



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

December 11, 2015

MEMORANDUM FOR MILITARY/INDUSTRY DISTRIBUTION

SUBJECT: A 2<sup>nd</sup> 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](mailto:ken.beymer@dlam.mil)

/ SIGNED /

MICHAEL A. RADECKI  
Chief  
Electronics Component Team

cc:  
VSS  
VSC  
VQP  
FMTC

NOTE: This draft dated 11 December 2015, prepared by DLA-CC has not been approved and is subject to modification.  
**DO NOT USE FOR ACQUISITION PURPOSES.**

INCH-POUND

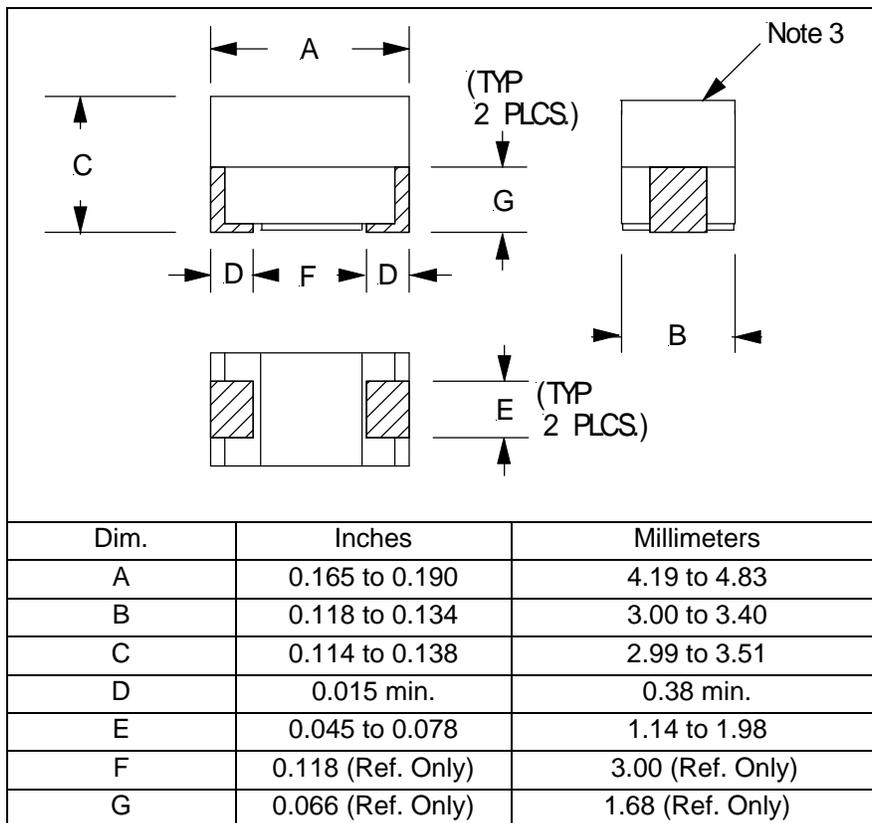
MIL-PRF-SMD/5  
**DRAFT**

PERFORMANCE SPECIFICATION SHEET

COIL, RADIO FREQUENCY, CHIP, FIXED, MOLDED, SHIELDED,  
 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.

MIL-PRF-SMD/5  
DRAFT

REQUIREMENTS:

Dimensions and configuration: See Figure 1.

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

Weight: 0.30 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.

MIL-PRF-SMD/5  
DRAFT

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.

MIL-PRF-SMD/5  
DRAFT

Table I Electrical characteristics (initial) and dash numbers.

