IEC 61169-52

Edition 1.0 2015-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Adio-frequency connectors –
Part 52: Sectional specification for series MMCX RF coaxial connectors

Connecteurs pour fréquences radioélectriques –
Partie 52: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques de type MMCX

IEC 61169-52:2015-06(en-fr)

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.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue
Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org
Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

IEC 61169-52

Edition 1.0 2015-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Adio-frequency connectors –
Part 52: Sectional specification for series MMCX RF coaxial connectors

Connecteurs pour fréquences radioélectriques –
Partie 52: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques de type MMCX

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.120.30

ISBN 978-2-8322-4713-6

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

RADIO-FREQUENCY CONNECTORS –

Part 52: Sectional specification for series MMCX RF 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.

International Standard IEC 61169-52 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 bilingual version (2017-08) corresponds to the monolingual English version, published in 2015-06.

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

FDIS	Report on voting
46F/314/FDIS	46F/320/RVD

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

The French version of this standard has not been voted upon.

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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

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.

RADIO-FREQUENCY CONNECTORS –

Part 52: Sectional specification for series MMCX RF coaxial connectors

1 Scope

This part of IEC 61169, which is a sectional specification (SS), provides information and rules for the preparation of detail specifications (DS) for RF coaxial connectors with snap-on coupling, typically for use in 50 Ω cable networks (MMCX).

It prescribes mating face dimensions for general purpose connectors – grade 2, 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 MMCX 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.

The MMCX miniature snap-on coupling structure series R.F. coaxial connector with the characteristic of normative impedance 50 Ω are used with various kinds of R.F cables and strips. The operating frequency limit is up to 6 GHz.

NOTE Metric dimension are original dimensions. All undimensioned pictorial configurations are for reference purpose only.

2 Normative references

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

IEC 61169-1:2013, *Radio frequency connectors – Part 1: Generic specification – General requirements and measuring methods*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

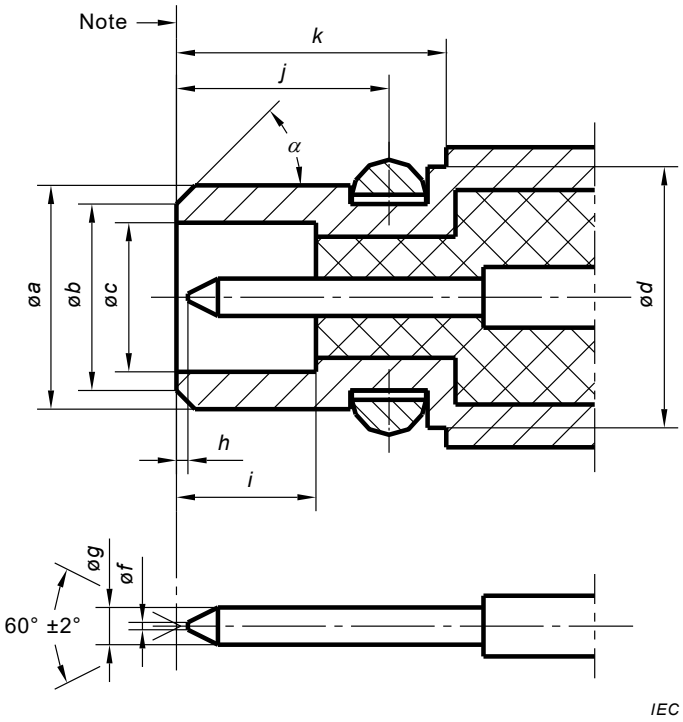
IEC 62037 (all parts), *Passive RF and microwave devices, intermodulation level measurement*

3 Mating face and gauge information

3.1 Dimensions – General connectors – Grade 2

3.1.1 Connector with pin centre contact

The mating face of connector with pin centre contact is shown in Figure 1 and its dimensions are shown in Table 1.



NOTE Mechanical and electrical reference plane.

