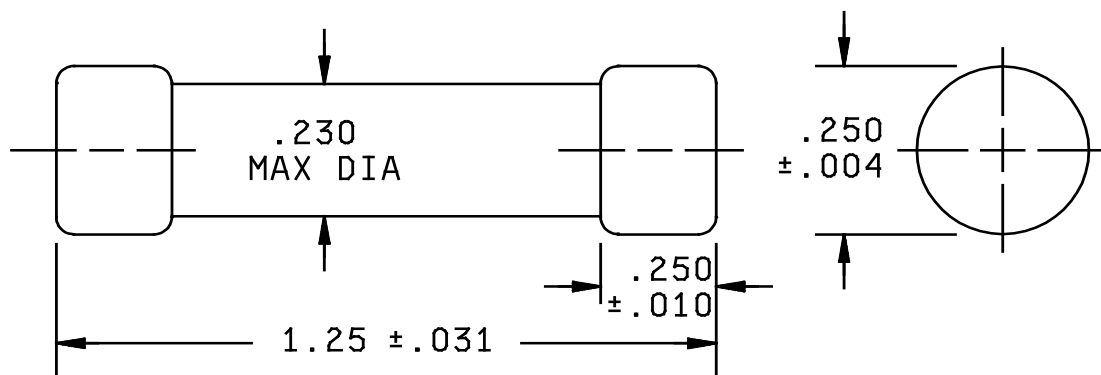


PERFORMANCE SPECIFICATION SHEET

FUSE CARTRIDGE, INSTRUMENT TYPE,
STYLE FM09, (NONINDICATING)

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-23419](#).



Inches	mm	Inches	mm	Inches	mm
.004	0.10	.031	0.79	.250	6.35
.010	0.25	.230	5.84	1.25	31.75

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerances are ±.005 (0.13 mm) for three place decimals and ±.02 (0.5 mm) for two place decimals.

FIGURE 1. Style FM09 fuses.

REQUIREMENTS:

Interface and physical dimensions: See [figure 1](#).

Applicable fuseholders (or equivalent):

[MIL-PRF-19207/1](#), Style FHL10U
[MIL-PRF-19207/2](#), Style FHL11U
[MIL-PRF-19207/8](#), Style FHL17G
[MIL-PRF-19207/9](#), Style FHL18G
[MIL-PRF-19207/11](#), Style FHL20G
[MIL-PRF-19207/16](#), Style FHL26G
[MIL-PRF-19207/17](#), Style FHL28WB
[MIL-PRF-19207/18](#), Style FHL29G
[MIL-PRF-19207/19](#), Style FHL30G
[MIL-PRF-19207/21](#), Style FHL32W
[MIL-PRF-19207/22](#), Style FHL33W

Terminals: Ferrule type.

Material: Brass, copper, or copper alloy.

Finish: Nickel or bright alloy plate, silver plated when specified.

Terminal strength: [MIL-STD-202-211](#), test condition E, 2 pound-inch torque between ferrules and fuse body.

Body material: Plastic or ceramic tube.

Current rating: See [table I](#).

Characteristic: See [table I](#).

Voltage rating: See [table I](#).

Current-carrying capacity for 20 amperes or less:

110 percent at room ambient temperature:

Characteristic A: 112.5 percent at -55°C, 91.5 percent at +85°C.

Characteristic B: 119 percent at -55°C, 69.5 percent at +85°C.

Current-carrying capacity for 25 amperes or 30 amperes:

100 percent with a maximum temperature rise of +90°C for all temperatures between -55°C and +85°C.

Characteristic: See [table I](#).

Overload interrupt: See [table I](#) (at all temperatures between -55°C and +85°C).

Resistance: See [table I](#).

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Short circuit interrupt: See [table I](#).

Mechanical shock: [MIL-STD-202-213, Method I](#).

Thermal shock: [MIL-STD-202-107](#), test condition A.

Vibration:

Characteristic A: All ratings, [MIL-STD-202-204](#).

Characteristic B: Fuses rated 0 ampere through 8/10 ampere shall meet the requirements of [MIL-STD-202-201](#).

Part or Identifying Number (PIN): The PIN is derived from [table I](#) and shall be as shown in [table IV](#).

TABLE I. PIN designation and electrical ratings.

