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# TECHNICAL SPECIFICATION

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## Requirements for Equipment connecting to ADSL, ADSL2 and ADSL2+ Services

TS TTE 011, Version 1.0

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## 1 General requirements

Technical specification has been prepared and approved by the Telecommunications Regulatory Authority (TDRA) based on the Telecommunication apparatus Type Approval Regime.

Several technical specifications may apply to the equipment. If equipment within the scope of this technical specification also incorporates functions that are covered by another technical specification, the relevant technical specification is applied to each function separately. The influence of one function on the other is taken into account.

## 2 Scope

This technical specification applies to terminal equipment which includes interfaces that may be connected to ADSL, ADSL2 and ADSL2+ services offered by public network operators.

This technical specification defines minimum technical requirements for health and safety, electromagnetic compatibility and additional essential requirements based on the Telecommunication apparatus Type Approval Regime.

Unless the context requires otherwise, the expressions and wordings appearing in the Telecommunication apparatus Type Approval Regime shall have the same meaning described thereto.

## 3 Technical Requirements

### 3.1 Network connection

The equipment shall meet the requirements of following standard(s):

#### HDSL

ETR 152                      Transmission and Multiplexing (TM); High bit-rate Digital Subscriber Line (HDSL) transmission system on metallic local lines; HDSL core specification and applications for 2 048 kbit/s based access digital sections

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### **SHDSL**

ITU G992.1 Single-Pair High-Speed Digital Subscriber Line (SHDSL) subscriber transceivers.

### **SDSL**

TS 101 524-1 Transmission and Multiplexing. Access transmission system on metallic access cables. Symmetrical single pair high bit rate Digital Subscriber Line (SDSL)

### **ADSL**

Technical Requirements to limit disturbance to Voice band Services:

ES 202 913 Access and Terminals (AT); POTS requirements applicable to ADSL modems when connected to an analogue presented PSTN line ETSI TS 101 952-1-1 Access network xDSL transmission filters; Part 1: ADSL splitters for European deployment; Sub-part 1: Specification of the low pass part of ADSL/POTS splitters

TS 101 952-1-2 Access network xDSL transmission filters; Part 1: ADSL splitters for European deployment; Sub-part 2: Specification of the high pass part of ADSL/POTS splitters.

ITU G.992.1 Power Spectral Density in the 0 to 4 KHz band.  
cl. A.2.4.2.1

The total power in the voice band (0 Hz to 4 kHz) shall not exceed 15 dBm.

The power spectral density in the range 0 to 4 kHz shall not exceed -97.5 dBm/Hz.

Technical requirements to limit disturbance to services operating at frequencies above the voiceband service:

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*Power Spectral Density (PSD)*

ADSL equipment shall operate within the specified upstream PSD mask (see Table 1) to prevent interference to other services.

*Aggregate transmit power*

The Upstream aggregate transmit power for an ADSL equipment shall not exceed the limits specified in Table 1.

*Power Spectral Density and aggregate power limits for ADSL equipment:*

Service	Specification	Upstream PSD	Aggregate upstream transmit power
ADSL (G.dmt)	G.992.1 (07/1999)	Annex A (A2.4)	Annex A (A.2.4.3.3)
Splitterless ADSL (G.Lite) (Non overlapped spectrum)	G.992.2 (07/1999)	Annex A (A1)	Annex A (A1.2.3)
Splitterless ADSL (Overlapped spectrum)	G.992.2 (07/1999)	Annex B (B1)	Annex B (B1.2.3)
ADSL2	G992.3 (01/2005)	Annex A	Annex A
RE-ADSL2	G992.3 (01/2005)	Annex L	Annex L
ADSL2 increased upstream rate	G992.3 (01/2005)	Annex M	Annex M
Splitterless ADSL2	G992.4 (07/2002)	Annex A	Annex A
ADSL2+	G992.5 (01/2005)	Annex A (A2.2)	Annex A (A2.2.2)
ADSL2+ increased Upstream rate	G992.5 (01/2005)	Annex M	Annex M

Table 1: Power Spectral Density and aggregate power limits for ADSL equipment.

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### 3.2 Electromagnetic compatibility

The equipment shall meet the requirements of following standard(s):

- EN 55022 Information technology equipment; Radio disturbance characteristics; Limits and methods of measurement (CISPR 22).
- EN 55024 Information technology equipment; Immunity characteristics; Limits and methods of measurement (CISPR 24).
- EN 55032 Electromagnetic compatibility of multimedia equipment - Emission requirements.
- EN 300 386 Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements

### 3.3 Health and safety

The equipment shall meet the requirements of Technical specification TS HS 001.

### 3.4 Additional essential requirements

ADSL equipment should not affect the performance of the analogue PSTN.

### 3.5 Validity of standards

If no issue or revision number is quoted along with the title of a standard, the valid edition should be used. The valid of the standard can be checked on:

- For EN standards:  
[http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/rte/index\\_en.htm](http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/rte/index_en.htm);
- For ETR, TS and ES standards:  
<http://www.etsi.org/>
- For ITU-T recommendation:

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<https://www.itu.int>