Figure 1 – Connector with pin centre contact

Table 1 – Dimensions of connector with pin centre contact

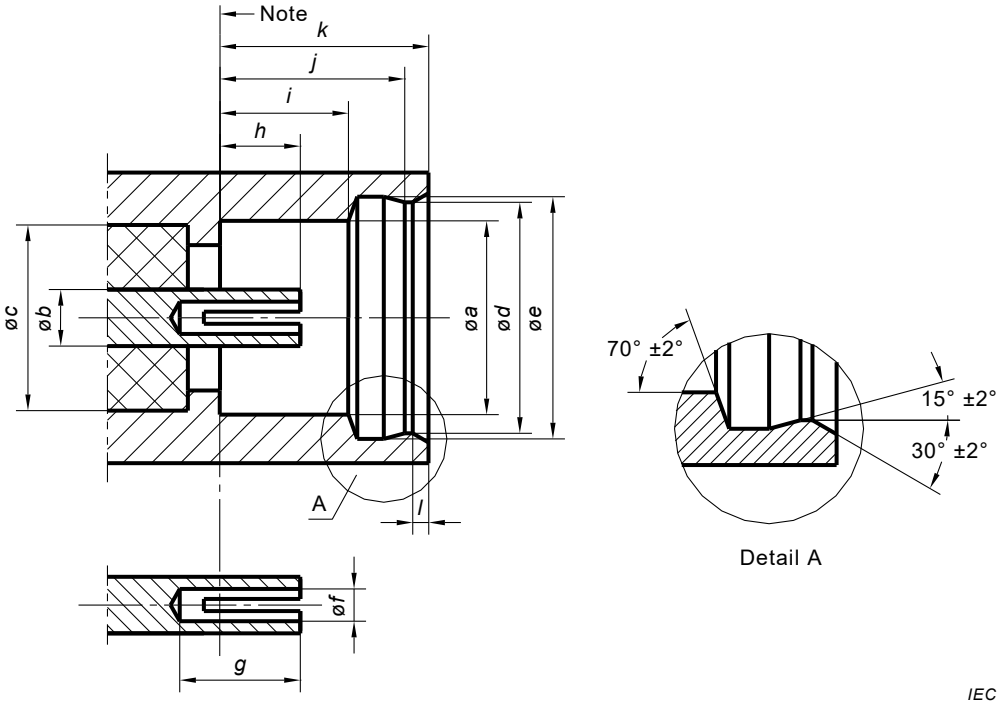
Ref.	mm	
	Min.	Max.
a	2,35	2,40
b	1,80	--
c	1,58	1,62
d	--	2,83
f	--	0,20
g	0,38	0,42
h	0,00	0,25
i[a]	1,23	--
j[b]	2,08	2,12
k	2,70	--
α	30°	--

[a] The dimension should meet the mechanical and electrical requirements, also compensate the electrical effect caused by gaps.

[b] The shape of elastic gasket is optional and its diameter and position should meet the mechanical and electrical requirements.

3.1.2 Connector with socket centre contact

The mating face of connector with socket centre contact is shown in Figure 2 and its dimensions are shown in Table 2.



NOTE Mechanical and electrical reference plane.

Figure 2 – Connector with socket centre contact

Table 2 – Dimensions of connector with socket centre contact

Ref.	mm	
	Min.	Max.
a	2,41	--
b	0,70 (nominal)	
c[a]	--	--
d	2,88	2,92
e	3,00	3,04
f[b]	--	--
g	1,40	--
h	0,90	1,20
i	1,57	1,63
j	2,26	2,34
k	--	2,69
l	0,14	0,23

[a] The diameter chosen shall meet nominal impedance of 50 Ω and electrical and mechanical requirements.

[b] Centre contact design is optional. It should however meet the gauging requirements of 3.2.1 and relevant reflection factor requirements of Clause 4 using grade 0 connector in accordance with Figure 5.

3.2 Gauges

3.2.1 Gauge pin for socket centre contact

The gauge pin for socket centre contact is shown in Figure 3 and its dimensions are shown in Table 3.

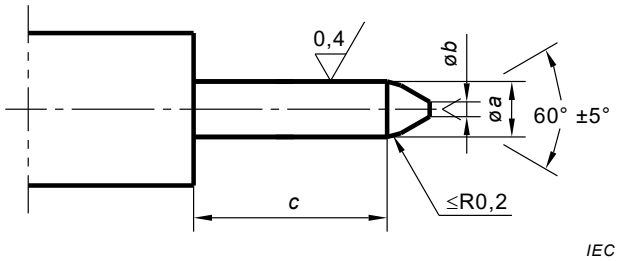


Figure 3 – Gauge pin for socket centre contact

Table 3 – Dimensions of gauge pin for socket centre contact

Ref.	Gauge A (For sizing purpose)		Gauge B (For retention purpose) Mass of gauge : 28 $^{+2}_{0}$ g	
	mm		mm	
	Min.	Max.	Min.	Max.
a	0,420	0,425	0,375	0,380
b	0,00	0,20	0,00	0,20
c	0,90	1,10	1,00	1,20
Material: steel, polished.				

