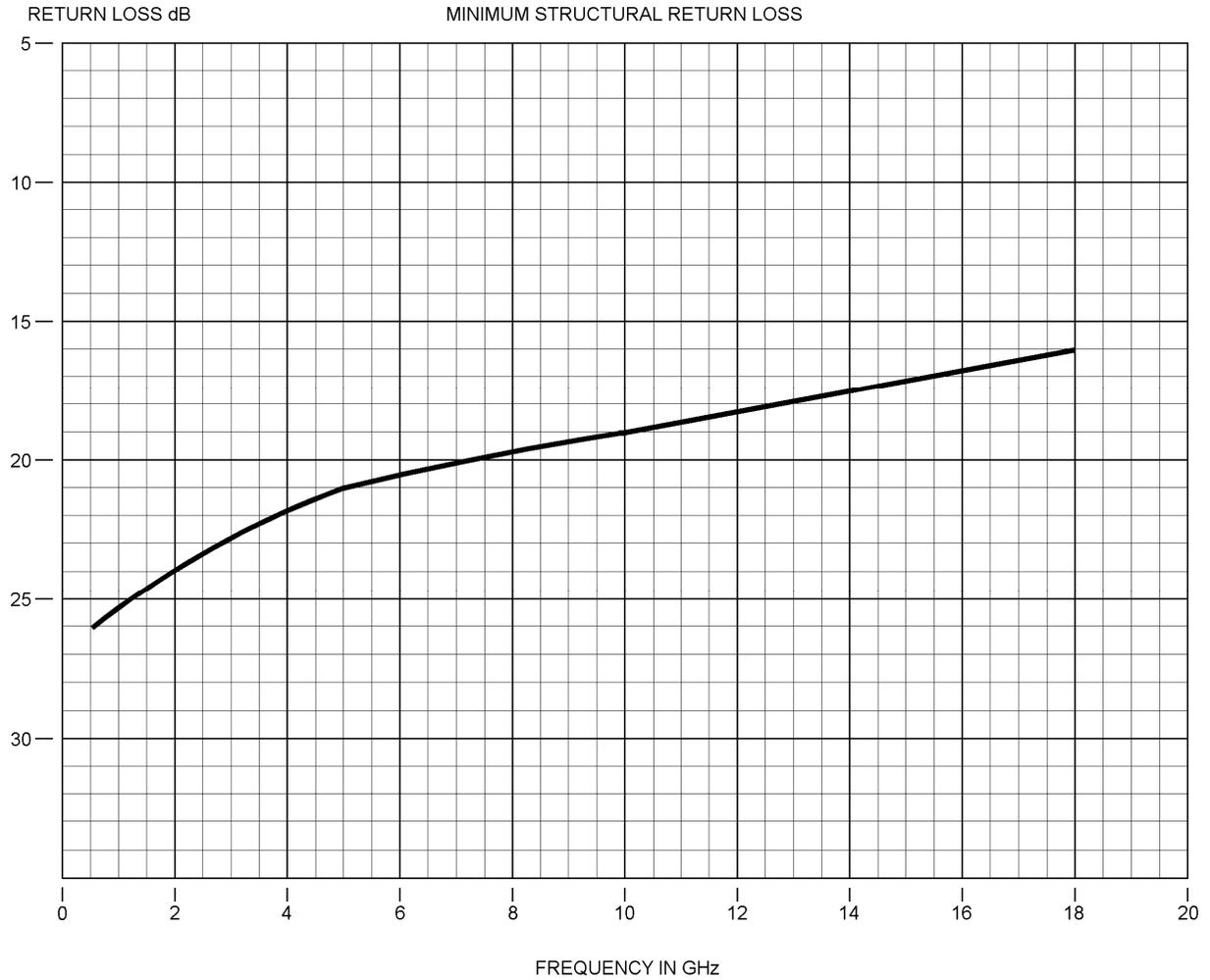
Maximum attenuation: \_\_\_\_\_ (Test requirements shall be a line indicted on graph)

Maximum power -----  
(at 25°C at sea level)

Attenuation		Power
MHz	dB	Watts
400	4.5	1900
1000	7.5	1400
3000	16	750
10000	33	350
18000	48	200

FIGURE 2. Power rating and attenuation.

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Structural Return Loss	
MHz	dB
500	26
5000	21
10000	19
18000	16

FIGURE 3. Structural return loss.

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SWR	Reflection coefficient	Return loss dB
17.3910	.8913	1
8.7242	.7943	2
5.8480	.7079	3
4.4194	.6310	4
3.5698	.5623	5
3.0095	.5012	6
2.6146	.4467	7
2.3229	.3981	8
2.0999	.3548	9
1.9250	.3162	10
1.7849	.2818	11
1.6709	.2512	12
1.5679	.2239	13
1.4985	.1995	14
1.4326	.1778	15
1.3767	.1585	16
1.3290	.1413	17
1.2880	.1259	18
1.2528	.1122	19
1.2222	.1000	20
1.1957	.0891	21
1.1726	.0794	22
1.1524	.0708	23
1.1347	.0631	24
1.1192	.0562	25
1.1055	.0501	26
1.0935	.0447	27
1.0829	.0398	28
1.0736	.0355	29
1.0653	.0316	30

FIGURE 3. Structural return loss - Continued.

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TABLE II. Cross reference of PIN.

PIN	Superseded PIN or type designation
M17/129-RG401	RG-401/U
M17/129-00001	--

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

Referenced documents. In addition to MIL-DTL-17, this document references the following:

ASTM B447  
ASTM B545  
MIL-PRF-39012

CONCLUDING MATERIAL

Custodians:  
Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC  
  
(Project 6145-2005-005)

Review activities:  
Army - AT, AV, CR4, MI  
Navy - AS, MC, OS, SH  
Air Force - 19, 99  
DLA - IS

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>.