IEC 61169-50

Edition 1.0 2014-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Radio-frequency connectors – Part 50: Sectional specification for RF coaxial connectors with inner diameter of outer conductors 4,11 mm with quick lock system – Characteristic impedance 50 Ω (type QMA)

Connecteurs pour fréquences radioélectriques – Partie 50: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques avec diamètre intérieur des conducteurs extérieurs de 4,11 mm à système de verrouillage rapide – Impédance caractéristique 50 Ω (type QMA)

IEC 61169-50:2014-10(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

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

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 It also gives information on projects, replaced and withdrawn publications.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 more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
More than 55 000 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 plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
Plus de 55 000 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 61169-50

Edition 1.0 2014-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Radio-frequency connectors –
Part 50: Sectional specification for RF coaxial connectors with inner diameter of outer conductors 4,11 mm with quick lock system – Characteristic impedance 50 Ω (type QMA)

Connecteurs pour fréquences radioélectriques –
Partie 50: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques avec diamètre intérieur des conducteurs extérieurs de 4,11 mm à système de verrouillage rapide – Impédance caractéristique 50 Ω (type QMA)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

S

ICS 33.120.30

ISBN 978-2-8322-1901-0

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

RADIO-FREQUENCY CONNECTORS –

Part 50: Sectional specification for RF coaxial connectors with inner diameter of outer conductors 4,11 mm with quick lock system – Characteristic impedance 50 Ω (type QMA)

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.

International Standard IEC 61169-50 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.

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

CDV	Report on voting
46F/264/CDV	46F/285/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, 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.

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.

INTRODUCTION

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the design of the connector given in 3.1.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licence under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holders of this patent right is registered with IEC. More detailed information may be obtained from:

HUBER+SUHNER AG

Mr. Germann Reto, RF Division

Reto.germann@hubersuhner.com

Phone:+41 71 353 4653

Degersheimerstrasse 14, CH-9100 Herisau, Switzerland

Or

Radiall SA

Mr. Pierre Bigot, RFI Division

Pierre.bigot@radiall.com

Phone:+33 47 650 0057

Z.I Centr'alp – 642 rue Emile Romanet, B.P. 35 – F-38341 Voreppe Cedex, France

Attention is drawn to the possibility that some of elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

ISO (www.iso.org/patents) and IEC (http://patents.IEC.ch) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

RADIO-FREQUENCY CONNECTORS –

Part 50: Sectional specification for RF coaxial connectors with inner diameter of outer conductors 4,11 mm with quick lock system – Characteristic impedance 50 Ω (type QMA)

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 type QMA R.F. coaxial connectors with quick lock.

The connectors are normally used with 50 Ω corrugated cable and flexible cables for middle power applications in an operating range up to 6 GHz.

It describes the interface dimensions for general purpose connectors with gauging information and the mandatory tests selected from IEC 61169-1, applicable to all detail specifications relative to type QMA connectors.

This specification indicates the recommended performance characteristics to be considered when writing a DS and covers all tests schedules and inspection requirements.

NOTE Metric dimension are original dimensions.

All un-dimensioned 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 62037 (all parts), *Passive RF and microwave devices, intermodulation level measurement*

