SLOVENSKI STANDARD
oSIST prEN 62228-1:2017

01-september-2017

Integrirana vezja - Vrednotenje elektromagnetne združljivosti (EMC) oddajnikov-sprejemnikov - 1. del: Splošni pogoji in definicije

Integrated Circuits - EMC evaluation of transceivers - Part 1: General conditions and definitions

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COMMITTEE DRAFT FOR VOTE (CDV)

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IEC SC 47A : INTEGRATED CIRCUITS

SECRETARIAT: Japan	SECRETARY: Mr Yoshinori FUKUBA
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ – Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☒ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

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TITLE:

Integrated circuits - EMC evaluation of transceivers - Part 1: General conditions and definitions

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTEGRATED CIRCUITS –
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Part 1: General conditions and definitions

FOREWORD

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International Standard IEC 62228-1 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/XX/FDIS	47A/XX/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 62228 series, published, in development or planned under the general title *Integrated circuits – EMC Evaluation of transceivers*, can be found below.

Part 1: General conditions and definitions

Part 2: LIN transceivers

Part 3: CAN transceivers

Part 4: FlexRay transceivers

Part 5: Ethernet transceivers

Part 6: PSI5 transceivers

Part 7: CXPI transceivers

The committee has decided that the contents of this 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- withdrawn,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.

The National Committees are requested to note that for this publication the stability date is 2021

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

INTEGRATED CIRCUITS – EMC Evaluation of transceivers –

Part 1: General conditions and definitions

1 Scope

This part of IEC 62228 provides general information and definitions for EMC evaluation of integrated circuits with transceivers for wired network applications under network condition. It defines general test conditions, general test setups, test and measurement methods that shall be applied to all parts of IEC 62228.

2 Normative references

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.

IEC 61967-1: *Integrated circuits – Measurement of electromagnetic emissions 150 kHz to 1 GHz – 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 Ω/150 Ω direct coupling method*

IEC 61967-4-A1: *Integrated circuits – Measurement of electromagnetic emissions 150 kHz to 1 GHz – Part 4: Measurement of conducted emissions – 1 Ω/150 Ω direct coupling method*

IEC 62132-1: *Integrated circuits – Measurement of electromagnetic immunity– Part 1: General 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*

ISO 10605: *Road vehicles - Test methods for electrical disturbances from electrostatic discharge*

3 Terms, definitions and abbreviations

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

3.1 Terms and definitions

3.1.1
Global pin

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

3.1.2

mandatory components

components needed for proper function of IC as specified by the IC manufacturer (e.g. application note)

3.2 Abbreviations

3.2.1
DUT

Device under test

3.2.2
DPI

Direct RF Power Injection

3.2.3
ESD

Electrostatic Discharge

3.2.4
PCB

Printed Circuit Board

3.2.5
RxD

Receive Data

3.2.6
SBC

System Base Chip

3.2.7
TxD

Transmit Data

4 Philosophy

The intention of this document is to provide general definitions to evaluate the EMC performance of transceiver ICs under application like conditions in a minimal network by applying standardized IC EMC test methods. The goal is to define guidelines for the EMC characterisation on dedicated global pins of transceiver ICs which are considered EMC relevant in the application.

The evaluation of the EMC characteristics of transceivers shall be performed in functional operation modes under minimal network condition with two transceivers for RF emission, RF immunity and impulse immunity tests. For electrostatic discharge tests related to packaging and handling of assembled devices a single unpowered transceiver IC shall be evaluated.

The test methods used for the EMC characterization are based on the international standards for IC EMC tests and are described in Table 1.

Table 1 – Overview of test and measurement methods

Transceiver mode	Required test	Test method
Functional (powered)	RF emission	150 Ω direct coupling (IEC 61967-4)
	RF immunity	DPI (IEC 62132-4)
	Impulse immunity	Impulse immunity (IEC 62215-3)
Passive (unpowered)	ESD	Contact discharge (ISO 10605)

The 150 Ω direct coupling, DPI and impulse immunity test methods are chosen for the evaluation of the EMC characteristic of transceivers in functional modes.

