IEC 61169-19

Edition 1.0 2011-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Radio-frequency connectors –
Part 19: Sectional specification – Radio frequency coaxial connectors of type SSMB

Connecteurs pour fréquences radioélectriques –
Partie 19: Spécification intermédiaire – Connecteurs coaxiaux pour fréquences radioélectriques de type SSMB

IEC 61169-19:2011

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FOREWORD

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International Standard IEC 61169-19 has been prepared by subcommittee 46F: R.F. and microwave passive components, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

This first edition cancels and replaces IEC/PAS 61169-19, published in 2009, of which it constitutes a minor revision. The only change is that the PAS has been changed into and International Standard.

The text of this standard is based on the following documents:

CDV	Report on voting
46F/138/CDV	46F/163/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

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

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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RADIO-FREQUENCY CONNECTORS –

Part 19: Sectional specification – Radio frequency coaxial connectors of type SSMB

1 Scope

The SSMB series connectors with characteristic impedance 50 Ω are one kind of low power miniature connectors with snap-on coupling mechanism and have the characteristics of light weight, small size, convenient connection and excellent characteristics. This connector range is suitable for the standard ranges of flexible and semi-rigid cables and is also available as a PCB mounted version. The connectors are usable up to a frequency of 3 GHz.

This sectional specification provides information and rules for preparation of detail specification of SSMB series R.F connectors together with the pro forma blank detail specification.

It also prescribes mating face dimensions for grade 2 general purpose connectors, dimensional detail of grade 0 standard test connectors, gauging information and tests selected from IEC 61169-1 applicable to all detail specifications relating to SSMB series RF connectors.

This specification indicates 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

3.1 Dimensions – General purpose connectors – Grade 2

3.1.1 Connector with socket-centre contact

All non-dimensioned pictorial configurations are for reference purpose only.

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

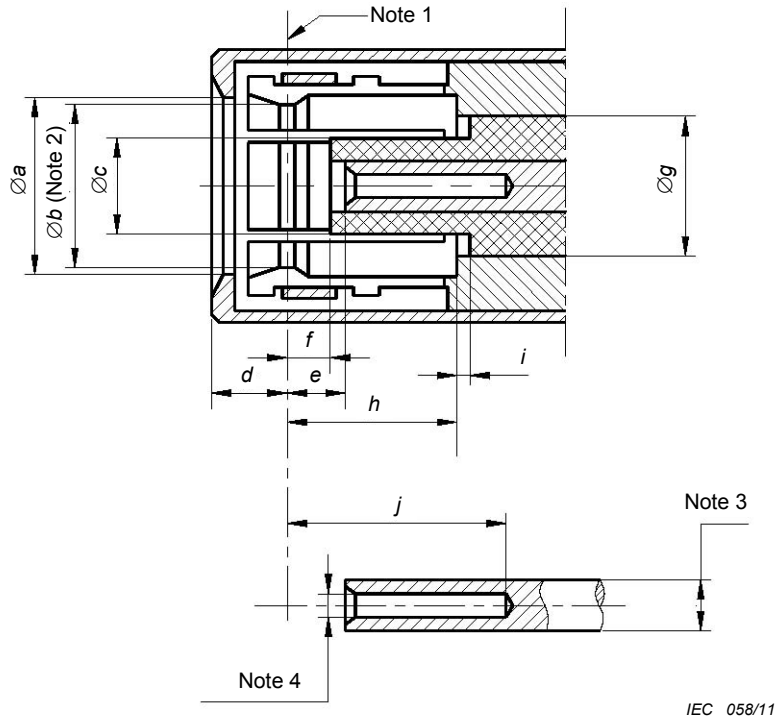

Figure 1 – Connector with socket-centre contact (for dimensions and notes, see Table 1)

Table 1 – Dimensions of connector with socket-centre contact

Ref.	mm	
	Min.	Max.
a	2,74	-
b	-	
c	-	1,34
d	-	1,78
e	0,84	-
f	0,84	-
g	2,11 (nominal)	
h	3,10	-
i	0,00	-
j	2,77	-

NOTE 1 Reference plane.

