IEC 62153-4-15

Edition 2.0 2024-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Metallic cables and other passive components test methods – Part 4-15: Electromagnetic compatibility (EMC) related test method for measuring transfer impedance and screening attenuation or coupling attenuation with triaxial cell

Méthodes d'essai des câbles métalliques et autres composants passifs – Partie 4-15: Compatibilité électromagnétique (CEM) – Méthode d'essai pour le mesurage de l'impédance de transfert et de l'affaiblissement d'écran ou de l'affaiblissement de couplage avec cellule triaxiale

IEC 62153-4-15:2021-08/AMD1:2024-05(en-fr)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, …). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications, symboles graphiques et le glossaire. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 500 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 25 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

IEC 62153-4-15

Edition 2.0 2024-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Metallic cables and other passive components test methods – Part 4-15: Electromagnetic compatibility (EMC) related test method for measuring transfer impedance and screening attenuation or coupling attenuation with triaxial cell

Méthodes d'essai des câbles métalliques et autres composants passifs – Partie 4-15: Compatibilité électromagnétique (CEM) – Méthode d'essai pour le mesurage de l'impédance de transfert et de l'affaiblissement d'écran ou de l'affaiblissement de couplage avec cellule triaxiale

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.100.10, 33.120.10 ISBN 978-2-8322-8831-3

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

METALLIC CABLES AND OTHER PASSIVE COMPONENTS TEST METHODS –

Part 4-15: Electromagnetic compatibility (EMC) related test method for measuring transfer impedance and screening attenuation or coupling attenuation with triaxial cell

AMENDMENT 1

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

Amendment 1 to IEC 62153-4-15:2021 has been prepared by IEC Technical Committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

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

Draft	Report on voting
46/992/FDIS	46/1004/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 Amendment 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/publications/.

A list of all parts in the IEC 62153 series, published under the general title *Metallic communication cable test methods*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

———————

10.3 Expression of results

Add, at the end of the subclause, the following new sentence:

The coupling attenuation shall be described by an envelope line as described in Annex H, Clause H.3. In case the measurement is made with mixed mode scattering parameters, the coupling attenuation shall be obtained as described in Annex H, Clause H.2.

Add, after Annex G, the following new Annex H:

Annex H
(normative)

Coupling attenuation expressed by mixed mode scattering parameter and an envelope line

H.1 General

Coupling attenuation is often measured with a multiport network analyser with mixed mode scattering parameters. In this case, the formulae for the conversion from voltage ratio to the coupling attenuation shall be rearranged.

An envelope curve shall be drawn for the coupling attenuation. This simplifies the comparison of test results.

H.2 Coupling attenuation expressed by mixed mode scattering parameter

Formula (19) is rearranged and expressed by a mixed mode scattering parameter:

$$a_c = -20\log_{10}\left|S_{sd21}\right| + 10\log_{10}\left|\frac{Z_{diff}}{Z_0}\right| + 10\log_{10}\left|\frac{2Z_s}{Z_{diff}}\right| = -20\log_{10}\left|S_{sd21}\right| + 10\log_{10}\left|\frac{2Z_s}{Z_0}\right| \quad \text{(H.1)}$$

where

a_c is the coupling attenuation;

S_{sd21} is the forward transmission scattering parameter; DUT exited in differential mode; received power in single ended mode;

Z_{diff} is the differential mode impedance;

Z_s is the normalised value of the characteristic impedance of the environment of the cable; Z_s = 150 Ω;

Z_0 is the system impedance; Z_0 = 50 Ω.

H.3 Envelope line of coupling attenuation

The coupling attenuation is expressed by a value A of an envelope line. The value A shall be deduced by drawing a curve derived from the following Formula (H.2):

$$E_c = \begin{cases} A \text{ if } 30\ \text{MHz} \le f < 100\ \text{MHz} \\ A - 20\log_{10}\left(\frac{f}{100}\right) \end{cases} \quad \text{(H.2)}$$

where

f is the frequency in MHz;

E_c is the envelop line of coupling attenuation in dB;

A is the starting value of the envelope in dB.