

# Card Products

CARD-PCI / EASI / SH-CARD

January / 2000



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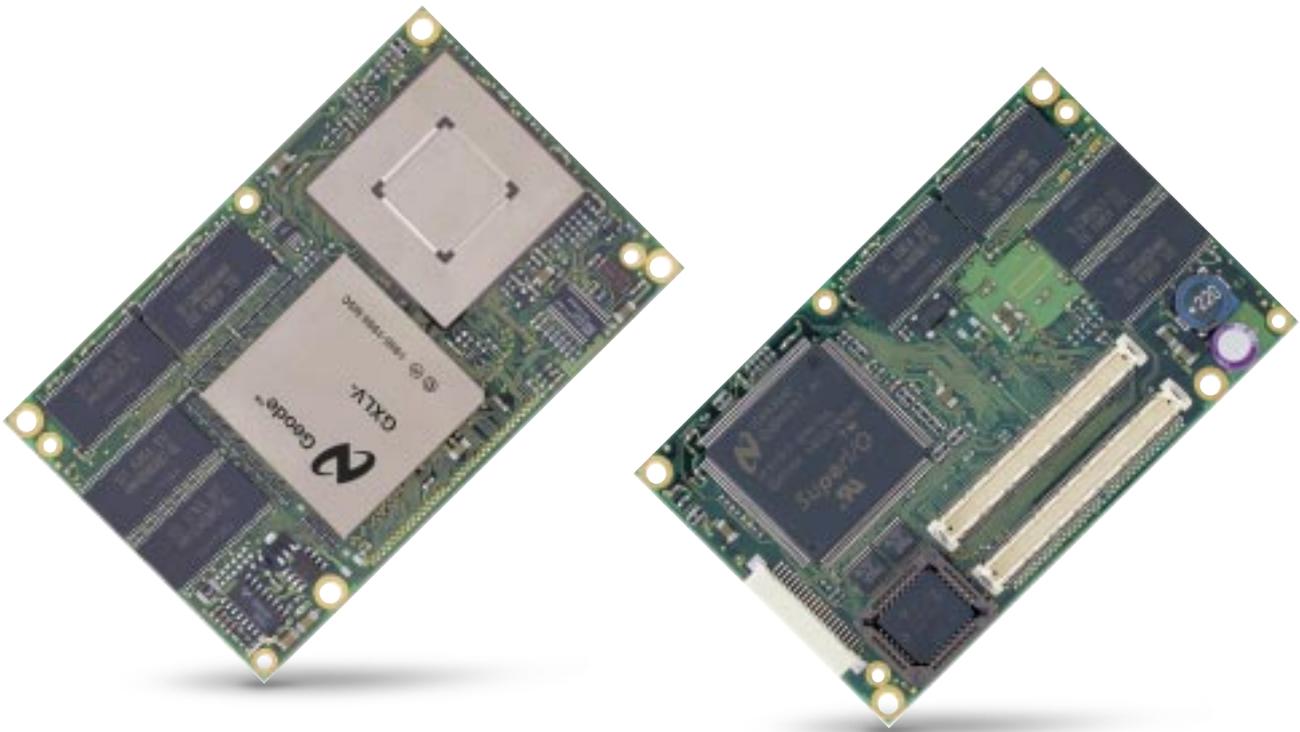
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# CARD-PCI

