

<b>STN</b>	<b>Vysokofrekvenčné konektory</b> <b>Časť 11: Rámcová špecifikácia VF koaxiálnych</b> <b>konektorov vnútorným priemerom vonkajšieho</b> <b>vodiča 9,5 mm so závitovým spojením</b> <b>Charakteristická impedancia 50 ohmov</b> <b>(typ 4.1-9.5)</b>	<b>STN</b> <b>EN 61169-11</b>  35 3811
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Radio-frequency connectors - Part 11: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 9,5 mm with threaded coupling - Characteristic impedance 50 ohmov (type 4,1-9,5)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/18

Obsahuje: EN 61169-11:2017, IEC 61169-11:2017

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EUROPEAN STANDARD

**EN 61169-11**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2017

ICS 33.120.30

English Version

**Radio-frequency connectors - Part 11: Sectional specification for  
RF coaxial connectors with inner diameter of outer conductor 9,5  
mm with threaded coupling - Characteristic impedance 50 Ω  
(type 4,1-9,5)  
(IEC 61169-11:2017)**

Connecteurs pour fréquences radioélectriques - Partie 11:  
Spécification intermédiaire relative aux connecteurs  
coaxiaux pour fréquences radioélectriques avec diamètre  
intérieur du conducteur extérieur de 9,5 mm à couplage  
fileté - Impédance caractéristique 50 Ω (type 4,1-9,5)  
(IEC 61169-11:2017)

Hochfrequenz-Steckverbinder - Teil 11:  
Rahmenspezifikation für koaxiale HF-Steckverbinder mit 9,5  
mm Innendurchmesser des Außenleiters und  
Schraubverriegelung - Wellenwiderstand 50 Ohm (Typ 4.1-  
9.5)  
(IEC 61169-11:2017)

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## European foreword

The text of document 46F/322A/CDV, future edition 1 of IEC 61159-11, prepared by SC 46F "RF and microwave passive components", of IEC/TC 46 "Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61159-11:2017.

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) 2018-01-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-26

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61169-1	2013	Radio-frequency connectors -- Part 1: Generic specification - General requirements and measuring methods	EN 61169-1	2013
IEC 62037-3	-	Passive RF and microwave devices, intermodulation level measurement -- Part 3: Measurement of passive intermodulation in coaxial connectors	EN 62037-3	-



# INTERNATIONAL STANDARD



**Radio-frequency connectors –  
Part 11: Sectional specification for RF coaxial connectors with inner diameter of  
outer conductor 9,5 mm with threaded coupling – Characteristic impedance 50  $\Omega$   
(type 4,1-9,5)**



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IEC 61169-11

Edition 1.0 2017-03

# INTERNATIONAL STANDARD



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**Radio-frequency connectors –  
Part 11: Sectional specification for RF coaxial connectors with inner diameter of  
outer conductor 9,5 mm with threaded coupling – Characteristic impedance 50  $\Omega$   
(type 4,1-9,5)**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 33.120.30

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## RADIO-FREQUENCY CONNECTORS –

**Part 11: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 9,5 mm with threaded coupling – Characteristic impedance 50  $\Omega$  (type 4,1-9,5)**

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International Standard IEC 61169-11 has been prepared by subcommittee 46F: RF and microwave passive components, of IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

The text of this International Standard is based on the following documents:

CDV	Report on voting
46F/322A/CDV	46F/336/RVC

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

This document 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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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- withdrawn,
- replaced by a revised edition, or
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## RADIO-FREQUENCY CONNECTORS –

### Part 11: Sectional specification for RF coaxial connectors with inner diameter of outer conductor 9,5 mm with threaded coupling – Characteristic impedance 50 $\Omega$ (type 4,1-9,5)

#### 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  $\Omega$  cable networks (type 4,1-9,5).

This document 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 4,1-9,5 types RF coaxial connectors with nominal impedance 50  $\Omega$  are threaded coupling units which are used with all kinds of RF cables and microstrips in microwave transmission systems. And the working frequency is up to 14 GHz.

