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MILITARY STANDARD

ATTENUATORS, FIXED AND VARIABLE, SELECTION OF

FSC 5985

DEPARTMENT OF DEFENSE
Washington, DC 20301

Attenuators, Fixed and Variable, Selection of.

MIL-STD-1352F

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Electronic Systems Command, ATTN: ELEX 8111, Department of the Navy, Washington, DC 20363, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

CONTENTS

TABLES

1. SCOPE

1.1 Scope. This standard provides a list of standard fixed and variable attenuators for use in military applications.

1.2 Purpose. The purpose of this standard is to:

a. Provide the equipment designer with a list of fixed and variable attenuators considered standard for use in military applications.

b. Restrict the number of fixed and variable attenuators for use in military applications in order to provide effective logistic support of equipment.

c. Establish criteria pertinent to choice and application of fixed and variable attenuators for use in military equipment.

2. REFERENCED DOCUMENTS

2.1 Government specifications. Unless otherwise specified, the following specifications of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation form a part of this standard to the extent specified herein.

SPECIFICATION

Military

MIL-A-3933	-	Attenuators, Fixed General Specification For.
MIL-A-24215	-	Attenuators, Variable (Coaxial and Waveguide), General Specification For.

(Copies of specifications and standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

3. DEFINITIONS

3.1 Definitions. The terms used in this standard are those commonly encountered in attenuator engineering practice.

4. GENERAL REQUIREMENTS

4.1 Selection of attenuators. Fixed attenuators to be used in military applications shall be selected from those listed in tables I through X. Variable attenuators to be used in military applications shall be selected from those listed in tables XI through XVII. A cross reference is shown in table XVIII.

4.2 Criteria for selection. The criteria for the selection of attenuators for inclusion in this standard are:

a. The fixed and variable attenuators shall be considered by representatives of the military departments the best available type for current application.

b. Availability of the fixed and variable attenuators shall be reasonably certain.

c. The fixed and variable attenuators shall have an approved military specification.

4.3 Application and use. Fixed and variable attenuators used in military applications shall be representative of manufactured lots possessing acceptable material and physical and electrical characteristics and shall in no manner degrade the operational characteristics of the equipment in which used.

4.4 Detailed requirements for attenuators. The detailed requirements for attenuators listed in this standard are covered by the applicable MIL-A-3933 and MIL-A-24215 specification sheets.

5. DETAILED REQUIREMENTS. Not applicable.

6. NOTES. Not applicable.

1-11	"	6	"	"	"	"	"	"	"	"
1-12	"	7	"	"	"	1	"	"	"	"
1-13	"	8	"	"	"	"	"	"	"	"
1-14	"	9	"	"	"	"	"	"	"	"
1-15	"	10	"	"	"	"	"	"	"	"
1-16	"	12	"	"	"	"	"	"	"	"
1-17	"	15	"	"	"	"	"	"	"	"

See footnotes at end of table.

TABLE II. Fixed attenuators with series N connectors - Continued.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max) (nom)	Impedance (ohms)	Power Avg (W)	Power Peak kW)	Length 1/ (max)	Class 2/
1-18	DC to 3.0	20	0.2	1.20:1	50	1	1	4.375(111.13)	IIA
1-19	"	25	"	"	"	"	"	"	"
1-20	"	30	"	"	"	"	"	"	"
1-21	"	40	0.3	"	"	"	"	"	"
1-22	"	50	0.3	"	"	"	"	"	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

2/ A class IIA attenuator is for use as a secondary standard, and in laboratory and precision test equipment.

TABLE III. Fixed attenuators with series N connectors (male and female).

