ALMEDIO

ABEX
Product Introduction

No.M30134

2010.10 Rev.1

TEST DVD-ROM

For Checking DVD Drives, DVD Players and DVD Recorders

TDR-840/ -840B

1. Purpose of use, Features

TDR-840/ -840B are Test Discs designed for confirmation of various kinds of operation, evaluation, measurement and adjustment of DVD-Drives, Players and Recorders.

To confirm stable operation check, physical characteristics are strictly controlled. In addition, it has enough capability for axial acceleration, it is available to rotate it at high speed from inner to outer area without decreasing rotation speed. It is usable for evaluation, measurement and adjustment of high-speed Drives.

The axial acceleration of TDR-840B is more strictly controlled than TDR-840.

User data are recorded from physical sector No. 30000h to 25FFFFh (outermost area).

It is usable for Access check, Seek time check and Data reading check.

2. Specifications

- Disc type : DVD-ROM Single Sided Dual Layer
- Disc structure : Parallel track path
- Capacity : 8.5 Gbytes (8,539,996,160 bytes)
- Data area :

	Physical sector (PSN)	Logical sector (LSN)
Layer 0	30000h～22D05Fh	0h～1FD05Fh
Layer 1	30000h～22D05Fh	1FD060h～3FA0BFh

- Physical Characteristics: Complies with DVD Specifications for Read-Only Disc Part1 Physical Specifications Version 1.0 However, following parameters are managed as described specifications.

Parameters	DVD Specifications	Managed Specifications
Radial run-out	≦100μm (p-p)	≦70μm (p-p)
Dynamic balance	≦1g・cm	≦0.3 g・cm
Radial Tilt (α)	±0.80°	±0.20° (ave.)
Tangential Tilt (α)	±0.30°	±015°
PI Error rate	≦280	≦100
Axial acceleration ※	-	TDR-840 ≦20 m/s2
	-	TDR-840B ≦15 m/s2

※Axial acceleration are values measured by our standard equipment at R=58mm, revolution 60r

- File system : Since it is used for various purposes, file system is not UDF 1.02 structure.
- Lead-in control data (hex) :

Byte0	01	Read-Only Disc, Version 1.0
Byte1	02	12cm disc, 10.08 Mbps
Byte2	21	Dual, Parallel track path, Completely read-only layer
Byte3	10	0.293μm/bit, 0.74μm/track
Byte4～7	00 03 00 00	Start sector number of the Data Area
Byte8～11	00 22 D0 5F	End sector number of the Data Area
Byte12～15	00 00 00 00	Parallel track path : All "00"
Byte16～2047	00	Byte16～2047 : All "00"

- Sector structure :

ID (4Bytes)	IED (2Bytes)	CPR_MAI (6Bytes)	USER DATA (2048Bytes)	EDC (4Bytes)

3. Content

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

(1) User data structure

Group	Byte Number In User Data	Contents	Code
A	MSB 0 1 2 LSB 3	MSB 30000h + Sequential Sector Number LSB	Binary
	4、5	Character Code " " (20h)	ASCII
	6 7 8 9	MSB Sequential Sector Number LSB	Binary
	10、11	Character Code " " (20h)	ASCII
	12 13 14 15	MSB ECC Block Number (1Block = 16 Sectors) LSB	Binary
	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 ～ 2,043	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

(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 moves to lower bit.

(3) 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.

(4) 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.

4. Use data sample (Head 96 Bytes and End 32 Bytes of the sector)

(1) LSN = 00000000h

・(ID+IED)&CPR_MAI : 20 03 00 00 D6 F5 00 00 00 00 00 00

・User data

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	03	00	00	20	20	00	00	00	00	20	20	00	00	00	00	....
0010	41	42	45	58	44	56	44	20	00	02	00	01	80	00	40	00	ABEXDVD ......@.
0020	20	00	10	00	08	00	04	00	02	00	01	00	00	02	00	01	.....
0030	80	00	40	80	20	C0	10	E0	08	F0	04	78	02	3C	01	1E	..@. ......x.<..
0040	00	0D	80	06	40	03	A0	81	D0	C0	68	E0	34	F0	1A	78	....@.....h.4..x
0050	0D	3C	06	1C	03	0E	01	05	80	00	40	80	20	C0	10	E0	.<.....@. ...
:																	
07E0	4E	BF	A7	5F	D3	AD	E9	D4	74	68	3A	34	1D	1A	0E	0F	N..._....th:4....
07F0	87	87	C3	C1	E1	62	70	B3	B8	D9	DC	6C	20	20	B4	F9	.....bp....l ..

