

TEST DVD-VIDEO/ DVD-ROM

For Checking DVD Players, DVD Recorders and DVD Drives TDH-940

1. Purpose of use, Features

TDH-940 is a Test Disc designed for confirmation of operation of DVD Players, Recorders and Drives.

It is Hybrid structure consisting of Video content and data file (ISO9660) in one disc.

The contents are recorded at outer most area of Layer 0 and inner most area of Layer 1.

Video content is recorded to the mid area of Layer 0, subsequently ISO9660 data are aligned.

ISO9660 file data is generated from the address information of the disc, the location on the disc is corresponded to the physical sector address. It is available to read confirmation by accessing the file.

In addition, since physical characteristics are controlled to confirm stable operation check by high-speed drives, it is usable for Access check, Seek time check and Data reading check when disc is rotating at high speed.

2. Specifications

· Disc type : DVD-VIDEO Disc Single Sided Dual Layer
NTSC

· Disc structure : Opposite track path

· Capacity : 8.5 Gbytes

· Video area

Recorded time : 1hr 36sec

Video Codec : MPEG-2

Bit Rate : 7.4 Mbps

Region : 1、2、3、4、5、6

Menu : None (Auto start)

Subtitle : None

· Data area	Address	Physical sector (PSN)	Logical sector (LSN)
	Layer 0	1E0786h~22D00Fh	1B0786h~1FD00Fh
	Layer 1	DD2FF0h~FCFFE0h	1FD010h~3FA000h

· Physical Characteristics

: Complies with DVD Specifications for Read-Only Disc Part1Physical Specifications Version 1.0

However, following parameters are managed as described specifications.

Parameters	DVD Specifications	Managed Specifications
Radial run-out	$\leq 100 \mu\text{m}$ (p-p)	$\leq 70 \mu\text{m}$ (p-p)
Dynamic balance	$\leq 1 \text{g}\cdot\text{cm}$	$\leq 0.3 \text{g}\cdot\text{cm}$
Radial Tilt (α)	$\pm 0.80^\circ$	$\pm 0.20^\circ$ (ave.)
Tangential Tilt (α)	$\pm 0.30^\circ$	$\pm 0.15^\circ$
PI error	≤ 280	≤ 100
Axial acceleration	$\leq 20 \text{m/s}^2$ (Radius 58mm, Revolution 60rps, by our standard equipment)	

· File System : UDF 1.02

· Application : Complies with DVD Specifications for Read-Only Disc Part3 Video Specifications Version 1.0

· Content Protection

CSS : None

3. Content

Volume name	Root directory
TDH_940	AUDIO_TS
	VIDEO_TS
	A01.DAT
	A02.DAT
	A03.DAT
	A04.DAT
	A05.DAT
	A06.DAT
	A07.DAT
	A08.DAT
	A09.DAT
	A10.DAT
	A11.DAT
	A12.DAT

Layer	Chapter No.	Time		Video Description		Audio Stream		PSN		LSN	
		min	sec	Contents	Rate Mbps	Dolby Digital 2ch	Rate kbps	Start hex	End hex	Start hex	End hex
0	1	6	01	Motion Picture JAL FILM (LIBRARY '90)	7.4	CRIMINAL	384	3015C	5B012	0015C	2B012
	2	6	57		7.4	CRIMINAL(Drum less)	384	5B013	8C68C	2B013	5C68C
	3	6	59		7.4	SPORTS TOPICS	384	8C68D	BE2FE	5C68D	8E2FE
	4	5	50		7.4	WONDER NATURE	384	BE2FF	E7E8F	8E2FF	B7E8F
	5	5	36		7.4	BREAK THROUGH	384	E7E90	10FFB7	B7E90	DFFB8
	6	6	11		7.4	MEDIA SCRAP	384	10FFB8	13BF2F	DFFB8	10BF2F
	7	5	44		7.4	HARD WORK	384	13BF30	164E58	10BF30	134E58
	8	5	36		7.4	SHAKE UP BEAT	384	164E59	18CE48	134E59	15CE48
	9	5	23		7.4	POWER ATTACK	384	18CE49	1B3523	15CE49	183523
	10	6	19		7.4	IN THE SHADOW	384	1B3524	1E076E	183524	1B076E
	Disc Volume			File Name	File Length byte	User Data byte					
	TDH_940			A01.DAT	409,600,000	409,600,000	1E0786	2114C5	1B0786	1E14C5	
				A02.DAT	409,600,000	232,411,136	2114C6	22D00F	1E14C6	1FD00F	
						177,188,864	DD2FF0	DE81E5	1FD010	212205	
1				A03.DAT	409,600,000	409,600,000	DE81E6	E18F25	212206	242F45	
				A04.DAT	409,600,000	409,600,000	E18F26	E49C65	242F46	273C85	
				A05.DAT	409,600,000	409,600,000	E49C66	E7A9A5	273C86	2A49C5	
				A06.DAT	409,600,000	409,600,000	E7A9A9	EAB6E5	2A49C6	2D5705	
				A07.DAT	409,600,000	409,600,000	EAB6E6	EDC425	2D5706	306445	
				A08.DAT	409,600,000	409,600,000	DEC426	F0D165	306446	337185	
				A09.DAT	409,600,000	409,600,000	F0D166	F3DEA5	337186	367EC5	
				A10.DAT	409,600,000	409,600,000	F3DEA6	F6EBE5	367EC6	398C05	
				A11.DAT	409,600,000	409,600,000	F6EBE6	F9F925	398C06	3C9945	
				A12.DAT	406,181,888	406,181,888	F9F926	FCFFE0	3C9946	3FA000	

