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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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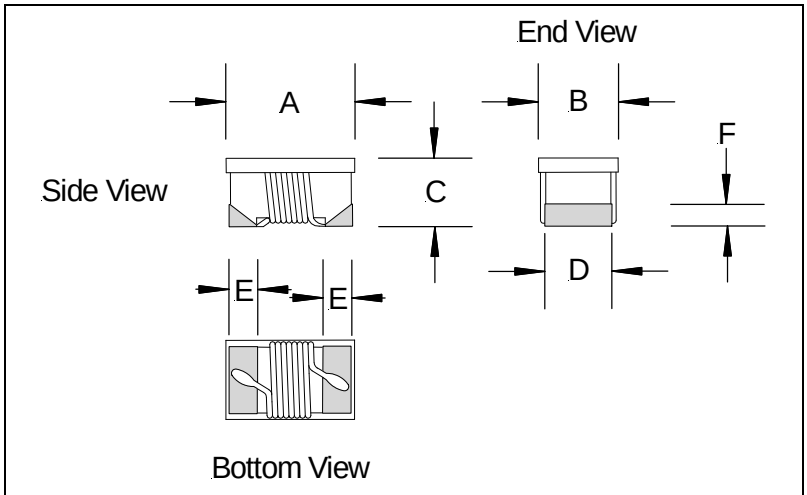
PERFORMANCE SPECIFICATION SHEET

COIL, RADIO FREQUENCY, CHIP, FIXED, OPEN CONSTRUCTION
ESTABLISHED RELIABILITY, SURFACE MOUNT, 0603 SIZE

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.



Dim.	Inches	Millimeters
A	0.071 max.	1.80 max.
B	0.047 max.	1.19 max.
C 1/	0.043 max.	1.09 max.
D	0.030 (Ref. Only)	0.76 (Ref. Only)
E	0.013/0.018 (Ref. Only)	0.33/0.46 (Ref. Only)
F	0.008 (Ref. Only)	0.20 (Ref. Only)

1/ 0.040 inch dimension applies to non-soldered device, and 0.043 inch dimension applies to solder coated terminations.

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

FIGURE 1. Dimensions and Configuration.

REQUIREMENTS:

Dimensions and configuration: See Figure 1.

Material: Ceramic core.

Weight: 0.008 gram maximum.

Operating temperature range: -55ºC to +125ºC.

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

Maximum operating temperature: +125ºC.

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, 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.
Inductance and tolerance: See Table I.
Quality Factor (Q): See Table I.
Self-resonant frequency: See Table I.
DC resistance: See Table I.

Terminal (Bond) Strength: 1.0 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, or J-STD-002, Test Method S (except solder preforms may be used). Both terminations are to be immersed simultaneously. Magnet wire and bonds are excluded from solder coverage.

Resistance to solvents: When tested in accordance with MIL-STD-202-215, full immersion of parts in solvents.

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.

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 260ºC +/- 5ºC, 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.

Table I Electrical characteristics (initial) and dash numbers.

Dash Number 1/	Inductance (µH)	Inductance (nH) 2/	Inductance Tolerance (%)	Inductance Test Frequency (MHz)	Q (min) 2/	Q Test Frequency (MHz)	Self-resonant frequency (MHz) (min) 3/	DC resistance (ohms) (max)	Current rating (mA) (max) 4/
BR0018***	0.0018	1.8	±2,±5,±10	250	22	250	6000	0.07	1,000
BR0024***	0.0024	2.4	±2,±5,±10	250	22	250	6000	0.07	1,000
BR0033***	0.0033	3.3	±2,±5,±10	250	22	250	6000	0.07	1,000
BR0036***	0.0036	3.6	±2,±5,±10	250	22	250	6000	0.07	1,000
BR0039***	0.0039	3.9	±2,±5,±10	250	22	250	6000	0.07	1,000
BR0043***	0.0043	4.3	±2,±5,±10	250	22	250	6000	0.09	885
BR0047***	0.0047	4.7	±2,±5,±10	250	22	250	6000	0.09	885
BR0051***	0.0051	5.1	±2,±5,±10	250	22	250	5800	0.10	840
BR0056***	0.0056	5.6	±2,±5,±10	250	22	250	5800	0.10	840
BR0068***	0.0068	6.8	±2,±5,±10	250	30	250	5800	0.10	840
BR0075***	0.0075	7.5	±2,±5,±10	250	30	250	5200	0.13	740
BR0082***	0.0082	8.2	±2,±5,±10	250	30	250	5200	0.14	705
BR0087***	0.0087	8.7	±2,±5,±10	250	30	250	5200	0.14	705
BR010***	0.010	10	±2,±5,±10	250	31	250	4800	0.16	665
BR012***	0.012	12	±2,±5,±10	250	35	250	4000	0.13	735
BR015***	0.015	15	±2,±5,±10	250	35	250	4000	0.17	645
BR016***	0.016	16	±2,±5,±10	250	35	250	3400	0.17	645
BR018***	0.018	18	±2,±5,±10	250	35	250	3100	0.17	645
BR022***	0.022	22	±2,±5,±10	250	38	250	3000	0.19	610
BR024***	0.024	24	±2,±5,±10	250	38	250	2800	0.21	580
BR027***	0.027	27	±2,±5,±10	250	40	250	2800	0.22	565
BR033***	0.033	33	±2,±5,±10	250	40	250	2300	0.22	565
BR039***	0.039	39	±2,±5,±10	250	40	250	2200	0.24	540
BR047***	0.047	47	±2,±5,±10	200	38	200	2000	0.28	500
BR056***	0.056	56	±2,±5,±10	200	38	200	1900	0.31	475
BR068***	0.068	68	±2,±5,±10	200	37	200	1700	0.36	440
BR082***	0.082	82	±2,±5,±10	150	34	150	1700	0.54	360
BR10***	0.100	100	±2,±5,±10	150	34	150	1400	0.75	305
BR12***	0.120	120	±2,±5,±10	150	32	150	1300	0.79	300
BR15***	0.150	150	±2,±5,±10	150	28	150	990	1.14	245
BR18***	0.180	180	±2,±5,±10	150	25	150	990	1.28	235
BR22***	0.220	220	±2,±5,±10	100	25	150	700	1.70	200
BR27***	0.270	270	±2,±5,±10	25	16	25	600	1.78	195
BR33***	0.330	330	±2,±5,±10	25	16	25	550	3.22	100

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. G = ±2%, J = ±5%, K = ±10%), ~~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/ Inductance and Q to be measured using HP4287A meter or equivalent, with 16197A test fixture or equivalent.

3/ Self-resonant frequency is tested using E5071C analyzer or equivalent.

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

Table II Electrical characteristics (final).

Inspection group	Allowable variation from initial measurements			
	Inductance (Percent)	DC resistance	Self-resonant frequency 1/ (Percent)	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)	-10	-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/06-********* (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 5950-2014-047)

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.