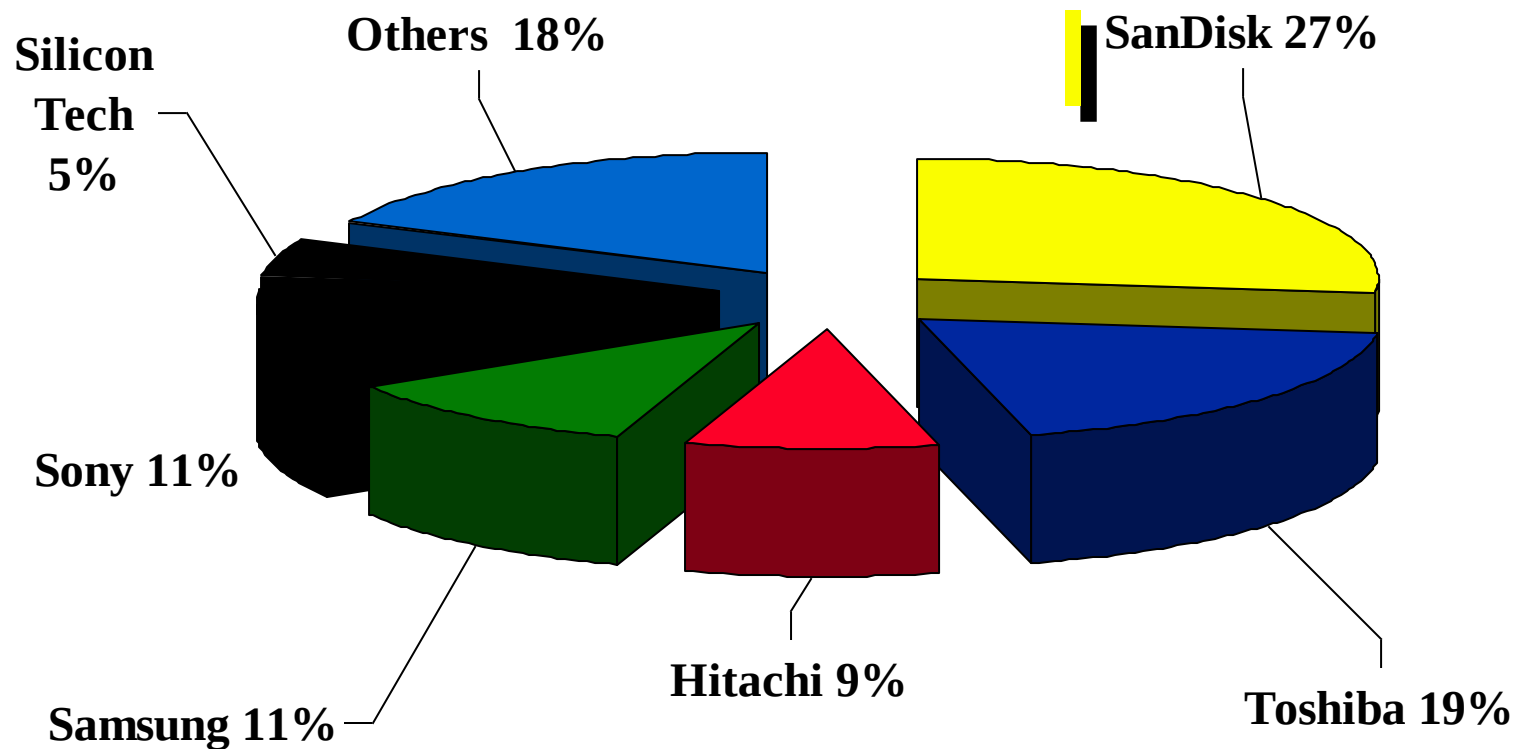


Corporate Overview

- Год основания 1988
- Кол-во персонала 900
- Кол-во розничных точек больше 15,000
- Зарегистрировано патентов: больше 100
- NASDAQ: SNDK



Рынок флэш-карт

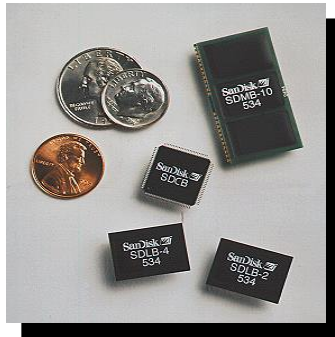


Source: IDC Insights, Inc. 9/00

SanDisk Confidential

SanDisk 
More Memory. More Possibilities.

SanDisk Products



SanDisk Strategy

- **Создание новых мегарынков**
- **Безусловное лидерство на рынке**
- **Использование новейших и самых эффективных технологий (NOR, NAND, D2, Controllers)**
- **Наращивание объемов производства (совместные производства с UMC, Celestica, Toshiba)**
- **Установление стандартов совместно с лидерами индустрии**
 - ◆ **Cameras (CompactFlash) - Kodak, Canon, Nikon**
 - ◆ **Cell/SmartPhones (MultiMediaCard) - Nokia, Ericsson, Motorola**
 - ◆ **Consumer A/V (SD Card) - Panasonic, Toshiba**

Стратегия SanDisk - абсолютное лидерство

- **Лидер в технологии**
- **Лидер в производстве**
- **Лидер на рынке**
- **Лидер продаж**



