

Blank detail specification

for fixed insulated (unshielded) R.F. inductors suitable for surface mounting
at the full assessment level

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**BLANK DETAIL SPECIFICATION FOR FIXED INSULATED (UNSHIELDED) R.F.
INDUCTORS SUITABLE FOR SURFACE MOUNTING AT THE FULL ASSESSMENT LEVEL**

1 Scope

This standard lists the ratings, characteristics, inspection requirements and additional information for fixed insulated (unshielded) r.f. inductors suitable for surface mounting (SM) at the full assessment level which are to be included as minimum mandatory requirements in the detail specification. It constitutes therefore a blank detail specification (BDS) derived from BS 9750: Specification for fixed r.f. inductors of assessed quality: Generic data and methods of tests. Supplementary tests are described in the appendices to cover the special requirements of surface mounted (SM) inductors: appendix A describes mounting procedures; appendix B details tests for solderability and dissolution of metallization; and appendix C describes tests for robustness of terminations.

2 Additional inspection requirements

Only those tests listed in BS 9750 shall be used for the comparison of parts. A scheme for the inspection of structurally similar components is included in appendix B of BS 9750.

The tests of BS 9750 (as supplemented herein) shall be used to prove the performance requirements of parts, although additional or alternative tests may be specified by a manufacturer subject to the provisions of 20.5 of BS 9000: Part 1: 1981. In addition to alternative tests, a manufacturer may also specify at his discretion more stringent inspection and acceptance quality levels, more severe environments and increased test durations where applicable.

Where alternative test methods are possible for a particular test, the detail specification shall state clearly which method is to be used.

3 Detail specification

The blank detail specification which follows, when completed where necessary as indicated by an asterisk, will form the relevant detail specification.

NOTE. The tests described in appendices A, B and C are common to all derived detail specifications and need not, therefore, be included in them.

Key to front page of BDS

The numbers between square brackets correspond to the following indications which should be (or are) given:

Identification of the detail specification (DS)

- [1] Name and address of the British Standards Institution.
- [2] The number allocated by BSI Milton Keynes.
- [3] The manufacturer may add his name and address.
- [4] The number and date of the blank detail specification.

Identification of the inductor

- [5] A short description of the type of inductor.
- [6] Information on typical construction (where applicable).
- [7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the relevant documents for outlines. Alternatively, this drawing may be given in an appendix to the detail specification.
- [8] Application or group of applications covered, or, preferably, the level of quality assessment covered by the detail specification.
- [9] Reference data on the most important properties, to allow comparison between the various induction types.

NOTE. This may start or continue on the second page of the BDS, e.g. table 1 and clause 1.

BRITISH STANDARDS INSTITUTION [1] 2 PARK STREET, LONDON, W1A 2BS	BS 9752 F000X* [2] ISSUE*, DATE
Specification available from: AS [3] SHOWN IN PD 9002 AND: *	* pages
ELECTRONIC COMPONENTS OF ASSESSED [4] QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BS 9752: 1989	MANUFACTURER'S TYPE [5] NUMBER SEE PD 9002
Outline and dimensions. Third [7] angle projection For other configurations give an appropriate drawing For values of dimensions see table 1 All dimensions in mm Marking information, see clause 2	For ordering information see clause 4
	INDUCTORS RADIO FREQUENCY STYLE - INSULATED SUITABLE FOR SURFACE MOUNTING TYPICAL CONSTRUCTION [6]
	FULL ASSESSMENT [8]
* To be completed by the specification writer. * If an N specification has to be prepared it is to be in accordance with circular letter no. 15 of PD 9004	
Refer to Qualified Products List PD 9002 for details of manufacturers approved to this specification.	

Table 1. Dimensions in mm and ratings*						
Pattern	Rated dissipation (W at * °C)	Isolation voltage V.d.c or a.c. peak	Dimensions with tolerances, as appropriate			
			Height H	Width W	Length L	Land width

The range of values available in each pattern is given in PD 9002.

1 Ratings and characteristics

Inductance range: The preferred values are those of the E* series of BS 2488: 1966 (IEC 63). Where the use of intermediate values is essential they should be chosen from the E* series of that document.

Standard selection tolerance: $\pm * \%$

Environmental classification: --/--/--*

Bump severity: *m/s²; *Bumps total

Vibration severity: * Hz to *Hz: amplitude *mm or acceleration *m/s² (whichever is less severe); of *h duration in each of 3 planes.