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak kW)	Length 1/ (max)	Class 2/
3-08	DC to 1.5	1	0.5	1.30:1	50	35	10	6.42(163.07)	III
3-09	"	2	"	"	"	18	"	"	"
3-10	"	3	"	"	"	15	"	"	"
3-11	"	4	"	"	"	12	"	"	"
3-12	"	5	"	"	"	10	"	"	"
3-13	"	6	"	"	"	"	"	"	"
3-14	"	10	"	"	"	"	"	"	"
3-15	"	20	"	"	"	"	"	6.85(163.07)	"
5-01	1 to 10.0	3	0.1	1.25:1	"	5	"	8.31(211.12)	IIB
5-02	"	6	"	1.25:1	"	3	6	"	"
5-03	"	10	"	1.30:1	"	1	2	"	"
5-04	"	7	"	1.30:1	"	3	6	"	"
5-08	"	1	"	1.25:1	"	5	10	"	"
5-09	"	2	"	"	5	5	10	"	"
5-10	"	4	"	"	50	4	8	"	"
5-11	"	5	"	"	"	3	6	"	"
5-12	"	8	"	1.30:1	"	2	2	"	"
5-13	"	9	"	"	"	"	"	"	"
5-14	2 to 10.0	20	0.2	"	"	"	"	"	"
6-01	DC to 1.5	10	0.1	1.15:1	"	1	1	3.25(82.55)	IIA
6-03	"	6	"	"	"	"	"	"	"
6-05	"	12	"	"	"	"	"	"	"
6-09	"	20	0.2	"	"	"	"	4.37(111.13)	"
6-10	"	30	0.3	"	"	"	"	4.37(111.13)	"
8-01	DC to 4.0	3	0.1	1.30:1	"	"	"	3.25(82.55)	IIB
8-02	"	6	"	"	"	"	"	"	"
8-03	"	10	"	"	"	"	"	"	"
9-04	DC to 4.5	1	0.2	1.35:1	"	4	2	2.75(69.85)	III
9-05	"	2	"	"	"	"	"	"	"
9-06	"	3	"	"	"	"	"	"	"
9-07	"	4	"	"	"	3	"	"	"

See footnotes at end of table.

TABLE III. Fixed attenuators with series N connectors (male and female) - Continued.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak kW)	Length 1/ (max)	Class 2/
9-08	DC to 4.5	5	0.2	1.35:1	50	3	2	2.75(69.85)	III
9-09	"	6	0.3	1.35:1	"	3	"	"	"
9-10	"	8	"	1.25:1	"	2	"	"	"
9-11	"	10	"	"	"	"	"	"	"
9-12	"	12	0.4	"	"	"	"	"	"
9-13	"	15	"	"	"	"	"	"	"
9-14	"	20	"	"	"	"	"	"	"
9-15	"	25	0.6	"	"	"	"	"	"
9-16	"	30	0.6	"	"	"	"	"	"
9-17	"	50	1.0	"	"	"	"	4.0(101.6)	"
9-18	"	60	1.2	"	"	"	"	4.0(101.6)	"
18-01	DC to 12.4	3	0.2	"	"	"	1	2.70(68.58)	IV
18-02	"	6	0.2	"	"	"	"	"	"
18-03	"	10	0.4	"	"	"	"	"	"
18-04	"	20	0.4	"	"	"	"	"	"
18-05	"	30	0.8	"	"	"	"	"	"
18-06	"	40	0.8	"	"	"	"	"	"
18-07	"	50	1.25	"	"	"	"	"	"
18-08	"	60	1.25	"	"	"	"	"	"
18-09	"	1	0.4	"	"	5	"	"	"
18-10	"	2	0.4	"	"	"	"	"	"
18-11	"	3	0.3	"	"	"	"	"	"
18-12	"	5	"	"	"	"	"	"	"
18-13	"	6	"	"	"	"	"	"	"
18-14	"	10	0.4	"	"	"	"	"	"
18-15	"	13	0.5	"	"	"	"	"	"
18-16	"	20	0.5	"	"	"	"	"	"
18-17	"	30	0.8	"	"	"	"	"	"
18-18	"	40	0.8	"	"	"	"	"	"
18-19	"	50	1.0	"	"	"	"	"	"
18-20	"	60	1.0	"	"	"	"	"	"
18-21	DC to 18.0	3	0.3	1.20:1	"	2	0.2	"	"
18-22	"	6	0.3	"	"	"	"	"	"
18-23	"	10	0.5	"	"	"	"	"	"
18-24	"	20	0.5	"	"	"	"	"	"
26-01	0.4 to 18.0	1	0.1	1.50:1	"	5	10	8.31(211.12)	"
26-02	0.5 to 18.0	2	"	"	"	"	"	"	"
26-03	0.6 to 18.0	3	"	"	"	"	"	"	"
26-04	1.0 to 18.0	4	"	"	"	4	8	"	"
26-05	"	5	"	"	"	3	6	"	"
26-06	"	6	"	"	"	3	6	"	"
26-07	"	7	"	"	"	2.5	5	"	"
26-08	"	8	"	"	"	1	1	"	"
26-09	"	9	"	"	"	"	"	"	"
26-10	"	10	"	"	"	"	"	"	"
26-11	2.0 to 18.0	20	0.2	"	"	"	"	"	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

2/ A class IIA or IIB attenuator is for use as a secondary standard, and in laboratory and precision test equipment; a class III attenuator is for use in general field equipment; and a class IV attenuator is for use in equipment in which precision and stability are secondary considerations.

