

DVD FORMATS & TECHNICAL INFORMATION

DVD stands for Digital Versatile/Video Disc

DVDR stands for DVD Recordable

DVDRW for DVD ReWriteable.

There are three competing DVD Recording standards, DVD-R/W and DVD+R/W have pretty similar features and are compatible with many standalone DVD Players and most DVD-ROMs while DVD-RAM has less DVD Player and DVD-ROM compatibility but better recording features.

1) DVD-R and DVD-RW

DVD-R/W was the first DVD recording format released that was compatible with standalone DVD Players.

DVD-R is a non-rewriteable format and it is compatible with about 93% of all DVD Players and most DVD-ROMs.

DVD-RW is a rewriteable format and it is compatible with about 79% of all DVD Players and most DVD-ROMs.

DVD-R/W supports single side 4.37 computer GB* DVDs(called DVD-5) and double sided 8.75 computer GB* DVDs(called DVD-10).

These formats are supported by DVDForum.

2) DVD+R and DVD+RW

DVD+R/W has some "better" features than DVD-R/W such as lossless linking and both CAV and CLV writing.

DVD+R is a non-rewritable format and it is compatible with about 88% of all DVD Players and most DVD-ROMs.

DVD+RW is a rewritable format and is compatible with about 79% of all DVD Players and most DVD-ROMs.

DVD+R/W supports single side 4.37 computer GB* DVDs(called DVD-5) and double side 8.75 computer GB* DVDs(called DVD-10).

These formats are supported by the DVD+RW Alliance.

DVD+R DL or called DVD+R9 is a Dual Layer writeable DVD+R. The dual layered discs can hold 7.95 computer GB* (called DVD-9) and dual layered double sides 15.9* computer GB (called dvd-18).

3) DVD-RAM

DVD-RAM has the best recording features but it is not compatible with most DVD-ROM drives and DVD-Video players. Think more of it as a removable hard disk. DVD-RAM is usually used in some DVD Recorders.

This format is supported by DVDForum.

DVD Sizes, What is DVD-5, DVD-10, DVD-9 and DVD-18?

How much does a DVDR/W fit? Is it 4.7GB or 4.38GB? 8.54 GB or 7.95 GB?

The DVD sizes can be a bit confusing. There are basically 4 different dvd sizes,

DVD-5, holds around 4 700 000 000 bytes and that is 4.37GB.

DVD+R/W and DVD-R/W supports this format. Also called Single Sided Single Layered.

DVD-10, holds around 9 400 000 000 bytes and that is 8.75GB. DVD+R/W and DVD-R/W supports this format. Also called Double Sided Single Layered.

DVD-9, holds around 8 540 000 000 bytes and that is 7.95GB. DVD+R supports this format. Also called Single Sided Dual Layered.

DVD-18, holds around 17 080 000 000 bytes and that is 15.9GB. DVD+R supports this format. Also called Double Sided Dual Layered.

Other non-standard special DVD formats:

DVD-VCD - is basically a VCD authored on a DVDR/W. DVD supports the VCD resolution but the audio has to be resampled to 48 khz. If the audio is resampled to 48 khz it is standard DVD-Video.

DVD-SVCD - is basically a SVCD authored on a DVDR/W. DVD do not supports the SVCD resolution but it may anyway work and the audio has to be resampled to 48 khz like the DVD-VCD.

DVD-MP3 - is MP3s burned on a DVDR/W but very few MP3 capable standalone DVD Players supports it because most Players verify DVDR/W as DVD-Video only.

DVD-ISO - is MPEG,MPG,VOB files burned on a DVDR/W without any DVD Authoring (making the vob,ifo files) but very few standalone DVD Players supports it because most Players verify DVDR/W as DVD-Video only.

Technical Info for DVD-Video

PAL

Video:

Up to 9.8 Mbit/sec MPEG2 or up to 1.856 MBit/sec MPEG1 video
720 x 576 pixels MPEG2 (Called Full-D1)
704 x 576 pixels MPEG2
352 x 576 pixels MPEG2 (Called Half-D1, same as the CVD Standard)
352 x 288 pixels MPEG2
352 x 288 pixels MPEG1 (Same as the VCD Standard)
25 fps (frames/second)
16:9 Anamorphic (only supported by 720x576)

Audio:

48000 Hz
32 - 1536 kbit/sec
Up to 8 audio tracks containing Dolby Digital, DTS, PCM(uncompressed audio), MPEG-1 Layer2. One audio track must have MPEG-1, DD or PCM Audio.

Extras:

Menus, still pictures, subtitles and more.

