

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD



Radio-frequency connectors –
Part 44: Sectional specification for series SMP push-on radio-frequency coaxial
connectors



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2010 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD



**Radio-frequency connectors –
Part 44: Sectional specification for series SMP push-on radio-frequency coaxial
connectors**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE



ICS 33.120.30

ISBN 978-2-88910-804-6

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Mating face and gauge information.....	6
3.1 Dimensions – General connectors – Grade 1.....	7
3.1.1 Connector with pin-centre contact.....	7
3.1.2 Connector with socket-centre contact	10
3.2 Gauges	11
3.2.1 Gauge pin for socket-centre contact	11
3.2.2 Gauge for outer contact of connector with socket-centre contact	12
3.3 Dimensions- standard test connectors – Grade 0	15
3.3.1 Connector with pin-centre contact.....	15
3.3.2 Connector with socket-centre contact	17
4 Quality assessment procedure.....	18
4.1 General.....	18
4.2 Rating and characteristics (see Clause 6 of IEC 61169-1).....	18
4.3 Test schedule and inspection requirements	22
4.3.1 Acceptance tests	22
4.3.2 Periodic tests	23
4.4 Procedures.....	24
4.4.1 Quality conformance inspection	24
4.4.2 Qualification approval and its maintenance.....	24
5 Instructions for preparation of detail specifications	25
5.1 General.....	25
5.2 Identification of the detail specification	25
5.3 Identification of the component.....	25
5.4 Performance.....	26
5.5 Marking, ordering information and related matters	26
5.6 Selection of tests, test conditions and severities.....	26
5.7 Blank detail specification pro forma for series RBMA connectors.....	27
Figure 1 – Connector with pin-centre contact limited detent and full detent (for dimensions and notes, see Table 1).....	7
Figure 2 – Connector with pin-centre contact – Smooth bore (for dimensions and notes, see Table 2).....	8
Figure 3 – Connector with pin- centre contact – Catchers mit (for dimensions and notes, see Table 3).....	9
Figure 4 – Connector with socket-centre contact (for dimensions and notes, see Table 4).....	10
Figure 5 – Gauge pin for socket-centre contact (for dimensions and notes, see Table 5).....	11
Figure 6 – Gauge with limited detent for outer contact of connector with socket-outer contact (for dimensions and notes, see Table 6).....	12
Figure 7 – Gauge pin – Full detent for outer contact of connector with socket-centre (for dimensions and notes, see Table 7)	13

Figure 8 – Gauge pin – Smooth bore for outer contact of connector with socket-centre (for dimensions and notes, see Table 8)	14
Figure 9 – Connector with pin-centre contact – Limited detent and full detent (for dimensions and notes, see Table 9)	15
Figure 10 – Connector with pin – centre contact – Smooth bore (for dimensions and notes, see Table 10)	16
Figure 11 – Connector with socket-centre contact (for dimensions and notes, see Table 11)	17
Table 1 – Dimensions of connector with pin-centre contact limited detent and full detent	7
Table 2 – Dimensions of connector with pin-centre contact – Smooth bore	8
Table 3 – Dimensions of connector with pin-centre contact – Catchers mit	9
Table 4 – Dimensions of connector with socket-centre contact	10
Table 5 – Dimensions of gauge pin for socket-centre contact	11
Table 6 – Gauge with limited detent for outer contact of connector with socket-outer contact	12
Table 7 – Gauge pin – Full detent for outer contact of connector with socket-centre	13
Table 8 – Gauge pin – Smooth bore for outer contact of connector with socket-centre	14
Table 9 – Dimensions of connector with pin-centre contact – Limited detent and full detent	16
Table 10 – Dimensions of connector with pin-centre contact – Smooth bore	17
Table 11 – Dimensions of connector with socket-centre contact	18
Table 12 – Rating and characteristics	19
Table 13 – Acceptance tests	22
Table 14 – Periodic tests	23

INTERNATIONAL ELECTROTECHNICAL COMMISSION

RADIO-FREQUENCY CONNECTORS –

Part 44: Sectional specification for series SMP push-on radio-frequency coaxial connectors

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public.

IEC-PAS 61169-44 has been processed by subcommittee 46F: RF and microwave passive components, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
46F/153/PAS	46F/159/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single 3-year period, following which it shall be revised to become another type of normative document, or shall be withdrawn.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61169 series, under the general title: *Radio-frequency connectors*, can be found on the IEC website.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

IECNORM.COM: Click to view the full PDF of IEC PAS 61169-44:2010

Withdrawn

RADIO-FREQUENCY CONNECTORS –

Part 44: Sectional specification for series SMP push-on radio-frequency coaxial connectors

1 Scope

Series SMP push-on connectors have a characteristic impedance of 50 Ω and are used with RF cables or micro-strips in microwave, telecommunication, wireless and other fields. The connectors are usable up to a frequency of 40 GHz.

This PAS provides information and rules for preparation of detail specification of SMP series push-on RF coaxial connectors together with the pro forma blank detail specification.

It also prescribes mating face dimensions for general purpose connectors – grade 1, dimensional details of standard test connectors-grade 0, gauging information and tests selected from IEC 61169-1 applicable to all detail specifications relating to series SMP RF connectors.

This PAS indicates the recommended performance characteristics to be considered when writing a detail specification and it covers test schedules and inspection requirements for assessment levels M and H.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61169-1:1992, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*¹⁾

Amendment 1 (1996)

Amendment 2 (1997)

3 Mating face and gauge information

Metric dimensions are original dimensions.

All undimensioned pictorial configurations are for reference purpose only.

¹⁾ There exists a consolidated edition 1.2 (1998) that comprises IEC 61169-1:1992, its Amendment 1:1996 and its Amendment 2:1997.

