

© Copyright SEK. Reproduction in any form without permission is prohibited.

Fastighetsnät för informationsöverföring – Generella kabelnät – Del 4: Bostäder

*Information technology –
Generic cabling systems –
Part 4: Homes*

Som svensk standard gäller europastandarden EN 50173-4:2007. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50173-4:2007.

Nationellt förord

Den svenska standarden innehåller en nationell informativ bilaga NA. Bilaga NA innehåller svenska termer som motsvarar de engelska termerna i standardens avsnitt 3.

Standarden skall användas tillsammans med SS-EN 50173-1, utgåva 2, 2007.

ICS 33.040.50

Denna standard är fastställd av SEK Svensk Elstandard, som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: SEK, Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00. Telefax: 08 - 444 14 30
E-post: sek@elstandard.se. Internet: www.elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

EUROPEAN STANDARD

EN 50173-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2007

ICS 33.040.50

English version

**Information technology -
Generic cabling systems -
Part 4: Homes**

Technologies de l'information -
Systèmes de câblage générique -
Partie 4: Locaux d'habitation

Informationstechnik -
Anwendungsneutrale
Kommunikationskabelanlagen -
Teil 4: Wohnungen

This European Standard was approved by CENELEC on 2007-04-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 215, *Electrotechnical aspects of telecommunication equipment*, in cooperation with the Technical Committee CENELEC TC 209, *Cable networks for television signals, sound signals and interactive services*.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50173-4 on 2007-04-11.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2008-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-05-01

The European Standards EN 50173:1995 and EN 50173-1:2002 have been developed to enable the application-independent cabling to support ICT applications in office premises. Their basic principles, however, are applicable to other types of applications and in other types of premises.

TC 215 has decided to establish relevant European Standards which address the specific requirements of these premises. In order to point out the commonalities of these cabling design standards, these EN are published as individual parts of the series EN 50173, thus also acknowledging that standards users recognize the designation “EN 50173” as a synonym for generic cabling design.

At the time of publication of this European Standard, series EN 50173 comprises the following standards:

EN 50173-1	Information technology – Generic cabling systems – Part 1: General requirements
EN 50173-2	Information technology – Generic cabling systems – Part 2: Office premises
EN 50173-3	Information technology – Generic cabling systems – Part 3: Industrial premises
EN 50173-4	Information technology – Generic cabling systems – Part 4: Homes
EN 50173-5	Information technology – Generic cabling systems – Part 5: Data centres

This standard, EN 50173-4, is based upon but is not identical to ISO/IEC 15018:2004, Information technology - Generic cabling for homes.

Contents

Introduction	6
1 Scope and conformance.....	10
1.1 Scope.....	10
1.2 Conformance.....	10
2 Normative references.....	11
3 Definitions and abbreviations.....	12
3.1 Definitions	12
3.2 Abbreviations	13
4 Structure of the generic cabling system to support ICT and/or BCT applications in homes	14
4.1 General	14
4.2 Functional elements	14
4.3 General structure and hierarchy for ICT and BCT cabling.....	14
4.4 Cabling subsystems for ICT and BCT applications	16
4.5 Accommodation of functional elements	16
4.6 Interfaces	17
4.7 Dimensioning and configuring	19
5 Cabling structure to support CCCB applications in homes	23
5.1 General	23
5.2 Functional elements	23
5.3 Cabling structure for CCCB applications.....	23
5.4 Cabling subsystems for CCCB applications.....	25
5.5 Accommodation of functional elements	25
5.6 Interfaces	25
5.7 Dimensioning and configuring	27
6 Channel performance in homes	29
6.1 General	29
6.2 Environmental performance.....	29
6.3 Transmission performance	29
7 Reference implementations in homes	33
7.1 General	33
7.2 Dimensions for ICT and BCT channels.....	34
7.3 Dimensions for CCCB channels	35

8	Cable requirements in homes.....	36
8.1	General	36
8.2	Balanced cables	36
8.3	Coaxial cables	36
9	Connecting hardware requirements in homes	37
9.1	General requirements	37
9.2	ICT connecting hardware	37
9.3	BCT connecting hardware	37
9.4	CCCB connecting hardware	38
10	Requirements for cords and jumpers	38
Annex A (normative) Link performance limits		39
Annex B (informative) Applications and Associated Cabling		40
Annex C (informative) Application-specific BCT outlets and baluns		42
Annex D (informative) Application-specific networks for audio/video applications		43
Bibliography		44

