

Australian Standard[®]

**Digital television—Terrestrial
broadcasting**

**Part 1: Characteristics of digital
terrestrial television transmissions**

STANDARDS
Australia



This Australian Standard® was prepared by Committee CT-002, Broadcasting and Related Services. It was approved on behalf of the Council of Standards Australia on 10 April 2007. This Standard was published on 23 May 2007.

The following are represented on Committee CT-002:

- Australian Broadcasting Corporation
- Australian Chamber of Commerce and Industry
- Australian Communications and Media Authority
- Australian Consumers Association
- Australian Electrical and Electronic Manufacturers Association
- Australian Greenhouse Office, Dept of the Environment and Heritage
- Australian Information Industry Association
- Australian Subscription Television and Radio Association
- CHOICE
- Commercial Radio Australia
- Community Broadcasting Association of Australia
- Consumer Electronics Suppliers Association
- Electronic Services Industry Association
- Free TV Australia
- Special Broadcasting Service
- SingTel Optus

Additional Interests:

- ATN 7 Television Centre
- Austar Communications
- AV Link Australia
- Broadcast Australia
- BTC Australia
- EICS
- Foxtel Management
- Intermedia
- Matchmaster Communications
- Modern Antenna Systems
- Network Ten
- Nine Network Australia
- Panasonic Australia
- Rohde & Schwarz (Australia)
- Talbingo – Consultant

This Standard was issued in draft form for comment as DR 06570.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting www.standards.org.au

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.org.au, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard[®]

**Digital television—Terrestrial
broadcasting**

**Part 1: Characteristics of digital
terrestrial television transmissions**

Original as AS 4599—1999.
Previous edition AS 4599.1—2005.
Second edition 2007.

COPYRIGHT

© Standards Australia

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia
ISBN 0 7337 8242 6

PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee CT-002, Broadcasting and Related Services to supersede AS 4599.1—2005. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian, rather than an Australian/New Zealand Standard.

This Standard was prepared in conjunction with the Australian Communications and Media Authority and the television broadcasting industry to ensure consistency of terrestrial broadcasting transmissions and to enable the design of receivers for that service. The Australian Communications and Media Authority has published a set of digital terrestrial television planning parameters in the document *The Digital Terrestrial Television Broadcasting Planning Handbook* which references this Standard.

The objective of this Standard is to provide television receiver manufacturers and broadcasters with the technical specification for the Australian digital terrestrial television transmission system in order to achieve interoperability in digital terrestrial television broadcasting (DTTB) transmission and reception. Standards Australia publishes AS 4933.1, *Digital television—Requirements for receivers, Part 1: VHF/UHF and VSB-T television broadcasts* which is derived from this Standard.

The objective of this revision is to update the reference documents and bring the Standard into line with current practice.

The Australian DTTB system uses the technical content of relevant ETSI Standards.

Copies of these Standards may be purchased from the relevant Standards authorities.

The development of standards within the EBU DVB project is a dynamic process. Reviews of existing and development of new ETSI standards are underway at DVB. End users of this Standard are encouraged to keep up to date with DVB reviews by contacting the DVB Project Office directly at:

DVB Project Office

C/- European Broadcasting Union

17A Ancienne Route

CH-1218 Grand Saconnex/Geneva

Switzerland

Phone: +41 22 717 27 19

Facsimile: +41 22 717 27 27

e-mail: dvb@dvb.org

or by visiting the DVB website:

<http://www.dvb.org>

To maintain consistency with the referenced documents, a comma is frequently used in this Standard when referring to a decimal marker, particularly in tables.

Within this Standard, organizations referred to by acronyms include—

- (a) Australian Communications and Media Authority..... ACMA
- (b) Digital Video Broadcasting ProjectDVB
- (c) Digital Television GroupDTG
- (d) European Broadcasting Union.....EBU
- (e) European Telecommunications Standards InstituteETSI
- (f) Free TV Australia.....Free TV
- (g) International Electrotechnical Commission.....IEC
- (h) International Organization for StandardizationISO
- (i) International Telecommunication Union.....ITU
- (j) Society of Motion Picture and Television EngineersSMPTE

Any international Standard references should be replaced by an equivalent Australian Standard when one is available. The availability of equivalent Australian Standards can be determined either from the Standards Australia catalogue or from the Standards Australia website (www.standards.com.au), select on-line shopping/search for equivalent Standards.

