IEC PAS 60512-27-200

Edition 1.0 2018-10

PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

colour inside

Connectors for electrical and electronic equipment – Tests and measurements – Part 27-200: Additional specifications for signal integrity tests up to 2 000 MHz on IEC 60603-7 series connectors – Tests 27a to 27g

IEC PAS 60512-27-200:2018-10(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 31.220.10

ISBN 978-2-8322-6093-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC PAS 60512-27-200 has been processed by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
48B/2652/DPAS	48B/2673/RVDPAS

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

A list of all parts of IEC 60512 series, under the general title *Connectors for electrical and electronic equipment – Tests and measurements* can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – TESTS AND MEASUREMENTS –

Part 27-200: Additional specifications for signal integrity tests up to 2 000 MHz on IEC 60603-7 series connectors – Tests 27a to 27g

1 Scope

This part of IEC 60512 covers additional, supplemental specifications for signal integrity and transmission performance test methods of IEC 60512-27-100, for connectors using de-embedded crosstalk measurements, which are specified in respective parts of IEC 60603-7 standards for connecting hardware applications up to 2 000 MHz.

These additional specifications are also applicable for testing the related lower frequency connectors. However, the test methodology specified in the detail specification for any given connector remains the reference conformance test for that connector.

Test procedures of IEC 60512-27-100 affected by these supplemental methods and procedures are:

- insertion loss, test 27a;
- return loss, test 27b;
- near-end crosstalk (NEXT) test 27c;
- far-end crosstalk (FEXT), test 27d;
- transverse conversion loss (TCL), test 27f;
- transverse conversion transfer loss (TCTL), test 27g.

Other test procedures referenced here are:

- transfer impedance (Z_T), see test procedures in IEC 62153-4-6 or IEC 62153-4-7.
- for coupling attenuation (a_C), see test procedures in IEC 62153-4-7 or IEC 62153-4-12.

2 Normative references

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 60050-581, *International Electrotechnical Vocabulary (IEV) – Part 581: Electromechanical components for electronic equipment*

IEC 60512-1, *Connectors for electronic equipment – Tests and measurements – Part 1: General*

IEC 60512-26-100, *Connectors for electronic equipment – Tests and measurements – Part 26-100: Measurement setup, test and reference arrangement and measurements for connectors according to IEC 60603-7 – Tests 26a to 26g*

IEC 60512-27-100, *Connectors for electronic equipment – Tests and measurements – Part 27-100: Signal integrity tests up to 500 MHz on 60603-7 series connectors – Tests 27a to 27g*

IEC 60512-28-100, *Connectors for electronic equipment – Tests and measurements – Part 28-100: Signal integrity tests up to 2 000 MHz on IEC 60603-7 and IEC 61076-3 series connectors – Tests 28a to 28g*

IEC 60603-7, *Connectors for electronic equipment – Part 7: Detail specification for 8-way, unshielded, free and fixed connectors*

IEC 60603-7-1, *Connectors for electronic equipment – Part 7-1: Detail specification for 8-way, shielded, free and fixed connectors*

IEC 60603-7-2, *Connectors for electronic equipment – Part 7-2: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz*

IEC 60603-7-3, *Connectors for electronic equipment – Part 7-3: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 100 MHz*

IEC 60603-7-4, *Connectors for electronic equipment – Part 7-4: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*

IEC 60603-7-5, *Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*

IEC 60603-7-41, *Connectors for electronic equipment – Part 7-41: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 500 MHz*

IEC 60603-7-51, *Connectors for electronic equipment – Part 7-51: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 500 MHz*

IEC 60603-7-81, *Connectors for electronic equipment – Part 7-81: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 2 000 MHz*

IEC 61156-1, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-9, *Multicore and symmetrical pair/quad cables for digital communications – Part 9: Cables for channels with transmission characteristics up to 2 GHz – Sectional specification*

IEC 61156-10, *Multicore and symmetrical pair/quad cables for digital communications – Part 10: Cables for cords with transmission characteristics up to 2 GHz – Sectional specification*

IEC 61169-16, *Radio-frequency connectors – Part 16: Sectional specification – RF coaxial connectors with inner diameter of outer conductor 7 mm (0,276 in) with screw coupling – Characteristics impedance 50 ohms (75 ohms) (type N)*