Figures

Figure 1 - Schematic relationship between the EN 50173 series and other relevant standards	7
Figure 2 – Schematic of generic cabling within homes	9
Figure 3 - Structure of the generic cabling system in homes.....	15
Figure 4 - Hierarchical structure of a generic cabling system in support of ICT and BCT applications	15
Figure 5 - Equipment and test interfaces in support of ICT and BCT applications.....	17
Figure 6 - Channels and permanent links within the home.....	18
Figure 7 - Examples of interconnection of home and network access cabling.....	20
Figure 8 – Interconnection of home cabling	22
Figure 9 - Structure of the generic cabling system in support of CCCB applications	24
Figure 10 - Hierarchical structure of a generic cabling system in support of CCCB applications	24
Figure 11 - Equipment and test interfaces in support of CCCB applications	26
Figure 12 - Channels and permanent links for CCCB cabling	27
Figure 13 - Reference implementations for ICT and BCT channels (HD/SHD - TO/BO)	34
Figure 14 - Reference implementations for CCCB channels with HD or SHD	35
Figure 15 - Reference implementations for CCCB channels with HD and SHD	35
Figure 16 - Conductor assignment of EN 61169-2 (Type 9,52) and EN 61169-24 (Type F)	38

Tables

Table 1 - Contextual relationship between EN 50173 series and other standards relevant for information technology cabling systems 8

Table 2 - Maximum channel lengths for reference implementations of ICT and BCT channels 19

Table 3 - Different channels and their potential use 30

Table 4 - BCT channel levels 32

Table 5 - Channel length equations 33

Table B.1 - Grouping of applications and cabling 40

Table B.2 - Characteristics of ICT, BCT and CCCB Cabling 41

Introduction

This European Standard specifies generic cabling in homes, installed to support one or more of the following groups of applications and based upon balanced and coaxial cabling as appropriate:

- Information and Communications Technologies (ICT);
- Broadcast and Communications Technologies (BCT);
- Commands, Controls and Communications in Buildings (CCCB).

Other cabling media, used for the above applications, are not covered in this standard.

Backbone cabling connecting individual homes within single premises is built according to the relevant standard (EN 50173-1, EN 50083 series).

Generic cabling realised according to this standard:

- i) allows deployment of a wide range of applications without changes to the fixed cabling infrastructure;
- ii) provides a platform to support moves, adds and changes of connectivity.

This European Standard, EN 50173-4, has been prepared to reflect the demands of generic cabling within homes and provides for each group of applications (ICT, BCT and CCCB):

- a) users with an application-independent generic cabling system;
- b) users with a flexible cabling scheme such that changes are both easy and economical;
- c) building professionals (for example, architects) with guidance for the design and dimensioning of home cabling according to the end-user needs or requirements (expressed or assumed);
- d) industry and applications standardisation bodies (e.g. ITU-T, ISO/IEC JTC 1/SC 6, ISO/IEC JTC 1/SC 25/WG1, IEC/TC 100, CLC/TC 205, CLC/TC 209, ETSI) with a cabling system that supports current products and provides a basis for future product development in application standardization;
- e) users, designers, and manufacturers of application-specific cabling systems with advice on interfacing to this generic cabling;
- f) suppliers of cabling components and installers of cabling with relevant requirements;
- g) service providers with a distribution system for their services.

This European Standard specifies multi-vendor cabling, and is related to:

