ISO/IEC TR 24750:2007-07 (E)

Information technology – Assessment and mitigation of installed balanced cabling channels in order to support 10GBASE-T

CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms, definitions and abbreviations 7
3.1 Terms and definitions 7
3.2 Abbreviations 9
4 New parameters needed for generic cabling for the support of 10GBASE-T 10
5 Channel requirements 11
5.1 General 11
5.2 Return loss 12
5.3 Insertion loss 12
5.4 Near-end crosstalk loss (NEXT) 13
5.4.1 Pair-to-pair NEXT 13
5.4.2 Power sum NEXT (PS NEXT) 13
5.5 Attenuation to crosstalk loss ratio near-end (ACR-N) 14
5.5.1 Pair-to-pair ACR-N 14
5.5.2 Power sum ACR-N (PS ACR-N) 15
5.6 Attenuation to crosstalk loss ratio far-end (ACR-F) 15
5.6.1 Pair-to-pair ACR-F 15
5.6.2 Power sum ACR-F (PS ACR-F) 16
5.7 Alien crosstalk 17
5.7.1 General 17
5.7.2 Power sum alien NEXT (PS ANEXT) 17
5.7.3 Power sum attenuation to alien crosstalk ratio far-end (PS AACR-F) 19
5.7.4 Alien crosstalk margin computation 21
5.7.5 Examples of implementations at key insertion loss at 250 MHz 21
5.8 Propagation delay 21
5.9 Delay skew 22
6 Guidance for mitigation 22
6.1 Certification, measurement and documentation 22
6.2 Mitigation techniques if in-channel parameters of the channel from clause 5 are not met 22
6.3 Mitigation techniques in case external parameters of the channel (alien noise) from 5.7 are not met 23
6.3.1 General 23
6.3.2 Screened cabling 23
6.3.3 Unscreened cabling 23
6.3.4 Grouped connectors 24
6.3.5 Example of a step by step mitigation procedure 24
Annex A (informative) Permanent link performance guidelines 26
A.1 General 26
A.2 Return loss 26
A.3 Insertion loss 26
A.4 NEXT 26

A.4.1 Pair-to-pair NEXT 26
A.4.2 Power sum NEXT (PS NEXT) 27
A.5 ACR-F 27
A.5.1 Pair-to-pair ACR-F 27
A.5.2 Power sum ACR-F (PS ACR-F) 27
Annex B (normative) Alien crosstalk margin computation 28
B.1 General 28
B.2 Terms, definitions and abbreviations 28
B.3 Requirements of 10GBASE-T 28
Bibliography 32

Table 1 – Changes and additions to definitions in ISO/IEC 11801:2002 11
Table 2 – Equations for return loss limits for a channel 12
Table 3 – Informative return loss limits for a channel at key frequencies 12
Table 4 – Equation for insertion loss limits for a channel 12
Table 5 – Informative insertion loss limits for a channel at key frequencies 13
Table 6 – Equations for NEXT limits for a channel 13
Table 7 – Informative NEXT limits for a channel at key frequencies 13
Table 8 – Equations for PS NEXT limits for a channel 14
Table 9 – Informative PS NEXT limits for a channel at key frequencies 14
Table 10 – Informative ACR-N limits for a channel at key frequencies 15
Table 11 – Informative PS ACR-N limits for a channel at key frequencies 15
Table 12 – Equation for ACR-F limits for a channel 16
Table 13 – Informative ACR-F limits for a channel at key frequencies 16
Table 14 – Equation for PS ACR-F limits for a channel 17
Table 15 – Informative PS ACR-F limits for a channel at key frequencies 17
Table 16 – Equations for PS ANEXT limits for a channel 18
Table 17 – Informative PS ANEXT limits for a channel at key frequencies 19
Table 18 – Equations for PS AACR-F limits for a channel 20
Table 19 – Informative PS AACR-F limits for a channel at key frequencies and lengths 21
Table 20 – Examples of implementations at key insertion loss 21
Table 21 – Equations for propagation delay limits for a channel 22
Table 22 – Propagation delay limits for a channel at key frequencies 22
Table 23 – Delay skew limits for a channel 22

Table A.1 – Return loss for permanent link 26
Table A.2 – Insertion loss for permanent link 26
Table A.3 – NEXT for permanent link 27
Table A.4 – PS NEXT for permanent link 27
Table A.5 – ACR-F for permanent link 27
Table A.6 – PS ACR-F for permanent link 27
Table B.1 – Power backoff schedule from main body 10GBASE-T 28