BS EN 61169-53:2016

BSI Standards Publication

Radio-frequency connectors

Part 53: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 16 mm with screw lock — Characteristic impedance 50 O (Type S7-16)

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National foreword

This British Standard is the UK implementation of EN 61169-53:2016. It is identical to IEC 61169-53:2015.

The UK participation in its preparation was entrusted to Technical Committee EPL/46, Cables, wires and waveguides, radio frequency connectors and accessories for communication and signalling.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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EUROPEAN STANDARD

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EN 61169-53

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English Version

Radio-frequency connectors - Part 53: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 16 mm with screw lock - Characteristic impedance 50 O (Type S7-16)
(IEC 61169-53:2015)

Connecteurs pour fréquences radioélectriques - Partie 53: Spécification intermédiaire relative aux connecteurs coaxiaux pour fréquences radioélectriques avec diamètre intérieur des conducteurs extérieurs de 16 mm à verrouillage à vis - Impédance caractéristique 50 O (Type S7-16)
(IEC 61169-53:2015)

Hochfrequenz-Steckverbinder - Teil 53: Rahmenspezifikation für koaxiale HF-Steckverbinder mit 16 mm Innendurchmesser des Außenleiters und Schraubverriegelung - Wellenwiderstand 50 O (Typ S7-16)
(IEC 61169-53:2015)

This European Standard was approved by CENELEC on 2015-10-21. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 46F/309/CDV, future edition 1 of IEC 61169-53, prepared by SC 46F "R.F. and microwave passive components" of IEC/TC 46 "Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61169-53:2016.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-07-29
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-01-29

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The text of the International Standard IEC 61169-53:2015 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)
Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61169-1	2013	Radio-frequency connectors -- Part 1: Generic specification - General requirements and measuring methods	EN 61169-1	2013
IEC 62037	series	Passive RF and microwave devices, intermodulation level measurement	EN 62037	series

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 53: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 16 mm with screw lock – Characteristic impedance 50 Ω (Type S7-16)

FOREWORD

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International Standard IEC 61169-53 has been prepared 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 standard is based on the following documents:

FDIS	Report on voting
46F/309/CDV	46F/321/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 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 53: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 16 mm with screw lock – Characteristic impedance 50 Ω (Type S7-16)

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 threaded coupling, typically for use in 50 Ω cable networks (Type S7-16).

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 4.1-9.5 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 S7-16 series RF coaxial connectors with nominal impedance 50 Ω are threaded coupling units which are used with all kinds of RF cables and microstrips in microwave transmission system. And the working frequency is up to 7,5 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*

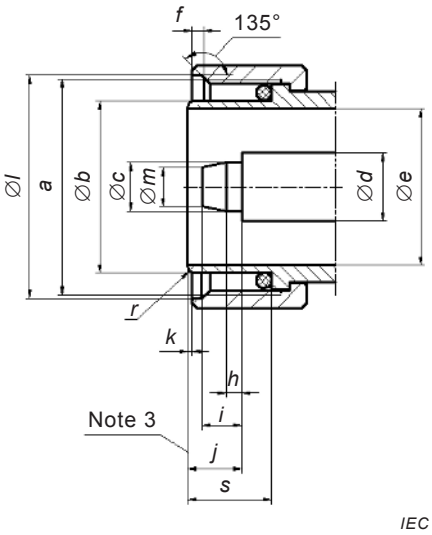
IEC 62037-3 (all parts), *Passive RF and microwave devices, intermodulation level measurement*

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.