Test procedure:

a) Sizing test

The gauge A should insert the socket centre contact three times, this is a sizing operation.

b) Insertion test

Following the sizing operation, if specified in the detail specification, the force necessary to insert gauge A fully into the socket centre contact shall be measured. When this test is required, the insertion force shall not exceed 5 N.

c) Retention test

After sizing or insertion test, the gauge B shall be inserted into the socket centre contact. The contact shall retain the mass of the gauge C in a vertical downward position.

3.2.2 Gauge for outer contact

The gauge for outer contact is shown in Figure 4 and its dimensions are shown in Table 4.

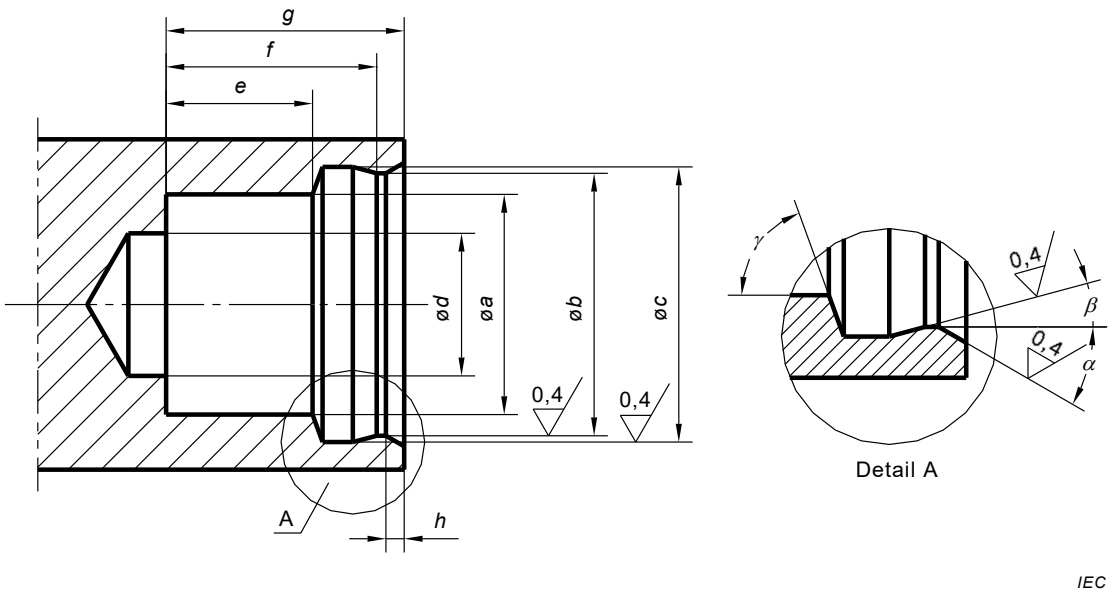


Figure 4 – Gauge for outer contact

Table 4 – Dimensions of gauge for outer contact

Ref.	Gauge A (For sizing purpose)		Gauge B (For retention purpose) Mass of gauge : 600 $^{+5}_{0}$ g	
	mm		mm	
	Min.	Max.	Min.	Max.
a	2,41	2,425	2,42	2,425
b	2,875	2,88	2,92	2,925
c	3,04	3,05	2,99	3,00
d	1,58	1,62	1,58	1,62
e	1,63	1,64	1,56	1,57
f	2,30	2,305	2,255	2,26
g	2,65	2,66	2,65	2,66
h	0,135	0,14	0,13	0,23
α	32°	32,5°	27°	33°
β	15,5°	16°	14°	14,5°
γ	69°	71°	69°	71°
Material: steel, polished.				

