



DEFENSE LOGISTICS AGENCY
LAND AND MARITIME
P.O. BOX 3990
COLUMBUS, OHIO 43218-3990

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.

The point of contact for this document is Mr. Ken Beymer, DLA Land and Maritime, VAT, Post Office Box 3990, Columbus, OH 43218-3990. Mr. Ken Beymer can also be reached at 614-692-0557/850-0557, or by facsimile 614-692-6939/850-6939, or by e-mail to: ken.beymer@dlam.mil

/ SIGNED /

MICHAEL A. RADECKI
Chief
Electronics Component Team

cc:
VSS
VSC
VQP
FMTC

NOTE: This draft dated 23 October 2014, prepared by DLA-CC has not been approved and is subject to modification.

DO NOT USE FOR ACQUISITION PURPOSES.

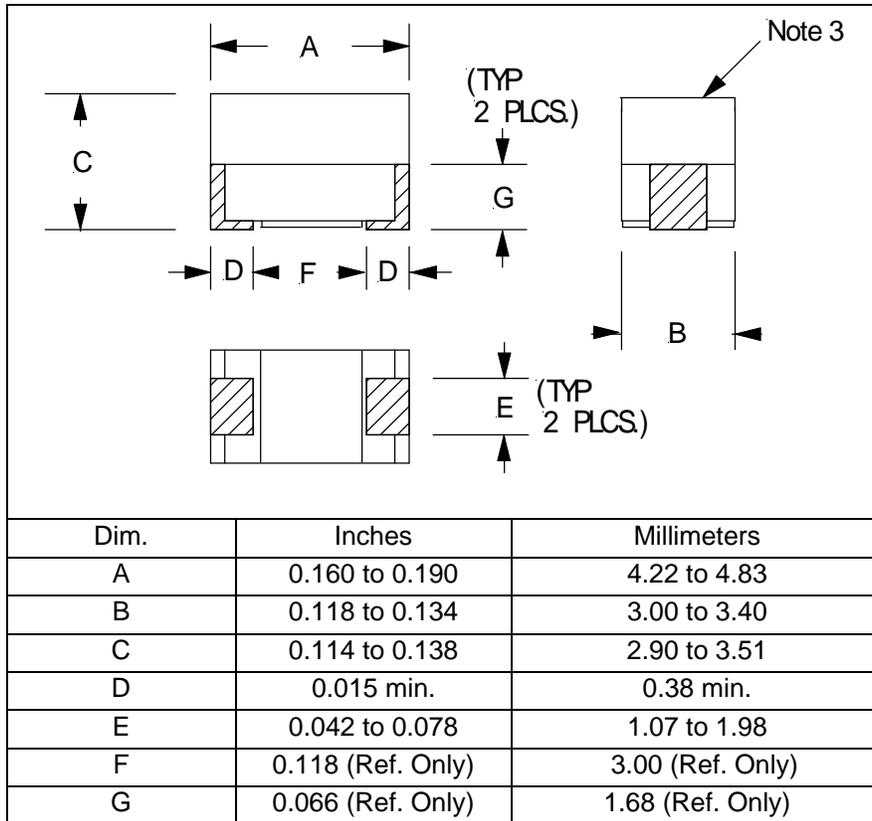
INCH-POUND
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PERFORMANCE SPECIFICATION SHEET

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 0.010 to 0.082 uH, inclusive); Iron core (inductance values 0.10 to 0.82 uH, inclusive); Ferrite core (inductance values 1.0 to 1000 uH, inclusive).

Weight: 0.3 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 megohms 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.

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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.