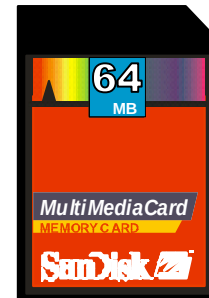
Marketing Leadership



**Inventor of
PCMCIA-ATA
Card**



**Inventor of
CompactFlash Card**

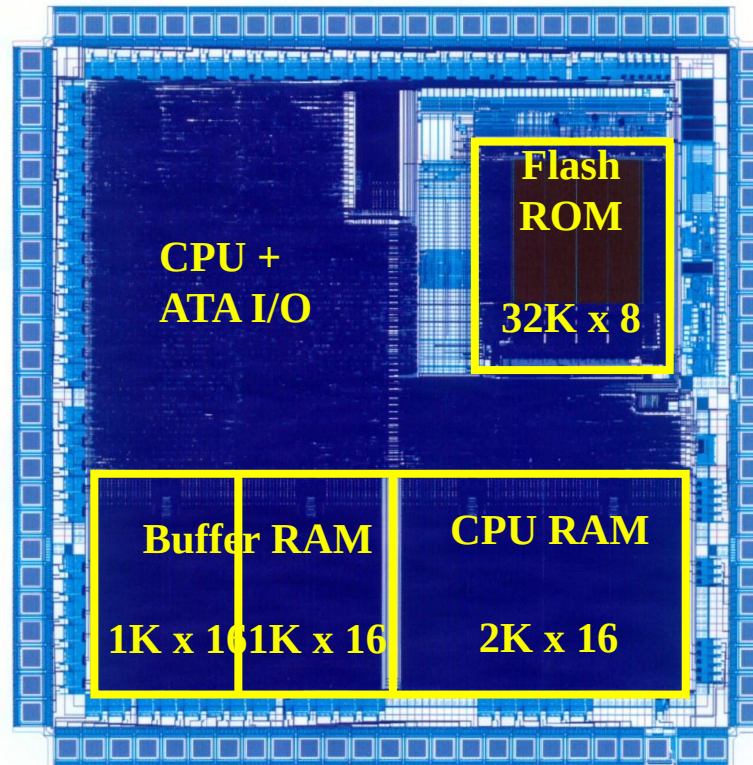


**Co-inventor of
MultiMediaCard**



**Co-inventor of
SD Card**

SanDisk CompactFlash Controller



Industry's lowest cost Flash Controller

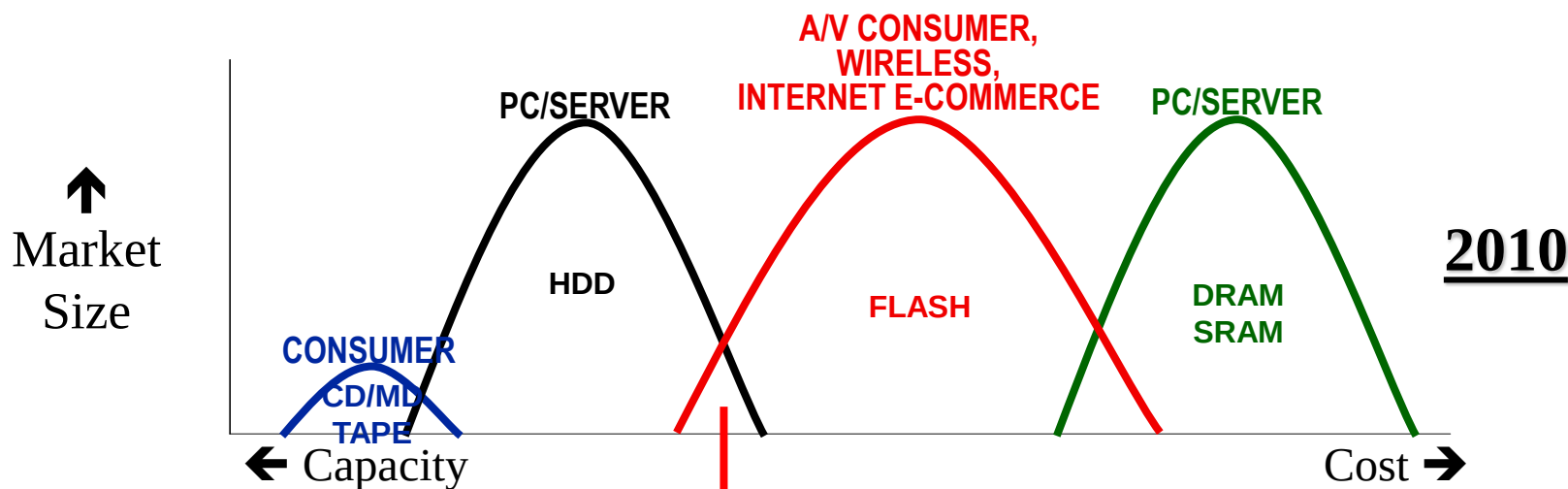
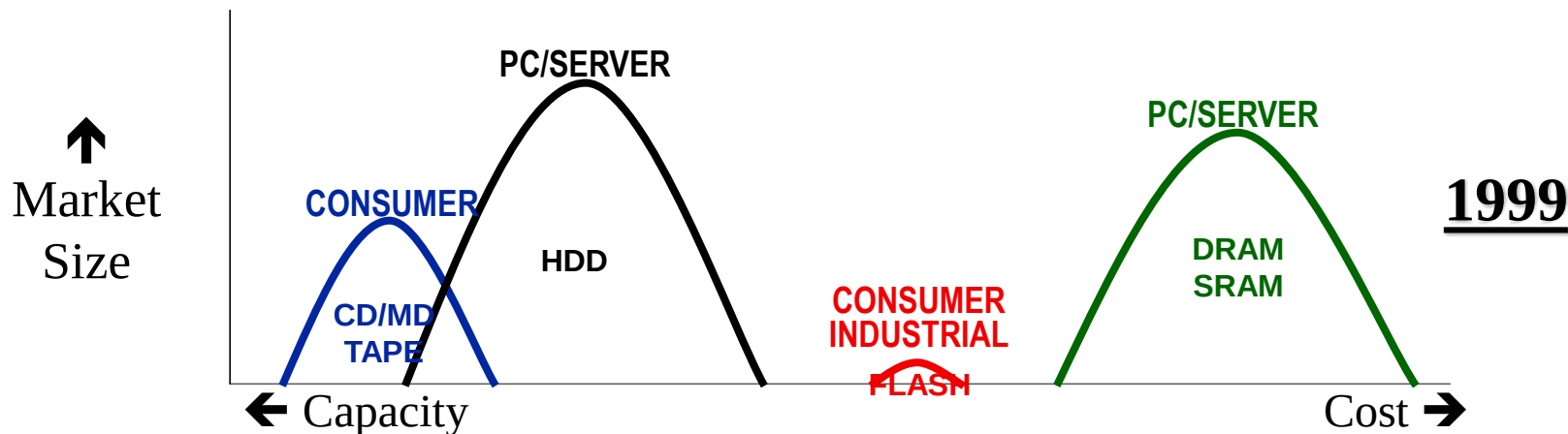
Forward/Backward Compatible



Controller is on-board CompactFlash and MultiMediaCard to act as the interface to the system. The interface is open standard in CompactFlash Association and MultiMediaCard Association



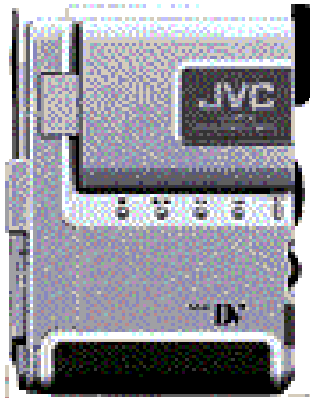
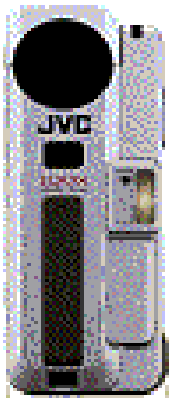
Перспективы рынка флэш-памяти



