

**Detail specification for
radio frequency
connectors
(series SMC) —
Unsealed, soldered,
captive contact 50 Ω
screw coupling —
Full assessment level**

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 29 and a back cover.

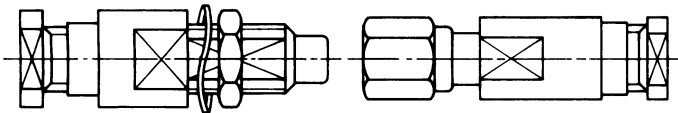
This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date of issue	Comments
3650	July 1981	Indicated by a sideline in the margin

Contents

	Page
1 Physical characteristics	2
2 Ratings (including limiting conditions of use) and characteristics	3
3 Related documents	4
4 Additional information	4
5 Marking of the connectors and packages	4
6 Ordering information	4
7 Control drawings	4
8 Inspection requirements	4
Appendix A Outline drawings	17
Appendix B Recommended piercings for metal panels printed wiring boards and overlap dimension	25
Appendix C Recommended grouping of specimens for qualification approval (Group D) testing	27

ELECTRONIC COMPONENTS OF ASSESSED QUALITY: DETAIL SPECIFICATION	
Typical outlines, styles 07-02 and 06-03  STYLE 07-02 STYLE 06-03 For other styles and dimensions see Appendix A	RADIO FREQUENCY CONNECTOR
	FULL ASSESSMENT LEVEL
	SERIES SMC UNSEALED, SOLDERED, CAPTIVE CONTACT 50 Ω (SCREW COUPLING)

1 Physical characteristics

1.1

Style reference number	Description	Mass (grams) max.	Connector variant	Cables BS 2316/ (URM No.)	Cables based on MIL-C-17 (RG No.) (for information only)
01-02	Connector coupler, free, straight, male centre contact	3.5		Matched	
02-02	Connector fixed, straight, 4-hole fixing, solder bucket, male centre contact	3.0	AB AC AE	110 95 109, 116	178B/U, 404/U 174A/U 316/0
05-02	Connector fixed, single hole front mounting, solder bucket, male centre contact	1.5			
06-03	Connector free, straight female centre contact	3.5			
07-02	Connector fixed, straight, single hole rear mounting, cable outlet, male centre contact	3.1		Unmatched	
08-03	Connector free, right angle, female centre contact	5.0	BB	111	179 B/U
10-02	Connector fixed, right angle, 4-hole fixing, solder bucket, male centre contact	8.0			
12-02	Connector fixed, right angle, single hole mounting, solder bucket, male centre contact	5.0	ZZ	Equipment wire	—
13-02	Connector fixed, straight, printed circuit board mounting, male centre contact	4.0			
14-02	Connector fixed, right angle, printed circuit board mounting, male centre contact	5.5			
18-04	Adaptor connector fixed, straight, single hole mounting, two male centre contacts	3.0			
18-05	Adaptor connector fixed, straight, single hole mounting, two female centre contacts	5.0			
26-02	Connector fixed, single hole rear mounting, solder bucket, male centre contact	1.5			
98-12	Cover protective, for connector fixed and connector coupler free	3.0			
99-12	Cover protective, for connector free	3.0			

1.2 Body finish

Gold (Au), or bright nickel alloy (Ni-).

NOTE Galvanic corrosion may occur when connectors are in contact with dissimilar metals.

1.3 Centre contact finish. Gold (Au).

2 Ratings (including limiting conditions of use) and characteristics

Nominal characteristic impedance	50 Ω		
	Matched variants		Unmatched variants
Reflection coefficient (and v.s.w.r.) max.	100 MHz to 4 GHz	Above 4 GHz to 10 GHz	Not measured
a) Straight cable outlet styles	0.17 (1.41)	0.25 (1.69)	
b) Right-angle styles and adaptors, straight			
c) Solder-bucket and p.c.b. mounting styles	0.22 (1.57)	0.33 (2.00)	
	Not measured		
Capacitance (max.) (solder-bucket styles only)	5 pF		
R.F. shunt resistance (min.) (solder-bucket styles only)	1 M Ω at 30 MHz		
^a Working voltage (d.c. or a.c. peak)	Inner conductor to shell		
a) At sea level	500 V		
b) At altitude of 20 km (44 mbar)	100 V		
^a Proof voltage (d.c. or a.c. peak)			
a) At sea level	1 500 V		
b) At altitude of 20 km (44 mbar ^b)	300 V		
Current rating (max.)	0.25 A d.c.		
Power rating ^c	—		

^a Some cables usable with these connectors have ratings lower than the values given here.

^b 1 mbar = 10^2 N/m² = 0.1 kPa.

^c As power is dependent on frequency and cable type, for information on power rating refer to the manufacturer.

