AS 1102 Parts 101 to 110 supersede AS 1102.1—1985, AS 1102.2—1981, AS 1102.3—1983, AS 1102.4—1983, AS 1102.5—1983, AS 1102.6—1982, AS 1102.7—1982, AS 1102.10—1985, AS 1102.11—1985, AS 1102.13—1979 and AS 1102.14—1979.

AS 1102.5—1983
UDC 003.62:621.3

Australian Standard 1102, Part 5—1983

GRAPHICAL SYMBOLS FOR ELECTROTECHNOLOGY
SEMICONDUCTOR DEVICES

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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This Australian standard was prepared by Committee TE/13, Symbols, Units and Quantities for Electrotechnology. It was approved on behalf of the Council of the Standards Association of Australia on 9 November 1982 and published on 11 January 1983.

The following interests were represented on the committee responsible for the preparation of this standard:

Confederation of Australian Industry

Department of Aviation

Department of Defence

Department of Defence Support

Departments of Technical and Further Education, N.S.W. and Victoria

Department of Transport and Construction

Electricity Supply Association of Australia

Institute of Draftsmen, Australia

Institution of Radio and Electronics Engineers, Australia

Melbourne and Metropolitan Board of Works

Queensland Chamber of Mines

Railways of Australia Committee

The Technical Press

Telecom Australia

AUSTRALIAN STANDARD

GRAPHICAL SYMBOLS FOR ELECTROTECHNOLOGY

SEMICONDUCTOR DEVICES

AS 1102.5—1983

First published 1972
Second edition 1983

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 2775 7

PREFACE

This edition of this standard was prepared by the Association's Committee on Symbols, Units ad Quantities for Electrotechnology under the authority of both the Telecommunications and Electronics, and the Electrical Standards Boards, to supersede the 1972 edition.

This edition incorporates Amendment No 1 (June 1976) and editorial and minor technical amendments to the 1972 edition, including renumbering of symbols, the rewording of Clauses 1.4.3 and 1.4.4 and changes to symbols 5-02-03 and 5-03-02 in accordance with current practice. In addition, the cross-references to other Australian standards have been updated.

In its terminology, definitions and general treatment of the subject, this standard is similar to related sections of Publication 117 of the International Electrotechnical Commission (IEC). The symbols shown in the standard are identical with those recommended by the IEC. Note has also been taken of BS 3939:Section 20. Acknowledgement is made for the assistance received from these sources.

This standard is one part in a series forming a comprehensive standard on graphical symbols for use generally in the field of electrotechnology. The purpose of this part is to specify standard graphical symbols for semiconductor devices for use in various types of diagrams used in the field of electronics.

The method of constructing the symbols adopted involves the establishment of symbols for the various basic elements of semiconductor devices. Qualifying symbols to indicate a special function or property essential for the operation of the circuit containing the device are also defined.

These symbols may be combined to produce more complex or more descriptive symbols, or both. The principles governing the combining of these various symbols are specified. Examples of their use in forming various types of semiconductor devices are given. These are not intended to be exhaustive. By using the principles and symbols specified herein, it should be possible to symbolize any type of semiconductor device, however complicated it may be.

For a fuller understanding of the methods adopted in this standard, reference will also be required to the following Australian standards:

AS 1102 Graphical Symbols for Electrotechnology
- Part 1—General, Qualifying and Supplementary Symbols
- Part 2—Conductors and Connecting Devices

AS 1103 Diagrams, Charts and Tables for Electrotechnology
- Part 1—Definitions and Classifications
- Part 2—Item Designation
- Part 3—Basic Principles for the Presentation of Elements of Electrical Diagrams
- Part 4—Guiding Principles for the Preparation of Circuit Diagrams

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for GRAPHICAL SYMBOLS FOR ELECTROTECHNOLOGY

PART 5—SEMICONDUCTOR DEVICES

SECTION 1. SPECIFICATION

1.1 SCOPE. This standard defines graphical symbols for semiconductor devices and sets out the principles governing their use. Examples demonstrating their method of application are given.

NOTE: The symbols are identical with those recommended by the International Electrotechnical Commission (IEC).

Reference designations for components, intended for uniquely identifying and locating discrete items on diagrams and for correlating them in parts lists, circuit descriptions and catalogues are not given in this standard. For this information, see AS 1103, Part 2.

1.2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1103 Diagrams, Charts and Tables for Electrotechnology
Part 1—Definitions and Classifications
Part 2—Item Designation.

1.3 TERMINOLOGY. The terms and definitions used in this standard are given in AS 1103, Part 1.

1.4 METHOD OF CONSTRUCTING SEMICONDUCTOR SYMBOLS.

1.4.1 Use of Symbol Elements. The method adopted is that of building a symbol for a device from its component elements. Symbol elements given include those for an envelope, emitters, collectors, junctions and connections. This standard lists the elements and gives examples of the assembled symbols for various devices.

1.4.2 Use of Qualifying Symbols. Qualifying symbols may then be added to the basic assembled symbol in order to define more closely the way in which the device works. For example, a semiconductor diode may have added to it the qualifying symbol for light or radiation to indicate that it is a light-sensitive device. Further, the direction of the arrows in this symbol indicates whether the symbol is a diode sensitive to incident radiation or a diode generating light energy.

Qualifying symbols cannot be employed independently, but a component symbol may be used for qualifying purposes in a more complicated symbol.

1.4.3 New Symbols. If a symbol for a particular type of component is not shown as an example in this standard, it should be possible to produce it from the basic and qualifying symbols. New basic symbols for specialized components should be derived and not created.

1.3.4 Size of Symbols. Precise dimensions and proportions of graphical symbols are difficult to specify. The symbols of this standard have been drawn to a size convenient for publication and comprehension. The sizes of symbols relative to one another may be changed to suit the circumstances of a given drawing or application.

The relative size of the symbols should be preserved except where it is necessary to enlarge a symbol to give it prominence in a diagram or to provide adequate space within or around it to show symbols for associated components, or for coding.

At all times, however, the relative proportions of the symbols should be maintained such that each symbol shall be unique and immediately recognizable.

1.4.5 General Principles. The following general principles apply:

(a) In general the angle at which a connection is brought to a symbol element has no special significance.

(b) The use of the envelope symbol is preferred. It may be omitted if no confusion could arise, provided however that the envelope shall be shown whenever there is a connection to it.

(c) Orientation, including mirror-image reversals, does not change the meaning of a symbol.

(d) The elements of a symbol shall be drawn in such an order as to show clearly the operating function of the device.

(e) The extensions of the end of the horizontal line representing the semiconductor region beyond an emitter, a collector or an ohmic connection have no particular significance.

(f) With the exception of qualifying symbols, letters and numbers used do not form part of the symbols listed in this standard.

1.4.6 Method. To draw the symbol of a semiconductor device, start at an electrode, the polarity of which is known (e.g. an emitter), and proceed along the device showing all of its regions individually. Finally indicate ohmic connections where required.