

Australian Standard[®]

**Presentation of reliability data on
electronic and similar components
(or parts)**

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Broadcasting Commission
Confederation of Australian Industry
Department of Defence
Department of Productivity
Department of Transport
Institution of Engineers, Australia
Institution of Radio and Electronics Engineers, Australia
Telecom Australia

This standard, prepared by Committee TE/21, Reliability of Electronics Components and Equipment, was approved on behalf of the Council of the Standards Association of Australia on 28 May 1981, and was published on 8 March 1982.

Review of Australian Standards. *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are 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 Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine '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which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.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 Standards Australia, are welcomed. 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.

This standard was issued in draft form for public review as DR 78176.

Australian Standard[®]

**Presentation of reliability data on
electronic and similar components
(or parts)**

First published 1982

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 2467 7

PREFACE

This standard was prepared by the Association's Telecommunications and Electronics Committee on Reliability of Electronics Components and Equipment. It is virtually identical with the second edition of IEC 319 issued by the International Electrotechnical Commission and acknowledgment is made of the assistance therefrom.

The purpose of this standard is to provide guidance on the presentation of the detailed data necessary to distinguish the reliability characteristics of an electronic component. Such data, on the changes in characteristics with time, or on the failure rates of the associated components or parts, are essential in order to be able to predict the operating performance of equipment of any kind and are not restricted to electronic or electrical components. The collection of such data in the field is the subject of an associated Australian standard (see AS 2529).

For the purposes of this standard reference may be necessary to the following Australian standards:

AS 1211	Reliability of Electronic Equipment and Components Part 1. Terminology Part 2. Reliability Concepts Part 3. Reliability Program for Equipment
AS 2529	Collection of Reliability, Availability and Maintainability Data for Electronic and Similar Engineering Use
AS 1099	Basic Environmental Testing Procedures for Electrotechnology Part 1. General
BS 2846	Guide to the Statistical Interpretation of Data

CONTENTS

	<i>Page</i>
FOREWORD	3
SPECIFICATION	3
1 Scope	3
2 Identification of Components Tested	3
3 Test Conditions	3
4 Data on Failures	4
5 Data on Changes in Characteristics	5
APPENDICES	
A Identification of Components and Test Conditions	6
B Presentation of Data	7
C Change in Characteristics: Observed Results and Presentation of Derived Data	8

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
PRESENTATION OF RELIABILITY DATA ON ELECTRONIC AND SIMILAR
COMPONENTS (OR PARTS)

FOREWORD

The increasing complexity of electronic equipment, the very large number of components (or parts) used and the requirement for reliability present serious difficulties to the circuit and equipment designer.

Information on ratings, characteristics, dimensions, etc., of an electronic component is normally supplied in specifications, catalogues and data sheets.

Nevertheless, to be able to predict the operating performance of equipment, detailed data are necessary on the changes in characteristics and on the failure rates of the associated electronic components (or parts).

SPECIFICATION

1 SCOPE. This standard is intended to provide guidance on the presentation of data necessary to distinguish the reliability characteristics of an electronic component, but may also be applicable to other engineering terms.

The data may relate to failures and failure rates or changes (or drift) of characteristics.

Such factual information should be available to the circuit and equipment designer to enable him to correctly assess the reliability of his circuits and units.

This information will be obtained from reliability tests made on the electronic components in laboratories and should be presented as indicated herein.

NOTES:

1. The validity and value of reliability test information and data depend upon the testing procedures, methods, duration, sample sizes, environments, etc, under which such data are obtained. The importance of associating test data with the specifications governing their acquisition cannot be over-emphasized.
2. Where laboratory test data is used to predict the reliability of equipment in the field, it will be necessary to use appropriate multiplying factors on the laboratory-determined failure rates.
3. The presentation of field data is described in AS 2529.

2 IDENTIFICATION OF COMPONENTS TESTED. Information identifying the components shall be in accordance with the relevant Australian standard or other component specifications.

The following information shall be supplied:

- (a) Kind of component, e.g. silicon planar epitaxial transistor.
- (b) Relevant specification number (with issue identification and date).

- (c) Type number and version, e.g. transistors which differ by the value of the maximum voltage.
- (d) Relevant information about ratings or characteristics, e.g. if storage tests are to be reported, the rating for storage temperature should be given.
- (e) Manufacturer and place of manufacture.
- (f) Date of manufacture, or lot number or, if unavailable, date of receipt. Such references shall permit access to more detailed information.
- (g) Production status, e.g. standard production, development samples.
- (h) Statement on whether the components have been subjected to normal production tests or to screening. The details of any screening should be stated.
- (j) Methods of selecting samples, e.g. drawn at a rate of ten parts per week over a 10-week period or 100 pieces selected at random from a purchased batch of 10 000.

As far as possible the presentation of these data should be in accordance with Appendix A.

3 TEST CONDITIONS. The test conditions to be used should be those given in the relevant component standards.

The following information shall be supplied:

- (a) By whom the results were obtained, e.g. quality assurance department or manufacturer.
- (b) Description of the test conditions used, e.g. electrical, mechanical and environmental conditions, duty cycle.