

**COMMUNICATIONS
ALLIANCE LTD**



AUSTRALIAN STANDARD

AS/ACIF S041.3:2009

Requirements for DSL Customer Equipment for
connection to the Public Switched Telephone
Network – Part 3: Filters for use in connection with
all ADSL services

**Adopted for
regulatory purposes**

Australian Standard – Requirements for DSL Customer Equipment for connection to the Public Switched Telephone Network – Part 3: Filters for use in connection with all DSL services

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FOREWORD

General

This Standard was prepared by Communications Alliance and most recently revised by the WC12 : *ADSL Filter/Splitter Revision* Working Committee. It is one of a series of Telecommunication Standards developed under the Memorandum of Understanding between the Australian Communications Authority (ACA) and the Australian Communications Industry Forum.

Note: On 1 July 2005 the ACA became the Australian Communications and Media Authority (ACMA) and the Memorandum of Understanding continues in effect as if the reference to the ACA were a reference to ACMA.

This Standard is a revision of AS/ACIF S041:2005 *Requirements for DSL Customer Equipment for connection to the Public Switched Telephone Network*. It is the result of a consensus among representatives on the Communications Alliance Working Committee to produce it as an Australian Standard.

The requirements in this Standard are consistent with the aims of s376 of the *Telecommunications Act 1997*. Specifically these aims are—

- (a) protecting the integrity of a telecommunications network or facility;
- (b) protecting the health and safety of persons;
- (c) ensuring access to emergency services; and
- (d) ensuring interoperability with a standard telephone service.

It should be noted that some Customer Equipment (CE) may also need to comply with requirements in other Standards or other Parts of this Standard.

Part 3 of this Standard should be read in conjunction with AS/ACIF S041.1 [3]

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This document has been made by ACMA as Telecommunications Technical Standard AS/ACIF S041.3-2009 under s376 of the *Telecommunications Act 1997*.

ACMA is a Commonwealth authority with statutory powers to impose requirements concerning telecommunications Customer Equipment and Customer Cabling.

ACMA requires Australian manufacturers and importers, or their Australian agents, of specified items of Customer Equipment and Customer Cabling to establish compliance with Standards such as this. Items are required to be labelled in accordance with the applicable labelling notices.

Details on current compliance arrangements can be obtained from the ACMA website at <http://www.acma.gov.au> or by contacting ACMA below at:

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Introduction

This introduction for the AS/ACIF S041.3 **Requirements for DSL Customer Equipment for connection to the Public Switched Telephone Network – Part 3: Filters for use in connection with all ADSL services** Standard is not an authoritative section of this Standard and is only provided as guidance for the user of the Standard to outline its objectives, the factors that have been taken into account in its development and to list the principle differences between the new and the previous edition.

The reader is directed to the clauses of this Standard for the specific requirements and to the Australian Communications and Media Authority (ACMA) for the applicable telecommunications labelling and compliance arrangements.

Note: Further information on the telecommunications labelling and compliance arrangements can be found in *The Telecommunications Labelling (Customer Equipment and Customer Cabling) Notice* (the TLN). The TLN can be obtained from the Australian Communications and Media Authority (ACMA) website at www.acma.gov.au.

The objective of this Standard is to provide the technical requirements and test methods for Customer Equipment (CE), or the parts of CE that are designed or intended for connection to a DSL service that shares the metallic local loop with an analogue PSTN two-wire service in order to meet the regulatory arrangements for such equipment in Australia.

The objective of this revision is to include requirements currently specified in the Telstra RCIT.0004 ADSL Splitter Specification to bring the Standard in line with the ADSL services being offered by Australian broadband service providers and to restructure the Standard as a multi-part Standard to streamline the compliance testing separately of DSL modems and ADSL splitters/filters.

The principal differences between this edition of AS/ACIF S041.3 and the previous edition of AS/ACIF S041 are that—

- (i) only requirements specifically related to DSL filters are included.
- (ii) ADSL filters are to be identified to avoid Centralised and Distributed filters being incorrectly used.
- (iii) ADSL filters are to be labelled to identify compliance with the latest standard and suitability for installation.
- (iv) DC series resistance requirements now specified out to 80 mA.
- (v) Table 1 re-drawn to ensure return loss measurements are done in each direction and with the correct impedances.
- (vi) LCTL limits of Table 2 deleted with the LCL limits now to be met for all unbalance measurements.
- (vii) Alternate test procedures added for filter loss measurements.
- (viii) Noise measurements will now be done with two un-terminated filters in parallel.
- (ix) Filter loss measurements are now done with a representation of the modem impedance present as well as not present.

