



Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Multi-channel radio frequency connectors PREVIEW Part 1: Generic specification – General requirements and test methods (standards.iten.ai)

Connecteurs radiofréquences multicanaux – Partie 1: Spécification générique – Exigences générales et méthodes d'essai





THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2019 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

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

Tel.: +41 22 919 02 11 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 corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

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 It also gives information on projects, replaced and withdrawn publications.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 38.67,000 electrotechnical terminology entries in English and once a month by email. https://standards.iteh.ai/catalog/standar

IEC Customer Service Centre - webstore.iec.2th/csc 68bdf/icc-collected from earlier publications of IEC TC 37, 77, 86 and If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22,000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary SEV online. 21

IEC Glossary - std.iec.ch/glossary

French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been CISPR.

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.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

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 une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques 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

67 000 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.





Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Multi-channel radio frequency connectors PREVIEW Part 1: Generic specification – General requirements and test methods

Connecteurs radiofréquences multicanaux₀₁₉ Partie 1: Spécification générique reg Exigences générales et méthodes d'essai c24d38768bdf/icc-63138-1-2019

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.120.30

ISBN 978-2-8322-7270-1

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.

 Registered trademark of the International Electrotechnical Commission Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

FC	DREWO	RD	4			
1	Scop	e	6			
2	Norm	ative references	6			
3	Term	s and definitions	7			
4	Design and construction					
	4.1	General	7			
	4.2	Materials and finishes	8			
	4.3	Connector interface dimensions and gauge	8			
	4.4	RF channel interface dimensions and gauge	8			
5	Stand	lard ratings and characteristics	8			
6	Class	Classifications into climatic categories				
7		vne designation	۰و م			
' 0		inements and test methods	0			
8	Requ	irements and test methods	9			
	8.1	General	9			
	8.2	Visual inspection	9			
	8.2.1	Requirements	9			
	8.2.2		10			
	8.3	Dimensions and interchangeability	10			
	8.3.1	Interface dimensions for RF channels	10			
	8.3.2	Interface dimensions for connectors	10			
	8.3.3	Outline dimensions IEC 63138-1:2019	10			
	8.3.4	https://standards.iteh.av/catalog/standards/sist/41e9958b-039c-4ebf-ad17-	10			
	0.4	Electrical tests				
	0.4.1	Return loss (applicable for cabled connectors and adaptors)	۱۱ ۱۹			
	0.4.Z	Contact resistance	I I 11			
	0.4.3 8 / /		12			
	0.4.4 9.4.5	Voltago proof	12			
	8/6	Screening effectiveness (applicable for cabled connectors and adaptors)	13			
	8/7	Discharge test (applicable for cabled connectors and adaptors)	13			
	848	Passive intermodulation level (PIM)	13			
	849	Isolation (applicable for cabled connectors and adaptors)	14			
	841	0 RE power rating (if necessary)	15			
	8.5	Mechanical test	17			
	8.5.1	Solderability (if applicable)	17			
	8.5.2	Centre contact captivation (if applicable)	17			
	8.5.3	RF channel captivation (if applicable)	18			
	8.5.4	Engagement and disengagement forces	18			
	8.5.5	Gauge retention force	18			
	8.5.6	Effectiveness against cable rotation (if applicable)	19			
	8.5.7	Effectiveness against cable pulling	19			
	8.5.8	Effectiveness against cable bending	20			
	8.5.9	Effectiveness against cable torsion (if applicable)	20			
	8.5.1	0 Strength of coupling mechanism (if applicable)	21			
	8.5.1	1 Low frequency vibration	21			
	8.5.1	2 High frequency vibration	22			

