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Semiconductor devices - Mechanical and climatic test methods -
Part 7: Internal moisture content measurement and the analysis of other residual gases

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FOREWORD

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IEC 60749-7 has been prepared by IEC technical committee 47: Semiconductor devices. It is an International Standard.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) This document has been re-written and rearranged to align with the text of MIL-STD-883, Method 1018.10.
b) Additional detail has been provided in the calibration requirements.

The text of this International Standard is based on the following documents:

Draft	Report on voting
47/2861/CDV	47/2918A/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60749 series, under the general title *Semiconductor devices - Mechanical and climatic test methods*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

1 Scope

This part of IEC 60749 specifies the testing and measurement of water vapour and other gas content of the atmosphere inside a metal or ceramic hermetically sealed device. The test is used as a measure of the quality of the sealing process and to provide information about the long-term chemical stability of the atmosphere inside the package. It is applicable to semiconductor devices sealed in such a manner but generally only used for high reliability applications such as military or aerospace.

Of particular interest is the measurement of the primary sealing gases (or lack thereof), the moisture content, the presence of bombing gases that are indicative of non-hermeticity (e.g. helium), oxygen to argon ratio indicative of room air ~ 20 to 1 (± 10 %), dissimilar concentration of internally sealed gases (e.g. nitrogen, helium) than originally sealed in the device package, the presence of leak test fluid (i.e. fluorocarbon, helium, air), and all other gases to determine if the device meets the specified moisture, hermeticity and other criteria. Also of interest is the measurement of all the other gases since they reflect upon the quality of the sealing process and provide information about the long-term chemical stability of the atmosphere inside the device. The presence of leak test fluorocarbon vapour in the internal gas analysis (IGA) is an indication of failure to meet leak test requirements of IEC 60749-8.

This test is destructive.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60749-8, *Semiconductor devices - Mechanical and climatic test methods - Part 8: Sealing*