3.1 Dimensions – General connectors – Grade 1

3.1.1 Connector with pin-centre contact

3.1.1.1 Connector with pin-centre contact limited detent and full detent

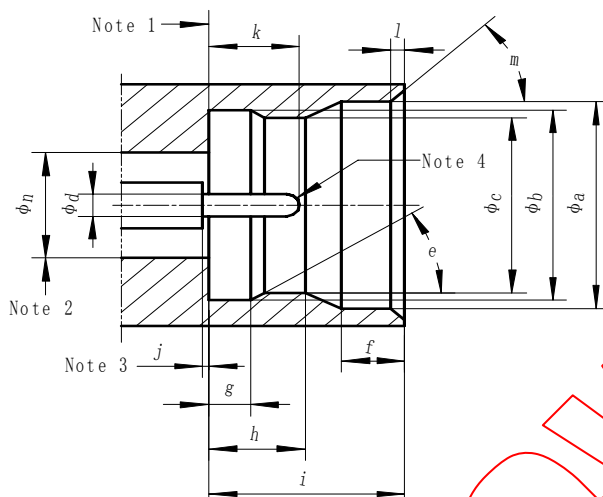


Figure 1 – Connector with pin-centre contact limited detent and full detent (for dimensions and notes, see Table 1)

Table 1 – Dimensions of connector with pin-centre contact limited detent and full detent

Ref.	mm		Notes
	Min.	Max.	
a	3,53	3,68	
b	3,13	3,23	
c	3,00	3,10	Limited detent
	2,90	3,00	Full detent
d	0,38	0,41	
e	30° REF,		Angle
f	0,84	0,94	
g	0,52	0,60	
h	1,37	1,52	Limited detent
	1,30	1,45	Full detent
i	2,74	2,84	
j	0,00	—	
k	1,14	1,40	
l	0,08	0,20	
m	40°	50°	Angle
n	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 The diameter chosen must meet the nominal impedance of 50 Ω and electrical and mechanical requirements.

NOTE 3 To meet electrical requirement.

NOTE 4 Spherical or chamfered.

3.1.1.2 Connector with pin-centre contact – Smooth bore

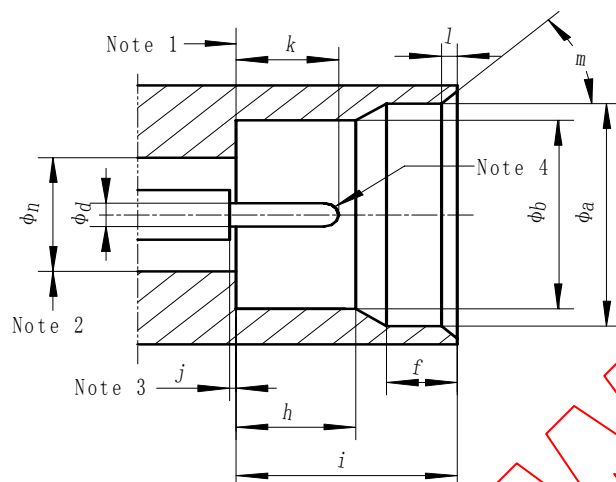


Figure 2 – Connector with pin-centre contact – Smooth bore (for dimensions and notes, see Table 2)

Table 2 – Dimensions of connector with pin-centre contact – Smooth bore

Ref.	mm		Notes
	Min.	Max.	
a	3,53	3,68	
b	3,13	3,23	
d	0,38	0,41	
f	0,84	0,94	
h	1,50	1,65	
i	2,74	2,84	
j	0,00	—	
k	1,14	1,40	
l	0,08	0,20	
m	40°	50°	Angle
n	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 The diameter chosen must meet the nominal impedance of 50 Ω and electrical and mechanical requirements.

NOTE 3 To meet electrical requirement.

NOTE 4 Spherical or chamfered.

3.1.1.3 Connector with pin-centre contact – Catchers mit

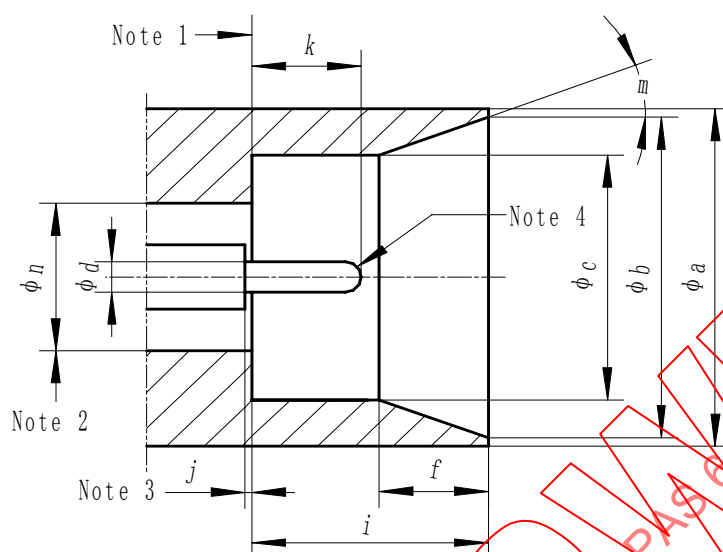


Figure 3 – Connector with pin- centre contact – Catchers mit (for dimensions and notes, see Table 3)

Table 3 – Dimensions of connector with pin-centre contact – Catchers mit

Ref.	mm		Notes
	Min.	Max.	
a	5,94	—	
b	—	5,59	
c	3,13	3,23	
d	0,38	0,41	
f	1,09	1,19	
i	2,74	2,84	
j	0,00	—	
k	1,14	1,40	
m	45 ° REF.		Angle
n	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 The diameter chosen must meet the nominal impedance of 50 Ω and electrical and mechanical requirements.

NOTE 3 To meet electrical requirement.

NOTE 3 Spherical or chamfered.

