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December 11, 2015

MEMORANDUM FOR MILITARY/INDUSTRY DISTRIBUTION

SUBJECT: A 2nd initial Draft of the proposed surface mount coil specification and 6 new associated specification sheets is being circulated once again. Project Number(s) 5950-2014-041, -042, -043, -044, -045, -046, -047

All comments have been incorporated from the first initial draft. All changes are in red strikeout (removal of requirement) and green lettering (additions). A couple of requirements need further discussion, shock and vibration. Should the use of MIL-STD-883 or MIL-STD-750 requirements be used, or more tailored to this specification?

The initial draft for this subject document, dated 11 December 2015, is now available for viewing and downloading from the DLA Land and Maritime-VA Web site:

<http://www.dscc.dla.mil/Programs/MilSpec/DocSearch.asp>

Concurrence or comments are required at this Center within 60 days from the date of this letter. Late comments will be held for the next coordination of the document. Any further coordination concerning these documents will be circulated only to firms and organizations that furnish comments or reply that they have an interest. Comments from military departments must be identified as either "Essential" or "Suggested". Essential comments must be justified with supporting data. Military review activities should forward comments to their custodians of this office, as applicable, in sufficient time to allow for consolidating the department reply.

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/ SIGNED /

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NOTE: This draft dated 11 December 2015, prepared by DLA-CC has not been approved and is subject to modification.

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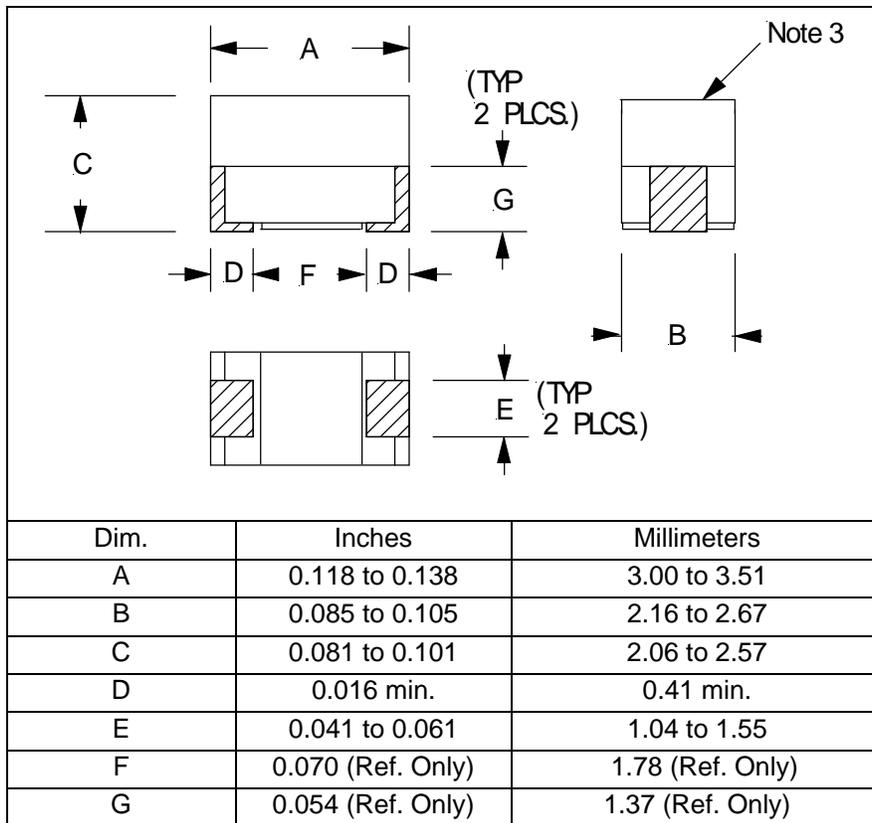
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PERFORMANCE SPECIFICATION SHEET

COIL, RADIO FREQUENCY, CHIP, FIXED, MOLDED, UNSHIELDED
ESTABLISHED RELIABILITY, SURFACE MOUNT

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the products described herein shall consist of this specification sheet and MIL-PRF-SMD.



NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Marking shall be on the top surface of the coil.

FIGURE 1. Dimensions and Configuration.

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REQUIREMENTS:

Dimensions and configuration: See Figure 1.

Material: Phenolic core (inductance values 0.0018 to 0.082 uH, inclusive); Iron core (inductance values 0.10 to 0.82 uH, inclusive); Ferrite core (inductance values 1.0 to 100 uH, inclusive).

Weight: 0.10 gram maximum.

Operating temperature range: -55°C to +125°C.

Temperature rise (at 90°C): 35°C maximum. Test performed with coil mounted on SMD test substrate.

Maximum operating temperature: +125°C.

Altitude: 70,000 feet maximum.