8.5.13 Sho	ock	22
8.5.14 Me	chanical endurance	23
8.5.15 Sat	fety wire hole pullout (if applicable)	24
8.6 Environ	mental test	24
8.6.1 Da	mp heat, steady state	24
8.6.2 The	ermal shock	24
8.6.3 Hig	gh temperature endurance	24
8.6.4 Lov	w temperature endurance	24
8.6.5 Lea	akage (if applicable)	24
8.6.6 He	rmetic seal	25
8.6.7 Sal	It mist	25
9 Quality asses	ssment	25
9.1 General	I	25
9.2 Qualific	ation inspection	25
9.2.1 Tes	st samples	25
9.2.2 Ins	pection procedure	26
9.2.3 Str	ucturally similar components	27
9.3 Conform	nance inspection	27
9.3.1 Ge	neral	27
9.3.2 Lot	t-by-lot inspection	27
9.3.3 Per	riodic Inspections ANDARD. PREVIEW	28
9.4 Specific	cation structures transformed suite in an inclusion structures transformed suite in an inclusion structure in the structure i	30
9.4.1 Ge	neral	30
9.4.2 See	ctional specification (SS), 63138-12019	30
9.4.3 De	tail specification (DS) log/standards/sist/41e9958b-039c-4ebf-ad17-	30
10 Marking		30
10.1 Marking	g of components	30
10.2 Marking	g and contents of package	31
Figure 1 – Diagrar	m for test for isolation	15
Table 1 – Preferre	ed climatic categories (see IEC 60068-1)	8
Table 2 – Severitie	es of vibration	22
Table 3 – Recomm	nended severities for shocks	23
Table 4 - Qualifier	ation inspection	<u>20</u> הב
		20
		28
Table 6 – Samplin	ng plans for mechanical compatibility and return loss inspection	28
Table 7 - Periodic	c inspection	29

INTERNATIONAL ELECTROTECHNICAL COMMISSION

MULTI-CHANNEL RADIO-FREQUENCY CONNECTORS -

Part 1: Generic specification – General requirements and test methods

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 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.
- misinterpretation by any end user. (standards.iteh.ai)
 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 of 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 63138-1 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:

FDIS	Report on voting
46F/467/FDIS	46F/481/RVD

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.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>IEC 63138-1:2019</u> https://standards.iteh.ai/catalog/standards/sist/41e9958b-039c-4ebf-ad17c24d38768bdf/iec-63138-1-2019

MULTI-CHANNEL RADIO-FREQUENCY CONNECTORS -

Part 1: Generic specification – General requirements and test methods

1 Scope

This part of IEC 63138-1, which is a generic specification, specifies general requirements for multi-channel radio-frequency connectors, including terms and definitions, design and construction, ratings and characteristics, climatic categories, IEC type designation, requirements and test procedures, quality assessment, marking, etc.

It provides the basis for establishing the sectional specifications for various multi-channel radio-frequency connector types.

This document applies to multi-channel radio-frequency connectors (called "connectors", hereinafter) for use in communications, electronics and other equipment.

2 Normative references

iTeh STANDARD PREVIEW

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 63138-12019

https://standards.iteh.ai/catalog/standards/sist/41e9958b-039c-4ebf-ad17-

IEC 60068-1, Environmental testing 4 Rans Id General and guidance

IEC 60068-2-6, Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)

IEC 60068-2-11, Basic environmental testing procedures – Part 2-11: Tests – Test Ka: Salt mist

IEC 60068-2-20, Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads

IEC 60068-2-27, Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock

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

IEC 61169-1-2, Radio-frequency connectors – Part 1-2: Electrical test methods – Insertion loss

IEC 61169-1-4:—¹, Radio-frequency connectors – Part 1-4: Electrical test methods – Voltage standing wave ratio, return loss and reflection coefficient

IEC 61726, Cable assemblies, cables, connectors and passive microwave components – Screening attenuation measurement by the reverberation chamber method

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

¹ Under preparation. Stage at the time of publication: IEC CDV 61169-1-4:2019.

IEC 63138-1:2019 © IEC 2019 - 7 -

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61169-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1

RF channel

channel for RF transmission which is composed of an RF contact pair

3.2

multi-channel radio-frequency connector

connector with two or more RF channels

3.3

isolation

RF signal leakage generated from any one RF channel, with respect to any other RF channel around it, and expressed by ratio of input power into the channel to the received power of any other RF channel around it, in dBT A ND A DD DDF VIEW

It can be also expressed by Formula (1): (standards.iteh.ai)

 $\frac{1}{1000} \frac{P_2}{1000} + \frac{1}{1000} \frac{P_2}{1000} + \frac{1}{1000} \frac{P_2}{1000} + \frac{1}{1000} + \frac{1$

(1)

where

 P_1 is the input power into the RF channel, transmitted by signal source;

 P_2 is the received power of any other RF channel

4 Design and construction

4.1 General

The connectors and accessories shall be designed and constructed to meet the allowance required for proper mating, installation and maintenance. The inserts in the connectors shall be designed and constructed to ensure proper mating and performance of RF channels. When design and construction permit, the connectors should have an indicator to show when mating is in place. The RF contacts of connectors should be removable as far as possible.