1 The tolerance on this dimension is determined by the tolerance of characteristic impedance.

2 The design of this dimension should meet sealing performance at the same time the electrical requirements.

3 Mechanical and electrical reference plane

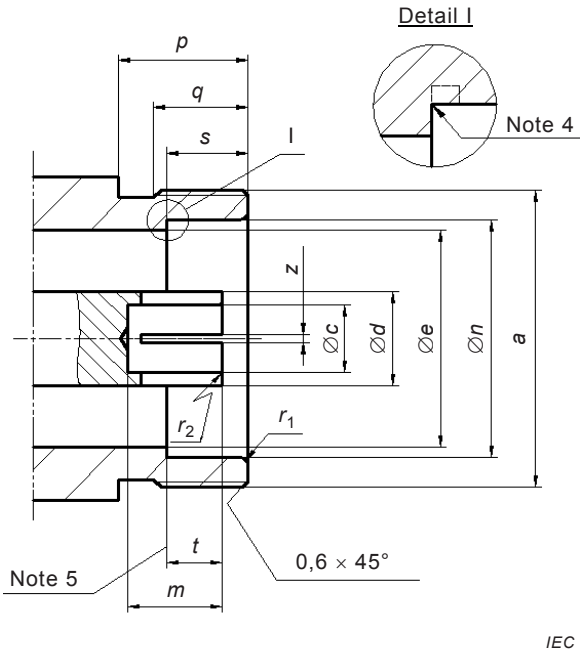
Figure 1 – Connector with pin-centre contact (for dimensions, see Table 1)

Table 1 – Dimensions of connector with pin-centre contact

Reference	mm		Additional notes
	Min.	Max.	
a	M22×1		
b	17,87	18,03	
c	4,80	4,86	
d	7 (nominal)		1
e	16,02	°16,08	
f	1,00	1,50	
h	1,80	2,20	
i	4,20	4,50	
j	5,20	5,50	
s	7,80	–	2
k	0,00	1,00	
l	22,05	22,35	
m	–	3,70	
r	0,12	0,30	

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.



1 The design of this dimension should meet gauge test of 3.2.1 and reflection factor requirement.

2 The tolerance on this dimension is determined by the tolerance of characteristic impedance.

3 Slot design optional. Contact to be closed to meet electrical and mechanical request..

4 Root cut.

5 Mechanical and electrical reference plane

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

Table 2 – Dimensions of connector with socket centre contact

Reference	mm		Additional notes
	Min.	Max.	
a	M22×1		
c	–	–	1
d	7 (nominal)		2
e	16,02	16,08	
n	18,05	18,13	
p	9,50	–	
q	7,50	–	
s	6,70	7,00	
t	4,90	5,20	
m	5,00	–	
z	–	–	3
r_1	0,20	0,35	
r_2	0,20	0,35	

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.

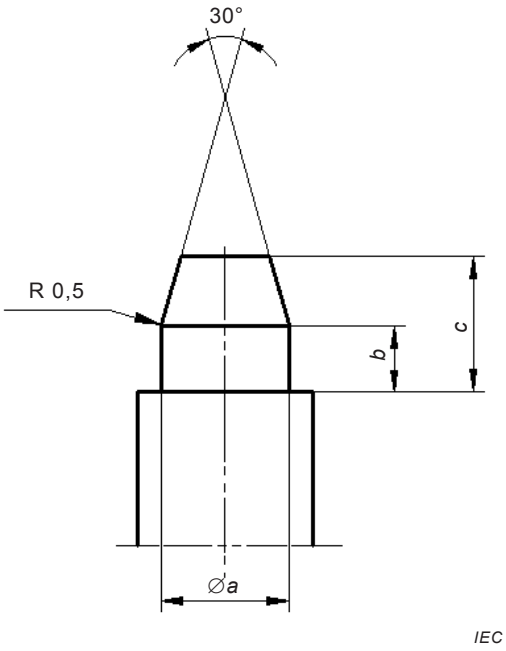


Figure 3 – Gauge pin for socket-centre contact (for dimensions, see Table 3)

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

Ref.	Gauge A (For sizing purpose)		Gauge B (For measurement of retention force) Mass of gauge : 1 000 $^{+5}_{0}$ g	
	mm		mm	
	Min.	Max.	Min.	Max.
a	4,91	4,92	4,81	4,82
b	2,00	3,00	2,00	3,00
c	4,50	5,00	4,50	5,00
Material: steel, 0,4 μm maximum finish.				

