IEC 60747-16-3

Edition 1.0   2009-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Semiconductor devices –
Part 16-3: Microwave integrated circuits – Frequency converters

Dispositifs à semiconducteurs –
Partie 16-3: Circuits intégrés hyperfréquences – Convertisseurs de fréquence

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FOREWORD

This amendment has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices.

This bilingual version, published in 2010-03, corresponds to the English version.

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

CDV	Report on voting
47E/357/CDV	47E/372/RVC

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

The French version of this amendment has not been voted upon.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability 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- withdrawn,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.

CONTENTS

6.12   Intermodulation distortion (P_n/P_1)

Replace the title of this subclause by the following new title:

6.12   Intermodulation distortion (P_1/P_n)

2   Normative references

Replace the existing references IEC 60617-12, IEC 60617-13 and IEC 60747-1 by the following new references:

IEC 60617, *Graphical symbols for diagrams*

IEC 60747-1:2006, *Semiconductor devices – Part 1: General*

Add, to the existing list, the following new references:

IEC 60050-702:1992, *International Electrotechnical Vocabulary – Chapter 702: Oscillations, signals and related devices*

IEC 60747-16-1:2001, *Semiconductor devices – Part 16-1: Microwave integrated circuits – Amplifiers*
Amendment 1 (2007)[1]

IEC 61340-5-1:2007, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

IEC/TR 61340-5-2:2007, *Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide*

3   Terms and definitions

Replace term and definition 3.14 and term and definition 3.15 by the following new terms and definitions:

3.14
noise figure, F
see 702-08-57 of IEC 60050-702

NOTE   The term "noise figure" expresses "noise factor" in decibels.

3.15
intermodulation distortion, P_1/P_n
see 3.7 of Amendment 1 of IEC 60747-16-1

5.1.1.4   Package identification

Replace, in item b), "or of" by "or".

5.3.1   Detailed block diagram – functional blocks

Replace, in the last sentence of the last paragraph, "IEC 60617-12 or IEC 60617-13" *by* "IEC 60617".

5.4.1   Electrical limiting values

Replace the existing Table 2 by the following new table:

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[1]   There exists a consolidated edition 1.1 published in 2007, including the base publication (2001) and its Amendment 1 (2007).

Table 2 – Electrical limiting values

Subclause	Parameters	Min.	Max.
5.4.1.1	Power supply voltage(s)		+
5.4.1.2	Power supply current(s) (where appropriate)		+
5.4.1.3	Terminal voltage(s) (where appropriate)	+	+
5.4.1.4	Terminal current(s) (where appropriate)		+
5.4.1.5	Input power		+
5.4.1.6	LO input power		+
5.4.1.7	Power dissipation		+

5.4.2 Temperatures

Replace the existing item a) by the following new item a):

a) Operating temperature (ambient or reference-point temperature)

5.6 Electrical characteristics

Replace the first line of the second paragraph by the following new line:

Each characteristic shall be stated: either

Replace parameter 5.6.13 by the following new parameter:

Sub-clause	Parameters	Min.	Typical*	Max.	Types A	B
5.6.13	Intermodulation distortion	+	+		+	+

5.7 Mechanical and environmental ratings, characteristics and data

Replace reference "IEC 60747-1, chapter VI, Clause 7" by "5.10 and 5.11 of IEC 60747-1".

5.8.8 Handling precautions

Replace reference "IEC 60747-1, chapter IX" by "IEC 61340-5-1 and IEC 61340-5-2".

6.1.1 General precautions

Replace, in the first line of the first paragraph "Clause 1 of IEC 60747-1, chapter VII" by "6.3, 6.4 and 6.6 of IEC 60747-1".

6.1.3 Handling precautions

Replace "IEC 60747-1, Chapter IX, Clause 1" by "IEC 61340-5-1 and IEC 61340-5-2".

6.2.6   Measurement procedure

Replace the fourth paragraph by the following new paragraph:

The bias under specified conditions is applied.

6.3.6.1   Conversion gain flatness for constant LO frequency

Replace the third paragraph by the following new paragraph:

The bias under specified conditions is applied.

Amend the existing seventh paragraph as follows:

Set the suitable input power level for measuring the conversion gain.

6.3.6.2   Conversion gain flatness for constant output frequency

Replace the third paragraph by the following new paragraph:

The bias under specified conditions is applied.

Amend the existing seventh paragraph as follows:

Set the suitable input power level for measuring the conversion gain.

Amend the existing eighth paragraph as follows:

Vary the input and local frequencies within the specified frequency band while keeping the input power level and the local power level constant.

Add the following new Subclause 6.3.6.3.

6.3.6.3   Conversion gain flatness for constant input frequency

The frequency of the signal generator for the local signal shall be set to the specified value.

The frequency of the signal generator for the input signal shall be set to the specified value.

The bias under specified conditions is applied.

The power level of the local signal shall be adjusted to the specified value.

An adequate input power shall be applied to the device being measured.

By varying the input power, confirm that a change of output power corresponds to an equal change in the input power.

Set the suitable input power level for measuring the conversion gain.

Vary the local frequency within the specified frequency band while keeping the local power level constant.

Obtain the maximum conversion gain $G_{c(max)}$ and the minimum conversion gain $G_{c(min)}$ in the specified frequency band.

The conversion gain flatness ΔG_c is calculated using equation (5).

6.3.7.2   Conversion gain flatness for constant output frequency

Delete, the fifth dashed item, "–   Input power".

Add the following new Subclause 6.3.7.3.

6.3.7.3   Conversion gain flatness for constant input frequency

– Ambient or reference point temperature
– Bias conditions
– Frequency band of local signal
– Incident power of local port
– Input frequency

6.7.7   Specified conditions

Replace the fifth dashed item, "Input power" *by the following dashed item:*

– Input power of RF port

6.11.3   Principle of measurement

Replace the ninth item of the list of variables introduced by "where" "P_{LO}" by "P_1".

6.12   Intermodulation distortion (P_n/P_1)

Replace the existing title of this subclause by the following new title:

6.12   Intermodulation distortion (P_1/P_n)

6.12.3   Principle of measurement

Insert, in the second sentence of the fourth paragraph, P_1/P_n. The amended sentence reads as follows:

P_1/P_n, L_1, L_2 and L_3 are expressed in decibels.

Replace in the last paragraph, "P_n/P_1" by "P_1/P_n".

Replace Equation (34) by the following equation:

$$P_1/P_n = P_o - P_n = P_2 - P_3 \tag{34}$$

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IEC 60747-16-3:2002/AMD1:2009
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686d11698bdc/iec-60747-16-3-2002-amd1-2009