

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with [ASME Y14.100](#)

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PMIC N/A	PREPARED BY Michael A. Radecki						DESIGN ACTIVITY DLA LAND AND MARITIME COLUMBUS, OH 43218-3990													
Original date of drawing 2 April 2013	CHECKED BY Andrew R. Ernst						TITLE ATTENUATORS, FIXED, MINIATURE, COAXIAL LINE (SMA CONNECTORS), FREQUENCY RANGE: DC TO 18 GHz, CLASS IV, LOW POWER													
	APPROVED BY Robert M. Heber																			
	SIZE A	CODE IDENT. NO. 037Z3						DWG NO. 13016												
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1. SCOPE

1.1 Scope. This drawing describes the requirements for fixed coaxial line (series S and N) attenuators screened to MIL-DTL-3933. The attenuators described herein are direct replacements for screened (S) and non-screened (N) MIL-DTL-3933/25 attenuators that lost their qualified MIL-DTL-3933 source (see 6.4 and table II).

1.2 Part or Identifying Number (PIN). The complete PIN will be in the following form:



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, and 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-3933 - Attenuators, Fixed, Space Level, Non-Space Level, General Specification for.

(Copies of these documents are available online at <https://assist.dla.mil/quicksearch> or from the DLA Document Service Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

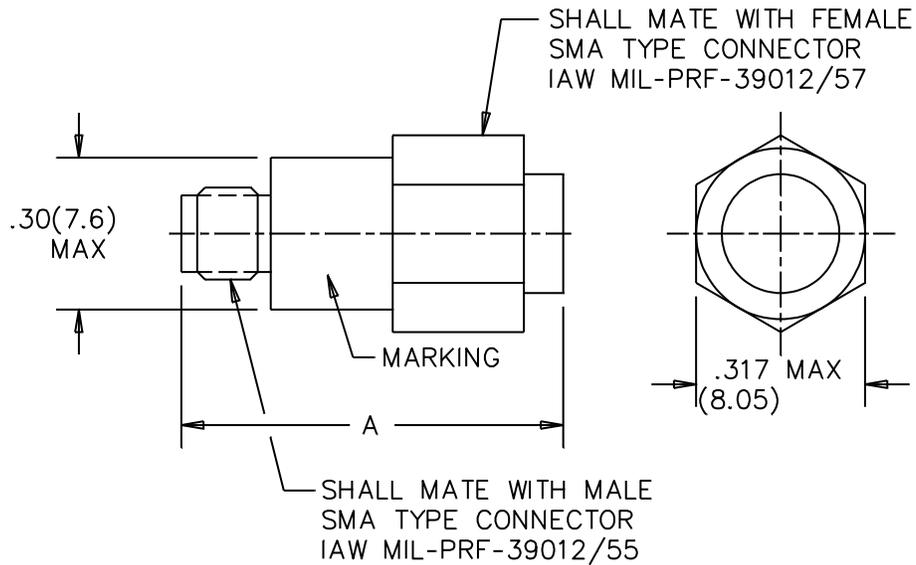
3.1 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-DTL-3933 and herein (see figure 1).

3.1.1 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of capacitor components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see 6.3).

3.2 Rated temperature. -55°C to +125°C.

3.3 Maximum weight. 0.45 ounces.

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NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Metric equivalents are in parentheses.
4. Dimension A is listed in table I.

FIGURE 1. Dimensions and configuration.

3.4 Electrical characteristics.

3.4.1 Nominal impedance. 50 ohms.

3.4.2 Attenuation: See table I. Stability and sensitivity:

Maximum attenuation change after:	Up to 10 dB, inclusive (dB)	Over 10 dB (dB/dB)
Temperature change / thermal shock	0.5	0.05
Vibration or shock	0.5	0.05
Moisture resistance or salt spray	0.5	0.05
Peak power	0.5	0.05

Frequency sensitivity, maximum: 0.4 dB/dB/GHz.
 Temperature sensitivity of attenuation, maximum: 0.0006 dB/dB/°C.

3.4.3 Power. See table I. Power sensitivity for full input power, maximum: 0.005 dB/dB/Watt.

3.4.4 VSWR. See table I.

3.4.5 Connector repeatability. Maximum variation in attenuation: 0.04 dB.

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3.5 Engineering data.

3.5.1 Operating frequency range. DC to 18 GHz (see table I).

3.5.2 Test frequency range.

3.5.2.1 For VSWR and attenuation measurements, measured or recorded, when using an Automatic Network Analyzer (ANA) or equivalent test equipment:

100 MHz (or lower) to 2.0 GHz for dash numbers 22 through 26.
 100 MHz (or lower) to 18 GHz for dash numbers 89 through 90.

