

BUREAU OF INDIAN STANDARDS

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मसौदा भारतीय मानक
डिजिटल संचारण के लिए बहुकोद और
सममित पेयर / क्वेड केबल
भाग 1: सामान्य विशिष्टता
(दूसरा पुनरीक्षण)

Draft Indian Standard

*Multicore and Symmetrical –
Pair/Quad Cables for Digital Communications –
Part 1: Generic Specification
(Second Revision)*

ICS 32.120.20

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LITD 06-Wires, Cables, Waveguides and
Accessories Sectional Committee

Last Date for Comments: 07 July 2024.

NATIONAL FOREWORD

(Formal clauses will be added later)

This Draft Indian Standard (Part 1) (Second Revision) which is identical with IEC 61156-1:2023 Multicore and symmetrical pair/quad cables for digital communications - Part 1: Generic specification' issued by the International Electrotechnical Commission (IEC) *will be* adopted by the Bureau of Indian Standards on the recommendation of the Wires, Cables, Waveguides And

Accessories Sectional Committee (LITD 06) and approval of the Electronics and Information Technology Division Council.

This standard was originally published in 1997 and was identical with IEC 1156-1: 1994. The first revision of this standard was published in 2020 and was identical with IEC 61156-1: 2009. The Second revision of the Indian Standard has been under taken up to align it with the latest version of IEC 61156-1:2023.

This edition includes the following significant technical changes with respect to the previous edition:

- a) modification of the scope in Clause 1 and updating of normative references documents in Clause 2;
- b) addition of PoE-related definitions in Clause 3;
- c) clarification of differential-mode and common-mode resistors, correction of formulae and addition of IEC 62153-4-9 test method for coupling attenuation in Clause 6;
- d) introduction of balunless measurement method in 6.3.1, modification of equipment requirements of unbalance attenuation in 6.3.5 and updating of balun's performance in Table 1;
- e) deletion of 'three layers of cables on a drum' method in alien (exogenous) near-end crosstalk measurement in 6.3.8 and addition of terminated input impedance in 6.3.11.4.

This standard (Part 1) is one of the parts of a series of standards on 'Multicore and Symmetrical Pair / Quad Cables for Digital Communications'. The other parts in this series are:

Part 2: Symmetrical Pair/Quad Cables with Transmission Characteristics up to 100 MHz Horizontal Floor Wiring Sectional Specification

Part 3: Work Area Cable Sectional Specification

Part 4: Riser Cables Sectional Specification

Part 5: Symmetrical pair / quad cables with transmission characteristics up to 1000 MHz - Horizontal floor wiring - Secal specification

Part 7: Symmetrical pair cables with transmission characteristics up to 1 200 MHz Sectional specification for digital and analogue communication cables

The text of IEC Standard *may be* approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appears referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

International standards	Corresponding Indian standards	Degree of Equivalence
IEC 60028, International standard of resistance for copper	IS 191 : 2007Copper - Specification (Fourth Revision)	Technically Equivalent
IEC 60068-2-1:2007, Environmental testing – Part 2-1: Tests – Tests A: Cold	IS/IEC 60068-2-1 : 2007 Environmental Testing Part 2 Tests Section 1 Test A: Cold	Identical
IEC 60189-1:2018, Low-frequency cables and wires with PVC insulation and PVC sheath –Part 1: General test and measuring methods	IS/IEC 60189-1 : 2018 Low-Frequency Cables and Wires with PVC Insulation and PVC Sheath Part 1 General Test and Measuring Methods	Identical
IEC 60304, Standard colours for insulation for low-frequency cables and wires	IS 9938 : 1981 Recommended colours for PVC insulation for LF wires and cables	Identical With IEC 60304: 1978
IEC 61196-1-105, Coaxial communication cables – Part 1-105: Electrical test methods – Test for withstand voltage of cable dielectric	IS/IEC 61196-1-105 : 2005 Coaxial communication cables: Part 1 - 105 electrical test methods - Test for withstand voltage of cable dielectric	Identical With IEC 61196-1-105: 2005
IEC 62153-4-3:2013, Metallic communication cables test methods – Part 4-3: Electromagnetic compatibility (EMC) – Surface transfer impedance – Triaxial method	IS/IEC 62153-4-3: 2013 Metallic communication cable test methods Part 4 Electromagnetic compatibility EMC Section 3 Surface transfer impedance-Triaxial method	Identical
IEC 62153-4-5, Metallic communication cables test methods – Part 4-5: Electromagnetic compatibility (EMC) – Screening or coupling attenuation – Absorbing clamp method	IS/IEC 62153-4-5 : 2006 Metallic communication cable test methods Part 4 Electromagnetic compatibility EMC Section 5 Coupling or screening attenuation Absorbing clamp method	Identical With IEC 62153-4-5 : 2006

The technical committee has reviewed the provisions of the following International Standard referred in this adopted draft standard and has decided that it is acceptable for use in conjunction with this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