3 Mating face and gauge information

3.1 Dimensions – General connectors

3.1.1 Connector with socket-centre contact

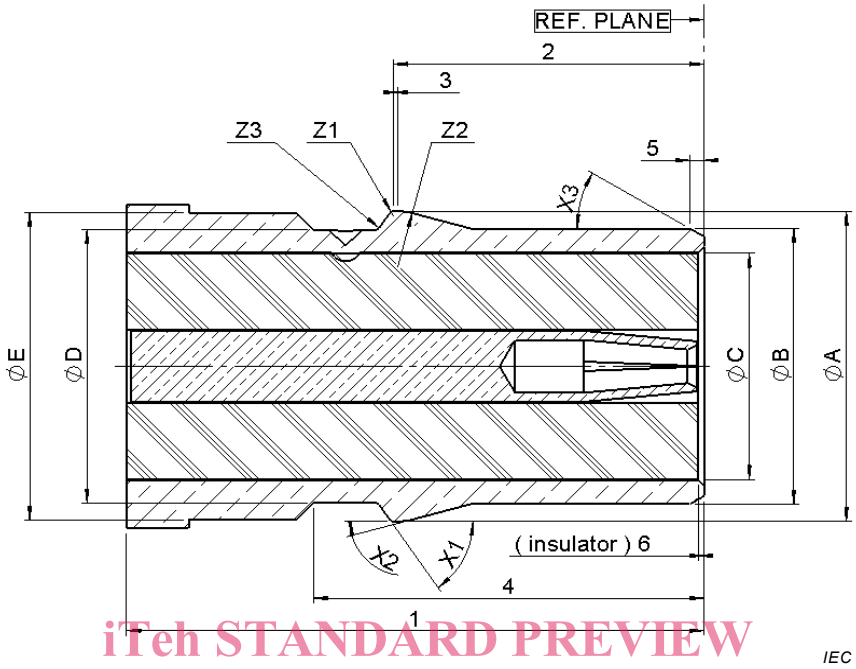

Figure 1 – Connector with socket-centre contact (for dimensions, see Table 1)

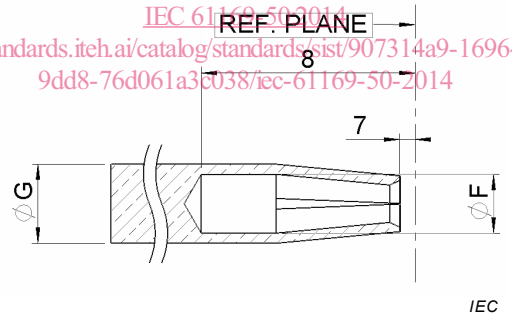

Figure 2 – Female centre contact (for dimensions, see Table 1)

Table 1 – Dimensions of connector with socket-centre contact

Ref.	mm		Additional notes
	Min.	Max.	
A	5,555	5,585	
B	4,9	4,95	
C	-	-	Dimensions shall match the 50 Ω line
D	-	4,95	
E	-	5,585	
F	0,95	-	
G	1,24	1,3	
X1	54	56	Degree
X2	13	17	Degree
X3	28	32	Degree
Z1	0,055	0,105	Radius
Z2	0,9	1,1	Radius
Z3	-	0,2	Radius
1	9,1	-	Degree
2	5,53	5,56	
3	0,2	0,4	
4	6,8	-	
5	0,2	0,3	
6	0,00	0,25	
7	0,00	0,25	
8	2,2	-	