CONTENTS

| | <i>Page</i> |
|--|-------------|
| SECTION 1 SCOPE AND GENERAL | |
| 1.1 SCOPE | 6 |
| 1.2 APPLICATION | 6 |
| 1.3 REFERENCED DOCUMENTS | 9 |
| SECTION 2 CODING | |
| 2.1 INTRODUCTION | 11 |
| 2.2 AUDIO (ETSI TS 101 154)..... | 13 |
| 2.3 AUDIO CODING FOR DIGITAL TERRESTRIAL TELEVISION BROADCASTING (ITU-R RECOMMENDATION BS.1196-1)..... | 13 |
| 2.4 EXAMPLES OF FULL SCREEN LUMINANCE RESOLUTIONS FOR SDTV AND HDTV (ANNEX A IN ETSI TS 101 154) | 13 |
| 2.5 EXAMPLES OF FULL SCREEN LUMINANCE RESOLUTIONS FOR MPEG-4 PART-10 (AVC) SDTV AND HDTV | 15 |
| SECTION 3 TELETEXT/SUBTITLES | |
| 3.1 DIGITAL VIDEO BROADCASTING (DVB); SPECIFICATION FOR CONVEYING ITU-R SYSTEM B TELETEXT IN DVB BIT STREAMS (ETSI EN 300 472)..... | 16 |
| 3.2 DIGITAL VIDEO BROADCASTING (DVB); SPECIFICATION FOR THE CARRIAGE OF VERTICAL BLANKING INFORMATION (VBI) DATA IN DVB BIT STREAMS (ETSI EN 301 775)..... | 16 |
| 3.3 DIGITAL VIDEO BROADCASTING (DVB) SUBTITLING SYSTEMS (ETSI EN 300 743)..... | 16 |
| SECTION 4 SERVICE INFORMATION | |
| 4.1 GENERAL | 17 |
| 4.2 DIGITAL VIDEO BROADCASTING (DVB); SPECIFICATION FOR SERVICE INFORMATION (SI) IN DVB SYSTEMS (ETSI EN 300 468)..... | 17 |
| 4.3 DIGITAL VIDEO BROADCASTING (DVB); GUIDELINES ON IMPLEMENTATION AND USAGE OF SERVICE INFORMATION (SI) (ETSI TR 101 211)..... | 30 |
| 4.4 DIGITAL VIDEO BROADCASTING (DVB); ALLOCATION OF SERVICE INFORMATION (SI) CODES FOR DIGITAL VIDEO BROADCASTING (DVB) SYSTEMS (DRAFT ETSI TR 101 162)..... | 31 |
| SECTION 5 DATA | |
| 5.1 DIGITAL VIDEO BROADCASTING (DVB); DVB SPECIFICATION FOR DATA BROADCASTING (ETSI EN 301 192)..... | 35 |
| 5.2 DIGITAL VIDEO BROADCASTING (DVB); IMPLEMENTATION GUIDELINES FOR DATA BROADCASTING (ETSI TR 101 202) | 35 |
| 5.3 DIGITAL VIDEO BROADCASTING (DVB); SPECIFICATION FOR THE CARRIAGE OF VERTICAL BLANKING INFORMATION (VBI) DATA IN DVB BIT STREAMS (ETSI EN 301 775)..... | 35 |
| 5.4 DIGITAL VIDEO BROADCASTING (DVB); SPECIFICATION FOR SYSTEM SOFTWARE UPDATE IN DVB SYSTEMS (ETSI TS 102 006)..... | 35 |