3.2.2 Test procedure

a) Sizing test

The gauge A shall be inserted into the centre contact for three times with a minimum distance of 2 mm. This is a sizing operation.

b) Withdrawal test

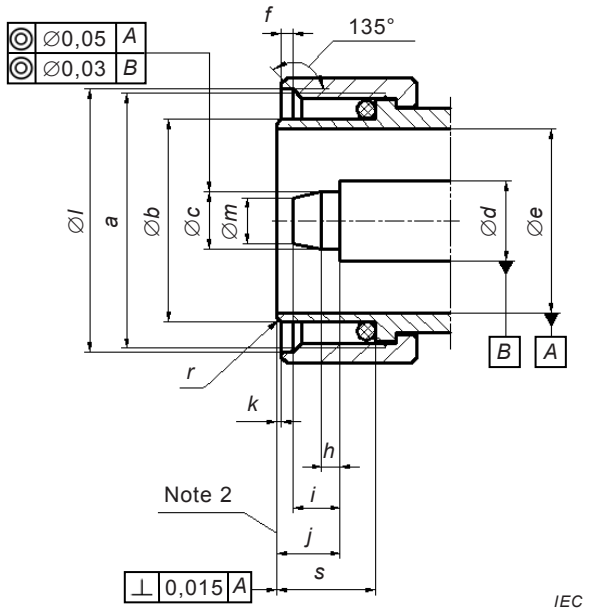
After sizing, the gauge B shall be inserted into socket centre contact. The force to withdraw gauge B shall be 10 N to 20 N.

3.3 Dimensions – Standard test connectors – Grade 0

3.3.1 Connector with pin-centre contact

Interface of connector with pin-centre contact is shown in Figure 4, dimensions are shown in Table 4.

NOTE The standard test connector with the tolerances specified in 3.3.1and 3.3.2 guarantees an accuracy of characteristic impedance of ±0,075 Ω. It is used to carry out the reflection coefficient measurement according to 9.2.1 of IEC 61169-1:2013.



[1] The design of this dimension and sealing performance at the same time meet the electrical requirements.

[2] Mechanical and electrical reference plane.

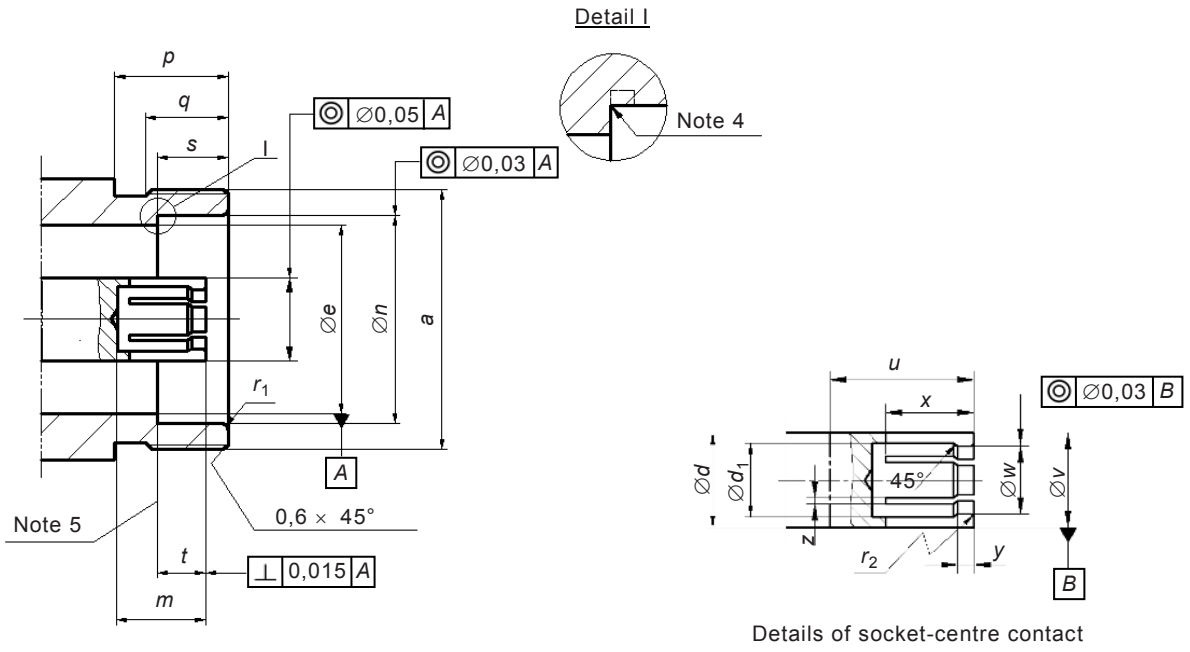
Figure 4 – Connector with pin-centre contact (for dimensions, see Table 4)