NTSC (NTSC Film)

Video:

Up to 9.8 Mbit/sec MPEG2 or up to 1.856 MBit/sec MPEG1 video
720 x 480 pixels MPEG2 (Called Full-D1)
704 x 480 pixels MPEG2
352 x 480 pixels MPEG2 (Called Half-D1, same as the CVD Standard)
352 x 240 pixels MPEG2
352 x 240 pixels MPEG1 (Same as the VCD Standard)
29,97 fps (frames/second)
23,976 fps with 3:2 pulldown = 29,97 playback fps (NTSC Film, this is only supported by MPEG2 video)
16:9 Anamorphic (only supported by 720x480)

Audio:

48000 Hz
32 - 1536 kbit/sec
Up to 8 audio tracks containing DD (Dolby Digital/AC3), DTS, PCM(uncompressed audio), MPEG-1 Layer2. One audio track must have DD or PCM Audio.

Extras:

Menus, still pictures, subtitles and more.

DVD File/Folder Structure

Explanation:

- . BUP = Backup files of the IFO files.
- . IFO = The IFO files includes information such as chapters, subtitle tracks and audio tracks.
- . VOB = The VOB files contains the actual video,audio,subtitles and menus.

Folder	Files	Explanation
AUDIO_TS	(undefined)	DVD Audio
VIDEO_TS	VIDEO_TS.BUP	
	VIDEO_TS.IFO	The first video play item, IFO , usally a copyright notice or a menu
	VIDEO_TS.VOB	The first video play item, VOB
	VTS_01_0.BUP	
	VTS_01_0.IFO	Title 01, IFO , usually the main movie
	VTS_01_0.VOB	Title 01, VOB 0, the menu for this title
	VTS_01_1.VOB	Title 01, VOB 1, the video for this title
	VTS_01_2.VOB	Title 01, VOB 2 , if larger than 1 GB it will be splitted into several vobs
	VTS_01_3.VOB	Title 01, VOB 3
	VTS_01_4.VOB	Title 01, VOB 4 , up to 10(0-9) VOB files if necessary
	VTS_02_0.BUP	
	VTS_02_0.IFO	Title 02, IFO , usually movie extras
	VTS_02_0.VOB	Title 02, VOB 0, the menu for this title
	VTS_02_1.VOB	Title 02, VOB 1, the video for this title
	VTS_xx_x.BUP	
	VTS_xx_x.IFO	And so on
	VTS_xx_x.VOB	
	VTS_xx_x.VOB	
	VTS_99_9.VOB	Up to 99(1-99) titles with max 10(0-9) VOB files each

Video File Comparison

Format	VCD	SVCD	DVD	DivX XviD WMV	MOV	ASF SMR nAVI	RM	DV
Resolution	352x240	480x480	720x480	640x480 ²	640x480 ²	320x240 ²	320x240 ²	720x480
NTSC	352x288	480x576	720x576 ²					720x576
PAL								
Video Compression	MPEG1	MPEG2	MPEG2, MPEG1	MPEG4	Sorenson, Cinepak, MPEG4	MPEG4	RM	DV
Video bitrate kbit/sec	1150 kbit/s	1000~2500 kbit/s	3000~9000 kbit/s	300~1000 kbit/s	300~2000 kbit/s	100~500 kbit/s	100~500 kbit/s	25 Mbit/s
Audio Compression	MP1	MP1	MP1, MP2, AC3, DTS, PCM	MP3, WMA, OGG, AAC, AC3	Sorenson, Cinepak, MP3	MP3, WMA	RM	DV
Audio bitrate kbit/sec	224 kbit/s	128~384 kbit/s	192~448 kbit/s	64~448 kbit/s	64~192 kbit/s	64~128 kbit/s	64~128 kbit/s	1000~1500 kbit/s
Size/min	10 MB/min	10 - 20 MB/min	30 - 70 MB/min	1 - 10 MB/min	1 - 20 MB/min	1 - 5 MB/min	1 - 5 MB/min	216 MB/min
Min/74min CD	74min	35-60min	15-20min	60- 180min	60- 180min	120- 300min	120- 300min	3min
Hours/DVDR	N/A	N/A	2-4hrs (3-7hrs ^a)	13-26hrs	13-26hrs	26-40hrs	26-40hrs	20min
DVD Player Compatibility	Great	Good	Excellent	Few	None	None	None	None
Computer CPU Usage	Low	High	Very High	Very High	High	Low	Low	High
Quality	Good	Great*	Excellent*	Great*	Great*	Decent*	Decent*	Excellent

? approximately resolution, it can be higher or lower

~ approximately bitrate, it can be higher or lower

? DVD with lower video quality, similiar to VCD/SVCD video quality

* the video quality depends on the bitrate and the video resolution, higher bitrate and higher resolution generally means better video quality but bigger file size