3.5.2.2 Basic test frequency for sensitive measurements like connector repeatability, temperature sensitivity, power sensitivity and any other measurements where a 'delta' specification is imposed:

1.0 GHz for dash numbers 22 through 26.
 8.0 GHz for dash numbers 89 through 90.

TABLE I. Electrical characteristics.

Dash number	Attenuation (dB)						Maximum Power Input		VSWR maximum ^{3/}					Dimension A (inches) maximum
	Nominal	Deviation					AV (W) ^{1/} (continuously)	Peak (W) ^{2/}	DC to 2.0 GHz	2 to 4.0 GHz	4 to 8.0 GHz	8 to 12.4 GHz	12.4 to 18.0 GHz	
		DC to 2.0 GHz	DC to 4.0 GHz	DC to 8.0 GHz	DC to 12.4 GHz	DC to 18.0 GHz								
22 N S	22	±0.5	---	---	---	---	2	500	1.15:1	---	---	---	---	1.03 (26.16)
24 N S	24	±0.5	---	---	---	---	2	500	1.15:1	---	---	---	---	1.03 (26.16)
26 N S	30	±0.5	---	---	---	---	2	500	1.15:1	---	---	---	---	1.03 (26.16)
89 N S	25	±0.3	---	---	---	1.0	2	500	1.10:1	1.15:1	1.20:1	1.25:1	1.35:1	1.04 (26.42)
90 N S	30	±0.6	---	---	---	1.0	2	500	1.10:1	1.15:1	1.20:1	1.25:1	1.35:1	1.04 (26.42)

^{1/} Power input is derated linearly to 0.5 watts at +125°C.

^{2/} Peak power for a duty cycle of 5×10^{-4} ; maximum pulse duration 5 microseconds.

^{3/} VSWR value is for both ends.

3.6 Marking. In accordance with [MIL-DTL-3933](#), except the attenuator shall be marked with the PIN as specified herein (see 1.2).

- 13016-22N - Drawing PIN
- 12345 - Manufacturer's source code or logo
- 1305 - Date code
- XXXX - Serialization

3.7 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the [MIL-DTL-3933 Qualified Products Database](#) for at least one part, or provide evidence that their parts have passed the qualification requirements of [MIL-DTL-3933](#).

3.8 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.

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3.9 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.10 Workmanship. The attenuator shall be uniform in quality and free from any defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Qualification inspection. Qualification inspection is not required.

4.2 Conformance inspection.

4.2.1 Inspection of product for delivery. For N level product, inspection of product for delivery shall consist of the group A inspection of [MIL-DTL-3933](#). For S level product, inspection of product for delivery shall consist of screening and the group A inspection of [MIL-DTL-3933](#).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see [6.2](#)). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. Attenuators conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing, this drawing becomes obsolete and will not be used for new design.

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete PIN (see [1.2](#)).
- b. Requirements for delivery of one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.
- c. Requirements for notification of change of product to the acquiring activity, if applicable.
- d. Requirements for packaging and packing.

6.3 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to [ASTM-B545](#) (Standard Specification for Electrodeposited Coatings of Tin).

6.4 MIL-DTL-3933/25 replacements. The attenuators described herein are direct replacements for some of the [MIL-DTL-3933/25](#) screened and non-screened attenuators (see table II).

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TABLE II. Replacement data.

MIL-DTL-3933/25 PIN	DLA Land and Maritime drawing PIN 13016-
M3933/25-22N	22N
M3933/23-22S	22S
M3933/25-24N	24N
M3933/25-24S	24S
M3933/25-26N	26N
M3933/25-26S	26S
M3933/25-89N	89N
M3933/25-89S	89S
M3933/25-90N	90N
M3933/25-90S	90S

1/ M3933 non-screened (N) PINs may also be known without the ending N character.

6.5 Replaceability. Attenuators covered by this drawing will replace the same commercial device covered by contractor prepared specification or drawing.

6.6 Users of record. Coordination of this document for future revisions is coordinated only with the approved sources of supply and the users of record of this document. Requests to be added as a recorded user of this drawing should be in writing to: DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, OH 43218-3990, by email to tubesamps@dla.mil, or by telephone (614) 692-0551 or DSN 850-0551.

6.7 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. For assistance in the use of this drawing, contact DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, OH 43218-3990, by email to tubesamps@dla.mil, or by telephone (614) 692-0551 or DSN 850-0551.

<u>Vendor</u>	<u>Vendor CAGE</u>	<u>Vendor name and address</u>	<u>Similar designation 1/</u>
A	95077	SV Microwave 2400 Centrepark West Drive Suite 100 West Palm Beach, FL 33409-6469	SF0965-6811-XXX

1/ Parts must be purchased to the DLA Land and Maritime PIN to assure that all performance requirements and tests are met.

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