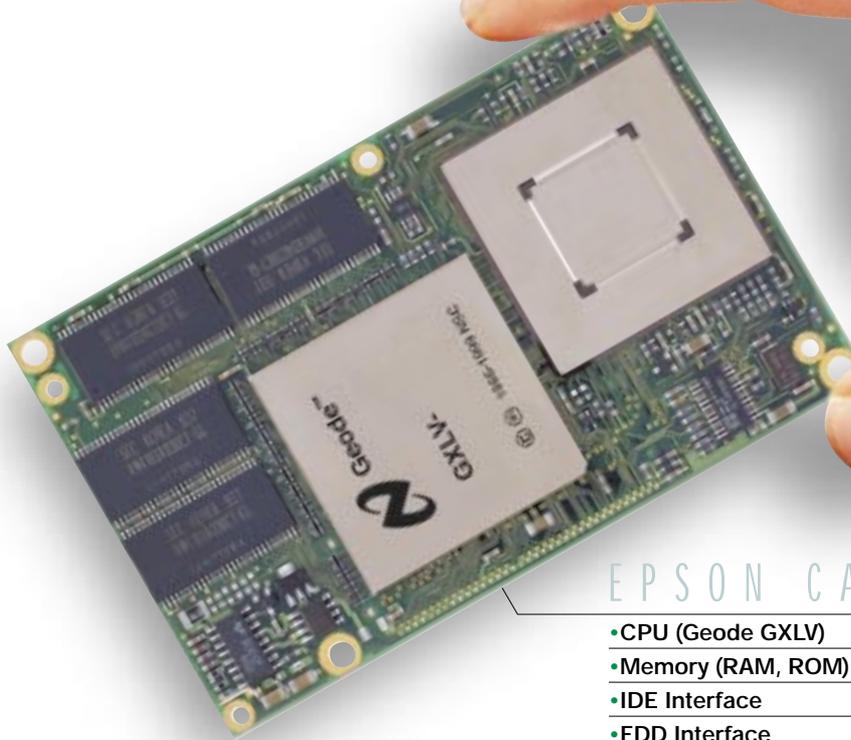
series

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CARD-PCI/GX



# The Platform for Next Generation CARD-PCI/GX



## EPSON CARD-PCI Series

- CPU (Geode GXLV)
- Memory (RAM, ROM)
- IDE Interface
- FDD Interface
- Keyboard Interface
- Mouse Interface
- Video Controller/VRAM
- Serial I/O Ports
- USB I/O Ports
- Parallel I/O Port

### ●Features

#### ▶ PCI bus compatibility

This is a PC/AT board for use in builds that require faster speeds and high performance. It is compatible with the PCI bus and fit for various applications.

#### ▶ Compact design

PC functions with high performance compressed into a compact size (101.6×63.5×15 mm) enables to use the CARD-PCI/GX in many different appliances.

#### ▶ Compatibility with many operating systems

The CARD-PCI/GX is compatible with Microsoft operating systems, including Windows® CE, enabling the selection of an operating system to suit the customer's requirements.

#### ▶ Total cost performance implemented

Cuts in hardware and software development costs and reductions in development times facilitate the early release of the products.

#### ▶ Lineup of evaluation tools

Seiko Epson has prepared tools for developing CARD-PCI/GX systems. Since commercial development tools for PCI bus applications can also be used, development can start immediately.