Table 4 – Dimensions of connector with pin-centre contact

Reference	mm		Additional notes
	Min.	Max.	
a	M22×1		
b	17,870	18,030	
c	4,800	4,860	
d	6,971	6,981	
e	16,050	16,070	
f	1,000	1,500	
h	1,800	2,200	
i	4,200	4,500	
j	5,200	5,230	
s	7,800	–	1
k	0,000	1,000	
l	22,050	22,350	
m	–	3,500	
r	0,120	0,300	

3.3.2 Standard test connector with socket-centre contact

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



1 When pin gauge Ø 4,850 mm min. Ø 4,860 mm max. is inserted to 2 mm depth.

2 The design of this dimension should meet requirement of dimension "*v*"'.

3 Slot design optional. Contact to be closed to meet electrical and mechanical request.

4 Root cut.

5 Mechanical and electrical reference plane.

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

Table 5 – Dimensions of connector with socket-centre contact

Reference	mm		Notes
	Min.	Max.	
a	M22×1		
d	6,971	6,981	
*d*1	5,000	5,500	
e	16,050	16,070	
n	18,080	18,100	
p	9,500	–	
q	7,500	–	
s	6,700	7,000	
t	5,170	5,200	
m	5,000	–	
u	7,200	7,400	
v	6,997	7,003	1
w	–	–	2
z	0,200	0,300	3
r_1	0,20	0,35	
r_2	0,20	0,35	

4 Quality assessment procedures

4.1 General

Subclauses 4.1 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 S7-16 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 6.

Table 6 – 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 7,5 GHz	
Return loss [a]	9.2.1		For interface only
Straight styles		≥20 dB (DC to 7,5 GHZ)	
Right angle styles		See DS	
For flexible cable		See DS	
Component mounting style		See DS	
Solder bucket and PCB mounting style		See DS	
Insertion loss		Na	
Power rating[a]	9.2.2	500 W at 2 GHz	25 °C VSWR = 1 at sea level 2GHz peak power 5 KW Duty ratio 10 %
Centre contact resistance [b]	9.2.3		
initial		< 0,4 mΩ	
after tests		< 0,8 mΩ	
Outer contact continuity [b]	9.2.3		
initial		≤ 1,5 mΩ	
after tests		≤ 1,9 mΩ	
Insulation resistance	9.2.5		
initial		≥ 10 GΩ	
after conditioning		≥ 100 MΩ	
Proof voltage [c, d]			
Sea level	9.2.6	3 000 Vrms	
At 4,4 Kpa		350 Vrms	
Screening effectiveness [e]	9.2.7		

Ratings and characteristics	Test method IEC 61169-1:2013 Subclause	Value	Remarks, deviation from standard test method
0,5 GHz to 1 GHz		>110 dB at 1 GHz	Applied torque 25 Nm Zt = 0,02 mΩ
Intermodulation level	IEC 62037	–155 dBc	Testing power 20 W
Discharge test (Corona effect) at sea level	9.2.8	2 800 V	
Mechanical			
Gauge retention force (resilient contact)	9.3.4		
Centre contact		10 N to 20 N	
Outer contact		Na	
Centre contact captivation [f]	9.3.5		
axial force		≥ 200 N	
torque		See DS	
Engagement and separation axial force			
engagement		≤ 28 N	Typical
separation		≤ 28 N	Typical
Coupling moment Coupling nut friction Coupling torque Proof torque		≤ 30 Nm	
Effectiveness of cable fixing against			
– cable rotation	9.3.7	See DS	
– cable pulling	9.3.8	See DS	
		See DS	
– cable bending	9.3.9	300 N climatic category A	Bending number 10 Bending angle 90°
		150 N climatic category B	
– cable torsion	9.3.10	5 Nm climatic category A 2,5 Nm climatic category B	
Tensile strength of coupling mechanism	9.3.11	≥ 445 N	
Bump	9.3.13	See DS	
Vibration	9.3.3	1 000 m/s^2 (10 Hz to 500 Hz)	10 g acceleration
Shock	9.3.14	500 m/s^2 1/2sine wave 11 ms	50 g acceleration
Endurance			
Mechanical endurance	9.3.15	500 operations	
High temperature endurance [g]	9.4.5	1 000 h at 125 °C	
Environmental			
Climatic category		40/85/21	A
		55/125/21	B
Salt mist	9.4.10	48 h spray	