3.1.2 Connector with socket-centre contact

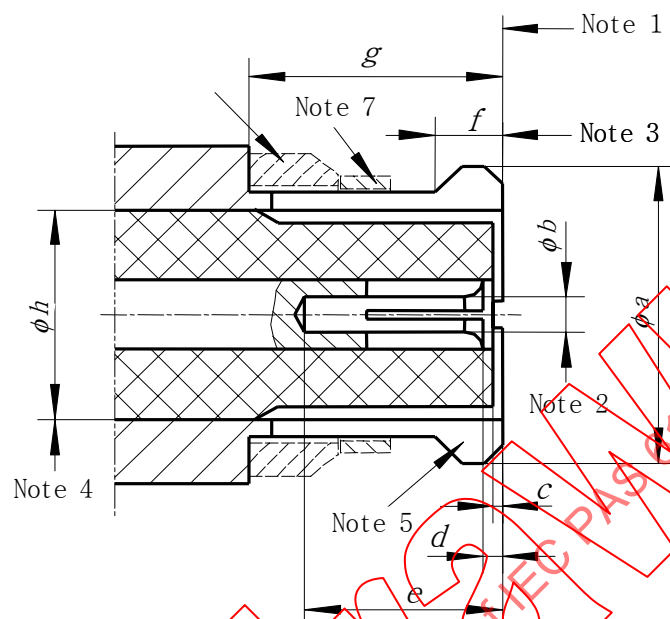


Figure 4 – Connector with socket-centre contact
(for dimensions and notes, see Table 4)

Table 4 – Dimensions of connector with socket-centre contact

Ref.	p		Notes
	Min.	Max.	
a	—	3,43	
b	—	—	
c	0,00	0,20	
d	0,00	0,20	
e	1,78	—	
f	0,46	0,64	uncabled
	0,64	0,89	cabled
g	2,84	—	
h	—	—	

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 The diameter should comply with required VSWR, mating feature and durability when mated with a $\Phi 0,38 \sim \Phi 0,41$ diameter.

NOTE 3 The form and dimensions of outer conductor to meet mechanical and electrical requirements.

NOTE 4 Diameter is chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of 50 Ω .

NOTE 5 The number and dimension of slots must meet mechanical and electrical requirements.

NOTE 6 Anti-rock ring is optional.

NOTE 7 EMI shield is optional.

3.2 Gauges

3.2.1 Gauge pin for socket-centre contact

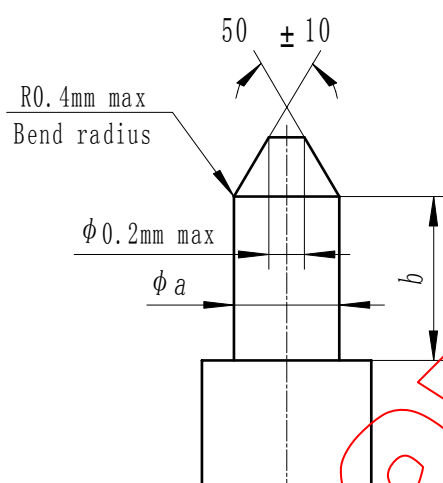


Figure 5 – Gauge pin for socket-centre contact
(for dimensions and notes, see Table 5)

Table 5 – Dimensions of gauge pin for socket-centre contact

Ref.	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor)	
			Mass of gauge: (28±2) g	
	mm		mm	
	Min.	Max.	Min.	Max.
a	0,410	0,415	0,375	0,380
b	1,00	1,14	1,00	1,14
Material: steel polished.				
Surface roughness: $R_a \leq 0,4 \mu\text{m}$, on the cylindrical surface of length b.				

3.2.1.1 Test procedure

The gauge A shall be inserted into the socket-centre contact three times with a minimum depth of 1,00 mm. This is a sizing operation and should only be carried out when the socket-centre contact is removed from the connector.

After this, the gauge B shall be inserted into socket-centre contact. The contact shall retain the mass of the gauge in a vertical downward position. The test should also be carried out on connector when the socket-centre contact is not removed.

3.2.1.2 Additional test

At the conclusion of the tests and if prescribed in the DS, the force necessary to insert gauge A shall be measured. When the additional test is required, the force required shall not exceed 7,0 N.

3.2.2 Gauge for outer contact of connector with socket-centre contact

3.2.2.1 Gauge with limited detent for outer contact of connector with socket-centre contact

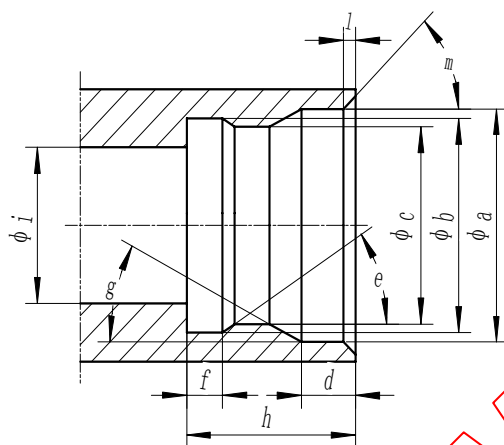


Figure 6 – Gauge with limited detent for outer contact of connector with socket-outer contact (for dimensions and notes, see Table 6)

Table 6 – Gauge with limited detent for outer contact of connector with socket-outer contact

Ref.	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge : (900+20) g		Notes
	mm		mm		
	Min.	Max.	Min.	Max.	
a	3,53	3,68	3,53	3,68	
b	3,13	3,23	3,13	3,23	
c	3,00	3,02	3,08	3,10	Note 1
d	0,84	0,94	0,84	0,94	
e	28°	32°	28°	32°	Note 2
f	0,52	0,60	0,52	0,60	
g	33°	37°	33°	37°	Note 3
h	2,74	2,84	2,74	2,84	
i	—	2,40	—	2,40	
l	0,08	0,20	0,08	0,20	
m	40°	50°	40°	50°	
Material: steel, polished.					
NOTE 1 Surface roughness: Ra ≤ 0,4 μm, on the cylindrical surface of length c.					
NOTE 2 Surface roughness: Ra ≤ 0,4 μm, on the slope surface of angle e.					
NOTE 3 Surface roughness: Ra ≤ 0,4 μm, on the slope surface of angle g.					