NOTE 2 The form and dimension of outer contact detent meet electrical and mechanical performance requirements.

NOTE 3 The diameters are chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of 50 Ω.

NOTE 4 Resilient contact may be closed or open entry, method of resilience is optional, provided that when a pin of 0,36 mm to 0,38 mm diameter is inserted, VSWR mating and endurance performances are obtained.

3.1.2 Connector with pin-centre contact

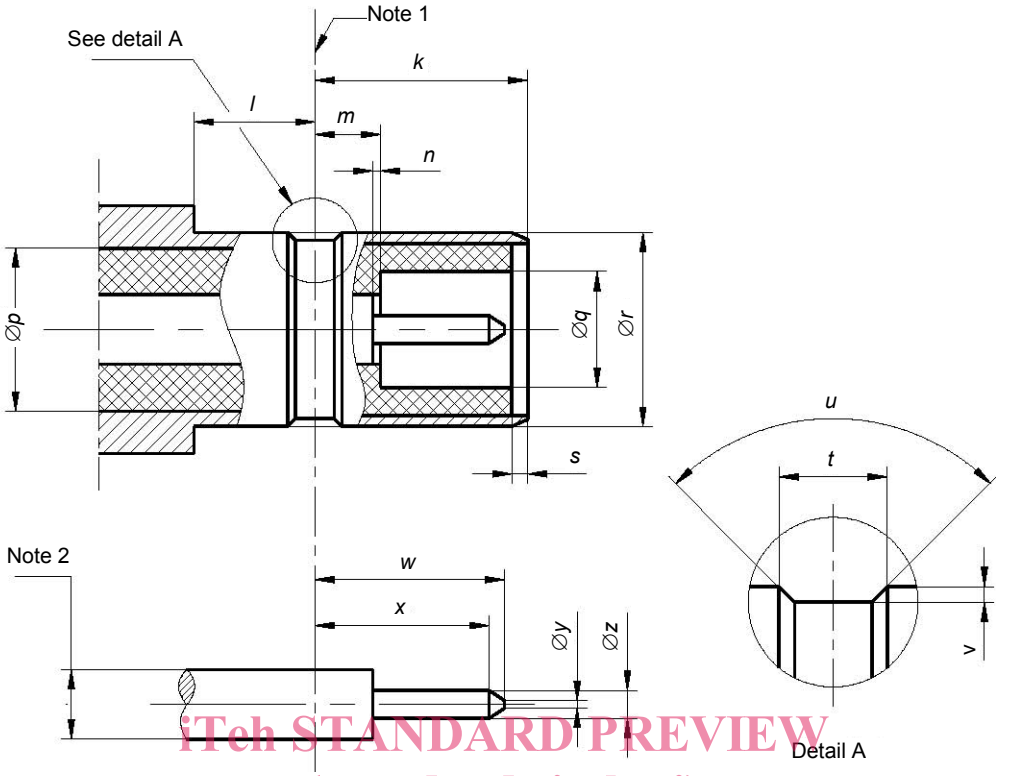

Figure 2 – Connector with pin-centre contact
(for dimensions and notes, see Table 2)

Table 2 – Dimensions of connector with pin-centre contact

Ref.	mm	
	Min.	Max.
k	-	3,10
l	1,91	-
m	-	0,84
n	0,00	-
p	2,11 (nominal)	
q	1,37	-
r	-	2,67
s	0,00	-
t	0,71	0,74
u	88°～92°	
v	0,05	0,15
w	-	2,75
x	1,91	-
y	-	0,25
z	0,36	0,38

NOTE 1 Reference plane.

NOTE 2 The diameters are chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of 50 Ω.

