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MIL-F-15733/61C
15 November 1994
SUPERSEDING
MIL-F-15733/61B
26 November 1982

MILITARY SPECIFICATION SHEET

FILTER, RADIO FREQUENCY INTERFERENCE, STYLES FL30, FL32, FL34, AND FL43

PART OR IDENTIFYING NUMBERS (PIN'S) M15733/61-0001, 0004, 0005, AND 0010 ARE INACTIVE FOR NEW DESIGN AFTER 4 DECEMBER 1979. SEE TABLE V FOR SUBSTITUTION DATA.

This specification sheet 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-F-15733.

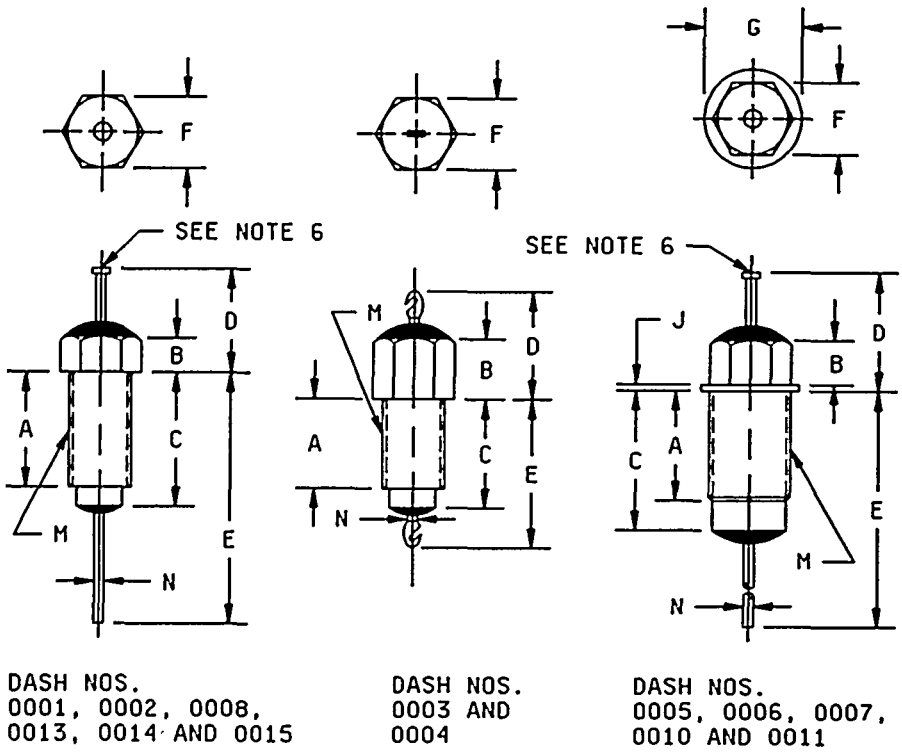

FIGURE 1. Filter and hardware dimensions and circuit configurations.

