
Polprevodniški elementi – 16-4. del: Mikrovalovna integrirana vezja – Stikala (IEC 60747-16-4:2004)

Semiconductor devices -- Part 16-4: Microwave integrated circuits - Switches

Halbleiterbauelemente -- Teil 16-4: Integrierte Mikrowellenschaltkreise - Schalter

Dispositifs à semiconducteurs -- Partie 16-4 : Circuits intégrés hyperfréquences - Commutateurs

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Ta slovenski standard je istoveten z: **EN 60747-16-4:2004**

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English version

Semiconductor devices
Part 16-4: Microwave integrated circuits –
Switches
(IEC 60747-16-4:2004)

Dispositifs à semiconducteurs
Partie 16-4 : Circuits intégrés
hyperfréquences –
Commutateurs
(CEI 60747-16-4:2004)

Halbleiterbauelemente
Teil 16-4: Integrierte
Mikrowellenschaltkreise –
Schalter
(IEC 60747-16-4:2004)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 47E/256/FDIS, future edition 1 of IEC 60747-16-4, prepared by SC 47E, Discrete semiconductor devices, of IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60747-16-4 on 2004-09-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2005-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-09-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60747-16-4:2004 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60747-16-1 NOTE Harmonized as EN 60747-16-1:2002 (not modified).
<https://standards.iteh.ai/catalog/standards/sist/c17dd0cb-4a4b-47b2-9f55-32faa98b99a7/sist-en-60747-16-4-2005>

Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60617-12	- ¹⁾	Graphical symbols for diagrams Part 12: Binary logic elements	EN 60617-12	1998 ²⁾
IEC 60617-13	- ¹⁾	Part 13: Analogue elements	EN 60617-13	1993 ²⁾
IEC 60747-1	1983	Semiconductor devices - Discrete devices Part 1: General	-	-
A3	1996		-	-
IEC 60747-4	- ¹⁾	Part 4: Microwave diodes and transistors	-	-
IEC 60748-2-1	- ¹⁾	Semiconductors devices - Integrated circuits Part 2: Digital integrated circuits - Section one - Blank detail specification for bipolar monolithic digital integrated circuit gates (excluding uncommitted logic arrays)	-	-
IEC 60748-3	- ¹⁾	Part 3: Analogue integrated circuits	-	-
IEC 60748-4	- ¹⁾	Part 4: Interface integrated circuits	-	-

1) Undated reference.

2) Valid edition at date of issue.

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INTERNATIONAL STANDARD

IEC 60747-16-4

First edition
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Semiconductor devices –

Part 16-4: Microwave integrated circuits – Switches

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES –

Part 16-4: Microwave integrated circuits –
Switches

FOREWORD

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International Standard IEC 60747-16-4 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices.

The text of this standard is based on the following documents:

FDIS	Report on voting
47E/256/FDIS	47E/261/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 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

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SEMICONDUCTOR DEVICES –

Part 16-4: Microwave integrated circuits – Switches

1 Scope

This part of IEC 60747 provides new measuring methods, terminology and letter symbols, as well as essential ratings and characteristics for integrated circuit microwave switches.

There are many combinations for RF ports in switches, such as SPST (single pole single throw), SPDT (single pole double throw), SP3T (single pole triple throw), DPDT (double pole double throw), etc. Switches in this standard are based on SPDT. However, this standard is applicable to the other types of switches.

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 60617-12, *Graphical symbols for diagrams – Part 12: Binary logic elements*

IEC 60617-13, *Graphical symbols for diagrams – Part 13: Analogue elements*

IEC 60747-1(1983), *Semiconductor devices – Discrete devices and integrated circuits – Part 1: General* <https://standards.iteh.ai/catalog/standards/sist/c17dd0cb-4a4b-47b2-9f55-32faa98b99a7/sist-en-60747-16-4-2005>
Amendment 3 (1996)

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

IEC 60748-2, *Semiconductor devices – Integrated circuits – Part 2: Digital integrated circuits*

IEC 60748-3, *Semiconductor devices – Integrated circuits – Part 3: Analogue integrated circuits*

IEC 60748-4, *Semiconductor devices – Integrated circuits – Part 4: Interface integrated circuits*

3 Terms and definitions

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

Terms related to electrical characteristics

3.1 insertion loss

L_{ins}

ratio of the output power at the switched on port to the input power in the linear region of the power transfer curve P_o (dBm) = $f(P_i)$

NOTE 1 In this region, ΔP_o (dBm) = ΔP_i (dBm).

NOTE 2 Usually the insertion loss is expressed in decibels.

**3.2
isolation**

L_{iso}

ratio of the output power at the switched off port to the input power in the linear region of the power transfer curve P_o (dBm) = $f(P_i)$

NOTE 1 In this region, ΔP_o (dBm) = ΔP_i (dBm).

NOTE 2 Usually the isolation is expressed in decibels.

**3.3
return loss**

L_{ret}

ratio of the incident power P_{inc} at the specified port to the reflected power P_{ref} at the same port in the linear region of the power transfer curve P_{ref} (dBm) = $f(P_{inc})$

NOTE 1 In this region, ΔP_{ref} (dBm) = ΔP_{inc} (dBm).

NOTE 2 Usually the return loss is expressed in decibels.

**3.4
input power at 1 dB compression**

$P_{i(1\text{ dB})}$

input power where the insertion loss increases by 1 dB compared with insertion loss in linear region

**3.5
output power at 1 dB compression**

$P_{o(1\text{ dB})}$

output power where the insertion loss increases by 1 dB compared with insertion loss in linear region

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**3.6
turn on time**

t_{on}

interval between the lower reference point on the leading edge of the control voltage and the upper reference point on the leading edge of the envelope of the output voltage in the linear region of the power transfer curve P_o (dBm) = $f(P_i)$

NOTE In this region, ΔP_o (dBm) = ΔP_i (dBm).

**3.7
turn off time**

t_{off}

interval between the upper reference point on the trailing edge of the control voltage and the lower reference point on the trailing edge of the envelope of the output voltage in the linear region of the power transfer curve P_o (dBm) = $f(P_i)$

NOTE In this region, ΔP_o (dBm) = ΔP_i (dBm).

**3.8
rise time**

$t_{r(out)}$

interval between the lower reference point on the leading edge of the output voltage and the upper reference point on the leading edge of the envelope of the output voltage in the linear region of the power transfer curve P_o (dBm) = $f(P_i)$

NOTE In this region, ΔP_o (dBm) = ΔP_i (dBm).