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INTERNATIONAL STANDARD

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AMENDMENT 2

Metallic communication cable test methods –
Part 4-9: Electromagnetic compatibility (EMC) related test method for measuring coupling attenuation of screened balanced cables – Triaxial method

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METALLIC COMMUNICATION CABLE TEST METHODS –

Part 4-9: Electromagnetic compatibility (EMC) related test method for measuring coupling attenuation of screened balanced cables – Triaxial method

AMENDMENT 2

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Amendment 2 to IEC 62153-4-9:2018 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
46/990/FDIS	46/1002/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

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- withdrawn, or
- revised.

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7.1 Procedure A: measuring with a standard head

Add, after Equation (15), the following new sentence:

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

7.2 Procedure B: measuring with an open head

Add, after Equation (17), the following new sentence:

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

Add, after Annex D, added by Amendment 1, the following new Annex E:

Annex E
(normative)

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

E.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.

E.2 Coupling attenuation expressed by mixed mode scattering parameter

Formulae (15) and (16) are rearranged and expressed by a mixed mode scattering parameter, see Formula (E.1).

$$a_c = -S_{sd21} + 10\log_{10}\left|\frac{Z_{diff}}{Z_0}\right| + 10\log_{10}\left|\frac{2Z_s}{Z_{diff}}\right| = -S_{sd21} + 10\log_{10}\left|\frac{2Z_s}{Z_0}\right| = -S_{sd21} + 7{,}78\ \text{dB} \quad \text{(E.1)}$$

where

a_c is the coupling attenuation;

S_{sd21} is the logarithmic magnitude (in dB) of the forward transmission scattering parameter; DUT stimulated in differential mode; received power in single ended mode;

Z_{diff} is the differential mode impedance; Z_{diff} = 2 × Z_0 = 100 Ω;

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.

E.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 (E.2):

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

where

f is the frequency in MHz;

E_c is the envelope line of coupling attenuation in dB;

A is the starting value of the envelope in dB.