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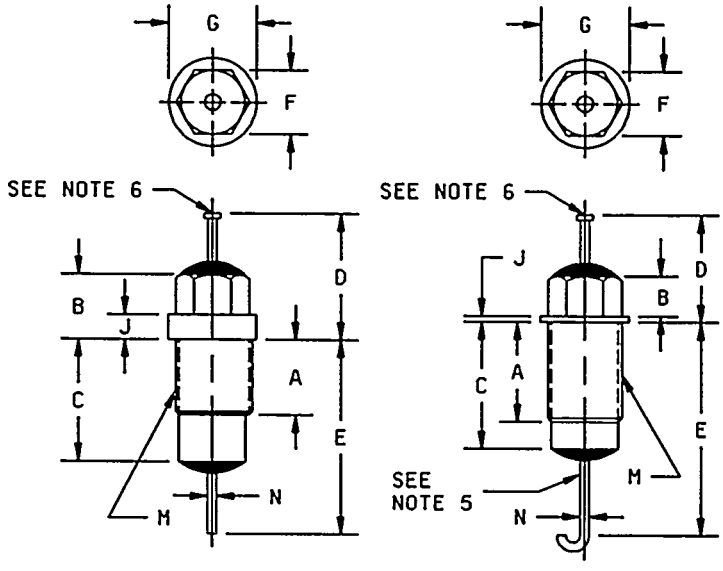
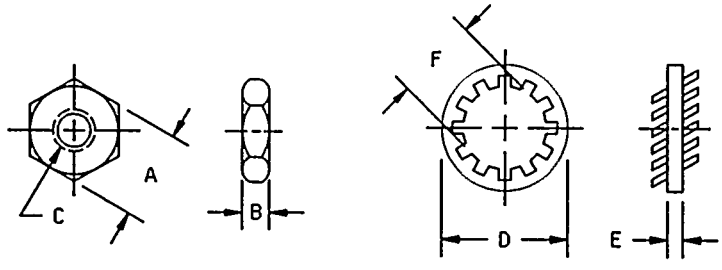
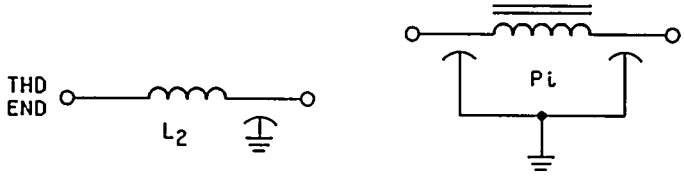


DASH NO. 0009 DASH NO. 0012



HEX NUT LOCKWASHER



TYPICAL CIRCUIT DIAGRAMS

NOTES:

1. Circuit diagram is for information only.
2. Case is ground terminal.
3. Mounting hardware (lockwasher and hex nut) will be supplied with each filter.
4. Terminal identification (nonsymmetrical filters): The case shall be marked at the threaded end of the filter, with the symbol "L" for L_2 circuits.
5. Hook bend radius: .046 (1.17 mm) (REF).
6. Turret headed terminal optional.
7. Potting shall not extend beyond .030 inch (0.76 mm) from the filter body.
8. An undercut or imperfect threads out to a maximum of .060 inch (1.52 mm) from the hex head or mounting surface is permissible.

FIGURE 1. Filter and hardware dimensions and circuit configurations - Continued.

TABLE I. Filter dimensions.