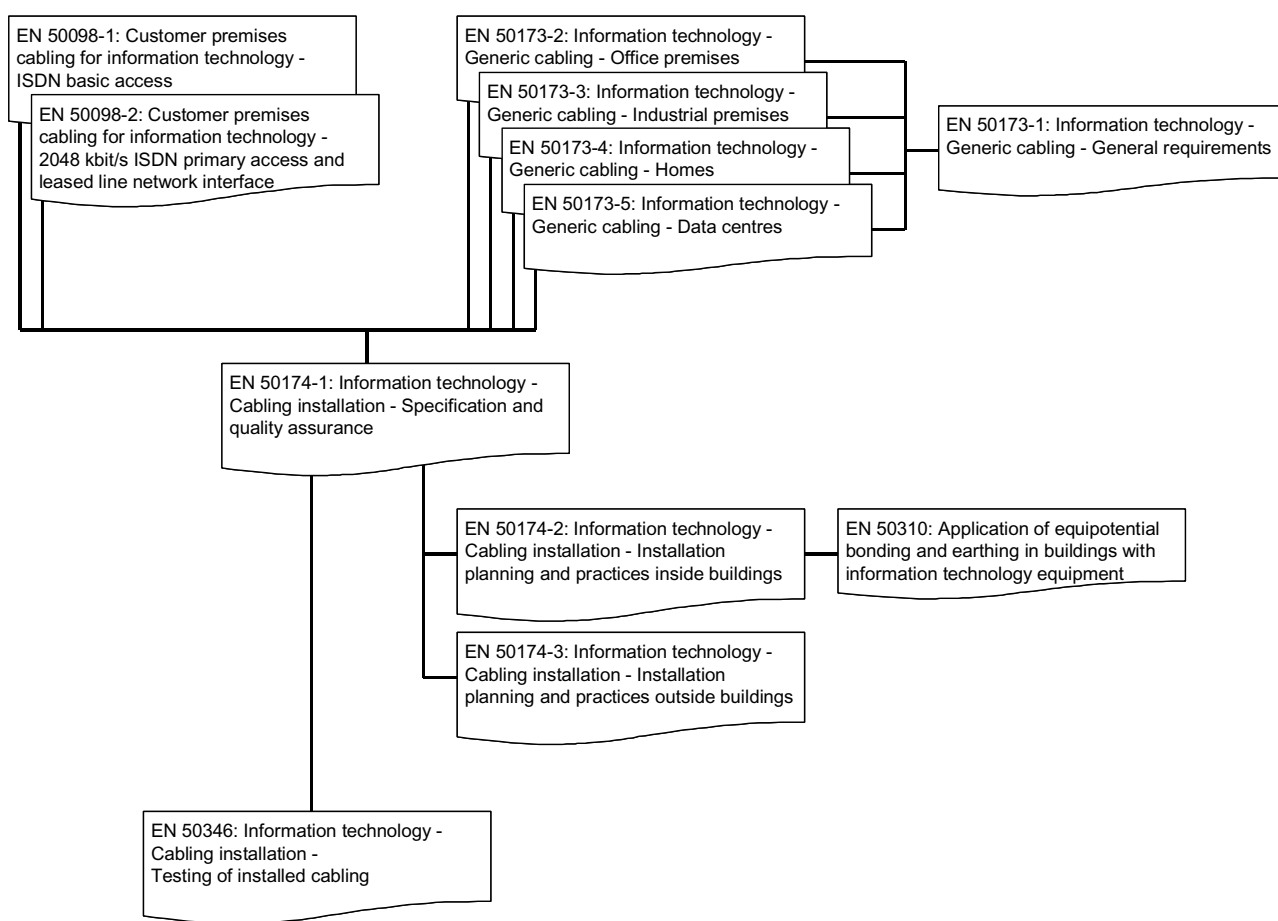
- the associated standard covering general requirements for generic cabling within premises (EN 50173-1);
- standards for cabling components developed by Technical Committees of CENELEC and/or IEC;
- standards for the quality assurance and installation of information technology cabling (series EN 50174) and testing of installed cabling (EN 50346);
- applications developed by the technical bodies of IEC (including the subcommittees of ISO/IEC JTC 1), CENELEC and study groups of ITU-T.

A number of ICT, BCT and CCCB applications have been analysed to determine the requirements for a generic cabling (see EN 50173-1:2007, Annex F) and to specify the minimum performance of channels given in Clause 6. These requirements, together with the logical and physical models described in Clauses 4 and 5, have been used to develop the transmission requirements for cabling components and to stipulate their arrangement into generic cabling systems.

Figure 1 and Table 1 show the schematic and contextual relationships between the standards produced by TC 215 for information technology cabling, namely

- 1) this and other parts of the EN 50173 series;
- 2) application dependent cabling design (e.g. EN 50098 series);
- 3) installation (EN 50174 series);
- 4) testing of installed cabling (EN 50346);
- 5) equipotential bonding requirements (EN 50310).

Figure 2 indicates the multi-layer approach specified in this standard in order to deliver ICT, BCT and CCCB applications within homes.