Ratings and characteristics	Test method IEC 61169-1:2013 Subclause	Value	Remarks, deviation from standard test method
Sealing	9.4.7	1 cm^3 /h max	100 kPa to 110 kPa differential pressure
Water immersion	9.4.9	See DS	

[a] Characteristics indicated are those that can be applied to basic connector. Intrinsic limitations of the cable may diminish the performance of the assembly and reference should always be made to the actual values given in the detail specification.

[b] Values for a single pair of connectors.

[c] Voltages are r.m.s. values of a.c. at 40 Hz to 65 Hz, unless otherwise specified.

[d] Values are depending also of the cable type.

[e] Applicable in fully mated position. Depending of cable type values for a single pair of connector.

[f] Maximum displacement of 0,25 mm in each direction.

[g] Upper temperature limit can be restricted by the cable characteristics. Reference should be made to the relevant cable specification.

4.3 Test schedule and inspection requirements

4.3.1 Acceptance tests

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

Table 7 describes the acceptance tests to be performed.

4.3.2 Periodic tests

Table 8 describes the periodic tests to be performed.

Table 7 – Acceptance tests

–	IEC 61169-1:2013 Subclause	Assessment level M (higher)				Assessment level H (lower)			
		Test required	IL	AQL %	Period	Test required	IL	AQL %	Period
Group A1					Lot by Lot				Lot by Lot
Visual inspection	9.1.1	a	II	1		a	S3	1,5	
Group B1									
Outline dimension	9.1.2	a	S4	0,4		a	S3	4,0	
Mechanical compatibility	9.1.2.2	a	II	1		a	S3	1,5	
Engagement and separation	9.3.6	a	S4	0,4		a	S3	1,5	
Gauge retention (resilient contacts)	9.3.4	ia	II	1		ia	S3	1,5	
Sealing									
non hermetic	9.4.7	ia	II	0,65		ia	S3	1	
hermetic	9.4.8	ia	II	0,015		ia	S3	0,025	
Voltage proof	9.2.6	a	II	0,4		a	II	4,0	
Solderability (d)	9.3.2.2	ia	S4	0,4		ia	S3	4,0	
Insulation resistance	9.2.5	a	S4	0,4		a	S3	4,0	
For the symbols, abbreviations and procedures, see the end of Table 8.									

Table 8 – Periodic tests

	IEC 61169-1:2013 Subclause	Assessment level M (higher)				Assessment level H (lower)			
Group D1 (d)			**6**	**1**	**3 years**		**3**	**1**	**3 years**
Solderability connector assemblies	9.3.2.2	ia				ia			
Resistance to soldering heat	9.3.2.3	ia				ia			
Mechanical tests on cable fixing									
cable rotation (nutation)	9.3.7	na				na			
cable pulling	9.3.8	ia				ia			
cable bending	9.3.9	ia				ia			
cable torsion	9.3.10	ia				ia			
Group D2 (d)			**6**	**1**	**3 years**		**3**	**1**	**3 years**
Contact resistance, outer conductor and screen continuity centre conductor continuity	9.2.3	a				a			
Vibration	9.3.3	a							
Damp heat, steady state	9.4.3	a				a			
Group D3 (d)			**1**	**1**	**3 years**		**1***	**1**	**3 years**
Dimensions piece-parts and materials	9.1.2	a				a			
Group D4 (d)			**6**	**1**	**3 years**		**3**	**1**	**3 years**
Mechanical endurance	9.3.15	a				a			
High temperature endurance	9.4.5	a				a			
Discharge test	9.2.8								
Climatic conditioning	9.4	na				na			
Group D5 (d)			**6**	**1**	**3 years**		**3**	**1**	**3 years**
Return loss	9.2.1	a				a			
Screening effectiveness	9.2.7	a				a			
Water immersion	9.4.9	ia				ia			
Group D6 (d)			**6**	**1**	**3 years**		**3**	**1**	**3 years**
Contact captivation	9.3.5	a				a			
Rapid change of temperature	9.4.4	na				na			
Climatic sequence	9.4.2	a				a			
Group D7 (d)			**1§**		**3 years**		**1§**		**3 years**
Salt mist	9.4.10	a							

a suggested as applicable
ia test suggested (if technically applicable)
na not applicable
IL inspection level
AQL acceptable quality level
* one set of piece-parts each style and variant, unless using common piece parts
# for quality conformance , a total of two failures only permitted for level H and 1 failure only for level M from groups D1 to D7
§ Group D7 – number of pairs for each solvent
(d) destructive tests – specimens shall not be returned to stock