3.2.2.1.1 Test procedure

The outer contact shall insert into the gauge A once. This is a sizing operation. After this, the outer contact shall insert into the gauge B. The outer contact shall retain the gauge in a vertical downward direction.

3.2.2.1.2 Additional test

After the sizing and if prescribed in the DS, the force required to insert gauge A shall be measured. This force shall not exceed 45 N.

3.2.2.2 Gauge pin – Full detent for outer contact of connector with socket-centre

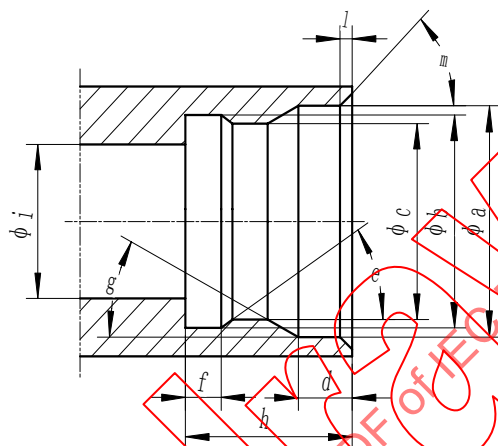


Figure 7 – Gauge pin – Full detent for outer contact of connector with socket-centre
(for dimensions and notes, see Table 7)

Table 7 – Gauge pin – Full detent for outer contact of connector with socket-centre

Ref.	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge: (900+20) g		Notes
	mm		mm		
	Min.	Max.	Min.	Max.	
a	3,53	3,68	3,53	3,68	
b	3,13	3,23	3,13	3,23	
c	2,90	2,92	2,98	3,00	Note 1
d	0,84	0,94	0,84	0,94	
e	28°	32°	28°	32°	Note 2
f	0,52	0,60	0,52	0,60	
g	33°	37°	33°	37°	Note 3
h	2,74	2,84	2,74	2,84	
i	—	2,40	—	2,40	
l	0,08	0,20	0,08	0,20	
m	40°	50°	40°	50°	
Material: steel, polished.					
NOTE 1 Surface roughness: Ra ≤0,4 μm, on the cylindrical surface of length c.					
NOTE 2 Surface roughness: Ra ≤0,4 μm, on the slope surface of angle e.					
NOTE 3 Surface roughness: Ra ≤0,4 μm, on the slope surface of angle g.					

3.2.2.2.1 Test procedure

The outer contact shall insert into the gauge A once. This is a sizing operation. After this, the outer contact shall insert into the gauge B. The outer contact shall retain the gauge in a vertical downward direction.

3.2.2.2.2 Additional test

After the sizing and if prescribed in the DS, the force required to insert gauge A shall be measured. This force shall not exceed 45 N.

3.2.2.3 Gauge pin – Smooth bore for outer contact of connector with socket-centre

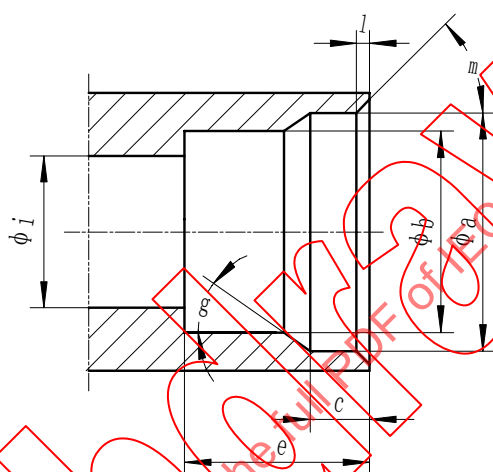


Figure 8 – Gauge pin – Smooth bore for outer contact of connector with socket-centre (for dimensions and notes, see Table 8)

Table 8 – Gauge pin – Smooth bore for outer contact of connector with socket-centre

Ref.	Gauge A (for sizing purposes)		Gauge B (for measurement of retention force for inner conductor) Mass of gauge: (900+20) g		Notes
	mm		mm		
	Min.	Max.	Min.	Max.	
<i>a</i>	3,53	3,68	3,53	3,68	
<i>b</i>	3,13	3,15	3,21	3,23	Note 1
<i>c</i>	0,84	0,94	0,84	0,94	
<i>e</i>	2,74	2,84	2,74	2,84	
<i>g</i>	33°	37°	33°	37°	Note 2
<i>i</i>	—	2,40	—	2,40	
<i>l</i>	0,08	0,20	0,08	0,20	
<i>m</i>	40°	50°	40°	50°	
Material: steel, polished.					
NOTE 1 Surface roughness: Ra ≤0,4 μm, on the cylindrical surface of length <i>c</i> .					
NOTE 2 Surface roughness: Ra ≤0,4 μm, on the slope surface of angle <i>g</i> .					

3.2.2.3.1 Test procedure

The outer contact shall insert into the gauge A once. This is a sizing operation.

After this, the outer contact shall insert into the gauge B. The outer contact shall retain the gauge in a vertical downward direction.

3.2.2.3.2 Additional test

After the sizing and if prescribed in the DS, the force required to insert the gauge A shall be measured. This force shall not exceed 45 N.