A visual means shall be provided to indicate when two mating connectors are properly mated.

The relevant specification is not intended to restrict details of construction which do not affect interchangeability or performance, or to be used as manufacturing drawings. The interface of the connector accessories and the recommended opening hole dimensions of the panel shall be as specified in the relevant specification.

The dimensions and tolerances shall be given in metric units. During conversion of dimensions given in inches into millimetres, they shall be rounded to the nearest 0,001 mm or 0,000 05 in. Where, however, mechanical and electrical considerations permit, the rounding shall usually be to the nearest 0,01 mm or 0,000 5 in.

4.2 Materials and finishes

The materials and finishes used for the connectors shall be as specified in the safety and environmental regulations and in the relevant specifications. Dissimilar metals (between which an electromotive coupling may exist) shall not be placed in contact with one another as an electromotive force may be created between them.

4.3 Connector interface dimensions and gauge

The connector interface dimensions (including RF channel arrangements) and gauge shall comply with the relevant specification.

4.4 RF channel interface dimensions and gauge

The interface dimensions and gauge for the RF channels in connectors shall comply with the relevant specification.

5 Standard ratings and characteristics

The ratings and characteristics applicable to each connector type and style shall be specified in the relevant specification. They should normally cover:

- electrical, mechanical and environmental performances;
- performances for each type of RF channel, which should be specified respectively when the connector is composed of different types of RF channel.

(standards.iteh.ai)

6 Classifications into climatic categories

IEC 63138-1:2019

The classification of connectors with regard to climatic conditions is based on IEC 60068-1 and indicated by a series of three sets of digits separated by oblique strokes corresponding respectively to tests at low temperature (minus sign not shown), high temperature and the number of days of exposure to damp heat, steady state.

The climatic severities are referenced by a cold temperature, high temperature and damp heat steady state duration. Examples of preferred climatic categories of this are shown in Table 1.

Category designation	Letter	Temperature range	Damp heat steady state
40/85/21	А	−40 °C to +85 °C	21 days
55/125/21	В	−55 °C to +125 °C	21 days
55/155/56	С	−55 °C to +155 °C	56 days

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

7 IEC type designation

The purpose of the IEC type designation is to identify a particular connector within the scope of IEC RF connector standardization. It is not intended to include information in excess of this.

In practice, it is usually necessary to identify a manufacturer's product because, although it may comply with this document, there may be features that are not covered by this document.

Connectors complying with the relevant specification shall be designated by the following indications and in the order given:

a) the number of this document;

- b) the letters "IEC";
- c) series code (type designation);
- d) additional identification as indicated in the relevant specification.

NOTE When an IEC type designation is used, either for the marking of the product or in a description of the product, it is the responsibility of the manufacturer to ensure that the item meets the requirements of the relevant specification.

8 Requirements and test methods

8.1 General

Unless otherwise specified, the following conditions shall apply:

- a) tests shall be carried out under standard atmospheric conditions for testing as specified in IEC 60068-1;
- b) before measurements are made, the connectors shall be preconditioned under standard atmospheric conditions for testing for a time sufficient to allow the entire connector to reach thermal stability;
- c) recovery conditions for the interval after a conditioning and the next measurement of the test shall be in accordance with IEC 60068-1.

When a nominal value only is given for an applied stress and/or the duration of application, the specified value shall be taken to indicate the minimum test severity to be applied.

In no case shall the contact parts be cleaned or otherwise prepared prior to tests, unless explicitly stated in the relevant specification.

If it is required that a cable be attached to an RF contact of the connector, this shall be done in accordance with the connector manufacturer's instructions. 8b-039c-4cbf-ad17c24d38768bdt/iec-63138-1-2019

Mated sets of connectors shall be fully engaged and screw-coupled connectors shall be tightened to the normal coupling torque quoted in the relevant specification.

