

**SINGAPORE STANDARD**  
**Specification for polyvinyl chloride**  
**insulated cables of rated voltages up to**  
**and including 450/750 V**  
**– Part 1 : General requirements**

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SINGAPORE STANDARD

**Specification for polyvinyl chloride insulated  
cables of rated voltages up to and including  
450/750 V**

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This Singapore Standard was approved by the Electrical and Electronic Standards Committee on behalf of the Standards Council of Singapore on 28 July 2011.

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Second revision, 2011

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*Energy Market Authority*  
*Institution of Engineers, Singapore*  
*Singapore Cables Manufacturers Pte Ltd*  
*Tai Sin Electric Cables Manufacturers Ltd*  
*TÜV SÜD PSB Pte Ltd*

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## National Foreword

This Singapore Standard was prepared by the Technical Committee on Electrical Accessories and Electric Cables under the purview of the Electrical and Electronic Standards Committee. It is a revision of SS 358 : Part 1 : 1996.

This revised standard is identical to the third edition of IEC 60227-1 : 2007-10 published by the International Electrotechnical Commission.

Attention is drawn to the following:

1. Where the words "International Standard" appear, they should be interpreted as "Singapore Standard".
2. Where the reference "IEC 60227" appears, it should be interpreted as Singapore Standards on polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V.
3. The following parts of IEC 60227 shall be replaced by SS 358 under the general title: Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V:  

IEC 60227-2	-	SS 358 : Part 2 : Test methods
IEC 60227-3	-	SS 358 : Part 3 : Non-sheathed cables for fixed wiring
IEC 60227-5	-	SS 358 : Part 5 : Flexible cables (cords)
4. The comma has been used throughout as a decimal marker whereas in Singapore Standards, it is a practice to use a full point on the baseline as the decimal marker.

Parts 3 and 5 are for particular types of cable and should be read in conjunction with Parts 1 and 2. Further parts may be added as other types are standardised.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

### NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*
2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*
3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**POLYVINYL CHLORIDE INSULATED CABLES  
OF RATED VOLTAGES UP TO AND  
INCLUDING 450/750 V –**

**Part 1: General requirements**

**FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60227-1 has been prepared by IEC technical committee 20: Electric cables.

This third edition of IEC 60227-1 cancels and replaces the second edition, published in 1993, amendment 1 (1995) and amendment 2 (1997) The document 20/903/FDIS, circulated to the National Committees as amendment 3, led to the publication of this new edition.

The text of this standard is based on the second edition, its amendments 1 and 2, and the following documents:

FDIS	Report on voting
20/903/FDIS	20/910/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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

**POLYVINYL CHLORIDE INSULATED CABLES  
OF RATED VOLTAGES UP TO AND  
INCLUDING 450/750 V –**

**Part 1: General requirements**

**1 General**

**1.1 Scope**

This part of International Standard IEC 60227 applies to rigid and flexible cables with insulation, and sheath if any, based on polyvinyl chloride, of rated voltages  $U_o/U$  up to and including 450/750 V used in power installations of nominal voltage not exceeding 450/750 V a.c.

NOTE For some types of flexible cables the term cord is used.

The particular types of cables are specified in IEC 60227-3, IEC 60227-4, etc. The code designations of these types of cables are given in Annex A.

The test methods specified in Parts 1, 3, 4, etc. are given in IEC 60227-2, IEC 60332-1-2 and in the relevant parts of IEC 60811.

**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 60173, *Colours of the cores of flexible cables and cords*

IEC 60227-2, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 2: Test methods*

IEC 60227-3, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 3: Non-sheathed cables for fixed wiring*

IEC 60227-4, *Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V – Part 4: Sheathed cables for fixed wiring*

IEC 60227-5, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 5: Flexible cables (cords)*

IEC 60228, *Conductors of insulated cables*

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 pre-mixed flame*

IEC 60811-1-1, *Common test methods for insulating and sheathing materials of electric cables and optical cables – Part 1: Methods for general application – Measuring of thickness and overall dimensions – Tests for determining the mechanical properties*

IEC 60811-1-2, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Two: Thermal ageing methods*

IEC 60811-1-4, *Common test methods for insulating and sheathing materials of electric cables – Part 1: Methods for general application – Section Four: Tests at low temperature*

IEC 60811-3-1, *Common test methods for insulating and sheathing materials of electric cables – Part 3: Methods specific to PVC compounds – Section One: Pressure test at high temperature – Tests for resistance to cracking*

IEC 60811-3-2, *Common test methods for insulating and sheathing materials of electric cables – Part 3: Methods specific to PVC compounds – Section Two: Loss of mass test – Thermal stability tests*

IEC 62440, *Electric cables – Guide to use for cables with a rated voltage not exceeding 450/750V*