SLOVENSKI STANDARD
SIST EN 62433-3:2017

01-september-2017

Modeliranje integriranih vezij (IC) za elektromagnetno združljivost (EMC) - 3. del: Modeli integriranih vezij za simulacijo obnašanja glede na elektromagnetno odpornost (EMI) - Modeliranje sevanih emisij (ICEM-RE) (IEC 62433-3:2017)

EMC IC modelling - Part 3: Models of Integrated Circuits for EMI behavioural simulation - Radiated emissions modelling (ICEM-RE) (IEC 62433-3:2017)

Modèles de circuits intégrés pour la CEM - Partie 3: Modèles de circuits intégrés pour la simulation du comportement lors de perturbations électromagnétiques - Modélisation des émissions rayonnées (ICEM-RE) (IEC 62433-3:2017)

Ta slovenski standard je istoveten z: **EN 62433-3:2017**

ICS:

31.200	Integrirana vezja, mikroelektronika	Integrated circuits. Microelectronics
33.100.10	Emisija	Emission

SIST EN 62433-3:2017 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

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ICS 33.100.10; 31.200

English Version

EMC IC modelling - Part 3: Models of Integrated Circuits for EMI behavioural simulation - Radiated emissions modelling (ICEM-RE)
(IEC 62433-3:2017)

Modèles de circuits intégrés pour la CEM - Partie 3: Modèles de circuits intégrés pour la simulation du comportement lors de perturbations électromagnétiques - Modélisation des émissions rayonnées (ICEM-RE)
(IEC 62433-3:2017)

EMV-IC-Modellierung - Teil 3: Modelle integrierter Schaltungen für die Simulation des Verhaltens bei elektromagnetischer Beeinflussung - Modellierung von abgestrahlten Aussendungen (ICEM-RE)
(IEC 62433-3:2017)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 47A/1000/FDIS, future edition 1 of IEC 62433-3, prepared by SC 47A "Integrated circuits" of IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62433-3:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2017-12-03
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-03-03

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62433-3:2017 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:

ISO 8879:1986	NOTE	Harmonized as EN 28879:1990[1)]

1) Withdrawn publication

Annex ZA
(normative)
Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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 61967-1	-	Integrated circuits - Measurement of electromagnetic emissions, 150 kHz to 1 GHz -- Part 1: General conditions and definitions	EN 61967-1	-
IEC 62433-2	-	EMC IC modelling - Part 2: Models of integrated circuits for EMI behavioural simulation - Conducted emissions modelling (ICEM-CE)	FprEN 62433-2	-
IEC/TS 61967-3	-	Integrated circuits - Measurement of electromagnetic emissions - Part 3: Measurement of radiated emissions - Surface scan method	-	-
IEC/TS 62433-1:2011	-	EMC IC modelling - Part 1: General modelling framework	-	-
ANSI INCITS 4	-	Information Systems - Coded Character Sets - 7-Bit American National Standard Code for Information Interchange (7-Bit ASCII)	-	-

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INTERNATIONAL STANDARD

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EMC IC modelling –
Part 3: Models of integrated circuits for EMI behavioural simulation – Radiated emissions modelling (ICEM-RE)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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EMC IC MODELLING –

Part 3: Models of integrated circuits for EMI behavioural simulation – Radiated emissions modelling (ICEM-RE)

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62433-3 has been prepared by subcommittee 47A: Integrated Circuits, of IEC technical committee 47: Semiconductor devices.

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

FDIS	Report on voting
47A/1000/FDIS	47A/1008/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.

A list of all parts in the IEC 62433 series, published under the general title *EMC IC modelling*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

EMC IC MODELLING –

Part 3: Models of integrated circuits for EMI behavioural simulation – Radiated emissions modelling (ICEM-RE)

1 Scope

This part of IEC 62433 provides a method for deriving a macro-model to allow the simulation of the radiated emission levels of an Integrated Circuit (IC). This model is commonly called Integrated Circuit Emission Model – Radiated Emission, ICEM-RE. The model is intended to be used for modelling a complete IC, with or without its associated package, a functional block and an Intellectual Property (IP) block of both analogue and digital ICs (input/output pins, digital core and supply), when measured or simulated data cannot be directly imported into simulation tools.

The proposed IC macro-model will be inserted in 3D electromagnetic simulation tools so as to:

- predict the near-radiated emissions from the IC
- evaluate the effect of the radiated emissions on neighbouring ICs, cables, transmission lines, etc.

This part of IEC 62433 has two main parts:

- the first is the electrical description of ICEM-RE macro-model elements,
- the second part proposes a universal data exchange format called REML based on XML. This format allows encoding the ICEM-RE in a more useable and generic form for emission simulation.

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 TS 62433-1, *EMC IC modelling – Part 1: General modelling framework*

IEC 62433-2, *EMC IC modelling – Part 2: Models of integrated circuits for EMI behavioural simulation – Conducted emissions modelling (ICEM-CE)*

IEC 61967-1, *Integrated circuits – Measurement of electromagnetic emissions, 150 kHz to 1 GHz – Part 1: General conditions and definitions*

IEC TS 61967-3, *Integrated circuits – Measurement of electromagnetic emissions – Part 3: Measurement of radiated emissions – Surface scan method*

ANSI INCITS 4:1986, *Information Systems – Coded Character Sets – 7-Bit American National Standard Code for Information Interchange (7-Bit ASCII)*

3 Terms, definitions, abbreviations and conventions

3.1 Terms and definitions

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

3.1.1
electric dipole
linear current-carrying element or wire that is always of finite length

3.1.2
current loop
closed current-carrying element or wire that is always of finite radius

3.1.3
magnetic dipole
linear “magnetic current” carrying element or wire that is of finite length

Note 1 to entry: A magnetic dipole is an equivalent magnetic source counterpart of an electric dipole that is used for mathematical formulations. This quantity is purely mathematical and not physical in nature.

Note 2 to entry: This term is used in an abstract manner to explain the motion of magnetic charges giving rise to magnetic currents, when compared to their dual quantities of moving electrical charges giving rise to electrical currents.

3.1.4
PDN
Passive Distribution Network
component of an IC model that represents the geometrical base within which equivalent radiating sources would be positioned

3.1.5
IA
Internal Activity
component of an IC model represented by a current or voltage source, which originates in activity of active devices in an IC or in a portion of the IC

Note 1 to entry: In this part of IEC 62433, a current source is commonly used to excite the elements of the PDN.

[SOURCE: IEC TS 62433-1:2011, 3.3, modified — Note 1 to entry has been added]

3.1.6
model$_{Hman}$
radiated magnetic emission model with manual sources

3.1.7
model$_{H}$
radiated magnetic emission model with automatic source detection

3.1.8
model$_{EM_Inv}$
radiated electric and magnetic emission model based on automatic source detection, using the matrix inverse method for problem solving

3.1.9
model$_{EM_Iter}$
radiated electric and magnetic emission model based on automatic source detection, using an iterative method for problem solving