TABLE IV. Fixed attenuators with type UG-45/U and UG-46/U connectors.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class 2/
2-02	1 to 4.0	3	0.1	1.30:1	46.5	10	20	14.312(363.52)	IIB
2-03	1 to 4.0	6	0.1	1.30:1	46.5	5	10	14.312(363.52)	IIB

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

2/ A class IIB attenuator is for use as a secondary standard, and in laboratory and precision test equipment.

TABLE V. Fixed attenuators with series N connectors (male and female) and cooling fins.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class 2/
10-1	DC to 4.0	6	0.2	1.30:1	50	15	3	5.25(133.35)	III
10-2	"	3	0.5	1.15:1	"	20	1	3.49(88.65)	"
10-3	"	10	"	"	"	"	"	"	"
10-4	"	20	"	"	"	"	"	"	"
10-5	"	30	0.75	"	"	"	"	"	"
10-6	DC to 8.0	3	0.6	1.30:1	"	25	5	"	"
10-7	"	6	"	"	"	"	"	"	"
10-8	"	10	"	"	"	"	"	"	"
10-9	"	20	"	"	"	"	"	"	"
10-10	"	30	1.0	"	"	"	"	"	"
10-11	DC to 11.0	3	0.75	"	"	20	1	"	"
10-12	"	6	"	"	"	"	"	"	"
10-13	"	10	"	"	"	"	"	"	"
10-14	"	20	"	"	"	"	"	"	"
10-15	"	30	"	"	"	"	"	"	"
10-16	DC to 18.0	3	0.3	1.40:1	"	"	"	"	"
10-17	"	6	0.3	"	"	10	"	"	"
10-18	"	10	0.5	"	"	"	2	"	"
10-19	"	20	0.5	"	"	"	"	"	"
10-20	"	30	1.0	"	"	"	"	"	"
10-21	"	40	1.0	"	"	"	"	"	"
10-22	"	50	1.35	"	"	"	"	"	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

2/ A class III attenuator is for use in general field equipment.

TABLE VI. Fixed attenuators with SMA connectors (male and female).