Informative Statement on the POTS impact on ADSL2+/ADSL2/ADSL services

Because of difficulties in specification, tests relating to the impact of POTS signalling events through the filter onto the ADSL2+/ADSL2/ADSL service have not been included in this Standard. Designers of filters are advised to take into account the POTS interference mechanisms known to cause degradation of ADSL2+/ADSL2/ADSL services, as described in Clause 5.3.19.

Therefore it must be recognised that Carriers and Carriage Service Providers may need to protect their ADSL2+/ADSL2/ADSL services by not listing as approved, and actively removing from service any filter type (that may have been tested and labelled as complying to this Standard) that causes degradation due to mechanisms like those above that have not been included in this Standard.

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1 INTERPRETATIVE GUIDELINES

1.1 Categories of requirements

This Standard contains mandatory requirements as well as provisions that are recommendatory only. Mandatory requirements are designated by the words '**shall**' or '**shall not**'. All other provisions are voluntary.

1.2 Compliance statements

Compliance statements, in italics, suggest methodologies for demonstrating CE's compliance with the requirements.

1.3 Definitions, expressions and terms

If there is any conflict between the definitions used in this Standard and the definitions used in the *Telecommunications Act 1997*, the definitions in the Act take precedence.

1.4 Notes

Text denoted as 'Note' is for guidance in interpretation and is shown in smaller size type.

1.5 References

- (a) Applicable editions (or versions) of other documents referred to in this Standard are specified in Section 3: REFERENCES.
- (b) If a document refers to another document, the other document is a sub-referenced document.
- (c) Where the edition (or version) of the sub-referenced document is uniquely identified in the reference document, then that edition (or version) applies.
- (d) Where the edition (or version) of the sub-referenced document is not uniquely identified in the reference document, then the applicable edition (or version) is that which is current at the date the reference document is legislated under the applicable regulatory framework, or for a non- legislated document, the date upon which the document is published by the relevant standards organisation.
- (e) A number in square brackets '[]' refers to a document listed in Section 3: REFERENCES.

1.6 Units and symbols

In this Standard the International System (SI) of units and symbols is used in accordance with Australian Standard AS ISO 1000 [1].

2 SCOPE

- 2.1 This Standard specifies the technical requirements for ADSL Filter Customer Equipment (CE), or the ADSL Filter parts of the CE that are designed or intended for connection to an ADSL service that shares the metallic local loop with an analogue PSTN two-wire service.
- 2.2 This Standard does not apply to CE or the parts of CE designed or intended only for connection to an analogue PSTN two-wire service.
- 2.3 CE is not excluded from the scope of this Standard by reason only that it is capable of performing functions additional to those listed in this Standard.

Note 1: For the purposes of this scope ADSL filters are examples of CE designed for connection to a DSL service operating over a shared metallic local loop with an analogue PSTN two-wire service.

Note 2: AS/ACIF S002 [2] specifies the technical requirements for connection to an analogue PSTN two-wire service.

3 REFERENCES

	Publication	Title
	Australian Standards	
[1]	AS ISO 1000-1998	The international System of Unit (SI) and its application.
	AS/ACIF Standards	
[2]	AS/ACIF S002:2005	Analogue interworking and non-interference requirements for Customer Equipment for connection to the Public Switched Telephone Network
	AS/ACIF S041	Requirements for DSL Customer Equipment for connection to the Public Switched Telephone Network
[3]	AS/ACIF S041.1:2009	Part 1: General
	AS/ACIF S043	Requirements for Customer Equipment for connection to a metallic local loop interface of a Telecommunications Network
[4]	AS/ACIF S043.2:2005	Part 2: Broadband
	ACIF Guidelines	
[5]	ACIF G534:2003	Assessment of Emergency Service Access and Network
	ETSI Standards and Reports	
[6]	ETSI TS 101 952-1-1 V1.2.1 (2004-12)	Access Network xDSL Transmission Filters; Part 1; ADSL Splitters for European Deployment; Sub Part 1:Generic Specification of the Low Pass Part of DSL over POTS Splitters including Dedicated Annexes for Specific xDSL Variants
[7]	ETSI TS 101 952-1-5 V1.2.1 (2006-10)	Access Network xDSL Transmission Filters; Part 1; ADSL Splitters for European Deployment; Sub Part 5: Specification for ADSL over POTS Distributed Filters
[8]	TR 101 953-1-1 V1.1.1 (2002-11)	Access and Terminals (AT); Unified and Generic Testing Methods for European Specific DSL splitters; Part 1: ADSL splitters for European deployment; Sub-part 1: Specification of Testing methods for Low Pass part of ADSL/POTS splitters

