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**Metallic communication cable test methods –
Part 4-9: Electromagnetic compatibility (EMC) – Coupling attenuation of
screened balanced cables, triaxial method**

INTERNATIONAL
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CONTENTS

FOREWORD.....	5
INTRODUCTION to Amendment 1	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and symbols.....	8
4 Principle of the measuring method.....	10
4.1 General.....	10
4.2 Procedure A: measuring with standard tube (standard head)	11
4.3 Procedure B: measuring with open head	12
5 Screening parameters	13
5.1 General.....	13
5.2 Transfer impedance	13
5.3 Screening attenuation	13
5.4 Unbalance attenuation	14
5.5 Coupling attenuation	14
6 Measurement.....	15
6.1 General.....	15
6.2 Equipment	15
6.3 Balun requirements.....	15
6.4 TP-connecting unit requirements.....	16
6.5 Sample preparation.....	16
6.6 Procedure	17
6.7 Test length.....	17
6.8 Measurement precautions	18
7 Expression of results	18
7.1 Procedure A: measuring with a standard head	18
7.2 Procedure B: measuring with an open head	18
8 Test report.....	19
9 Requirements	20
10 Plots of coupling attenuation versus frequency (typical results)	20
Annex A (normative) Insertion loss of absorber with triaxial set-up.....	22
Annex B (informative) Physical background	24
B.1 Unbalance attenuation a_U	24
B.2 Screening attenuation a_S	25
B.3 Coupling attenuation a_C	25
Annex C (informative) Mixed mode parameters	27
C.1 Definition of mixed mode S-Parameters	27
C.2 Reference impedance of VNA	29
Annex D (normative) Measuring the screening effectiveness of unscreened single or multiple balanced pairs	30
D.1 General.....	30
D.2 Background.....	30
D.3 Triaxial set-up for unscreened balanced pairs	30
D.3.1 Principle	30
D.3.2 Inner and outer system	31

D.4	Unscreened single pairs.....	31
D.4.1	Near-end coupling attenuation of a single unscreened balanced pair	31
D.4.2	Far end screening attenuation and coupling attenuation of single unscreened balanced pairs	32
D.5	Screening- and coupling attenuation measurement of multiple unscreened balanced pairs	32
D.6	Measurement.....	33
D.7	Expression of test results.....	33
D.8	Low frequency coupling attenuation	33
D.9	Set-up verification and measurement uncertainties	34
Annex E (normative)	Coupling attenuation expressed by mixed mode scattering parameter and an envelope line	36
E.1	General.....	36
E.2	Coupling attenuation expressed by mixed mode scattering parameter.....	36
E.3	Envelope line of coupling attenuation.....	36
Bibliography	38
Figure 1	– Coupling attenuation, principle test set-up with balun and standard tube	10
Figure 2	– Coupling attenuation, principle test set-up with balun and open head	11
Figure 3	– Coupling attenuation, principle set-up with multiport VNA and standard head.....	12
Figure 4	– Coupling attenuation, principle set-up with multiport VNA and open head.....	12
Figure 5	– Definition of transfer impedance.....	13
Figure 6	– Termination of the cable under test with balun feeding	17
Figure 7	– Test set-up to measure a_{tube}	19
Figure 8	– Coupling attenuation Twinax 105, open head procedure.....	20
Figure 9	– Coupling attenuation Cat 7a, standard head procedure	21
Figure 10	– Coupling attenuation Cat 8.2, open head procedure	21
Figure A.1	– Insertion loss of absorber with triaxial set-up	22
Figure A.2	– Insertion loss of absorber with triaxial set-up	22
Figure C.1	– Common two-port network	27
Figure C.2	– Common four port network.....	27
Figure C.3	– Physical and logical ports of VNA	28
Figure C.4	– Nomenclature of mixed mode S-Parameters	28
Figure C.5	– Measurement configuration, single ended response.....	29
Figure C.6	– Measurement configuration, differential mode response	29
Figure D.1	– Basic triaxial tube procedure according to IEC 62153-4-3 / IEC 62153-4-4	30
Figure D.2	– Screening effectiveness of unscreened balanced pairs, principle set-up	31
Figure D.3	– Configuration for near end coupling measurement of an unscreened single pair, principle set-up	32
Figure D.4	– Far end screening attenuation and coupling attenuation ($S_{\text{sc}21}$ and $S_{\text{sd}21}$) of an unscreened balanced pair, principle set-up	32
Figure D.5	– Basic configuration of screening attenuation and coupling attenuation test of multiple unscreened balanced pairs	33
Figure D.6	– Low frequency coupling attenuation $a_{\text{C,lf}}$ of a single screened and unscreened balanced pair, 3 m	34
Figure D.7	– Reflected mode conversion parameter $S_{\text{cd}11}$ with a TP-connecting unit having an open loop.....	35

