

## OEM MEMORY CARDS

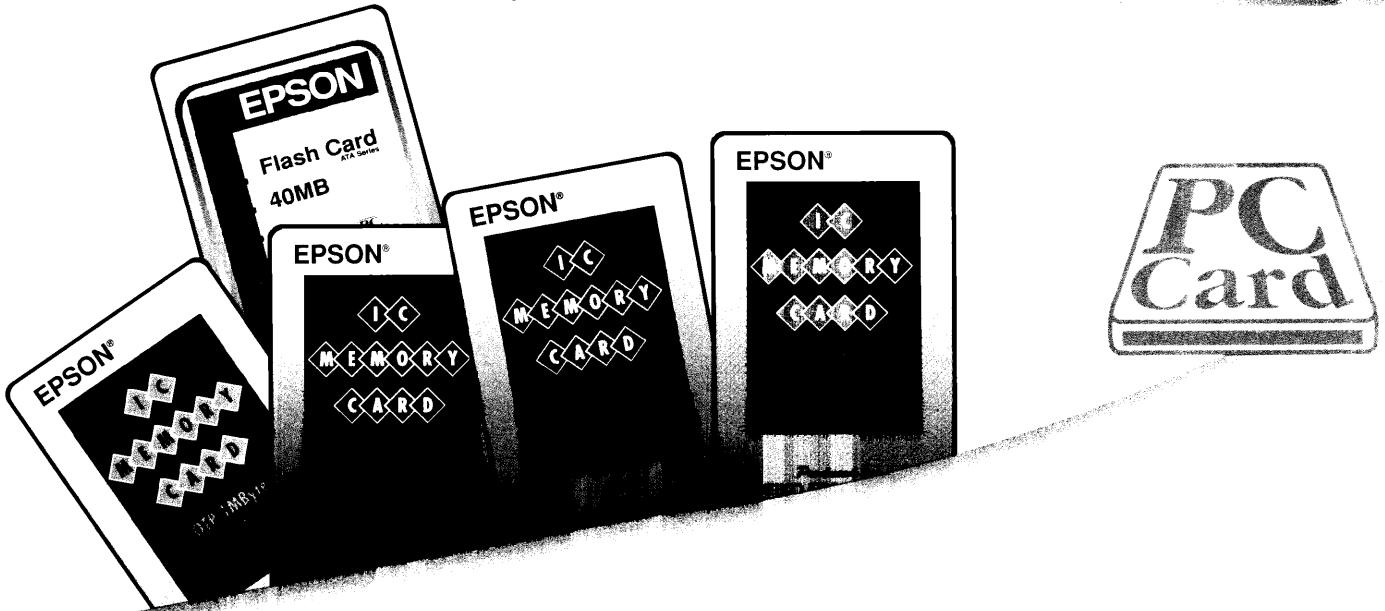
SRAM  
64KB - 4MB

OTP  
64KB - 1MB

Flash  
256KB - 16MB

ATA Flash  
2.5MB - 40MB

DRAM  
256KB - 16MB



# BRANDED MEMORY CARDS

HIGH PERFORMANCE  
MOST COMPATIBLE  
HIGH SPEED  
LOW POWER CONSUMPTION

RETAIL READY PRODUCTS  
FOR OEM BUSINESS



\*EPSON004\*

# CARD EDGE

## Shutter Door Mechanism

The shutter door mechanism protects the terminal contacts from dirt, grease, static electricity, etc. The stainless steel shutter door opens when the card is inserted into the host connector and closes when it is removed.

## Stainless Steel Protective Panels

The cards are covered by two stainless steel panels to protect the cards from static electricity. The panels also increase mechanical strength by resisting bending and twisting and also provide shielding against noise. Cards with custom panel artwork can be supplied.