# Evaluation Kit

## Evaluation kit (SCE88J5X01)

### ■ Outline

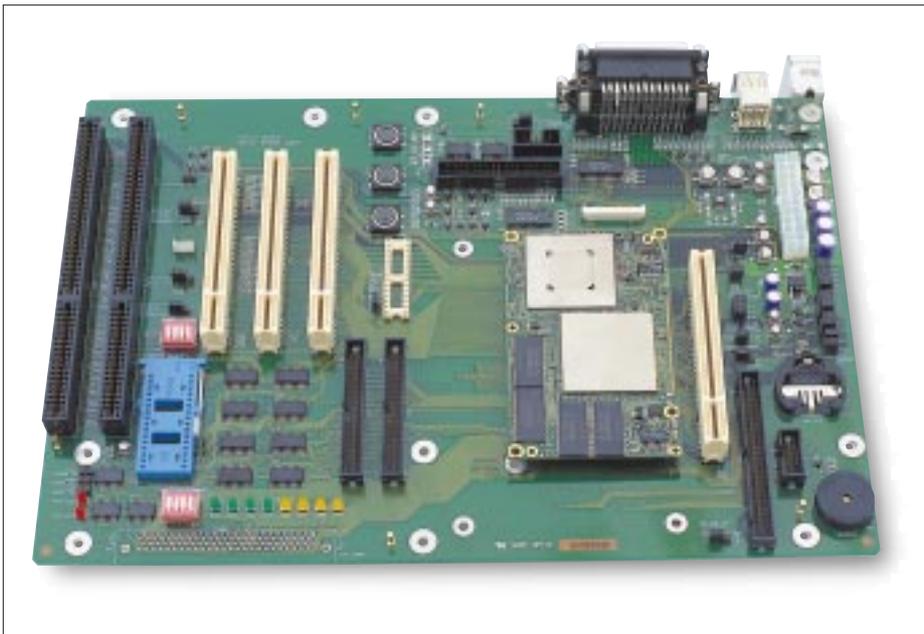
This evaluation board comes complete with accessories such as standard connectors for peripheral devices and a cable set, for evaluating the functions of the CARD-PCI SCE8720C series (called the CARD-PCI/GX below), using Geode GXLV.

### ■ Main Features

- 280-pin connector for connection to CARD-PCI/GX
- PCI bus slot (One slot for 3.3V power, three slots for 5.0V power)
- ISA subset-bus slot (Two sets)
- 50-pin connector for LCD and D-sub 15-pin connector for CRT
- MiniDIN connector for PS/2 mouse and keyboard
- Parallel interface
- Serial interface: two channels
- USB interface: two channels
- Primary IDE connector/Secondary IDE connector
- FDD connector
- PROM socket
- Backup battery

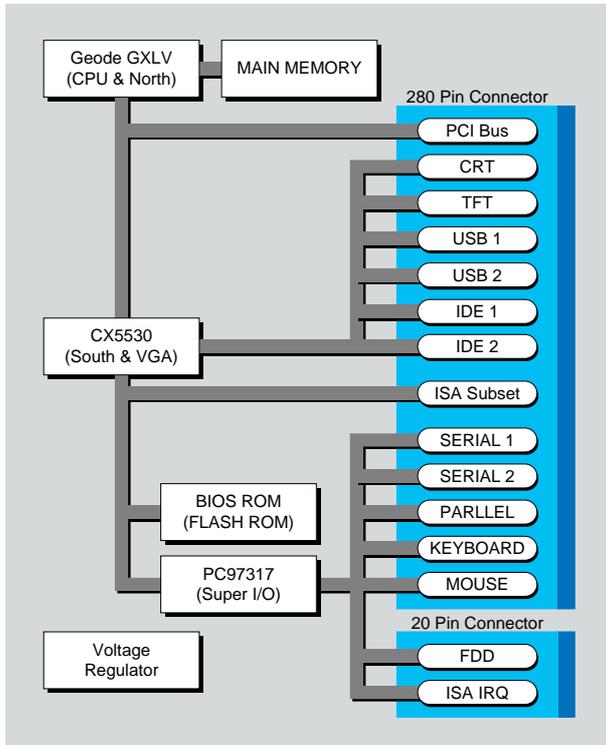
### ■ Components

- Evaluation board
- A set of manuals
- A set of connection cables



Evaluation board

# Line up



## CARD-PCI/GX



(CPU side)



(Connector side)

There is a heat sink on CPU side of the actual product.