Figure E.1 – Example of coupling attenuation with envelope line 37

Table 1 – Balun performance characteristics (1 MHz to 1 GHz)..... 16

Table 2 – TP-connecting unit performance characteristics (1 MHz to 2 GHz) 16

INTERNATIONAL ELECTROTECHNICAL COMMISSION

METALLIC COMMUNICATION CABLE TEST METHODS –

Part 4-9: Electromagnetic compatibility (EMC) – Coupling attenuation of screened balanced cables, triaxial method

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This consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.

IEC 62153-4-9 edition 2.2 contains the second edition (2018-05) [documents 46/681/FDIS and 46/685/RVD], its amendment 1 (2020-07) [documents 46/773/FDIS and 46/776/RVD] and its amendment 2 (2024-06) [documents 46/990/FDIS and 46/1002/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62153-4-9 has been prepared by IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

This second edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- two test procedures, open head and standard head procedure;
- measuring with balun or with multipoint respectively mixed mode VNA;
- extension of frequency range up to and above 2 GHz.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

The committee has decided that the contents of this document and its amendments 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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IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

INTRODUCTION to Amendment 1

The goal of this amendment is to extent IEC 62153-4-9 such that also the coupling attenuation of unscreened single or multiple balanced pairs or unscreened quads can be measured with the triaxial test procedure.

Further complement is the extension of the usable frequency range down to frequencies below 9 kHz to measure the low frequency coupling attenuation of screened and unscreened balanced pairs or quads.

METALLIC COMMUNICATION CABLE TEST METHODS –

Part 4-9: Electromagnetic compatibility (EMC) – Coupling attenuation of screened balanced cables, triaxial method

1 Scope

This part of IEC 62153 applies to metallic communication cables. It specifies a test method for determining the coupling attenuation a_C of screened balanced cables. Due to the concentric outer tube, measurements are independent of irregularities on the circumference and external electromagnetic fields.

A wide dynamic and frequency range can be applied to test even super screened cables with normal instrumentation from low frequencies up to the limit of defined transversal waves in the outer circuit at approximately 4 GHz. However, when using a balun, the upper frequency is limited by the properties of the balun.

Measurements can be performed with standard tube procedure (respectively with standard test head) according to IEC 62153-4-4 or with open tube (open test head) procedure.

The procedure described herein to measure the coupling attenuation a_C is based on the procedure to measure the screening attenuation a_S according to IEC 62153-4-4.

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 60050-726, *International Electrotechnical Vocabulary – Chapter 726: Transmission lines and waveguides*

IEC TS 62153-4-1, *Metallic communication cable test methods – Part 4-1: Electromagnetic compatibility (EMC) – Introduction to electromagnetic screening measurements*

IEC 62153-4-3, *Metallic communication cable test methods – Part 4-3: Electromagnetic compatibility (EMC) – Surface transfer impedance – Triaxial method*

IEC 62153-4-4, *Metallic communication cable test methods – Part 4-4: Electromagnetic compatibility (EMC) – Test method for measuring of the screening attenuation as up to and above 3 GHz, triaxial method*

IEC 62153-4-5, *Metallic communication cables test methods – Part 4-5: Electromagnetic compatibility (EMC) – Coupling or screening attenuation – Absorbing clamp method*