## Incorrect Insertion Protection

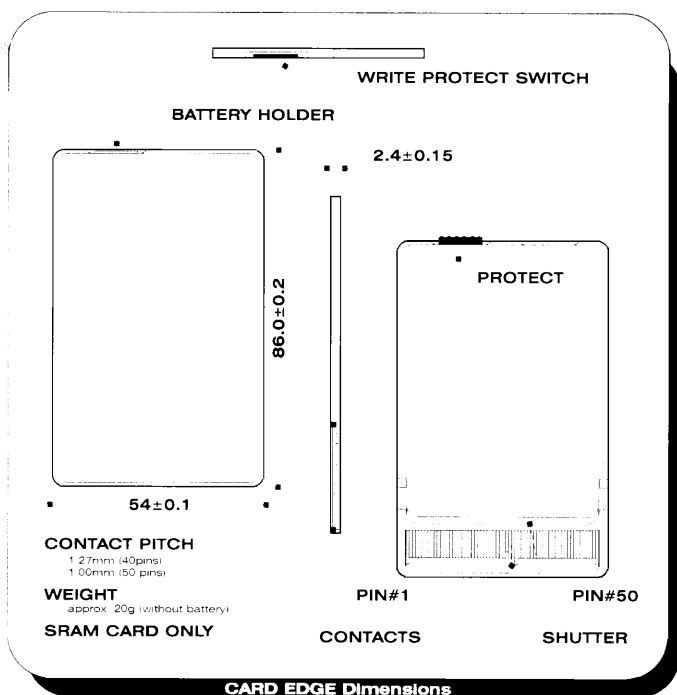
The cards contain a mechanism which prevents the improper insertion of the card into the mating connector. This special keying prevents damage from occurring on the contacts when cards are used with EPSON's exclusive connectors.

## Write Protect Switch (SRAM Cards only)

The write protect switch allows or prevents writing to the memory card depending on the switch position: On/Off. The status of this switch can be read through defined pins.

## Battery Replacement (SRAM Cards only)

SRAM cards use a lithium battery (CR-2016) to hold data while not plugged into a system that supplies power to the card. Users can easily replace this battery.



CARD EDGE Dimensions

## 40-pin 8-bit bus system type

MEMORY TYPE	STORAGE CAPACITY (bytes)
SRAM	8K ~ 1M
Mask ROM	128K ~ 4M
Flash Memory	32K ~ 1M
OTP ROM	32K ~ 1M
EEPROM	8K ~ 32K

## 50-pin 16-bit bus system type

MEMORY TYPE	STORAGE CAPACITY (bytes)
SRAM	64K ~ 1M
Mask ROM	256K ~ 4M
Flash Memory	256K ~ 1M
OTP ROM	64K ~ 1M

## 40-pin 8-bit interface

PIN		DESCRIPTION
Number	Name	
1	VCC	Supply
2	VBB/VPP	Battery voltage output/PROM write supply
3 to 19	A0 to A16	Address inputs
20	WE	Write enable input
21	CE	Chip enable input
22	OE	Output enable input
23 to 30	D0 to D7	Data inputs/outputs
31 to 36	A17 to A22	Address inputs
37	WPOUT	Write protect output, write is enabled when HIGH, disabled when LOW
38	CST	Card present output. High when card is inserted
39	ROM/RAM	Device type output. HIGH when ROM, LOW when RAM
40	GND	Ground

## 50-pin-16-bit interface

PIN		DESCRIPTION
Number	Name	
1	GND	Ground
2 to 21	A1 to A20	Address inputs
22	NC	No connection
23	WE	Write enable input
24	ROM/RAM	Device type output. HIGH when ROM LOW when RAM
25,26	CE1,CE2	Chip enable inputs
27	WPOUT	Write protect output, write is enable when HIGH, disabled when LOW
28	OE	Output enable input
29	CST	Card present output, HIGH when the card is inserted
30	VBB	Battery voltage output
31,32	VCC	Supply
33	VPP	PROM write supply
34 to 49	D0 to D15	Data inputs/outputs
50	GND	Ground

## Connector (40-pin & 50-pin type)

Pin Type	Right angle connector	Straight angle connector	Description
40-pin Type	7508-1110	7508-1100	With tabs
	7508-111A	7508-110A	Without tabs
	7508-1160		Surface mount type
	7508-1200		Surface mount type with eject mechanism
50-pin Type	7508-0980	7508-0990	With tabs

