

AS/NZS 13818.4:2002

ISO/IEC 13818-4:1998

ISO/IEC 13818-4:1998/Amd 1:1999

ISO/IEC 13818-4:1998/Amd 2:2000

ISO/IEC 13818-4:1998/Amd 3:2000

ISO/IEC 13818-4:1998/Corr.2:1998

Australian/New Zealand Standard™

**Information technology—Generic
coding of moving pictures and
associated audio information**

Part 4: Conformance testing

AS/NZS 13818.4:2002

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT-001, Information Systems—Interconnections. It was approved on behalf of the Council of Standards Australia on 23 August 2002 and on behalf of the Council of Standards New Zealand on 20 August 2002. It was published on 28 November 2002.

The following are represented on Committee IT-001:

Australian Bureau of Statistics
Australian Chamber of Commerce and Industry
Australian Communications Industry Forum
Australian Information Industry Association
Australian Telecommunications Users Group
Australian Vice-Chancellors Committee
Electrical Compliance Testing Association
Information Technology Association of New Zealand
Internet Industry Association
Telstra Corporation

Keeping Standards up-to-date

Standards are living documents which 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 Standards may also be withdrawn.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 which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia web site at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 02308.

Australian/New Zealand Standard™

Information technology—Generic coding of moving pictures and associated audio information

Part 4: Conformance testing

First published as AS/NZS 13818.4:2002.

COPYRIGHT

© Standards Australia/Standards New Zealand

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.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 4810 4

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-001, Information Systems—Interconnections. This Standard is identical with and has been reproduced from ISO/IEC 13818-4:1998, *Information technology—Generic coding of moving pictures and associated audio information*, Part 4: *Conformance testing*, Amendment 1:1999, Amendment 2:2000, Amendment 3:2000 and Technical Corrigendum 2:1998 which are bound at the back of this Standard.

The objective of this Standard is to specify how tests can be designed to verify whether bitstreams and decoders meet requirements specified in Parts 1, 2 and 3 of ISO/IEC 13818.

This Standard is Part 4 of AS/NZS 13818, *Information technology—Generic coding of moving pictures and associated audio information*, which is published in parts as follows:

- Part 1: Systems
- Part 2: Video
- Part 3: Audio
- Part 4: Conformance testing (this Standard)
- Part 5: Software simulation
- Part 6: Extensions for DSM-CC
- Part 7: Advanced audio coding
- Part 9: Extension for real time interface for systems decoders
- Part 10: Conformance extensions for digital storage media command and control

The term ‘normative’ has been used in this Standard to define the application of the annex to which it applies. A ‘normative’ annex is an integral part of a Standard.

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to equivalent Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
ISO/IEC			
10918	Information technology—Digital compression and coding of continuous-tone still images	4473	Information technology—Digital compression and coding of continuous-tone still images
10918-1	Part 1: Requirements and guidelines	4473.1	Part 1: Requirements and guidelines
11172	Information technology—Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s	4230	Information technology—Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s
11172-1	Part 1: Systems	4230.1	Part 1: Systems
11172-2	Part 2: Video	4230.2	Part 2: Video
11172-3	Part 3: Audio	4230.3	Part 3: Audio
11172-4	Part 4: Conformance testing	4230.4	Part 4: Compliance testing

ISO/IEC			
13818	Information technology—Generic coding of moving pictures and associated audio information	13818	Information technology—Generic coding of moving pictures and associated audio information
13818-1	Part 1: Systems	13818.1	Part 1: Systems
13818-2	Part 2: Video	13818.2	Part 2: Video
13818-3	Part 3: Audio	13818.3	Part 3: Audio

CONTENTS

Page

1	General.....	1
1.1	Scope	1
1.2	Normative references	1
2	Technical elements	2
2.1	Definitions	2
2.2	Abbreviations and symbols	12
2.2.1	Arithmetic operators.....	13
2.2.2	Logical operators	13
2.2.3	Relational operators.....	13
2.2.4	Bitwise operators.....	14
2.2.5	Assignment.....	14
2.2.6	Mnemonics.....	14
2.2.7	Constants	15
2.3	Systems.....	16
2.3.1	System bitstream characteristics	16
2.3.1.1	General system bitstream characteristics.....	16
2.3.1.2	Transport Stream specific characteristics.....	16
2.3.1.3	Program Stream specific characteristics.....	16
2.3.2	System bitstream tests.....	17
2.3.2.1	Tests of Transport Streams	17
2.3.2.2	Tests of Program Streams	29
2.3.2.3	Tests of timing accuracy	32
2.3.2.4	Buffer overflow/underflow tests for Transport Streams	34
2.3.3	General system decoder capabilities.....	35
2.3.3.1	Handling of decoder discontinuities	35
2.3.3.2	Presentation timing.....	36
2.3.3.3	Presentation synchronisation	36
2.3.3.4	Support of variable bitrate within a program	36
2.3.3.5	General capabilities for program acquisition	37
2.3.3.6	Private data handling	37
2.3.3.7	Support of trick modes	37
2.3.3.8	Systems decoder requirements for forward compatibility	38
2.3.4	Procedures to test system decoder conformance	38
2.4	Video	39
2.4.1	Definition of video bitstream compliance.....	39
2.4.1.1	Requirements and restrictions related to profile-and-level.....	39
2.4.1.2	Additional restrictions on bitstream applied by the encoder	40
2.4.1.3	Encoder requirements and recommendations	40
2.4.2	Procedure for testing bitstream compliance	40
2.4.3	Definition of video decoder compliance.....	41
2.4.3.1	Requirement on arithmetic accuracy (without IDCT).....	42
2.4.3.2	Requirement on arithmetic accuracy (with IDCT)	42
2.4.3.3	Requirement on output of the decoding process and timing	42
2.4.3.4	Requirement for compatibility with ISO/IEC 11172-2 (MPEG-1 video)	43
2.4.3.5	Requirements for compatibility between various profile-and-level combinations	43
2.4.3.6	Requirement for forward compatibility of future extensions.....	43
2.4.3.7	Requirements related to zero byte stuffing, user data and reserved extensions.....	43
2.4.3.8	Recommendations	44
2.4.4	Procedure to test decoder compliance.....	44
2.4.4.1	Static tests	44

