

English version

**Safety aspects for xDSL signals on circuits
connected to telecommunication networks
(DSL: Digital Subscriber Line)
(IEC 62367:2004)**

Aspects de sécurité pour signaux xDSL
sur circuits connectés aux réseaux
de télécommunication
(DSL: ligne d'abonné numérique)
(CEI 62367:2004)

Sicherheitsaspekte für xDSL-Signale
in Stromkreisen für den Anschluss
an Telekommunikationsnetze
(DSL: digitale Teilnehmerleitung)
(IEC 62367:2004)

This Technical Specification was approved by CENELEC on 2004-12-07.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the Technical Specification IEC/TS 62367:2004, prepared by IEC TC 108, Safety of electronic equipment within the field of audio/video, information technology and communication technology, was submitted to the formal vote and was approved by CENELEC as CLC/TS 62367 on 2004-12-07.

The following date was fixed:

- latest date by which the existence of the CLC/TS
has to be announced at national level (doa) 2005-06-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the Technical Specification IEC/TS 62367:2004 was approved by CENELEC as a Technical Specification without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60950	Series	Safety of information technology equipment	EN 60950	Series
IEC 60950-1 (mod)	- ¹⁾	Safety of information technology equipment Part 1: General requirements	EN 60950-1	2001 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms, definitions and abbreviations	6
4 xDSL signals on circuits connected to telecommunication networks.....	7
Annex A (informative) xDSL telecommunication systems	8
A.1 Introduction	8
A.2 General description	8
A.3 Peak-to average ratio and CF	9
A.4 CF distribution	10
A.5 Line termination impedance.....	12
A.6 Measurement of xDSL parameters.....	12
Bibliography.....	13
Figure A.1 – Typical configuration of an xDSL system.....	8
Figure A.2 – Typical xDSL (VDSL) signal in the time-domain	9
Figure A.3 – Probability of symbol with CF >x	11
Figure A.4 – Inter-arrival time of symbol with CF > x (DMT-symbol rate = 4 kHz)	11

INTRODUCTION

xDSL signals are high-speed telecommunication signals that may be present on a telecommunication line, together with:

- analogue PSTN (Public Switched Telephone Network);
- ISDN (Integrated Services Digital Network) signals; or
- a d.c. power-feeding component.

An xDSL signal is characterised by an amplitude of the order of 3 V r.m.s. with superimposed spikes having very short duration (about 1 μ s) and peak values not exceeding 30 V.

When combined with other services as above, the peak voltage can very occasionally exceed the limits for a TNV-3 CIRCUIT. However the excursions above these limits consist of these very short duration spikes.

There are no published documents from IEC on the effect of such spikes on the human body, but experience with xDSL is that the safety risk, if any, is very small because of:

- the low power of the spikes; and
- the limited accessibility of TNV circuits.

The amplitude and probability of the spikes have been calculated as follows:

- amplitude up to 15V/1 μ s with a probability of occurrence of one every few seconds to every few minutes;
- amplitude up to 20V/1 μ s with a probability of occurrence of one every few hours;
- amplitude up to 27V/1 μ s with a probability of occurrence of one every few years.

Annex A gives more detail on the operation of xDSL telecommunication systems.

SAFETY ASPECTS FOR XDSL SIGNALS ON CIRCUITS CONNECTED TO TELECOMMUNICATION NETWORKS (DSL: DIGITAL SUBSCRIBER LINE)

1 Scope

This technical specification addresses the safety implications of having xDSL signals on circuits in equipment connected to a TELECOMMUNICATION NETWORK, and gives rules for dealing with such equipment in the context of the IEC 60950 series.

2 Normative references

The following referenced documents are indispensable for the application 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 60950 (all parts), *Information technology equipment – Safety*

IEC 60950-1 (all parts), *Information technology equipment – Safety – Part 1: General requirements*

3 Terms and definitions, and abbreviations

For the purposes of this document, the terms and definitions in the IEC 60950 series and the following abbreviations apply.

ADSL	Asymmetric Digital Subscriber Line
CF	Crest Factor
CO	Central Office
CPE	Customer Premises Equipment
DMT	Discrete Multi Tone
DSL	Digital Subscriber Line
HDSL	High Speed Digital Subscriber Line
IEC	International Electrotechnical Commission
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union
ITU-T	Telecommunication Standardization Sector of ITU
NT	Network Termination
PAR	Peak to Average Ratio
PSTN	Public Switched Telephone Network
QAM	Quadrature Amplitude Modulation
RSS	Remote Signal Source
SDSL	Symmetric Digital Subscriber Line
TNV	Telecommunication Network Voltage
VDSL	Very-high-bit-rate Digital Subscriber Line