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class
14-01	DC to 12.4	3	0.3	1.25:1	50	2	0.2	1.24(31.50)	IV
14-02	"	6	"	"	"	"	"	"	"
14-03	"	10	"	"	"	"	"	"	"
14-04	"	20	0.5	"	"	"	"	"	"
14-05	"	15	0.5	"	"	"	"	"	"
14-06	"	1	0.3	"	"	"	"	"	"
14-07	"	2	"	"	"	"	"	"	"
14-08	"	4	"	"	"	"	"	"	"
14-09	"	5	"	"	"	"	"	"	"
14-10	"	7	0.4	"	"	"	"	"	"
14-11	"	8	"	"	"	"	"	"	"
14-12	"	9	"	"	"	"	"	"	"
14-13	"	30	0.8	"	"	"	"	1.85(46.99)	"
14-14	"	40	0.8	"	"	"	"	"	"
14-15	"	60	2.0	"	"	"	"	"	"
14-16	"	50	2.0	"	"	"	"	"	"
14-17	"	28	0.9	"	"	"	"	"	"
14-18	"	16	0.5	"	"	"	"	1.24(31.50)	"
14-19	"	14	"	"	"	"	"	"	"
14-20	"	13	"	"	"	"	"	"	"
14-21	"	12	"	"	"	"	"	"	"
14-22	"	11	"	"	"	"	"	"	"
14-23	"	1.5	0.3	"	"	"	"	"	"
14-24	"	31	0.9	"	"	"	"	1.85(46.99)	"
16-01	DC to 18.0	3	0.3	1.35:1	"	"	0.5	1.24(31.50)	"
16-02	"	6	0.3	"	"	"	"	"	"
16-03	"	10	0.5	"	"	"	"	"	"
16-04	"	20	0.7	"	"	"	"	"	"
16-05	"	1	0.4	"	"	"	"	"	"
16-06	"	2	0.4	"	"	"	"	"	"
16-07	"	4	0.3	"	"	"	"	"	"
16-08	"	5	0.3	"	"	"	"	"	"
16-09	"	7	0.5	"	"	"	"	"	"
16-10	"	8	"	"	"	"	"	"	"
16-11	"	9	"	"	"	"	"	"	"
16-12	"	30	1.0	"	"	"	"	1.85(46.99)	"
16-13	"	40	1.0	"	"	"	"	"	"
16-14	"	50	2.0	"	"	"	"	"	"
16-15	"	60	2.0	"	"	"	"	"	"
16-16	"	0	0.4	"	"	"	"	1.24(31.50)	"
16-17	"	0.5	"	"	"	"	"	"	"
16-18	"	1.5	"	"	"	"	"	"	"
16-19	"	2.5	"	"	"	"	"	"	"
16-20	"	3.5	0.3	"	"	"	"	"	"
16-21	"	4.5	"	"	"	"	"	"	"
16-22	"	5.5	"	"	"	"	"	"	"
16-23	"	6.5	"	"	"	"	"	"	"
16-24	"	7.5	0.5	"	"	"	"	"	"
16-25	"	8.5	"	"	"	"	"	"	"
16-26	"	9.5	"	"	"	"	"	"	"
16-27	"	10.5	"	"	"	"	"	"	"
16-28	"	11	"	"	"	"	"	"	"
16-29	"	11.5	"	"	"	"	"	"	"
16-30	"	12	"	"	"	"	"	"	"
16-31	"	12.5	"	"	"	"	"	"	"

See footnote at end of table.

TABLE VI. Fixed attenuators with SMA connectors (male and female) - Continued.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Imped-ance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class
16-32	DC to 18.0	13	0.5	1.35:1	50	2	0.5	1.24(31.50)	IV
16-33	"	13.5	"	"	"	"	"	"	"
16-34	"	14	"	"	"	"	"	"	"
16-35	"	14.5	"	"	"	"	"	"	"
16-36	"	15	"	"	"	"	"	"	"
16-37	"	15.5	"	"	"	"	"	"	"
16-38	"	16	0.7	"	"	"	"	"	"
16-39	"	16.5	"	"	"	"	"	"	"
16-40	"	17	"	"	"	"	"	"	"
16-41	"	17.5	"	"	"	"	"	"	"
16-42	"	18	"	"	"	"	"	"	"
16-43	"	18.5	"	"	"	"	"	"	"
16-44	"	19	"	"	"	"	"	"	"
16-45	"	19.5	"	"	"	"	"	"	"
16-46	"	20.5	"	"	"	"	"	"	"
16-47	"	21	"	"	"	"	"	"	"
16-48	"	21.5	"	"	"	"	"	"	"
16-49	"	22	"	"	"	"	"	"	"
16-50	"	22.5	"	"	"	"	"	"	"
16-51	"	23	"	"	"	"	"	"	"
16-52	"	23.5	"	"	"	"	"	"	"
16-53	"	24	"	"	"	"	"	"	"
16-54	"	24.5	"	"	"	"	"	"	"
16-55	"	25	"	"	"	"	"	"	"
16-56	"	28	"	"	"	"	"	"	"
16-57	"	32	1.0	"	"	"	"	1.85(46.99)	"
16-58	"	36	"	"	"	"	"	"	"
16-59	"	44	"	"	"	"	"	"	"
16-60	"	45	"	"	"	"	"	"	"
25-01	DC to 2.0	1	0.3	1.15:1	"	"	"	0.87(22.10)	"
25-02	"	2	"	"	"	"	"	"	"
25-03	"	3	"	"	"	"	"	"	"
25-04	"	4	"	"	"	"	"	"	"
25-05	"	5	"	"	"	"	"	"	"
25-06	"	6	"	"	"	"	"	"	"
25-07	"	7	"	"	"	"	"	"	"
25-08	"	8	"	"	"	"	"	"	"
25-09	"	9	"	"	"	"	"	"	"
25-10	"	10	"	"	"	"	"	"	"
25-11	"	11	"	"	"	"	"	"	"
25-12	"	12	"	"	"	"	"	"	"
25-13	"	13	"	"	"	"	"	1.03(26.16)	"
25-14	"	14	"	"	"	"	"	"	"
25-15	"	15	"	"	"	"	"	"	"
25-16	"	16	"	"	"	"	"	"	"
25-17	"	17	"	"	"	"	"	"	"
25-18	"	18	"	"	"	"	"	"	"
25-19	"	19	"	"	"	"	"	"	"
25-20	"	20	"	"	"	"	"	"	"
25-21	"	21	0.5	"	"	"	"	"	"
25-22	"	22	"	"	"	"	"	"	"
25-23	"	23	"	"	"	"	"	"	"
25-24	"	24	"	"	"	"	"	"	"
25-25	"	25	"	"	"	"	"	"	"
25-26	"	30	"	"	"	"	"	"	"

