INTERNATIONAL STANDARD

IEC 60748-23-1

QC 165000-1

First edition
2002-05

Semiconductor devices – Integrated circuits –

Part 23-1: Hybrid integrated circuits and film structures – Manufacturing line certification – Generic specification

Dispositifs à semiconducteurs – Circuits intégrés –

Partie 23-1: Circuits intégrés hybrides et structures par films – Certification de la ligne de fabrication – Spécification générique

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE XC

For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES — INTEGRATED CIRCUITS –

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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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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5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60748-23-1 has been prepared by subcommittee 47A: Integrated circuits, of IEC technical committee 47: Semiconductor devices.

The text of this standard is based on the European standard EN 165000-1 and the following documents:

FDIS	Report on voting
47A/638/FDIS	47A/649/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 3.

IEC 60748-23-1 should be read in conjunction with Parts 23-2, 23-3 and 23-4.

Annex A forms an integral part of this standard.

Annex B if for information only.

The QC number that appears on the front cover of this publication is the specification number in the IEC Quality Assessment System for Electronic Components (IECQ).

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

This set of specifications prescribes a set of procedures to be used by users and manufacturers for the production and delivery of high-quality, special requirement hybrid integrated circuits and film structures with a specified level of quality and reliability.

This set of specifications prescribes reference criteria for the establishment, control, maintenance and development of a certified manufacturing line and represents a manufacturing line certification methodology.

The targeted level of quality and reliability is to be achieved by using best design and manufacturing practices. Examples of quality and reliability best practices for elimination of potential failure mechanisms and achievement of a targeted quality and reliability level include: material characterization for derivation of process design rules, in-process control, continuous improvement, etc.

Assessment (estimation) of the targeted quality and reliability level may be accomplished by:

a) using data obtained from the material characterization, design and process control and improvement activities; or

b) through the use of product assessment level schedule (PALS) tests.

Part 23-2 of this set of specifications provides guidance to 'users' of hybrids in terms of the 'visual inspection standards' to be expected.

Part 23-3 of this set of specifications provides a framework for use as an assessment/audit tool to assist the suppliers, customers or an independent organization to carry out an assessment of a certified manufacturing line of a hybrid manufacturing company.

Part 23-4 of this set of specifications provides a blank detail specification, which provides guidance to 'users' of hybrids for procurement purposes.

Part 23-5 of this set of specifications provides a means of quality assessment on the basis of qualification approval.

SEMICONDUCTOR DEVICES – INTEGRATED CIRCUITS –

Part 23-1: Hybrid integrated circuits and film structures – Manufacturing line certification – Generic specification

1 Scope

This set of specifications applies to high quality hybrid integrated circuits (with films) incorporating special customer quality and reliability requirements. Hybrid integrated circuits may be fully or partly completed. Partly completed devices are those that may be supplied to customers for further processing.

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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050 (all parts), *International Electrotechnical Vocabulary*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 60068-2-1:1990, *Environmental testing – Part 2: Tests – Tests A: Cold*
Amendment 1 (1993)
Amendment 2 (1994)

IEC 60068-2-2:1974, *Basic environmental test procedures – Part 2: Tests – Tests B: Dry heat*
Amendment 1 (1993)
Amendment 2 (1994)

IEC 60068-2-3:1984 (incorporating amendment 1: 1984), *Basic environmental test procedures – Part 2: Tests – Test Ca: Damp heat, steady state*
Amendment 1 (1984)

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-7:1983, *Basic environmental testing procedures – Part 2: Tests – Test Ga and guidance: Acceleration, steady state*
Amendment 1 (1986)

IEC 60068-2-11:1981, *Basic environmental testing procedures – Part 2: Tests – Test Ka: Salt mist*

IEC 60068-2-14:1984, *Basic environmental testing procedures – Part 2: Tests – Test N: Change of temperature*
Amendment 1 (1986)

IEC 60068-2-17:1994, *Basic environmental testing procedures – Part 2: Tests – Test Q: Sealing*

IEC 60068-2-20:1979, *Basic environmental testing procedures – Part 2: Tests – Test T: Soldering*
Amendment 2 (1987)

IEC 60068-2-21:1999, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27:1987, *Basic environmental testing procedures– Part 2: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30:1980, *Environmental testing – Part 2: Tests – Test Db: Damp heat, cyclic (12 + 12-hour cycle)*
Amendment 1 (1985)

IEC 60068-2-44:1995, *Environmental testing – Part 2: Tests – Guidance on Test T: Soldering*

IEC 60068-2-45:1980, *Basic environmental testing procedures – Part 2: Tests – Test XA and guidance: Immersion in cleaning solvents*
Amendment 1 (1993)

IEC 60068-2-47:1999, *Environmental testing – Part 2-47: Tests – Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests*

IEC 60068-3 (all parts) E*nvironmental testing procedures – Part 3: Supporting documentation and guidance*

IEC 60068-3-4:2001, *Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests*

IEC 60068-5 (all parts), *Environmental testing – Part 5: Guide to drafting of test methods*

IEC 60134:1961, *Rating systems for electronic tubes and valves and analogous semiconductor devices*

IEC 60191-2:1996, *Mechanical standardization of semiconductor devices*

IEC 60617 (all parts), *Graphical symbols for diagrams*

IEC 60695-2-2:1991, *Fire hazard testing – Part 2: Test methods – Section 2: Needle-flame test*
Amendment 1 (1994)

IEC 60747-1:1983, *Semiconductor devices – Discrete devices – Part 1: General* [1]
Amendment 3 (1996)

IEC 60748-1, *Semiconductor devices – Integrated circuits – Part 1: General* [2]

IEC 60748-23-2:2002, *Semiconductor devices – Integrated circuits – Part 23-2: Hybrid integrated circuits and film structures – Manufacturing line certification – Internal visual inspection and special tests*

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[1] Together with any other part of IEC 60747 or IEC 60748 relevant to the specific hybrid application, including terminology.

[2] To be published.

IEC 60748-23-3:2002, *Semiconductor devices – Integrated circuits – Part 23-3: Hybrid integrated circuits and film structures – Manufacturing line certification – Manufacturers' self-audit checklist and report*

IEC 60749:1996, *Semiconductor devices – Mechanical and climatic test methods* [3]
Amendment 1 (2000)
Amendment 2 (2001)

IEC 61340-5-1:1998, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

ISO 1000:1992, *SI units and recommendations for use of their multiples and of certain other units*
Amendment 1 (1998)

ISO 9000:2000, *Quality management systems – Fundamentals and vocabulary*

ISO 2859 (all parts), *Sampling procedures for inspection by attributes*

IECQ 001002-3:1998, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of Procedure – Part 3: Approval procedures*

IECQ 001005:2000, *Register of Firms, Products and Services approved under the IECQ System, including ISO 9000*

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3 There exists a consolidated edition 2.2 (2002) that includes edition 2.0 (1996), its amendment 1 (2000) and amendment 2 (2001).