TECHNICAL REPORT

TR-285
Broadband Copper Cable Models

Issue: 1 Corrigendum 1
Issue Date: November 2015

Notice

Issue History

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1	23 February 2015	16 March 2015	Andre Holley	Original
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TABLE OF CONTENTS

Executive Summary

This corrigendum updates the Cable transfer function equations in TR-285.

1 Purpose and Scope

1.1 Purpose

The purpose of this corrigendum is to align the transfer function definition in TR-285 with that used in ITU-T G.993.2.

1.2 References

The following references are of relevance to this Technical Report. At the time of publication, the editions indicated were valid. All references are subject to revision; users of this Technical Report are therefore encouraged to investigate the possibility of applying the most recent edition of the references listed below.
A list of currently valid Broadband Forum Technical Reports is published at www.broadband-forum.org.

Document	Title	Source	Year
RFC 2119	Key words for use in RFCs to indicate Requirement Levels [2]	BBF	1997
ATIS-0600024	Multiple-Input Multiple Output Crosstalk Channel Model	ATIS	2009
ITU-T G.9701	Telecommunications Standardization Draft Recommendation Study Group 15 TD 159 Rev, 2 (PLEN/15) Fast Access to Subscriber Terminals (FAST) – Physical layer specifications.	ITU-T	2014
ITU-T G.993.2	Very high speed digital subscriber line transceivers 2 (VDSL2)	ITU-T	2006
ETSI TS 101 271, V1.2.1	Access Terminals Transmission and Multiplexing (ATTM); Access transmission system on metallic pairs. Very High Speed digital subscriber line systems. (VDSL2)	ETSI	Jan. 2013

2 Technical Report Impact

2.1 Energy Efficiency

TR-285i1c1 has no impact on energy efficiency.

2.2 IPv6

TR-285i1c1 has no impact on IPv6.

2.3 Security

TR-285i1c1 has no impact on security.

2.4 Privacy

Any issues regarding privacy are not affected by TR-285i1c1.

3 Update Section A.1. Patch, A.1.1 Transfer Function

Use the nomenclature:

Patch Section length =“d_P”
Source impedance = “Z_{soP}”
Load impedance of “Z_{LP}”

Compute

$\gamma = \alpha + j\beta = [Z_s(j\omega)\ Y_p(j\omega)]^{0.5}$
$Z_0 = [Z_s(j\omega) / Y_p(j\omega)]^{0.5}$

The Patch Section transfer function, “H_P,” is then given by the following equation:

$H_P = 2 * [Z_{inP} / (Z_{inP} + Z_{soP})]\ T_P$

NOTE – The Isolated Drop Wire transfer function definition is associated with a two port network, normalized to the reference load impedance Z_{LW} (see clause 11.4.1.1.1 of [ITU-T G.993.2]). The formula assumes that Z_{LW} and Z_{soW} are equal.

Here:

$T_P = [\cosh(\gamma d_P) + (Z_0 / Z_{LP}) \sinh(\gamma d_P)]^{-1}$
Z_{inP} = The Input Impedance of the Patch Section– which follows in Section A.1.2

4 Update Section A.2 Multi-Pair Cable, A.2.1 Transfer Function

Use the nomenclature:

Multi-Pair Cable Section length =“d_D”
Source impedance = “Z_{soD}”
Load impedance of “Z_{LD}”

Compute

$\gamma = \alpha + j\beta = [Z_s(j\omega)\ Y_p(j\omega)]^{0.5}$
$Z_0 = [Z_s(j\omega) / Y_p(j\omega)]^{0.5}$

The Multi-Pair Cable transfer function, “H_D,” is then given by the following equation

$H_D = 2 * [Z_{inD} / (Z_{inD} + Z_{soD})]\ T_D$

NOTE – The Isolated Drop Wire transfer function definition is associated with a two port network, normalized to the reference load impedance Z_{LW} (see clause 11.4.1.1.1 of [ITU-T G.993.2]). The formula assumes that Z_{LW} and Z_{soW} are equal.

Here:

$T_D = [\cosh(\gamma d_D) + (Z_0 / Z_{LD}) \sinh(\gamma d_D)]^{-1}$

Z_{inD} = The Input Impedance of the Multi-Pair Cable– which follows in Section A.2.2

5 Update Section A.3 Isolated Drop Wire, A.3.1 Transfer Function

The Isolated Drop Wire transfer function, “H_W,” is then obtained by the following equation

$$H_W = 2 * [Z_{inW} / (Z_{inW} + Z_{soW})]\, T_w$$

NOTE – The Isolated Drop Wire transfer function definition is associated with a two port network, normalized to the reference load impedance Z_{LW} (see clause 11.4.1.1.1 of [ITU-T G.993.2]). The formula assumes that Z_{LW} and Z_{soW} are equal.

Here:

$T_W = [\cosh(\gamma d_W) + (Z_0 / Z_{LW}) \sinh(\gamma d_W)]^{-1}$

Z_{inW} = The Input Impedance of the Isolated Drop Wire – which follows in Section A.3.2

End of Broadband Forum Technical Report TR-285i1c1

