

ISO/IEC 17341:2009-06 (E)

Information technology - Data interchange on 120 mm and 80 mm optical disk using +RW form at - Capacity: 4,7 Gbytes and 1,46 Gbytes per side (recording speed up to 4X)

Contents		Page
Foreword		vii
Introduction		viii
1	Scope	1
2	Conformance	1
2.1	Optical disk	1
2.2	Generating system	1
2.3	Receiving system	2
2.4	Compatibility statement	2
3	Normative references	2
4	Terms and definitions	2
5	Conventions and notations	4
5.1	Representation of numbers	4
5.2	Names	4
6	Abbreviated terms	5
7	General description of the optical disk	6
8	General Requirements	7
8.1	Environments	7
8.1.1	Test environment	7
8.1.2	Operating environment	7
8.1.3	Storage environment	7
8.1.4	Transportation	7
8.2	Safety requirements	8
8.3	Flammability	8
9	Reference Drive	8
9.1	Optical system	8
9.2	Optical beam	9
9.3	Read channel 1	9
9.4	Disk clamping	9
9.5	Rotation of the disk	10
9.6	Wobble channel (Read channel 2)	10
9.7	Tracking channel (Read channel 2)	11
9.8	Reference servo systems	11
9.8.1	Normalized servo transfer function	11
9.8.2	Reference Servo for Axial Tracking	11
9.8.3	Reference Servo for Radial Tracking	12
10	Dimensional characteristics	14
10.1	Reference Planes	14
10.2	Overall dimensions	15

10.3	First transition area	15
10.4	Second transition area	16
10.5	Clamping Zone	16
10.6	Third transition area	16
10.7	Information Zone	16
10.8	Rim area	17
10.9	Remark on tolerances	17
11	Mechanical characteristics	17
11.1	Mass	17
11.2	Moment of inertia	17
11.3	Dynamic imbalance	17
11.4	Axial runout	17
11.5	Radial runout	17
12	Optical characteristics in the Information Zone	18
12.1	Index of refraction	18
12.2	Thickness of the substrate	18
12.3	Reflectivity	19
12.4	Birefringence	19
12.5	Angular deviation	19
13	Data format	19
13.1	Data Frames	20
13.1.1	Identification Data (ID)	20
13.1.2	ID Error Detection Code (IED)	21
13.1.3	RSV	22
13.1.4	Error Detection Code (EDC)	22
13.2	Scrambled Frames	22
13.3	ECC Blocks	23
13.4	Recording Frames	24
13.5	Modulation and NRZI conversion	25
13.6	Physical Sectors	26
13.7	Layout of a Recording UNit (RUN)	27
13.7.1	Recording Unit position	28
13.8	d.c. component suppression control	28
14	Track format	29
14.1	Track shape	29
14.2	Track path	30
14.3	Track pitch	30
14.4	Track layout	30
14.4.1	ADIP information	30
14.4.2	Physical format information in ADIP	33
15	General description of the Information Zone	50
16	Layout of the Information Zone	51
16.1	Physical Sector Numbers (PSNs)	51
17	Lead-in Zone	52
17.1	Initial Zone	52
17.2	Inner Disk Test Zone	52
17.3	Inner Drive Test Zone	52
17.4	Guard Zone 1	52
17.5	Reserved Zone 1	53
17.6	Reserved Zone 2	53
17.7	Inner Disk Identification Zone	53
17.8	Reserved Zone 3	54
17.9	Reference Code Zone	54
17.10	Buffer Zone 1	54
17.11	Control Data Zone	54
17.11.1	Physical format information	54
17.11.2	Disk manufacturing information	56
17.11.3	Content provider information	56
17.12	Buffer Zone 2	56
18	Data Zone	56
19	Lead-out Zone	56
19.1	Buffer Zone 3	57

19.2	Outer Disk Identification Zone	57
19.3	Guard Zone 2	57
19.4	Reserved Zone 4	57
19.5	Outer Drive Test Zone	57
19.6	Outer Disk Test Zone	57
19.7	Guard Zone 3	58
20	Assignment of Logical Sector Numbers (LSNs)	58
21	Formatting	58
21.1	Pre-formatting	59
21.1.1	Verification	59
21.2	Background formatting	59
21.2.1	Initialization	59
21.2.2	De-icing	59
21.2.3	Finalization	60
21.2.4	Verification (optional)	60
21.3	Sequential recording without formatting	60
22	Disk Control Blocks	61
22.1	General format of Disk Control Blocks	61
22.2	Format of the Formatting DCB (FDCB)	63
22.3	Format of the Write inhibit DCB (WDCB)	67
23	General	69
24	Method of testing	69
24.1	Environment	69
24.2	Reference Drive	69
24.2.1	Optics and mechanics	69
24.2.2	Read power	69
24.2.3	Read channels	70
24.2.4	Tracking	70
24.3	Definition of signals	70
25	Characteristics of the groove signals	71
25.1	Phase depth	71
25.2	Push-pull signal	71
25.3	Track Cross signal	71
25.4	Normalized wobble signal	71
25.5	Characteristics of the wobble	72
26	Method of testing	72
26.1	Environment	72
26.2	Reference Drive	72
26.2.1	Optics and mechanics	72
26.2.2	Read power	72
26.2.3	Read channels	72
26.2.4	Tracking	73
26.2.5	Scanning velocity	73
26.3	Write conditions	73
26.3.1	Write pulse waveform	73
26.3.2	Write power	73
26.4	Measurement conditions	74
27	Characteristics of the recorded signals	74
27.1	Channel bit length	74
27.2	Definition of signals	74
27.2.1	High frequency signals (HF)	74
27.2.2	Modulated amplitude	75
27.2.3	Signal asymmetry	75
27.2.4	Normalized Slicing Level jump	75
27.2.5	Jitter	75
27.2.6	Track Cross signal	76
27.3	Read stability	76
28	Additional testing conditions	76
28.1	Test environment	76
28.1.1	Optics	76
28.2	Definition of signals	76

28.2.1	Modulated amplitude	77
28.2.2	Signal asymmetry	77
28.2.3	Jitter	77
28.2.4	Track Cross signal	77
28.2.5	Differential phase tracking error signal	77
28.2.6	Tangential push-pull signal	78
29	Quality of the recording layer	79
29.1	Defects	79
29.2	Data errors	79
30	Method of testing	80
30.1	Environment	80
30.2	Reference Drive	80
30.2.1	Optics and mechanics	80
30.2.2	Read power	80
30.2.3	Read channels	80
30.2.4	Error correction	80
30.2.5	Tracking	80
31	Minimum quality of a Recording Unit	81
31.1	Tracking	81
31.2	User-written data	81
Annex A (normative) 80 mm disk		82
Annex B (normative) Structure for Extended format information in the Data Zone		85
Annex C (normative) Measurement of light reflectivity		88
Annex D (normative) Measurement of birefringence		91
Annex E (normative) Measuring conditions for operation signals		94
Annex F (normative) Measurement of the differential phase tracking error		97
Annex G (normative) The write pulse wave form for testing		101
Annex H (normative) 8-to-16 Modulation		104
Annex I (normative) Optimum Power Control		113
Annex J (normative) Logical to Physical address translation		118
Annex K (informative) Measurement of the groove wobble amplitude		119
Annex L (informative) Transportation		121
Annex M (informative) Defect Management and Physical Formatting		122
Annex N (informative) Video Content Protection System		123
Annex O (informative) How to use the Physical format information in ADIP		124
Annex P (informative) Values to be Implemented in Existing and Future Specifications		126
Bibliography		129