INTERNATIONAL STANDARD

IEC 61169-16

QC 222400

First edition
2006-12

Radio-frequency connectors –

Part 16:
Sectional specification –
RF coaxial connectors with inner diameter of outer conductor 7 mm (0,276 in) with screw coupling – Characteristics impedance 50 Ω (75 Ω) (type N)

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61169-16 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 part of IEC 61169 cancels and replaces IEC 60169-16 published in 1982 and Amendment 1 (1996). This edition constitutes a technical revision.

This edition included the following significant technical changes with respect to IEC 60169-16:

Clauses 7 and 8 have been totally re-written and Clause 9 has been removed Clause 7 currently include test schedules and Clause 8 gives indications to fill a Blank Detail Specification (BDS).

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

FDIS	Report on voting
46F/54/FDIS	46F/59/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 QC numbers that appear on the front cover of this publication are the specification numbers in the IEC Quality Assessment System for Electronic Components (IECQ).

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 maintenance result 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

RADIO-FREQUENCY CONNECTORS –

Part 16: Sectional specification – RF coaxial connectors with inner diameter of outer conductor 7 mm (0,276 in) with screw coupling – Characteristics impedance 50 Ω (75 Ω) (type N)

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 pin and socket R.F. coaxial connectors, with screw coupling mechanism, for low to medium power applications. The connector is commonly known as the "type N".

Three versions of the 50 Ω characteristic impedance type N connector are included, each version being mateable with each of the others.

The general purpose connector (grade 2) derived from the specifications MIL-C17B and MIL-C-39012 may preferably be used with R.F. cable 60096 IEC 50-7 up to about 12 GHz maximum frequency.

The high performance connector (grade 1) is particularly suitable for microwave applications when lower reflection factors than are offered by the general purpose connector are required. The connectors may also be suitable for microwave components. The tolerances of the interface dimensions lie between those for grade 0 and grade 2, and are chosen to give the performance required. Some grade 1 connectors conforming to this specification may be used up to 18 GHz maximum frequency.

The standard test connector (grade 0) has a closely controlled interface to provide a reference for the measurement of connectors, cable assemblies, components and equipment with the above two interfaces. It may also be used as a microwave connector in situations when the most precise interface for use up to 18 GHz maximum frequency is required.

A 75 Ω characteristic impedance connector is given in Annex A even though the use of 75 Ω type N connectors is strongly deprecated.

Accidental cross-coupling of 75 Ω with 50 Ω connectors can destructively damage the 75 Ω version, but in view of the extensive use of a number of marginally different 75 Ω versions, the interface now given provides common design guidance. 75 Ω connectors should be clearly identified.

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

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 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 60096-2:1988, *Radio-frequency cables – Part 2: Relevant cable specifications*

IEC 61169-1:1992, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*
Amendment 1 (1996)
Amendment 2 (1997)

ISO 263:1973, *ISO inch screw threads – General plan and selection for screws, bolts and nuts – Diameter range 0.06 to 6 in*

3 IEC type designation

Connectors conforming to this specification shall be designated by:

a) the reference to this specification: 61169-16 IEC;
b) characteristic impedance 50 Ω (75 Ω);
c) number of the grade :
   grade 0 = standard test connector = G 0;
   grade 1 = high performance connector = G 1;
   grade 2 = general purpose connector
   – if grade 2 is required, no grade designation is necessary;
d) a group of figures specifying the climatic category (see 7.2.5).

Example:

61169-16 IEC-50-G 0 denotes a standard test connector, type N, 50 Ω.

4 Interface dimensions

4.1 Dimensions – General purpose connectors – Grade 2

4.1.1 General

Inch dimensions are original dimensions.

NOTE The values for dimensions in millimetres derived from those in inches are not necessarily exact (according to ISO 370[1]), but they should be considered as acceptable alternatives to the original values.

All undimensioned pictorial configurations are for reference purposes only.

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[1] This document has been withdrawn.

