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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.

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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.

**DO NOT USE FOR ACQUISITION PURPOSES.**

INCH-POUND

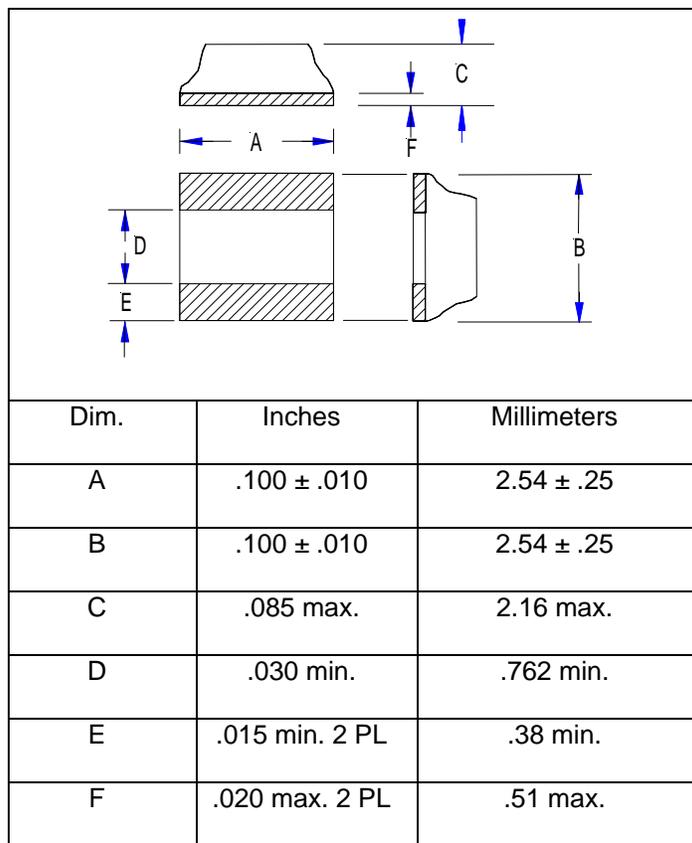
MIL-PRF-SMD/1  
**DRAFT**

PERFORMANCE SPECIFICATION SHEET

COIL, RADIO FREQUENCY, CHIP, FIXED, CONFORMAL COATED,  
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. Shape of curved portions optional provided dimensions A, B, and C are met.

FIGURE 1. Dimensions and Configuration.

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REQUIREMENTS:

Dimensions and configuration: See Figure 1.

Material: Phenolic core (Inductance values 0.010 uH through 0.100 uH, inclusive); Ferrite core (0.12 uH through 27.0 uH, inclusive).

Weight: 0.5 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, Method 301, test voltage of 200 volts rms.

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

Insulation Resistance: MIL-STD-202, Method 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: 0.5 pound, 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 <u>1/</u>	Inductance <u>5/</u> μH	Inductance Tolerances (%)	Q <u>5/</u> (min)	Test Frequency (MHz)	Self <u>2/</u> resonant frequency (MHz) (min)	DC resistance (ohms) (max)	<u>3/ 4/</u> Current (mA) (max)
BR010***	0.010	±5,±10	60	50	2700	0.060	1270
BR012***	0.012	±5,±10	57	50	2450	0.069	1190
BR015***	0.015	±5,±10	55	50	2200	0.078	1110
BR018***	0.018	±5,±10	52	50	2000	0.093	1030
BR022***	0.022	±5,±10	50	50	1800	0.108	950
BR027***	0.027	±5,±10	49	50	1625	0.114	925
BR033***	0.033	±5,±10	48	50	1450	0.120	900
BR039***	0.039	±5,±10	45	50	1335	0.133	860
BR047***	0.047	±5,±10	42	50	1220	0.145	820
BR056***	0.056	±5,±10	39	50	1110	0.170	760
BR068***	0.068	±5,±10	36	50	1000	0.195	705
BR082***	0.082	±5,±10	34	50	915	0.212	675
BR10***	0.10	±5,±10	32	50	830	0.230	650
BR12***	0.12	±5,±10	30	25	750	0.125	880
BR15***	0.15	±5,±10	25	25	650	0.175	745
BR18***	0.18	±5,±10	25	25	550	0.200	695
BR22***	0.22	±5,±10	25	25	450	0.220	665
BR27***	0.27	±5,±10	25	25	375	0.230	650
BR33***	0.33	±5,±10	25	25	300	0.235	645
BR39***	0.39	±5,±10	22	25	235	0.240	635
BR47***	0.47	±5,±10	22	25	215	0.260	610
BR56***	0.56	±5,±10	22	25	195	0.278	590
BR68***	0.68	±5,±10	22	25	175	0.520	435
BR82***	0.82	±5,±10	22	25	160	0.530	430
B1R0***	1.0	±5,±10	22	25	145	0.540	425
B1R2***	1.2	±5,±10	22	7.9	130	0.740	360
B1R5***	1.5	±5,±10	22	7.9	115	0.840	340
B1R8***	1.8	±5,±10	22	7.9	105	0.920	325
B2R2***	2.2	±5,±10	22	7.9	85	1.00	310
B2R7***	2.7	±5,±10	24	7.9	77	1.15	290
B3R3***	3.3	±5,±10	24	7.9	70	1.40	260
B3R9***	3.9	±5,±10	24	7.9	68	1.55	250
B4R7***	4.7	±5,±10	24	7.9	60	1.80	230
B5R6***	5.6	±5,±10	22	7.9	55	2.00	220
B6R8***	6.8	±5,±10	22	7.9	50	2.20	210
B8R2***	8.2	±5,±10	22	7.9	48	2.50	195
B100***	10.0	±5,±10	24	7.9	40	3.45	165
B120***	12.0	±5,±10	25	2.5	35	3.80	160
B150***	15.0	±5,±10	25	2.5	30	5.60	135
B180***	18.0	±5,±10	25	2.5	28	5.80	130
B220***	22.0	±5,±10	25	2.5	25	6.40	125
B270***	27.0	±5,±10	25	2.5	22	6.90	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 = ±5%, K = ±10%, M = ±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 dash numbers BR010\*\*\* 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/ These values are also the maximum incremental current applicable to ferrite cores only.

5/ 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) <del>1/</del>	Q (Percent)
Qualification inspection				
Group II	± 5	----	----	-10
Group IV	± 5	±(3% +.001 ohm)	-8	-10
Group VI	± 5	±(3% +.001 ohm)	-10	-10
Group B inspection				
Subgroup 1	± 5	±(3% +.001 ohm)	-8	-10
Subgroup 3	± 5	----	----	-10
Subgroup 4	± 5	±(3% +.001 ohm)	-8	-10

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

Part or Identifying Number (PIN): The part number shall be in the following form.

MPRFSMD/01-\*\*\*\*\* (dash number per Table I)

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 5950-2014-042)

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>.