

# Australian Standard® 2547.1.11—1986

---

## SEMICONDUCTOR DEVICES— Part 1.11—SECTIONAL SPECIFICATION FOR DISCRETE DEVICES (QC 750 000)



**STANDARDS ASSOCIATION OF AUSTRALIA**  
*Incorporated by Royal Charter*



This Australian standard was prepared by Committee TE/12, Semiconductors and Devices. It was approved on behalf of the Council of the Standards Association of Australia on 5 November 1986 and published on 5 December 1986.

---

The following interests are represented on Committee TE/12:

Confederation of Australian Industry  
Department of Defence  
Department of Industry, Technology and Commerce  
Institution of Radio and Electronics Engineers, Australia  
Telecom Australia

---

**Review of Australian Standards.** To keep abreast of progress in industry, Australian standards are subject to periodic review and kept up-to-date by the issue of amendments or new editions as necessary. It is important therefore that standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all SAA publications will be found in the Catalogue of SAA Publications; this information is supplemented each month by SAA's journal 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn standards.

Suggestions for improvements to Australian standards, addressed to the head office of the Association, are welcome. Notification of any inaccuracy or ambiguity found in an Australian standard should be made without delay in order that the matter may be investigated and appropriate action taken.

---

AUSTRALIAN STANDARD

**SEMICONDUCTOR DEVICES—  
Part 1.11  
SECTIONAL SPECIFICATION  
FOR DISCRETE DEVICES  
(QC 750 000)**

AS 2547.1.11—1986

First published ..... 1986  
*See also Preface.*

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

ISBN 0 7262 4446 5



17 DEC 1986

## PREFACE

This standard was prepared by the Association's Committee on Semiconductors and Devices. It is reproduced from IEC 747.11:1984 and is one of the standards prepared by IEC/TC 47, Semiconductor Devices.

This standard is one of a series of standards published under the generic specification AS 2547. This standard supersedes:

- the existing AS 2547 series (published in 1982 and 1983 and identical with equivalent parts of IEC 147 published between 1966 and 1981);
- AS C366, Part 4—1978 and Part 5—1978 (equivalent to IEC 147-5 and IEC 147-5A);
- AS C367—1970 (endorsement of IEC 148—1969);
- AS 1967—1977 (identical to IEC 147-1D and 1E).

The purpose of IEC 747 is to reorganize the material originally presented in the IEC 147\* series and IEC 148†, on semiconductor devices and letter symbols representing them. It is now republished as a device-oriented publication as follows:

- (a) Specific requirements for integrated circuits—now IEC 748.
- (b) Mechanical and climatic test methods—now IEC 749.

It was in view of the above reorganization that Committee TE/12 agreed to integrate the entire series into one series of Australian standards using the generic designation AS 2547. The relationship with the three IEC standards is as follows:

- (i) Part 1.1 onwards—identical with the IEC 747 series.
- (ii) Part 2.1 onwards—identical with the IEC 748 series.
- (iii) Part 3.1—identical with IEC 749.

For the purpose of this Australian standard and all other standards in this AS 2547 series, the text of the reproduced IEC Publications should be modified as follows:

- A. *Terminology.* The words 'Australian Standard' should replace the words 'IEC Publication' wherever they appear.
- B. *Cross-references.* The reference to IEC Publications should be replaced by references to the appropriate Australian standards as follows:

| <i>Reference to IEC Publications</i> |                                                                 | <i>Appropriate Australian Standard</i> |                                                                       |
|--------------------------------------|-----------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------|
| IEC 27                               | Letter symbols to be used in electrical technology              | AS 1046                                | Letter Symbols for Use in Electrotechnology                           |
| IEC 50                               | International electro-technical vocabulary                      | AS 1852                                | International Electro-technical Vocabulary                            |
| IEC 191                              | Mechanical standardization of semiconductor devices             | AS C379                                | Mechanical Standardization of Semiconductor Devices                   |
| IEC 319                              | Presentation of reliability data on electronic components       | AS 2350                                | Presentation of Reliability Data on Electronic and Similar Components |
| IEC 747                              | Semiconductor devices. Discrete devices and integrated circuits | AS 2547                                | Semiconductor Devices                                                 |
| 747.1                                | Part 1—General                                                  | 1.1                                    | Discrete Devices—General                                              |
| 747.2                                | Part 2—Rectifier diodes                                         | 1.2                                    | Discrete Devices—Rectifier Diodes                                     |
| 747.3                                | Signal (including switching) and regulator diodes               | 1.3                                    | Discrete Devices—Signal (Including Switching) and Regulator Diodes    |
| 747.4                                | R.F. Diodes                                                     | 1.4                                    | Discrete Devices—R.F. Diodes                                          |
| 747.5                                | Optoelectronic devices                                          | 1.5                                    | Discrete Devices—Optoelectronic Devices                               |

\* IEC 147, Essential ratings and characteristics of semiconductor devices and general principles of measuring methods.