Dielectric Withstanding Voltage: MIL-STD-202-301, test voltage of 200 volts rms.

Barometric Pressure: MIL-STD-202-105, test Condition C (70,000 feet), test voltage of 80 volts rms.

Insulation Resistance: MIL-STD-202-302, test Condition A, 1,000 megaohms minimum.

Points of test voltage application for Dielectric Withstanding Voltage, Barometric Pressure, and Insulation Resistance are between the terminals of the coil shorted together and the contact arm or assembly. The contact arm is made of conductive, moisture-resistant, resilient material and it shall cover the entire surface opposite the terminals, and shall be held firmly in place against this surface during testing.

Electrical characteristics (initial): See Table I. ~~Test fixture or equivalent shall be as shown in Figure 2.~~

Inductance and tolerance: See Table I. ~~Test fixture or equivalent shall be as shown in Figure 2.~~

Quality Factor (Q): See Table I. ~~Test fixture or equivalent shall be as shown in Figure 2.~~

Self-resonant frequency: See Table I. ~~Test fixture or equivalent shall be as shown in Figure 2.~~

DC resistance: See Table I. ~~Test fixture or equivalent shall be as shown in Figure 2.~~

Terminal (Bond) Strength: 2.0 pounds, when tested in accordance with MIL-STD-883, Method 2011, Test condition F. Test performed with coil mounted on SMD test substrate.

Solderability: MIL-STD-202-208, test Condition B. Both terminations are to be immersed simultaneously.

Resistance to solvents: Test is not applicable.

Overload: Test performed with coil mounted on SMD test substrate.

Low temperature storage: Test performed with coil mounted on SMD test substrate.

Vibration: MIL-STD-202-204, test condition D. Test performed with coil mounted on SMD test substrate.

Mechanical Shock: MIL-STD-202-213, test condition I. Test performed with coil mounted on SMD test substrate.

Life: Test performed with coil mounted on SMD test substrate.

Moisture Resistance: MIL-STD-202-106. Polarization voltage is not applicable. Step 7a shall be performed during any five (5) of the first eight (8) cycles only. Test performed with coil mounted on SMD test substrate.

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SMD test substrate (where applicable): Material shall be made of a minimum of 96 percent alumina, or equivalent. The test substrate shall be prepared with metallized surface land areas.

Coil Mounting (where applicable): Test coils are to be soldered to the SMD test substrate's metallized areas only. Solder used shall be Sn63Pb37 solder or equivalent. The test substrate shall then be placed in or on a suitable heat transfer unit (molten solder, hot plate, tunnel oven, etc.) with the temperature maintained at 260°C +/- 5°C, until the solder melts and reflows forming a homogenous solder connection.

Electrical characteristics (final): See Table II. For any Subgroup test requiring coils to be mounted to an SMD test substrate, the electrical characteristics (final) measurements are to be referenced to the electrical characteristics (initial) measurements determined after the test coil is mounted to the test substrate.

Part Marking: Coil marking is not applicable due to body size constraints.

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Table I Electrical characteristics (initial) and dash numbers.

Dash Number 1/	Inductance (μ H) 4/	Inductance Tolerance (%)	Q (min) 4/	Test Frequency (MHz)	Self- resonant frequency (MHz) (min) 2/	DC resistance (ohms) (max)	Current rating (mA) (max) 3/
BR0018***	0.0018	± 20	40	50	2700	0.050	1,562
BR0022***	0.0022	± 20	40	50	2700	0.050	1,562
BR0027***	0.0027	± 20	40	50	2700	0.050	1,562
BR0033***	0.0033	± 20	40	50	2700	0.050	1,562
BR0039***	0.0039	± 20	40	50	2700	0.050	1,562
BR0047***	0.0047	± 20	40	50	2700	0.050	1,562
BR0056***	0.0056	± 20	40	50	2700	0.050	1,562
BR0068***	0.0068	± 20	40	50	2700	0.050	1,562
BR0082***	0.0082	± 20	40	50	2700	0.050	1,562
BR010***	0.010	± 10	30	50	2000	0.13	966
BR012***	0.012	± 10	30	50	1850	0.14	931
BR015***	0.015	± 10	30	50	1700	0.16	871
BR018***	0.018	± 10	30	50	1550	0.18	821
BR022***	0.022	± 10	30	50	1300	0.20	779
BR027***	0.027	± 10	30	50	1150	0.22	743
BR033***	0.033	± 10	30	50	1000	0.24	711
BR039***	0.039	± 10	30	50	900	0.27	670
BR047***	0.047	± 10	30	50	800	0.30	636
BR056***	0.056	± 10	30	50	750	0.33	606
BR068***	0.068	± 10	30	50	700	0.36	580
BR082***	0.082	± 10	30	50	625	0.40	551
BR10***	0.10	± 10	30	25	550	0.20	1,018
BR12***	0.12	± 10	30	25	500	0.22	971
BR15***	0.15	± 10	30	25	450	0.25	910
BR18***	0.18	± 10	30	25	400	0.28	860
BR22***	0.22	± 10	30	25	350	0.32	805
BR27***	0.27	± 10	30	25	320	0.36	759
BR33***	0.33	± 10	30	25	300	0.40	720
BR39***	0.39	± 10	30	25	250	0.45	679
BR47***	0.47	± 10	30	25	220	0.50	644
BR56***	0.56	± 10	30	25	180	0.55	614
BR68***	0.68	± 10	30	25	160	0.60	588
BR82***	0.82	± 10	30	25	140	0.67	556
B1R0***	1.0	± 5	30	7.9	120	0.70	515
B1R2***	1.2	± 5	30	7.9	100	0.75	497
B1R5***	1.5	± 5	30	7.9	85	0.85	467
B1R8***	1.8	± 5	30	7.9	75	0.90	454
B2R2***	2.2	± 5	30	7.9	70	1.0	431
B2R7***	2.7	± 5	30	7.9	65	1.1	411
B3R3***	3.3	± 5	30	7.9	58	1.2	393
B3R9***	3.9	± 5	30	7.9	50	1.3	378
B4R7***	4.7	± 5	30	7.9	45	1.5	352
B5R6***	5.6	± 5	30	7.9	42	1.6	341
B6R8***	6.8	± 5	30	7.9	40	1.8	321
B8R2***	8.2	± 5	30	7.9	35	2.0	305
B100***	10	± 5	30	7.9	30	2.1	297

