# Panasonic

2000 Vol. 1

## Memory Cards & PC Card Adapters

- ATA Cards, CompactFlash, SRAM Cards, Flash Memory Cards
- Adapters for SmartMedia, CompactFlash, MMC (MultiMediaCard) and Small PC Cards






**Panasonic memory cards provide leading edge storage media technology for applications such as mobile communications devices, portable devices and factory automation equipment.**



Notebook PCs

## I/O Interface



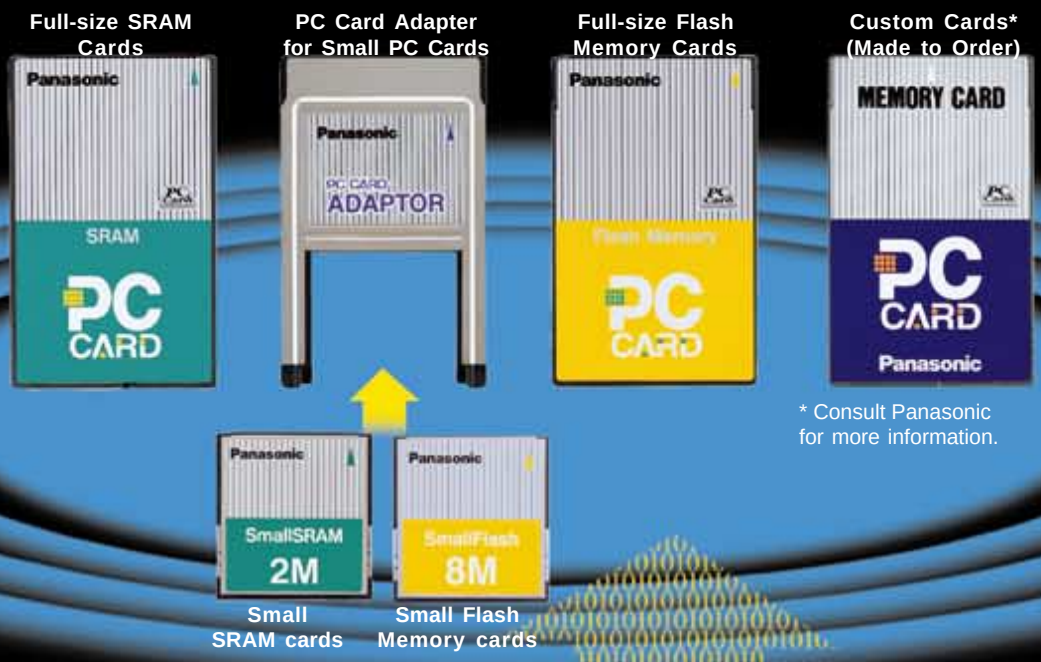

Small ATA Cards

CompactFlash™ Cards

SmartMedia™ (For Reference Only)

- External data storage media for PCs
- Audio recorders
- POS handy terminals
- Portable scanners
- Medical equipment
- Sequencers ( FA program controllers )
- Electrocardiographs

# Memory Interface




* Consult Panasonic for more information.

ATA PC Card Adapter for MMC (MultiMediaCard)







MMC (MultiMediaCard) (For Reference Only)

- Digital cameras
- Digital video cameras
- Solid-state audio players (MP3 players, etc)
- PDAs
- Electronic musical instruments
- Hand-held PCs, Palmtops

- Test and measurement equipment
- Multimedia projectors
- Factory automation equipment
- Printers
- Vending machines
- Handy terminals
- POS terminals
- Medical equipment
- Sewing machines

C O N T E N T S


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Realize smaller size, larger capacity PC cards with advanced technology.

# (About PC cards…)

"PC Card" is the name standardized by the "PC Cards Standard", a U.S.-Japan industry common standard that was negotiated between PCMCIA(Personal Computer Memory Card International Association) and JEIDA(Japan Electronic Industry Development Association).

In the beginning, PC cards were used as storage media (memory cards) for personal computers, but because of the need for additional functionality PC cards began to be used as I/O devices in notebook PCs. Today, PC card technologies have expanded to include Flash memory cards which are used to transfer and store data from items such as digital cameras, SCSI cards, Modem cards, LAN cards, Audio cards and various combinations of each.

PC cards also have expanded to include more functionality in a smaller form for use with mobile devices. Panasonic can satisfy the demands of next generation mobile devices with our large capacity, high speed and high performance line-up of small PC cards, memory cards and adapter cards.