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

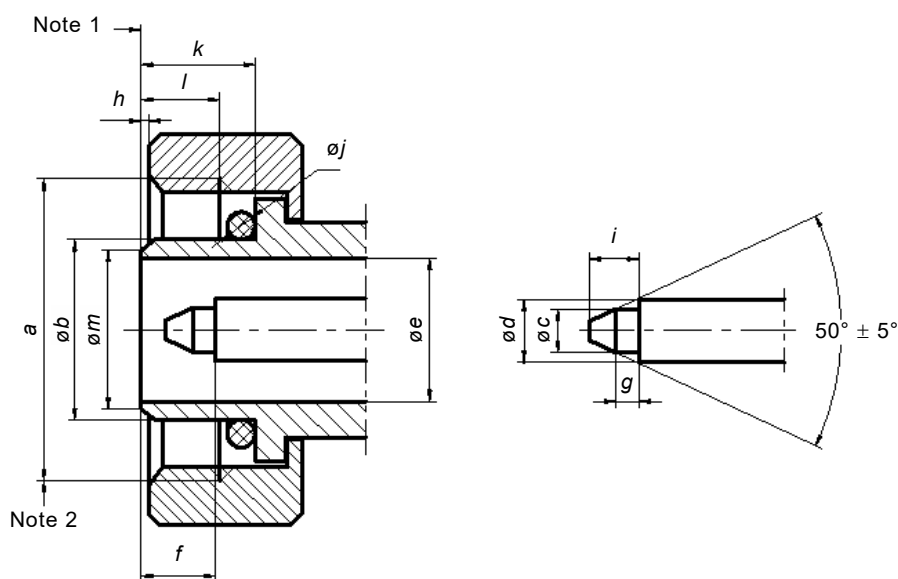
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IEC 61169-1:2013, *Radio frequency connectors – Part 1: Generic specification – General requirements and measuring methods*

IEC 62037-3, *Passive RF and microwave devices, intermodulation level measurement – Part 3: Measurement of passive intermodulation in coaxial connectors*

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IEC

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 "M20×1" indicates metric screw thread with nominal diameter 20 mm and screw-pitch of 1 mm.

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

**Table 1 – Dimensions of connector with pin centre contact**

Ref.	mm	
	Min.	Max.
<i>a</i>	M20×1	
<i>b</i>	11,84	12,02
<i>c</i>	2,855	2,945
<i>d</i> <sup>a</sup>	4,13 (nominal)	
<i>e</i>	9,45	9,55
<i>f</i>	5,05	5,35
<i>g</i>	1,4	1,6
<i>h</i>	0	1,0
<i>i</i>	3,0	4,0
<i>j</i> <sup>b</sup>	–	–
<i>k</i> <sup>c</sup>	–	–
<i>l</i>	6,2	–
<i>m</i>	10,8	–

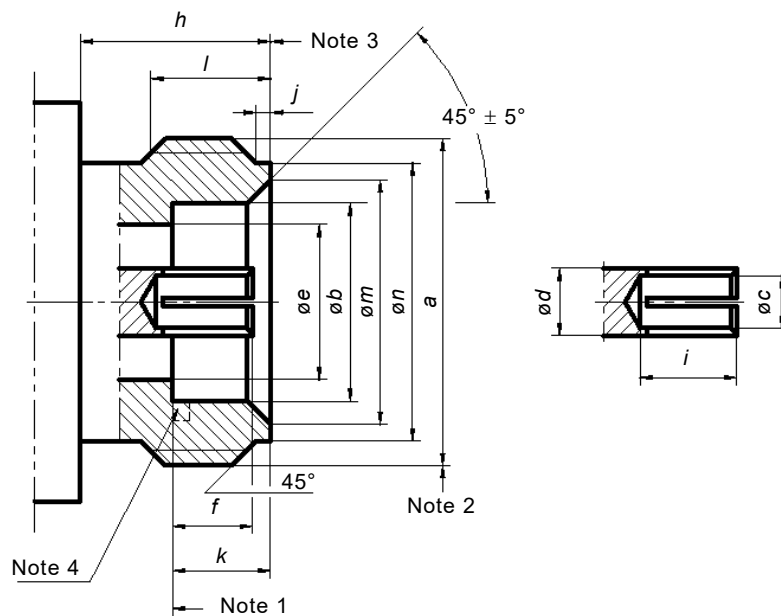
<sup>a</sup> This dimension tolerance is determined by the tolerance of characteristic impedance.

