



# **DVD Multi Specifications**

# **PRODUCT REQUIREMENTS**

**Version 1.1**

**June 2004**

## **Conditions for publication**

### **Copyright Holder**

DVD Forum\*

\* The DVD Forum is a voluntary, ad hoc association of hardware manufacturers, software firms and other users of digital versatile discs (the "DVD Format"), created for the purpose of exchanging and disseminating ideas and information about the DVD Format and its technical capabilities and improvements and innovations.

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## **Brief History**

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Version 0.9 was published as a pre-release of version 1.0.

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Version 1.0 (draft) was drafted by TCG in the DVD Forum, adding Note for Normative References and Note for AUDIO RECORDING Specifications.

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Version 1.0 was approved by SC in the DVD Forum.

December 18, 2001

Version 1.01 to add Notes for excluding DVD Multi Audio Player and DVD Multi Audio Recorder was approved by TCG in the DVD Forum.

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Version 1.1 for adding Video Format on R for General disc to DVD Multi Video Player and Recorder, and for deleting Notes for excluding DVD Multi Audio Player and Recorder, was approved by TCG in DVD Forum.

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Version 1.1 was approved by SC in DVD Forum.

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## 1. General

### 1.1 Scope

"DVD Multi" is not a format, but rather will set physical and logical specifications to enable disc compatibility for virtually all formats officially created by the DVD Forum, both for Personal Computer (PC) and Consumer Electronics (CE) products.

This book defines the minimum requirements of DVD Multi Drive, Player and Recorder using 4.7 Gbytes DVD discs without case for compliance among the DVD Multi products.

## 1.2 DVD Multi Products category

DVD Multi specification defines compatibility of the following products category;

### 1.2.1 Personal Computer (PC) Products

This specification covers two categories of implementations for PC attached drives as follows;

- (1) DVD Multi Drive (Read-Only)
- (2) DVD Multi Drive (Writable)

### 1.2.2 Consumer Electronics (CE) Products

This specification covers two categories of implementations for consumer electronics (CE) appliances as follows;

- (1) DVD Multi Player (Read-Only)
- (2) DVD Multi Recorder (Writable)

### 1.3 Normative References

DVD Multi product shall comply with all of relevant specifications listed here.

Notes: In the event of future updates of these specifications with the change of second digit or third digit of version number, such as from 1.1 to 1.2, DVD Multi product shall comply with the updated specifications after reasonable time period, even if the DVD Multi specifications is not updated. The latest version of each of these specifications will be posted in DVD FLLC web site, [www.dvdfllc.co.jp](http://www.dvdfllc.co.jp).

In the event of future updates of these specifications with the change of first digit of version number such as from 1.0 to 2.0, and creation of new format, DVD Multi product does not have to comply with these updates and new format until the DVD Multi specifications is updated.

In general, the DVD Multi specifications will be reviewed to be updated once a year.

- 1) DVD Specifications for Read-Only Disc  
Part 1: PHYSICAL SPECIFICATIONS Version 1.0
- 2) DVD Specifications for Read-Only Disc  
Part 2: FILE SYSTEM SPECIFICATIONS Version 1.0
- 3) DVD Specifications for Read-Only Disc  
Part 3: VIDEO SPECIFICATIONS Version 1.1  
Reference Information: Jacket Picture Format Version 1.0  
Reference Information: IEC958 to convey non-PCM encoded Audio bitstreams Version 1.0
- 4) DVD Specifications for Read-Only Disc  
Part 4: AUDIO SPECIFICATIONS Version 1.2  
Reference Information: Packed PCM: MLP Reference Information Version 1.0
- 5) DVD Specifications for Recordable Disc for General (DVD-R for General)  
Part 1: PHYSICAL SPECIFICATIONS Version 2.0
- 6) DVD Specifications for Recordable Disc for General (DVD-R for General)  
Part 2: FILE SYSTEM SPECIFICATIONS Version 2.1
- 7) DVD Specifications for Re-recordable Disc (DVD-RW)  
Part 1: PHYSICAL SPECIFICATIONS Version 1.2

- 8) DVD Specifications for Re-recordable Disc (DVD-RW)  
Part 2: FILE SYSTEM SPECIFICATIONS Version 1.0
  
- 9) DVD Specifications for Rewritable Disc (DVD-RAM)  
Part 1: PHYSICAL SPECIFICATIONS Version 2.2
  
- 10) DVD Specifications for Rewritable Disc (DVD-RAM)  
Part 2: FILE SYSTEM SPECIFICATIONS Version 2.0
  
- 11) DVD Specifications for DVD-RAM/DVD-RW/DVD-R for General Discs  
Part 3: VIDEO RECORDING Version 1.1
  
- 12) DVD Specifications for DVD-RAM/DVD-RW/DVD-R for General Discs  
Part 4: AUDIO RECORDING Version 1.0



## 1.4 Copyright Protection

Basic policy of DVD Forum is to respect copyright and to enable copyright protection system.

According to basic policy stated above, an appropriate copyright protection system for each DVD content and media has been adopted as follows.