CONTENTS

FOREWORD.....	5
INTRODUCTION to Amendment 1	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and symbols.....	8
4 Principle of the measuring method.....	10
4.1 General.....	10
4.2 Procedure A: measuring with standard tube (standard head)	11
4.3 Procedure B: measuring with open head	12
5 Screening parameters	13
5.1 General.....	13
5.2 Transfer impedance	13
5.3 Screening attenuation	13
5.4 Unbalance attenuation	14
5.5 Coupling attenuation	14
6 Measurement.....	15
6.1 General.....	15
6.2 Equipment	15
6.3 Balun requirements.....	15
6.4 TP-connecting unit requirements.....	16
6.5 Sample preparation.....	16
6.6 Procedure	17
6.7 Test length.....	17
6.8 Measurement precautions	18
7 Expression of results	18
7.1 Procedure A: measuring with a standard head	18
7.2 Procedure B: measuring with an open head	18
8 Test report.....	19
9 Requirements	20
10 Plots of coupling attenuation versus frequency (typical results)	20
Annex A (normative) Insertion loss of absorber with triaxial set-up.....	22
Annex B (informative) Physical background	24
B.1 Unbalance attenuation a_U	24
B.2 Screening attenuation a_S	25
B.3 Coupling attenuation a_C	25
Annex C (informative) Mixed mode parameters	27
C.1 Definition of mixed mode S-Parameters	27
C.2 Reference impedance of VNA	29
Annex D (normative) Measuring the screening effectiveness of unscreened single or multiple balanced pairs	30
D.1 General.....	30
D.2 Background.....	30
D.3 Triaxial set-up for unscreened balanced pairs	30
D.3.1 Principle	30
D.3.2 Inner and outer system	31

D.4	Unscreened single pairs.....	31
D.4.1	Near-end coupling attenuation of a single unscreened balanced pair	31
D.4.2	Far end screening attenuation and coupling attenuation of single unscreened balanced pairs	32
D.5	Screening- and coupling attenuation measurement of multiple unscreened balanced pairs	32
D.6	Measurement.....	33
D.7	Expression of test results.....	33
D.8	Low frequency coupling attenuation	33
D.9	Set-up verification and measurement uncertainties	34
Annex E (normative)	Coupling attenuation expressed by mixed mode scattering parameter and an envelope line	36
E.1	General.....	36
E.2	Coupling attenuation expressed by mixed mode scattering parameter.....	36
E.3	Envelope line of coupling attenuation.....	36
Bibliography	38
Figure 1	– Coupling attenuation, principle test set-up with balun and standard tube	10
Figure 2	– Coupling attenuation, principle test set-up with balun and open head	11
Figure 3	– Coupling attenuation, principle set-up with multiport VNA and standard head.....	12
Figure 4	– Coupling attenuation, principle set-up with multiport VNA and open head.....	12
Figure 5	– Definition of transfer impedance.....	13
Figure 6	– Termination of the cable under test with balun feeding	17
Figure 7	– Test set-up to measure a_{tube}	19
Figure 8	– Coupling attenuation Twinax 105, open head procedure.....	20
Figure 9	– Coupling attenuation Cat 7a, standard head procedure	21
Figure 10	– Coupling attenuation Cat 8.2, open head procedure	21
Figure A.1	– Insertion loss of absorber with triaxial set-up	22
Figure A.2	– Insertion loss of absorber with triaxial set-up	22
Figure C.1	– Common two-port network	27
Figure C.2	– Common four port network.....	27
Figure C.3	– Physical and logical ports of VNA	28
Figure C.4	– Nomenclature of mixed mode S-Parameters	28
Figure C.5	– Measurement configuration, single ended response.....	29
Figure C.6	– Measurement configuration, differential mode response	29
Figure D.1	– Basic triaxial tube procedure according to IEC 62153-4-3 / IEC 62153-4-4	30
Figure D.2	– Screening effectiveness of unscreened balanced pairs, principle set-up	31
Figure D.3	– Configuration for near end coupling measurement of an unscreened single pair, principle set-up	32
Figure D.4	– Far end screening attenuation and coupling attenuation ($S_{\text{sc}21}$ and $S_{\text{sd}21}$) of an unscreened balanced pair, principle set-up	32
Figure D.5	– Basic configuration of screening attenuation and coupling attenuation test of multiple unscreened balanced pairs	33
Figure D.6	– Low frequency coupling attenuation $a_{\text{C,lf}}$ of a single screened and unscreened balanced pair, 3 m	34
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