See footnote at end of table.

TABLE VI. Fixed attenuators with SMA connectors (male and female) - Continued.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class
25-27	DC to 12.4	1	0.3	1.25:1	50	2	0.5	0.87(22.10)	IV
25-28	"	2	"	"	"	"	"	"	"
25-29	"	3	"	"	"	"	"	"	"
25-30	"	4	"	"	"	"	"	"	"
25-31	"	5	"	"	"	"	"	"	"
25-32	"	6	"	"	"	"	"	"	"
25-33	"	7	0.4	"	"	"	"	"	"
25-34	"	8	"	"	"	"	"	"	"
25-35	"	9	"	"	"	"	"	"	"
25-36	"	10	"	"	"	"	"	"	"
25-37	"	11	"	"	"	"	"	"	"
25-38	"	12	"	"	"	"	"	"	"
25-39	"	13	"	"	"	"	"	0.94(23.88)	"
25-40	"	14	"	"	"	"	"	"	"
25-41	"	15	"	"	"	"	"	"	"
25-42	"	16	"	"	"	"	"	"	"
25-43	"	17	"	"	"	"	"	"	"
25-44	"	18	"	"	"	"	"	"	"
25-45	"	19	"	"	"	"	"	"	"
25-46	"	20	0.7	"	"	"	"	1.04(26.42)	"
25-47	"	21	"	"	"	"	"	"	"
25-48	"	22	"	"	"	"	"	"	"
25-49	"	23	"	"	"	"	"	"	"
25-50	"	24	"	"	"	"	"	"	"
25-51	"	25	"	"	"	"	"	"	"
25-52	"	30	1.0	"	"	"	"	"	"
25-53	"	35	"	"	"	"	"	1.35(34.29)	"
25-54	"	40	"	"	"	"	"	"	"
25-55	"	45	1.5	"	"	"	"	"	"
25-56	"	50	2.0	"	"	"	"	"	"
25-57	"	60	2.0	"	"	"	"	"	"
25-58	DC to 18.0	0	0.3	1.35:1	"	"	"	0.87(22.10)	"
25-59	"	0.5	"	"	"	"	"	"	"
25-60	"	1	"	"	"	"	"	"	"
25-61	"	1.5	"	"	"	"	"	"	"
25-62	"	2	"	"	"	"	"	"	"
25-63	"	2.5	"	"	"	"	"	"	"
25-64	"	3	"	"	"	"	"	"	"
25-65	"	3.5	"	"	"	"	"	"	"
25-66	"	4	"	"	"	"	"	"	"
25-67	"	4.5	"	"	"	"	"	"	"
25-68	"	5	"	"	"	"	"	"	"
25-69	"	5.5	"	"	"	"	"	"	"
25-70	"	6	"	"	"	"	"	"	"
25-71	"	6.5	"	"	"	"	"	"	"
25-72	"	7	0.4	"	"	"	"	"	"
25-73	"	7.5	"	"	"	"	"	"	"
25-74	"	8	"	"	"	"	"	"	"
25-75	"	8.5	"	"	"	"	"	"	"
25-76	"	9	0.5	"	"	"	"	"	"
25-77	"	9.5	"	"	"	"	"	"	"
25-78	"	10	"	"	"	"	"	"	"
25-79	"	11	"	"	"	"	"	"	"
25-80	"	12	"	"	"	"	"	"	"

See footnote at end of table.

