IEC 60603-7-3

Edition 2.0 2010-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Connecteurs pour équipements électroniques – Partie 7-3: Spécification particulière pour les fiches et les embases blindées à 8 voies pour la transmission de données à des fréquences jusqu'à 100 MHz

IEC 60603-7-3:2010

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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International Standard IEC 60603-7-3 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This second edition of IEC 60603-7-3 cancels and replaces the first edition issued in 2008, and constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

– Removal of test methods that are now referenced to IEC 60512-26-100.
– Addition of TCL and TCTL requirements.
– Removal of the electrical, mechanical, dimensional, environmental conditioning tests by reference to IEC 60603-7.

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

FDIS	Report on voting
48B/2136/FDIS	48B/2177/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

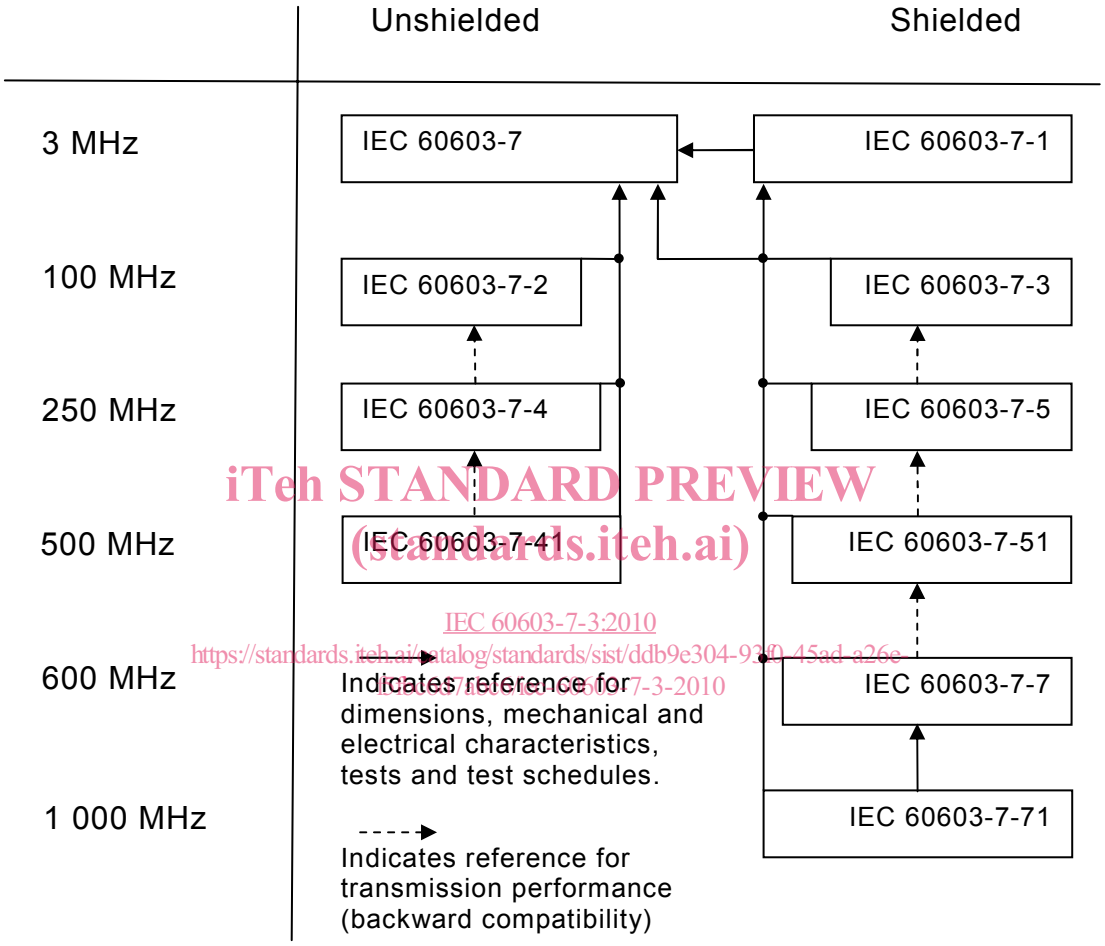
A list of all parts of IEC 60603 series, under the general title *Connectors for electronic equipment*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