Type designation 1/	Dash number	A		B		C		D		E	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FL30	0001	.203 (5.16)	.233 (5.92)	.172 (4.37)	.202 (5.13)	—	.291 (7.39)	.328 (8.33)	.390 (9.91)	.391 (9.93)	.515 (13.08)
FL30	0002	.203 (5.16)	.233 (5.92)	.172 (4.37)	.202 (5.13)	—	.291 (7.39)	.328 (8.33)	.390 (9.91)	.391 (9.93)	.515 (13.08)
FL34	0003	.203 (5.16)	.235 (5.97)	.235 (5.97)	.265 (6.73)	.390 (9.91)	.482 (12.24)	.531 (13.49)	.593 (15.06)	.719 (19.84)	.781 (19.84)
FL34	0004	.203 (5.16)	.235 (5.97)	.235 (5.97)	.265 (6.73)	.390 (9.91)	.482 (12.24)	.531 (13.49)	.593 (15.06)	.719 (19.84)	.781 (19.84)
FL32	0005	.235 (5.97)	.265 (6.73)	.110 (2.79)	.140 (3.56)	.296 (7.52)	.326 (8.28)	.312 (7.92)	.374 (9.50)	.890 (22.61)	.952 (24.18)
FL32	0006	.235 (5.97)	.265 (6.73)	.110 (2.79)	.140 (3.56)	.296 (7.52)	.326 (8.28)	.312 (7.92)	.374 (9.50)	.890 (22.61)	.952 (24.18)
FL32	0007	.240 (6.10)	.260 (6.60)	.115 (2.92)	.135 (3.43)	.296 (7.52)	.326 (8.28)	.312 (7.92)	.374 (9.50)	.890 (22.61)	.952 (24.18)
FL32	0008	.206 (5.23)	.226 (5.74)	.083 (2.11)	.103 (2.62)	—	.276 (7.01)	.281 (7.14)	.343 (8.71)	.363 (9.22)	.549 (13.94)
FL32	0009	.240 (6.10)	.260 (6.60)	.271 (6.88)	.291 (7.39)	.396 (10.06	.416 (10.57)	.44 (11.2)	.50 (12.7)	.65 (16.5)	.71 (18.0)
FL43	0010	.235 (5.97)	.265 (6.73)	.110 (2.79)	.140 (3.56)	.296 (7.52)	.326 (8.28)	.312 (7.92)	.374 (9.50)	.890 (22.61)	.952 (24.18)
FL43	0011	.235 (5.97)	.265 (6.73)	.110 (2.79)	.140 (3.56)	.296 (7.52)	.326 (8.28)	.312 (7.92)	.374 (9.50)	.890 (22.61)	.952 (24.18)
FL43	0012	.235 (5.97)	.265 (6.73)	.110 (2.79)	.140 (3.56)	.296 (7.52)	.326 (8.28)	.312 (7.92)	.374 (9.50)	.890 (22.61)	.952 (24.18)
FL43	0013	.201 (5.11)	.231 (5.87)	.078 (1.98)	.108 (2.74)	—	.276 (7.01)	—	.312 (7.92)	.859 (21.82)	.921 (23.39)
FL43	0014	.206 (5.23)	.226 (5.74)	.13 (3.3)	.17 (4.3)	—	.315 (8.00)	.31 (7.9)	—	.49 (12.4)	—
FL43	0015	.203 (5.16)	.233 (5.92)	.172 (4.37)	.202 (5.13)	.266 (6.76)	.296 (7.52)	.328 (8.33)	.390 (9.91)	.422 (10.72)	.484 (12.29)

See footnotes at end of table.

TABLE I. Filter dimensions - Continued.

Type designation 1/	Dash number	F		G		J		M	N 2/	Weight (grams) (max)
		Min	Max	Min	Max	Min	Max	Thread		
FL30	0001	.235 (5.97)	.265 (6.73)	—	—	—	—	.216-28 UNEF-2A	AWG 20 (.032)	2.6
FL30	0002	.235 (5.97)	.265 (6.73)	—	—	—	—	.216-32 UNEF-2A	AWG 20 (.032)	2.2
FL34	0003	.360 (9.14)	.390 (9.91)	—	—	—	—	.3125-24 UNF-2A	AWG 15 (.057)	7.1
FL34	0004	.360 (9.14)	.390 (9.91)	—	—	—	—	.3125-32 UNEF-2A	AWG 15 (.057)	7.1
FL32	0005	.177 (4.50)	.197 (5.00)	.235 (5.97)	.265 (6.73)	.017 (0.43)	.047 (1.19)	.216-32 UNEF-2A	AWG 20 (.032)	2.0
FL32	0006	.177 (4.50)	.197 (5.00)	.220 (5.59)	.250 (6.35)	.017 (0.43)	.047 (1.19)	.216-32 UNEF-2A	AWG 20 (.032)	2.0
FL32	0007	.177 (4.50)	.197 (5.00)	.235 (5.97)	.265 (6.73)	—	.032 (0.81)	.216-32 UNEF-2A	AWG 20 (.032)	2.0
FL32	0008	.177 (4.50)	.197 (5.00)	—	—	—	—	.164-32 UNC-2A	AWG 20 (.032)	2.0
FL32	0009	.177 (4.50)	.197 (5.00)	.240 (6.10)	.260 (6.60)	.115 (2.92)	.135 (3.43)	.216-32 UNEF-2A	AWG 20 (.032)	3.2
FL43	0010	.172 (4.37)	.202 (5.13)	.235 (5.97)	.265 (6.73)	—	.032 (0.81)	.216-32 UNEF-2A	AWG 20 (.032)	2.4
FL43	0011	.172 (4.37)	.202 (5.13)	.220 (5.59)	.250 (6.35)	—	.032 (0.81)	.216-32 UNEF-2A	AWG 20 (.032)	2.0
FL43	0012	.172 (4.37)	.202 (5.13)	—	.235 (5.97)	—	.032 (0.81)	.216-32 UNEF-2A	AWG 20 (.032)	2.8
FL43	0013	.171 (4.34)	.202 (5.13)	—	—	—	—	.164-32 UNC-2A	AWG 20 (.032)	2.2
FL43	0014	.177 (4.50)	.197 (5.00)	—	—	—	—	.164-32 UNC-2A	AWG 20 (.032)	1.4
FL43	0015	.235 (5.97)	.265 (6.73)	—	—	—	—	.216-32 UNEF-2A	AWG 18 (.040)	2.0