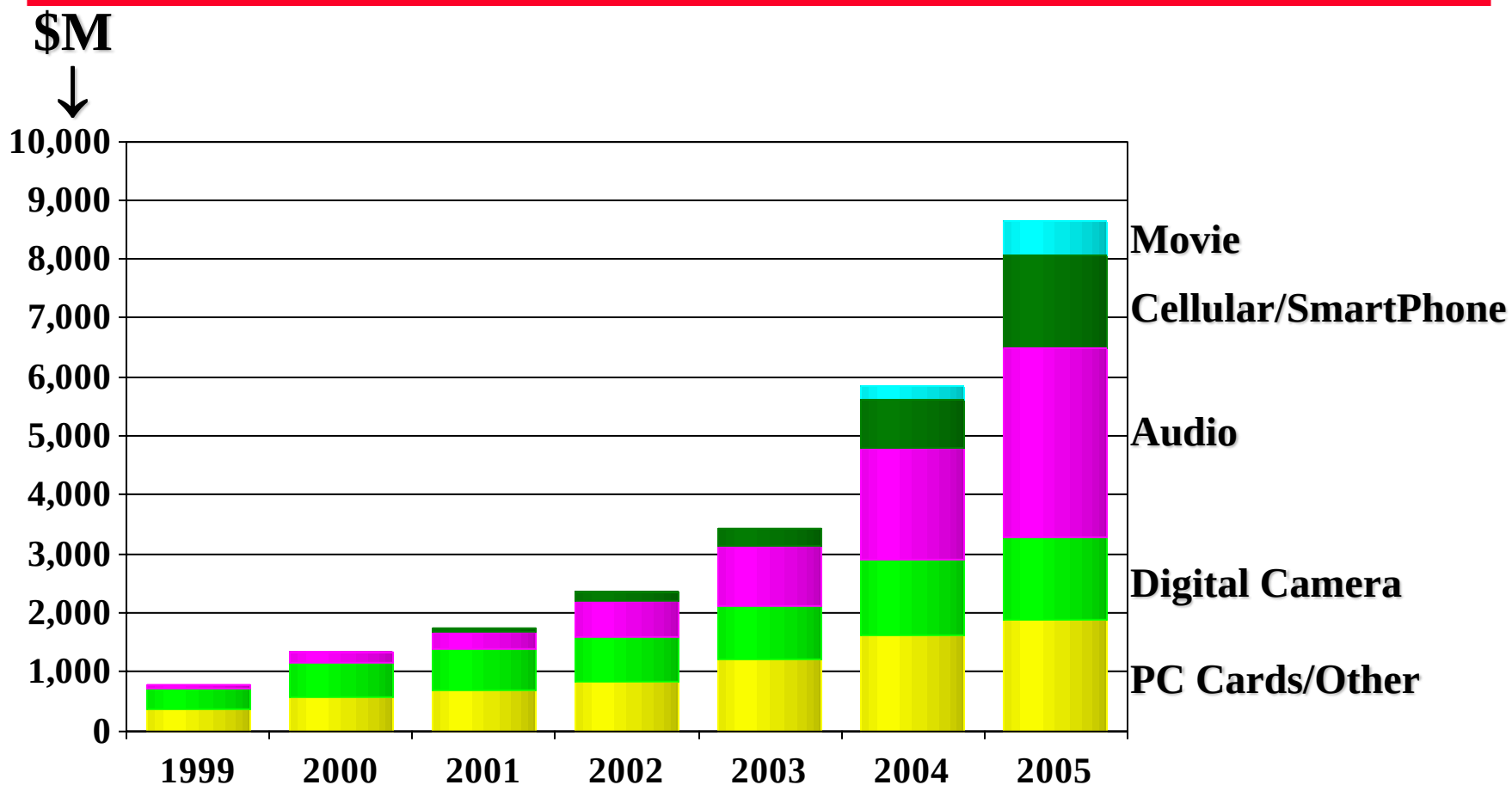
Mechanical ← → Solid State

Key Markets

Consumer



Перспективы рынка



Source: Toshiba/Panasonic/SanDisk

SanDisk Confidential

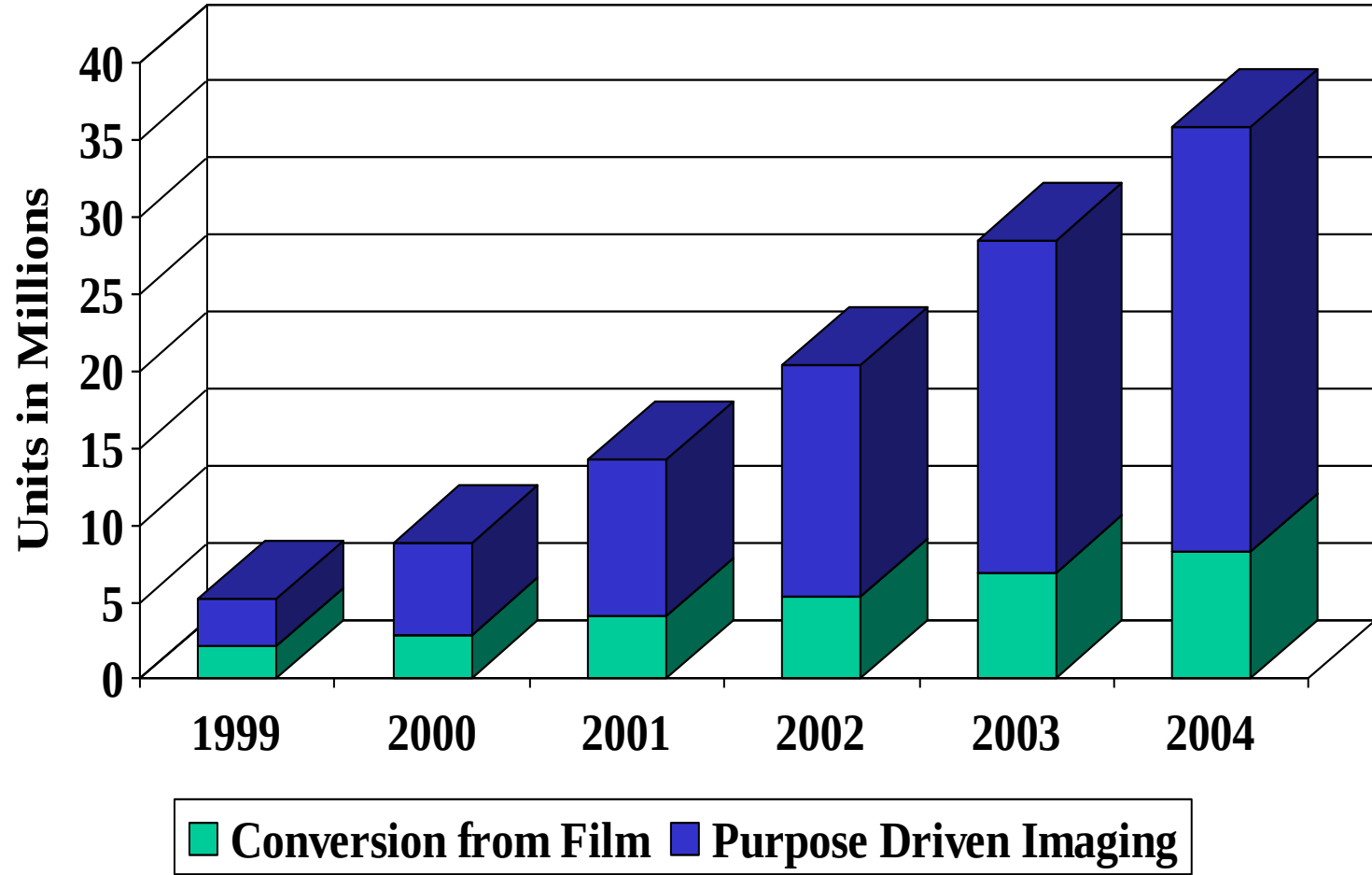
SanDisk 
More Memory. More Possibilities.