3.3 Dimensions- standard test connectors – Grade 0

3.3.1 Connector with pin-centre contact

3.3.1.1 Connector with pin-centre contact – Limited detent and full detent

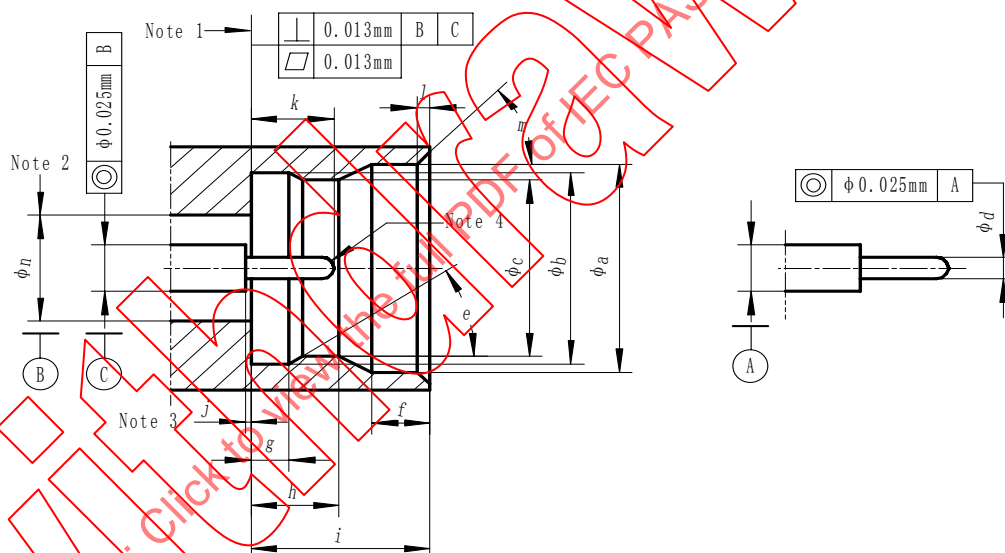


Figure 9 – Connector with pin-centre contact – Limited detent and full detent
(for dimensions and notes, see Table 9)

Table 9 – Dimensions of connector with pin-centre contact – Limited detent and full detent

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	3,53	3,68	
<i>b</i>	3,13	3,23	
<i>c</i>	3,00	3,10	Limited detent
	2,90	3,00	Full detent
<i>d</i>	0,36	0,41	
<i>e</i>	30° REF.		Angle
<i>f</i>	0,84	0,94	
<i>g</i>	0,52	0,60	
<i>h</i>	1,37	1,52	Limited detent
	1,30	1,45	Full detent
<i>i</i>	2,74	2,84	
<i>j</i>	0,00	—	
<i>k</i>	1,14	1,40	
<i>l</i>	0,08	0,20	
<i>m</i>	40°	50°	Angle
<i>n</i>	—	—	

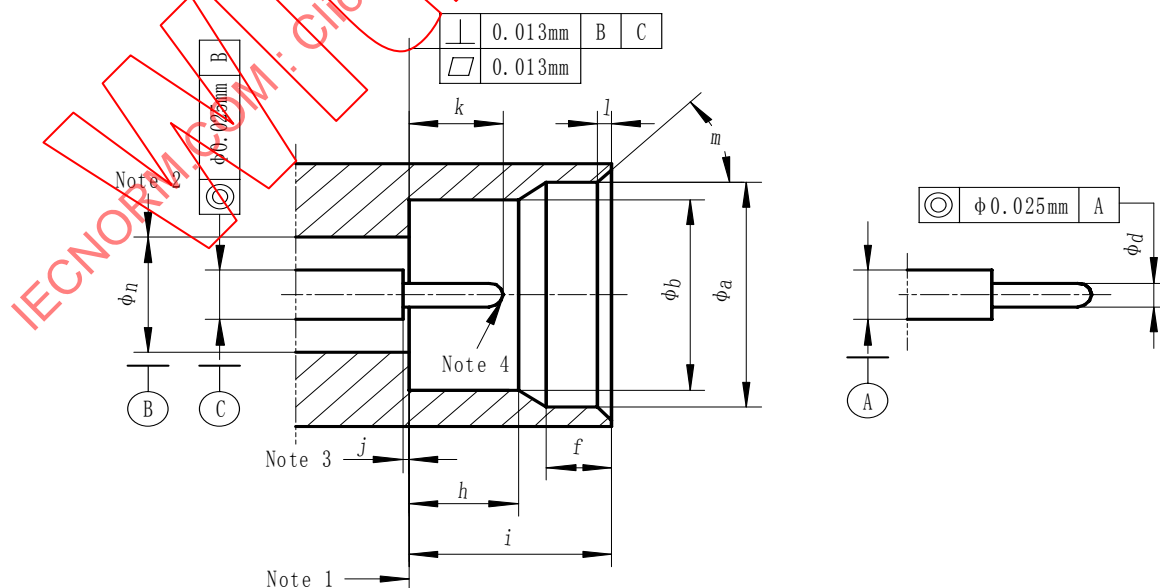
NOTE 1 Mechanical and electrical reference plane.

NOTE 2 Diameter is chosen to obtain a characteristic impedance of $(50 \pm 0,5) \Omega$.

NOTE 3 To meet electrical requirement.

NOTE 4 Spherical or chamfered.

3.3.1.2 Connector with pin-centre contact – Smooth bore



**Figure 10 – Connector with pin – centre contact – Smooth bore
(for dimensions and notes, see Table 10)**

Table 10 – Dimensions of connector with pin-centre contact – Smooth bore

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	5,94	6,10	
<i>b</i>	5,33	5,59	
<i>c</i>	3,13	3,23	
<i>d</i>	0,36	0,41	
<i>f</i>	1,09	1,19	
<i>i</i>	2,74	2,84	
<i>j</i>	0,00	—	
<i>k</i>	1,14	1,40	
<i>m</i>	45° REF.		Angle
<i>n</i>	—		

NOTE 1 Mechanical and electrical reference plane.
 NOTE 2 Diameter is chosen to obtain a characteristic impedance of $(50 \pm 0,5) \Omega$.
 NOTE 3 To meet electrical requirement.
 NOTE 4 Spherical or chamfered.