# (Overview…)

### ATA Flash cards

ATA flash cards use Flash memory as the memory media and are a recognized PC Card standard by PCMCIA/JEIDA. Because of the ATA format, a hard disk interface for PC-AT type computers, ATA cards use existing IDE/ESDI hard disk controller drivers allowing for easy MS Windows compatibility and making them useful for data transfer from items such as digital cameras. Because the product does not have any mechanically moving parts like a hard disk, it is highly resistant to vibration or shock and provides high-speed access with low power consumption.

### SRAM cards

SRAM cards are re-writable and are best for applications that need high read/write speed. SRAM cards contain back-up batteries.

### Flash memory cards

Flash memory cards contain linear flash memory and have no need for any back-up batteries. Flash memory can be deleted instantly and is re-writable so these cards are best suited for applications that do not need high read/write speeds and may require re-write functionality.

### PC Card Adapters

PC Card Adapters provide portable PC connectivity for various small-sized removable storage media cards by allowing them to be used in full-size PC card (PCMCIA) slots.

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### Characteristics of Panasonic PC Cards

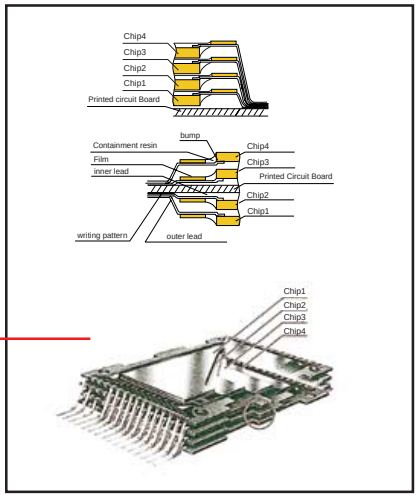
**Using our original MB(Multi-Layer Bonding) methods to expand the memory size!**

The MB method is our original technology which uses the TAB system to bond the memory chips to the film carrier and then stacks them on the printed circuit board. MB technology provides a mounting density 4 times that of conventional SOP(*1) mounting and twice that of TSOP(*2) mounting.

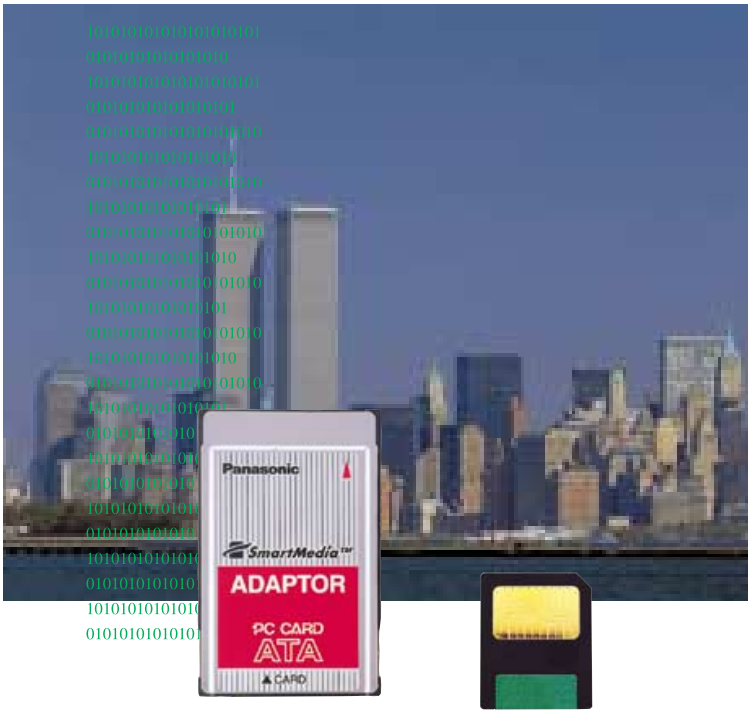
*1 SOP : Small Outline Package

*2 TSOP : Thin Small Outline Package



# ATA PC Card Adapter for SmartMedia™




BN-FDAD (For Reference Only)

Full-size ATA PC card adapter provides portable PC connectivity for the super compact SmartMedia™ memory card.

## Features

1. Complies with PC card ATA standards.
2. PC card type II.
3. 5V operating voltage.
4. High speed read/write operation. (see Interface Characteristics.)
5. Low power consumption. (see Power Supply Characteristics.)
6. Built-in eject button.
7. Automatic SmartMedia voltage detection function(3.3V to 5V).