3.2 Gauges

3.2.1 Gauge pins for socket-centre contact

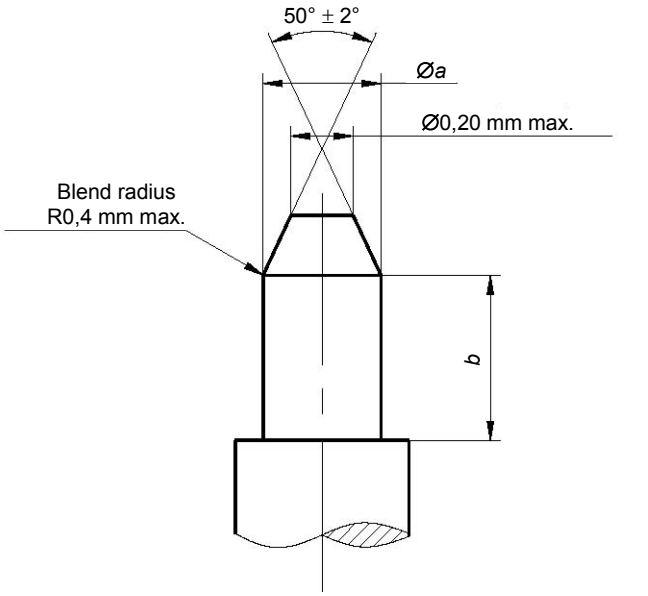

Figure 3 – Gauge pins for socket-centre contact
(for dimensions and notes, see Table 3)

Table 3 – Dimensions of gauge pins for socket-centre contact

Ref.	Gauge A Maximum material for sizing purposes		Gauge B Minimum material for measurement of retention force	
	mm		mm	
	Min.	Max.	Min.	Max.
a	0,381	0,384	0,353	0,356
b	1,70	1,80	1,70	1,80
Material: steel, polished, surface roughness: Ra=0,4 μm maximum. Mass of gauge: 16 g ± 1 g				

3.2.2 Test procedure

The gauge A shall be inserted into the socket-centre contact three times with a minimum depth of *b* .

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.

This test also shall be carried out on connector when the socket-centre contact is not removed.

3.2.3 Gauge for outer contact of socket-centre contact

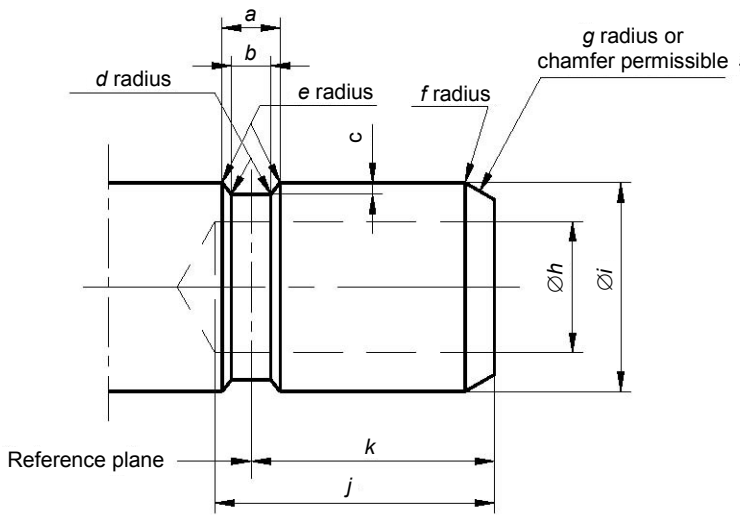

Figure 4 – Outer contact sizing and retention force gauges A and B (for dimensions and notes, see Table 4)

Table 4 – Dimensions of gauge for outer contact

Ref	Gauge A (maximum material for sizing purpose)		Gauge B (minimum material for measurement of gauge retention force)	
	mm		mm	
	Min.	Max.	Min.	Max.
a	0,74	0,75	0,58	0,64
b	0,48	0,51	0,43	0,46
c	0,14	0,15	0,075	0,125
d	-	0,08	-	0,08
e	0,08	0,18	0,08	0,18
f	0,2	0,4	0,2	0,4
g	-	0,38	-	0,38
h	1,68	-	1,68	-
i	2,672	2,675	2,667	2,670
k	3,05	3,10	3,05	3,10
j	3,50	-	3,50	-
Material: steel, polished, surface roughness: Ra=0,4 μm maximum. Mass of gauge: 460 g ± 20 g				

3.2.4 Test procedure

The gauge A shall be inserted into the outer contact of the socket-centre contact three times. This is a sizing operation.