2.4.4.2 Dynamic tests	44
2.4.4.3 Specification of the test bitstreams.....	44
2.4.4.4 Implementation of the static test	50
2.4.4.5 Implementation of the dynamic test.....	51
2.4.4.6 Decoder conformance.....	51
2.4.5 Conformance of scalable bitstreams and decoders	53
2.4.5.1 Definition of scalable video bitstream hierarchy compliance	53
2.4.5.2 Procedure for testing bitstream compliance.....	54
2.4.5.3 Definition of video decoder compliance	54
2.4.5.4 Procedure to test decoder compliance	54
2.5 Audio	55
2.5.1 Audio bitstreams.....	55
2.5.1.1 Extension of ISO/IEC 11172-3 audio coding to lower sampling frequencies	55
2.5.1.2 Low bit rate coding of Multichannel Audio	55
2.5.2 Audio bitstream tests.....	56
2.5.2.1 Extension of ISO/IEC 11172-3 audio coding to lower sampling frequencies	56
2.5.2.2 Low bit rate coding of Multichannel Audio	57
2.5.3 Audio decoder characteristics	59
2.5.3.1 Extension of ISO/IEC 11172-3 audio coding to lower sampling frequencies	59
2.5.3.2 Low bit rate coding of Multichannel Audio	59
2.5.4 Audio decoder tests.....	61
2.5.4.1 Calculation for RMS	62
2.5.4.2 Descriptions of the audio test bitstreams	62
Annex A (informative) Systems test bitstreams.....	67
Annex B (informative) Systems decoder characteristics beyond conformance	68
B.1 Number of PIDs that can be processed	68
B.2 Error handling	68
B.3 Program acquisition	68
B.4 Input processing capabilities	69
B.5 Presentation Timing	69
Annex C (informative) Video test bitstreams	70
Annex D (informative) Audio test bitstreams.....	71
Annex E (informative) Patent statements	72
Bibliography	74

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

Information technology — Generic coding of moving pictures and associated audio information —**Part 4:
Conformance testing****1 General****1.1 Scope**

This part of ISO/IEC 13818 specifies how tests can be designed to verify whether bitstreams and decoders meet requirements specified in parts 1, 2 and 3 of ISO/IEC 13818. In this part of ISO/IEC 13818, encoders are not addressed specifically. An encoder may be said to be an ISO/IEC 13818 encoder if it generates bitstreams compliant with the syntactic and semantic bitstream requirements specified in parts 1, 2 and 3 of ISO/IEC 13818.

Characteristics of coded bitstreams and decoders are defined for parts 1, 2 and 3 of ISO/IEC 13818. The characteristics of a bitstream define the subset of the standard that is exploited in the bitstream. Examples are the applied values or range of the picture size and bitrate parameters. Decoder characteristics define the properties and capabilities of the applied decoding process. An example of a property is the applied arithmetic accuracy. The capabilities of a decoder specify which coded bitstreams the decoder can decode and reconstruct, by defining the subset of the standard that may be exploited in decodable bitstreams. A bitstream can be decoded by a decoder if the characteristics of the coded bitstream are within the subset of the standard specified by the decoder capabilities.

Procedures are described for testing conformance of bitstreams and decoders to the requirements defined in parts 1, 2 and 3 of ISO/IEC 13818. Given the set of characteristics claimed, the requirements that must be met are fully determined by parts 1, 2 and 3 of ISO/IEC 13818. This part of ISO/IEC 13818 summarises the requirements, cross references them to characteristics, and defines how conformance with them can be tested. Guidelines are given on constructing tests to verify bitstream and decoder conformance. This document gives guidelines on how to construct bitstream test suites to check or verify decoder conformance. In addition, some test bitstreams implemented according to those guidelines are provided in the electronic file directory called "Test bitstreams".

1.2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 13818. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 13818 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 639:1988, *Code for the representation of names of languages*.

ISO/IEC 8859-1:1998, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1*.

ISO/IEC 10918-1:1994, *Information technology — Digital compression and coding of continuous-tone still images: Requirements and guidelines*. (See also ITU-T Rec. T.81.)

ISO/IEC 11172-1:1993, *Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 1: Systems*.

ISO/IEC 11172-2:1993, *Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 2: Video*.

ISO/IEC 11172-3:1993, *Information technology — Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s — Part 3: Audio*.

This is a free preview. Purchase the entire publication at the link below:

- ▶ Looking for additional Standards? Visit [SAI Global Infostore](#)
- ▶ Subscribe to our [Free Newsletters about Australian Standards® in Legislation; ISO, IEC, BSI and more](#)
- ▶ Do you need to [Manage Standards Collections Online?](#)
- ▶ Learn about [LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
- ▶ Do you want to [know when a Standard has changed?](#)
- ▶ Want to [become an SAI Global Standards Sales Affiliate?](#)

Learn about other SAI Global Services:

- ▶ [LOGICOM Military Parts and Supplier Database](#)
- ▶ [Metals Infobase Database of Metal Grades, Standards and Manufacturers](#)
- ▶ [Materials Infobase Database of Materials, Standards and Suppliers](#)
- ▶ [Database of European Law, CELEX and Court Decisions](#)

Need to speak with a Customer Service Representative - [Contact Us](#)