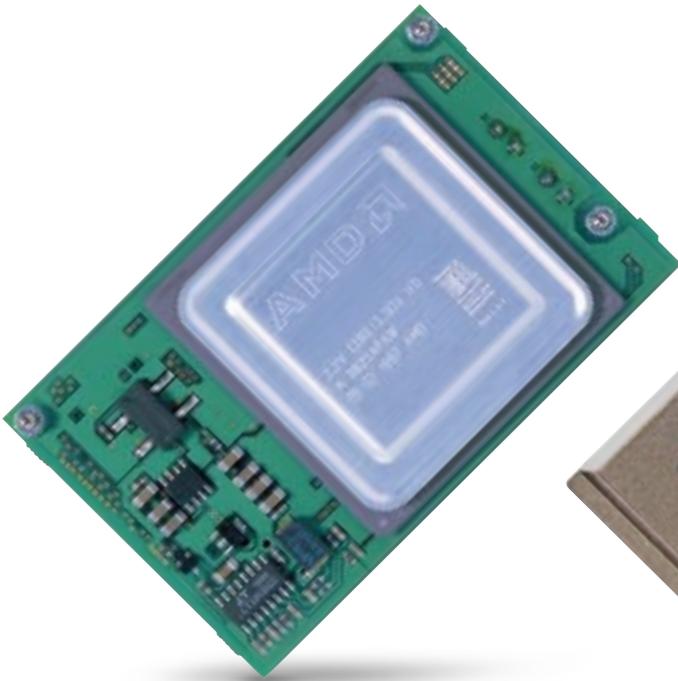
| Series name              | CARD-PCI/GX                 |
|--------------------------|-----------------------------|
| Model name               | SCE8720C <sub>01/02</sub> * |
| CPU                      | Geode GXLV                  |
| Frequency                | 200MHz                      |
| RAM                      | 64MB/32MB                   |
| LCD (TFT)                | (Max.) 1024×768, 64K color  |
| CRT                      | (Max.) 1280×1024, 256 color |
| BIOS Flash               | 256KB                       |
| Power management support | applicable                  |
| Power consumption (ope.) | TBD                         |
| (Suspend mode)           | TBD                         |
| Dimensions               | 101.6×63.5×15.0mm           |
| Operating temp. range    | TBD                         |

\*Under development

# EASI series

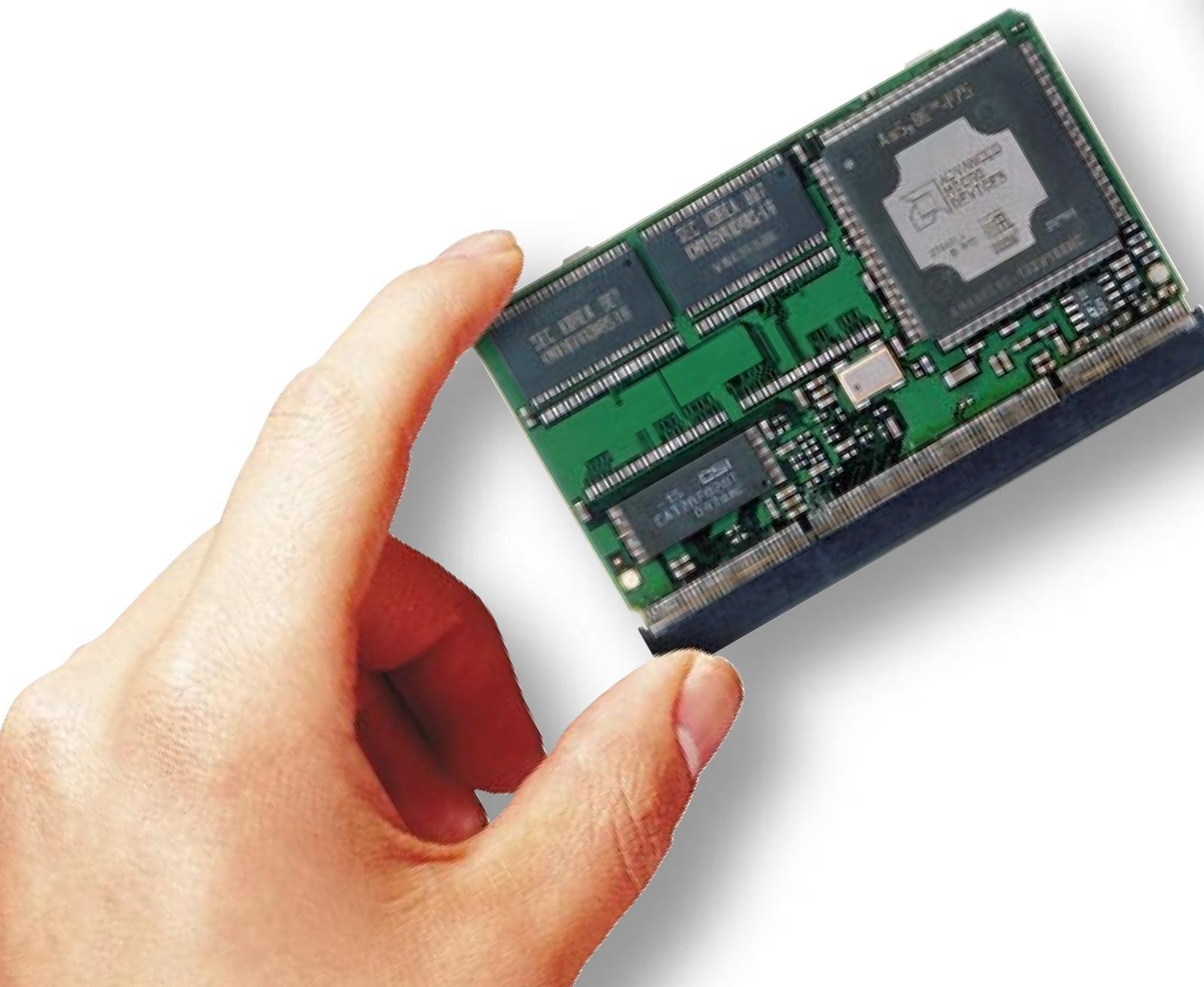
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CARD-686, CARD-586, CARD-486HB/HBL