1/ The type designation does not describe a discrete item. For complete identification, the PIN and type designation should be referenced.
2/ The equivalent diameter in inches is shown in parentheses.

TABLE II. Hardware dimensions.

Dash number	Hex nut					Lockwasher					
	A		B		C	D		E		F	
	Min	Max	Min	Max	Thread	Min	Max	Min	Max	Min	Max
0001	.235 (5.97)	.265 (6.73)	.070 (1.78)	.080 (2.03)	.216-28 UNEF-2B	.372 (9.45)	.380 (9.65)	.020 (0.51)	.024 (0.61)	.215 (5.46)	.225 (5.72)
0002,0005 0006,0007 0009 thru 0012,0015	.235 (5.97)	.265 (6.73)	.070 (1.78)	.080 (2.03)	.216-32 UNEF-2B	.372 (9.45)	.380 (9.65)	.020 (0.51)	.024 (0.61)	.215 (5.46)	.225 (5.72)
0003	.365 (9.27)	.385 (9.78)	.085 (2.16)	.100 (2.54)	.3125-24 UNEF-2B	.425 (10.80)	.435 (11.05)	.012 (0.30)	.032 (0.81)	.313 (7.95)	.332 (8.43)
0004	.365 (9.27)	.385 (9.78)	.085 (2.16)	.100 (2.54)	.3125-32 UNEF-2B	.425 (10.80)	.435 (11.05)	.012 (0.30)	.032 (0.81)	.313 (7.95)	.332 (8.43)
0008,0013 0014	.235 (5.97)	.265 (6.73)	.073 (1.85)	.078 (1.98)	.164-32 UNC-2B	.324 (8.23)	.336 (8.53)	.015 (0.38)	.025 (0.64)	.162 (4.11)	.172 (4.37)

REQUIREMENTS:

Design and construction:

Dimensions and configuration: See figure 1, and tables I and II.

Weight: See table I.

Case: Silver plated.

Terminals: Solderable. Leads shall be tin-lead coated copper wire.

Mounting torque (by dash number):

0001, 0002, 0005, 0006, 0007, 0009 through 0012	-	6 inch-pounds, maximum.
0003, 0004	-	8 inch pounds, maximum.
0008, 0013, 0014	-	3 inch pounds, maximum.

Operating temperature range: -55°C to +125°C except -0012 shall be -65°C to +85°C

Rated voltage: See table III.

Rated current: See table III.

Insertion loss: At 25°C and at temperature extremes (see table III).

Voltage conditioning (quality conformance inspection only) (applicable to dash numbers 0002, 0003, 0006 through 0015). The test shall be performed as follows:

Test temperature: 125°C +4°C, -0°C except -0012 shall be 85°C +4°C, -0°C

Test voltage: 1.4 times rated dc voltage.

Test duration: 168 ± 4 hours.

Capacitance to ground: See table III.

Temperature rise: 25°C maximum except -0014 shall be 40°C maximum.

Dielectric withstanding voltage: In accordance with MIL-F-15733 except that the voltage shall be applied between either terminal and ground (case) for 1 to 5 seconds.