IEC 61935-1, *Specification for the testing of balanced and coaxial information technology cabling – Part 1: Installed balanced cabling as specified in ISO/IEC 11801 and related standards*

IEC 61935-2, *Specification for the testing of balanced and coaxial information technology cabling – Part 2: Cords as specified in ISO/IEC 11801 and related standards*

ISO/IEC 11801-1, *Information technology – Generic cabling for customer premises – Part 1: General requirements*

ITU-T Recommendation G.117, *Transmission aspects of unbalance about earth*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581, IEC 60512-1 and IEC 60603-7 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

4 Overall test arrangement

4.1 General

This document specifies test methods and procedures for connectors.

The test fixtures and reference connectors specified in this document are referenced by IEC 60512-28-100.

The test methods and procedures for signal integrity and transmission performance, specified in IEC 60512-28-100, covering the frequency range up to 2 000 MHz, are referenced by connector standards, specified in IEC 60603-7 and IEC 60603-7-1, with signal integrity specifications up to 2 000 MHz; e.g., IEC 60603-7-81.

This document extends the frequency range, up to 2 000 MHz, for IEC 60512-27-100, which has a frequency range up to 500 MHz.

The test methods and procedures for signal integrity and transmission performance specified herein are for connectors using de-embedded crosstalk specifications and measurements up to 2 000 MHz; e.g. IEC 60603-7-81.

The test methods and procedures specified herein are referenced by connector standards for connecting hardware normally used with twisted-pair cables having 100 Ω nominal differential characteristic impedance, which are specified up to 2 000 MHz, in accordance with IEC 61156-1 cable standard and its sectional specifications; e.g. IEC 61156-9 and IEC 61156-10.

4.2 Indirect-reference test fixtures

Indirect-reference test fixtures are for connector types utilizing indirect reference to re-embedded crosstalk vectors for measurement of transmission parameters, e.g. IEC 60603-7 series (8-way types): IEC 60603-7-2, IEC 60603-7-3, IEC 60603-7-4, IEC 60603-7-5, IEC 60603-7-41, IEC 60603-7-51, and IEC 60603-7-81.

The detail tests and measurement specifications for the measurement of the respective transmission parameters required by the detail product specifications of the IEC 60603-7 series 8-way connector types are given in Annex A.

The indirect-reference test fixtures and associated test procedures used for measuring IEC 60603-7 series 8-way connector types transmission parameters, up to 2 000 MHz, shall conform to their respective detail tests and measurements specifications requirements, given in Annex A, and to the additional requirements in this standard, which are given in Annex B, Annex C, Annex D, and Annex E.

Annex A
(normative)

Indirect-reference test fixtures

A.1 General

Indirect-reference test fixtures are for connector types utilizing indirect reference to re-embedded crosstalk vectors for measurement of transmission parameters, e.g. IEC 60603-7 series (8-way types), IEC 60603-7-2, IEC 60603-7-3, IEC 60603-7-4, IEC 60603-7-5, IEC 60603-7-41, IEC 60603-7-51, IEC 60603-7-81.

The indirect-reference test fixtures and associated test procedures used for measuring IEC 60603-7 series 8-way connector types transmission parameters shall conform to their respective detail specification test procedures requirements and to the requirements in this annex.

The IEC 60603-7 series, 8-way connector types detail specifications and respective detail test procedures standards for connector transmission parameters measurements are given in Table A.1.

Table A.1 – IEC 60603-7 series, 8-way connector types detail specifications and respective detail connector test procedures standards

Connector specification	Frequency MHz	Test procedure	Frequency MHz
IEC 60603-7-2 IEC 60603-7-3	100	IEC 60512-25-x series	100
IEC 60603-7-4 IEC 60603-7-5	250	IEC 60512-26-100	250
IEC 60603-7-41 IEC 60603-7-51	500	IEC 60512-27-100	500
IEC 60603-7-81	2 000	IEC PAS 60512-27-200	2 000

A.2 Requirements

Indirect reference test fixtures for 2 000 MHz shall also meet the overall test fixtures minimum signal integrity requirements for 2 000 MHz listed in IEC 60512-28-100.