	Before conditioning	After conditioning
Contact resistance, max.	5 mΩ	10 mΩ
Outer conductor continuity, max.	2 mΩ	5 mΩ
Insulation resistance, min.	5 GΩ	500 MΩ
Vibration severity		
Frequency range	10 Hz to 500 Hz	} Cross over at approximately 60 Hz
Displacement	0.75 mm	
Acceleration	98 m/s ²	
Duration	6 h	
Shock severity	490 m/s ² for 11 ms	
Bump severity	4 000 at 390 m/s ²	
Climatic category	55/155/21	
Resistance to test prod damage	Not applicable	
Impact severity (free styles only)	5 impacts at 1 m	
Engagement and separation torque	110 mN m max.	
Normal coupling torque	420–450 mN m	

3 Related documents

BS 192, *Open-ended wrenches (not including B.A. sizes).*

BS 1580, *Unified screw threads.*

BS 2011, *Basic environmental testing procedures.*

BS 2316, *Radio-frequency cables.*

BS 6000, *Guide to the use of BS 6001. Sampling procedures and tables for inspection by attributes.*

BS 6001, *Sampling procedures and tables for inspection by attributes.*

BS 9000, *General requirements for electronic components of assessed quality.*

BS 9210, *Radio frequency connectors of assessed quality: generic data and methods of test.*

4 Additional information (Not for inspection purposes)

For recommended piercings for metal panels and printed circuit boards, and overlap dimension see Appendix B.

5 Marking of the connectors and packages

The marking of the component and package shall be in accordance with **1.1.6** of BS 9210. Assembly and cable mounting instructions shall be included in every individual package of connector piece parts.

6 Ordering information

In accordance with the requirements of **1.1.15** of BS 9210, orders for connectors and their accessories covered by this specification shall contain the following information.

- a) The number of this detail specification, i.e. BS 9210 N0009.
- b) Style as in **1.1**, e.g. 01–02.
- c) Variant as in **1.1**, e.g. AB.
- d) Climatic category, i.e. 55/155/21.
- e) Body finish, e.g. gold (Au).
- f) Coupling nut. If non-preferred knurled type required add/k.
- g) Any additional information, e.g. fixing hole details, any special marking, or packaging requirements.

Example. BS 9210 N0009/01-02/AB/55/155/21/Au.

7 Control drawings

Control drawings BS 9210 N0009-2, are available from BSI.

NOTE Normally required by manufacturers and inspectorates only.

8 Inspection requirements

8.1 Unless otherwise stated in the table of tests the provisions of **8.2**, **8.3** and **8.4** of this specification shall apply.

8.2 Contact resistance and outer conductor continuity for each mated pair shall be measured using the “light current” method specified in **1.2.4.3.3 1)** of BS 9210. When testing the outer conductor continuity of panel mounted styles, where the connector shell is electrically connected to a mounting plate (see **1.2.1.1** of BS 9210), the continuity test shall include a measurement between cable braid(s) and the mounting plate. The initial contact resistances for each mated pair of contacts and for any outer conductor path shall not exceed 5 mΩ and 2 mΩ respectively. Resistances after conditioning shall not exceed 10 mΩ and 5 mΩ respectively.

8.3 Insulation resistance measurements between inner conductor and shell shall be made at 500 ± 50 V d.c.

8.4 Voltage proof measurements (at sea level) shall be made at $1\,500 \pm 100$ V d.c. or a.c. peak (40 Hz to 60 Hz). There shall be no breakdown or flashover.

8.5 For tests in subgroups C3, C5, D3(iii), and D3(v), involving exposure to the upper temperature category, it is essential that cable having a compatible temperature capability shall be used.

8.6 Due to the nature of the accessories referred to in note 1 of this specification, certain tests are not possible, e.g. contact resistance tests are not applicable to protective cover styles 98-12 and 99-12 either before or after conditioning.

8.7 Samples subjected to tests which are marked as “(D)” shall not be accepted for release under BS 9000 (see **2.6.5** of BS 9000-1).

NOTES See end of table.

8.8 The tests or measurements prescribed in BS 9210 after environmental conditioning are omitted between the environmental conditionings where these form part of a sequence in accordance with **1.2.6** of BS 9210. The appropriate tests are included at the end of each test sequence.