# The Smallest PC.

SEIKO EPSON makes PC/AT full functions into the just credit card size "CARD-PC".  
CARD-PC enables your embedded or system to be as powerful as a full PC.  
CARD-PC can expand the new possibility of hand held system.





## EPSON EASI Series

- CPU (Am5x86) Interrupt Controller, DMA Controller, Real Time Clock, Memory Mapper
- Programmable Timers
- IDE Interface
- Keyboard Interface
- Memory (RAM, ROM)
- Hard Disk Controller
- Floppy Disk Controller
- Video Controller VRAM
- Serial I/O Ports
- Parallel I/O Port

### ●Features

#### ▶ PC/AT architecture

CARD-PC is PC/AT full compatible. System development becomes easy and quick by using PC/AT's software and hardware.

#### ▶ Up grade path

From CARD-486HB to CARD-686, all the CARD-PC model has common interface (EASI) which enables you to up grade the system very easily.

#### ▶ Power management function support

CARD-PC supports power management function so that it is suitable for battery operated hand held system.

#### ▶ Operating system

MS-DOS®, WindowsNT®, Windows® CE and real time OSs like OS-9, Vx Works, pSOS and QNX can be operated on CARD-PC.

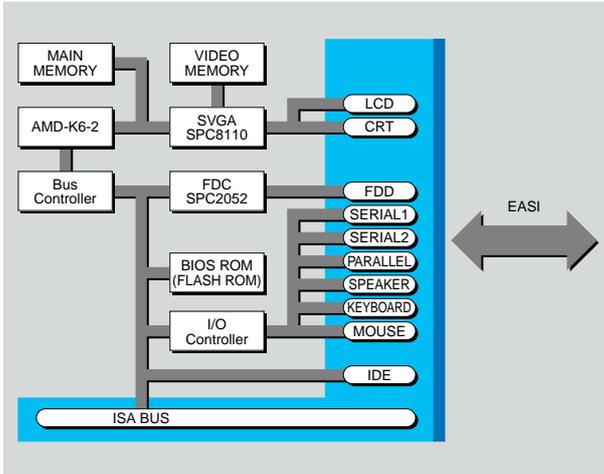
#### ▶ Evaluation and development tools

SEIKO EPSON provides evaluation and development tool so that you do not worry about system details and focus on the total product development.