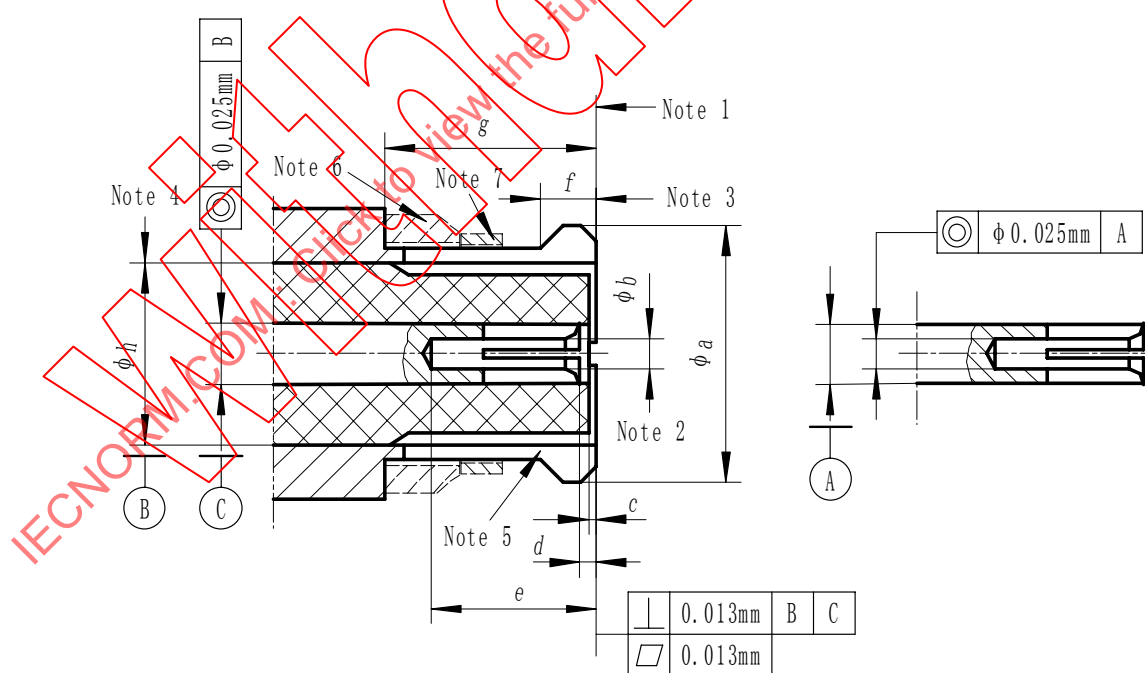
3.3.2 Connector with socket-centre contact**Figure 11 – Connector with socket-centre contact
(for dimensions and notes, see Table 11)**

Table 11 – Dimensions of connector with socket-centre contact

Ref.	mm		Notes
	Min.	Max.	
<i>a</i>	—	3,43	
<i>b</i>	—	—	
<i>c</i>	0,00	0,20	
<i>d</i>	0,00	0,20	
<i>e</i>	1,78	—	
<i>f</i>	0,46	0,64	
<i>g</i>	2,84	—	
<i>h</i>	—	—	
NOTE 1 Mechanical and electrical reference plane.			
NOTE 2 The diameter should comply with required VSWR, mating feature and durability when mated with a $\Phi 0,38 \sim \Phi 0,41$ diameter.			
NOTE 3 The form and dimensions of outer conductor to meet mechanical and electrical requirements.			
NOTE 3 Diameter is chosen to obtain a characteristic impedance of $(50 \pm 0,5) \Omega$.			
NOTE 5 The number and dimension of slots must meet mechanical and electrical requirements.			
NOTE 6 Anti-rock ring is optional.			
NOTE 7 EMI shield is optional.			

4 Quality assessment procedure

4.1 General

The following subclauses provide recommended rating, performance and test conditions to be considered when writing a detail specification. They also provide an appropriate schedule of tests with minimum levels of conformance inspection sampling, together with the pro forma blank detail specification (BDS) and instructions for the preparation of a detail specification.

4.2 Rating and characteristics (see Clause 6 of IEC 61169-1)

The values indicated below are recommended for SMP series RF coaxial connectors and are given for the writer of the detail specification. They are applicable for the condition when the connectors are fully mated.

Certain tests are listed without any recommended values being given. These tests will usually not be required. When these tests are required, appropriate values shall be entered in the detail specification at the discretion of the specification writer.

Table 12 – Rating and characteristics

Rating and characteristics	Test method IEC 61169-1 Subclause	Value	Remarks, deviations from standard test method
Electrical			
Nominal impedance		50 Ω	
Frequency range Grade1 connectors – straight styles – right-angle styles – solder bucket and PCB mounting styles		Up to 40,0 GHz Up to 26,5 GHz Up to 12,0 GHz	On upper frequency limit of cable
Reflection factor ¹⁾ Grade 1connectors – straight styles – right-angle styles – component mounting styles – solder bucket and PCB mounting styles	9.2.1	0,05 GHz to 12 GHz 0,07 max. 12 GHz to 26,5 GHz 0,15 max. 26,5 GHz to 40,0 GHz 0,23 max. See DS See DS See DS	
Centre contact resistance ²⁾ – initial – after conditioning	9.2.3	$\leq 6,0 \text{ m}\Omega$ $\leq 15,0 \text{ m}\Omega$	
Outer conductor continuity ²⁾ – initial – after conditioning	9.2.3	$\leq 3,0 \text{ m}\Omega$ $\leq 9,0 \text{ m}\Omega$	
Insulation resistance ²⁾ – initial – after conditioning	9.2.5	$\geq 5\,000 \text{ M}\Omega$ $\geq 200 \text{ M}\Omega$	
Proof voltage at sea-level ³⁾⁴⁾ – uncabled styles – 96IEC50-3 cable – 96IEC50-2 cable – 96IEC50-1 cable – semi-rigid and semi-flexible 0,141 in (3,58 mm) diameter – semi-rigid and semi-flexible 0,086 in (2,16 mm) diameter – semi-rigid and semi-flexible 0,047 in (1,19 mm) diameter	9.2.6	500 V 500 V 350 V 350 V 500 V 350 V 260 V	
Proof voltage at 4,4 kPa ³⁾⁴⁾ – uncabled styles – 96IEC50-3 cable – 96IEC50-2 cable	9.2.6	170 V 170 V 100 V	4,4 kPa approximately equivalent to 20 km