Digital Cameras



- Сотрудничество с ведущими производителями - гарантия качества и надежности
- Рынок растет лавинообразно - новые возможности, новая прибыль
- 1999: 4.9 million Flash Cards, 2004: 59.3 million
- \$1.1B in 2004

Digital Cameras: Images of the Future

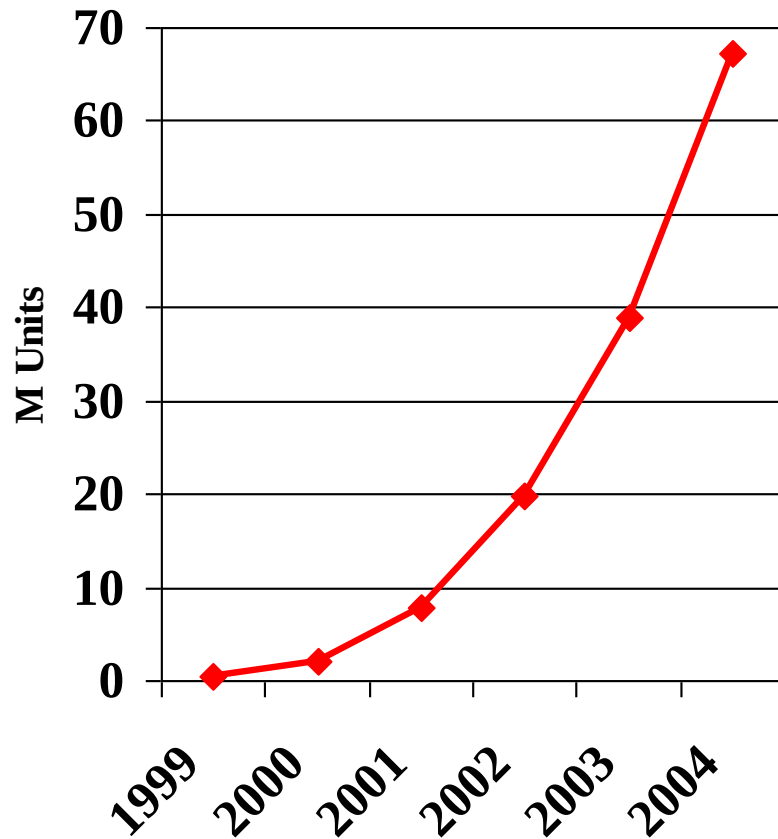


Music Industry Will Never Be the Same



- **Embedded & Removable Flash**
- **64MB Flash = 1-2 Hours Music**
- **Copy Protection Issues**

Flash Cards For a Song



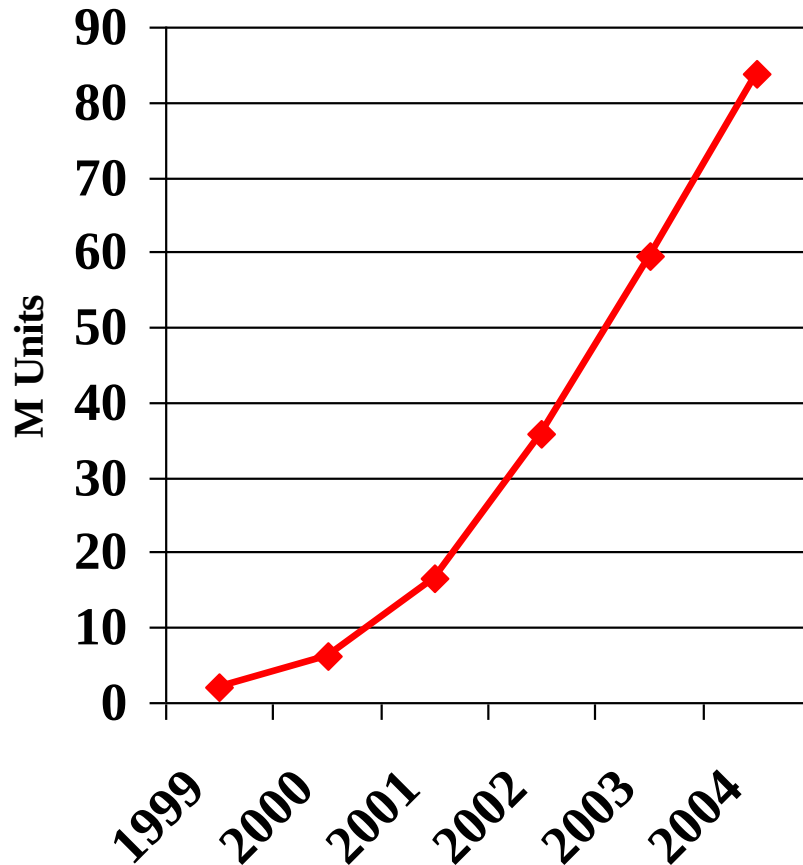
- Attachment Rate: 1.5 to 3.0 cards/Player
- 1999: 0.5 million Flash cards
- 2004: 67.3 million Flash cards
- \$1.3 billion in 2004

Digital Migration Sparks Flash Cards



- **Digital Phones**
- **Flash Cards Add Greater Functionality**
 - ◆ **E-mail, voice messages**
 - ◆ **Web Addresses, home pages**
 - ◆ **Font storage**
 - ◆ **Memos, etc.**

Cellular Phone Flash Card Market: UP!