<sup>b</sup> Sealing gasket to meet climatic and environmental requirements.

<sup>c</sup> The dimension given assumes no sealing gasket fitted. If sealing is required, dimension *k* (Figure 1) should be arranged so that with the gasket chosen adequate pressure is applied to the front face (dimensions *m* and *b*) of the socket connector (Figure 2) to ensure adequate sealing.

### 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.



IEC

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 "M20×1" indicates metric screw thread with nominal diameter 20 mm and screw-pitch of 1 mm.

NOTE 3 Minimum distance from installation flanges or accessories.

NOTE 4 Design for undercut to be allowed.

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

**Table 2 – Dimensions of connector with socket centre contact**

Ref.	mm	
	Min.	Max.
<i>a</i>	M20×1	
<i>b</i>	12,03	12,21
<i>c</i> <sup>a</sup>	–	–
<i>d</i> <sup>b</sup>	4,13 (nominal)	
<i>e</i>	9,45	9,55
<i>f</i>	4,73	5,03
<i>h</i>	6,5	–
<i>i</i>	5	–
<i>j</i>	1,9	2,3
<i>k</i>	6,05	6,20
<i>l</i>	6	–
<i>m</i>	14,9	15,0
<i>n</i>	18,3	18,4

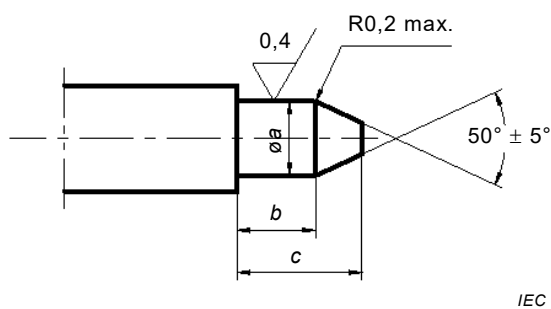
<sup>a</sup> Slot design optional. When mating with a pin with  $\Phi 2,855$  mm to  $\Phi 2,945$  mm, it shall meet the mechanical and electrical requirements.

<sup>b</sup> This dimension tolerance is determined by the tolerance of characteristic impedance.

## 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 retention purpose) Mass of gauge : $150^{+5}_0$ g	
	mm		mm	
	Min.	Max.	Min.	Max.
<i>a</i>	2,945	2,950	2,850	2,855
<i>b</i>	2,0	2,2	2,0	2,2
<i>c</i>	3,3	3,5	3,3	3,5

Material: steel, polished.

The test procedure is as follows:

a) Sizing test

The gauge A shall be inserted once only into the socket centre contact. This is a sizing operation.

b) Retention test

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

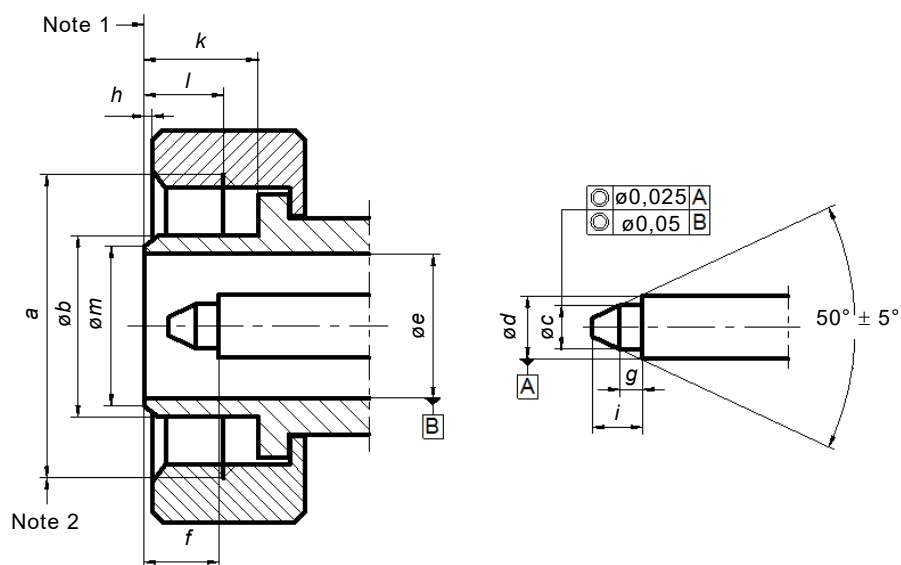
### 3.2.2 Connector with pin centre contact

Not applicable.