NOTE For the purposes of the standards in the EN 50173 and EN 50174 series the term "information technology" includes ICT, BCT and CCCB applications.

Figure 1 - Schematic relationship between the EN 50173 series and other relevant standards

Table 1 - Contextual relationship between EN 50173 series and other standards relevant for information technology cabling systems

Building design phase	Generic cabling design phase	Specification phase	Installation phase	Operation phase
EN 50310 5.2: Common bonding network (CBN) within a building 6.3: AC distribution system and bonding of the protective conductor (TN-S)	EN 50173 series except EN 50173-4 4: Structure 5: Channel performance 7: Cable requirements 8: Connecting hardware requirements 9: Requirements for cords and jumpers A: Link performance limits and EN 50173-4 4 and 5: Structure 6: Channel performance 8: Cable requirements 9: Connecting hardware requirements 10: Requirements for cords and jumpers A: Link performance limits	EN 50174-1 4 Requirements for installers 5: Requirements for premises owners	EN 50174-2 4: Requirements for installers of information technology cabling 6: Segregation of metallic information technology and mains power cabling and EN 50174-3 and (for equipotential bonding) EN 50310 5.2: Common bonding network (CBN) within a building 6.3: AC distribution system and bonding of the protective conductor (TN-S) and EN 50346 4: General requirements 5: Test parameters for balanced cabling 6: Test parameters for optical fibre cabling	EN 50174-1 5: Requirements for premises owners
		Planning phase		
		EN 50174-2 5: Requirements for planning installations of information technology cabling 6: Segregation of metallic information technology and mains power cabling 7: Additional considerations		

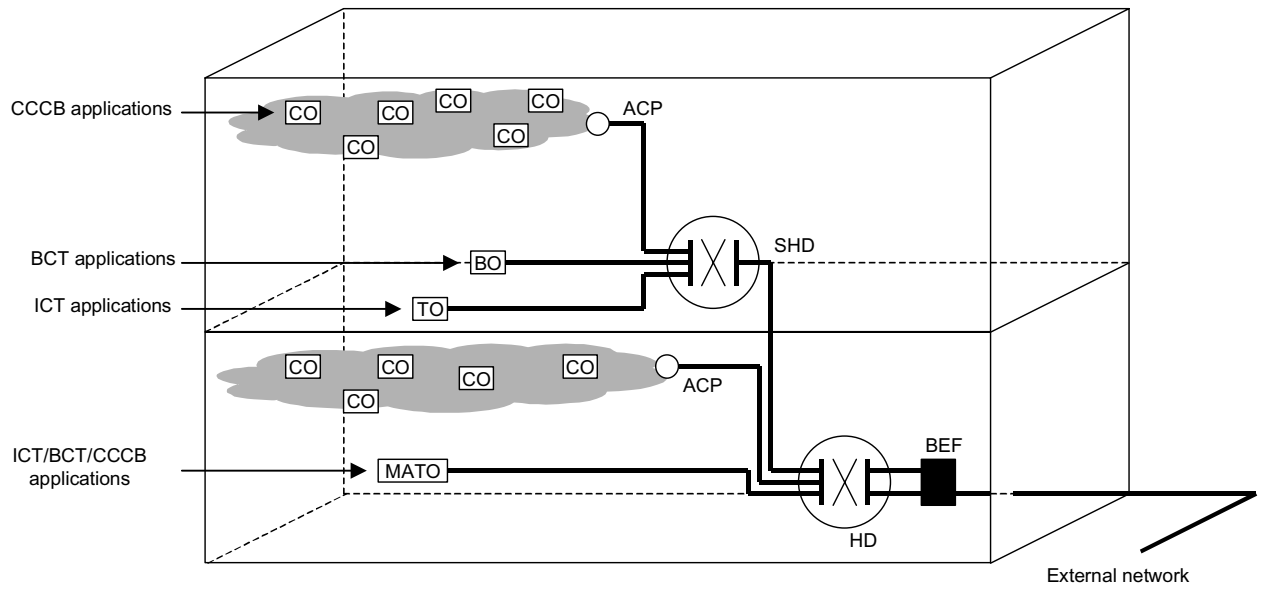


Figure 2 – Schematic of generic cabling within homes

1 Scope and conformance

1.1 Scope

This European Standard specifies generic cabling in homes, installed to support one or more of the following groups of applications and based upon balanced and coaxial cabling as appropriate:

- 1) Information and Communications Technologies (ICT);
- 2) Broadcast and Communications Technologies (BCT);
- 3) Commands, Controls and Communications in Buildings (CCCB).