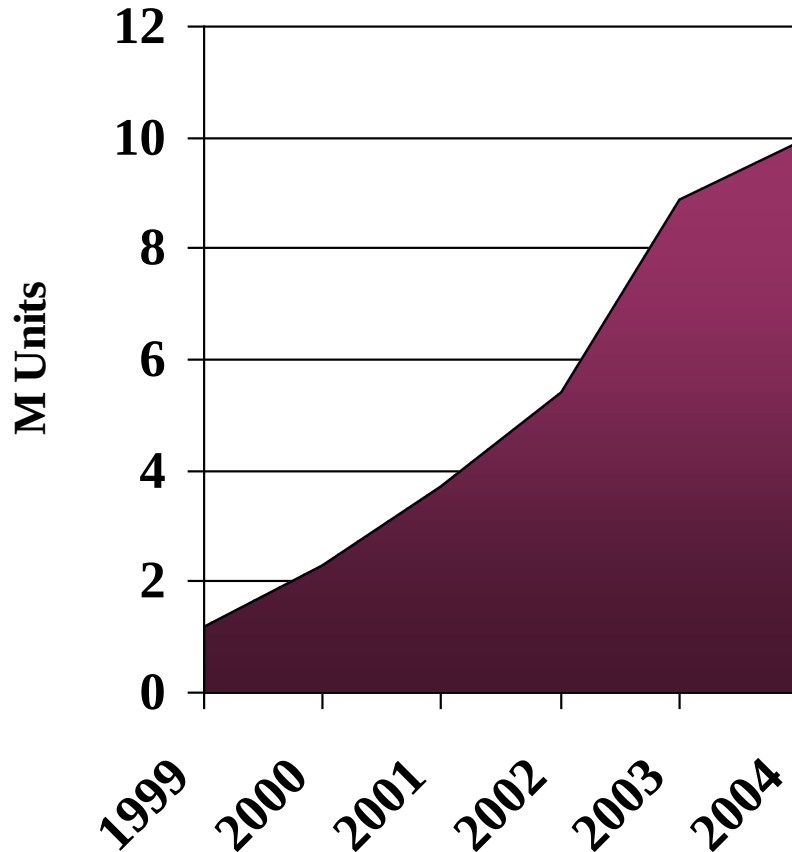
- **1999: 2.0M Flash Cards**
- **2004: 83.9M Flash Cards**
- **\$1.1B Flash Cards, 2004**

Handheld PCs



- **Palm Pilot,
Cassiopeia, etc.**
- **Flash Card Revenue**
 - ◆ 1999; \$51.4M
 - ◆ 2004; \$320.3M

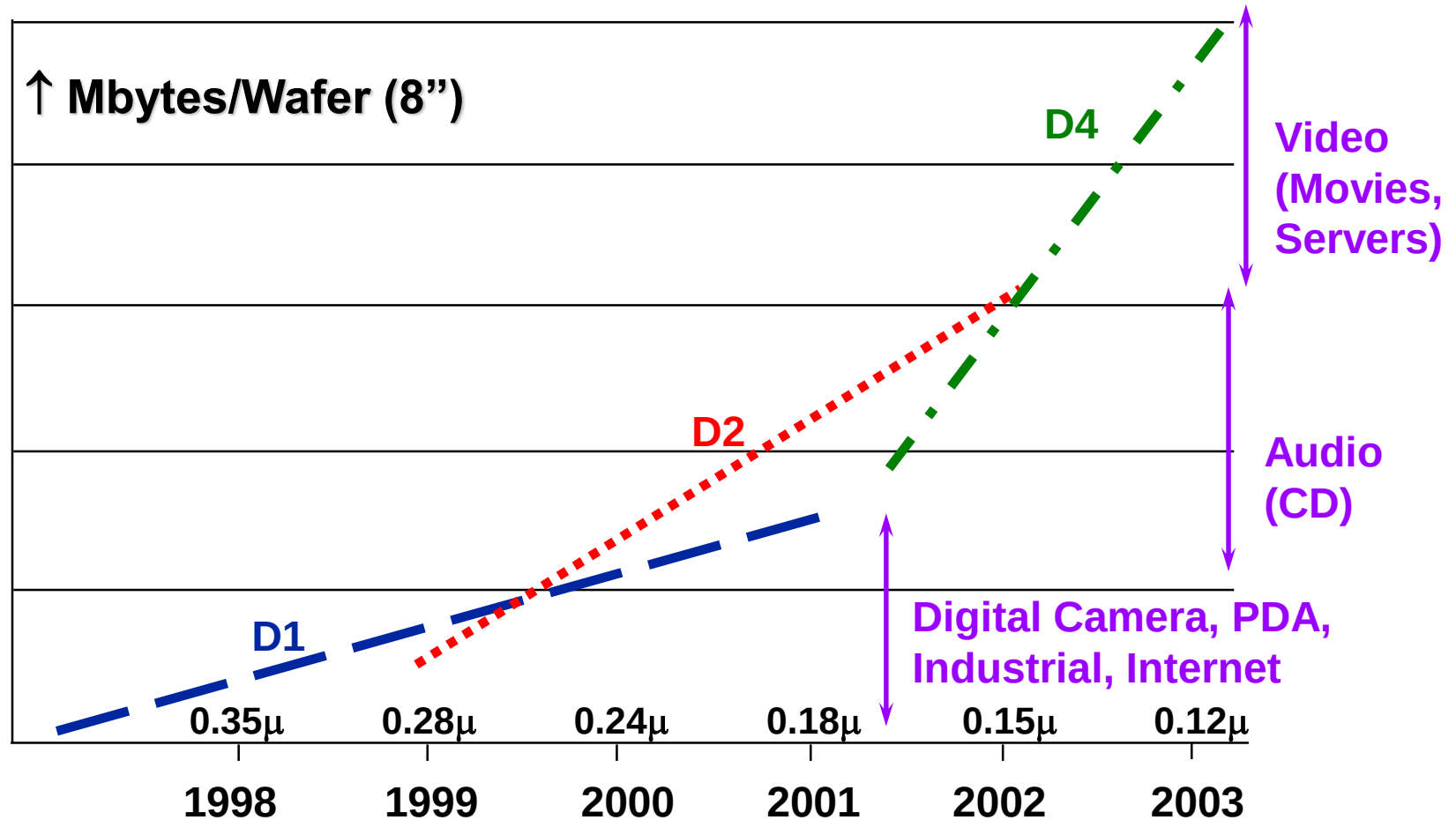
Notebook PCs



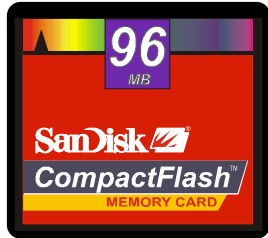
- 1999: 1.2M Flash Cards
- 2004: 9.9M Flash Cards
- \$445.0M Flash Card Revenue in 2004