### 3.3 Dimensions – Standard test connectors – Grade 0

#### 3.3.1 Connector with pin centre contact

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



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NOTE 1 Mechanical and electrical reference plane.

NOTE 2 "M20×1" indicates metric screw thread with nominal diameter 20 mm and screw-pitch of 1 mm.

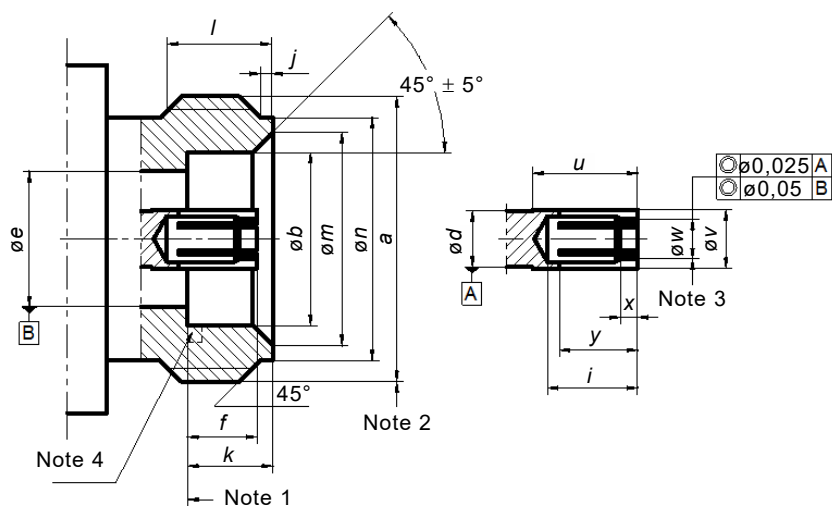


**Figure 4 – Connector with pin centre contact (for dimensions, see Table 4)****Table 4 – Dimensions of connector with pin centre contact**

Ref.	mm	
	Min.	Max.
<i>a</i>	M20×1	
<i>b</i>	11,84	12,02
<i>c</i>	2,898	2,902
<i>d</i>	4,126	4,130
<i>e</i>	9,500	9,510
<i>f</i>	5,040	5,060
<i>g</i>	1,4	1,6
<i>h</i>	0	1,0
<i>i</i>	3,0	4,0
<i>k</i>	6,3	–
<i>l</i>	6,2	–
<i>m</i>	10,8	–

### 3.3.2 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.



IEC

NOTE 1 Mechanical and electrical reference plane.

NOTE 2 "M20×1" indicates metric screw thread with nominal diameter 20 mm and screw-pitch of 1 mm.

NOTE 3 Six 0,3 mm wide slots  $60^\circ \pm 50'$  apart.

NOTE 4 The design for undercut to be allowed.

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

**Table 5 – Dimensions of connector with socket centre contact**

Ref.	mm	
	Min.	Max.
<i>a</i>	M20×1	
<i>b</i>	12,03	12,21
<i>d</i>	4,126	4,130
<i>e</i>	9,500	9,510
<i>f</i>	5,000	5,020
<i>i</i>	5	–
<i>j</i>	1,9	2,3
<i>k</i>	6,05	6,20
<i>l</i>	6	–
<i>m</i>	14,9	15,0
<i>n</i>	18,3	18,4
<i>u</i> <sup>a</sup>		
<i>v</i> <sup>a</sup>		
<i>w</i> <sup>b</sup>	–	–
<i>x</i> <sup>a</sup>		–
<i>y</i> <sup>a</sup>		

<sup>a</sup> The return loss should be 10 dB better than grade 2 connector.