International Standards	Title
IEC 60332-1-2	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW premixed flame
IEC 60332-2-2	Tests on electric and optical fibre cables under fire conditions – Part 2-2: Test for vertical flame propagation for a single small insulated wire or cable – Procedure for diffusion flame
IEC 60332-3-24	Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C
IEC 60332-3-25	Tests on electric and optical fibre cables under fire conditions – Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category D
IEC 60708	Low-frequency cables with polyolefin insulation and moisture barrier polyolefin sheath
IEC 60754-2	Test on gases evolved during combustion of materials from cables – Part 2: Determination of acidity (by pH measurement) and conductivity
IEC 60794-1-21:2015	Optical fibre cables – Part 1-21: Generic specification – Basic optical cable test procedures – Mechanical test methods
IEC 60811-201	Electric and optical fibre cables – Test methods for non-metallic materials – Part 201: General tests – Measurement of insulation thickness
IEC 60811-202	Electric and optical fibre cables – Test methods for non-metallic materials – Part 202: General tests – Measurement of thickness of non-metallic sheath
IEC 60811-203	Electric and optical fibre cables – Test methods for non-metallic materials – Part 203: General tests – Measurement of overall dimensions
IEC 60811-401	Electric and optical fibre cables – Test methods for non-metallic materials – Part 401: Miscellaneous tests – Thermal ageing methods – Ageing in an air oven
IEC 60811-501	Electric and optical fibre cables – Test methods for non-metallic materials – Part 501: Mechanical tests – Tests for determining the mechanical properties of insulating and sheathing compounds

IEC 60811-502	Electric and optical fibre cables – Test methods for non-metallic materials – Part 502: Mechanical tests – Shrinkage test for insulations
IEC 60811-504	Electric and optical fibre cables – Test methods for non-metallic materials – Part 504: Mechanical tests – Bending tests at low temperature for insulation and sheaths
IEC 60811-506	Electric and optical fibre cables – Test methods for non-metallic materials –Part 506: Mechanical tests – Impact test at low temperature for insulations and sheaths
IEC 60811-508	Electric and optical fibre cables – Test methods for non-metallic materials – Part 508: Mechanical tests – Pressure test at high temperature for insulation and sheaths
IEC 60811-509	Electric and optical fibre cables – Test methods for non-metallic materials –Part 509: Mechanical tests – Test for resistance of insulations and sheaths to cracking (heat shock test)
IEC 60811-510	Electric and optical fibre cables – Test methods for non-metallic materials –Part 510: Mechanical tests – Methods specific to polyethylene and polypropylene compounds – Wrapping test after thermal ageing in air
IEC 61034 (All Parts)	Measurement of smoke density of cables burning under defined conditions
IEC TR 61156-1-2	Multicore and symmetrical pair/quad cables for digital communications – Part 1-2: Electrical transmission characteristics and test methods of symmetrical pair/quad cables
IEC TR 61156-1-5	Multicore and symmetrical pair/quad cables for digital communications – Part 1-5: Correction procedures for the measurement results of return loss and input impedance
IEC 62012-1:2002	Multicore and symmetrical pair/quad cables for digital communications to be used in harsh environments – Part 1: Generic specification
IEC 62153-4-9	Metallic communication cable test methods – Part 4-9: Electromagnetic compatibility (EMC) – Coupling attenuation of screened balanced cables, triaxial method
IEC 62255 (All Parts)	Multicore and symmetrical pair/quad cables for broadband digital communications (high bit rate digital access telecommunication networks) – Outside plant cables
ISO/IEC TS 29125:2017	Information technology – Telecommunications cabling requirements for remote powering of terminal equipment

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:2022 ‘Rules for rounding off numerical values (*Second Revision*)’.

The number of significant places retained in the rounded off value should be same as that of the specified value in this standard.

SCOPE OF IEC 61156-1: 2023

“This part of IEC 61156 specifies the definitions, requirements and test methods of multicore, symmetrical pair and quad cables.

This document is applicable to communication systems such as local area networks (LANs) and data communication cables. It is also applicable to cables used for industrial applications, customer premises wiring and generic cabling comprising installation cables and cables for work area wiring which are defined in ISO/IEC 11801 (all parts).

The cables covered by this document are intended to operate with voltages and currents normally encountered in communication systems. While these cables are not intended to be used in conjunction with low impedance sources, for example the electric power supplies of public utility mains, they are intended to be used to support the delivery of low voltage remote powering applications including but not restricted to Power over Ethernet as specified in ISO/IEC/IEEE 8802-3. More information on the capacity to support these applications according to the installation practices are given in IEC 61156-1-4, IEC TR 61156-1-6 and ISO/IEC TS 29125.”

Note: - The Technical content of this document has not been enclosed as these are identical with the corresponding IEC Standard. For details please refer to IEC 61156-1: 2023 or kindly contact.

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