

PRE-RELEASE VERSION (FDIS)



**Metallic cables and other passive components test methods –
Part 4-7: Electromagnetic compatibility (EMC) –Test method for measuring of
transfer impedance Z_T and screening attenuation a_s or coupling attenuation a_c of
connectors and assemblies – Triaxial tube in tube method**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.100.10; 33.120.10

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FINAL DRAFT INTERNATIONAL STANDARD (FDIS)

PROJECT NUMBER:
IEC 62153-4-7 ED3

DATE OF CIRCULATION:
2021-04-30

CLOSING DATE FOR VOTING:
2021-06-11

SUPERSEDES DOCUMENTS:
46/774/CDV, 46/802/RVC

IEC TC 46 : CABLES, WIRES, WAVEGUIDES, RF CONNECTORS, RF AND MICROWAVE PASSIVE COMPONENTS AND ACCESSORIES	
SECRETARIAT: United States of America	SECRETARY: Mr David Wilson
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 46A, SC 46C, SC 46F, SC 48B	HORIZONTAL STANDARD: <input type="checkbox"/>
FUNCTIONS CONCERNED: <input checked="" type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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TITLE:

Metallic cables and other passive components test methods - Part 4-7: Electromagnetic compatibility (EMC) -Test method for measuring of transfer impedance Z_T and screening attenuation a_s or coupling attenuation a_c of connectors and assemblies – Triaxial tube in tube method

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
4 Physical background.....	12
5 Principle of the test methods	12
5.1 General.....	12
5.2 Transfer impedance	13
5.3 Screening attenuation	13
5.4 Coupling attenuation.....	14
6 Test procedure	15
6.1 General.....	15
6.2 Tube in tube procedure	15
6.3 Test equipment.....	16
6.4 Calibration procedure.....	16
6.5 Connection between extension tube and device under test	17
6.6 Dynamic range respectively noise floor	17
6.7 Impedance matching.....	18
6.8 Influence of adapters	18
7 Sample preparation	19
7.1 Coaxial connector or device.....	19
7.2 Balanced or multiconductor device.....	19
7.3 Cable assembly	21
8 Measurement of transfer impedance.....	21
8.1 General.....	21
8.2 Principle block diagram of transfer impedance	21
8.3 Measuring procedure – Influence of connecting cables	22
8.4 Measuring.....	22
8.5 Evaluation of test results.....	22
8.6 Test report.....	23
9 Screening attenuation.....	23
9.1 General.....	23
9.2 Impedance matching.....	23
9.2.1 General	23
9.2.2 Evaluation of test results with matched conditions	24
9.2.3 Measuring with mismatch.....	25
9.2.4 Evaluation of test results	25
9.3 Test report.....	25
10 Coupling attenuation.....	26
10.1 General.....	26
10.2 Procedure for testing connectors	26
10.3 Procedure for testing cable assemblies.....	27
10.4 Evaluation of test results when using a balun.....	28
10.5 Evaluation of test results when using a multiport VNA.....	28

10.6	Test report	29
Annex A (normative)	Determination of the impedance of the inner circuit	30
Annex B (informative)	Example of a self-made impedance matching adapter	31
Annex C (informative)	Measurements of the screening effectiveness of connectors and cable assemblies	33
C.1	General.....	33
C.2	Physical basics	33
C.2.1	General coupling equation	33
C.2.2	Coupling transfer function.....	35
C.3	Triaxial test set-up	37
C.3.1	General	37
C.3.2	Measurement of cable assemblies	38
C.3.3	Measurement of connectors.....	39
C.4	Conclusion.....	42
Annex D (informative)	Influence of contact resistances	43
Annex E (informative)	Direct measurement of screening effectiveness of connectors.....	45
E.1	Scope	45
E.2	Test set-up	45
E.3	Construction details of test set-up.....	46
Annex F (normative)	Mixed mode S-parameters.....	48
F.1	General.....	48
F.2	Definition of mixed mode S-parameters.....	48
F.3	Reference impedance of a VNA	51
Annex G (normative)	Accessories for measuring coupling attenuation.....	52
G.1	TP connecting unit	52
G.2	Termination of the DUT.....	52
G.3	Test adapter	53
G.3.1	General	53
G.3.2	Direct feeding with coaxial cables	53
G.3.3	Balanced feeding cable	54
G.3.4	Movable short circuit.....	54
Annex H (informative)	Low frequency screening attenuation	56
Bibliography.....		57
Figure 1 –	Definition of Z_T	10
Figure 2 –	Principle of the test set-up to measure transfer impedance and screening or coupling attenuation of connectors with tube in tube	13
Figure 3 –	Principle of the test set-up to measure transfer impedance and screening attenuation of a cable assembly.....	15
Figure 4 –	Principle set-up for verification test	18
Figure 5 –	Preparation of balanced or multiconductor connectors	21
Figure 6 –	Test set-up (principle) for transfer impedance measurement according to test of IEC 62153-4-3 with load resistor in inner circuit and without damping resistor in outer circuit.....	22
Figure 7 –	Measuring the screening attenuation with tube in tube with impedance matching device.....	24
Figure 8 –	Coupling attenuation, principle test set-up with 2-port VNA and balun	26