After this, the gauge B shall be inserted into the outer contact of the socket-centre contact. The contact shall support the mass of the gauge in a vertical downward position.

NOTE Additional test: Following the sizing operation, the force necessary to insert gauge A into the outer contact of the socket-centre contact is measured. When this test is required, the maximum permitted insertion force is then specified and is smaller than 27 N.

3.3 Dimensions – Standard test connectors – Grade 0

3.3.1 Connector with socket-centre contact

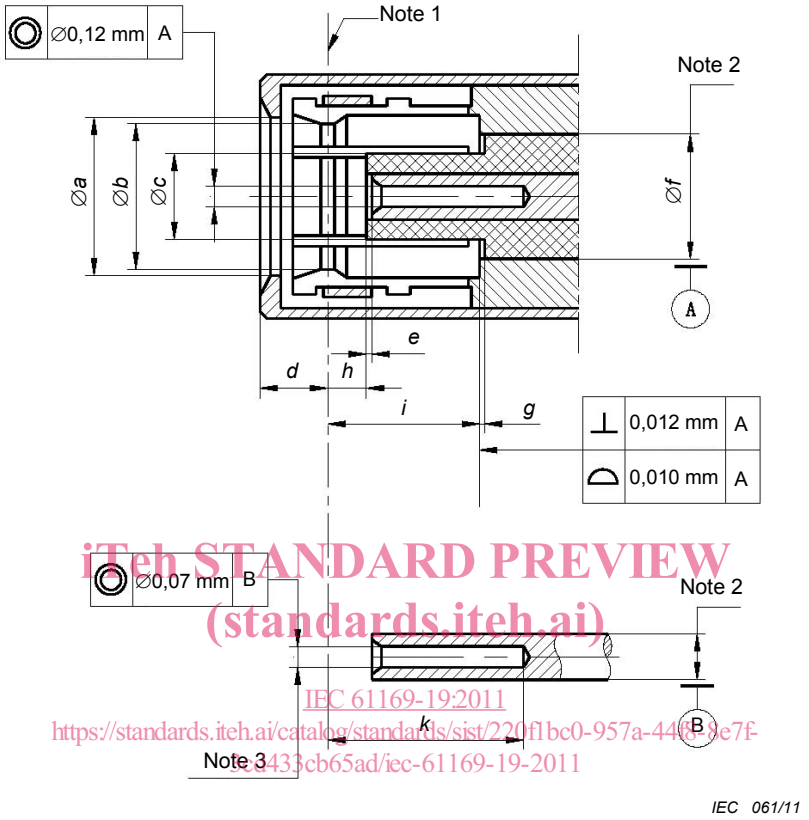

Figure 5 – Connector with socket-centre contact (for dimensions and notes, see Table 5)

Table 5 – Dimensions of connector with socket-centre contact

Ref.	mm	
	Min.	Max.
a	2,740	2,840
b	2,464	2,514
c	1,295	1,340
d	-	1,780
e	0,000	0,127
f	2,110 (nominal)	
g	0,000	0,127
h	0,840	0,942
i	3,100	3,150
k	2,770	-
NOTE 1 Reference plane. NOTE 2 The diameters are chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of		

50 Ω ± 0,5 Ω.

NOTE 3 Resilient contact may be closed or open entry, method of resilience optional, provided that when a pin of 0,36 mm to 0,38 mm diameter is inserted, VSWR mating and endurance performances are obtained.