CP system	Media / Content	Proposer
CSS	DVD-ROM Video	Originally proposed by Matsushita/Toshiba and transferred to DVD-CCA*
CPRM	DVD-RAM, DVD-RW, DVD-R for General	4C*
CPPM	DVD-ROM Audio	4C*
CPSA	Total copyright protection system compliance rule	4C*

\*Contact : DVD Copy Control Association Inc. and 4C Entity, LLC.

c/o Mr. John Hoy, President, License Management, International, LLC.

Since copyright protection system is not DVD Forum specification, it is not subject to DVD Forum verification but compliance to the specification is recommended by DVD-Forum.

Appropriate copyright protection systems are described in each specification.

## 1.5 Terminology

### **Read-Only disc :**

A DVD disc specified by "DVD Specifications for Read-Only Disc".

### **Recordable disc :**

A DVD disc specified by "DVD Specifications for Recordable Disc for General".

### **Re-recordable disc :**

A DVD disc specified by "DVD Specifications for Re-recordable Disc".

### **Rewritable disc :**

A DVD disc specified by "DVD Specifications for Rewritable Disc".

**1.6 Abbreviations**

CPPM	Content Protection for Prerecorded media
CPRM	Content Protection for Recordable media
CSS	Content Scramble System
CPSA	Content Protection System Architecture

## 2. Personal Computer (PC) Implementations

### 2.1 General Descriptions

This specification covers two categories of implementations for PC attached drives as follows;

(1) DVD Multi Drive (Read-Only)

The drive of this category shall support the read functionality for DVD-ROM, DVD-R for General, DVD-RAM and DVD-RW discs.

(2) DVD Multi Drive (Writable)

The drive of this category shall support all kinds of read functionality and write functionality for DVD-ROM, DVD-R for General, DVD-RAM and DVD-RW discs.

When DVD Multi Drive is used with the DVD-Video/Audio playback software/hardware, the requirements for playback functionality shall be defined in the same way as DVD Multi Player.

When DVD Multi Drive (Writable) is used with the DVD-Video/Audio recording software/hardware, the requirements for recording functionality shall be defined in the same way as DVD Multi Recorder.

**2.2 Requirements of DVD Multi Drive (Read-Only )**

The technical requirements for DVD Multi Drive (Read-Only) are listed as below.

- (1) Read capability for DVD-ROM disc which complies with  
DVD-ROM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CSS & CPPM Specifications.

- (2) Read capability for DVD-R disc which complies with  
DVD-R for General Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

Note : DVD Multi Drive (Read-Only) shall support all recording modes as specified Disc at once recording mode and Incremental recording mode with three kinds of linking methods named 2K-Link, 32K-Link and Lossless-Link in DVD-R for General Specifications.

- (3) Read capability for DVD-RAM disc which complies with  
DVD-RAM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

- (4) Read capability for DVD-RW disc which complies with  
DVD-RW Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

### 2.3 Requirements of DVD Multi Drive (Writable)

The technical requirements for DVD Multi Drive (Writable) are listed as below.

- (1) Read capability for DVD-ROM disc which complies with  
DVD-ROM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CSS & CPPM Specifications.

- (2) Read and Write capability for DVD-R disc which complies with  
DVD-R for General Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

Note : DVD Multi Drive (Writable) shall support all recording modes as specified Disc at once recording mode and Incremental recording mode with three linking methods named 2K-Link, 32K-Link and Lossless-Link in DVD-R for General Specifications.

- (3) Read and Write capability for DVD-RAM disc which complies with  
DVD-RAM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

- (4) Read and Write capability for DVD-RW disc which complies with  
DVD-RW Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

### 3. Consumer Electronics (CE) Implementations

#### 3.1 General Descriptions

This specification covers two categories of implementations for CE appliances as follows;

(1) DVD Multi Player (Read-Only)

The player of this category shall support the playback functionality for DVD Video/Audio format on DVD-ROM, DVD-R for General, DVD-RAM and DVD-RW discs.

(2) DVD Multi Recorder (Writable)

The recorder of this category shall support all kinds of playback functionality and recording functionality for DVD-Video/Audio format on DVD-ROM, DVD-R for General, DVD-RAM and DVD-RW discs.

### 3.2 Requirements of DVD Multi Player

DVD Multi Player is standalone CE appliance. The following conditions define the minimum requirements of DVD Multi compliant Player.

#### 3.2.1 DVD Multi Video Player

The technical requirements for DVD Multi Video Player are listed as below.

- (1) Content Playback capability for DVD Video disc which complies with DVD-ROM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO SPECIFICATIONS.

It is recommended to comply with CSS Specifications.

- (2) Content Playback capability for DVD-R disc which complies with DVD-R for General Specifications;  
Part 1: PHYSICAL SPECIFICATIONS (Only Incremental recording mode),  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO RECORDING  
DVD-ROM Specifications Part 3: VIDEO SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

- (3) Content Playback capability for DVD-RAM disc which complies with DVD-RAM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO RECORDING.

It is recommended to comply with CPRM Specifications.