<sup>b</sup> When mating with pin  $\Phi 2,898$  to  $\Phi 2,902$  mm, it shall meet the mechanical and electrical requirements.

## 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 4,1-9,5 type 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
<b>Electrical</b>			
Nominal impedance		50 $\Omega$	
Frequency range		DC to 14 GHz	Or upper frequency limit of cable
Return loss <sup>a</sup>	9.2.1		For interface only
Straight styles		$\geq 26,4$ dB (DC to 4 GHz) $\geq 20,1$ dB (4 GHz to 10 GHz) $\geq 17,7$ dB (10 GHz to 14 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 <sup>a</sup>	9.2.2	500 W at 2 GHz	25 °C VSWR = 1 at sea level 2 GHz peak power 5 KW Duty ratio 10 %
Centre contact resistance <sup>b</sup>	9.2.3		
Initial		<1,0 m $\Omega$	
After tests		<1,5 m $\Omega$	
Outer contact continuity <sup>b</sup>	9.2.3		
Initial		$\leq 1,3$ m $\Omega$	
After tests		$\leq 2,6$ m $\Omega$	
Insulation resistance	9.2.5		
Initial		$\geq 5\ 000$ M $\Omega$	
After conditioning		$\geq 2\ 000$ M $\Omega$	
Proof voltage <sup>c, d</sup>			
Sea level	9.2.6	2 500 Vrms	
At 4,4 KPa		450 Vrms	
Screening effectiveness <sup>e</sup>	9.2.7		
0,5 GHz to 1 GHz		>114 dB at 1 GHz	Applied torque 10 Nm $Z_t = 0,1$ m $\Omega$
Intermodulation level	IEC 62037-3	-166 dB <sup>c</sup>	Testing power 20 W
Discharge test (Corona effect) at sea level	9.2.8	2 100 V	
<b>Mechanical</b>			
Gauge retention force (resilient contact)	9.3.4		
centre contact		$\geq 1,5$ N	
Outer contact			
Centre contact captivation <sup>f</sup>	9.3.5		

Ratings and characteristics	Test method IEC 61169-1:2013 Subclause	Value	Remarks, deviation from standard test method
Axial force		≥ 80 N	Only applicable to centre contact with captivation structure, after test, the dimension of centre contact comply with interface dimension
Torque		See DS	
Engagement and separation axial force			
Engagement			Typical
Separation			Typical
Coupling moment Coupling nut friction Coupling torque Proof torque		10 Nm to 15 Nm 20 Nm	Shall be achievable by hand in a normal manner
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	See DS See DS	
– cable torsion	9.3.10	See DS	
Tensile strength of coupling mechanism	9.3.11	500 N	
Bump	9.3.13	See DS	
Vibration	9.3.3	1 000 m/s <sup>2</sup> (10 Hz to 500 Hz)	10 g acceleration
Shock	9.3.14	500 m/s <sup>2</sup> ½ sine wave 11 ms	50 g acceleration
<b>Endurance</b>			
Mechanical endurance	9.3.15	500 operations	
High temperature endurance <sup>9</sup>	9.4.5	1 000 h at 125 °C	

Ratings and characteristics	Test method IEC 61169-1:2013 Subclause	Value	Remarks, deviation from standard test method
<b>Environmental</b>			
Climatic category		40/85/21	A
		55/125/21	B
		55/155/56	C
Salt mist	9.4.10	48 h spray	
Sealing	9.4.7	1 cm <sup>3</sup> /h max	100 kPa to 110 kPa differential pressure
Water immersion	9.4.9	See DS	
<p><sup>a</sup> 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.</p> <p><sup>b</sup> Values for a single pair of connectors.</p> <p><sup>c</sup> Voltages are RMS values of AC at 40 Hz to 65 Hz, unless otherwise specified.</p> <p><sup>d</sup> Values are depending also of the cable type.</p> <p><sup>e</sup> Applicable in fully mated position. Depending of cable type values for a single pair of connectors.</p> <p><sup>f</sup> Maximum displacement of 0,25 mm in each direction.</p> <p><sup>g</sup> Upper temperature limit can be restricted by the cable characteristics. Reference should be made to the relevant cable specification.</p>			

