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**Integrirana vezja - Vrednotenje elektromagnetne združljivosti (EMC) oddajnikov-sprejemnikov - 3. del: Oddajniki-sprejemniki CAN (IEC 62228-3:2019)**

Integrated circuits - EMC evaluation of transceivers - Part 3: CAN transceivers (IEC 62228-3:2019)

Integrierte Schaltungen - Bewertung der elektromagnetischen Verträglichkeit von Sende-Empfangsgeräten - Teil 3: CAN-Sende-Empfangsgeräte (IEC 62228-3:2019)

Circuits intégrés - Évaluation de la CEM des émetteurs-récepteurs - Partie 3: Émetteurs-récepteurs CAN (IEC 62228-3:2019)

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EUROPEAN STANDARD

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English Version

**Integrated circuits - EMC evaluation of transceivers - Part 3:  
CAN transceivers  
(IEC 62228-3:2019)**

Circuits intégrés - Évaluation de la CEM des émetteurs-  
récepteurs - Partie 3: Émetteurs-récepteurs CAN  
(IEC 62228-3:2019)

Integrierte Schaltungen - Bewertung der  
elektromagnetischen Verträglichkeit von Sende-  
Empfangsgeräten - Teil 3: CAN-Sende-Empfangsgeräte  
(IEC 62228-3:2019)

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**EN IEC 62228-3:2019 (E)****European foreword**

The text of document 47A/1050/CDV, future edition 1 of IEC 62228-3, 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 IEC 62228-3:2019.

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) 2020-01-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-04-15

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61000-4-4	NOTE	Harmonized as EN 61000-4-4
CISPR 16-1-1	NOTE	Harmonized as EN 55016-1-1

## 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61967-1	-	Integrated circuits - Measurement of electromagnetic emissions - Part 1: General conditions and definitions	EN IEC 61967-1-	-
IEC 61967-4	-	Integrated circuits - Measurement of electromagnetic emissions, 150 kHz to 1 GHz - Part 4: Measurement of conducted emissions, 1 ohm/150 ohm direct coupling method	EN 61967-4	-
IEC 62132-1	-	Integrated circuits - Measurement of electromagnetic immunity - Part 1: General conditions and definitions	EN 62132-1	-
IEC 62132-4	-	Integrated circuits - Measurement of electromagnetic immunity 150 kHz to 1 GHz - Part 4: Direct RF power injection method	EN 62132-4	-
IEC 62215-3	-	Integrated circuits - Measurement of impulse immunity - Part 3: Non-synchronous transient injection method	EN 62215-3	-
IEC 62228-1	-	Integrated circuits - EMC evaluation of transceivers - Part 1: General conditions and definitions	EN IEC 62228-1-	-
ISO 7637-2	-	Road vehicles - Electrical disturbances from conduction and coupling - Part 2: Electrical transient conduction along supply lines only	-	-
ISO 10605	-	Road vehicles - Test methods for electrical disturbances from electrostatic discharge	-	-
ISO 11898-1	-	Road vehicles - Controller area network (CAN) - Part 1: Data link layer and physical signalling	-	-
ISO 11898-2	-	Road vehicles - Controller area network (CAN) - Part 2: High-speed medium access unit	-	-

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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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Part 3: CAN transceivers (standards.iteh.ai)

Circuits intégrés – Évaluation de la CEM des émetteurs-récepteurs –  
Partie 3: Émetteurs-récepteurs CAN

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**INTEGRATED CIRCUITS –  
EMC EVALUATION OF TRANSCEIVERS –****Part 3: CAN transceivers****FOREWORD**

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International Standard IEC 62228-3 has been prepared by subcommittee 47A: Integrated circuits, of IEC technical committee 47: Semiconductor devices.

This first edition cancels and replaces the first edition of IEC TS 62228 published in 2007 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC TS 62228:

- a) introduction of CAN transceivers with partial networking functionality and CAN transceivers with flexible data rate capability and addition of operation modes and test descriptions in the respective subclauses of the document;
- b) introduction of minimal communication network with two CAN transceivers;
- c) update of the test requirements and targets in Annex C;
- d) addition of Annex D for common mode choke characterization.

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

CDV	Report on voting
47A/1050/CDV	47A/1069/RVC

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 62228 series, published under the general *title Integrated circuits – EMC evaluation of transceivers*, 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.

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# INTEGRATED CIRCUITS – EMC EVALUATION OF TRANSCEIVERS –

## Part 3: CAN transceivers

### 1 Scope

This part of IEC 62228 specifies test and measurement methods for EMC evaluation of CAN transceiver ICs under network condition. It defines test configurations, test conditions, test signals, failure criteria, test procedures, test setups and test boards. It is applicable for CAN standard transceivers, CAN transceivers with partial networking functionality and CAN transceivers with flexible data rate capability and covers

- the emission of RF disturbances,
- the immunity against RF disturbances,
- the immunity against impulses, and
- the immunity against electrostatic discharges (ESD).

### 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 61967-1, *Integrated circuits – Measurement of electromagnetic emissions – Part 1: General conditions and definitions*

IEC 61967-4, *Integrated circuits – Measurement of electromagnetic emissions, 150 kHz to 1 GHz – Part 4: Measurement of conducted emissions – 1  $\Omega$ /150  $\Omega$  direct coupling method*

IEC 62132-1, *Integrated circuits – Measurement of electromagnetic immunity – Part 1: General conditions and definitions*

IEC 62132-4, *Integrated circuits – Measurement of electromagnetic immunity 150 kHz to 1 GHz – Part 4: Direct RF power injection method*

IEC 62215-3, *Integrated circuits – Measurement of impulse immunity – Part 3: Non-synchronous transient injection method*

IEC 62228-1, *Integrated circuits – EMC evaluation of transceivers – Part 1: General conditions and definitions*

ISO 7637-2, *Road vehicles – Electrical disturbances from conduction and coupling – Part 2: Electrical transient conduction along supply lines only*

ISO 10605, *Road vehicles – Test methods for electrical disturbances from electrostatic discharge*

ISO 11898-1, *Road vehicles – Controller area network (CAN) – Part 1: Data link layer and physical signalling*

ISO 11898-2, *Road vehicles – Controller area network (CAN) – Part 2: High speed medium access unit*

### 3 Terms, definitions and abbreviated terms

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62228-1, IEC 61967-1, IEC 62132-1, as well as the following 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

##### **global pin**

pin that carries a signal or power, which enters or leaves the application board without any active component in between

##### 3.1.2

##### **CAN standard transceiver**

transceiver with functionality according to ISO 11898-2 with data rates up to 1 MBit/s and access to RxD and TxD signal

##### 3.1.3

##### **CAN PN transceiver**

transceiver with partial networking functionality according to ISO 11898-2 with access to RxD and TxD signal

##### 3.1.4

##### **CAN FD transceiver**

transceiver with flexible data rate capability according to ISO 11898-2 with data rates up to 2 MBit/s or 5 Mbit/s and access to RxD and TxD signal

##### 3.1.5

##### **Low Power – standby**

transceiver functional operation mode low power with active bus biasing

##### 3.1.6

##### **Low Power – sleep**

transceiver functional operation mode low power with inactive bus biasing

##### 3.1.7

##### **Low Power – PN standby**

transceiver functional operation mode low power with active bus biasing and frame detection active

##### 3.1.8

##### **Low Power – PN sleep**

transceiver functional operation mode low power with inactive bus biasing and frame detection configured

##### 3.1.9

##### **mandatory components, pl**

components needed for proper function of IC as specified by the IC manufacturer