IEC 60603-7-51

Edition 1.0 2010-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Connecteurs pour équipements électroniques – Partie 7-51: Spécification particulière pour les fiches et les embases blindées à 8 voies pour la transmission de données à des fréquences jusqu'à 500 MHz

IEC 60603-7-51:2010

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 General 7
1.1 Scope 7
1.2 Normative references 7
2 Terms and definitions 8
3 Common features and isometric view 8
4 Cable terminations and internal connections – Fixed and free connectors 8
5 Gauges 8
6 Characteristics 8
6.1 General 8
6.2 Pin and pair grouping assignment. 8
6.3 Classification into climatic category 8
6.4 Electrical characteristics 8
6.5 Transmission characteristics 8
6.5.1 General 8
6.5.2 Insertion loss 9
6.5.3 Return loss 9
6.5.4 Propagation delay 9
6.5.5 Delay skew 9
6.5.6 NEXT loss 9
6.5.7 Power sum NEXT loss (for information only) 9
6.5.8 FEXT Loss 10
6.5.9 Power sum FEXT loss (for information only) 10
6.5.10 Transverse conversion loss 10
6.5.11 Transverse conversion transfer loss 10
6.5.12 Power Sum Alien (Exogenous) NEXT 10
6.5.13 Power Sum Alien (Exogenous) FEXT 11
6.6 Mechanical 11
7 Tests and test schedule 11
7.1 General 11
7.2 Arrangement for contact resistance test 11
7.3 Arrangement for vibration test 11
7.4 Test procedures and measuring methods 11
7.5 Preconditioning 11
7.6 Wiring and mounting of specimens 12
7.6.1 Wiring 12
7.6.2 Mounting 12
7.7 Test schedules 12
7.7.1 Basic (minimum) test schedule 12
7.7.2 Full test schedule 12
Bibliography 14

Documents
Document Sharing Hub
Full document details: IEC 60603-7-51 2010

Table 1 – Test Group EP 13

Documents
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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International Standard IEC 60603-7-51 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

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

FDIS	Report on voting
48B/2093/FDIS	48B/2143/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.

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A list of all parts of the 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.

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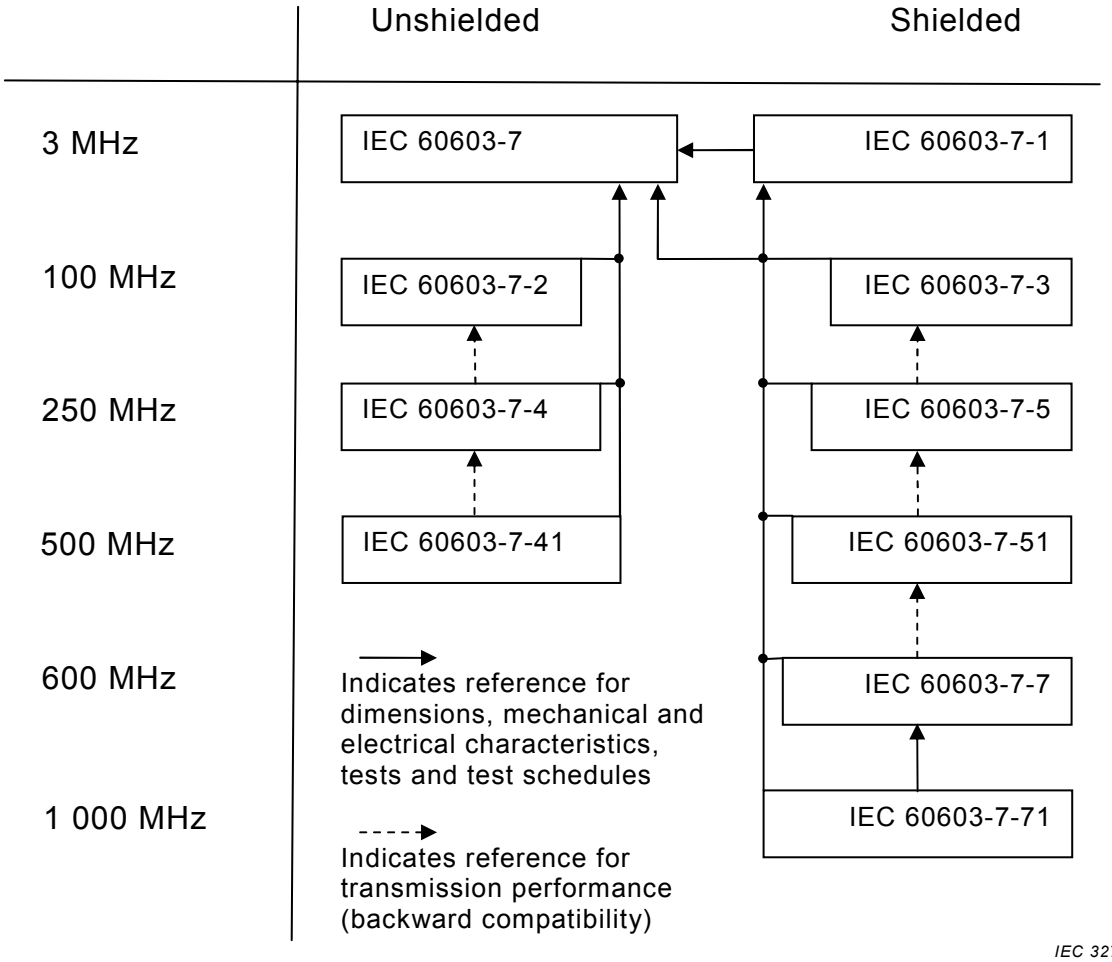
INTRODUCTION

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:



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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

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 specifies electrical transmission requirements, including power sum alien (exogenous) crosstalk, for frequencies up to 500 MHz.

These connectors are typically used as category 6_A connectors in class E_A 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 60603-7-1.

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 – Tests and measurements – Part 1-100: General – Applicable publications*

IEC 60512-25-9, *Connectors for electronicl equipment – Tests and measurements – Part 25-9: Signal integrity tests – Test 25i: Alien crosstalk*

IEC 60512-27-100[1], *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*

EC 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: Detail specification for 8-way, shielded, free and fixed connectors*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

[1] To be published.

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2 Terms and definitions

For the purposes of this document, the terms and definitions of Clause 2 of IEC 60603-7, 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 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 60603-7-51 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 60603-7-51 are classified in the same climatic categories as defined by IEC 60603-7.

6.4 Electrical characteristics

Connectors according to IEC 60603-7-51 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 future IEC 60512-27-100, Compliance to this standard in respect to the alien (exogenous) crosstalk is determined according to specific test methods described in IEC 60512-25-9.

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All transmission performance requirements apply between the reference planes specified in future 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: ≤ $0{,}02x\sqrt{f}$ dB from 1 MHz to 500 MHz.

Whenever the formula 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: ≥ 68-20log (*f*) dB from 1 MHz to 500 MHz .

Whenever the formula 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 loss

Conditions:

IEC 60512, test 27c

Mated connectors

All pair combinations: ≥ 94-20log (*f*) dB from 1 MHz to 250 MHz .

All pair combinations: ≥ 46,04 -30log (*f/250*) dB from 250 MHz to 500 MHz .

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

6.5.7 Power sum NEXT loss (for information only)

Conditions:

Mated connectors,

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

All pairs: ≥ 90-20log (*f*) dB from 1 MHz to 250 MHz .

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