
Polprevodniški elementi - Polprevodniški vmesnik za komuniciranje človeškega telesa - 2. del: Opredelitev značilnosti vmesniških zmogljivosti (IEC 62779-2:2016)

Semiconductor devices - Semiconductor interface for human body communication - Part 2: Characterization of interfacing performances (IEC 62779-2:2016)

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Dispositifs à semi-conducteurs - Interface à semi-conducteurs pour les communications via le corps humain - Partie 2: Caractérisation des performances d'interfaçage (IEC 62779-2:2016)

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Ta slovenski standard je istoveten z: EN 62779-2:2016

ICS:

31.080.01	Polprevodniški elementi (naprave) na splošno	Semiconductor devices in general
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62779-2

May 2016

ICS 31.080.01

English Version

**Semiconductor devices - Semiconductor interface for human
body communication - Part 2: Characterization of interfacing
performances
(IEC 62779-2:2016)**

Dispositifs à semiconducteurs - Interface à
semiconducteurs pour les communications via le corps
humain - Partie 2: Caractérisation des performances
d'interfaçage
(IEC 62779-2:2016)

Halbleiterbauelemente - Halbleiterschnittstelle zur
Kommunikation über den menschlichen Körper -
Teil 2: Beschreibung der Schnittstellenfunktion
(IEC 62779-2:2016)

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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

EN 62779-2:2016**European foreword**

The text of document 47/2268/FDIS, future edition 1 of IEC 62779-2, prepared by IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62779-2:2016.

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) 2016-12-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-03-24

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IEC 62779	NOTE	Harmonized in EN 62779 series.
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IEC 62779-2

Edition 1.0 2016-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Semiconductor devices – Semiconductor interface for human body communication –
Part 2: Characterization of interfacing performances**

**Dispositifs à semiconducteurs – Interface à semiconducteurs pour les communications via le corps humain –
Partie 2: Caractérisation des performances d'interfaçage**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 31.080.01

ISBN 978-2-8322-3175-3

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES – SEMICONDUCTOR INTERFACE FOR HUMAN BODY COMMUNICATION –

Part 2: Characterization of interfacing performances

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International Standard IEC 62779-2 has been prepared by IEC technical committee 47: Semiconductor devices.

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

FDIS	Report on voting
47/2268/FDIS	47/2278/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 62779 series, published under the general title *Semiconductor devices – Semiconductor interface for human body communication*, 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 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.

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INTRODUCTION

The IEC 62779 series is composed of three parts as follow:

- IEC 62779-1 defines general requirements of a semiconductor interface for human body communication. It includes general and functional specifications of the interface.
- IEC 62779-2 defines a measurement method on electrical performances of an electrode that constructs a semiconductor interface for human body communication.
- IEC 62779-3 defines functional type of a semiconductor interface for human body communication, and operational conditions of the interface.

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SEMICONDUCTOR DEVICES – SEMICONDUCTOR INTERFACE FOR HUMAN BODY COMMUNICATION –

Part 2: Characterization of interfacing performances

1 Scope

This part of IEC 62779 defines a measurement method on electrical performances of an electrode that composes a semiconductor interface for human body communication (HBC). In the measurement method, a signal transmitter is electrically isolated from a signal receiver, so an isolation condition between the transmitter and receiver is maintained to accurately measure the electrode's performances. This part includes general and functional specifications of the measurement method.

HBC uses the body of a user as a transmission medium using near-field coupling inside the body: a signal transmitter and receiver are coupled with each other through a near field that is formed inside the human body and air. The intensity of the near field is strong especially inside the body due to high dielectric constant of the body, so a data signal is transmitted through the human body by modulating the near field. A signal transmitter and receiver for HBC include an internal ground respectively, and, in most HBC applications, the grounds are separated from each other as maintaining the coupling condition through the air. Quality of a data transmission strongly depends on a coupling degree between the grounds; hence, it is important to maintain the coupling degree between grounds of a signal transmitter and receiver for an accurate measurement of the electrode's performances. This part defines a measurement method to measure electrical performances of an electrode while the coupling degree between grounds of a signal transmitter and receiver is maintained.

NOTE 1 HBC semiconductor interface consists of an electrode and analog front end.

NOTE 2 General analog and digital modulation techniques can be used to modulate a near field used in HBC, and a modulation technique to be used is determined according to required performances for a data transmission and a HBC application.

2 Normative references

The following referenced documents are indispensable for the application 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.

None.

3 Terms, definitions and letter symbols

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

3.1 General terms

3.1.1

electrode

physical structure to transmit an electrical signal between an analog front end and the human body while attached to or located near the human body

Note 1 to entry: An electrode transfers an electrical signal to be transmitted to a non-metallic transmission channel, the human body. It also transfers an electrical signal received from the human body to the analog front end.

Note 2 to entry: electrode can have an adhesive material on its surface like a disposable ECG electrode to be attached itself to the human body; or a metal surface for a simple implementation. In the case of a metal surface, an electrode makes contact with the human body by attaching it to the human body using an attachment aid like a rubber band; or simply touching it with the hand.

[SOURCE: IEC 62779-1: 3.1.1, modified – Note 2 to entry has been added.]

3.1.2

transmitter module

circuit module that generates a pulse signal to be transmitted to the human body through an electrode for measurement of the electrode's performances; and a synchronization signal of an optical type to be transmitted through an optical cable for synchronization of the pulse signal transmitted through the human body

Note 1 to entry: A transmitter module includes a signal amplifier to amplify the transmitting pulse signal; and a signal filter to remove a signal component causing an interference to other measurement modules and measurement equipment.

3.1.3

receiver module

circuit module that processes a pulse signal received from the human body through an electrode to increase signal quality for measurement of the electrode's performances

Note 1 to entry: A receiver module includes a signal amplifier to amplify the received pulse signal; and a signal filter to remove a noise or interference signal from the received pulse signal.

3.1.4

synchronization module

circuit module that transforms a synchronization signal transmitted through an optical cable into an electrical signal; and generates a trigger signal using the transformed synchronization signal to trigger measurement equipment

Note 1 to entry: A synchronization module includes an optical transceiver to transform an optical signal into an electrical signal or vice versa.

3.1.5

pulse signal

electrical signal that is generated in the transmitter module and then transmitted to the human body through an electrode to measure the electrode's performances while having a specific pulse-width to include a signal component at frequency bands over which the performances are to be measured

Note 1 to entry: Figure 1 shows a pulse signal and its related terms.