TABLE VI. Fixed attenuators with SMA connectors (male and female) - Continued.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class
25-81	DC to 18.0	13	0.5	1.35:1	50	2	0.5	0.94(23.88)	IV
25-82	"	14	0.5	"	"	"	"	0.94(23.88)	"
25-83	"	15	0.6	"	"	"	"	1.04(26.42)	"
25-84	"	16	"	"	"	"	"	"	"
25-85	"	17	"	"	"	"	"	"	"
25-86	"	18	"	"	"	"	"	"	"
25-87	"	19	"	"	"	"	"	"	"
25-88	"	20	"	"	"	"	"	"	"
25-89	"	25	1.0	"	"	"	"	"	"
25-90	"	30	"	"	"	"	"	"	"
25-91	"	35	"	"	"	"	"	1.35(34.29)	"
25-92	"	40	"	"	"	"	"	"	"
25-93	"	45	"	"	"	"	"	"	"
25-94	"	50	2.0	"	"	"	"	"	"
25-95	"	60	2.0	"	"	"	"	"	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

TABLE VII. Fixed attenuators, stripline.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Peak (W)	Length 1/ (max)	Class
22-01	DC to 12.4	3	0.6	1.50:1	50	100	0.125(3.18)	IV
22-02	"	6	"	"	"	100	"	"
22-03	"	10	"	"	"	50	"	"
22-04	"	20	1.5	"	"	50	0.250(6.35)	"
22-05	"	1	0.6	"	"	100	0.125(3.18)	"
22-06	"	5	"	"	"	100	"	"
22-07	"	7	"	"	"	50	"	"
22-08	"	8	0.6	"	"	"	"	"
22-09	"	12	0.7	"	"	"	"	"
22-10	"	15	1.0	"	"	"	"	"
22-11	"	17	1.2	"	"	"	"	"
22-13	"	2	0.6	"	"	100	"	"
22-15	"	4	0.6	"	"	"	"	"
22-23	DC to 18.0	1	0.7	1.80:1	"	"	"	"
22-24	"	2	"	"	"	"	"	"
22-25	"	3	"	"	"	"	"	"
22-26	"	4	"	"	"	"	"	"
22-27	"	5	"	"	"	"	"	"
22-28	"	6	"	"	"	"	"	"
22-29	"	7	"	"	"	"	"	"
22-30	"	8	"	"	"	"	"	"
22-31	"	9	"	"	"	"	"	"
22-32	"	10	0.5	"	"	"	"	"
22-33	"	11	0.5	"	"	"	"	"
22-34	"	12	1.0	"	"	"	"	"
22-35	"	13	1.0	"	"	"	"	"
22-36	"	14	+0.0 -1.7	"	"	"	"	"
22-37	"	15	+0.0 -2.0	"	"	"	"	"
22-38	"	16	+0.0 -2.3	"	"	"	"	"
22-39	"	17	+0.0 -2.5	"	"	"	"	"
22-40	"	18	+0.0 -3.0	"	"	"	"	"
22-41	"	19	+0.0 -3.5	"	"	"	"	"
22-42	"	20	+0.0 -3.5	"	"	"	"	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

TABLE VIII. Fixed attenuators, TO-5 configuration.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB/dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg mW	Class
23-01	DC to 1.0	3	0.1	1.35:1	50	100	IV
23-02	"	6	"	"	"	"	"
23-03	"	10	"	"	"	"	"
23-04	"	13	"	"	"	"	"
23-05	"	15	"	"	"	"	"
23-06	"	20	"	"	"	"	"
23-07	"	30	"	"	"	"	"
23-08	"	1	"	"	"	"	"
23-09	"	2	"	"	"	"	"
23-10	"	4	"	"	"	"	"
23-11	"	5	"	"	"	"	"
23-12	"	7	"	"	"	"	"
23-13	"	8	"	"	"	"	"
23-14	"	9	"	"	"	"	"
23-15	"	11	"	"	"	"	"
23-16	"	12	"	"	"	"	"
23-17	"	14	"	"	"	"	"
23-18	"	16	"	"	"	"	"
23-19	"	17	"	"	"	"	"
23-20	"	18	"	"	"	"	"
23-21	"	19	"	"	"	"	"
23-22	"	21	"	"	"	"	"
23-23	"	22	"	"	"	"	"
22-24	"	23	"	"	"	"	"
22-25	"	24	"	"	"	"	"
22-26	"	25	"	"	"	"	"
22-27	"	26	"	"	"	"	"
22-28	"	27	"	"	"	"	"
22-29	"	28	"	"	"	"	"
22-30	"	29	"	"	"	"	"
22-31	"	31	"	"	"	"	"
22-32	"	32	"	"	"	"	"
22-33	"	33	"	"	"	"	"
22-34	"	34	"	"	"	"	"
22-35	"	35	"	"	"	"	"
22-36	"	36	"	"	"	"	"
22-37	"	37	"	"	"	"	"
22-38	"	38	"	"	"	"	"
22-39	"	39	"	"	"	"	"
22-40	"	40	"	"	"	"	"
22-41	"	41	"	"	"	"	"