Low air pressure: *kPa (*mbar)

Limits of change after
1000 h endurance test:

Inductance $\pm * \%$

Q.Factor $\pm * \%$

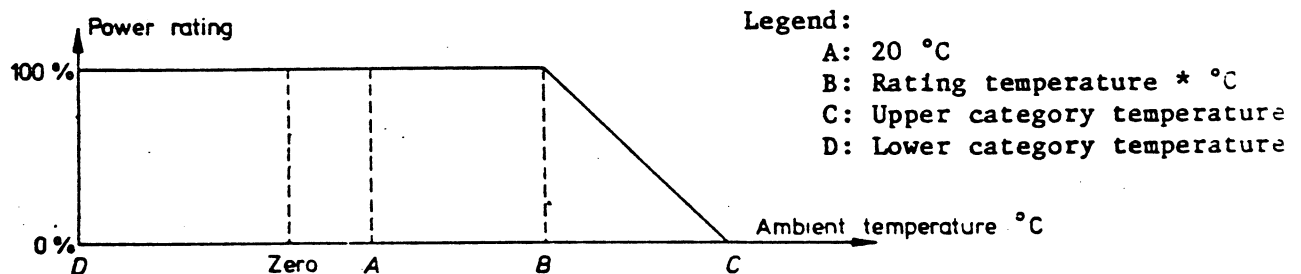
Self resonant frequency $\pm * \%$

D.C. resistance $\pm * \%$

* To be completed by the specification writer.

1.1 Derating

The inductors covered by this specification shall be derated in accordance with figure 1.



NOTE. Where the sloping portion is extrapolated to 20 °C in order to provide a rating for a test at laboratory temperature, this should be indicated by a dotted line.

Figure 1. Derating curve

2 Marking of the part and package

The marking of part and package shall be in accordance with the requirements of 1.1.6 of BS 9750.

3 Related documents

BS 2488	Schedule of preferred numbers for the resistance of resistors and the capacitance of capacitors for telecommunication equipment
BS 4849	Specification for 1,1,2-Trichlorotrifluoroethane (R113)
BS 6001	Sampling procedures for inspection by attributes Part 1. Specification for sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection
BS 9000	General requirements for a system for electronic components of assessed quality
BS 9750	Specification for fixed r.f. inductors of assessed quality: generic data and methods of test
PD 9002	BS 9000, BS CECC and IECQ qualified products list
PD 9004	BS 9000, CECC and IECQ UK administrative guide

4 Ordering information

Orders for inductors covered by this specification shall contain the following information (in accordance with 1.1.15 of BS 9750: 1978):

- (a) value of rated inductance;
- (b) selection tolerance of rated inductance;
- (c) number of this detail specification, i.e. BS 9752 F000X;
- (d) pattern.

5 Certified test records

Certified test records may be prepared in accordance with 1.1.11 of BS 9750 and may be presented in the format given in appendix C of that document.

6 Delayed delivery

The provisions of 1.1.9 of BS 9750 shall apply.

7 Additional information (not for inspection purposes)

The detail specification may include information such as circuit diagrams, curves, drawings and notes needed for clarification, e.g. recommended mounting and soldering techniques.

8 Inspection requirements

8.1 When drying is called for, procedure 1 of 1.2.5.1 of BS 9750 shall be used.

8.2 Specified requirements concerning maximum allowable uncertainty of test equipment are additional to the general requirement to take measurement uncertainty into account when assessing results against the limits given in detail specifications.

8.3 There shall be satisfactory balance between high, medium and low inductance values in the sample taken (see appendix B of BS 9750).

8.4 Samples submitted to test that are marked 'D' shall not be accepted for release under BS 9000 (see 2.6.5 of BS 9000: Part 1).

8.5 Where a subgroup contains more than one test, the tests shall be carried out in the order given in the test schedule.

8.6 For the following subgroups, tests shall be carried out on unmounted inductors. A suitable test fixture shall be used.

A0, A1, A3, A4, B1, B2 (Solderability - Wetting and dewetting),
B3, C3 (Resistance to soldering heat) D4

For the following subgroups, tests shall be carried out on inductors mounted in accordance with appendix A and a suitable test fixture used where necessary.

B2 Adhesion and climatic sequence C3 Bump, C5, D1, D3, D6.

8.7 The test fixtures specified in BS 9750: 1978 for making electrical measurements are not suitable for use with SM inductors. Detail specifications shall therefore give **full details** of the test fixtures needed to be used with the SM inductors specified therein.