# BRANDED PCMCIA

**EPSON OFFERS THE FOLLOWING PCMCIA "PC CARDS"  
PRE-PACKAGED FOR "OFF THE SHELF" BUNDLING OR  
RESELLING.**

## FEATURES

- SHRINK WRAPPED BOX (6 x 6 x 1)
- DETAILED USERS MANUAL
- CLEAR PLASTIC JEWEL CASE
- 2 YEAR LIMITED WARRANTY
- 1-800 "EPSON CONNECTION"  
TECHNICAL SUPPORT
- BACK-UP BATTERY (SRAM only)
- SYSTEM SOFT CARD & SOCKET  
SERVICES (Hard Disk Card only)
- REGISTRATION CARD
- UTILITIES DISKETTE (ATA Flash card  
only)
- RJ11 TO 9PIN CABLE (72") (Fax/  
Modem only)
- COMIT AND WINFAX LITE
- SOFTWARE (Fax/Modem only)
- COMPRESSION SOFTWARE (ATA  
Flash card only)

### MEMORY TYPE

Solid State Flash EEPROM

### DENSITY

2.5, 5.0, 10.0, 20.0MB

### SIZE

PCMCIA Type II

### COMPATIBILITY

PCMCIA 2.1

### DATA TRANSFER RATE

Write Sustained = 75Kbyte/sec  
Read Sustained = 625KByte/sec

### POWER CONSUMPTION

DC Input Voltage: 5 volts  $\pm 10\%$   
Maximum Current: Sleep Mode Max 1ma, Typical 0.6ma  
Max Operating: Reading 44ma-150ma, Writing 44ma-150ma

### ENVIRONMENT CHARACTERISTICS

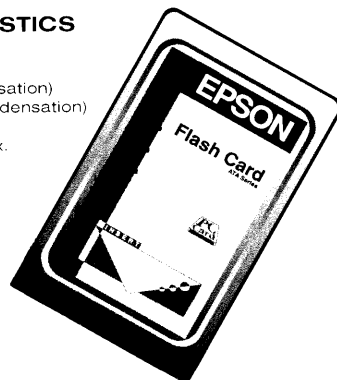
Operating temperature: 0° to 60°C  
Non-operating temperature: -20° to 85°C  
Operating humidity: 8% - 95% (non condensation)  
non operating humidity: 8% - 95% (non condensation)  
Shock capacity: 1000 G max.  
Vibration capacity: 15 G peak-to-peak max.

### SERVICE MAINTENANCE

Covered by standard EPSON  
two-year limited warranty

### ENDURANCE LIMIT

200,000 programming cycles



### MEMORY TYPE

Static Random-Access Memory

### DENSITY

1/2, 1, 2MB

### SIZE

PCMCIA Type I

### ATTRIBUTE MEMORY

2KByte with preloaded CIS for 'hot swapping'

### ACCESS TIME

200 Nanoseconds

### POWER CONSUMPTION

Active: 35mA Typ.  
Standby: 1.1 mA Typ.

### DC SUPPLY VOLTAGE

5 volts

### ENVIRONMENT CHARACTERISTICS

OPERATING HUMIDITY  
10% - 90% relative humidity  
(no condensation)