PIN designation				Overload interrupt time 135 % of rating, maximum 1 hour <u>1/</u>		AC short circuit Interrupt		Cold resistance <u>2/</u> (ohms)	
Style	Characteristic	Maximum voltage	Current rating (amperes)	200% of rating (seconds)	300 % of rating (seconds)	125 volts	250 volts	Minimum	Maximum
FM09	A	250 V	1/100 A	0.0001 - 1.0	0.0001 - 0.003	10,000A	35 A	100.0	280.0
		250 V	1/32 A	0.0008 - 1.0	0.0002 - 0.003		35 A	20.0	50.0
		250 V	1/16 A	0.009 - 2.0	0.001 - 0.050		35 A	2.7	36.0
		250 V	1/8 A	0.01 - 2.0	0.003 - 0.15		35 A	0.96	11.0
		250 V	1/4 A	0.02 - 2.0	0.01 - 0.20		35 A	1.98	4.62
		250 V	3/8 A	0.02 - 3.0	0.01 - 0.30		35 A	.96	2.24
		250 V	1/2 A	0.03 - 3.0	0.01 - 0.30		35 A	.66	1.54
		250 V	3/4 A	0.03 - 3.0	0.015 - 0.50		35 A	.20	.95
		250 V	1 A	0.05 - 3.0	0.015 - 0.50		35 A	.114	.266
		250 V	1-1/4 A	0.05 - 3.0	0.02 - 0.50		35 A	.081	.200
		250 V	1-1/2 A	0.05 - 3.0	0.02 - 0.50		35 A	.061	.143
		250 V	2 A	0.08 - 3.0	0.04 - 0.50		35 A	.045	.106
		250 V	3 A	0.08 - 3.0	0.04 - 0.70		35 A	.023	.060
		250 V	4 A	0.10 - 5.0	0.05 - 1.00		35 A	.023	.055
		250 V	5 A	.20 - 60.0	0.05 - 6.00		100 A	.018	.042
		250 V	6 A	.20 - 60.0	0.05 - 6.00		100 A	.014	.032
		250 V	8 A	.30 - 60.0	0.05 - 6.00		100 A	.009	.021
		250 V	10 A	.30 - 60.0	0.05 - 6.00		100 A	.0068	.0158
		250 V	12 A	.30 - 60.0	0.05 - 6.00		200 A	.0045	.0114
		250 V	15 A	0.5 - 60.0	0.05 - 6.00		200 A	.0027	.0065
		125 V	20 A	0.5 - 60.0	0.05 - 6.00		Not rated	.0016	.0045
		125 V	25 A	0.5 - 60.0	0.05 - 6.00		Not rated	.0013	.0035
		125 V	30 A	0.5 - 60.0	0.05 - 6.00		Not rated	.0010	.0027

See footnotes at end of table.

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TABLE I. PIN designation and electrical ratings - Continued.