・EDC : 0D B0 CD 09

(2) LSN = 001FD05Fh

・(ID+IED)&CPR_MAI : 20 22 D0 5F CF 42 00 00 00 00 00 00

・User data

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	22	D0	5F	20	20	00	1F	D0	5F	20	20	00	01	FD	05	□."._ ..._ ....
0010	41	42	45	58	44	56	44	20	30	E8	18	F4	0C	FA	06	FD	□ABEXDVD 0.....
0020	83	FE	41	7D	A0	3C	50	1E	28	0F	94	07	CA	03	E5	01	□..A}.<P.(.....
0030	F2	02	79	01	BC	02	5E	01	AF	00	57	02	2B	83	95	43	□..y...^...W.+..C
0040	CA	23	E5	11	F2	8A	79	45	BC	20	5E	90	2F	C8	17	66	□.#....yE. ^./..f
0050	0B	31	85	9A	42	4F	A1	27	D0	91	E8	48	74	A4	3A	D2	□.1..BO.'...Ht.:.
:																	
07E0	4E	06	27	03	93	03	C9	03	E4	83	F2	C1	F9	60	7C	32	□N.'.....`|2
07F0	3E	19	9F	8C	4F	44	27	20	13	12	09	8B	20	20	7C	3C	□>...OD' .... |<

・EDC : 47 BF D2 56

(3) LSN = 001FD60Fh

・(ID+IED)&CPR_MAI : 21 03 00 00 C9 EB 00 00 00 00 00 00

・User data

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	22	D0	60	20	20	00	1F	D0	60	20	20	00	01	FD	06	□.".` ...` ....
0010	41	42	45	58	44	56	44	20	30	EA	18	F5	8C	FA	46	FD	□ABEXDVD 0.....F.
0020	A3	FE	51	7D	A8	3C	54	1E	2A	0F	95	07	CA	01	E5	00	□..Q}.<T.*.....
0030	72	02	39	81	9C	C2	4E	E1	A7	F0	53	7A	29	BF	94	5D	□r.9...N...Sz)..]
0040	CA	2E	65	17	B2	89	D9	C4	6C	E0	36	70	1B	38	0D	1E	□..e.....l.6p.8..
0050	06	0D	83	86	41	41	A0	22	50	91	A8	C8	54	64	2A	32	□....AA."P...Td*2
:																	
07E0	00	B9	80	5C	40	AE	20	D7	90	EB	C8	F5	E4	7A	72	3D	□...¥@. ......zr=
07F0	B9	9E	5C	4D	AE	26	57	93	AB	CB	D5	E7	20	20	A0	7E	□..¥M.&W..... .~

・EDC : 3A 72 A8 73

(4) LSN = 3FA0BFh

・(ID+IED)&CPR_MAI : 21 22 D0 5F D0 5C 00 00 00 00 00 00

・User data

Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	ASCII
0000	00	42	A0	BF	20	20	00	3F	A0	BF	20	20	00	03	FA	0B	□.B.. .?.. ....
0010	41	42	45	58	44	56	44	20	60	D0	30	E8	18	F4	0C	FA	□ABEXDVD `.0.....
0020	06	FD	83	FE	41	7D	A0	3C	50	1E	28	0F	94	07	CA	03	□....A}.<P.(.....
0030	E5	01	F2	02	79	01	BC	02	5E	01	AF	00	57	02	2B	83	□....y...^...W.+.
0040	95	43	CA	23	E5	11	F2	8A	79	45	BC	20	5E	90	2F	C8	□.C.#....yE. ^./.
0050	17	66	0B	31	85	9A	42	4F	A1	27	D0	91	E8	48	74	A4	□.f.1..BO.'...Ht.
:																	
07E0	9C	0C	4E	06	27	03	93	03	C9	03	E4	83	F2	C1	F9	60	□..N.'.....`
07F0	7C	32	3E	19	9F	8C	4F	44	27	20	13	12	20	20	70	89	□|2>...OD' .. p.

・EDC : 7C 1B EE 65

Values in this sheet are measured by the equipments ALMEDIO-owned. Appearance and specifications are subject to change without notice.

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