	Publication	Title
	ITU-T and CCITT Recommendations	
[9]	G.122 (03/93)	Influence of national systems on stability, talker echo, and listener echo in international connections
[10]	G.992.5 (01/05)	Asymmetric Digital Subscriber Line (ADSL) transceivers - Extended bandwidth ADSL2 (ADSL2plus)
[11]	O.9 (03/99)	Measuring arrangements to assess the degree of unbalance about earth
[12]	O.41 (10/94)	Psophometer for use on telephone-type circuits
[13]	O.42 (11/88)	Equipment to measure non-linear distortion using the 4-tone method

4 ABBREVIATIONS AND DEFINITIONS

For the purposes of this Standard, the following abbreviations and definitions and those of Part 1 apply:

4.1 Abbreviations

ACA	Australian Communications Authority
ACIF	Australian Communications Industry Forum
ACMA	Australian Communications and Media Authority
ADSL	Asymmetric Digital Subscriber Line
AS	Australian Standard
CE	Customer Equipment
DC	Direct Current
DSL	Digital Subscriber Line
DUT	Device under test
ITU-T	International Telecommunications Union – Telecommunications
LCL	Longitudinal Conversion Loss
LCTL	Longitudinal Conversion Transfer Loss
PE	Protective Earth
PSTN	Public Switched Telephone Network
SI	International System
TN12	Termination Network 12
TRC	Telecommunications Reference Conductor
VDSL	Very high speed Digital Subscriber Line
VF	Voice Frequency

4.2 Definitions

4.2.1 Carrier

Refer to the *Telecommunications Act 1997*.

4.2.2 Carriage Service Provider

Refer to the *Telecommunications Act 1997*.

4.2.3 Centralised Filter (Master Splitters)

Centralised filters are typically three port devices, designed to be located and hard-wired at a central point in the customer premises (often the carrier demarcation point) from which all Voiceband PSTN CE cabling radiates, providing separation of PSTN and ADSL signals at a single location.

Note 1: Figure 15(b) shows how the Centralised filter is used to isolate the DSL functions from the PSTN CE.

Note 2: The parallel connection to the Metallic Local Loop of a centralised filter with any other filter (inline or centralised) is not recommended.

4.2.4 Customer Equipment

Refer to the *Telecommunications Act 1997*.

4.2.5 Distributed Filters ('in-line' filters or 'micro-filters')

Distributed filters are functionally two port devices, optionally provided with a third port for modem connection, allowing for self installation by the end user in series with each item of Voiceband PSTN CE.

Note 1: Multiple Distributed Filters will typically be used in a customer premises as ADSL signals are delivered over the entire premises wiring.

Note 2: The Distributed Filters specified by the current document are only intended to be connected individually in series with the PSTN CE. Operation is not specified for stacking (i.e. connecting one Distributed Filter in series with another Filter of any type).

Note 3: Figure 15(a) shows how the distributed filter is used to isolate the DSL functions from the PSTN CE.

Note 4: The parallel connection to the Metallic Local Loop of distributed filters with a centralised filter is not recommended.

4.2.6 Facility

Refer to Section 374(2) of the *Telecommunications Act 1997*.

4.2.7 Line Port

A port on CE for connection to the Metallic Local Loop.

4.2.8 Line Terminating Equipment

Line terminating equipment incorporates circuitry that applies an online condition to the PSTN line. CE incorporating this functionality may be associated with the line as—

- (a) the only line terminating equipment connected to a line, to provide the sole termination of that line; or
- (b) one or more parallel items of line terminating equipment, one or all of which can be used to terminate the line; or
- (c) one of a number of items of line terminating equipment, which can be used alternatively to terminate the line, e.g. for alternative voice/data applications.

4.2.9 Local Port

A port on series CE for connection of other CE.