BS EN IEC 60747-16-7:2022

BSI Standards Publication

Semiconductor devices

Part 16-7: Microwave integrated circuits — Attenuators

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60747-16-7

January 2023

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English Version

Semiconductor devices - Part 16-7: Microwave integrated circuits - Attenuators (IEC 60747-16-7:2022)

Dispositifs à semiconducteurs - Partie 16-7: Circuits intégrés hyperfréquences - Atténuateurs (IEC 60747-16-7:2022)

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European foreword

The text of document 47E/794/FDIS, future edition 1 of IEC 60747-16-7, prepared by SC 47E "Discrete semiconductor devices" of IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60747-16-7:2023.

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- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-10-03
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IEC 60747-16-1:2001	NOTE Harmonized as EN 60747-16-1:2002 (not modified)
IEC 60747-16-1:2001/AMD1:2007	NOTE Harmonized as EN 60747-16-1:2002/A1:2007 (not modified)
IEC 60747-16-1:2001/AMD2:2017	NOTE Harmonized as EN 60747-16-1:2002/A2:2017 (not modified)
IEC 60747-16-4:2004	NOTE Harmonized as EN 60747-16-4:2004 (not modified)
IEC 60747-16-4:2004/AMD1:2009	NOTE Harmonized as EN 60747-16-4:2004/A1:2011 (not modified)
IEC 60747-16-4:2004/AMD2:2017	NOTE Harmonized as EN 60747-16-4:2004/A2:2017 (not modified)
IEC 60747-16-6:2019	NOTE Harmonized as EN IEC 60747-16-6:2019 (not modified)

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60747-1	2006	Semiconductor devices - Part 1: General	-	-
+ A1	2010		-	-
IEC 60747-4	-	Semiconductor devices - Discrete devices -- Part 4: Microwave diodes and transistors		-
IEC 61340-5-1	-	Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements	EN 61340-5-1	-
IEC/TR 61340-5-2	-	Electrostatics - Part 5-2: Protection of electronic devices from electrostatic phenomena - User guide	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Semiconductor devices –
Part 16-7: Microwave integrated circuits – Attenuators

Dispositifs à semiconducteurs –
Partie 16-7: Circuits intégrés hyperfréquences – Atténuateurs

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SEMICONDUCTOR DEVICES –

Part 16-7: Microwave integrated circuits – Attenuators

FOREWORD

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IEC 60747-16-7 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices. It is an International Standard.

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

Draft	Report on voting
47E/794/FDIS	47E/798/RVD

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.

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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 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 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.

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SEMICONDUCTOR DEVICES –

Part 16-7: Microwave integrated circuits – Attenuators

1 Scope

This part of IEC 60747 specifies the terminology, essential ratings and characteristics, and measuring methods of microwave integrated circuit attenuators.

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/AMD 1:2010

IEC 60747-4, *Semiconductor devices – Discrete devices – Part 4: Microwave diodes and transistors*

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

IEC TR 61340-5-2, *Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide*

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 https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
reference state
thru state
state of minimum attenuation

3.2
attenuation state
state in which the attenuation is greater than that in the reference state

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3.3
transmission loss
L_{trans}
ratio of the input power to the output power, in the linear region of the power transfer curve P_o(dBm) = $f(P_i)$

Note 1 to entry: In this region, ΔP_o(dBm) = ΔP_i(dBm).

Note 2 to entry: Usually the transmission loss is expressed in decibels.

3.4
insertion loss
L_{ins}
ratio of the input power to the output power, in the linear region of the power transfer curve P_o(dBm) = $f(P_i)$ in the reference state

Note 1 to entry: In this region, ΔP_o(dBm) =ΔP_i(dBm).

Note 2 to entry: Usually the insertion loss is expressed in decibels.

[SOURCE: IEC 60747-16-4:2004/AMD 1:2009, 3.1, modified – “at the switched on port” has been deleted and “in the reference state” has been added.]

3.5
attenuation value
A_{att}
difference between the insertion loss and the transmission loss in the attenuation state

3.6
attenuation range
A_{ran}
difference between the maximum and minimum attenuation value

3.7
attenuation accuracy
A_{aur}
maximum difference between the measured and the nominal attenuation values

3.8
attenuation accuracy (RMS)
$A_{aur\ (RMS)}$
root-mean-square value of the attenuation accuracy

3.9
input return loss
$L_{ret(in)}$
ratio of the incident power at the input port to the reflected power at the input port

[SOURCE: IEC 60747-16-6:2019, 3.4]

3.10
output return loss
$L_{ret(out)}$
ratio of the incident power at the output port to the reflected power at the output port

[SOURCE: IEC 60747-16-6:2019, 3.5]

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