Figure 9 – Coupling attenuation, principle set-up with multiport VNA and TP-connecting unit.....	27
Figure 10 – Coupling attenuation, principle test set-up with multiport VNA and TP-connecting unit for measuring complete cable assemblies.....	27
Figure 11 – Coupling attenuation, principle test set-up with multiport VNA and TP-connecting unit for measuring halved cable assemblies.....	28
Figure 12 – Typical measurement of a connector of 0,04 m length with 1 m extension tube ..	29
Figure B.1 – Attenuation and return loss of a 50 Ω to 5 Ω impedance matching adapter, log scale	31
Figure B.2 – Attenuation and return loss of a 50 Ω to 5 Ω impedance matching adapter, lin scale	32
Figure C.1 – Equivalent circuit of coupled transmission lines	34
Figure C.2 – Summing function S	35
Figure C.3 – Calculated coupling transfer function ($l = 1$ m; $\epsilon_{r1} = 2,3$; $\epsilon_{r2} = 1$; $Z_F = 0$).....	36
Figure C.4 – Triaxial set-up for the measurement of the screening attenuation a_S and the transfer impedance Z_T	37
Figure C.5 – Simulation of a cable assembly (logarithmic scale)	39
Figure C.6 – Simulation of a cable assembly (linear scale)	39
Figure C.7 – Triaxial set-up with extension tube for short cable assemblies	40
Figure C.8 – Triaxial set-up with extension tube for connectors.....	40
Figure C.9 – Simulation, logarithmic frequency scale	41
Figure C.10 – Measurement, logarithmic frequency scale	41
Figure C.11 – Simulation, linear frequency scale.....	41
Figure C.12 – Measurement, linear frequency scale.....	41
Figure C.13 – Simulation, logarithmic frequency scale	42
Figure C.14 – simulation, linear frequency scale	42
Figure D.1 – Contact resistances of the test set-up.....	43
Figure D.2 – Equivalent circuit of the test set-up.....	43
Figure E.1 – Principle of the test set-up to measure transfer impedance and screening attenuation of a connector	45
Figure E.2 – Principle of the test set-up to measure transfer impedance and screening attenuation of a cable assembly.....	46
Figure E.3 – Example of sample preparing.....	46
Figure E.4 – Screening tube with separate nut.....	47
Figure E.5 – Screening fixed with associated nut	47
Figure F.1 – Common two-port network	48
Figure F.2 – Common four port network	48
Figure F.3 – Physical and logical ports of a VNA.....	49
Figure F.4 – Nomenclature of mixed mode S-parameters.....	49
Figure F.5 – Measurement configuration, single ended response	50
Figure F.6 – Measurement configuration, differential mode response.....	51
Figure G.1 – Termination of the device under test, principle.....	53
Figure G.2 – Balunless measurement of coupling attenuation of a balanced connector, direct feeding, principle.....	54
Figure G.3 – Balunless measurement of coupling attenuation of a cable assembly using balanced feeding cable, principle.....	54

Figure G.4 – Balunless measurement of coupling attenuation of a cable assembly using adapters with implemented short circuit, principle	55
Figure H.1 – Example for a screening attenuation test result of a cable assembly with a test length of 2 meters	56
Table 1 – IEC 62153, Metallic communication cable test methods – Test procedures with triaxial test set-up	12
Table G.1 – TP-connecting unit performance characteristics (100 kHz to 2 GHz)	52

INTERNATIONAL ELECTROTECHNICAL COMMISSION

METALLIC CABLES AND OTHER PASSIVE COMPONENTS TEST METHODS –

Part 4-7: Electromagnetic compatibility (EMC) – Test method for measuring of transfer impedance Z_T and screening attenuation a_S or coupling attenuation a_C of connectors and assemblies – Triaxial tube in tube method

FOREWORD

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IEC 62153-4-7 has been prepared by IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories. It is an International Standard.