PIN designation				Overload interrupt time 135 % of rating, maximum 1 hour ^{1/}		AC short circuit interrupt		Cold resistance ^{2/} (ohms)	
Style	Characteristic	Maximum voltage	Current rating (amperes)	200% of rating (seconds)	300 % of rating (seconds)	125 volts	250 volts	Minimum	Maximum
FM09	B	250 V	1/100A	4.0 - 250.0	2.0 - 40.0	10,000A	35 A	950.0	4620.0
		250 V	1/32 A	4.0 - 80.0	2.0 - 25.0		35 A	100.0	462.0
		250 V	1/16 A	4.0 - 80.0	2.0 - 25.0		35 A	49.0	120.0
		250 V	1/10 A	4.0 - 80.0	2.0 - 25.0		35 A	14.0	17.5
		250 V	1/8 A	4.0 - 80.0	2.0 - 25.0		35 A	9.0	11.0
		250 V	15/100 A	4.0 - 80.0	2.0 - 25.0		35 A	6.9	8.0
		250 V	3/16 A	4.0 - 80.0	2.0 - 25.0		35 A	4.0	5.5
		250 V	1/4 A	4.0 - 80.0	2.0 - 25.0		35 A	3.18	10.5
		250 V	3/10 A	4.0 - 80.0	2.0 - 25.0		35 A	2.22	7.10
		250 V	3/8 A	4.0 - 80.0	2.0 - 25.0		35 A	1.5	4.77
		250 V	1/2 A	4.0 - 80.0	2.0 - 25.0		35 A	1.2	2.83
		250 V	6/10 A	4.0 - 0.0	2.0 - 25.0		35 A	.60	2.10
		250 V	3/4 A	4.0 - 80.0	2.0 - 25.0		35 A	.45	1.43
		250 V	8/10 A	4.0 - 80.0	2.0 - 25.0		35 A	.35	1.26
		250 V	1 A	4.0 - 80.0	2.0 - 25.0		35 A	.21	.64
		250 V	1-1/4 A	4.0 - 80.0	2.0 - 25.0		35 A	.16	.38
		250 V	1-1/2 A	4.0 - 80.0	2.0 - 25.0		35 A	.102	.340
		250 V	1-6/10 A	4.0 - 80.0	2.0 - 25.0		35 A	.099	.270
		250 V	2 A	4.0 - 80.0	2.0 - 25.0		35 A	.072	.180
		250 V	2-1/2 A	10.0 - 250.0	2.0 - 25.0		35 A	.052	.154
		250 V	2-8/10 A	10.0 - 250.0	2.0 - 25.0		35 A	.032	.090
		250 V	3 A	10.0 - 250.0	2.0 - 25.0		35 A	.026	.090
		250 V	3-2/10 A	10.0 - 250.0	2.0 - 25.0		35 A	.025	.090
		125 V	4 A	10.0 - 250.0	2.0 - 25.0		Not rated	.0240	.0560
		125 V	5 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0108	.0600
		125 V	6-1/4 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0071	.0450
		125 V	7 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0059	.0300
		125 V	8 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0070	.0200
		125 V	10 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0056	.0140
		125 V	12 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0036	.0110
		125 V	15 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0017	.0080
		125 V	20 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0012	.0040
		125 V	25 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0009	.0030
		125 V	30 A	10.0 - 250.0	0.05 - 10.0		Not rated	.0006	.0022

- ^{1/} The overload interrupt time ranges, as shown, cover the temperature range from -55°C to +85°C. For characteristic B, the overload interrupt time at room ambient temperature shall be 12 seconds minimum at 200 percent of rating.
- ^{2/} Cold resistance is measured at 10 percent or less of rated current.
- ^{3/} Add "S" suffix to the end of the PIN designation if optional silver plating is required.

VERIFICATION:

Inspection routine: Qualification not required and replaced with First Article Inspection per [table II](#) of [MIL-PRF-23419](#). The number of group II samples for First Article Inspection shall be as shown in [table II](#). Information pertaining to first article inspection and approval of products covered by this specification sheet should be obtained from the acquiring activity.

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TABLE II. Group II samples. 1/

Inspection	Number of sample fuses
Group II	20
Terminal strength	20
Overload interrupt	
135% at room ambient	4
200 percent at -55°C	4
200 percent at +85°C	4
300 percent at -55°C	4
300 percent at +85°C	4

1/ For characteristic B fuses only, four additional fuses shall be tested at 200 percent of rating at room ambient temperature.

The number of group III samples for First Article Inspection shall consist of four fuses of each of the styles shown in [table III](#). Short circuit interrupt tests shall be conducted at the alternating current voltage indicated, and the fuses shall be capable of withstanding a minimum short circuit current as shown in [table III](#).

Inspection of product for delivery shall consist of group A and group B inspection.

TABLE III. Short circuit tests.

Fuse style	Current rating	Short circuit current	AC type voltage
FM09A	4 A	35 A	250
FM09A	10 A	100 A	250
FM09A	15 A	200 A	250
FM09A	30 A	10,000 A	125
FM09B	3 2/10 A	35 A	250
FM09B	30 A	10,000 A	125

Fuse selection: The following steps should apply in the selection of a fuse for any application:

- Step 1: Select a fuse with a voltage rating equal to or in excess of the circuit voltage.
- Step 2: The short circuit interrupting rating of the fuse should be checked to determine that it is adequate to protect against the short circuit currents that the particular equipment or circuit can be exposed to.
- Step 3: The ambient temperature in which the fuse is to be used should be compared to the curves shown on figure 1 or figure 2 to determine the effect the ambient will have on the current rating. For example, if a characteristic A fuse is to be used in a 60°C ambient, it will only carry 95 percent of its nominal rating. A fuse which is used in a -20°C ambient will carry 107 percent of its nominal rating.
- Step 4: A fuse rating should be selected on the basis of equipment ampere load with compensation made for ambient temperature (see figure 2 and figure 3). Characteristic A and characteristic B fuses should not be loaded to more than 80 percent of the fuse rating (or 80 percent of the adjusted rating based on ambient temperature consideration) to avoid nuisance openings caused by inrush currents and other harmless overloads. Time lag (characteristic B) fuses can be loaded to a higher level because of the ability to override harmless overloads, transients, and inrush currents of short duration.