PSN : Physical Sector Number LSN : Logical Sector Number

note) Data file of A2.DAT switches to Layer 1 from DD2FFh (PSN), 1FD010h (LSN).

4. User data

· Address No., M-sequence data, Check Sum and specific ASCII code are recorded.

(1) User data structure

Group	Byte Number In User Data	Contents		Code		
		Layer 0	Layer 1			
A	0	MSB	MSB	Binary		
	1	PSN = 30000h + LSN				
	2	PSN = DD2FF0h + LSN - 1FD010h				
	3	LSB	LSB			
	4、5	Character Code " " (20h)		ASCII		
	6	MSB	LSN		Binary	
	7					
	8					
	9	LSB				
	10、11	Character Code " " (20h)		ASCII		
12	MSB	ECC Block Number (1Block = 16 Sectors)		Binary		
13						
14						
15	LSB					
16	Character Code "A" (41h)		ASCII			
17	Character Code "B" (42h)					
18	Character Code "E" (45h)					
19	Character Code "X" (58h)					
20	Character Code "D" (44h)					
21	Character Code "V" (56h)					
22	Character Code "D" (44h)					
23	Character Code " " (20h)					
B	24 }	M-Sequence(2 ³² -1)Data		Binary		
C	2044、2045	Character Code " " (20h)		ASCII		
D	2046	LSB	Check Sum		Binary	
	2047	MSB				

MSB = Most Significant Byte LSB = Least Significant Byte
 PSN = Physical Sector Number LSN = Logical Sector Number

(2) Generation of M-sequence data

· The following function is used for the generation polynomial equation that generates M-sequence data.

Polynomial = 1E0000401h

The data notation adopts the method of making MSB to the left and LSB to the right.

· The default value of M-sequence data is used Sequential Sector Number +1 of each sector, the direction of bit shift move to lower bit.

· Generation process of M-sequence data

1. The primitive polynomial equation is shifted by 1 bit to the lower bit and the result is stored into IFED (32bits data).
IFED = F0000200h
2. 32bits Work Register is stored with the Sequential Sector Number +1.
3. If the LSB of the work register is 1, then Flag LSBF=1, else, flag LSBF=0.
4. The data in register is shifted by 1 bit to the lower bit bringing 0 into MSB (The data of LSB is cleared off).
5. If LSBF=1, the work register is Exclusive-Ored with the IFED and replaced by the result. If LSBF=0, the work register is left unchanged
6. The work register is ANDed with "FFFF", in order to get the lower 16bits as the 2 bytes of the result. The lower bytes of the result is stored into the lower address.
7. Keeping the work register unchanged, return to process No.3 for the next address value. This process is repeated 1009 times to generate the user data in sector.

(3) Calculation of Check Sum

In order to check data within the User Data, Check Sum is recorded in the last 2 Bytes (16bits) of this area. The Check Sum is achieved by considering 16 bits as 1 word in the User Data and accumulating all the words besides the Check Sum Bytes, and taking the lower 16 bits (2 bytes) as the result. The lower bytes of this result stored into Byte Number 2046 of the User Data, and the higher Bytes into 2047.