INTRODUCTION

IEC 60603-7 is the base specification of the whole series. Subsequent specifications do not duplicate information given in the base document, but list only additional requirements. For complete specification regarding a component of a higher number document all lower numbered documents shall be considered as well. The following diagram shows the interrelation of the documents:



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

1 General

1.1 Scope

This part of IEC 60603 covers 8-way, shielded, free and fixed connectors, references dimensional, mechanical, electrical and environmental characteristics and tests in IEC 60603-7 and IEC 60603-7-1, and specifies electrical transmission requirements for frequencies up to 100 MHz. These connectors are typically used as category 5 connectors in class D cabling systems specified in ISO/IEC 11801.

These connectors are intermateable and interoperable with other IEC 60603-7 series connectors as defined in Clause 2 of IEC 60603-7.

These connectors are backward compatible with other IEC 60603-7 series connectors.

NOTE Transmission performance categories: in this IEC standard, the term “category”, when used in reference to transmission performance, refers to those categories defined by ISO/IEC 11801.

1.2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60512-1-100: *Connectors for electronic equipment – Part 1-100: General – Applicable publications*

IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance - Millivolt level method*

IEC 60512-27-100, *Connectors for electronic equipment – Tests and measurements – Part 27-100: Signal integrity tests up to 500 MHz on IEC 60603-7 series connectors – Tests 27a to 27g*[1]

IEC 60603-7:2008, *Connectors for electronic equipment – Part 7: Detail specification for 8-way, unshielded, free and fixed connectors*

IEC 60603-7-1:2009, *Connectors for electronic equipment – Part 7-1: Detail specification for 8-way, shielded, free and fixed connectors*

IEC 61156 (all parts): *Multi-core and symmetrical pair/quad cables for digital communications*

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[1] To be published.

2 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60603-7, Clause 2 apply as well as the following.

2.1
backward compatibility
the backward compatibility requirement ensures that a free or fixed connector which is in compliance with this standard, mated with a fixed or free connector respectively in compliance with any lower frequency IEC 60603-7 series connector, fully complies with the requirements of the lower frequency IEC 60603-7 series connector

3 Common features and isometric view

See Clause 3 of IEC 60603-7-1 for dimensions, views and requirements.

4 Cable terminations and internal connections – Fixed and free connectors

See Clause 4 of IEC 60603-7-1 for cable termination and internal connections types.

5 Gauges

The gauges as defined by Clause 5 of IEC 60603-7-1 shall apply.

6 Characteristics

6.1 General

Connectors according to IEC 60603-7-3 shall also conform to all relevant requirements specified by IEC 60603-7-1.

6.2 Pin and pair grouping assignment

The pin and pair grouping assignment of 6.2 of IEC 60603-7 applies.

6.3 Classification into climatic category

Connectors according to IEC 60603-7-3 are classified in the same climatic categories as defined by IEC 60603-7.

6.4 Electrical characteristics

Connectors according to IEC 60603-7-3 shall also conform to the electrical characteristics specified by IEC 60603-7-1.

6.5 Transmission characteristics

6.5.1 General

Compliance to this standard in respect to transmission characteristics, is determined according to specific test methods described in test group EP, see Table 1. The

interoperability of connectors compliant to this standard shall be demonstrated by testing the fixed connectors with the full range of free connectors according to IEC 60512-27-100[2].

All transmission performance requirements apply between the reference planes specified in IEC 60512-27-100.

NOTE In the following subclauses *f* is the frequency expressed in MHz.

6.5.2 Insertion loss

Conditions:

IEC 60512, test 27a

Mated connectors

All pairs: ≤ $0{,}04x\sqrt{f}$ dB from 1 MHz to 100 MHz .

Whenever the equation results in a value less than 0,1 dB, the requirement shall revert to 0,1 dB.

6.5.3 Return loss

Conditions:

IEC 60512, test 27b

Mated connectors

All pairs: ≥ 60-20log (*f*) dB from 1 MHz to 100 MHz .

Whenever the equation results in a value greater than 30 dB, the requirement shall revert to 30 dB.