## Specification Table

| Part No. | SmartMedia™ Type | | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|
| | Operating Voltage | Memory Capacity (bytes) | | |
| BN-FDAD | 5V | 2M, 4M | PC Card TYPE II<br>85.6x54.0x5.0 | 68 |
| | 3.3V | 2M, 4M, 8M, 16M, 32M, 64M, (128M)* | | |

* Electrically and physically designed to be ready for next generation 128MB card. Further compatibility tests will follow upon future release of this card.

## Power Supply Characteristics

| | Symbol | Conditions | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| DC Input Voltage (V) | $V_{CC}$ | | 4.5 | 5.0 | 5.5 |
| Operating Power Current (mA)<br>At Read<br>At Write | <br>$I_{CCR}$<br>$I_{CCW}$ | | | <br>10<br>20 | <br>15<br>35 |
| Stand-by Current (mA) | $I_{SB}$ | $V_{IH}=V_{CC}$<br>$V_{IL}=0V$ | | 0.55 | |

## Operating Environment

| | Min. | Max. |
|---|---|---|
| Operating Temperature (°C) | 0 | 60 |
| Storage Temperature (°C) | -20 | 70 |
| Humidity (R.H.%) | 5 | 95 |
| Vibration (G) | | 15 |
| Impact (G) | | 50 |

## Interface Characteristics

| | Characteristics |
|---|---|
| Read Data Transfer Rate (Card » Host) | 3.5 Mbytes/sec |
| Write Data Transfer Rate (Host » Card) | 0.65 Mbytes/sec |

SmartMedia™ and logos are trademarks of Toshiba Corporation.

# ATA PC Card Adapter for MultiMediaCard




BN-MMAB (For Reference Only)

Full-size ATA PC card adapter provides portable PC connectivity for the stamp-size MultiMediaCard.

## Features

1. Complies with PC card ATA standards.
2. PC card type II.
3. 5V operating voltage.
4. Built-in eject button.
5. Low power consumption. (see Power Supply Characteristics.)
6. High speed read/write operation. (see Interface Characteristics.)

## Specification Table

| Part No. | MultiMediaCard Type<br>Memory Capacity (bytes) | Dimensions (mm) | Number of Pins |
|---|---|---|---|
| BN-MMAB | 4M, 8M, 16M, 32M | PC Card TYPE II<br>85.6x54.0x5.0 | 68 |

## Power Supply Characteristics

| | Symbol | Conditions | Min. | Typ. | Max. |
|---|---|---|---|---|---|
| DC Input Voltage (V) | $V_{CC}$ | | 4.5 | 5.0 | 5.5 |
| Operating Power Current (mA)<br>At Read<br>At Write | <br>$I_{CCR}$<br>$I_{CCW}$ | | | <br>75<br>85 | <br>110<br>120 |
| Stand-by Current (mA) | $I_{SB}$ | $V_{IH}=V_{CC}$<br>$V_{IL}=0V$ | | 15 | |

* Using 4M bytes MMC made by SanDisk.

## Operating Environment

| | Min. | Max. |
|---|---|---|
| Operating Temperature (°C) | 0 | 70 |
| Storage Temperature (°C) | -20 | 70 |
| Humidity (R.H.%) | 5 | 95 |
| Vibration (G) | | 15 |
| Impact (G) | | 50 |

## Interface Characteristics

| | Characteristics |
|---|---|
| Read Data Transfer Rate (Card » Host) | 3.5 Mbytes/sec |
| Write Data Transfer Rate (Host » Card) | 0.65 Mbytes/sec |

# CompactFlash™ & PC Card Adapter for CompactFlash™




BN-C128AB-P

BN-CFADP PC Card
PC Card Type II
(85.6 x 54.0 x 5.0mm)

## Ideal for digital cameras and PDAs. Connects to notebook PCs with full-size card adapters.

### Features

1. Low power consumption. (see Power Supply Characteristics.)
2. High speed read/write operation. (see Interface Characteristics.)
3. Read/write up to 1 million times.
4. Either 3.3V or 5V operating voltage.
5. Converts to PC card type II with card adapter BN-CFADP.