Inspection	BS 9210:1971 reference and conditions of test		Performance requirements
GROUP A	To be applied on a sampling basis lot-by-lot. Subgroups A0, A2, A3 and A4 are not applicable		
<u>Subgroup A1</u>	<u>Inspection level S-3, AQL 1.5 %</u> (See note 1 of this specification)		
Visual examination	1.2.2 2)	Either on assembled components or on contents of packages	As in 1.2.2 2) of BS 9210
<u>Subgroup A5</u>			
CTR information	1.1.11	Attributes information for subgroup A1	
GROUP B	To be applied on a sampling basis lot-by-lot. Subgroups B3, B5, B6 and B7 are not applicable. (The specimens used for subgroups B1 and B2 may also be used for subgroup B4.) Connectors shall be assembled in accordance with the instructions supplied by the manufacturer		
<u>Subgroup B1</u>	<u>Inspection level S-3, AQL 1.5 %</u>		
Compatibility-mechanical (assurance)	1.2.5.9 2)	See note 1 of this specification	As in 1.2.5.9 2) of BS 9210
<u>Subgroup B2</u> (D)	<u>Inspection level S-3, AQL 4 %</u>		
Soldering	1.2.6.1	Soldering iron method Bit size 3 mm Iron size (b) Centre contact for all styles; also mounting spills for styles 13-02 and 14-02	There shall be no damage or loosening of parts
Insulation resistance	1.2.4.6	As in 8.3 of this specification	≥ 5 GΩ
NOTES See end of table.			

Inspection	BS 9210:1971 reference and conditions of test		Performance requirements
<u>Sub group B2</u> (D) (Continued) Voltage proof	1.2.4.7	As in 8.4 of this specification	As in 8.4 of this specification
<u>Subgroup B4</u> (D) Engagement and separation Gauge retention force	1.2.5.5 1.2.5.2	<u>Inspection level S-3, AQL 4 %</u> See note 1 of this specification See control drawings BS 9210 N0009-2 for details of gauges	As in clause 2 of this specification As in 1.2.5.2 of BS 9210
<u>Subgroup B8</u> CTR information	1.1.11	Attributes information for subgroups B1, B2, and B4	
GROUP C		Applied at three-monthly intervals except when group D tests are due. In addition the issue number of the manufacturer's drawing list shall be checked against that in the qualification approval application or certificate. Specimens used for subgroup C1 may also be used for subgroups C3 and C5. Subgroups C2 and C4 are not applicable	
Subgroup C1 Outline dimensions and mass	1.2.3.1	<u>Inspection level S-3, AQL 1 %</u> See note 1 of this specification	As in 1.1 and Appendix A both of this specification
<u>Subgroup C3</u> (D) Test prod damage Rapid change of temperature followed by Damp heat, steady state	 1.2.5.7 1.2.6.9 1.2.6.8	<u>Inspection level S-3, AQL 4 %</u> 8.5, 8.8, notes 1 and 2 of this specification apply to tests in this subgroup. Connectors shall be assembled as for group B. Normal coupling torque as in clause 2 of this specification Test not to be applied – 55 °C and + 155 °C Severity 40 ± 2 °C for 4 days. Polarizing voltage 60 ± 5 V d.c. Inner conductor to be positive. Working voltage 500 ± 50 V d.c. or a.c. peak	As in 1.2.6.8 of BS 9210. There shall be no breakdown or flashover
NOTES See end of table.			

Inspection	BS 9210:1971 reference and conditions of test		Performance requirements
<u>Final measurements</u>			
Contact resistance	1.2.4.3	As in 8.2 of this specification (mated connectors not separated). Not applicable to styles referred to in note 1 of this specification	As in 8.2 of this specification
Outer conductor continuity	1.2.4.4	As in 8.2 of this specification (mated connectors not separated). Not applicable to styles referred to in note 1 of this specification	As in 8.2 of this specification
Insulation resistance	1.2.4.6	As in 8.3 of this specification. Not applicable to styles referred to in note 1 of this specification	≥ 500 MΩ
Voltage proof	1.2.4.7	As in 8.4 of this specification. Not applicable to styles referred to in note 1 of this specification	As in 8.4 of this specification
Visual inspection	1.2.2		As in 1.2.2 of BS 9210
Engagement and separation	1.2.5.5		Torque as in clause 2 of this specification
<u>Subgroup C5</u> (D)		<u>Inspection level S-3, AQL 4 %</u> 8.5, 8.8, notes 1 and 2 of this specification apply to tests in this subgroup. Connectors shall be assembled as for group B. Normal coupling torque as in clause 2 of this specification	
Mechanical endurance	1.2.7.1	50 operations at not more than 15 per min. Normal coupling torque applies	
<u>followed by</u>			
High temperature endurance	1.2.7.2	Severity 155 ± 5 °C for 250 h with no electrical load	
<u>Final measurements</u>			
Insulation resistance	1.2.4.6	As in 8.3 of this specification. Not applicable to styles referred to in note 1 of this specification	≥ 500 MΩ
Contact resistance	1.2.4.3	As in 8.2 of this specification. Not applicable to styles referred to in note 1 of this specification	As in 8.2 of this specification
NOTES See end of table.			