6.5.4 Propagation delay

All pairs: ≤ 2,5 ns

Propagation delay test does not need to be performed, since it is assumed that connectors comply by design.

6.5.5 Delay skew

All pair combinations: ≤ 1,25 ns

NOTE This characteristic is calculated from the individual propagation delay measurements and, as with propagation delay (6.5.4), it is assumed that connectors comply by design.

6.5.6 NEXT

Conditions:

IEC 60512, test 27c

Mated connectors

All pair combinations: ≥ 83-20log (*f*) dB from 1 MHz to 100 MHz .

Whenever the equation results in a value greater than 75 dB, the requirement shall revert to 75 dB.

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2 For transmission performance, interoperability and backwards compatibility, IEC 60512-26-100 may be used as an alternative to IEC 60512-27-100 for connecting hardware that has been previously qualified to IEC 60603-7-3 edition 1. Where IEC 60512-26-100 is used that shall be reported.

6.5.7 Power sum NEXT (for information only)

Conditions:

Mated connectors

$$PS\quad NEXT_k = -10\log\sum_{i=1,i\neq k}^{n} 10^{\frac{-NEXT_{ik}}{10}}$$

All pairs: ≥ 80-20log (*f*) dB from 1 MHz to 100 MHz .

NOTE This characteristic is calculated from the individual NEXT measurements and connector compliance is achieved by compliance to the NEXT requirements (6.5.6).

6.5.8 FEXT

Conditions:

IEC 60512, test 27d

Mated connectors

All pair combinations: ≥ 75,1-20log (*f*) dB from 1 MHz to 100 MHz .

Whenever the equation results in a value greater than 75 dB, the requirement shall revert to 75 dB.

6.5.9 Power sum FEXT (for information only)

Conditions:

Mated connectors

$$PS\quad FEXT_k = -10\log\sum_{i=1,i\neq k}^{n} 10^{\frac{-FEXT_{ik}}{10}}$$

All pairs: ≥ 72,1-20log (*f*) dB from 1 MHz to 100 MHz .

NOTE This characteristic is calculated from the individual FEXT measurements and connector compliance is achieved by compliance to the FEXT requirements (6.5.8).

6.5.10 Transverse conversion loss

Conditions:

IEC 60512, test 27f

Mated connectors

All pairs : ≥ 68-20log (*f*) dB from 1 MHz to 100 MHz .

Whenever the equation results in a value greater than 50 dB, the requirement shall revert to 50 dB.

6.5.11 Transverse conversion transfer loss

Conditions:

IEC 60512, test 27g

Mated connectors

All pairs: ≥ 68-20log (*f*) dB from 1 MHz to 100 MHz .

Whenever the equation results in a value greater than 50 dB, the requirement shall revert to 50 dB.

6.6 Mechanical

Connectors according to IEC 60603-7-3 shall also conform to the mechanical characteristics specified by IEC 60603-7-1.

7 Tests and test schedule

7.1 General

See 7.1 of IEC 60603-7.

7.2 Arrangement for contact resistance test:

For useful information regarding contact resistance tests see 7.2 of IEC 60603-7.

7.3 Arrangement for vibration test

For useful information regarding the principle of vibration tests see 7.3 of IEC 60603-7.

7.4 Test procedures and measuring methods

See 7.4 of IEC 60603-7.

7.5 Preconditioning

See 7.5 of IEC 60603-7.

7.6 Wiring and mounting of specimens

7.6.1 Wiring

Wiring of these connectors shall take into account the wire and cable diameter of the cables defined in the IEC 61156 series as applicable by manufacturer's specification.

7.6.2 Mounting

See 7.6.2 of IEC 60603-7.

7.7 Test schedules

The test parameters required shall not be less than those listed in Clause 6.

7.7.1 Basic (minimum) test schedule

Not applicable.

7.7.2 Full test schedule

7.7.2.1 General

In addition to the test schedules of IEC 60603-7 and IEC 60603-7-1, one further group of two sets of mated connectors is required for group EP. The free connectors for group EP shall additionally meet the requirements of IEC 60512-27-100.

7.7.2.2 Test group P preliminary

All the test group specimens shall be subjected to the preliminary groups P of IEC 60603-7 and IEC 60603-7-1.