TABLE IX. Fixed attenuators with SMA connectors (male and female), bulkhead.

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class 2/
24-01	2 to 12.4	10	0.3	1.25:1	50	2	0.1	1.03(26.2)	IV
24-02	"	15	0.5	"	"	"	"	"	"
24-03	"	20	0.5	"	"	"	"	"	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

2/ A class IV attenuator is for use in equipment in which precision and stability are secondary considerations.

TABLE X. Fixed attenuators with BNC connectors (male and female).

Part number M3933/	Frequency range (GHz)	Attenuation Nom (dB)	Attenuation Devn (±dB)	VSWR (max)	Impedance (nom) (ohms)	Power Avg (W)	Power Peak (kW)	Length 1/ (max)	Class
19-01	DC to 4.5	1	0.3	1.25:1	50	4	0.5	2.7(68.6)	III
19-02	"	2	"	"	"	"	"	"	"
19-03	"	3	"	"	"	"	"	"	"
19-04	"	4	"	"	"	3	"	"	"
19-05	"	5	"	"	"	"	"	"	"
19-06	"	6	"	"	"	"	"	"	"
19-07	"	8	0.5	"	"	2	"	"	"
19-08	"	10	"	"	"	"	"	"	"
19-09	"	11	"	"	"	"	"	"	"
19-10	"	12	"	"	"	"	"	"	"
19-11	"	15	"	"	"	"	"	"	"
19-12	"	20	"	"	"	"	"	"	"
19-13	"	25	0.9	"	"	"	"	"	"
19-14	"	30	"	"	"	"	"	"	"
19-15	"	40	"	"	"	"	"	3.0(76.2)	"
19-16	"	50	1.2	"	"	"	"	"	"
19-17	"	60	1.4	"	"	"	"	"	"
19-18	"	13	0.5	"	"	"	"	2.7(68.6)	"

1/ The length is given in inches and metric equivalents (metric equivalents are in parentheses).

TABLE XI. Variable waveguide attenuators.

Part number M24215/	Frequency range (GHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
4-001	8.5-9.6	0-60	--	1.0	1.15:1	-	1	--
4-002	7.0-11.0	0-20	--	0.3	1.25:1	-	5	100
4-003	10.8-18.0	0-20	--	0.3	1.25:1	-	5	"
4-004	11.0-17.0	0-30	--	0.5	1.40:1	-	1	"
4-005	12.4-18.0	"	--	"	1.15:1	-	"	"
4-006	12.4-18.0	"	--	"	"	-	"	"
5-001	3.95-5.85	0-50	0.1	1	"	-	15	--
5-002	5.3-8.2	"	"	"	"	-	10	--
5-003	8.2-12.4	"	"	"	"	-	10	--
5-004	12.4-18.0	"	"	"	"	-	5	--
5-005	2.6-3.95	0-60	"	"	"	-	10	--

TABLE XII. Variable attenuators with series BNC connectors.

Part number M24215/	Frequency range (GHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
6-001	DC to 1.0	0-12 (in 1 dB step)	0.35	1.5	1.50:1	50	0.5	--
6-002	"	0-120 (in 10 dB step)	3.0	1.5	1.50:1	"	0.5	--
10-001	"	0-101 (in 1 dB step)	2	0.6	1.40:1	"	1	--
10-002	DC to 0.5	0-101 (in 1 dB step)	2	0.2	1.40 1	75	0.5	--

TABLE XIII. Variable attenuators with series SMA connectors.