These three test methods are based on the same approach using conductive coupling. Therefore it is possible to use the same test board for all tests in functional operation mode, which increases the reproducibility and comparability of test results.

The test configuration in general consists of two transceivers with mandatory external components and components for filtering (e.g. bus filter) and decoupling in a minimal test network, where filtered power supplies, signals, monitoring probes and coupling ports are connected as shown in Figure 1.

Note: In specific cases or for analyses a deviation from this setup can be agreed between the users of this standard and will be noted in the test report.

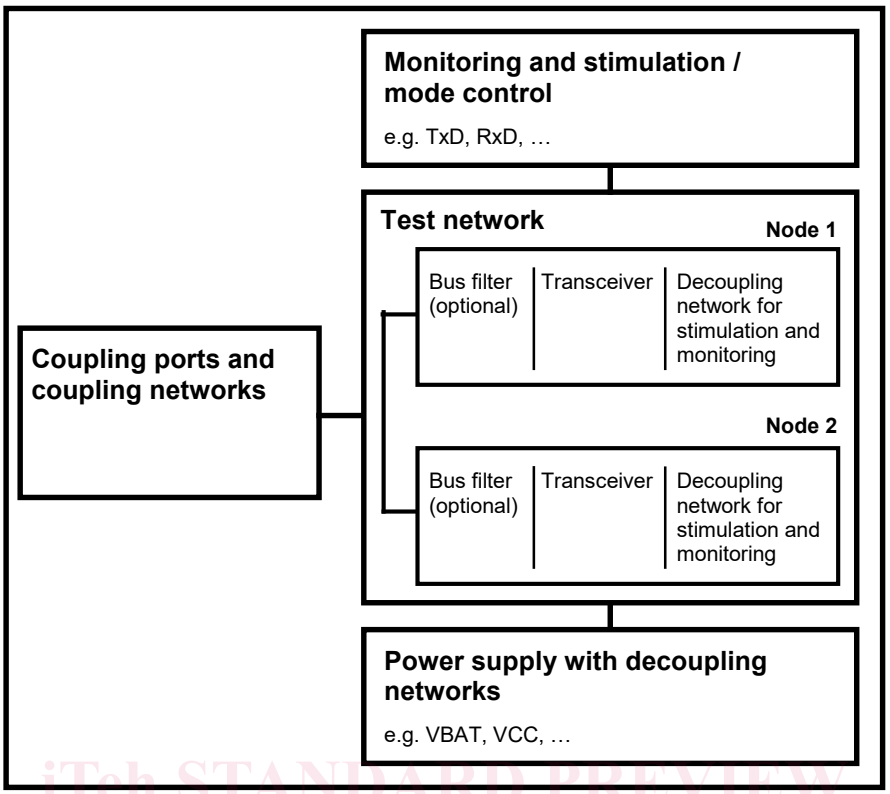

Figure 1 – General test configuration for tests in functional operation modes

The general test configuration for unpowered ESD test of transceiver ICs consists of a single transceiver IC with mandatory external components and components for filtering on a test board with discharge coupling ports as shown in Figure 2.

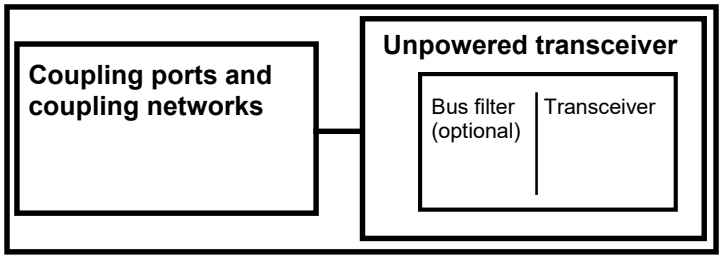

Figure 2 – General test configuration for unpowered ESD test

5 General test conditions and test board specification

5.1 Test conditions

For the purposes of this document, the test conditions given in IEC 61967-1, IEC 62132-1 and IEC 62215-3 and ISO 10605 apply for the related test methods.

These test conditions are intended to ensure a consistent test environment. If the users of this procedure agree to use other values, they shall be documented in the test report.