† IEC 148, Letter symbols for semiconductor devices and integrated microcircuits.

|         |                                                                                 |         |                                                                                 |
|---------|---------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------|
| 747.6   | Thyristors                                                                      | 1.6     | Discrete Devices—Thyristors                                                     |
| 747.7   | Bipolar transistors                                                             | 1.7     | Discrete Devices—Bipolar Transistors                                            |
| 747.8   | Field-effect transistors                                                        | 1.8     | Discrete Devices—Field-effect Transistors                                       |
| 747.9   | Miscellaneous devices                                                           | 1.9     | Discrete Devices—Miscellaneous Devices                                          |
| 747.10  | Generic specification for discrete devices and integrated circuits (QC 700 000) | 1.10    | Generic Specification for Discrete Devices and Integrated Circuits (QC 700 000) |
| 747.11  | Sectional specification for discrete devices (QC 750 000)                       | 1.11    | Sectional Specification for Discrete Devices (QC 750 000)                       |
| IEC 748 | Semiconductor Devices. Integrated circuits                                      | AS 2547 | Semiconductor Devices                                                           |
| 748.1   | General                                                                         | 2.1     | Integrated Circuits—General                                                     |
| 748.2   | Digital integrated circuits                                                     | 2.2     | Integrated Circuits—Digital                                                     |
| 748.3   | Analogue integrated circuits                                                    | 2.3     | Integrated Circuits—Analogue                                                    |
| 748.4   | Interface integrated circuits                                                   | 2.4     | Integrated Circuits—Interface                                                   |
| IEC 749 | Semiconductor devices. Mechanical and climatic test methods                     | 3.1     | Mechanical and Climatic Test Methods                                            |

© Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1986

Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

## CONTENTS

| Clause                                                                                          | Page |
|-------------------------------------------------------------------------------------------------|------|
| 1. Scope .....                                                                                  | 5    |
| 2. General .....                                                                                | 5    |
| 2.1 Related documents .....                                                                     | 5    |
| 2.2 Recommended values of temperatures (preferred values) .....                                 | 5    |
| 2.3 Recommended values of voltages and currents (preferred values) .....                        | 5    |
| 2.4 Terminal identification .....                                                               | 5    |
| 2.5 Colour codes for type designation .....                                                     | 6    |
| 2.5.1 For JEDEC type numbers .....                                                              | 6    |
| 2.5.2 For PRO ELECTRON type numbers .....                                                       | 6    |
| 2.5.3 Any other type numbers .....                                                              | 7    |
| 3. Quality assessment procedures .....                                                          | 7    |
| 3.1 Primary stage of manufacture .....                                                          | 7    |
| 3.2 Structurally similar devices .....                                                          | 7    |
| 3.2.1 Grouping for electrical tests .....                                                       | 7    |
| 3.2.2 Grouping for dimensional, climatic and mechanical inspections or tests .....              | 8    |
| 3.2.3 Grouping for endurance tests .....                                                        | 9    |
| 3.3 Inspection requirements for qualification approval .....                                    | 9    |
| 3.4 Quality conformance inspection .....                                                        | 9    |
| 3.4.1 Division into groups and sub-groups .....                                                 | 9    |
| Table I — Group A: Lot by lot .....                                                             | 10   |
| Table II — Group B: Lot by lot .....                                                            | 10   |
| Table III — Group C: Periodic .....                                                             | 11   |
| 3.5 Group D tests .....                                                                         | 12   |
| 3.6 Screening .....                                                                             | 12   |
| Table IV — Screening .....                                                                      | 13   |
| 3.7 Sampling requirements .....                                                                 | 13   |
| Table V — Sampling requirements for Group A tests .....                                         | 14   |
| Table VI — Sampling requirements for Groups B and C tests, in which LTPD<br>shall be used ..... | 14   |
| 4. Test and measurement procedures .....                                                        | 15   |

## STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard**  
**for**  
**SEMICONDUCTOR DEVICES**

**PART 1.11—SECTIONAL SPECIFICATION FOR DISCRETE DEVICES (QC 750 000)**

**1. Scope**

This sectional specification applies to discrete semiconductor devices, excluding opto-electronic devices.

**2. General**

This specification shall be read together with the generic specification to which it refers; it gives details of the Quality Assessment Procedures, the inspection requirements, screening sequences, sampling requirements, test and measurement procedures required for the assessment of semiconductor devices.

**2.1 Related documents**

IEC Publication 747-10/QC 700000 (1984), Semiconductor devices. Part 10: Generic Specification for Discrete Devices and Integrated Circuits.

**2.2 Recommended values of temperatures (preferred values)**

See IEC Publication 747-1, Chapter VI, Clause 5.

**2.3 Recommended values of voltages and currents (preferred values)**

See IEC Publication 747-1, Chapter VI, Clause 6.

**2.4 Terminal identification****2.4.1 Diodes**

The polarity of diodes shall be clearly indicated by one of the following methods:

1) The rectifier symbol pointing towards the cathode.

2) A colour code as follows:

– Diodes in A20 (IEC 191-2) and smaller outlines:

These diodes shall be marked with a contrasting colour band or dot at the cathode end. Alternatively, when the type is identified by colour bands, the cathode end may be identified by the use of a double-width band for the first digit. If there is a possibility of the colour code at the cathode end of diodes in envelopes smaller than A1B (IEC 191-2) being confused with a type marking, then the latter shall be omitted.

– Diodes in outlines larger than A20:

Red shall be used for the cathode.

**2.4.2 Transistors**

The terminal identification shall be as given in the detail specification.