INTERNATIONAL STANDARD

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60747-16-1

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AMENDMENT 1
2007-01

Amendment 1

Semiconductor devices –

Part 16-1:
Microwave integrated circuits –
Amplifiers

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE   Q

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FOREWORD

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

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

FDIS	Report on voting
47E/305/FDIS	47E/317/RVD

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 committee has decided that the contents of this amendment and the base 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- withdrawn,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.

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CONTENTS

Replace the titles of Subclauses 5.11, 5.13, 5.14, 5.15, 5.19, and 5.21 by the following new titles:

Add the titles of following new clause and subclauses:

Add the titles of following new figures:

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2 Normative references

Replace existing references IEC 60617-12, IEC 60617-13 and IEC 60747-1 as follows:

IEC 60617:2001, *Graphical symbols for diagrams*

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

IEC 60747-4:-, *Semiconductor devices – Discrete devices – Part 4: Microwave diodes and transistors[1]*

IEC 60747-16-2:2001, *Semiconductor devices – Part 16-2: Microwave integrated circuits – Frequency prescalers*

IEC 60747-16-4:2004, *Semiconductor devices – Part 16-4: Microwave integrated circuits – Switches*

IEC/TS 61340-5-1:1998, *Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements*

IEC/TS 61340-5-2:1999, *Electrostatics - Part 5-2: Protection of electronic devices from electrostatic phenomena - User guide*

3 Terminology

Replace, on pages 6 and 7, the terms 3.7, 3.9, 3.10, 3.11, 3.14, and 3.16 by the following new terms:

3.7
intermodulation distortion P_1/P_n
ratio of the fundamental component of the output power to the nth order component of the output power, at a specified input power

3.9
magnitude of the input reflection coefficient
(input return loss)
$|S_{11}|$
see 3.5.2.1 of IEC 60747-7

3.10
magnitude of the output reflection coefficient
(output return loss)
$|S_{22}|$
see 3.5.2.2 of IEC 60747-7

3.11
magnitude of the reverse transmission coefficient
(isolation)
$|S_{12}|$
see 3.5.2.4 of IEC 60747-7

3.14
nth order harmonic distortion ratio P_1/P_{nth}
ratio of the power of the fundamental frequency measured at the output port of the device to the power of the nth order harmonic component measured at the output port for a specified output power

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[1] The second edition of IEC 60747-4, which is cited in this standard, and to which terms introduced in this amendment refer, is currently in preparation (ADIS).

3.16
spurious intensity under specified load VSWR P_o/P_{sp}
ratio of the power of the fundamental frequency measured at the output port of the device to the maximum spurious power measured at the output port under specified load VSWR

Add the following new terms:

3.17
output power
P_o
see 3.3 of IEC 60747-16-2

3.18
output power at 1 dB gain compression
$P_{o(1dB)}$
see 8.2.13 of IEC 60747-4

3.19
noise figure
F
see 702-08-57 of IEC 60050-702

3.20
power added efficiency
η_{add}
see 8.2.15 of IEC 60747-4

3.21
adjacent channel power ratio
$P_{o(mod)}/P_{adj}$
see 3.10 of IEC 60747-16-4

3.22
load mismatch tolerance
Ψ_L
see 7.2.20 of IEC 60747-4

3.23
source mismatch tolerance
Ψ_S
see 7.2.21 of IEC 60747-4

3.24
load mismatch ruggedness
Ψ_R
see 7.2.22 of IEC 60747-4

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4.3.1   Detailed block diagram – Functional blocks

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

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4.6.2   Dynamic or a.c. characteristics

Replace the title and parameters 4.6.2.10, 4.6.2.20 and 4.6.22 by the following new title and new parameters:

4.6.2 Dynamic or r.f. characteristics

Parameters		Min.	Max.	Types			
				A	B	C	D
4.6.2.10	Intermodulation distortion	+				+	+
4.6.2.20	nth order harmonic distortion ratio (where appropriate) (note 2)	+					+
4.6.2.22	Spurious intensity under specified load VSWR (where appropriate) (note 2)	+					+

Add the following new parameters:

Parameters		Min.	Max.	Types			
				A	B	C	D
4.6.2.23	Adjacent channel power ratio (where appropriate)	+					+
4.6.2.24	Load mismatch tolerance (where appropriate)		+				+
4.6.2.25	Source mismatch tolerance (where appropriate)		+				+
4.6.2.26	Load mismatch ruggedness (where appropriate)		+				+

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4.7 Mechanical and environmental ratings, characteristics and data

Replace "IEC 60747-1, Chapter VI, clause 7" by "Subclause 5.10 and 5.11 of IEC 60747-1:2006".

4.8.8 Handling precautions

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

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5.1.2 General precautions

Replace "clause 2 of IEC 60747-1, Chapter VII, Section One" by "clause 6.3, 6.4 and 6.6 of IEC 60747-1:2006".

5.1.3 Handling precautions

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

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Replace the existing title of Subclause 5.11 by the following new title:

5.11   Intermodulation distortion (two-tone) (P_1/P_n)

5.11.3   Principle of measurement

Replace, in the first line "P_n and P_1" by "P_1 and P_n".

Replace Equation (14) by the following:

$$P_1 = P_b + L_2 \qquad (14)$$

Replace the text after Equations (13), (14), (15) and (16) as follows:

where

P_1 and P_n are the powers of the fundamental signal and the intermodulation distortion, respectively;

P_a, P_b and P_c are the values indicated by the spectrum analyser corresponding to P_i, P_1 and P_n, respectively:

L_1 is the difference between the loss L_A and L_B where L_A is the loss from point E to point A and L_B is the loss from point E to point B shown in Figure 3, respectively. L_2 is the circuit loss from point C to point D shown in Figure 3. P_i, P_1, P_n, P_a, P_b and P_c are expressed in dBm. L_1 and L_2 are expressed in decibels.

The intermodulation distortion, P_1/P_n, which is expressed in dBc, is derived from Equations (14) and (15) as follows:

$$P_1/P_n = P_1 - P_n = P_b - P_c \qquad (16)$$

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Replace the existing title of subclause 5.13 by the following new title:

5.13   Magnitude of the input reflection coefficient (input return loss) ($|S_{11}|$)

Replace, in Equation (17), the symbol "$|s_{11}|$" by "$|S_{11}|$".

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Replace, the symbol "($|s_{22}|$)" by "($|S_{22}|$)" in the following places:

in both the title and text of subclause 5.14, on page 30 in Equation (18); on page 31, in Subclause 5.14.2.1 and in Equation (19),

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5.14.2.4   Circuit description and requirements

Delete, in the second paragraph of this subclause, the symbol "$|s_{22}|$".