Flash Technology Roadmap

D1 → D2 → D4 (future): Turbocharging Moore's Law



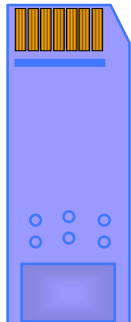
Capacity Roadmap



- **CompactFlash**
 - ◆ 8, 16, 32, 48, 64, 96, 128, 160, 192MB,
 - ◆ 256MB, 384MB 1999
 - ◆ Type II 256, 300MB 2000
 - ◆ Type I 512MB 2001



- **MultiMediaCard**
 - ◆ 8, 16, 32, 64MB 1999
 - ◆ 128 MB 2000
 - ◆ 256 MB 2001



- ◆ **Memory Stick**
 - ◆ 4, 8, 16, 32, 64MB 1999
 - ◆ 128MB 2001

CompactFlash Association - более 200 участников

- 3COM
- 3 S System Co.
- Acecom Inc.
- Action Tec Electronics
- Adaptec
- Adtron Corp
- A Force Group
- ALL TOP Technology
- Alps
- AMCO TEC Int'l Inc.
- AMP Inc.
- Ando Electric Co. Ltd.
- Apacer Technology
- Apricorn Inc.
- Asahi Optical Co. (Pentax)
- Askey Computer Corp.
- Atmel Corp.
- Barun Electronics Co., Ltd
- Billinton Systems
- Buffer-Tek Coporation
- Butterfly Group (ACDC Memory)
- Canon
- Capstone Technology
- Carry Computer Eng., Ltd.
- Casio Computer Co.
- Cellotape - Affiliate
- Centennial Technologies
- Centron Electronics
- CIS Technology
- COM One
- Compaq Computer
- CUE Corporation
- Cute Technology
- Cycolor
- Dane-Elec
- DataFab Systems Inc.
- DDK Electronics
- Delkin Devices, Inc.
- Digital Print Corp.
- Duel Systems
- Eastman Kodak Co.
- EEMS Italia Spa
- Epson
- ETON Inc.
- ETRI
- FCI Electronics
- FEIYA Technology
- Foxconn
- Fuji Photo Film Co.
- Fujifilm Microdevices
- Fujisoku Corp.
- Fujitsu Computer Technology Ltd.
- Fujitsu Ltd.
- Fujitsu Takamisawa
- Fujitsu Towa Electron
- Green House
- GoldenRAM
- Hagiwara Sys-Com Co., Ltd.
- Halo Data devices
- Hewlett-Packard
- Highlead Technology Inc.
- Hirose Electric (USA) Ltd.
- Hitachi Ltd. (alternate source)
- Hitachi Maxell, Ltd.
- Honda Tsushin Kogyo
- Hosiden
- Hyperstone Electronics
- Hynudai Electronics
- Icon CMS
- I-O Data Devices
- I/O Interconnect
- IBM Corp.
- Intel
- Iomega
- ITT Cannon
- Japan Aviation Electronics
- JST Manufacturing
- KEY Technology
- KingMax
- Kingston Technology Corp.
- Konica
- Kyocera
- Kyocera Elco Corp.
- Lexar Media (alternate source)
- Lexmark Int'l, Inc.
- M-Systems
- MarQlin Corp.
- Matsushita Battery Industrial
- Matsushita Electronic Instruments
- MCCI
- MELCO Inc.
- Memory Card Technology
- Memory Corporation
- Memtek Products
- Micron Quantum Devices
- Microsoft
- Microtech International
- Minolta Co., Ltd.
- Mitsubishi Electric Corp.
- Mitsubishi Plastic, Inc.
- Molex
- Motorola
- National Semiconductor
- NEC
- Nikon
- Nokia
- OKI Electric Industry Co.
- Olympus
- Option International
- Palmax Technologies
- Panasonic
- Phillips Electronics
- Phoenix Technologies
- Pixela Corporation
- PNY Electronics
- Point Star
- Polaroid
- Power Quotient International
- Pretec (alternate source)
- Princeton Technology
- Proxima Corp
- Quantum Corporation
- RATOC Systems, Inc.
- Ricoh
- Ritek Corporation
- Rohm Co., Ltd.
- Saehan Media America
- Samsung
- SanDisk
- Sanyo
- SCM Microsystems
- Sharp Corp.
- Silicom Multimedia Systems
- Silicon Storage Technology, Inc.
- Simple Technology
- SmartDisk Corp.
- SMART Modular Tech.
- Socket Communications
- Southland Micro Systems
- STMicroelectronics
- Tanisys Technology
- Tec-Hill Company Ltd.
- TEKA Interconnections Systems
- Testmetrix
- Tokyo Electron Ltd.
- Transcend Information
- TRG Products
- TwinMos Technologies, Inc.
- UCONN Technology
- Uniden San Diego R&D Center, Inc.
- Unifosa Enterprise Co.
- Unity Digital
- USA Speed Tech., Inc.
- Victor Company (JVC)
- Viking Components Inc.
- VisionTek
- Wichmann WorkX AG
- Wintec Industries
- Xircom
- YISO Telecom

Более 175 моделей цифровых фотокамер

■ 13 New Digital Still Cameras in 2001

- ◆ Agfa ePhoto CL45
- ◆ Canon Digital IXUS 300
- ◆ Canon PowerShot A10
- ◆ Canon PowerShot A20
- ◆ Canon Pro90 IS
- ◆ Casio QV-3500EX
- ◆ Kodak mc3 (photo's, mp3's, video)
- ◆ Minolta Dimage S304
- ◆ Minolta Dimage 5
- ◆ Minolta Dimage 7
- ◆ Nikon D1X
- ◆ Nikon D1H
- ◆ Ricoh RDC-i500



Более 90 моделей карманных компьютеров

- Casio
 - ◆ Cassiopeia
- Compaq
 - ◆ iPAQ
- Hewlett Packard
 - ◆ Jornada
- Lucky Goldstar (LG)
 - ◆ Phenom
- NEC
 - ◆ Mobile Pro
- Philips
 - ◆ Nino



MP3 -плееры, фотопринтеры и проч.