This third edition cancels and replaces the second edition published in 2015 and its Amendment 1:2018. This edition constitutes a technical revision.

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

The document is revised and updated. It now includes IEC 62153-4-7:2015/COR1:2016 and IEC 62153-4-7:2015/AMD1:2018. Furthermore, the changes of the revised IEC 62153-4-9:2018 are included.

Measurements of the coupling attenuation can be achieved now by using a mixed mode network analyser (virtual balun). The following new annexes have been added:

- Annex E contains informative information about the direct measurement of screening effectiveness of connectors;
- Annex F gives normative information about mixed mode parameters;
- Annex G contains normative information about accessories for measuring coupling attenuation;
- Annex H discusses the low frequency screening attenuation.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
46/XX/FDIS	46/XX/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 International Standard 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/standardsdev/publications.

A list of all parts of the IEC 62153 series, under the general title *Metallic cables and other passive components 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,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

The shielded screening attenuation test set-up according to IEC 62153-4-3 and IEC 62153-4-4 have been extended to take into account the particularities of electrically short elements like connectors and cable assemblies. Due to the concentric outer tube of the triaxial set-up, measurements are independent of irregularities on the circumference and outer electromagnetic fields.

With the use of an additional resonator tube (inner tube respectively tube in tube), a system is created where the screening effectiveness of an electrically short device is measured in realistic and controlled conditions. Also, a lower cut off frequency for the transition between electrically short (transfer impedance Z_T) and electrically long (screening attenuation a_S) can be achieved.

A wide dynamic and frequency range can be applied to test even super screened connectors and assemblies with normal instrumentation from low frequencies up to the limit of defined transversal waves in the outer circuit at approximately 4 GHz.

METALLIC CABLES AND OTHER PASSIVE COMPONENTS TEST METHODS –

Part 4-7: Electromagnetic compatibility (EMC) – Test method for measuring of transfer impedance Z_T and screening attenuation a_S or coupling attenuation a_C of connectors and assemblies – Triaxial tube in tube method

1 Scope

This part of IEC 62153 deals with the triaxial tube in tube method. This triaxial method is suitable to determine the surface transfer impedance and/or screening attenuation and coupling attenuation of mated screened connectors (including the connection between cable and connector) and cable assemblies. This method could also be extended to determine the transfer impedance, coupling or screening attenuation of balanced or multipin connectors and multicore cable assemblies. For the measurement of transfer impedance and screening- or coupling attenuation, only one test set-up is needed.

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 TS 62153-4-1:2014, *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 62153-4-8, *Metallic cables and other passive components – Test methods – Part 4-8: Electromagnetic compatibility (EMC) – Capacitive coupling admittance*

IEC 62153-4-9:2018, *Metallic communication cable test methods – Part 4-9: Electromagnetic compatibility (EMC) – Coupling attenuation of screened balanced cables, triaxial method*

IEC 62153-4-10, *Metallic communication cable test methods – Part 4-10: Electromagnetic compatibility (EMC) – Transfer impedance and screening attenuation of feed-throughs and electromagnetic gaskets - Double coaxial test method*

IEC 62153-4-15:2015, *Metallic communication cable test methods – Part 4-15: Electromagnetic compatibility (EMC) – Test method for measuring transfer impedance and screening attenuation – or coupling attenuation with triaxial cell*

IEC 62153-4-16, *Metallic communication cable test methods – Part 4-16: Electromagnetic compatibility (EMC) – Extension of the frequency range to higher frequencies for transfer impedance and to lower frequencies for screening attenuation measurements using the triaxial set-up*

EN 50117-9-2:2019, *Coaxial cables – Part 9-2: Sectional specification for coaxial cables for analogue and digital transmission – Indoor droop cables for systems operating at 5 MHz – 3 000 MHz*