4.4 Procedures for the quality conformance

4.4.1 Quality conformance inspection

This shall consist of test group 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) writers shall use the appropriate BDS pro-forma. The following pages comprise the pro-forma BDS dedicated for use with type 50 Ω type S7-16 connectors. As such, it will already have entered on it information relating to

a) the basic specification number applicable to all the detail specification covering connector styles of the type covered by the sectional specification,

b) the connector series designation.

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

5.2 Identification of the component

(1) 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;

(2) Enter details of assessment level and the climatic category.

(3) 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 mouting plane(s) relative to the front face of the connector.

(4) Any maximum panel thickness limitations for fixed connectors shall be stated.

(5) 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.

5.3 Performances

(6) Performance data listing the most important characteristics of the connectors in accordance with the requirements of the relevant sectional specification. Deviation from the minimum requirements shall be clearly indicated. Non-applicable parameters shall be marked "na".

5.4 Marking, ordering information and related matters

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

5.5 Selection of tests, test conditions and severities

(8) "na" shall be used to indicated 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 tests 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 method and test conditions, including any relevant deviations given in the test schedule of the sectional specification.

5.6 Blank detail specification pro-forma for type S7-16 connector

The following pages contain the complete BDS pro-forma.

<table>
<tr><td colspan="3">(1)</td><td colspan="3">Page 1 of
(2)</td></tr>
<tr><td colspan="3">ELECTRONIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH GENERIC SPECIFICATION IEC 61169-1 NATIONAL REFERENCE</td><td colspan="3">(3) .
(4) .</td></tr>
<tr><td colspan="4">(5) Detail specification for radio frequency coaxial connector of assessed quality</td><td colspan="2">Type</td></tr>
<tr><td colspan="3">Style</td><td colspan="3">Special features and markings</td></tr>
<tr><td colspan="2">Method of cable/wire+ attachment</td><td colspan="4">centre conductor – solder/crimp+
outer conductor – solder/clamp/crimp +
+ delete as appropriate</td></tr>
<tr><td colspan="2">(6) Assessment level.</td><td colspan="2">Characteristic impedance
50 Ω</td><td colspan="2">Climatic category..40/85./21./</td></tr>
<tr><td colspan="3">(7) Outline and maximum dimensions</td><td colspan="3">Panel piercing and mounting details</td></tr>
<tr><td colspan="6">(8) Variants</td></tr>
<tr><td>Variant No.</td><td>Description of variant</td><td>IEC 61196</td><td></td><td></td><td></td></tr>
<tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr>
<tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr>
<tr><td colspan="6">Information about manufacturers who have components qualified under the IECQ Conformity Assessment System is available through the IECQ on-line certificate system.</td></tr>
</table>

(9) Performance (including limiting conditions of use)

Ratings and characteristics	Variant No. Designation	IEC 61169-1:2013 Subclause	Value	Remarks, including any deviations from standard test methods
Electrical				
Nominal impedance			50 Ω	
Frequency range Return loss		9.2.1	0 GHz to 7,5 GHz GHz GHz GHz	Measurement frequency range
Centre contact resistance		9.2.3	≤ mΩ ≤ mΩ	Initial After conditioning
Centre conductor continuity		9.2.3	≤ mΩ ≤ mΩ ≤ mΩ ≤ mΩ	Resistance change due to conditioning
Outer contact continuity		9.2.3	≤ mΩ ≤ mΩ	Initial After conditioning
Insulation resistance		9.2.5	≥ GΩ ≥ GΩ	Initial After conditioning
+ Proof voltage at sea level		9.2.6	kV kV kV kV	86 kPa to 106 kPa
+ Proof voltage at 4,4 kPa		9.2.6	kV kV kV kV	kPa (if not 4,4 kPa)
Screening effectiveness		9.2.7	dB at GHz	Z_t ≤.. mΩ
Discharge test (corona) at sea level		9.2.8	≥ V ≥ V ≥ V ≥ V	Extinction voltage
ADDITIONAL ELECTRICAL CHARACTERISTICS				
Intermodulation level		IEC 62037	dBc at GHz	Testing 20 W
+ Voltage values are r.m.s. values at 50 Hz to 60 Hz, unless otherwise specified.				