■ **MP3 Players**

◆ **Thomson**

◆ **RCA Lyra/Lyra 2**

◆ **I2Go**

◆ **eGo**

◆ **Others**

■ **Photo Printers**

◆ **Canon**

◆ **Epson**

◆ **HP**

◆ **Kodak**

◆ **Many others**

■ **More Than 76 Other Products**

◆ **Audio Recorders**

◆ **Auto PC's**

◆ **Internet Appliances**



MultiMediaCard Association - более 80 участников

- Aiwa
- Amkor Technology
- Amphenol-Tuchel
- Apacer Technology
- ARM
- Atmel
- Barun Electronics
- Bosch Telecom
- C-One Technology
- Canon
- Carry Computer Engineering
- Compaq Computer
- Datafab Systems
- DDK Fijukura America
- EEMS Italia
- EMTEC Magnetics
- Engineering Design Automation (EDA)
- Ericsson Mobile Communications
- Etrend Electronics
- FCI/Berg Electronics
- Feiya Technology
- Flash Vision
- Franklin Electronic Publishers
- FujiFilm Microdevices
- Fujitsu Microelectronics
- High Tech Computer
- Hitachi
- Hon Hai Precision Industries
- Hosiden
- Hyundai Electronics
- I-Jam Multimedia
- Infineon Technologies
- Information Storage Devices
- Integrated Technology Express
- Intel
- I-O Data Devices
- JAE Electronics
- JST Mfg. Co.
- KC Technology

- Kyocera Elco
- LEOCO
- Link-Up Systems
- Luxxon
- Macronix
- Micron Technology
- Matsushita Electric Industrial
- Mitsubishi Electric
- Mitsubishi Plastics
- Molex
- Motorola
- Nissei Sangyo
- Nokia
- Orga Kartensysteme
- Palm
- PC Card Packaging
- Pontis
- Power Digital Card
- PPC Card Systems
- Prochips Technology
- Qualcomm
- ROHM
- SanDisk
- Sanyo Electric
- SCM Microsystems
- Sempac
- Siemens
- Silicon Storage Technology
- Simple Technology/Silicon Tech
- SmartDisk
- Socket Communications
- Sophia Systems
- STMicroelectronics
- Symbian
- Texas Instruments
- Thomas & Betts
- Tokyo Electron Device
- USA Speed Tech
- Victor Company of Japan
- Yamaichi Electronics



MultiMediaCard Products

105 Music Players/Recorders

Advantech CPC-2245
AIWA MP3 Player
AIWA MM-FX500 MP3 Recorder
ATLM et310
Audiovox MP 3000
AudioVox MPDJ Series MP-1000
AudioVox MPDJ Series MP-2000
AudioVox MPDJ Series MP-3000
Baromtec Mus.M BMP-100
Baromtec Mus.M MDM-H2
Casio Cassiopeia EM500
Casio MP3 Watch WMP-1V
CMC MP3 Jumper
C-ONE Tech mpWOW
Cowon Systems MP3 Player
Daiyoo Electronics MPECHO DY-1000
Daiyoo Electronics MPECHO DY-2000
Digitalway MPIO
Digitra Systems MP Trio
Divacom MOMO D-210M
DNA Pocket Digital Audio MP3 Player
DnC Digital Audio Player
DSC Corporation M-Any MR-100
DSC Corporation POP3
Eiger Eiger200
Ericsson MP3 Plug-in
Fast System MP Player
Fujitsu CuPlay FMP322MU
Gaon Electronics Mutizen
Gaon Electronics Titi @
Grundig Mpaxx
Haitai MP3 Player
HanGo Mpride
Hanyang MP3+CarAmp
Hyun Won Micro
Hyun Won DDR
I&C MP Master AK-11W
I&C MP Master IM-100
I&C MP Master IM-150M
I&C MP Master IM-110M
I&C MP Master IM-300FM
I&C MP Master IM-320FM
I&C MP Master IM-360FM
I&C MP Master IM-620H Headset
I-Jam MP3 Player
Innogear MiniJam MP3 Player

Kedcom MP300
Kedcom Mp500
Koreamedia MP-CAP
KS Communication MP Player
LG Electronics A1F MP3 Player
LG Electronics A2F MP3 Player
LG Electronics MP Free MF-FD330
LG Electronics MP Free MF-FD340
LG Electronics MP Free AHA-FD770
LGIC MPCoin LG-P810
IO-Data Hyper-Hyde
MacPower MP3-GO
Maycom Merit MP3 Player
Maycom Merit MP-90
Maycom Merit MP-100F
Maycom Merit MP-100R
Maycom Merit MP-100M
Maycom Merit MP-100N
MC&T MP3 Player
MIC Teen
Milletech MP9
MPMan Mobile
MPMan MP-M40
MPMan MP-M41
mPride MP3 Player
Multiport Zuum3
My Music DM701
Namsung MP5th Ave.
Opener's Hanzoom DMP-2000
PenMan NETTI PN-2000
Pine D'music Mini
Pontis SP503
Pontis SP-504
RFC JazPiper
Saehan MPMan Mobile
Saehan MPMan MP-M40
Saehan MPMan MP-M41
Sanyo SSP-HP7
Sanyo SSP-PD7 Solid State
Scott Digital Audio Player
Audio Player
SK Global EncoDeco ED-H10
Sonus(Focus) MP-3 Player
Sphere OmniPlayer
Standard Telecom Nixxon NXC-3200
Taekwang MP3 Player ED/HO

Tecpoint itune
Telian MPDJ Series Unitech Juli UP-303
Unitech Juli UP-303
Unitech Juli UP-304
Unitech Juli UP-305
Unitech ROME UP-301
Wooju Tami WJ-2000
Wooju Tami WJ-2100
ZipLabs ZAPPEE MP3 Player
ZipMan ZMP-1000 MP3 Player
ZipAudio ZMP 3000 MP3 Player