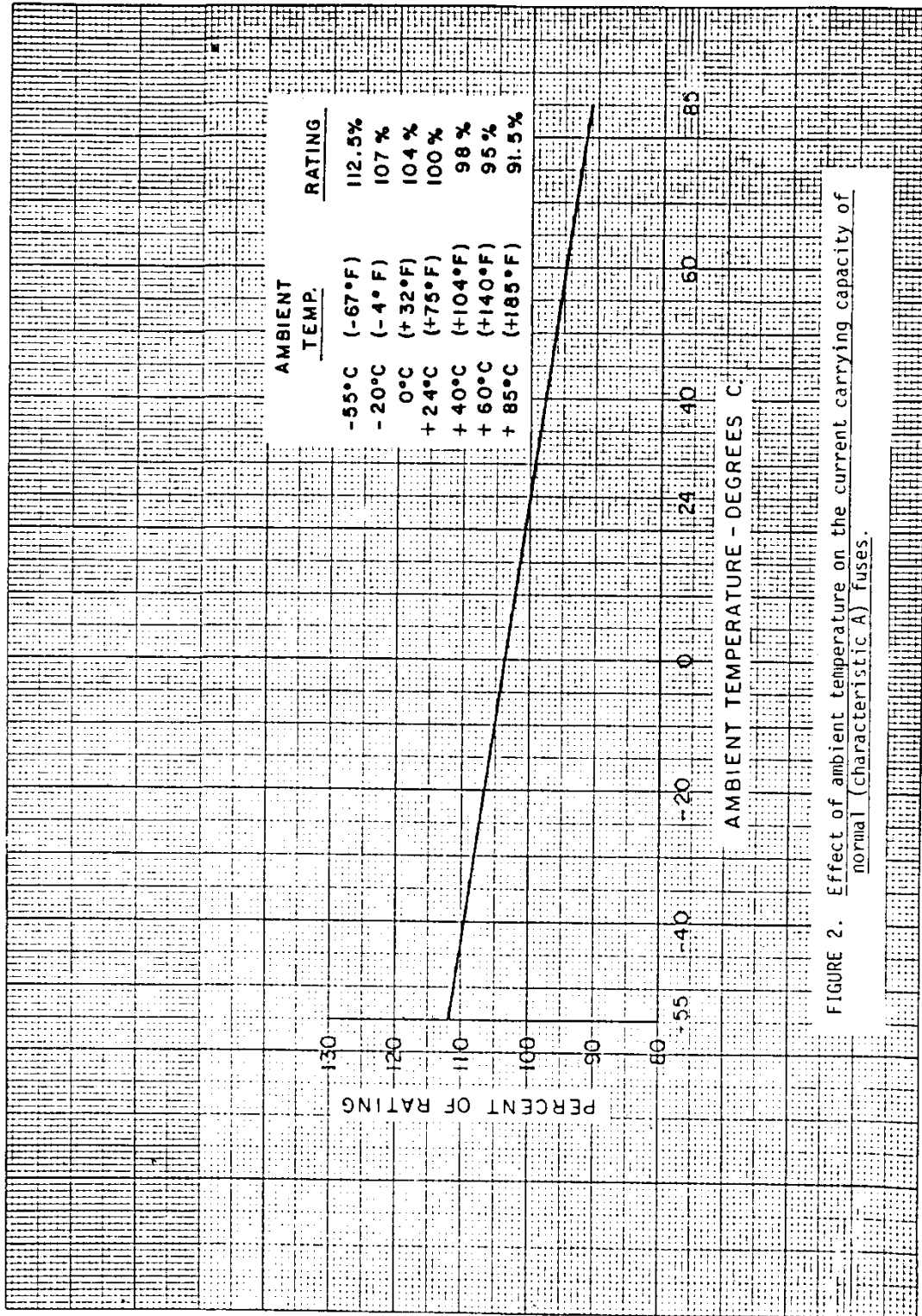


FIGURE 2. Effect of ambient temperature on the current carrying capacity of normal (characteristic A) fuses.