Rating and characteristics	Test method IEC 61169-1 Subclause	Value	Remarks, deviations from standard test method
– 96IEC50-1 cable – semi-rigid and semi-flexible 0,141 in (3,58 mm) diameter – semi-rigid and semi-flexible 0,086 in (2,16 mm) diameter – semi-rigid and semi-flexible 0,047 in (1,19 mm) diameter		100 V 170 V 100 V 80 V	
Environmental test voltage at sea-level ³⁾⁴⁾ – uncabled styles – 96IEC50-3 cable – 96IEC50-2 cable – 96IEC50-1 cable – semi-rigid and semi-flexible 0,141 in (3,58 mm) diameter – semi-rigid and semi-flexible 0,086 in (2,16 mm) diameter – semi-rigid and semi-flexible 0,047 in (1,19 mm) diameter	9.2.6	170 V 170 V 100 V 100 V 170 V 100 V 80 V	
Environmental test voltage at 4,4 kPa ³⁾⁴⁾ – uncabled styles – 96IEC50-3 cable – 96IEC50-2 cable – 96IEC50-1 cable – semi-rigid and semi-flexible 0,141 in (3,58 mm) diameter – semi-rigid and semi-flexible 0,086 in (2,16 mm) diameter – semi-rigid and semi-flexible 0,047 in (1,19 mm) diameter	9.2.6	85 V 85 V 65 V 45 V 85 V 65 V 50 V	4,4 kPa approximately equivalent to 20 km
Screening effectiveness (straight cables only) ⁸⁾	9.2.8	≥ 70 dB at 1 GHz	
Discharge test (corona effect)	9.2.9	See DS	Extinction voltage
Mechanical			
Gauge retention force (resilient contacts) – centre – outer – Smooth bore/Limited detent/Full detent	9.3.4	≥ 0,28 N ≥ 2,2 N/9 N/22 N	
Centre contact captivation – axial force – torque	9.3.5	≥ 7 N See DS	Interface dimensions shall remain as specified.

Rating and characteristics	Test method IEC 61169-1 Subclause	Value	Remarks, deviations from standard test method
Engagement and separation force and torques – engagement force – Smooth bore/Limited detent/Full detent – separation force – Smooth bore/Limited detent/Full detent	9.3.6	$\leq 9 \text{ N}/45 \text{ N}/68 \text{ N}$ $\geq 2,2 \text{ N}/9 \text{ N}/22 \text{ N}$	
Technical tests on cable fixing – cable rotation (nutation) – cable pulling – cable bending – cable torsion	9.3.7.2 9.3.8 9.3.9 9.3.10	See DS See DS See DS See DS	
Tensile strength of coupling mechanism	9.3.11	na ⁷⁾	
Bending moment	9.3.12	na ⁷⁾	
Vibration ⁵⁾	9.3.3	150 m/s ² (10 ~ 2 000) Hz	15 g _n
Shock ⁵⁾	9.3.14	500 m/s ² 1/2 sine wave 11 ms	50 g _n
Environmental			
Climatic category ⁶⁾		55/125/21	
Sealing non-hermetic	9.4.5.1	na ⁷⁾	
Hermetic	9.4.5.2	$\leq 1 \text{ Pa} \cdot \text{cm}^3/\text{s}$	100 kPa to 110 kPa differential
Salt mist	9.4.6	48 h spray	
Endurance			
Mechanical endurance – Smooth bore/Limited detent/Full detent	9.5	1 000/500/100 operations	
High temperature endurance ⁶⁾	9.6	250 h at 125 °C	
¹⁾ These values apply to basic connector. In practice, these may be influenced by the cable used and reference should always be made to the actual values given in the detail specification. ²⁾ Values for a single pair of connectors. ³⁾ Voltages are r.m.s. values of AC at 40 Hz to 65 Hz, unless otherwise specified. ⁴⁾ Some cables usable with these connectors have ratings lower than the values given here. ⁵⁾ Not applicable for pin-centre contact (smooth bore) connected with cables. ⁶⁾ For certain connectors, the upper temperature limit is restricted by the cable characteristics. Reference should be made to the relevant cable specification. When semi-rigid and semi-flexible cables are used, the upper temperature is limited to 115 °C maximum. ⁷⁾ na = not applicable ⁸⁾ When interfaces are fully mated.			

4.3.1 Acceptance tests

Table 13 – Acceptance tests

	Test method IEC61169-1 Subclause	Assessment level M (higher)				Assessment level H (lower)			
		Test required	IL	AQL %	Period	Test required	IL	AQL %	Period
Group A1					Lot				Lot
Visual examination	9.1.2	a	II	1,0		a	S3	1,5	
Group B2									
Outline dimensions	9.1.3.1	a	S4	0,40		a	S3	0,40	
Mechanical compatibility	9.1.3.3	a	II	1,0		a	S3	1,5	
Engagement and separation	9.3.6	a	S4	0,40		a	S3	1,5	
Gauge retention (resilient contacts)	9.3.4	ia	II	1,0		ia	S3	1,5	
Sealing, non-hermetic	9.4.5.1	ia	II	0,65		ia	S3	1,0	
Sealing, hermetic	9.4.5.2	ia	II	0,015		ia	S3	0,025	
Voltage proof	9.2.6	a	II	0,40	a	II	4,0		
Solderability piece-parts ^{d)}	9.3.2.1.1	ia	S4	0,40	ia	S3	4,0		
Insulation resistance	9.2.5	a	S4	0,40	a	S3	4,0		

ABBREVIATIONS:
a applicable
ia test required (if technically applicable)
IL inspection level
AQL acceptable quality level
^{d)} destructive test -specimens shall not be returned to stock

4.3.2 Periodic tests

There are no group C tests for levels H and M.