In the case of mounted connectors subjected to environmental conditioning, care shall be taken to ensure that the back-of-panel portion of such fixed connectors, when appropriate, is protected.

When using for tests involving exposure to extreme temperatures, a cable with appropriate temperature capability should be used.

8.2 Visual inspection

8.2.1 Requirements

Visual inspection shall meet the following requirements:

a) Marking

Marking shall be in compliance with 10.1 and be legible after any of the specified tests.

b) Workmanship

Connectors and associated fittings shall be processed in such a manner as to be uniform in quality and shall be free from visible sharp edges, burrs and other defects that will affect life, serviceability or appearance.

c) Deterioration after electrical, mechanical and environmental tests

Unless otherwise specified, there shall be no visible deterioration likely to influence performance.

8.2.2 Inspection procedure

The inspection will be performed visually or under a magnification as stated in the relevant specification.

8.3 Dimensions and interchangeability

8.3.1 Interface dimensions for RF channels

8.3.1.1 Requirements

The mating face dimensions for RF channels shall comply with the relevant specification.

8.3.1.2 Inspection procedure

The inspection for the interface dimensions shall be performed by mating the gauge stated in the relevant specification with the RF channel.

When critical dimensions of mating faces are specified in the relevant specification for the RF channels, the inspection shall be performed using a measuring tool with adequate accuracy.

8.3.2 Interface dimensions for connectors

8.3.2.1 Requirements

The mating face dimensions for connectors shall comply with the relevant specification.

8.3.2.2 Inspection procedure standards.iteh.ai)

The inspection for the interface dimensions for connectors shall be performed by mating the gauge stated in the relevant specification with the connector 0.39c-4ebf-ad17-

c24d38768bdf/iec-63138-1-2019

8.3.3 Outline dimensions

8.3.3.1 Requirements

The outline dimensions shall be as specified in the relevant specification.

8.3.3.2 Inspection procedure

The inspection for the outline dimensions shall be performed using a measuring tool with adequate accuracy.

8.3.4 Mechanical compatibility

8.3.4.1 Requirements

The connector under test shall be mated normally with its mating connector.

8.3.4.2 Inspection procedure

The inspections for mechanical compatibility shall be performed using at least three mating connectors to mate with the connector under test separately.

IEC 63138-1:2019 © IEC 2019 - 11 -

8.4 Electrical tests

8.4.1 Return loss (applicable for cabled connectors and adaptors)

8.4.1.1 Requirements

The return loss for each RF channel in the connector shall comply with the relevant specification.

8.4.1.2 Test procedure

Each RF channel in the connector shall be tested individually for return loss in accordance with IEC 61169-1-4². All RF channels should remain in the connector when testing. Unless otherwise specified, the connectors shall be fully engaged.

8.4.1.3 Information to be given in the relevant specification

The following information shall be given in the relevant specification:

- a) frequency range to be measured;
- b) minimum return loss value;
- c) detail of the standard test connector, if required;
- d) necessary characteristics of the appropriate cable, when cable is needed;
- e) any deviation from the standard test procedure. **PREVIEW**

8.4.2 Insertion loss (applicable for cabled connectors and adaptors) (standards.iten.al)

8.4.2.1 Requirements

The insertion loss for each RF channel in the connector shall comply with the relevant specification. c24d38768bdf/iec-63138-1-2019

8.4.2.2 Test procedure

Each RF channel in the connector shall be tested individually for insertion loss as specified in IEC 61169-1-2. All RF channels should remain in the connector when testing. Unless otherwise specified, the connectors shall be fully engaged.

8.4.2.3 Information to be given in the relevant specification

The following information shall be given in the relevant specification:

- a) frequency range to be measured;
- b) maximum insertion loss value;
- c) detail of the standard test connector, if required;
- d) necessary characteristics of the appropriate cable, when cable is needed;
- e) any deviation from the standard test procedure.

8.4.3 Contact resistance

8.4.3.1 Requirements

Contact resistances of the centre contact in the RF channel, contact resistances of the outer contact in the RF channel and contact resistances of the connector shell (if applicable), shall be measured separately. The initial values of contact resistance and the value after environmental test shall be in accordance with the relevant specification.

