
**Modeliranje integriranih vezij (IC) za elektromagnetno združljivost (EMC) - 1. del:
Splošni modelirni okvir (IEC 62433-1:2019)**

EMC IC modelling - Part 1: General modelling framework (IEC 62433-1:2019)

EMV-IC-Modellierung - Teil 1: Allgemeine Modellierungsstruktur

Modèles de circuits intégrés pour la CEM - Partie 1: Cadre de modèle général

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31.200	Integrirana vezja, mikroelektronika	Integrated circuits. Microelectronics
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(IEC 62433-1:2019)**

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EN IEC 62433-1:2019 (E)**European foreword**

The text of document 47A/1042/CDV, future edition 1 of IEC 62433-1, 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 IEC 62433-1:2019.

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) 2020-01-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-04-12

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The text of the International Standard IEC 62433-1:2019 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:

CISPR 17 NOTE Harmonized as EN 55017

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62433	series	EMC IC modelling	EN 62433	series
ISO 8879	-	Information processing - Text and office systems - Standard Generalized Markup Language (SGML)	-	-
ANSI INCITS 4	1986	Information Systems - Coded Character Sets - 7-Bit American National Standard Code for Information Interchange (7-Bit ASCII)	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EMC IC MODELLING –**Part 1: General modelling framework**

FOREWORD

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International Standard IEC 62433-1 has been prepared by subcommittee 47A: Integrated circuits, of IEC technical committee 47: Semiconductor devices.

IEC 62433-1 cancels and replaces IEC TS 62433-1 published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC TS 62433 1:2011:

Incorporation of a data exchange format for an integrated circuit's model representation.

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

CDV	Report on voting
47A/1042/CDV	47A/1055/RVC

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62433 series, under the general title *EMC IC modelling*, 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 "<http://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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EMC IC MODELLING –

Part 1: General modelling framework

1 Scope

This part of IEC 62433 specifies the framework and methodology for EMC IC macro-modelling. Terms that are commonly used in IEC 62433 (all parts), different modelling approaches, requirements and data-exchange format for each model category that is standardized in this series are defined in this document.

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 62433 (all parts), *EMC IC modelling*

ISO 8879, *Information processing – Text and office systems – Standard Generalized Markup Language (SGML)*

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

3 Terms, definitions, abbreviated terms and conventions

3.1 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 <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

ICEM-CE

Integrated Circuit Emission Model – Conducted Emissions

macro-model of an integrated circuit (IC) to simulate the conducted electromagnetic emissions

Note 1 to entry: An ICEM-CE macro-model can be used for modelling an IC-die, a functional block and an Intellectual Property (IP) block.

3.1.2

ICEM-RE

Integrated Circuit Emission Model – Radiated Emissions

macro-model of an integrated circuit (IC) to simulate the radiated electromagnetic emissions

3.1.3**ICIM-CI**

Integrated Circuit Immunity Model – Conducted Immunity

macro-model of an integrated circuit (IC) to simulate the susceptibility levels of the IC to conducted disturbances applied on the IC pins

3.1.4**ICIM-RI**

Integrated Circuit Immunity Model – Radiated Immunity

macro-model of an integrated circuit (IC) to simulate the susceptibility levels of the IC to external radiated disturbances

3.1.5**ICIM-CPI**

Integrated Circuit Immunity Model – Conducted Pulse Immunity

macro-model of an integrated circuit (IC) to simulate the susceptibility levels of the IC to conducted pulse disturbances applied on the IC pins

3.1.6**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: The component is applicable for both analogue and digital circuitry.

3.1.7**IB**

Immunity Behaviour

block that describes the internal immunity behaviour of the IC

3.1.8**FB**

Failure Behaviour

block that describes the internal failure behaviour of the IC

3.1.9**PDN**

Passive Distribution Network

component of an IC model that represents the characteristics of propagation path of electromagnetic noises such as power distribution network

Note 1 to entry: The propagation path can be represented either as an electrical network or as an equivalent network of electromagnetic sources such as electric and magnetic dipoles.

3.1.10**NLB**

Non-Linear Block

component of the IC model that represents the non-linear characteristics of the propagation path of the electromagnetic noises such as power distribution network

EXAMPLE ESD diodes, clamping diodes, back-to-back diodes.

3.1.11**IBC**

Inter-Block Coupling

network of passive elements that presents a coupling effect between circuit blocks within an IC

3.1.12**DI**

Disturbance Input

input terminal for the injection of RF and transient disturbances

Note 1 to entry: It could be any pin of IC, an input, supply or an output.

3.1.13**DO**

Disturbance Output

terminal whose load influences the impedance of DI terminal, and/or the transfer characteristics of PDN, and that outputs a part of the disturbance received on the DI terminals

3.1.14**OO**

Observable Output

output terminal where the immunity criteria are monitored during the test

3.1.15**section**

XML element placed one level below the root element or within another section and that contains one or more XML elements, but no value

3.1.16**parent**

keyword which is one level above another keyword

3.1.17**child**

keyword which is one level below another keyword

3.1.18**parser**

tool for syntactic analysis of data that is encoded in a specified format

3.1.19**S-parameter**

scattering parameter

 S_{ij}

element of the S-matrix expressing the transmission and reflection coefficients of a device

Note 1 to entry: As most commonly used, each S-parameter relates the complex electric field strength of a reflected or transmitted wave to that of an incident wave; the subscripts of a typical S-parameter S_{ij} refer to the output and input ports related by the S-parameter, which may vary with frequency.

[SOURCE: CISPR 17:2011, 3.1.13, modified – The example has been removed.]

3.1.20**IC EMCML**Integrated Circuit ElectroMagnetic Compatibility Markup Language
data exchange format for EMC IC model description**3.1.21****CEML**Conducted Emissions Markup Language
data exchange format for conducted emissions macro-model