- (4) Content Playback capability for DVD-RW disc which complies with DVD-RW Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO RECORDING.

It is recommended to comply with CPRM Specifications.



### 3.2.2 DVD Multi Audio Player

The technical requirements for DVD Multi Audio Player are listed as below.

- (1) Content Playback capability for DVD Audio disc which complies with DVD-ROM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO SPECIFICATIONS.

It is recommended to comply with CPPM Specifications.

- (2) Content Playback capability for DVD-R disc which complies with DVD-R for General Specifications;  
Part 1: PHYSICAL SPECIFICATIONS (Only Incremental recording mode),  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

- (3) Content Playback capability for DVD-RAM disc which complies with DVD-RAM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

- (4) Content Playback capability for DVD-RW disc which complies with DVD-RW Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

### 3.2.3 DVD Multi Video/Audio Player

The technical requirements for DVD Multi Video/Audio Player are listed as below.

- (1) Content Playback capability for DVD Video & Audio discs which complies with DVD-ROM Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS,
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO SPECIFICATIONS,
  - Part 4: AUDIO SPECIFICATIONS.

It is recommended to comply with CSS & CPPM Specifications.

- (2) Content Playback capability for DVD-R disc which complies with DVD-R for General Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS (Only Incremental recording mode),
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO RECORDING,
  - Part 4: AUDIO RECORDING,DVD-ROM Specifications Part 3: VIDEO SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

- (3) Content Playback capability for DVD-RAM disc which complies with DVD-RAM Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS,
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO RECORDING,
  - Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

- (4) Content Playback capability for DVD-RW disc which complies with DVD-RW Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS,
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO RECORDING,
  - Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

### 3.3 Requirements of DVD Multi Recorder

DVD Multi Recorder is standalone CE appliances. The following conditions define the minimum requirements of DVD Multi compliant Recorder.

#### 3.3.1 DVD Multi Video Recorder

The technical requirements for DVD Multi Video Recorder are listed as below.

- (1) Content Playback capability for DVD Video disc which complies with DVD-ROM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO SPECIFICATIONS.

It is recommended to comply with CSS Specifications.

- (2) Content Playback and Content Recording capability for DVD-R disc which complies with DVD-R for General Specifications;  
Part 1: PHYSICAL SPECIFICATIONS (Only Incremental recording mode),  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO RECORDING  
DVD-ROM Specifications Part 3: VIDEO SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

- (3) Content Playback and Content Recording capability for DVD-RAM disc which complies with DVD-RAM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO RECORDING.

It is recommended to comply with CPRM Specifications.

- (4) Content Playback and Content Recording capability for DVD-RW disc which complies with DVD-RW Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 3: VIDEO RECORDING.

It is recommended to comply with CPRM Specifications.

### 3.3.2 DVD Multi Audio Recorder

The technical requirements for DVD Multi Audio Recorder are listed as below.

- (1) Content Playback capability for DVD Audio disc which complies with DVD-ROM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO SPECIFICATIONS.

It is recommended to comply with CPPM Specifications.

- (2) Content Playback and Content Recording capability for DVD-R disc which complies with DVD-R for General Specifications;  
Part 1: PHYSICAL SPECIFICATIONS (Only Incremental recording mode),  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

- (3) Content Playback and Content Recording capability for DVD-RAM disc which complies with DVD-RAM Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

- (4) Content Playback and Content Recording capability for DVD-RW disc which complies with DVD-RW Specifications;  
Part 1: PHYSICAL SPECIFICATIONS,  
Part 2: FILE SYSTEM SPECIFICATIONS,  
Part 4: AUDIO RECORDING.

It is recommended to comply with CPRM Specifications.

### 3.3.3 DVD Multi Video/Audio Recorder

The technical requirements for DVD Multi Video/Audio Recorder are listed as below.

- (1) Content Playback capability for DVD Video & Audio discs which complies with DVD-ROM Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS,
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO SPECIFICATIONS,
  - Part 4: AUDIO SPECIFICATIONS.

It is recommended to comply with CSS & CPPM Specifications.

- (2) Content Playback and Content Recording capability for DVD-R disc which complies with DVD-R for General Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS (Only Incremental recording mode),
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO RECORDING,
  - Part 4: AUDIO RECORDING,DVD-ROM Specifications Part 3: VIDEO SPECIFICATIONS.

It is recommended to comply with CPRM Specifications.

- (3) Content Playback and Content Recording capability for DVD-RAM disc which complies with DVD-RAM Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS,
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO RECORDING,
  - Part 4: AUDIO RECORDING \*.

It is recommended to comply with CPRM Specifications.

- (4) Content Playback and Content Recording capability for DVD-RW disc which complies with DVD-RW Specifications;
  - Part 1: PHYSICAL SPECIFICATIONS,
  - Part 2: FILE SYSTEM SPECIFICATIONS,
  - Part 3: VIDEO RECORDING,
  - Part 4: AUDIO RECORDING \*.

It is recommended to comply with CPRM Specifications.

**Technical Coordination Group members of the DVD Forum who participated in making this specifications**

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