Inspection	D or ND (see note 2)	BS 9750: 1978 reference and conditions of test	IL (see note 1)	AQL	Performance requirements (BS 9750 reference unless otherwise specified)
GROUP A					
To be conducted on a sampling basis lot-by-lot. Subgroup A2 not applicable. A0 tests carried out prior to formation of inspection lots					
Subgroup A0	ND		100 %		
Inductance		1.2.5.2.2			In accordance with table 2+
Q factor		1.2.5.3; test fixture:*			
Subgroup A1	ND		S4	1.0 %	
Visual inspection		1.2.3 with a x5 magnifier, if required			1.2.3
Inductance		1.2.5.2.2			In accordance with table 2+
Q factor		1.2.5.3; test fixture:*			
Subgroup A3	ND		S4	1.0 %	
Self-resonant frequency (SRF)		1.2.5.4.1			In accordance with table 2+
D.C. resistance		1.2.5.5 at 20 °C			In accordance with table 2+
Subgroup A4	ND		S3	2.5 %	
Voltage proof		1.2.5.7 mounted as in 1.2.5.6.3			1.2.5.7
Subgroup A5					
CTR information	1.1.11 Attributes information subgroup A1, A3 and A4				
* To be completed by the specification writer (see 8.7). + Of this detail specification.					

Inspection	D or ND (see note 2)	BS 9750: 1978 reference and conditions of test	IL (see note 1)	AQL	Performance requirements (BS 9750 reference unless otherwise specified)
GROUP B To be conducted on a sampling basis, lot-by-lot. Subgroups B4, B5, B6 and B7 not applicable					
Subgroup B1 Dimensioning and gauging	ND	-	S4	1.0 %	In accordance with table 1+
Subgroup B2 Soldering: Wetting Mounting Initial measurements after mounting Visual inspection Inductance (L_m) Q factor (Q_m) Robustness of termination (a) Adhesion	D	As in appendix B [‡] $* s \pm * s$ $* ^\circ C \pm * ^\circ C$ As in appendix A [‡] Half the sample on substrates according to figure 2 and the remainder according to figure 3 1.2.3 with a x5 magnifier, if required 1.2.5.2.2 1.2.5.3 As in clause C.1 of appendix C [‡] Specimens mounted on substrates according to figure 3	S3 (see note 3)	2.5 %	As in appendix B [‡] 1.2.3 } The values shall be recorded and shall be in accordance with table 2+ As in clause C.1 of appendix C [‡]
* To be completed by the specification writer. + Of this detail specification. ‡ Of BS 9752.					

Inspection	D or ND (see note 2)	BS 9750: 1978 reference and conditions of test	IL (see note 1)	AQL	Performance requirements (BS 9750 reference unless otherwise specified)
Subgroup B2 cont'd					
Intermediate measurements					
Visual examination		1.2.3 with a x5 magnifier, if required			1.2.3
Inductance		1.2.5.2.2			$\frac{\Delta L_m}{L_m} \leq 2\%$
Q Factor		1.2.5.3			As in table 2+
Robustness of terminations					
(b) Bond strength of end face plating		As in clause C.2 of appendix C‡			As in clause C.2 of appendix C‡
		Specimens mounted on substrates according to figure 2			
Measurements whilst under stress					
Inductance		1.2.5.2.2			$\left \frac{\Delta L_m}{L_m} \right \leq * \%$
Q factor		1.2.5.3			As in table 2+
Intermediate measurements					
Visual examination		1.2.3, with a x5 magnifier, if required			1.2.3
Inductance		1.2.5.2.2			$\left \frac{\Delta L_m}{L_m} \right \leq 2\%$
Q factor		1.2.5.3			As in table 2+
* To be completed by the specification writer. + Of this detail specification. ‡ Of BS 9752.					

Inspection	D or ND (see note 2)	BS 9750: 1978 reference and conditions of test	IL (see note 1)	AQL	Performance requirements (BS 9750 reference unless otherwise specified)
Subgroup B2 cont'd					
Climatic sequence (all specimens)		1.2.7.6 Procedure 3 of test Z/ABDM of BS 2011			
Dry heat		* °C			
Cold		* °C			
Low air pressure		* kPa (mbar)			
Final measurements					
Visual inspection		1.2.3 with a x5 magnifier, if required			1.2.3
Inductance		1.2.5.2.2			$\left \frac{\Delta L_m}{L_m} \right \leq * \%$
Q factor		1.2.5.3			$\left \frac{\Delta Q_m}{Q_m} \right \leq * \%$
Insulation resistance		1.2.5.6			* MΩ minimum
Subgroup B3	D		S3	2.5 %	
Soldering: De-wetting		As in appendix B‡ * s ± * s * °C ± * °C			As in appendix B‡
Dissolution of metallization		As in appendix B‡ One immersion * s ± * s * °C ± * °C			As in appendix B‡
Visual inspection		1.2.3			1.2.3
Subgroup B8					
CTR information	1.1.11	The attributes information for the conditioning test in subgroups B1, B2 and B3 is without reference to the parameter for which rejection was made.			
* To be completed by the specification writer. ‡ Of BS 9752.					