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(4) Sample

① A01.DAT

• Head (LSN = 1B0786h)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	1E	07	86	20	20	00	1B	07	86	20	20	00	01	B0	78	□. x
0010	41	42	45	58	44	56	44	20	C3	81	E1	C2	70	63	B8	B1	ABEXDVD pc..
0020	DC	D8	6E	6C	37	36	1B	19	8D	0E	46	05	A3	02	51	03	□nl76. . . . F. . . Q.
0030	A8	03	D4	81	EA	40	75	A0	3A	D2	1D	69	8E	B6	47	5B	□. . . @u. . . . i. . . G[
0040	A3	AF	D1	55	E8	A8	74	D4	3A	EA	1D	F5	8E	78	47	3C	□. U. . t. . : xG<
0050	23	9C	11	CC	08	E4	04	72	02	39	81	1C	40	8C	20	C6	#. r. 9. . @. .
:																	
07E0	26	BF	93	5F	C9	AD	E4	54	72	2A	39	15	9C	08	4E	84	&. . . . Tr*9. . . N.
07F0	27	42	13	23	89	93	C4	4B	E2	A5	F1	D2	20	20	BF	7E	▯. #. . . K. ~

• End (LSN = 1E14C5h)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	21	14	C5	20	20	00	1E	14	C5	20	20	00	01	E1	4C	□. L
0010	41	42	45	58	44	56	44	20	63	0A	31	87	98	C1	CC	E0	ABEXDVD c. 1.
0020	66	F0	33	78	19	3E	0C	1D	86	0E	43	07	A1	01	D0	02	▯3x. > C.
0030	68	01	B4	00	5A	80	2D	40	16	22	0B	11	85	8A	42	C7	▯. . Z. -@. " B.
0040	A1	63	D0	33	E8	19	F4	0C	7A	6	3D	03	9E	03	CF	81	▯. 3. . . . z. =.
0050	E7	42	73	A3	B9	D3	DC	6B	EE	B5	F7	5A	7B	AF	BD	55	▯s. . . . k. . . Z{. . U
:																	
07E0	9A	03	CD	01	E6	82	73	41	B9	22	5C	13	AE	09	D7	04	□. . . . sA. "¥.
07F0	6B	80	35	42	1A	23	8D	11	C6	8A	63	C5	20	20	D1	41	▯5B. #. . . . c. . . A

② A02.DAT

• Head (LSN = 1E14C6h)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	21	14	C6	20	20	00	1E	14	C6	20	20	00	01	E1	4C	□□. L
0010	41	42	45	58	44	56	44	20	63	08	31	86	18	C1	8C	E0	□ABEXDVD c. 1.
0020	46	F0	23	78	11	3E	08	1D	84	0E	42	07	A1	03	D0	03	□#x. > B.
0030	E8	01	F4	80	7A	40	3D	A0	1E	D2	0F	69	87	B6	43	D9	□□. . z@=. . . . i. . . C.
0040	A1	6E	50	35	A8	1A	54	8D	AA	C6	55	E3	AA	F3	D5	F9	□▯P5. . T. . . U.
0050	EA	7E	75	BF	BA	DD	DD	6E	6E	B5	B7	DA	5B	6F	AD	B5	□□u. . . . nn. . [o. . .
:																	
07E0	D4	BC	6A	5E	35	2F	9A	95	CD	4A	66	27	B3	13	D9	0B	□□j^5/. . . . Jf'
07F0	EC	07	F6	83	FB	41	FD	A2	7E	53	BF	A9	20	20	97	CB	□□. . . A. . . ~S. . . .

• End of Layer 0 (LSN = 1FD00Fh)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	22	D0	0F	20	20	00	1F	D0	0F	20	20	00	01	FD	00	□□.
0010	41	42	45	58	44	56	44	20	08	E8	04	F4	02	FA	01	FD	□ABEXDVD
0020	80	FC	40	7E	20	3F	90	1F	C8	0F	E4	07	F2	03	F9	01	□□@~ ?
0030	FC	02	7E	01	BF	00	5F	02	2F	03	97	83	CB	C3	E5	E3	□□~. /
0040	F2	F3	F9	79	FC	3E	7E	1F	BF	0F	DF	85	EF	C0	77	E2	□□. y. >~ w.
0050	3B	73	9D	3B	CE	9F	E7	4F	F3	25	F9	10	7C	8A	3E	C5	□▯. . . . 0. % . . . >.
:																	
07E0	D4	BC	6A	5E	35	2F	9A	95	CD	4A	66	27	B3	13	D9	0B	□□a. 0. . n. . . [. - . .
07F0	EC	07	F6	83	FB	41	FD	A2	7E	53	BF	A9	20	20	97	CB	□▯8. C. . . .

