# IEC 60747-9

Edition 3.0 2019-11

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Semiconductor devices –**
**Part 9: Discrete devices – Insulated-gate bipolar transistors (IGBTs)**

**Dispositifs à semiconducteurs –**
**Partie 9: Dispositifs discrets – Transistors bipolaires à grille isolée (IGBT)**

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# SEMICONDUCTOR DEVICES –

# Part 9: Discrete devices – Insulated-gate bipolar transistors (IGBTs)

## FOREWORD

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International Standard IEC 60747-9 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices.

This third edition cancels and replaces the second edition published in 2007. This edition constitutes a technical revision.

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

a) reverse-blocking IGBT and its related technical contents have been added;
b) reverse-conducting IGBT and its related technical contents have been added;
c) some parts of the previous edition have been amended, combined or deleted.

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

| FDIS | Report on voting |
|---|---|
| 47E/675/FDIS | 47E/684/RVD |

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60747 series, published under the general title: *Semiconductor devices*, 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

# SEMICONDUCTOR DEVICES –

# Part 9: Discrete devices – Insulated-gate bipolar transistors (IGBTs)



## 1 Scope

This part of IEC 60747 specifies product specific standards for terminology, letter symbols, essential ratings and characteristics, verification of ratings and methods of measurement for insulated-gate bipolar transistors (IGBTs).

## 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 60747-1:2006, *Semiconductor devices – Part 1: General*
IEC 60747-1:2006/AMD1:2010

IEC 61340 (all parts), *Electrostatics*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

### 3.1 General terms

**3.1.1**
**insulated-gate bipolar transistor**
**IGBT**
transistor having a conductive channel and one PN junction in the forward direction and another PN junction in the reverse direction, the current flowing through the channel and the junction being controlled by an electric field resulting from a voltage applied between the gate and emitter terminals

Note 1 to entry: With collector-emitter voltage applied, the collector side PN junction is forward biased.

Note 2 to entry: This note applies to the French language only.

**3.1.2**
**N-channel IGBT**
IGBT that has one or more N-type conduction channels

[SOURCE: IEC 60050-521:2002, 521-04-56, modified – reworded for IGBT.]