A home may contain one or more buildings or may be within a building that contains more than one home.

This European Standard is based upon and references the requirements of EN 50173-1. In addition to the requirements of EN 50173-1, this European Standard specifies the following aspects of generic home cabling:

- a) structure and topology;
- b) minimum configuration;
- c) performance requirements for permanent links and channels¹⁾;
- d) density and location of connection points;
- e) interfaces to application-specific equipment and external networks;
- f) coexistence with other building services.

Safety (electrical safety and protection, optical power, fire, etc.) and electromagnetic compatibility (EMC) requirements are outside the scope of this European Standard and are covered by other standards and regulations. However, information given in this European Standard may be of assistance in meeting these standards and regulations.

NOTE 1 National regulations and local codes may preclude carrying certain services on the cabling specified in this standard.

NOTE 2 Test requirements in this standard are for system designers.

NOTE 3 The installation tests should be decided between supplier and customer or according to the relevant installation guide.

NOTE 4 Audio/video applications are traditionally supported by application-specific cabling implemented with cabling systems based on EN 50083 (see Annex D). Such cabling systems may co-exist with generic cabling specified by this European Standard.

1.2 Conformance

For a cabling system to conform to this European Standard:

- a) the cabling shall support ICT applications;
- b) the structure and configuration of cabling in support of ICT and BCT applications shall conform to the requirements of Clause 4;
- c) the structure and configuration of cabling in support of CCCB applications shall conform to the requirements of Clause 5;
- d) the interfaces to the cabling at the Multi-Application Telecommunications Outlet (MATO), Telecommunications Outlet (TO) and the Broadcast Outlet (BO) shall conform to the requirements of Clause 9 with respect to mating interfaces and performance;
- e) connecting hardware at other places in the cabling structure shall meet the performance requirements specified in Clause 9;

¹⁾ This term, as defined in EN 50173-1, refers to the passive cabling between the interfaces described in Clauses 4 and 5. Differing definitions of the term "channel" as given in other standards are not applicable in this European Standard.

- f) the performance of channels shall conform to the requirements of Clause 6. This shall be achieved by one of the following:
- a channel design and implementation ensuring that the prescribed channel performance Class of Clause 6 is met;
 - attachment of appropriate components to a link design meeting the prescribed performance Class of Annex A. Channel performance shall be assured where a channel is created by adding more than one cord to either end of a link meeting the requirements of Annex A;
 - using the reference implementations of Clause 7 and compatible cabling components conforming to the requirements of Clauses 8, 9 and 10 based upon a statistical approach of performance modelling.
- g) local regulations concerning safety shall be met.

In addition the following requirements of the EN 50174 series of standards shall be met:

- h) installation specification and quality planning to address:
- the test parameters to be measured;
 - the sampling levels to be applied;
 - the treatment of channels or links which fail to meet requirements or for which test results lie within the relevant measurement accuracy;
- i) administration;
- j) installation.

Test methods to verify conformance with the channel and link requirements of Clause 6 and Annex A respectively are specified in EN 50346. Neither this standard nor EN 50174-1 specifies the test and sampling levels to be adopted.

Specifications marked "ffs" (for further study) in this standard as well as in EN 50173-1 are preliminary and are not required for conformance to this European Standard.

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.

EN 50083-7, *Cable networks for television signals, sound signals and interactive services - Part 7: System performance*

NOTE EN 50083-7 will be superseded by EN 60728-1 (in preparation).

EN 50173-1:2007, *Information technology – Generic cabling systems – Part 1: General requirements*

EN 50174-1, *Information technology – Cabling installation – Part 1: Specification and quality assurance*

EN 50174-2, *Information technology – Cabling installation – Part 2: Installation planning and practices inside buildings*

EN 50174-3, *Information technology – Cabling installation – Part 3: Installation planning and practices outside buildings*

EN 60603-7-7, *Connectors for electronic equipment – Part 7-7: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 600 MHz (IEC 60603-7-7:2006)*