### CARD LIFE EXPECTANCY

Over 10,000 insertions or over 10 years

## 68-pin 8/16-bit bus system type conforming to PCMCIA Rel. 1.0/2.0

PART NO.	Memory type	Storage capacity (bytes)	Access time $t_{ACC}$ (nS)	Current consumption (max.)		Operating temperature range (°C)	Storage temperature range (°C)	Battery B/U time (Year)	Erase units
				Operating (mA)	Stand-by (mA)				
WWB065ES20/40	Mixed CMOS SRAM with Sub Battery	64K	200	140	1.5	0~60	-20~60	10	-
WWB129ES20/40		128K						10	
WWB257ES20/40		256K						7.6	
WWB513ES20/40		512K						3.9	
WWB101ES20/40		1M						1.9	
WWB201ES20/40	Low power Mixed CMOS SRAM	2M	200	140	0.3	0~60	-20~60	1.0	-
LWB065SD20/40		64K						10	
LWB129SD20/40		128K						10	
LWB257SD20/40		256K						7.6	
LWB513SD20/40		512K						3.9	
LWB101SD20/40	1M	1.9							
KWB257SDX0/Y0	CMOS Mask ROM	256K	250	100	1.0	0~60	-20~60	-	-
KWB513SDX0/Y0		512K							
KWB101SDX0/Y0		1M							
KWB201SDX0/Y0		2M							
KWB401SDX0/Y0		4M							
KWB801SDX0/Y0	8M								
HWB257ESX0/Y0	CMOS Flash memory	256K	200	70	1.5	0~60	-20~65	-	Chip
HWB513ESX0/Y0		512K							
HWB101ESX0/Y0		1M							
HWB201ESX0/Y0		2M							
HWB401ESX0/Y0		4M							
HWB201S8X0/Y0		2M	110	-	-	-	-	Block	
HWB401S8X0/Y0		4M							
HWB801S8X0/Y0		8M							
HWB111S8X0/Y0		10M							
HWB161S8X0/Y0		16M							
OWB065SDX0/Y0	(FACTORY PROGRAMMED) CMOS OTP	64K	200	70	1.5	0~60	-20~60	-	-
OWB129SDX0/Y0		128K							
OWB257SDX0/Y0		256K							
OWB513SDX0/Y0		512K							
OWB101SDX0/Y0	1M	200	70	1.5	0~60	-20~60	-	-	
BWB065SDX0/Y0	64K								
BWB129SDX0/Y0	128K								
BWB257SDX0/Y0	256K								
BWB513SDX0/Y0	512K								
BWB101SDX0/Y0	1M								
ATA202SD11/01	ATA Flash	2.6M*	44 ~ 150	<1	0~60	-20~85	-	-	Sector
ATA502SD11/01		5.2M							
ATA112SD11/01		10.4M							
ATA212SD11/01		20.9M							
ATA412SD12/02		40.0M							

**1** AWB series (without sub battery) is also available.

**2** Battery backup time is a reference value based on typical values at  $T_a=25^\circ\text{C}$ .

**3** Sub battery backup time is 10 minutes at  $T_a=25^\circ\text{C}$ .

**4** Standby current of WWB series is measured when sub battery is fully charged.

**5** OWB: factory programmed  
BWB: unprogrammed (for users development).

**6** ATA cards can be shipped with compression software to approx. double capacity  
11&12 = with compression  
01&02 = without compression

### Connectors 2-piece type (PCMCIA/JEIDA)

Pin type	Part No.	Description
68-pin type	7508-1300	Right angle connector
	7508-1310	Right angle connector with eject mechanism
	7508-1320*	Right angle connector with eject mechanism and grounding terminal
	7508-1330	Right angle connector with eject mechanism. (stand-off type)

\*: Under development

### Attribute memory

Series name	Part code	Attribute information holding methods
WWB/LWB Series	20	2K bytes EEPROM
	40	Without attribute memory ("FF" output)
KWB/HWB/OWB/BWB Series	X0	2K bytes EEPROM
	Y0	Without attribute memory ("FF" output)

# JEIDA/PCMCIA

## Conforming to PCMCIA and JEIDA

These cards conform to PCMCIA Rel. 1.0 and Rel. 2.0 which correspond to JEIDA version 4.0 and version 4.1 respectively.

## Attribute Memory

A separate memory area from common memory which is accessed by use of the reg pin. This memory is most commonly used as storage for information about the card such as type of card, access speed, size, manufacturer, date of manufacture, serial number, and many other possible card attributes.

## Write Protect Switch (SRAM & Flash only)

The write protect switch allows or prevents writing or erasing to the memory card depending on the switch position: On/Off. The status of this switch can be read through defined pins.

## Battery Replacement (SRAM only)

SRAM cards use a lithium battery (LWB: CR-2025, WWB: BR-2325) to hold data while not plugged into a system that supplies power to the card. Users can easily replace this main battery.

## Battery Lock (SRAM only)

This mechanism locks the battery holder to prevent it from falling out.