## CompactFlash™ Cards

### Specification Table

| Part No. | Memory Capacity (bytes) | Number of Cylinders | Number of Heads | Number of Sectors/Tracks | Number of Sectors | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|
| BN-C008AB-T | 8,192,000 | 125 | 8 | 16 | 16,000 | 36.4x42.8x3.3 | 50 |
| BN-C016AB-T | 16,384,000 | 250 | 8 | 16 | 32,000 | | |
| BN-C024AB-T | 24,576,000 | 375 | 8 | 16 | 48,000 | | |
| BN-C032AB-T | 32,768,000 | 500 | 8 | 16 | 64,000 | | |
| BN-C064AB-P | Under Development | | | | | | |
| BN-C128AB-P | | | | | | | |

### Power Supply Characteristics

| | Symbol | 3.3V | | | 5.0V | | |
|---|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. |
| DC Input Voltage (V) | $V_{CC}$ | 3.0 | 3.3 | 3.6 | 4.5 | 5.0 | 5.5 |
| Operating Power Current (mA) | | | | | | | |
| At Read | $I_{CCR}$ | | 31 | | | 45 | |
| At Write | $I_{CCW}$ | | 34 | | | 52 | |
| Stand-by current (mA) | $I_{SB}$ | | 0.03 | | | 0.03 | |

### Interface Characteristics

| | Characteristics |
|---|---|
| Read Data Transfer Rate (Card » Host) | 3.5 Mbytes/sec |
| Write Data Transfer Rate (Host » Card) | 1.2 Mbytes/sec |

### Operating Environment

| | Min. | Max. |
|---|---|---|
| Operating Temperature (°C) | 0 | 60 |
| Storage Temperature (°C) | -20 | 85 |
| Humidity (R.H.%) | 5 | 95 |
| Vibration (G) | | 15 |
| Impact (G) | | 1000 |

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Full-size/small-size

For Small ATA Cards

# ATA Flash Memory Cards & PC Card Adapter




**BN-640AC-P** **BN-S032AC-S** **BN-SPCADP**

**PC Card Type II**
**(85.6 x 54.0 x 5.0mm)**

## Full-size ATA Cards

### Specification Table

| Part No. | Memory Capacity (bytes) | Number of Cylinders | Number of Heads | Number of Sectors/Tracks | Number of Sectors | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|
| BN-008AB-M | 8,192,000 | 250 | 4 | 16 | 16,000 | PC Card TYPEII 85.6 x 54.0 x 5.0 | 68 |
| BN-016AB-M | 16,384,000 | 500 | 4 | 16 | 32,000 | | |
| BN-024AB-M | 24,576,000 | 375 | 8 | 16 | 48,000 | | |
| BN-040AB-M | 40,960,000 | 625 | 8 | 16 | 80,000 | | |
| BN-080AB-M | 81,920,000 | 625 | 8 | 32 | 160,000 | | |
| BN-096AB-M | 98,304,000 | 375 | 16 | 32 | 192,000 | | |
| BN-160AB-M | 163,840,000 | 625 | 16 | 32 | 320,000 | | |
| BN-320AC-P | 327,680,000 | 1,000 | 16 | 40 | 640,000 | | |
| BN-640AC-P | 655,360,000 | 2,000 | 16 | 40 | 1,280,000 | | |

### Power Supply Characteristics

| | Symbol | Conditions | 3.3V | | | 5.0V | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. |
| DC Input Voltage (V) | $V_{CC}$ | | 3.0 | 3.3 | 3.6 | 4.5 | 5.0 | 5.5 |
| Operating Power Current (mA) | | | | | | | | |
| At Read | $I_{CCR}$ | | | 20 | 35 | | 25 | 40 |
| At Write | $I_{CCW}$ | | | 25 | 35 | | 30 | 40 |
| Stand by current (mA) | $I_{SB}$ | $V_{IH}=V_{CC}$ $V_{IL}=0V$ | | 0.25 | | | 0.30 | |

### Interface Characteristics

| | Characteristics |
|---|---|
| Read Data Transfer Rate (Card » Host) | 3.5 Mbytes/sec |
| Write Data Transfer Rate (Host » Card) | 0.65 Mbytes/sec |

### Operating Environment

| | Min. | Max. |
|---|---|---|
| Operating Temperature (°C) | 0 | 70 |
| Storage Temperature (°C) | -30 | 80 |
| Humidity (R.H.%) | 5 | 95 |
| Vibration (G) | | 15 |
| Impact (G) | | 1000 |



# Storage media for portable information equipment.

## Features

1. Complies with PC card ATA standards.
2. Operates with IDE mode.
3. PC card type II. (Full-size ATA cards.)
4. Grounding clips for EMI protection.
5. Low power consumption. (See Power Supply Characteristics.)
6. Either 3.3V or 5V operating voltage.
7. High speed read/write operation. (See Interface Characteristics.)
8. Excellent reliability against vibration and shock. (See Operating Environment.)
9. Read/write up to 1 million times.
10. Built-in ECC. (Error Correcting Codes.)
11. Small ATA cards convert to PC card type II with the card adapter BN-SPCADP.