Ratings and characteristics		IEC 61169-1:2013 Subclause	Value	Remarks, including any deviations from standard test methods
Mechanical				
Soldering – bit size		9.3.2		
Gauge retention resilient contacts – inner contact – outer contact		9.3.4	 N N	 See Figure 7 and Table 3 See Figure 8 and Table 4
Centre contact captivation – axial force – permitted displacement each direction – torque		9.3.5	 N mm Nm	
Engagement and separation – axial force		9.3.6		Achievable by hand
Strength of coupling mechanism		9.3.11	N	
Effectiveness of cable fixing against – cable rotation		9.3.7	Rotations	
– cable pulling		9.3.8	 N N N N	Point of application and duration mm s mm s mm s mm s
– cable bending		9.3.9	 cycles cycles cycles cycles	Length of cable and mass mm mm mm mm
– cable torsion		9.3.10	 Nm Nm Nm Nm	Duration of applied torque s s s s
Bending moment		9.3.12	Nm	Relative to reference plane
Bumps total		9.3.13	m/s^2 to Hz	(g_n acceleration)
Vibration		9.3.3	m/s^2 to Hz	(g_n acceleration)
Shock		9.3.14	m/s^2 Shape ms	(g_n acceleration)
ADDITIONAL MECHANICAL CHARACTERISTICS				

Ratings and characteristics		IEC 61169-1:2013 Subclause	Value	Remarks including any deviations from standard test methods
Environmental				
Climatic category				
Sealing non-hermetically sealed connectors		9.4.7	cm^3/h	100 kPa to 110 kPa pressure differential
Sealing hermetically sealed connectors		9.4.8	10^{-5} $bar/cm^3/h$	100 kPa to 110 kPa pressure differential
Water immersion		9.4.9		
Salt mist		9.4.10	h	Duration of spraying
ADDITIONAL ENVIRONMENTAL CHARACTERISTICS				
ENDURANCE				
Mechanical		9.3.15	operations	
High temperature		9.4.5	h at °C	
ADDITIONAL ENDURANCE CHARACTERISTICS				
CHEMICAL CONTAMINATION				
Resistance to solvents and contaminating fluids to be used. Applicable fluids		9.4.11		
Sulphur dioxide		9.4.12	days	

(10) Supplementary information

– **Marking of the component: in accordance with 11.1 of IEC 61169-1:2013 in the following order of procedure**
1) Identity of manufacture
2) Manufacturing date code year /week
Component identification variant No./designation Identification
– Marking and contents of package: in accordance with 11.2 of IEC 61169-1:2013
1) Information prescribed in 11.1 of IEC 61169-1:2013 detailed above
2) Nominal characteristic impedance Ω
3) Assessment level code letter
4) Any additional marking required
– Ordering information:
1) Number of the detail specification/variant code
2) Assessment level code letter
3) Body finish (if more than one listed)
4) Any additional information or special requirements
– Related documents (if not included in IEC 61169-1:2013 or sectional specification): . .
– Structural similarity in accordance with 10.2.2 of IEC 61169-1:2013
Relevant information on a basic style should be entered as variant 01.

6 Marking

6.1 Marking of component

Each component shall be legibly and durably marked, where space permits and in the following order of precedence, with:

a) identity code of the manufacturer;

b) manufacturer’s connector identification code or IEC connector designation.

6.2 Marking and contents of package

The package shall be marked with the information prescribed in 6.1 and, in addition, the following information shall be given:

a) nominal characteristic impedance;

b) manufacturing date code;

c) any additional marking required by the relevant specification.

When required by the relevant specification, the package shall also include instructions for assembling the connector(s) and instructions for the use of any special tools or materials, as necessary.

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