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INTERNATIONAL STANDARD

AMENDMENT 1

Metallic communication cable test methods – Part 4-3: Electromagnetic compatibility (EMC) related test method for measuring surface transfer impedance – Triaxial method

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METALLIC COMMUNICATION CABLE TEST METHODS –

Part 4-3: Electromagnetic compatibility (EMC) related test method for measuring surface transfer impedance − Triaxial method

AMENDMENT 1

FOREWORD

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Amendment 1 to IEC 62153-4-3:2013 has been prepared by IEC Technical Committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

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

Draft	Report on voting
46/991/FDIS	46/1003/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- withdrawn, or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.

7.5 Evaluation of test results

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

In case of single pair cables where the attenuation is measured as a mixed mode scattering parameter, the conversion formula given in Annex G shall be used.

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

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Annex G
(normative)

Single pair cables – Conversion of measured mixed mode scattering parameters to transfer impedance

G.1 General

The formulae for the conversion from the measured attenuation or scattering parameter to the transfer impedance given in Clause 6 to Clause 8 are only valid for single ended measurements.

However, when measuring the transmission and mode conversion parameters of single pair cables (having a differential characteristic impedance of 100 Ω), one often measures them in a triaxial setup with a multiport network analyser with mixed mode scattering parameters. Such a test configuration is equivalent to test method B "Inner circuit with load resistor and outer circuit without damping resistor". In this case, the conversion formula has to be derived from Formula (D.2) given in Annex D.

G.2 Conversion formula for test method B: Inner circuit with load resistor and outer circuit without damping resistor

The conversion from measured mixed mode scattering parameter to transfer impedance of single pair cables is given by Formula ((G.1).

$$Z_T = \frac{(R_1 + Z_G) Z_R}{2\sqrt{Z_R Z_G} \times L_c} \times 10^{-\frac{|S_{sc,21}|}{20}} = \frac{Z_0}{\sqrt{2} \times L_c} \times 10^{-\frac{|S_{sc,21}|}{20}} \quad \text{(G.1)}$$

where

Z_T is the transfer impedance;

R_1 is the terminating resistor of the inner circuit (common mode), $R_1 = Z_0/2 = 25\ \Omega$;

Z_G is the impedance of generator (common mode), $Z_G = Z_0/2 = 25\ \Omega$;

Z_R is the impedance of the receiver (single ended), $Z_R = Z_0 = 50\ \Omega$;

L_c is the coupling length;

Z_0 is the single ended system impedance, $Z_0 = 50\ \Omega$;

$S_{sc,21}$ is the forward transfer scattering parameter (logarithmic ratio); DUT stimulated in common mode; received power in single ended mode.

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