Test procedure:

a) Sizing test

The gauge A should insert the outer contact once, this is a sizing operation.

b) Insertion test

Following the sizing operation, if specified in the detail specification, the force necessary to insert gauge A fully into the outer contact shall be measured. When this test is required, the insertion force shall not exceed 18 N.

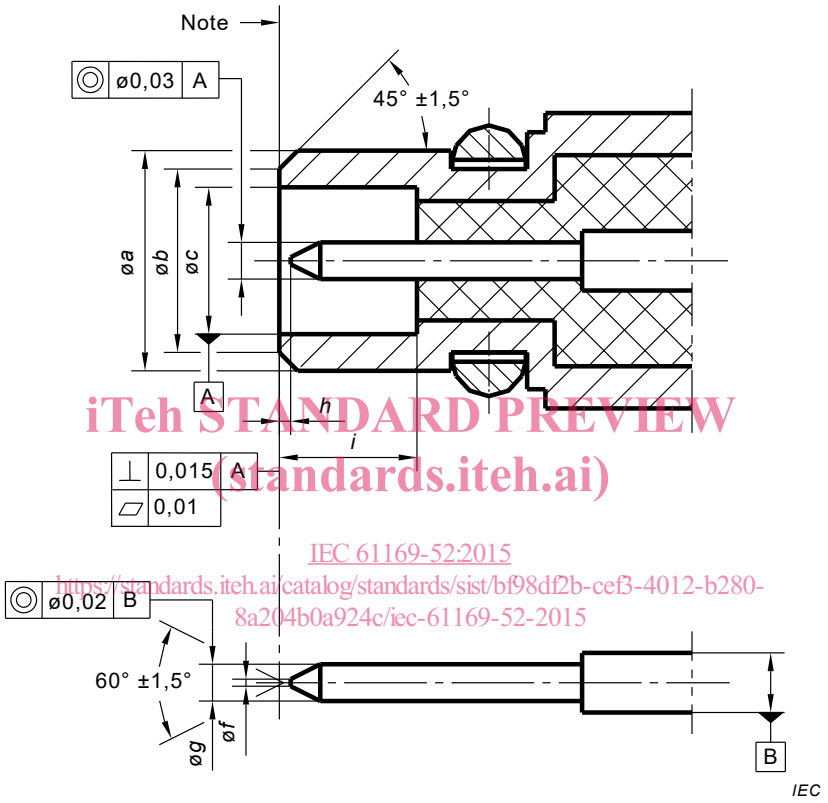
c) Retention test

After sizing or insertion test, the gauge B shall be inserted into the outer contact. The contact shall retain the mass of the gauge B in a vertical downward position.

3.3 Dimensions – Standard test connectors – Grade 0

3.3.1 Connector with pin centre contact

The mating face of standard test connector with pin centre contact is shown in Figure 5 and its dimensions are shown in Table 5.



NOTE Mechanical and electrical reference plane.