SECTION 6 MODULATION

| | | |
|-----|---|----|
| 6.1 | GENERAL | 36 |
| 6.2 | DIGITAL VIDEO BROADCASTING (DVB); FRAMING STRUCTURE, CHANNEL CODING AND MODULATION FOR DIGITAL TERRESTRIAL TELEVISION (ETSI EN 300 744) | 36 |
| 6.3 | DIGITAL VIDEO BROADCASTING (DVB); DVB MEGA-FRAME FOR SINGLE FREQUENCY NETWORK (SFN) SYNCHRONIZATION (ETSI TS 101 191) | 54 |
| 6.4 | DIGITAL VIDEO BROADCASTING (DVB); TRANSMISSION SYSTEM FOR HANDHELD TERMINALS (DVB-H) (ETSI EN 302 304) | 54 |
| 6.5 | DIGITAL VIDEO BROADCASTING (DVB); IMPLEMENTATION GUIDELINES FOR DVB TERRESTRIAL SERVICES; TRANSMISSION ASPECTS (ETSI TR 101 190) (INFORMATIVE)..... | 54 |
| 6.6 | DIGITAL VIDEO BROADCASTING (DVB); IMPLEMENTATION GUIDELINE FOR DVB HANDHELD SERVICES (ETSI TR 102 377) (INFORMATIVE) | 54 |

SECTION 7 CONDITIONAL ACCESS

| | | |
|-----|---|----|
| 7.1 | DIGITAL VIDEO BROADCASTING (DVB); SUPPORT FOR USE OF SCRAMBLING AND CONDITIONAL ACCESS (CA) WITHIN DIGITAL BROADCASTING SYSTEMS (ETSI ETR 289)..... | 55 |
| 7.2 | DIGITAL VIDEO BROADCASTING (DVB); DVB SIMULCRYPT, HEAD-END ARCHITECTURE AND SYNCHRONIZATION (ETSI TS 103 196) | 55 |
| 7.3 | DIGITAL VIDEO BROADCASTING (DVB); HEAD-END IMPLEMENTATION OF DVB SIMULCRYPT (ETSI TS 103 197)..... | 55 |
| 7.4 | DIGITAL VIDEO BROADCASTING (DVB); IMPLEMENTATION GUIDELINES OF THE DVB SIMULCRYPT STANDARD (ETSI TR 102 035)..... | 55 |

SECTION 8 MULTIMEDIA HOME PLATFORM

| | | |
|-----|--|----|
| 8.1 | DIGITAL VIDEO BROADCASTING (DVB); MULTIMEDIA HOME PLATFORM SPECIFICATION 1.0.3 (ETSI ES 201 812)..... | 56 |
|-----|--|----|

STANDARDS AUSTRALIA

Australian Standard
Digital television—Terrestrial broadcasting

Part 1: Characteristics of digital terrestrial television transmissions

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for digital terrestrial television transmissions in Australia, including the video, audio and data coding, the characteristics of the transport stream, the channel coding and the modulation system to be used.

This update includes consideration of standards related to broadcasting of MPEG-4 AVC encoded video and associated audio in MPEG-2 transport streams. Also, the inclusion of updates in MHP and the consideration of standards related to DVB-T.

1.2 APPLICATION

This Standard shall be read in conjunction with the referenced international standards detailed in Clause 1.3.

Digital terrestrial television broadcasting in Australia is based on the DVB specifications published in the ETSI Standards referenced in this Standard.

This Standard is set out in Sections, which deal with specific topics in ETSI Standards. These are summarized below:

| Addressed Standards | | |
|---------------------|------------------------|--|
| Section | Title | ETSI Standard |
| 2 | Coding | ETSI TS 101 154 V 1.7.1 (2005-06) Digital Video Broadcasting (DVB); Implementation Guidelines for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream |
| | Teletext/ subtitles | ETSI EN 300 472 V1.3.1 (2003-01) Digital Video Broadcasting (DVB); Specification for Conveying ITU-R System B Teletext in DVB Bit-streams |
| | | ETSI EN 301 775 V 1.2.1 (2003-05) Digital Video Broadcasting (DVB); Standard for the carriage of Vertical Blanking Information (VBI) data in DVB bitstreams |
| | | ETSI EN 300 743 V 1.2.1 (2002-10) Digital Video Broadcasting (DVB); Subtitling Systems |
| 4 | Service information | ETSI EN 300 468 V 1.6.1 (2004-06) Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB Systems |