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 4/ (μ H)	Inductance Tolerance (%)	Q 4/ (min)	Test Frequency (MHz)	Self-resonant frequency (MHz) (min) 2/	DC resistance (ohms) (max)	Current rating (mA) (max) 3/
BR010**	0.010	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.10	1,230
BR012**	0.012	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.10	1,230
BR015**	0.015	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.10	1,230
BR018**	0.018	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.10	1,230
BR022**	0.022	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.10	1,230
BR027**	0.027	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.15	1,000
BR033**	0.033	$\pm 5, \pm 10, \pm 20$	40	50	1,000	0.15	1,000
BR039**	0.039	$\pm 5, \pm 10, \pm 20$	30	50	1,000	0.20	870
BR047**	0.047	$\pm 5, \pm 10, \pm 20$	30	50	1,000	0.20	870
BR056**	0.056	$\pm 5, \pm 10, \pm 20$	30	50	850	0.25	770
BR068**	0.068	$\pm 5, \pm 10, \pm 20$	25	50	750	0.25	770
BR082**	0.082	$\pm 5, \pm 10, \pm 20$	25	50	750	0.25	700
BR10**	0.10	$\pm 5, \pm 10$	30	25	650	0.30	818
BR12**	0.12	$\pm 5, \pm 10$	30	25	600	0.30	818
BR15**	0.15	$\pm 5, \pm 10$	30	25	500	0.30	818
BR18**	0.18	$\pm 5, \pm 10$	30	25	400	0.35	757
BR22**	0.22	$\pm 5, \pm 10$	30	25	350	0.40	708
BR27**	0.27	$\pm 5, \pm 10$	30	25	300	0.45	668
BR33**	0.33	$\pm 5, \pm 10$	30	25	250	0.55	604
BR39**	0.39	$\pm 5, \pm 10$	30	25	220	0.70	535
BR47**	0.47	$\pm 5, \pm 10$	30	25	190	0.80	501
BR56**	0.56	$\pm 5, \pm 10$	30	25	170	1.20	409
BR68**	0.68	$\pm 5, \pm 10$	30	25	150	1.40	379
BR82**	0.82	$\pm 5, \pm 10$	30	25	140	1.60	354
B1R0**	1.0	$\pm 5, \pm 10$	50	7.9	100	0.50	634
B1R2**	1.2	$\pm 5, \pm 10$	50	7.9	80	0.55	604
B1R5**	1.5	$\pm 5, \pm 10$	50	7.9	70	0.60	578
B1R8**	1.8	$\pm 5, \pm 10$	50	7.9	60	0.65	556
B2R2**	2.2	$\pm 5, \pm 10$	50	7.9	55	0.70	535
B2R7**	2.7	$\pm 5, \pm 10$	50	7.9	50	0.75	517
B3R3**	3.3	$\pm 5, \pm 10$	50	7.9	45	0.80	501
B3R9**	3.9	$\pm 5, \pm 10$	50	7.9	40	0.90	472
B4R7**	4.7	$\pm 5, \pm 10$	50	7.9	35	1.00	448
B5R6**	5.6	$\pm 5, \pm 10$	50	7.9	33	1.10	427
B6R8**	6.8	$\pm 5, \pm 10$	50	7.9	27	1.20	409
B8R2**	8.2	$\pm 5, \pm 10$	50	7.9	25	1.40	375
B100**	10	$\pm 5, \pm 10$	50	7.9	20	1.60	354
B120**	12	$\pm 5, \pm 10$	50	2.5	18	2.00	317
B150**	15	$\pm 5, \pm 10$	50	2.5	17	2.50	283
B180**	18	$\pm 5, \pm 10$	50	2.5	15	2.80	268
B220**	22	$\pm 5, \pm 10$	50	2.5	13	3.20	250
B270**	27	$\pm 5, \pm 10$	50	2.5	12	3.60	236
B330**	33	$\pm 5, \pm 10$	50	2.5	11	4.00	224
B390**	39	$\pm 5, \pm 10$	50	2.5	10	4.50	211
B470**	47	$\pm 5, \pm 10$	50	2.5	10	5.00	200
B560**	56	$\pm 5, \pm 10$	50	2.5	9	5.50	191
B680**	68	$\pm 5, \pm 10$	50	2.5	9	6.00	183
B820**	82	$\pm 5, \pm 10$	50	2.5	8	7.00	169

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

Dash Number <u>1/</u>	Inductance <u>4/</u> (μ H)	Inductance Tolerance (%)	Q <u>4/</u> (min)	Test Frequency (MHz)	Self-resonant frequency (MHz) (min) <u>2/</u>	DC resistance (ohms) (max)	Current rating (mA) (max) <u>3/</u>
B101**	100	$\pm 5, \pm 10$	50	2.5	8	8.00	158
B121**	120	$\pm 5, \pm 10$	40	0.79	6	8.0	158
B151**	150	$\pm 5, \pm 10$	40	0.79	5	9.0	149
B181**	180	$\pm 5, \pm 10$	40	0.79	5	9.5	145
B221**	220	$\pm 5, \pm 10$	40	0.79	4	10.0	142
B271**	270	$\pm 5, \pm 10$	40	0.79	4	12.0	129
B331**	330	$\pm 5, \pm 10$	40	0.79	3.5	14.0	120
B391**	390	$\pm 5, \pm 10$	40	0.79	3.0	20.0	100
B471**	470	$\pm 5, \pm 10$	40	0.79	3.0	26.0	88
B561**	560	$\pm 5, \pm 10$	30	0.79	3.0	30.0	82
B681**	680	$\pm 5, \pm 10$	30	0.79	3.0	30.0	82
B821**	820	$\pm 5, \pm 10$	30	0.79	2.5	45.0	67
B102**	1000	$\pm 5, \pm 10$	30	0.79	2.5	60.0	55

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 BR010*** through BR27***, 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.

Table II Electrical characteristics (final).

Inspection group	Allowable variation from initial measurements			
	Inductance (Percent)	DC resistance	Self-resonant frequency <u>1/</u> (Percent)	Q (Percent)
Qualification inspection				
Group II	± 5	----	----	-10
Group IV	± 5	$\pm(3\% +.001 \text{ ohm})$	-8	-10
Group VI	± 5	$\pm(3\% +.001 \text{ ohm})$	-10	-10
Group B inspection				
Subgroup 1	± 5	$\pm(3\% +.001 \text{ ohm})$	-8	-10
Subgroup 3	± 5	----	----	-10
Subgroup 4	± 5	$\pm(3\% +.001 \text{ ohm})$	-8	-10

~~1/ 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 5950-2014-045)

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>.