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• Head of Layer 1 (LSN = 1FD010h)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	DD	2F	F0	20	20	00	1F	D0	10	20	20	00	01	FD	01	□□/.
0010	41	42	45	58	44	56	44	20	08	EA	04	F5	82	FA	41	FD	□ABEXDVD A.
0020	A0	FC	50	7E	28	3F	94	1F	CA	0F	E5	07	F2	01	F9	00	□□P~(?).
0030	7C	02	3E	81	9F	C0	4F	E2	27	F3	93	FB	C9	FF	E4	FD	□□>. . . 0.'
0040	F2	FE	79	7F	BC	3D	DE	9E	6F	CF	B7	65	DB	30	6D	9A	□□y. . . =. . o. . e. 0m.
0050	36	4F	9B	27	CD	91	E6	4A	73	25	B9	90	5C	4A	2E	25	□60.' . . . Js%. . ¥J. %
:																	
07E0	8C	C7	C6	E3	E3	71	F1	BA	78	DF	BC	6F	DE	37	EF	1B	□. . . q. . x. . o. 7. .
07F0	F7	8F	FB	C5	FD	60	7E	B2	3F	59	9F	AE	20	20	FA	48	□. . . ~. ?Y. . . H

End (LSN = 212205h)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	DE	81	E5	20	20	00	21	22	05	20	20	00	02	12	20	□. . . !".
0010	41	42	45	58	44	56	44	20	03	91	81	4A	40	27	A0	13	ABEXDVD . . . J@' . .
0020	D0	09	E8	84	74	42	3A	21	9D	10	4E	0A	27	05	93	00	□. . tB:!. . N.' . . .
0030	49	02	24	03	92	81	C9	40	64	22	32	11	99	88	4C	46	□\$. . . @d"2. . . LF
0040	26	23	93	11	C9	8A	64	C7	B2	63	D9	B1	EC	DA	76	ED	&#. . . d. . c. . . v.
0050	BB	76	5D	39	AE	9E	57	CF	AB	65	D5	B0	6A	DA	35	6D	□]9. . W. . e. . j. 5m
:																	
07E0	7C	D4	3E	EA	1F	F5	8F	F8	47	FE	23	FD	91	FC	48	7C	□>. G. #. . . H
07F0	24	BE	12	5F	89	2F	C4	15	E2	8A	71	C5	20	20	D3	1B	□. . _/ q. . .

③ A12.DAT

• Head (LSN = 3C9946h)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	F9	F9	26	20	20	00	3C	99	46	20	20	00	03	C9	94	□. & . <. F
0010	41	42	45	58	44	56	44	20	A3	4E	51	25	A8	90	54	C8	ABEXDVD . NQ%. . T.
0020	2A	E4	15	F2	0A	7B	85	3D	C2	1C	61	0E	30	05	98	02	£. . . { . = . a. 0. . .
0030	4C	01	A6	80	53	40	29	A2	14	D3	8A	69	C5	B4	62	D8	□. . S@). . . . i. . b.
0040	31	EC	18	74	0C	3A	06	1D	83	0E	41	85	A0	C0	50	60	□. t. :. . . . A. . . P`
0050	28	B0	14	58	0A	2C	05	16	02	09	81	84	40	40	20	20	□. X. ,. @@
:																	
07E0	94	0B	CA	05	E5	82	72	C3	B9	E1	DC	F2	6E	79	B7	BC	□. . . . r. ny. .
07F0	5B	5C	2D	AC	16	D4	0B	6A	05	B7	82	59	20	20	AE	E1	□¥- j. . . . Y . .

• End (LSN = 3FA00Fh = End of Layer 1)

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	FC	FF	E0	20	20	00	3F	A0	00	20	20	00	03	FA	00	□. . . ?
0010	41	42	45	58	44	56	44	20	00	D2	00	E9	80	F4	40	FA	ABEXDVD @.
0020	20	FD	90	FE	48	7F	A4	3F	D2	1F	E9	0F	F4	05	FA	02	□. . H. . ?
0030	7D	01	BE	82	5F	C1	AF	E2	57	F3	AB	7B	D5	3F	EA	1D	□. W. . { . ? . .
0040	F5	0E	7A	05	BD	02	5E	83	AF	C1	D7	E2	6B	73	B5	BB	□z. . . ^ ks. .
0050	DA	5F	ED	AF	F6	D5	FB	6A	7D	37	BE	99	DF	CC	6F	64	□. j} 7. . . . od
:																	
07E0	15	DB	8A	EF	C5	F7	E2	F9	F1	7C	78	3C	3C	1E	1E	8F	□. x<<. . .
07F0	8F	47	C7	A1	E3	52	71	AB	B8	D7	DC	6B	20	20	2B	10	□G. . . Rq. . . . k +.

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<Proper handling of the disc>
 Do not write on the surface with a pen and others, nor put a sticker on it.
 Do not expose the disc to direct sunlight, nor leave it in the place of high temperature and high humidity.
 After playing, store the disc in its own case.

ALMEDIO INC.
 Sales Headquarters
<http://www.almedio.co.jp>
 E-Mail : tm-sales@almedio.co.jp