

# Rules

for the preparation of

## Detail specifications

for

ANALOGUE INTEGRATED CIRCUITS OF ASSESSED QUALITY

FULL ASSESSMENT LEVEL

### Copyright

Users of British Standards are reminded that copyright subsists in all BSI publications. No part of this publication may be reproduced in any form without the prior permission in writing of BSI. This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols and size, type or grade designations. Enquiries should be addressed to the BSI Secretariat.

AMD 1837

AMENDMENT SLIP No.1 published December 1975 to BS 9491 : 1975.

RULES FOR THE PREPARATION OF  
DETAIL SPECIFICATIONS FOR  
ANALOGUE INTEGRATED CIRCUITS  
OF ASSESSED QUALITY:  
FULL ASSESSMENT LEVEL

FULL ASSESSMENT LEVEL

Revised text

Delete the existing entry for subgroup B2(b) and substitute the following

|                                                         |                                                           |      |
|---------------------------------------------------------|-----------------------------------------------------------|------|
| rapid change<br>of temperature,<br>followed by:         | 1.2.6.13 Rated maximum<br>and minimum<br>$T_{stg}$ values | None |
| either                                                  |                                                           |      |
| healing (fine and<br>gross leak) for<br>cavity packages | 1.2.6.14                                                  | None |
| or                                                      |                                                           |      |
| Damp heat, cyclic<br>for non-cavity<br>packages         | 1.2.6.5 Six cycles                                        | None |

Revised text

Delete the existing BS 9400 reference for subgroup B3 and substitute the following.

1.2.6.16.1 As appropriate to  
to the terminations of  
1.2.6.16.4 the integrated circuit  
under test.

Additional text

Note The tests in subgroups C4(a) and C4(b) may be transferred to subgroups A3(b) and A3(c) respectively, the tests shown in subgroup A3 at 25°C to be included in subgroup A3(a).

AMD 2431

AMENDMENT SLIP No. 2 published January 1978 to BS 9491 : 1975

RULES FOR THE PREPARATION OF DETAIL SPECIFICATIONS  
FOR ANALOGUE INTEGRATED CIRCUITS OF ASSESSED  
QUALITY FULL ASSESSMENT LEVEL

Introduction

This amendment implements the Technical Committees' decision to provide a minimum Rules coverage for analogue devices not covered by the existing Rules.

BS 9491 provides a convenient vehicle for this purpose and will be subject to further amendment in due course.

In the interim period, the individual appendices will incorporate specific test references, when the appropriate general clauses of the parent document do not directly apply.

Instructions for the insertion of new and revised pages and minor revisions to existing pages in BS 9491.

Insert appendix B to follow appendix A in the existing document.

Insert appendix C to follow the new appendix B.

Revised text

Clause 4. Delete 'appendix A' and substitute 'appendices'.



AMD 2825

Amendment Slip No. 3 published and effective from 30 March 1979  
to BS 9491 : 1975

Rules for the preparation of detail specifications  
for analogue integrated circuits of assessed quality.  
Full assessment level

Instructions for the insertion of revised pages and minor  
revisions to existing pages of BS 9491

The revised pages also include the text from Amendment No. 1, and part of the text of Amendment No. 2. This amendment removes the subgroup C4(a) and C4(b) tests inserted into appendices B and C by Amendment No. 2.

Remove page marked Clause 5, subgroup B2(b) and substitute revised page marked subgroup B2(a).

Remove page marked Clause 5, subgroup C5 and substitute revised page marked Clause 5, subgroup C4(a).

Remove marked page Appendix A and substitute revised page marked Clause 6.

Remove page marked A3 and substitute revised page marked A2.

Insert page marked A4.

Remove page marked Appendix C.

Remove page marked C3 and substitute revised page marked C3.

Remove page marked C4(b).

Revised text

Clause 2, fourth paragraph, fourth line, delete '2.2.5' and substitute '2.2'.

Clause 4, delete 'appendices' and substitute 'appendix'.



BRITISH STANDARD RULES FOR THE PREPARATION  
OF DETAIL SPECIFICATIONS FOR ANALOGUE INTEGRATED  
CIRCUITS OF ASSESSED QUALITY

FULL ASSESSMENT LEVEL

1. INTRODUCTION

This British Standard shall be read and used in conjunction with section 2 of BS 9400 : 1970, 'Integrated electronic circuits of assessed quality: generic data and methods of test', which gives the general rules for the preparation of detail specifications for integrated circuits.

The object of the general rules given in section 2 of BS 9400 is to ensure that detail specifications for integrated circuits are broadly similar as regards their subject matter and presentation.

. SCOPE

This British Standard lists the ratings, characteristics, inspection requirements and supplementary information for integrated circuits, which shall be included as minimum mandatory requirements, in accordance with the general rules given in section 2 of BS 9400, in the detail specification for these devices. A complete detail specification is, therefore, a combination of the requirements of both documents. Its purpose is to describe fully the particular integrated circuits so that the detail specification can be used for contractual purposes and for circuit design and equipment maintenance purposes.