Part number M24215/	Frequency range (GHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
8-001	DC to 2.0	0-10 (in 1 dB step)	0.5	0.5	1.25:1	50	0.5	--
8-002	DC to 1.0	0-1 (in 0.1 dB step)	0.05	1.0	1.20:1	"	0.5	--
9-001	2-8.0	0-20	--	0.5	1.50:1	"	2	--
9-002	2-8.0	0-20	--	"	"	"	"	--
9-003	7.0-11.0	0-30	--	"	"	"	"	--
9-004	9.0-9.2	0-30	0.5	0.7	"	"	"	200
9-005	4.0-18.0	0-15	--	1.0	"	"	5	3000
9-006	11.0-17.0	0-20	--	0.5	1.60:1	"	5	3000

TABLE XIV. Variable attenuators with banana plug connections.

Part number M24215/	Frequency range (MHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
11-001	DC to 1.0	0-100 (in 1 and 10 dB step)	.25 for 10 dB .75 for 100 section	--	--	600	5	--

TABLE XV. Variable attenuators with series N connectors.

Part number M24215/	Frequency range (MHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
12-001	DC - 1.0	0-10	0.2	0.8	1.50:1	50	2	60
12-002	0.5-1.0	0-10	0.2	0.5	"	"	2	60
12-003	0.8-2.5	0-30	--	0.2	"	"	10	5 kW
12-004	3.0-3.7	0-10	--	0.5	"	"	1	1 kW
12-005	2.0-5.0	0-20	--	0.5	"	"	2	2 kW
12-006	0.3-8.0	0-25	--	0.7	"	"	10	--
12-007	4.0-8.0	0-20	1.0	1.0	1.25:1	"	"	5 kW
12-008	4.0-8.0	0-40	1.5	1.5	"	"	"	"
12-009	7.0-11.0	0-40	1.5	1.5	"	"	"	5 "
12-010	DC-12.4	0-99	2.0	0.8	1.50:1	"	2	200
12-011	2.5-11.0	0-20	0.2	1.0	1.60:1	"	1	1 kW

TABLE XVI. Variable attenuators with series SMA connectors (coaxial, step).

Part number M24215/	Frequency range (MHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
13-01	DC-18.0	0-9	0.5	1.0	1.50·1	50	2	200
13-02	DC- 4.0	0-99	1.6	0.6	1.35:1	50	2	200

TABLE XVII. Variable attenuators with series TNC connectors (coaxial, step).

Part number M24215/	Frequency range (MHz)	Attenuation range (dB)	Accuracy (±dB)	Insertion loss (dB)	VSWR (max)	Impedance (ohms)	Power Avg (W)	Power Peak (W)
14-01	DC-12.4	0-69	1.8	0.8	1.50:1	50	2	200

TABLE XVIII. Cross-reference of AN nomenclature to part number.

AN nomenclature	Part number M3933/	AN nomenclature	Part number
CN-30B/U	6-1	CN-330A/U	M3933/3-5
CN-32B/U	6-3	CN-796/U	M24215/10-001
CN-35B/U	6-5	CN-1128/U	M24215/6-002
CN-39B/U	6-9	CN-1138/U	M24215/4-001
CN-40B/U	6-10	CN-1139/U	M24215/5-001
CN-84B/U	5-1	CN-1140/U	M24215/6-001
CN-85B/U	5-2	CN-1295/U	M3933/8-1
CN-86B/U	5-3	CN-1296/U	M3933/8-2
CN-87B/U	4-1	CN-1297/U	M3933/8-3
CN-168B/U	2-2	CN-1298/U	M3933/9-1
CN-169B/U	2-3	CN-1299/U	M3933/9-2
CN-248A/U	1-4	CN-1300/U	M3933/9-3
CN-265A/U	5-4	CN-1301/U	M3933/10-1

Custodians:
Army - ER
Navy - EC
Air Force - 85

Review activities:
Army - AR, MI
Navy - OS
Air Force - 11, 17, 99
DLA - ES

User activities:
Army - AV, ME
Navy - AS, MC, CG, SH
Air Force - 19

Agent:
DLA - ES

Preparing activity:
Navy - EC

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