3.3.2 Connector with pin-centre contact

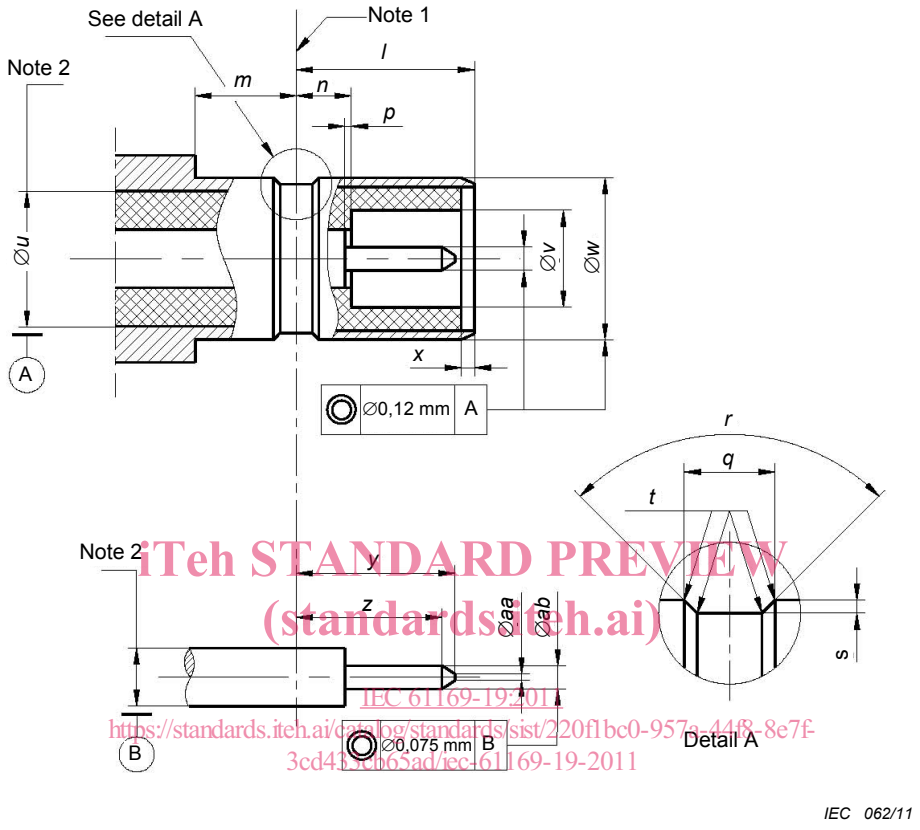

Figure 6 – Connector with pin-centre contact (for dimensions and notes, see Table 6)

Table 6 – Dimensions of connector with pin-centre contact

Ref.	mm	
	Min.	Max.
l	3,050	3,100
m	1,905	-
n	0,740	0,840
p	0,000	0,127
q	0,710	0,740
r	89° to 91°	
s	0,120	0,150
t	0,080 radius	
u	2,110 (nominal)	
v	1,370	1,420
w	2,620	2,670
x	0,000	0,050
y	-	2,750
z	1,910	-

Ref.	mm	
	Min.	Max.
aa	-	0,250
ab	0,360	0,380
NOTE 1 Reference plane. NOTE 2 The diameters are chosen upon the assumption that the PTFE dielectric has a dielectric constant of 2,02 to give an impedance of 50 Ω ± 0,5 Ω.		

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 SSMB series RF 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 7 – Rating and characteristics

Rating and characteristics	IEC 61169-1 Subclause	Values	Remarks, deviations from standard test method
Electrical			
Nominal impedance		50 Ω	
Frequency range		Up to 3 GHz	
Reflection factor [a] Grade 2 connectors – straight styles – right-angle styles – component mounting styles – solder bucket and PCB mounting styles	9.2.1	 ≤0,1 ≤0,15 ≤0,2 ≤0,24 See DS See DS	 Up to 1 GHz Up to 3 GHz Up to 1 GHz Up to 3 GHz
Centre contact resistance [b] – initial – after conditioning	9.2.3	 ≤ 5,0 mΩ ≤ 15,0 mΩ	
Outer conductor continuity [b] – initial – after conditioning	9.2.3	 ≤ 2,5 mΩ ≤ 7,5 mΩ	
Insulation resistance [a] – initial – after conditioning	9.2.5	 ≥ 1 000 MΩ ≥ 200 MΩ	