Irish Standard
I.S. EN 62496-2:2017

Optical circuit boards - Basic test and measurement procedures - Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards

I.S. EN 62496-2:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 62496-2:2017 is the adopted Irish version of the European Document EN 62496-2:2017, Optical circuit boards - Basic test and measurement procedures - Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62496-2

September 2017

ICS 33.180.01

English Version

Optical circuit boards - Basic test and measurement procedures - Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards (IEC 62496-2:2017)

Cartes à circuits optiques - Procédures fondamentales d'essais et de mesures - Partie 2: Recommandations générales relatives à la détermination des conditions de mesure des caractéristiques optiques des cartes à circuits optiques (IEC 62496-2:2017)

Optische Leiterplatten - Grundlegende Prüf- und Messverfahren - Teil 2: Allgemeiner Leitfaden zur Festlegung der Bedingungen für die Messung der optischen Eigenschaften von optischen Leiterplatten (IEC 62496-2:2017)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 86/509/CDV, future edition 1 of IEC 62496-2, prepared by IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62496-2:2017.

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)	2018-03-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-06-28

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The text of the International Standard IEC 62496-2:2017 was approved by CENELEC as a European Standard without any modification.

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

IEC 60793-2	NOTE	Harmonized as EN 60793-2.
IEC 60793-1-43	NOTE	Harmonized as EN 60793-1-43.
IEC 60825-1	NOTE	Harmonized as EN 60825-1.
IEC 61280-4-1	NOTE	Harmonized as EN 61280-4-1.
IEC 61745	NOTE	Harmonized as EN 61745.
IEC 62496-1	NOTE	Harmonized as EN 62496-1.
IEC 62496-2-4	NOTE	Harmonized as EN 62496-2-4.
IEC 62496-4-1 [1)]	NOTE	Harmonized as EN 62496-4-1 [2)].

1) Under preparation. Stage at the time of publication: IEC PCC 62496-4-1:2017.

2) Under preparation. Stage at the time of publication: prEN 62496-4-1.

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 When 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.

Publication	Year	Title	EN/HD	Year
IEC 61300-1	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance	EN 61300-1	-
IEC 61300-3-53	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-53: Examinations and measurements - Encircled angular flux (EAF) measurement method based on two-dimensional far field data from step index multimode waveguide (including fibre)	EN 61300-3-53	-
IEC 62496-2-1	2011	Optical circuit boards - Part 2-1: Measurements - Optical attenuation and isolation	EN 62496-2-1	2011
IEC 62614	-	Fibre optics - Launch condition requirements for measuring multimode attenuation	EN 62614	-

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IEC 62496-2

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INTERNATIONAL STANDARD

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Optical circuit boards – Basic test and measurement procedures – Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards

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INTERNATIONAL STANDARD

Optical circuit boards – Basic test and measurement procedures – Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards

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OPTICAL CIRCUIT BOARDS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards

FOREWORD

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International Standard IEC 62496-2 has been prepared by IEC technical committee 86: Fibre optics.

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

CDV	Report on voting
86/509/CDV	86/515/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 in the IEC 62496 series, published under the general title *Optical circuit boards – Basic test and measurement procedures*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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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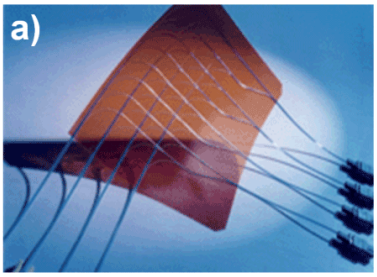
INTRODUCTION

Bandwidth densities in modern data communication systems are driven by interconnect speeds and scalable input/output (I/O) and will continue to increase over the coming years, thereby severely impacting cost and performance in future data communication systems, bringing increased demands in terms of signal integrity and power consumption.

The projected increase in capacity, processing power and bandwidth density in future information communication systems will need to be addressed by the migration of embedded optical interconnects into system enclosures. In particular, this would necessitate the deployment of optical circuit board technologies on some or all key system cards, such as the backplane, motherboard and peripheral circuit boards.

Many varieties of optical circuit board technology exist today, which differ strongly from each other in terms of their intrinsic waveguide technology. As shown in Figure 1, these varieties include, but are not limited to: a) fibre-optic laminate, b) polymer waveguides and c) planar glass waveguides. Annex A provides a detailed overview of the state of the art of such optical interconnect technologies.



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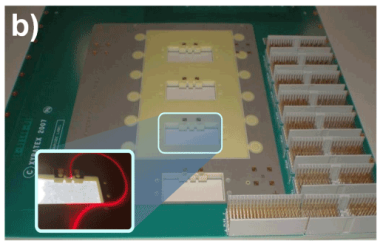

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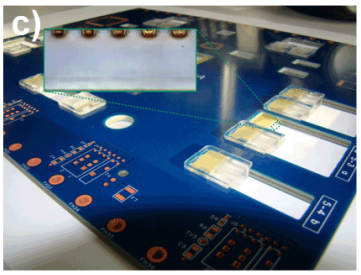

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a) Fibre-optic laminate **b) Polymer waveguides** **c) Planar glass waveguides**

Figure 1 – Optical circuit board varieties

One important prerequisite to the commercial adoption of optical circuit boards is a reliable test and measurement definition system that is agnostic to the type of waveguide system under test and, therefore, can be applied to different optical circuit board technologies as well as being adaptable to future variants. A serious and common problem with the measurement of optical waveguide systems has been lack of proper definition of the measurement conditions for a given test regime, and consequently strong inconsistencies ensue in the results of measurements by different parties on the same test sample. To date, no methodology has been established to ensure that test and measurement conditions for such optical waveguide systems are properly identified.

This document specifies a method of capturing sufficient information about the measurement conditions for a given optical circuit board to ensure consistency of measurement results within an acceptable margin.

Given the substantial variety in properties and requirements for different optical circuit board types, some test environments and conditions are more appropriate than others for a given optical circuit board. It is, therefore, crucial that this measurement identification standard encompass a comprehensive range of test and measurement scenarios for all known types of optical circuit boards and their waveguide systems, while also being sufficiently adaptable and extendable to accommodate future waveguide technologies. In addition, a degree of customisation is possible to account for arbitrary test parameters.

OPTICAL CIRCUIT BOARDS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2: General guidance for definition of measurement conditions for optical characteristics of optical circuit boards

1 Scope

This part of IEC 62496 specifies a method of defining the conditions for measurements of optical characteristics of optical circuit boards. The method comprises the use of code reference look-up tables to identify different critical aspects of the measurement environment. The values extracted from the tables are used to construct a measurement identification code, which, in itself, captures sufficient information about the measurement conditions, so as to ensure consistency of independently measured results within an acceptable margin. Recommended measurement conditions are specified to minimise further variation in independently measured results.

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 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

IEC 61300-3-53, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-53: Examinations and measurements – Encircled angular flux (EAF) measurement method based on two-dimensional far field data from step index multimode waveguide (including fibre)*

IEC 62614, *Fibre optics – Launch condition requirements for measuring multimode attenuation*

IEC 62496-2-1:2011, *Optical circuit boards – Part 2-1: Measurements – Optical attenuation and isolation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62496-2-1 and 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/
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