## Sub Battery (WWB series SRAM only)

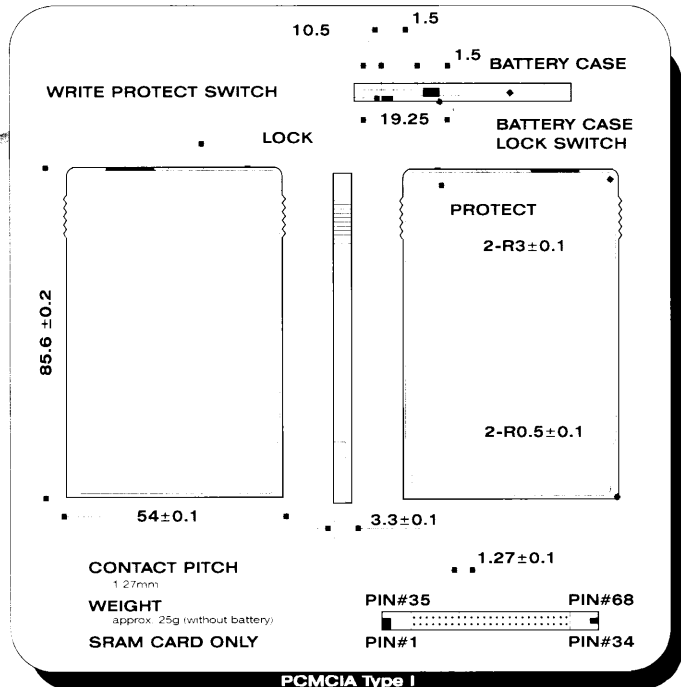
SRAM cards equipped with a sub-battery allow the replacement of the main battery without data loss. The sub-battery is a rechargeable lithium cell that is charged as the card is used in a host system.

## Wide Operation Temp. Range

EPSON's IC Memory cards are designed and guaranteed for a wide operating and storage temperature range.

## Data Compression

Available with ATA Flash cards, to approx. double capacity.



## 68-pin two-piece type (PCMCIA Rel. 1.0/2.0)

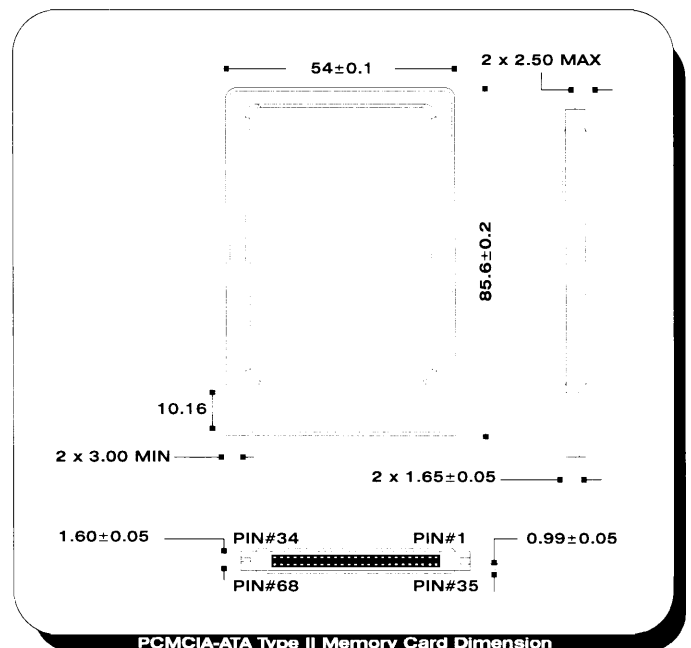
Memory type	Storage capacity (bytes)	Attribute storage cap. (bytes)
SRAM w/sub battery	64K ~ 2M (4M)	2K/none("FF" output)
Low power SRAM	64K ~ 1M	2K/none("FF" output)
Mask ROM	256K ~ 16M	2K/none("FF" output)
Flash memory	256K ~ 16M	2K/none("FF" output)
OTP ROM	64K ~ 1M (2M)	2K/none("FF" output)
ATA Flash	2.5M ~ 40M*	Read only

