ALMEDIO

ABEX
Product Introduction

No.M30133

2010.10 Rev.1

TEST DVD-ROM

For Checking DVD Drives, DVD Players and DVD Recorders

TDR-820A/ -820B

1. Purpose of use, Features

TDR-820/ -820B 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-820B is more strictly controlled than TDR-820.

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 Single Layer

・Capacity : 4.7 Gbytes (4,697,618,432 bytes)

・Data area :

Physical sector (PSN)	30000h～25FFFFh
Logical sector (LSN)	0h～22FFFFh

・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-820A ≦20 m/s²
	-	TDR-820B ≦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	01	Single, Single layer, Completely read-only layer
Byte3	10	0.267μm/bit, 0.74μm/track
Byte4～7	00 03 00 00	Start sector number of the Data Area
Byte8～11	00 25 FF FF	End sector number of the Data Area
Byte12～15	00 00 00 00	Single layer : 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 MSB Check Sum	Binary
	2047		

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 : 00 03 00 00 11 12 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 : 0A 7E 52 F5

(2) LSN = 0022FFFFh

・(ID+IED)&CPR_MAI : 00 25 FF FF 15 30 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	25	FF	FF	20	20	00	22	FF	FF	20	20	00	02	2F	FF	□.%.. .″.. ../.
0010	41	42	45	58	44	56	44	20	00	80	00	C0	00	60	00	30	□ABEXDVD .....`.0
0020	00	18	00	8C	00	46	00	23	80	11	C0	8	60	04	30	02	□.....F.#....`.0.
0030	18	01	8C	00	46	00	23	00	11	02	08	03	84	01	C2	00	□....F.#.....
0040	61	00	30	02	18	01	8C	00	46	00	23	00	11	02	08	03	□a.0.....F.#.....
0050	84	01	C2	80	61	40	30	22	18	11	8C	88	46	C4	23	E2	□....a@0″....F.#.
:																	
07E0	B9	78	5C	BE	2E	DF	97	EF	CB	F5	E5	F8	72	FE	39	FF	□.x¥.....r.9.
07F0	9C	7D	CE	3E	67	9F	B3	CD	D9	64	6C	B0	20	20	1F	2F	□.}.>g....dl. ./

・EDC : EC 0F 38 84

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