² Under preparation. Stage at the time of publication: IEC CDV 61169-1-4:2019.

8.4.3.2 Test procedure

The connector shall be tested for contact resistance as specified in 9.2.3 of IEC 61169-1:2013; however, the following details shall be applied:

- a) all the RF channels shall remain in the connector while testing;
- b) the centre contact and outer contact in every RF channel in the connector shall be tested for contact resistance;
- c) the connector shell shall also be measured for contact resistance, when needed.

8.4.3.3 Information to be given in the relevant specification

The following information shall be given in the relevant specification:

- a) the initial value of contact resistance and the value after environmental test for the centre contacts and the outer contacts in the RF channels and the connector shell, if applicable;
- b) any deviation from the standard procedure.

8.4.4 Insulation resistance

8.4.4.1 Requirements

The initial values of insulation resistance between centre and outer contacts in every RF channel in the connector, between outer contacts for every two RF channels, if applicable, as well as between outer contacts in every RF channel and connector shell, if applicable, and the values after the environmental test, shall be in accordance with the relevant specification.

8.4.4.2 Test procedure (standards.iteh.ai)

The connector shall be tested for <u>Ecinsulation19</u> resistance as specified in 9.2.5 of IEC 61169-1:2013; however, the following details shall be applied: 4ebf-ad17-

- a) the RF channel shall remain in the connector while testing;
- b) insulation resistance between centre contact and outer contact in every RF channel in the connector shall be tested;
- c) insulation resistance between outer contacts for every two RF channels shall be tested;
- d) insulation resistance between the outer contact in every RF channel and the connector shell, if applicable, shall also be tested.

8.4.4.3 Information to be given in the relevant specification

The following information shall be given in the relevant specification:

- a) value of the test voltage if other than 500 V;
- b) minimum value of insulation resistance;
- c) test arrangement (mated or un-mated connector with or without cables);
- d) any deviation from the standard procedure.

8.4.5 Voltage proof

8.4.5.1 Requirements

Connectors shall withstand the voltage specified in the relevant specification, without breakdown or flashover.

8.4.5.2 Test procedure

The connector shall be tested for voltage proof as specified in 9.2.6 of IEC 61169-1:2013; however, the following details shall be applied:

- a) the RF channel shall remain in the connector while testing;
- b) the voltage proof between centre contact and outer contact in every RF channel in the connector shall be tested;
- c) the voltage proof between outer contacts for every two RF channels shall be tested;
- d) the voltage proof between the outer contact in every RF channel and the connector shell, if applicable, shall also be tested.

8.4.5.3 Information to be given in the relevant specification

The following information shall be given in the relevant specification:

- a) values of test voltage between centre contact and outer contact in every RF channel in the connector;
- b) values of test voltage between outer contacts for every two RF channels;
- c) values of test voltage between the outer contact in every RF channel and the connector shell, if applicable;
- d) maximum leakage current;
- e) any deviation from the standard test procedure.

8.4.6 Screening effectiveness (applicable for cabled connectors and adaptors)

8.4.6.1 Requirements

The screening effectiveness of the connector shall comply with requirements over the frequency range as stated in the relevant specification. (standards.iteh.ai)

8.4.6.2 Test procedure

IEC 63138-1:2019

The connector shall be tested for screening effectiveness as specified in IEC 61726.

c24d38768bdf/iec-63138-1-2019

Every RF channel shall be tested for screening effectiveness separately unless otherwise specified in relevant specification.

8.4.6.3 Information to be given in the relevant specification

The following information shall be given in the relevant specification:

a) frequency range to be measured;

b) allowable worst value of screening effectiveness;

c) any deviation from the standard test procedure.

8.4.7 Discharge test (applicable for cabled connectors and adaptors)

8.4.7.1 Requirements

The corona level of connectors shall be in accordance with requirements as stated in the relevant specification.

8.4.7.2 Test procedure

Every RF channel in the connector shall be tested for discharge as specified in 9.2.8 of IEC 61169-1:2013; however, the following details shall be applied:

- a) all RF channels shall remain in the connector while testing;
- b) every RF channel in the connector shall be tested separately for discharge.