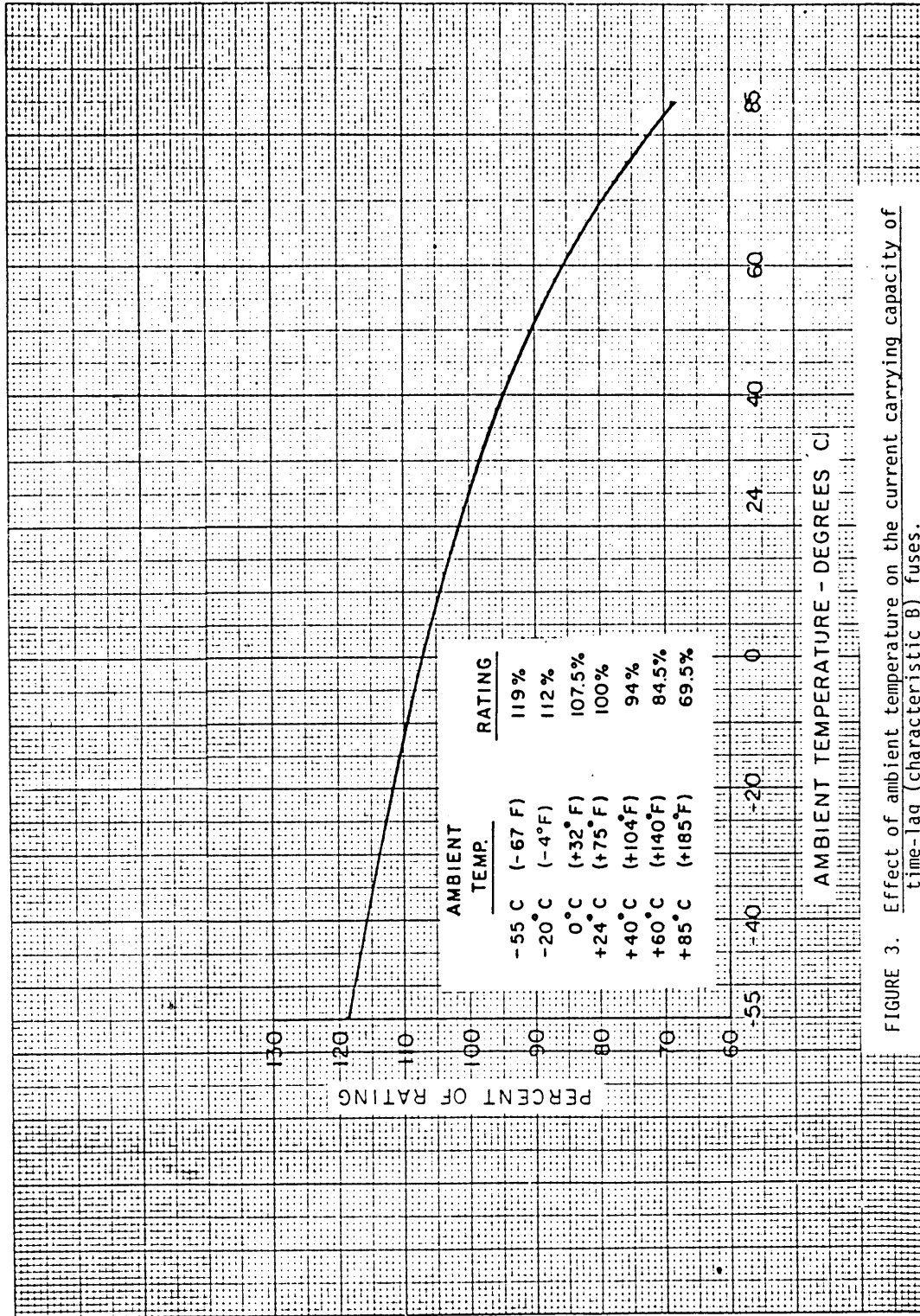


FIGURE 3. Effect of ambient temperature on the current carrying capacity of time-lag (characteristic B) fuses.

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Cross reference: For applicable cross reference, see [table IV](#). The existing stocks of superseded items may be used. When exhausted, the superseding parts shall be used.

TABLE IV. Cross-reference.