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Table I Electrical characteristics (initial) and dash numbers. - continued

Dash Number <u>1/</u>	Inductance (μ H) <u>4/</u>	Inductance Tolerance (%)	Q (min) <u>4/</u>	Test Frequency (MHz)	Self-resonant frequency (MHz) (min) <u>2/</u>	DC resistance (ohms) (max)	Current rating (mA) (max) <u>3/</u>
B120***	12	± 5	30	2.5	28	2.5	272
B150***	15	± 5	30	2.5	25	2.8	257
B180***	18	± 5	30	2.5	23	3.3	237
B220***	22	± 5	30	2.5	20	3.7	224
B270***	27	± 5	30	2.5	18	5.0	193
B330***	33	± 5	30	2.5	15	5.6	182
B390***	39	± 5	30	2.5	14	6.4	170
B470***	47	± 5	30	2.5	13	7.0	163
B560***	56	± 5	30	2.5	11	8.0	152
B680***	68	± 5	30	2.5	10	9.0	144
B820***	82	± 5	30	2.5	9	10.0	136
B101***	100	± 5	30	2.5	8	13.0	120

1/ The complete dash number will include ~~three~~ two(2) additional letters (indicated by **). The first additional letter will indicate the inductance tolerance (e.g. J = $\pm 5\%$, K = $\pm 10\%$, M = $\pm 20\%$), ~~the second additional letter will indicate the termination finish (e.g. A = Gold over nickel, F = Tin Lead),~~ and the third ~~second~~ additional letter will indicate the product level (e.g. M, P, R, S) and will be added to the end of the dash number.

2/ ~~When self resonant frequency (SRF) is measured for BR0018*** through BR33***, any value 250 MHz or higher is acceptable. The specified minimum values of SRF over 250 MHz are estimates and are to be used for design reference only.~~

3/ Maximum current allowed not to exceed the specified maximum temperature rise.

4/ Inductance and Q to be measured using HP4291A; HP 4194A or equivalent using TF16092; TF16034 or equivalent.

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Table II Electrical characteristics (final).

Inspection group	Allowable variation from initial measurements			
	Inductance (Percent)	DC resistance	Self-resonant frequency ± (Percent)	Q (Percent)
Qualification inspection				
Group II	± 5	----	----	-10
Group IV	± 5	±(3% +.001 ohm)	-10	-10
Group VI	± 5	±(3% +.001 ohm)	-10	-10
Group B inspection				
Subgroup 1	± 5	±(3% +.001 ohm)	-10	-10
Subgroup 3	± 5	----	----	-10
Subgroup 4	± 5	±(3% +.001 ohm)	-10	-10

~~±/ Not applicable to self resonant frequencies exceeding 250 MHz.~~

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Referenced documents: In addition to MIL-PRF-SMD, this document references:

MIL-STD-202
MIL-STD-883

Custodians:

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

Preparing activity:

DLA – CC

Review Activities:

Army – AR, CR4, MI
Navy – AS, CG, MC, OS
Air Force – 19, 99
NASA – NA
Other - MDA

(Project 5950-2014-044)

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>.