5 Other Products

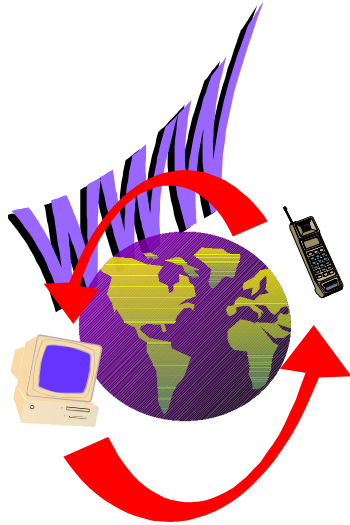
Casio Cassiopeia EM-500
Casio DoCoMo PocketPet
KB Gear JAMC@M 3.0
MPMan MMC-Downloader
Nokia 9110 Communicator

>20 Digital Camcorders

JVC GR-DVL-700
JVC GR-DVL9800U
JVC GR-DVM 70U
JVC GR-DVX7 DVC
Matsushita Video NV-C3
Matsushita Video NV-C5
Matsushita Video NV-DS200
Panasonic NV-C3 DVC

Panasonic NC-C5 DVC
Panasonic PV-DV200
Panasonic PV-DV400
Panasonic PV-DV600
Panasonic PV-DV800
Thomson VMD9
Thomson VMD10
Thomson VMD20

2001 Secure Digital



Бурное развитие Интернета,
электронной
коммерции, мобильной связи



Музыка

Речь

Фотоизображения

Базы данных

Географические карты

Panasonic

SanDisk

TOSHIBA

SanDisk Confidential

SanDisk
More Memory. More Possibilities.

SD Card

- **What is it?**

- Карта памяти с защитой от нелегального копирования (Imaging, Audio, PDA, etc)
- За основу взята **MultiMediaCard**
- Совместная разработка трех лидеров в области потребительской электроники и хранения данных. Де факто- стандарт для “**Secure Applications**”

Panasonic

#1 in Consumer Electronics
Co-inventor VHS
Co-inventor DVD

SanDisk

#1 in Flash Data Storage
Inventor of CompactFlash
Co-inventor of MultiMediaCard

TOSHIBA

Inventor of Flash Technology
Inventor of SmartMedia
Co-inventor DVD



SanDisk
More Memory. More Possibilities.

SD Card vs MMC

- Большая скорость чтения/записи
- 3 дополнительных контакта
- Толщина 2.1 мм (MMC-1.4)
- Переключатель защиты от записи (аналогично дискете)
- Защита от перезаписи

SD Association – >100 Members

A.I. Corporation
AIWA Co., Ltd.
Alpine Electronics
Alps Electric Co., Ltd.
Amkor Technology
Amphenol-Tuchel
Asahi Optical Co., Ltd
AVX Corp.
BORG instruments
Canon
Carry Computer Eng.
Casio Computer Co., Ltd.
Datafab Systems inc.
DataPlay
DDK
e.Digital Corp.
FCI Japan Ltd.
Fuji Photo Films Co., Ltd
Fujikura American Inc.
Fujitsu Media Devices of America
Gig.com
Hagiwara Sys-Com., Ltd
HealtheTech Inc.
Hewlett Packard
Hirose Electric Co., Ltd.
I-Jam Multimedia
I-O Data Devices Inc.
Iriso Electronics Co., Ltd.

JAEI
J.S.T. Manufacturing Co., Ltd.
Kinpo Electronics Inc.
Kyocera Elco Ltd.
LG Electronics Inc.
LinkUp Systems Corp.
Megachips
Matsushita Electric Industrial
Midoriya Electric Co., Ltd
Mitsubishi Plastics Inc.
Mitsumi Electric Co., Ltd
Molex
Navigation Technologies
N.D.S Technologies
NEC Corp.
Olympus Optical Co., Ltd
OMRON Corporation
Palm Inc.
Philips Consumer Electronics
Pioneer Corporation
Pontis
Preview Systems Inc.
Qualcomm
Ricoh
Samsung Corp.
SanDisk Corp.
SCM Microsystems Inc.
Sharp Corp.

Shin Shin Co., Ltd.
Simple technology Inc.
SmartDisk Corp.
Socket Communications Inc.
Speed Tech Corp.
Symbian K.K.
Techno Science co.
Test Metrix.
Texas Instruments
Thomas & Betts
Thompson CSE
Tokyo Electron Co. Ltd
Tomita Traders Corp., Ltd.
Toshiba Corp.
Toyota Motor Corp.
Trek Technology
Unigen
Victor Co. of Japan, Ltd.
Yamaha Corporation
Yamaichi Electronics
YE Data
Yokowo Co., Ltd.
Zoran Corp.

SD Products

>50 Products

Panasonic NV-C7 MiniDV Video Camera
Panasonic SV-SD70 Audio Player

Panasonic SV-SD01 HeadSet Audio Player
Toshiba Audio Player MEA110AS

Toshiba MPEG Camera MEC100AS

Устройства чтения/записи флэш карт

■ CompactFlash & SmartMedia

- ◆ Desktop
 - ♦ Parallel Port
 - ♦ USB Port
- ◆ Notebook
 - ♦ PC Card Adapter

■ CompactFlash Type II

- ◆ Desktop
 - ♦ ImageMate also accepts CF Type II
- ◆ Notebook
 - ♦ CF type II Adapter available from SanDisk and Third Parties

■ MultiMediaCard & SmartMedia

- ◆ Desktop
 - ♦ Parallel Port, USB Port
 - ♦ Floppy Disk Adapter
- ◆ Notebook
 - ♦ Type II Adapter



Устройства чтения/записи флэш карт

■ ImageMate

◆ Multiple Configurations: Parallel or USB

◆ Multiple Media Types:

◆ CompactFlash (USB/PP): **Available Now**

◆ SmartMedia

■ USB **Available Now**

■ Parallel **Available Now**

◆ MultiMediaCard: **Available Now**

◆ Fast & Easy-to-use

◆ Up to 30X faster than serial port, 10X faster than Parallel



OS Support

	<u>USB</u>	<u>Parallel</u>
Windows 95		
Windows 98		
Windows NT		
MAC OS		
Windows 2000		
Linux		
“Millennium”	Q2’01	

Продукты СанДиск как мегарынок

Мировой объем продаж флэш-карт и аксессуаров

◆ Растущий рынок цифрового аудио и фото

- Продукты СанДиск более чем в 20000 магазинах по всему миру
- Широкая линейка продуктов

	1999	2000	2001	2002
Retail	\$80M	\$240M	\$450M	\$600M



Source: SanDisk

SanDisk Confidential

SanDisk 
More Memory. More Possibilities.

Блестящие перспективы



- Рынок флэш памяти в самом начале своего развития - блестящие возможности
- Сандиск предлагает верную маркетинговую стратегию и конкурентные продукты
- Сандиск- ключевой игрок на новом рынке