3.1.2 Connector with pin-centre contact

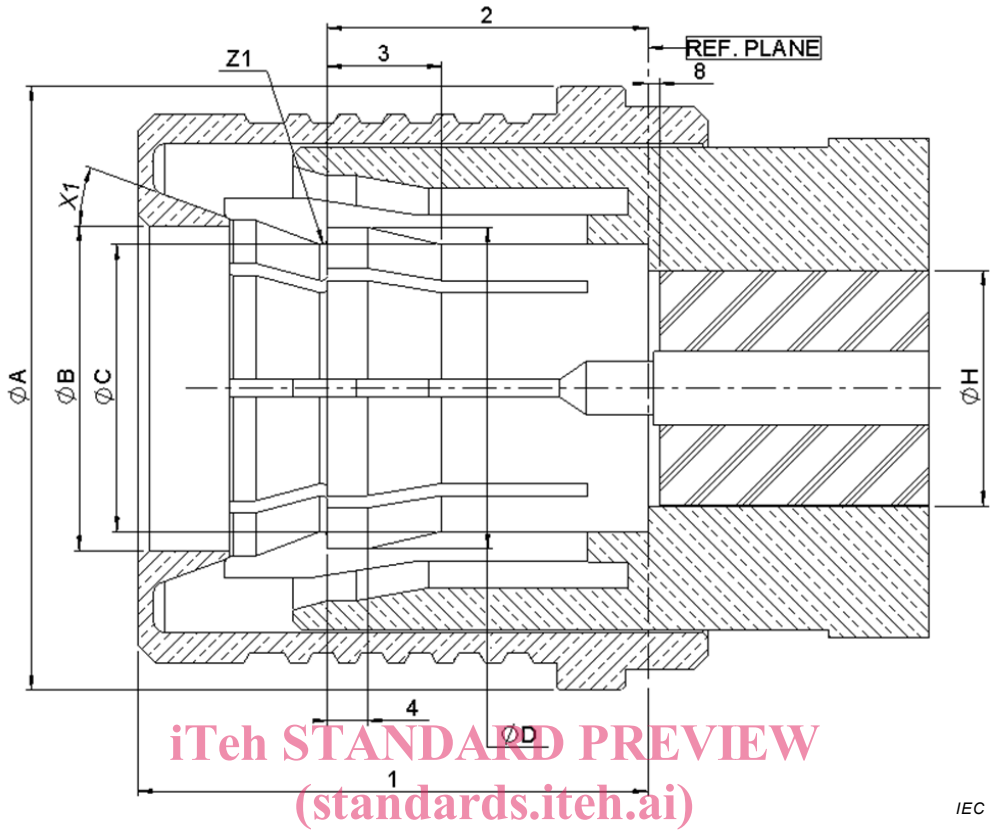

Figure 3 – Connector with pin-centre contact (for dimensions, see Table 2)

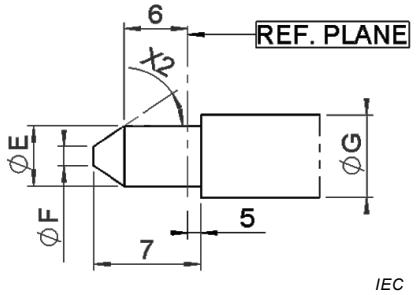

Figure 4 – Details of pin-centre contact (for dimensions, see Table 2)

Table 2 – Dimensions of connector with pin-centre contact

Ref.	mm		Additional notes
	Min.	Max.	
A	-	10,55	
B	5,62	-	
C	4,98	5,02	
D	5,60	-	
E	0,90	0,94	
F	-	0,38	
G	-	-	
H	-	-	
X1	-	-	Degree
X2	33	35	Degree
Z1	0,07	0,13	Radius
1		9,28	
2	-	-	
3	-	-	
4	0,00	0,25	
5	0,88	-	
6	1,35	1,7	
7	0	0,25	

3.2 Gauges for general purpose connectors

3.2.1 Gauge pins for socket-centre contact

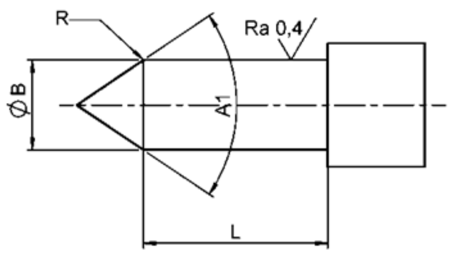

Figure 5 – Gauge pin for socket-centre contact (for dimensions, see Table 3)

Table 3 – Gauge dimensions for socket-centre contact

Gauge A Maximum material for measurement of maximum insertion force			Gauge B Minimum material for measurement of minimum retention force Mass of gauge: 20 g + 2 g	
Ref.	mm		mm	
	Min.	Max.	Min.	Max.
B	0,950	0,955	0,899	0,902
L	1,27	1,90	1,27	1,90
A1	40°	60°	89°	91°
R		0,38		0,38
Material: steel, polished, surface roughness: Ra=0,4 µm maximum.				

3.2.2 Test procedure

The gauge A (see Figure 5) shall be inserted into the socket-centre contact one time with a minimum depth of 0,51 mm. The insertion force shall not exceed 13,3 N.

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

4 Quality assessment procedures

4.1 General

Subclauses 4.2 to 4.4 provide recommended ratings, performance and test conditions to be considered when writing a detail specification (DS). 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 Ratings and characteristics (see Clause 5 of IEC 61169-1:2013)

The values indicated below are recommended for QMA 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 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.

Rating and characteristics are given in Table 4.

Table 4 – Rating and characteristics

Ratings and characteristics	Test method IEC 61169-1:2013 Subclause	Value	Remarks, deviation from standard test method
Electrical			
Nominal Impedance		50 Ω	
Frequency range		DC to 6 GHz	Or upper frequency limit of cable
Reflection factor [a]	9.2.1		For interface only
DC to 2,5 GHz		≤ 0,025	