Figure 5 – Connector with pin centre contact

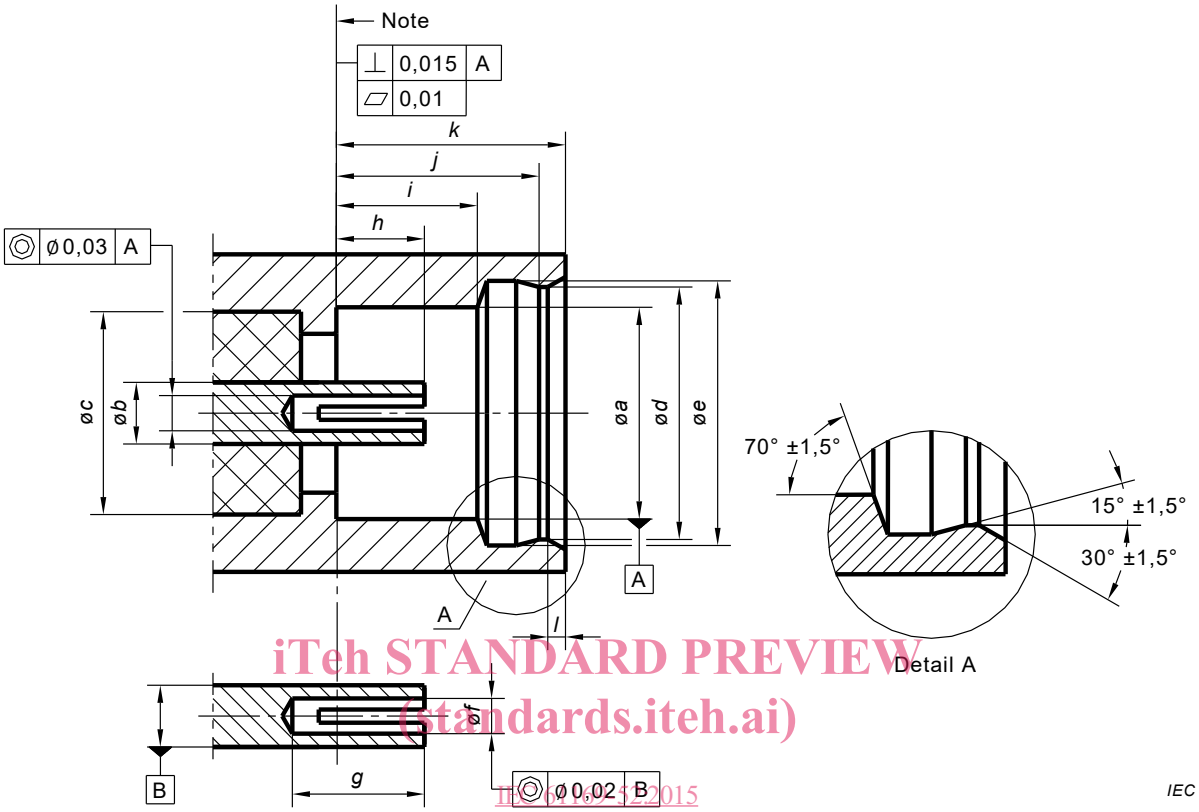
Table 5 – Dimensions of connector with pin centre contact

Ref.	mm	
	Min.	Max.
a	2,38	2,405
b	2,10	2,20
c	1,59	1,61
f	0,10	0,20
g	0,39	0,41
h	0,10	0,25
i	1,23	1,55

NOTE Dimensions not indicated in Table 5 are included in Table 1.

3.3.2 Connector with socket centre contact

The mating face of standard test connector with socket centre contact is shown in Figure 6 and its dimensions are shown in Table 6.



NOTE Mechanical and electrical reference plane.

Figure 6 – Connector with socket centre contact

Table 6 – Dimensions of connector with socket centre contact

Ref.	mm	
	Min.	Max.
a	2,41	2,42
b	0,69	0,71
c[a]	--	--
d	2,88	2,92
e	3,01	3,03
f[b]	--	--
g	1,40	--
h	1,00	1,20
i	1,57	1,63
j	2,26	2,34
k	--	2,69
l	0,14	0,23

[a] The diameter chosen shall meet the characteristic impedance of (50 ± 0,5) Ω.

[b] Design for slotting is optional, and should meet electrical and mechanical requirements, when mating with Φ0,39 mm ~ Φ0,41 mm gauge pin.

4 Quality assessment procedure

4.1 General

Clause 10 of IEC 61169-1:2013 applies to this sectional specification, except the following requirement:

Subclauses 4.2 to 4.4 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 5 of IEC 61169-1:2013)

The values indicated below are recommended for MMCX 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.

Preferred climatic categories are given in Table 7. Rating and characteristics are given in Table 8.

Table 7 – Preferred climatic categories (see IEC 60068-1)

Category designation	Letter	Temperature range	Damp heat steady state
40/85/21	A	–40 °C to +85 °C	21 days
55/125/21	B	–55 °C to +125 °C	21 days

Table 8 – Rating and characteristics

Rating and characteristics	IEC 61169-1: 2013 Subclause	Value	Remarks deviations from standard test methods
Electrical			
Nominal impedance		50 Ω	
Frequency range [a]		DC ~ 6 GHz	Or upper frequency limit of cable
Return loss [a]	9.2.1		
Grade 2 connectors			
– straight styles		≥20,1 dB	
– right-angle styles		≥16,8 dB	
– component mounting styles		See DS	
– solder bucket and PCB mounting styles		See DS	
Power rating	9.2.2	See DS	
Contact resistance, outer conductor and centre conductor continuity (mated cabled connectors)	9.2.3		
Centre contact resistance [b]			
– initial		≤5,0 mΩ	