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Integrated circuits – EMC evaluation of transceivers – Part 5: Ethernet transceivers

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FOREWORD

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International Standard IEC 62228-5 has been prepared by subcommittee 47A: Integrated circuits, of IEC technical committee 47: Semiconductor devices.

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

Draft	Report on voting
47A/1115/FDIS	47A/1117/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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- withdrawn,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
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INTEGRATED CIRCUITS – EMC EVALUATION OF TRANSCEIVERS –

Part 5: Ethernet transceivers

1 Scope

This part of IEC 62228 specifies test and measurement methods for EMC evaluation of Ethernet 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 transceiver of the Ethernet systems

- 100BASE-T1 according to ISO/IEC/IEEE 8802-3/AMD1;
- 100BASE-TX according to ISO/IEC/IEEE 8802-3;
- 1000BASE-T1 according to ISO/IEC/IEEE 8802-3/AMD4

and covers

- the emission of RF disturbances;
- the immunity against RF disturbances;
- the immunity against impulses;
- 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 ohm/150 ohm 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 10605, *Road vehicles – Test methods for electrical disturbances from electrostatic discharge*

ISO 21111-2, *Road vehicles – In-vehicle Ethernet – Part 2: Common physical entity requirements*

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

ISO/IEC/IEEE 8802-3:2017, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Standard for Ethernet*

ISO/IEC/IEEE 8802-3:2017/AMD1:2017, *Amendment 1 – Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Standard for Ethernet – Physical layer specifications and management parameters for 100 Mb/s operation over a single balanced twisted pair cable (100BASE-T1)*

ISO/IEC/IEEE 8802-3:2017/AMD4:2017, *Amendment 4 – Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Standard for Ethernet – Physical layer specifications and management parameters for 1 Gb/s operation over a single twisted-pair copper cable*

Electronic Components Industry Association, EIA-198-1, *Ceramic Dielectric Capacitors Classes I, II, III and IV*

3 Terms, definitions and abbreviated terms

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at http://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

3.1 Terms and definitions

3.1.1
100BASE-T1 transceiver
transceiver 100 Mbit/s via single balanced twisted pair, with a functionality according to ISO/IEC/IEEE 8802-3/AMD1 (100BASE-T1)

3.1.2
100BASE-TX transceiver
transceiver 100 Mbit/s via two balanced twisted pairs, with a functionality according to ISO/IEC/IEEE 8802-3(100BASE-TX)

3.1.3
1000BASE-T1 transceiver
transceiver 1000 Mbit/s via single balanced twisted pair, with a functionality according to ISO/IEC/IEEE 8802-3/AMD4 (1000BASE-T1)

3.1.4
global pin
pin that carries a signal or power, which enters or leaves the application board without any active component in between