# Small ATA Cards

## Specification Table

| Part No. | Memory Capacity (bytes) | Number of Cylinders | Number of Heads | Number of Sectors/Tracks | Number of Sectors | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|
| BN-S008AC-S | 8,192,000 | 250 | 4 | 16 | 16,000 | SPC TYPEI 45.0 x 42.8 x 3.3 | 68 |
| BN-S016AC-S | 16,384,000 | 500 | 4 | 16 | 32,000 | | |
| BN-S024AC-S | 24,576,000 | 375 | 8 | 16 | 48,000 | | |
| BN-S032AC-S | 32,766,000 | 500 | 8 | 16 | 64,000 | | |

## Power Supply Characteristics

| | Symbol | Conditions | 3.3V | | | 5.0V | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. |
| DC Input Voltage (V) | $V_{CC}$ | | 3.0 | 3.3 | 3.6 | 4.5 | 5.0 | 5.5 |
| Operating Power Current (mA) | | | | | | | | |
| At Read | $I_{CCR}$ | | | 20 | | | 25 | |
| At Write | $I_{CCW}$ | | | 21 | | | 27 | |
| Stand-by current (mA) | $I_{SB}$ | $V_{IH}=V_{CC}$ $V_{IL}=0V$ | | 0.05 | 0.1 | | 0.05 | 0.1 |

## Interface Characteristics

| | Characteristics |
|---|---|
| Read Data Transfer Rate (Card » Host) | 3.5 Mbytes/sec |
| Write Data Transfer Rate (Host » Card) | 0.65 Mbytes/sec |

## Operating Environment

| | Min. | Max. |
|---|---|---|
| Operating Temperature (°C) | 0 | 70 |
| Storage Temperature (°C) | -30 | 80 |
| Humidity (R.H.%) | 5 | 95 |
| Vibration (G) | | 15 |
| Impact (G) | | 1000 |

Full-size/small-size For Small SRAM Cards

# SRAM Cards & PC Card Adapter




BN-08MHSR BN-S02MSR BN-SPCADP

PC Card Type II
(85.6 x 54.0 x 5.0mm)

## For applications that need speed.

### Features

1. High capacity types available with Panasonic's MB technology. ( Realizes 8M bytes with Type I.)
2. TTL input level (VIH(min.) = 2.2V).
3. Low stand-by current mode (Typical 100 μA).
4. "Snap-in" type battery holder with lock switch for easy battery replacement.
5. Conventional CR2025 lithium battery for memory backup.
6. 5V±0.5V operating voltage.
7. Small SRAM converts to PC card type II with the card adapter BN-SPCADP.
8. Small SRAM available in 2 types : Built-in battery type which uses a rechargeable lithium battery, and battery replaceable type which uses a lithium BR1225 primary battery.

## Full-size SRAM Cards

Add C to the end of the part number to order cards with attribute memory (EEPROM).

| Part No. | Memory Capacity (bytes) | Access Time | Current Consumption | Battery Life Lithium Battery (CR2025) 25°C | Sub Battery | Operating Temperature | Storage Temperature | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|---|---|
| BN-064HSR | 64K | 200ns | 150mA (Max) | 5 years | Built-in | 0°C~60°C | -20°C~70°C | PC Card TYPE I 85.6x54.0x3.3 | 68 |
| BN-128HSR | 128K | | | | | | | | |
| BN-256HSR | 256K | | | | | | | | |
| BN-512HSR | 512K | | | | | | | | |
| BN-01MHSR | 1M | | | | | | | | |
| BN-02MHSR | 2M | | | 3 years | | | | | |
| BN-04MHSR | 4M | | | 1 year | | | | | |
| BN-08MHSR | 8M | | | 6 months | | | | | |

## Built-In Battery Type Small SRAM Cards

| Part No. | Memory Capacity (bytes) | Access Time | Current Consumption | Back Up Time* Rechargable Lithium Battery (VL 621) | Operating Temperature | Storage Temperature | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|---|
| BN-S256SR | 256K | 200ns | 150mA (Max) | 3 months | 0°C~60°C | -20°C~70°C | SPC TYPE I 45.0x42.8x3.3 | 68 |
| BN-S512SR | 512K | | | 2 months | | | | |
| BN-S01MSR | 1M | | | 8 months | | | | |
| BN-S02MSR | 2M | | | 4 months | | | | |

* Back up time from fully charged, using at 25°C.