Barometric pressure (reduced): In accordance with MIL-F-15733 and the following:

Test condition: C (70,000 feet)

Dielectric withstanding voltage: 1.5 times the rated dc voltage applied between either terminal and ground (case) for 1 to 5 seconds. Maximum charging current shall not exceed 50 milliamperes.

Insulation resistance: In accordance with MIL-F-15733. The following details and exceptions shall apply:

Test temperature: 25°C ±3°C.

Test potential: 100 V dc or rated dc voltage, whichever is less.

Points of measurement: Between either terminal and ground (case).

Minimum insulation resistance: 10,000 megohms.

Voltage drop: See table III.

Terminal strength: In accordance with MIL-F-15733. The following details shall apply:

Test condition: A

Applied force: 5 pounds.

Flashpoint of impregnant or potting compound: Not applicable.

Overload: In accordance with MIL-F-15733.

Measurements at 25°C after test: Insulation resistance shall meet initial requirements.

Resistance to soldering heat: In accordance with MIL-F-15733.

Thermal shock and immersion: Not applicable.

Shock (specified pulse): In accordance with MIL-F-15733. The following details shall apply:

Test condition: I

Measurements after test: Insertion loss (check test) shall meet initial requirements.

Vibration, high frequency: In accordance with MIL-F-15733. The following details and exceptions shall apply:

Test condition: D (20G).

Measurement after test: Insertion loss (check test) shall meet initial requirements.

Radiographic inspection (quality conformance only) (applicable to dash numbers 0010 through 0012 only).

Filters shall be x-rayed in one plane at 90 degrees rotation perpendicular to their longitudinal axis. Any evidence of poor capacitor mounting or uneven soldering of capacitor to case shall be cause for rejection; rejected units shall be dissected and examined for poor workmanship or uneven soldering. Any defects noted shall require corrective action prior to acceptance of future lots. Magnification during visual inspection shall be 2 power, minimum. Unless otherwise specified, one radiograph shall be taken of each unit. Filters shall be positioned to yield a longitudinal image of the body.

Moisture resistance: Not applicable.

Solderability: In accordance with MIL-F-15733.

Life: In accordance with MIL-F-15733. The following details and exceptions shall apply:

Test condition: D (1000 hours).

Measurements after test:

Dielectric withstanding voltage with 90 percent of the initial voltage applied for 5 ±1 seconds.

Insulation resistance shall be not less than 30 percent of the initial requirement.

Insertion loss (check test) shall meet the initial requirements.

Marking: Each filter shall be marked with the PIN, as shown below. In addition, full marking in accordance with MIL-F-15733 shall be marked on the unit package.

PIN: M15733/61-(dash number from table I).

Application note: These nonhermetically sealed filters may be susceptible to moisture intrusion when subjected to repeated thermal cycling. If these items are to be utilized in applications enduring harsh environments, the user should consider placing them within hermetic enclosures.

TABLE III. Electrical characteristics.