### 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
<b>Group A1</b>					Lot by lot				Lot by lot
Visual inspection	9.1.1	a	II	1		a	S3	1,5	
<b>Group B1</b>									
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 tables, 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)			
<b>Group D1 (d)</b>			<b>6</b>	<b>1</b>	<b>3 years</b>		<b>3</b>	<b>1</b>	<b>3 years</b>
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			
<b>Group D2 (d)</b>			<b>6</b>	<b>1</b>	<b>3 years</b>		<b>3</b>	<b>1</b>	<b>3 years</b>
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			
<b>Group D3 (d)</b>			<b>1</b>	<b>1</b>	<b>3 years</b>		<b>1*</b>	<b>1</b>	<b>3 years</b>
Dimensions piece-parts and materials	9.1.2	a				a			
<b>Group D4 (d)</b>			<b>6</b>	<b>1</b>	<b>3 years</b>		<b>3</b>	<b>1</b>	<b>3 years</b>
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			
<b>Group D5 (d)</b>			<b>6</b>	<b>1</b>	<b>3 years</b>		<b>3</b>	<b>1</b>	<b>3 years</b>
Return loss	9.2.1	a				a			
Screening effectiveness	9.2.7	a				a			
Water immersion	9.4.9	ia				ia			
<b>Group D6 (d)</b>			<b>6</b>	<b>1</b>	<b>3 years</b>		<b>3</b>	<b>1</b>	<b>3 years</b>
Contact captivation	9.3.5	a				a			
Rapid change of temperature	9.4.4	na				na			
Climatic sequence	9.4.2	a				a			
<b>Group D7 (d)</b>			<b>1§</b>		<b>3 years</b>		<b>1§</b>		<b>3 years</b>
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  $\Omega$  type 4,1-9,5 connectors. As such, it will already have entered on it information relating to

- a) the basic specification number applicable to all the detail specifications 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;
  - enter details of assessment level and the climatic category.
- 2) 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 mounting plane(s) relative to the front face of the connector.
- 3) Any maximum panel thickness limitations for fixed connectors shall be stated.
- 4) 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

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



#### 5.4 Marking, ordering information and related matters

(10) 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

(11) "na" shall be used to indicate 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 4,1-9,5 connector

The following pages contain the complete BDS pro-forma.

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

## (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
<b>Electrical</b>				
Nominal impedance			50 $\Omega$	
Frequency range Reflection factor		9.2.1	0 GHz to 14 GHz GHz GHz GHz	Measurement frequency range
Centre contact resistance		9.2.3	$\leq$ m $\Omega$ $\leq$ m $\Omega$	Initial After conditioning
Centre conductor continuity		9.2.3	$\leq$ m $\Omega$ $\leq$ m $\Omega$ $\leq$ m $\Omega$ $\leq$ m $\Omega$	Resistance change due to conditioning
Outer contact continuity		9.2.3	$\leq$ m $\Omega$ $\leq$ m $\Omega$	Initial After conditioning
Insulation resistance		9.2.5	$\geq$ G $\Omega$ $\geq$ G $\Omega$	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	GHz dB at	$Z_t \leq$ m $\Omega$
Discharge test (corona) at sea level		9.2.8	$\geq$ V $\geq$ V $\geq$ V $\geq$ V	Extinction voltage
<b>ADDITIONAL ELECTRICAL CHARACTERISTICS</b>				
Intermodulation level		IEC 62037-3	GHz dB at	Under 2 carries of +43 dBm
+ Voltage values are RMS 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
<b>Mechanical</b>			
Soldering – bit size	9.3.2		
Gauge retention resilient contacts – inner contact  – outer contact	9.3.4	N  N	See Figure 3 and Table 3
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 <sup>2</sup> to Hz	(g <sub>n</sub> acceleration)
Vibration	9.3.3	m/s <sup>2</sup> to Hz	(g <sub>n</sub> acceleration)
Shock	9.3.14	m/s <sup>2</sup> Shape ms	(g <sub>n</sub> acceleration)
<b>ADDITIONAL MECHANICAL CHARACTERISTICS</b>			

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

## (10) Supplementary information

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

## 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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