Superseding PIN MIL-PRF-23419/9	Superseded number MIL-F-23419/3	Superseding PIN MIL-PRF-23419/9	Superseded number MIL-F-23419/6
FM09A250V1/100A	FM03A 250V 1/100A	FM09B250V1/100A	FM06-250V 1/100A
FM09A250V1/32A	FM03A 250V 1/32A	FM09B250V1/32A	FM06-250V 1/32A
FM09A250V1/16A	FM03A 250V 1/16A	FM09B250V1/16A	FM06-250V 1/16A
FM09A250V1/8A	FM03A 250V 1/8A	FM09B250V1/10A	FM06-250V 1/10A
FM09A250V1/4A	FM03A 250V 1/4A	FM09B250V1/8A	FM06-250V 1/8A
FM09A250V3/8A	FM03A 250V 3/8A	FM09B250V15/100A	FM06-250V 15/100A
FM09A250V1/2A	FM03A 250V 1/2A	FM09B250V3/16A	FM06-250V 3/16A
FM09A250V3/4A	FM03A 250V 3/4A	FM09B250V2/10A	FM06-250V 2/10A
FM09A250V1A	FM03A 250V 1A	FM09B250V1/4A	FM06-250V 1/4A
FM09A250V1-1/2A	FM03A 250V 1-1/2A	FM09B250V3/10A	FM06-250V 3/10A
FM09A250V2A	FM03A 250V 2A	FM09B250V3/8A	FM06-250V 3/8A
FM09A250V3A	FM03A 250V 3A	FM09B250V4/10A	FM06-250V 4/10A
FM09A250V5A	FM03A 250V 4A	FM09B250V1/2A	FM06-250V 1/2A
FM09A250V6A	FM03A 250V 5A	FM09B250V6/10A	FM06-250V 6/10A
FM09A250V8A	FM03A 250V 6A	FM09B250V7/10A	FM06-250V 7/10A
FM09A250V10A	FM03A 250V 8A	FM09B250V3/4A	FM06-250V 3/4A
FM09A250V12A	FM03A 250V 10A	FM09B250V1A	FM06-250V 1A
FM09A250V15A	FM03A 250V 12A	FM09B250V1-1/4A	FM06-250V 1-1/4A
FM09A125V20A	FM03A 125V 15A	FM09B250V1-1/2A	FM06-250V 1-1/2A
FM09A125V25A	FM03A 125V 20A	FM09B250V1-6/10A	FM06-250V 1-6/10A
FM09A125V30A	FM03A 125V 25A	FM09B250V2A	FM06-250V 2A
N/A	N/A	FM09B250V2-1/2A	FM06-125V 2-1/2A
N/A	N/A	FM09B250V2-8/10A	FM06-125V 2-8/10A
N/A	N/A	FM09B250V3A	FM06-125V 3A
N/A	N/A	FM09B250V3-2/10A	FM06-125V 3-2/10A
N/A	N/A	FM09B250V4A	FM06-125V 4A
N/A	N/A	FM09B250V5A	FM06-125V 5A
N/A	N/A	FM09B250V6-1/4A	FM06-125V 6-1/4A
N/A	N/A	FM09B250V7A	FM06-125V 7A
N/A	N/A	FM09B250V8A	FM06-125V 8A
N/A	N/A	FM09B250V10A	FM06-125V 10A
N/A	N/A	FM09B250V12A	FM06-125V 12A
N/A	N/A	FM09B250V15A	FM06-125V 15A
N/A	N/A	FM09B250V20A	FM06-125V 20A
N/A	N/A	FM09B250V25A	FM06-125V 25A
N/A	N/A	FM09B250V30A	FM06-125V 30A

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Referenced documents. In addition to [MIL-PRF-23419](#), this document references the following:

[MIL-STD-202-107](#)
[MIL-STD-202-201](#)
[MIL-STD-202-204](#)
[MIL-STD-202-211](#)
[MIL-STD-202-213](#)
[MIL-PRF-19207/1](#)
[MIL-PRF-19207/2](#)
[MIL-PRF-19207/8](#)
[MIL-PRF-19207/9](#)
[MIL-PRF-19207/11](#)
[MIL-PRF-19207/16](#)
[MIL-PRF-19207/17](#)
[MIL-PRF-19207/18](#)
[MIL-PRF-19207/19](#)
[MIL-PRF-19207/21](#)
[MIL-PRF-19207/22](#)

Amendment notations. The margins of this specification sheet 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.

Custodians:

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

Preparing activity:
DLA - CC

(Project 5920-2020-025)

Review activities:

Army - AR, CR4, MI
Navy - AS, MC, OS, SH
Air Force - 19
NSA - NA

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>.