\*Capacity measured w/out compression

## 68-pin 8/16-bit interface

PIN		DESCRIPTION
Number	Name	
1	GND	Ground
2 to 6	D3 to D7	Data inputs/outputs
7	CE1	Chip enable input for even bytes (D0 to D7)
8	A10	Address input
9	OE	Output enable input
10 to 14	A11, A9, A8, A13, A14	Address inputs
15	WE/PGM	Write enable/program when PROM (EEPROM)
16	RDY/BSY/REQ	
17	VCC	Supply
18	VPP1	PROM write supply
19 to 21	A16, A15, A12	Address inputs
22 to 29	A7 to A0	Address inputs
30 to 32	D0 to D2	Data inputs/outputs
33	WP/IOIS16	Write protect output. Write is enabled when LOW, disabled When HIGH
34,35	GND	Ground
36	CD1	Card detect output. Conn. to ground int.
37 to 41	D11 to D15	Data inputs/outputs
42	CE2	Chip en. input for odd bytes (D8 to D15)
43	RFSH	(Pseudo-static RAM)
44, 45	NC	No connection
46 to 50	A17 to A21	Address inputs
51	VCC	Supply
52	VPP2	PROM write supply
53 to 56	A22 to A25	Address inputs
57 to 60	NC	No connection
61	REG	Register select input
62	BVD2	Battery voltage detect 2
63	BVD1	Battery Voltage detect 1
64 to 66	D8 to D10	Data inputs/outputs
67	CD2	Card det. output. Conn. to ground int.
68	GND	Ground

PCMCIA-ATA requires additional pin definition, not shown.





**DENSITY**

170MB

**COMPATIBILITY**

PCMCIA2.1

**SIZE**

PCMCIA Type III

**FUNCTIONAL**

Formatted Capacity  
Sector Size  
Disks  
Heads  
Data Surfaces  
Track Density  
Flux Density  
Recording Density  
Recording Method

170.8 MBytes  
512 Bytes  
2  
4  
4  
3,800 TPI  
63,000 FCI  
84,000 BPI  
1,7 RLL Code

**COMPATIBILITY**

PCMCIA 2.1

**MODELS**

EFM-144:  
14,400 bps send/receive fax operation  
14,400 bps data transmission  
EFM-96:  
9,600 bps send/receive fax operation  
2,400 bps data transmission

**SIZE**

PCMCIA Type II

**COMMUNICATIONS COMPATIBILITY**

Standards:  
Hayes AT command set  
MNP levels 1-5  
CCITT V.42  
CCITT V.42bis

Protocols:  
Bell 103  
Bell 212A  
CCITT V.21  
CCITT V.22  
CCITT V.22bis  
CCITT V.22 A & B  
CCITT V.23  
CCITT V.32 (EFM-144)  
CCITT V.32bis (EFM-144)

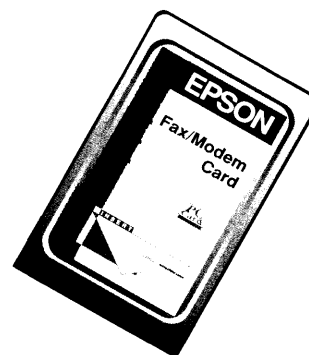
Fax Compatibility:  
CCITT V.17 (EFM-144)  
CCITT V.21 Channel 2  
CCITT V.27ter  
CCITT V.29  
CCITT Group III  
EIA Class II (EFM-96)  
EIA Class I & II (EFM-144)

**OPERATING MODES**

Asynchronous, Full duplex, Automatic and manual call originate, Automatic and manual answer, Cellular-ready (interface optional)

**SERVICE MAINTENANCE**

Covered by standard EPSON two-year limited warranty



**PERFORMANCE**

Media Transfer Rate  
Interface Transfer Rate  
Rational Speed  
Latency  
Average Seek Time  
Track to Track Seek Time  
Maximum Seek Time  
Start Time (Typical)  
Buffer Size  
Interface

Up to 3.5MB/sec.  
Up to 12.0MB/sec.  
4,500 RPM  
6.67 ms  
12 ms  
2 ms  
20 ms  
1.4 sec.  
32 Kbytes  
PCMCIA-ATA



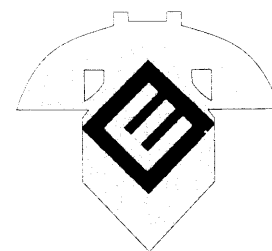
**POWER**

Voltage  
Maximum Currents  
Typical Power Dissipation  
Sign Up  
Idle  
Read/Write  
Seek  
Standby Mode  
Sleep Mode

+5 VDC ± 5%  
0.8 amps  
2.0 watts  
0.5 watts  
1.9 watts  
1.4 watts  
0.005 watts  
0.005 watts



**2YEAR LIMITED WARRANTY**



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