Dash number	Circuit	Rated voltage		Rated current (amps)	Capacitance (min)	Voltage drop	Minimum insertion loss (dB) in accordance with MIL-STD-220 1/																			
							+25°C										-55°C and +125°C 2/									
		V dc	3/ Vrms		pF	volts	1 MHz	5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz	10 GHz	1 MHz	5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz	10 GHz
0001 4/	π	200	140	10	1,500	.1	--	--	--	--	32	45	58	70	70	70	--	--	--	--	15	28	46	70	70	70
0002	"	200	140	10	1,500	.1	--	--	--	--	32	45	58	70	70	70	--	--	--	--	15	28	46	70	70	70
0003	"	500	350	25	2,000	.5	--	--	--	--	40	55	65	70	70	70	--	--	--	--	25	40	59	70	70	70
0004 4/	"	500	350	25	2,000	.5	--	--	--	--	40	55	65	70	70	70	--	--	--	--	25	40	59	70	70	70
0005 4/	"	200	140	10	1,500	.1	--	--	--	--	32	45	58	70	70	70	--	--	--	--	16	30	48	70	70	70
0006	"	200	140	"	1,500	"	--	--	--	--	32	45	58	70	70	70	--	--	--	--	16	30	48	70	70	70
0007	"	100	70	"	5,000	"	--	--	--	--	50	65	70	70	70	70	--	--	--	--	16	30	48	70	70	70
0008	"	100	70	"	1,000	"	--	--	--	--	50	65	70	70	70	70	--	--	--	--	20	35	55	70	70	70
0009	"	70	--	"	12,000	"	--	20	--	48	--	65	--	--	65	65	--	8	--	30	--	63	--	--	65	65
0010 4/	"	100	70	"	5,000	.5	--	--	--	--	50	65	--	65	70	70	--	--	--	--	16	30	--	65	70	70
0011	"	"	70	"	5,000	.5	--	--	--	--	50	65	--	65	70	70	--	--	--	--	16	30	--	65	70	70
0012	"	"	--	"	25,000	.1	--	15	--	60	60	65	--	65	65	65	--	13	--	27	58	70	--	65	65	65
0013	L_2	"	--	"	22,000	.1	10	--	30	--	--	42	45	--	60	60	8	--	28	--	--	40	43	--	60	60
0014	π	50	--	20	10,000	.5	--	--	20	--	50	65	70	--	70	70	--	--	18	--	48	63	70	70	70	70
0015	π	500	--	15	2,500	.15	--	--	5	--	--	50	55	--	70	70	--	--	3	--	--	45	50	--	70	70

1/ Insertion loss measurements between 1 MHz and 10 MHz, inclusive, shall be performed at full load. Insertion loss measurements above 10 MHz shall be performed at no load.
2/ For dash number 0012 measurements shall be performed at -65°C and +85°C.
3/ Zero to 400 Hz over the rated temperature range of -55°C to +125°C.
4/ Inactive for new design.

QUALITY ASSURANCE PROVISIONS:

Qualification inspection: In accordance with MIL-F-15733, except that solderability shall be performed as the final test in group III.

Quality conformance inspection: In accordance with MIL-F-15733 except as follows:

Group A: In accordance with MIL-F-15733 for dash numbers 0001, 0004, and 0005. Group A inspection for all other dash numbers shall be in accordance with table IV. Lots having greater than 10 percent rejects shall be considered reject lots. Reject lots, at the option of the manufacturer, may be reworked and submitted to group A inspection of table IV.

TABLE IV. Group A inspection.

Test or inspection	Sampling procedure
Voltage conditioning	100%
Dielectric withstanding voltage	100%
Insulation resistance	100%
Voltage drop 1/	100%
Insertion loss (check test)	100%
Radiographic inspection 2/	100%
Visual and mechanical inspection	See MIL-F-15733, group A inspection

1/ DC voltage drop/dc resistance test for dc rated filters shall be performed on a sample basis in accordance with MIL-F-15733, group A inspection.
2/ Applicable to dash numbers 0010 through 0012 only.

SUPERSESSION DATA: See table V.

TABLE V. Supersession data.

Canceled PIN's	Superseding PIN's M15733/61-	Inactive PIN's	Superseding PIN's M15733/61-
M15733/35-0001	0002	M15733/61-0001	0002
M15733/35-0002	0002	M15733/61-0004	0003
M15733/36-0001	0003	M15733/61-0005	0006
M15733/36-0002	0003	M15733/61-0010	0011
M15733/52-0001	0006	M15733/43-0001	0002
M15733/52-0002	0006	M15733/43-0002	0008
M15733/52-0003	0007	M15733/28-0001	0008
M15733/52-0004	0008	M15733/28-0002	0008
M15733/52-0005	0009	M15733/28-0003	0014
M15733/47-0001	0011	M15733/28-0004	0013
M15733/47-0002	0011		
M15733/47-0003	0012		
M15733/47-0005	0013		
M15733/47-0004	0014		

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

CONCLUDING MATERIAL

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

Review activities:
Army - AR, AT, AV, ME, MI
Navy - AS, MC, OS, SH
Air Force - 19, 99

Preparing activity:
DLA - ES

(Project 5915-0380)