This standard covers analogue circuits of several basic types as shown in the appendices to this standard. The complete requirements for the recommended conditions of use and associated characteristics (clause 4); and the inspection requirements for subgroups A2, A3 and A4 of clause 5; are given in the appendices, relevant to each type of analogue circuit.

The detail specification shall fully describe the type of circuit and its declared function or functions.

The rules given in this standard refer primarily to integrated circuits using a sealed package type of encapsulation. They can be used, however, for solid encapsulation (plastics) types of device provided that the modifications listed in 2.2.5 of BS 9400 are included in the detail specifications for these devices.

### 3. LIMITING CONDITIONS OF USE (RATINGS)

Limiting conditions (ratings) are not for inspection purposes.

Values of the limiting conditions of use shall be given as follows:

(a) The limiting values of positive and negative voltages at each terminal referred to a common terminal and any other inter-terminal voltages as appropriate, unless implied by limiting values of currents.

(b) The limiting values of positive and negative currents into each terminal, unless implied by limiting values of voltages.

If these voltages and currents may be exceeded for transient overload the permissible excesses and their durations shall be stated.

(c) The limiting ambient or case operating temperatures (minimum and maximum).

(d) The limiting storage temperatures (minimum and maximum).

(e) Any limiting mechanical or environmental conditions.

Additional ratings may be included at the manufacturer's discretion but in all cases the values of the limiting conditions of use and the conditions under which they apply shall be stated.

Any interdependence of limiting conditions shall be stated.

If externally connected elements have an influence on the values of the ratings, the ratings should be given for the integrated circuit with the elements connected. Any instructions on the switching sequence of supply voltages, as appropriate, should be stated.

Any other mechanical or environmental ratings or cautionary statements peculiar to a particular integrated circuit, shall be included.

### 4. RECOMMENDED CONDITIONS OF USE AND ASSOCIATED CHARACTERISTICS

See appendix A to these rules appropriate to the type of analogue circuit.

[Clause 5

## 5. INSPECTION REQUIREMENTS

In accordance with the requirements of 2.2 of BS 9400 except that the electrical tests in subgroups A2, A3 and A4 are categorized as 'major', 'interface' and 'other basic' measurements.

Standard test methods are given in BS 9400.

Where additional test methods are required they may be added in an appendix until such times as they are incorporated in BS 9400.

Unless otherwise indicated tests shall be made at 25 °C.

External elements necessary to ensure stable operation shall be specified and shall be connected for all electrical tests.

| amination                                                                                               | BS 9400 : reference and conditions of test                         | Limits to be specified at this point |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------|
| <p>GROUP A</p> <p>Subgroup A1</p> <p>Visual inspection</p>                                              | <p>Sugroup A5 is not applicable</p> <p>1.2.2 None</p>              |                                      |
| For subgroups A2, A3 and A4 see the appendix to these rules appropriate to the type of analogue circuit |                                                                    |                                      |
| <p>GROUP B</p> <p>Subgroup B1</p> <p>Dimensions</p>                                                     | <p>Subgroups B4 and B5 not applicable</p> <p>1.2.3 As required</p> | As required                          |
| <p>Subgroup B2(a)</p> <p>Solderability</p>                                                              | <p>See also 2.2.2.2 of BS 9400</p> <p>1.2.6.15.1 See note 1</p>    |                                      |

[Clause 5, subgroup B2(b)]

| Examination                                                | BS 9400 : reference and conditions of test                                                                                                                                   | Limits to be specified at this point |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <i>Subgroup B2(b)</i>                                      |                                                                                                                                                                              |                                      |
| Rapid change of temperature followed by Damp heat, cyclic  | 1.2.6.13 Rated maximum and minimum $T_{stg}$ values<br>1.2.6.5 Six cycles                                                                                                    | None<br>None                         |
| <i>Subgroup B3</i>                                         |                                                                                                                                                                              |                                      |
| Terminal robustness, bending                               | 1.2.6.16.2 None                                                                                                                                                              | None                                 |
| <i>Subgroup B6</i>                                         |                                                                                                                                                                              |                                      |
| Acceleration steady state                                  | 1.2.6.9 Value depending on construction and weight<br>Mounting and direction of acceleration                                                                                 | None                                 |
| <i>Subgroup B7</i>                                         |                                                                                                                                                                              |                                      |
| Electrical endurance                                       | 1.2.7 Duration = 160 h minimum<br><br>Ambient or reference point temperature<br><br>Test circuit to be specified<br><br>Electrical conditions to be applied to all terminals | None                                 |
| <i>Post-test end-points for subgroups B2(b), B6 and B7</i> |                                                                                                                                                                              |                                      |
| Major electrical characteristics                           | Requirements as for subgroup A2                                                                                                                                              |                                      |
| Interface (input/output) electrical characteristics        | Conditions and limits as for subgroup A3                                                                                                                                     |                                      |