## Battery Replaceable Type Small SRAM Cards

| Part No. | Memory Capacity (bytes) | Access Time | Current Consumption | Battery Life Lithium Battery (BR1225) 25°C | Operating Temperature | Storage Temperature | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|---|
| BN-S01MMC | 1M | 200ns | 150mA(max) | 3 years | 0°C~60°C | -20°C~70°C | SPC TYPE I 45.0x42.8x3.3 | 68 |

Full-size/small-size

For Small Flash Memory Cards

# Flash Memory Cards & PC Card Adapter




BN-28MHFCCK2 BN-S08MFCC BN-SPCADP

PC Card type II

(85.6 x 54.0 x 5.0mm)

## Ideal for storing re-writable functions.

### Features

1. Either 8 bit or 16 bit can be selected in the same card.
2. Various types are available depending on the application.
3. High capacity. ( up to 28M bytes. )
4. Both single power and dual power supplies are available.
5. Write protection switch.
6. Small flash memory cards convert to PC card type II with the card adapter BN-SPCADP.

## Full-size Flash Memory Cards

| Power Supply | Memory Capacity (bytes) | Part No. | Common Memory (bytes) | Attribute Memory (EEPROM) (bytes) | Access Time | Current Consumption | Operating Temperature | Storage Temperature | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|---|---|---|
| Single Power Supply (5V | Using 8M bit chips | BN-02MHFCCK2 | 2M | 2K | 250ns | 150mA (Max) | 0°C~60°C | -30°C~80°C | PC Card TYPE I 85.6x54.0x3.3 | 68 |
| | Using 16M bit chips | BN-04MHFCCK2 | 4M | | | | | | | |
| | | BN-08MHFCCK2 | 8M | | | | | | | |
| | | BN-12MHFCCK2 | 12M | | | | | | | |
| | | BN-16MHFCCK2 | 16M | | | | | | | |
| | | BN-20MHFCCK2 | 20M | | | | | | | |
| | | BN-24MHFCCK2 | 24M | | | | | | | |
| | | BN-28MHFCCK2 | 28M | | | | | | | |

## Small Flash Memory Cards

| Part No. | Memory Capacity (bytes) | Access Time | Current Consumption | Operating Temperature | Storage Temperature | Dimensions (mm) | Number of Pins |
|---|---|---|---|---|---|---|---|
| BN-S02MFCC | 2M | 250ns | 150mA (Max) | 0°C~70°C | -30°C~80°C | SPC TYPE I 45.0x42.8x3.3 | 68 |
| BN-S04MFCC | 4M | | | | | | |
| BN-S08MFCC | 8M | | | | | | |

uses Flash Memory made by Fujitsu(AMD).

## ⚠ Safety Instructions

Please read operating instructions carefully before use.

### ⚠ Caution

- Do not disassemble or modify the product, otherwise, it may cause the product to ignite, cause electrical shock or damage the main device.
- Immediately discontinue use of the product if, while using, the product emits smoke or an unusual smell, makes a strange noise, gets liquid or any kind of material inside of it, gets dropped or damaged.
- Do not misuse coin type lithium batteries which are used as back-up batteries for IC memory cards (SRAM cards), otherwise, it may cause batteries to generate heat, explode or ignite.
- Do not install the product into a slot unless you confirm it is a standard PC card slot (PCMCIA).
- Do not install the product into the PC card slot if it is wet, otherwise, it may damage the main device.


**U.S.A.**

Panasonic Industrial Company
A division of Matsushita Electric Corporation of America
Toll Free: 1-877-726-2228
E-mail: pccard@panasonic.com
Internet: www.panasonic.com

**Canada**

Panasonic Canada, Inc.
A subsidiary of Matsushita Electric Corporation of America
Tel: 1-905-238-2236
E-mail: ind_batteries@panasonic.ca
Internet: www.panasonic.ca


*Photos of some products in this catalog are different from actual design.
*Specifications are subject to change without notice for further improvement.
*Some products have operating instructions on the back.


Contents valid as of May 2000.

BSGPC0500

# OCEAN CHIPS
## Океан Электроники
## Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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AVIC JONHON

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Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

**«FORSTAR»** (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А