Table 14 – Periodic tests

	Test method IEC61169-1 Subclause	Assessment level M(higher)				Assessment level H(lower)			
		Test required	Number of specimens	Permit- ted failures per group	Period	Test requi- red	Number of speci- mens	Permitted failures per group	Period
Group D1 ^{d)}			6	0	3 years		3	0	3 years
Solderability – connector assemblies	9.3.2.1.1	ia				ia			
Resistance to soldering heat	9.3.2.1.2	ia				ia			
Mechanical tests on cable fixing						ia			
– cable rotation (rotation)	9.3.7.2	ia							
– cable pulling	9.3.8	ia				ia			
– cable bending	9.3.9	ia							
– cable torsion	9.3.10	ia							
Bending moment	9.3.12	ia				ia			
Strength of coupling mechanism	9.3.11	ia				ia			
Group D2 ^{d)}			6	0	3 years		3	0	3 years
Contact resistance, Outer conductor and screen continuity, Centre conductor continuity	9.2.3	a				a			
Bump	9.3.13	a ³⁾							
Vibration	9.3.3	a							
Shock	9.3.14	a							
Salt mist	9.4.6	a							
Group D3			¹⁾	0	3 years		¹⁾	0	3 years
Dimensions piece part and materials	9.1.3	a				a			
Group D4 ^{d)}			6	0	3 years		3	0	3 years
Mechanical endurance	9.5	a				a			
High temperature endurance	9.6	a							

	Test method IEC61169-1 Subclause	Assessment level M(higher)				Assessment level H(lower)			
		Test required	Number of specimens	Permit- ted failures per group	Period	Test requi- red	Number of speci- mens	Permitted failures per group	Period
Group D5 ^{d)} Reflection factor	9.2.1	ia	6	0	3 years	ia	3	0	3 years
Screening effectiveness	9.2.8	ia							
Water Immersion	9.2.7	ia ³⁾							
Group D6 ^{d)} Contact Captivation	9.3.5	ia	6	0	3 years		3	0	3 years
Discharge test (corona)	9.2.9	a							
Rapid change of temperature	9.4.4	a				a			
Climatic sequence	9.4.2	a				a			
Group D7 ^{d)} Resistance to solvents and contamination fluids	9.7	a ³⁾	1 ²⁾	0	3 years		1 ²⁾	0	3 years
ABBREVIATIONS:									
a applicable									
ia test required (if technically applicable)									
d) destructive test -specimens shall not be returned to stock									
¹⁾ One set of piece parts each style and variant, unless using common piece parts.									
²⁾ Group D7 -number of pairs for each solvent.									
³⁾ See detail specification.									

4.4 Procedures

4.4.1 Quality conformance inspection

This shall consist of test groups A1 and B1 on a lot-by-lot basis.

4.4.2 Qualification approval and its maintenance

This still consists of three consecutive lots passing test groups A1 and B1 followed by selection of specimens from the lots as appropriate. These specimens shall successfully pass the specified periodic D tests.

5 Instructions for preparation of detail specifications

5.1 General

Detail specifications (DS) shall use the appropriate blank detail specification (BDS). The following pages comprise the BDS dedicated for use with series RBMA connectors. As such, it will already have entered on it information relating to:

- a) the basic specification number applicable to all the detail specifications covering connector styles of the series covered by the sectional specification;
- b) the connector series designation.

The specification writer should enter the details relating to the connector style to be covered as indicated. The numbers in brackets in the BDS correspond to the following indications which shall be given.

5.2 Identification of the detail specification

- (1) The name of the National Authorized Institution (NAI) under whose authority the DS is published and, if applicable, the organization from whom the DS is available.
- (2) The number allocated to the DS by the relevant National Authorized Institution immediately preceded by the ISO two letter national identity code or "XX" when the DS is produced by an IEC technical subcommittee.
- (3) The number and issue number of the IECQ generic specification and, when applicable, the sectional specification; also the national reference if different.
- (4) If different from the IEC QC number, the national number of DS, date of issue and any further information required by the national system, together with any amendment numbers.

5.3 Identification of the component

- (5) Enter the following details:
 - style: the style designation of the connector including type of fixing and sealing if applicable;
 - attachment: by deletion of the inapplicable options of cable /wire given for centre and outer conductors;
 - special features and markings: as applicable;
 - series designation: in bold characters/digits approximately 15 mm high;
 - enter details of assessment level and the climatic category.
- (6) A reproduction of the outline drawing and details of the panel piercing (if applicable). It shall provide the maximum envelope dimensions, also the position of the reference plane and, in the case of a fixed connector, the position of the mounting plane, both relative to the front face of the connector.
- (7) Any maximum panel thickness limitations for fixed connectors shall be stated.
- (8) Particulars of all variants covered by the DS. As appropriate, the information shall include:
 - cable types (or sizes) applicable to each variant;
 - alternative plated or protective finishes;
 - details of alternative mounting flanges having either tapped or plain mounting holes;
 - details of alternative solder spills or solder buckets including, when applicable, those for use with microwave integrated circuit (MIC) components.

5.4 Performance

- (9) Performance data listing the most important characteristics of the connector in accordance with the requirements of the relevant sectional specification. Deviations from the minimum requirements shall be clearly indicated. Non-applicable parameters shall be marked “na”.

5.5 Marking, ordering information and related matters

- (10) Insert marking and ordering information as appropriate, together with details of related documents and any invoked structural similarity.

5.6 Selection of tests, test conditions and severities

- (11) “na” shall be used to indicate non-applicable tests. All tests marked “a” by the detail specification writer shall be mandatory.

When using the normal procedure with a dedicated BDS, the letter “a” – for applicable – shall be entered in the “test required” column against each of the tests indicated as being mandatory in the test schedule of the relevant sectional specification. Any additional test required at the discretion of the specification writer shall also be indicated by an “a”.

The specification writer shall also indicate, when necessary, details of deviations from the standard test methods and conditions including any relevant deviations given in the test schedule of the sectional specification.

The qualification approval and conformance inspection shall be such that the NSI shall be satisfied that they are appropriate and in line with those for other connectors within the system providing a reasonably comparable service.