4.1.2 Connector with pin centre contact

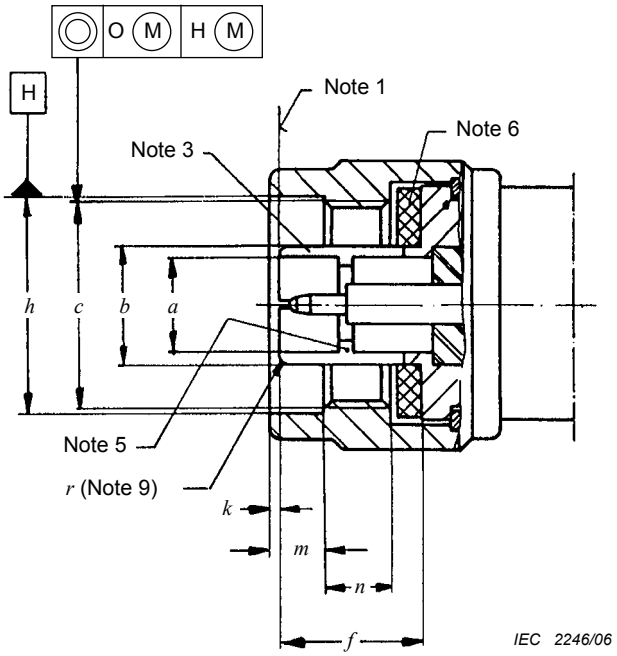

Figure 1 – Connector with pin centre contact (for notes and dimensions, see Table 1)

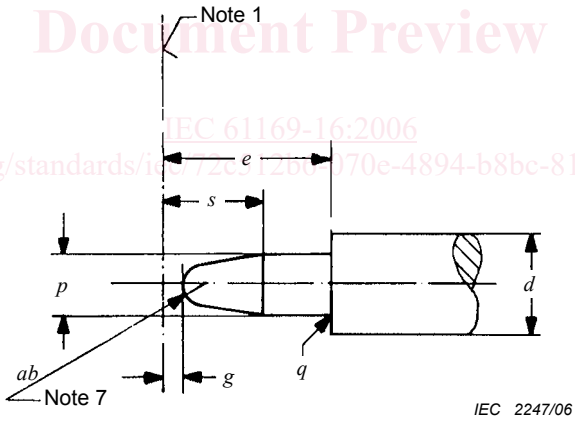

Figure 2 – Details of pin centre contact (for notes and dimensions, see Table 1)

Table 1 – Dimensions for connector with pin centre contact

Reference	mm		inches		Note
	Min.	Max.	Min.	Max.	
a	7,00 nom.		0,275 6 nom.		2, diam.
b	–	8,027	–	0,316	3/10, diam.
c	–	–	5/8-24 UNEF-2B		4
d	3,04 nom.		0,120 nom.		2, diam.
e	5.33	–	0.210	–	
f	9,25	–	0,364	–	6
g	0,0	1,57	0,0	0,062	
h	16,0	–	0,630	–	10, diam.
k	0,41	1,52	0,016	0,060	8
m	4,013	4,267	0,158	0,168	
n	4,5	–	0,177	–	
p	1,600	1,676	0,063	0,066	10, diam.
q	–	0,1	–	0,004	radius
r	0,15	–	0,006	–	9
s	2,79	3,56	0,110	0,140	
ab	–	0,64	–	0,025	7, radius

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 Diameter of outer and centre contact to provide nominal (50 Ω) characteristic impedance to meet electrical performance requirements.

NOTE 3 Slots or other forms of resilience optional. If slotted, indicated dimension *b* should not exceed 8,38 mm (0,330 in). Gauging requirements (see 5.1.1) to be met.

NOTE 4 Thread 5/8-24 UNEF-2B (according to ISO 263).

NOTE 5 Compensation for inductance of inner conductor gap in mated pair of connectors optional.

NOTE 6 Dimensions given assume no sealing gasket fitted. If sealing is required, dimension *f* (Figure 1) should be arranged so that with the gasket chosen adequate pressure is applied to the front face (dimensions *w* and *x*) of the socket connector (Figure 2) to ensure adequate sealing.

NOTE 7 Radius or chamfer, shape of tip optional. 0,25 mm (0,010 in) maximum flat permitted.

NOTE 8 Applies with nut biased forward.

NOTE 9 External form of leading edge of outer contact optional, but connector should meet electrical and mechanical performance requirements.

NOTE 10 Diameters *b*, *h* and *p* and thread *c* should be gauged to ensure that on MMC, each feature is on or can take up a common axis.