Dash Number 1/	Inductance ( $\mu$ H) 4/	Inductance Tolerance (%)	Q (min) 4/	Test Frequency (MHz)	Self- resonant frequency (MHz) (min) <del>2/</del>	DC resistance (ohms) (max)	Current rating (mA) (max) 3/
BR10**	0.10	$\pm 5, \pm 10, \pm 20$	50	25	460	0.09	1,490
BR12**	0.12	$\pm 5, \pm 10, \pm 20$	50	25	400	0.10	1,412
BR15**	0.15	$\pm 5, \pm 10, \pm 20$	50	25	390	0.11	1,347
BR18**	0.18	$\pm 5, \pm 10, \pm 20$	50	25	350	0.12	1,290
BR22**	0.22	$\pm 5, \pm 10, \pm 20$	50	25	310	0.15	1,154
BR27**	0.27	$\pm 5, \pm 10, \pm 20$	50	25	280	0.18	1,053
BR33**	0.33	$\pm 5, \pm 10, \pm 20$	40	25	240	0.22	952
BR39**	0.39	$\pm 5, \pm 10, \pm 20$	40	25	215	0.26	876
BR47**	0.47	$\pm 5, \pm 10, \pm 20$	40	25	205	0.31	802
BR56**	0.56	$\pm 5, \pm 10, \pm 20$	40	25	185	0.37	735
BR68**	0.68	$\pm 5, \pm 10, \pm 20$	40	25	166	0.44	675
BR82**	0.82	$\pm 5, \pm 10, \pm 20$	40	25	155	0.53	614
B1R0**	1.0	$\pm 5, \pm 10$	40	7.9	160	0.35	755
B1R2**	1.2	$\pm 5, \pm 10$	40	7.9	140	0.38	725
B1R5**	1.5	$\pm 5, \pm 10$	40	7.9	110	0.40	706
B1R8**	1.8	$\pm 5, \pm 10$	40	7.9	100	0.43	681
B2R2**	2.2	$\pm 5, \pm 10$	40	7.9	90	0.46	658
B2R7**	2.7	$\pm 5, \pm 10$	40	7.9	67	0.49	638
B3R3**	3.3	$\pm 5, \pm 10$	40	7.9	61	0.70	534
B3R9**	3.9	$\pm 5, \pm 10$	40	7.9	56	0.84	487
B4R7**	4.7	$\pm 5, \pm 10$	40	7.9	50	0.90	471
B5R6**	5.6	$\pm 5, \pm 10$	40	7.9	40	1.00	447
B6R8**	6.8	$\pm 5, \pm 10$	40	7.9	32	1.20	408
B8R2**	8.2	$\pm 5, \pm 10$	40	7.9	30	1.44	372
B100**	10	$\pm 5, \pm 10$	50	2.5	25	1.80	333
B120**	12	$\pm 5, \pm 10$	50	2.5	22	2.00	315
B150**	15	$\pm 5, \pm 10$	50	2.5	18	2.20	301
B180**	18	$\pm 5, \pm 10$	50	2.5	15	2.40	288
B220**	22	$\pm 5, \pm 10$	50	2.5	14	2.60	277
B270**	27	$\pm 5, \pm 10$	50	2.5	13	2.80	267
B330**	33	$\pm 5, \pm 10$	50	2.5	12	3.00	258
B390**	39	$\pm 5, \pm 10$	50	2.5	11	3.20	250
B470**	47	$\pm 5, \pm 10$	50	2.5	9.0	3.40	242
B560**	56	$\pm 5, \pm 10$	50	2.5	8.0	3.60	235
B680**	68	$\pm 5, \pm 10$	50	2.5	7.6	4.30	215
B820**	82	$\pm 5, \pm 10$	50	2.5	7.2	5.20	196
B101**	100	$\pm 5, \pm 10$	40	0.79	7.0	7.00	169
B121**	120	$\pm 5, \pm 10$	40	0.79	6.0	7.50	163
B151**	150	$\pm 5, \pm 10$	40	0.79	5.0	8.00	158
B181**	180	$\pm 5, \pm 10$	40	0.79	4.5	8.50	153
B221**	220	$\pm 5, \pm 10$	40	0.79	4.2	9.00	149
B271**	270	$\pm 5, \pm 10$	40	0.79	4.0	11.0	135
B331**	330	$\pm 5, \pm 10$	40	0.79	3.7	12.0	129
B391**	390	$\pm 5, \pm 10$	40	0.79	3.5	18.0	105

See footnotes at end of table.

MIL-PRF-SMD/5  
DRAFT

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

Dash Number <u>1/</u>	Inductance <u>4/</u> ( $\mu$ 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>
B471**	470	$\pm 5, \pm 10$	40	0.79	3.3	24.0	91
B561**	560	$\pm 5, \pm 10$	40	0.79	2.8	28.0	84
B681**	680	$\pm 5, \pm 10$	40	0.79	2.6	32.0	79
B821**	820	$\pm 5, \pm 10$	40	0.79	2.2	40.0	71
B102**	1000	$\pm 5, \pm 10$	40	0.79	2.0	55.0	60

1/ The complete dash number will include 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 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 BR10\*\*\* 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	$\pm 5$	----	----	-10
Group IV	$\pm 5$	$\pm(3\% +.001 \text{ ohm})$	-8	-10
Group VI	$\pm 5$	$\pm(3\% +.001 \text{ ohm})$	-10	-10
Group B inspection				
Subgroup 1	$\pm 5$	$\pm(3\% +.001 \text{ ohm})$	-8	-10
Subgroup 3	$\pm 5$	----	----	-10
Subgroup 4	$\pm 5$	$\pm(3\% +.001 \text{ ohm})$	-8	-10

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

MIL-PRF-SMD/5  
DRAFT

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 5950-2014-046)

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>.