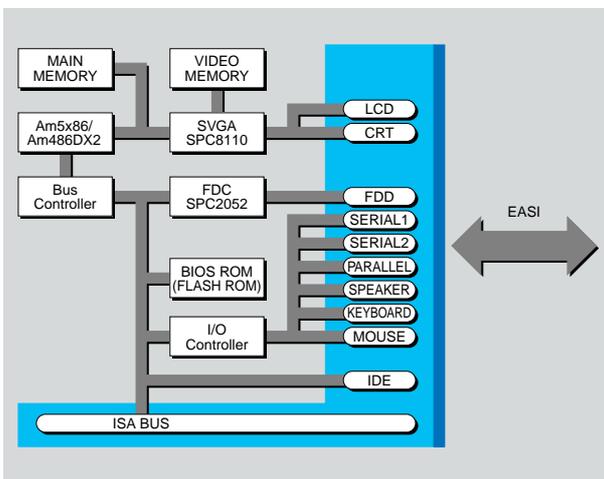
#### ▶ Power management function support

PCMCIA expansion board (CARDPRESSO) are ready for you to make a quick evaluation and construct your system.

# CARD-PC line up



## CARD-686 Series



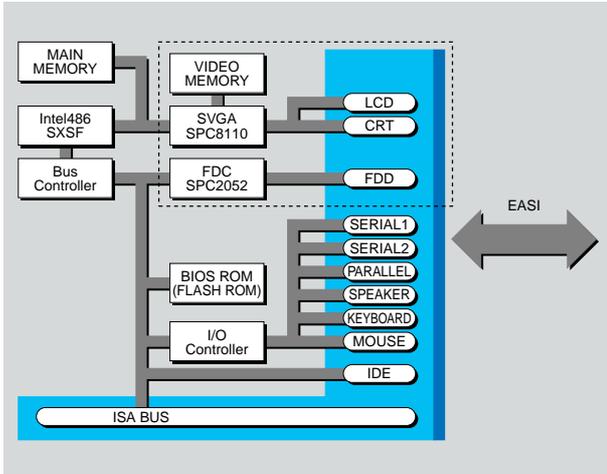
## CARD-586 Series



| Series name              | CARD-686<br>(SCE86638 Series) | CARD-586<br>(SCE86537 Series) | CARD-586<br>(SCE86537 Series) |
|--------------------------|-------------------------------|-------------------------------|-------------------------------|
| Parts number             | SCE8663803/02                 | SCE8653712/11/10              | SCE8653703/02*2               |
| CPU                      | AMD-K6-2                      | Am5x86                        | Am486DX2                      |
| Clock speed              | 233MHz                        | 133MHz                        | 66MHz                         |
| RAM                      | 64/32MB                       | 48/32/16MB                    | 32/16MB                       |
| BIOS FLASH               | 256KB                         |                               |                               |
| System interface         | EASI                          |                               |                               |
| LCD*1                    | (Max.) 800×600, 256 color     |                               |                               |
| CRT*1                    | (Max.) 800×600, 256 color     |                               |                               |
| Power management support | applicable                    |                               |                               |
| Power consumption (ope.) | 8.3W                          | 4.3W                          | 2.7W                          |
| (Suspend mode)           | 0.44W/0.43W                   | 8mW/6mW/5mW                   | 7mW/5mW                       |
| Dimensions               | 85.6×54.0×16.75mm             | 85.6×54.0×7.5mm               |                               |
| Operating temp. range    | Tcase = 85°C                  | Tcase=70°C                    |                               |

\*1:256 color display driver is available through your sales agent.  
\*2:Under development

# CARD-PC line up



CARD-486HBL does not include the function circled by dot line.

## CARD-486HB/HBL Series



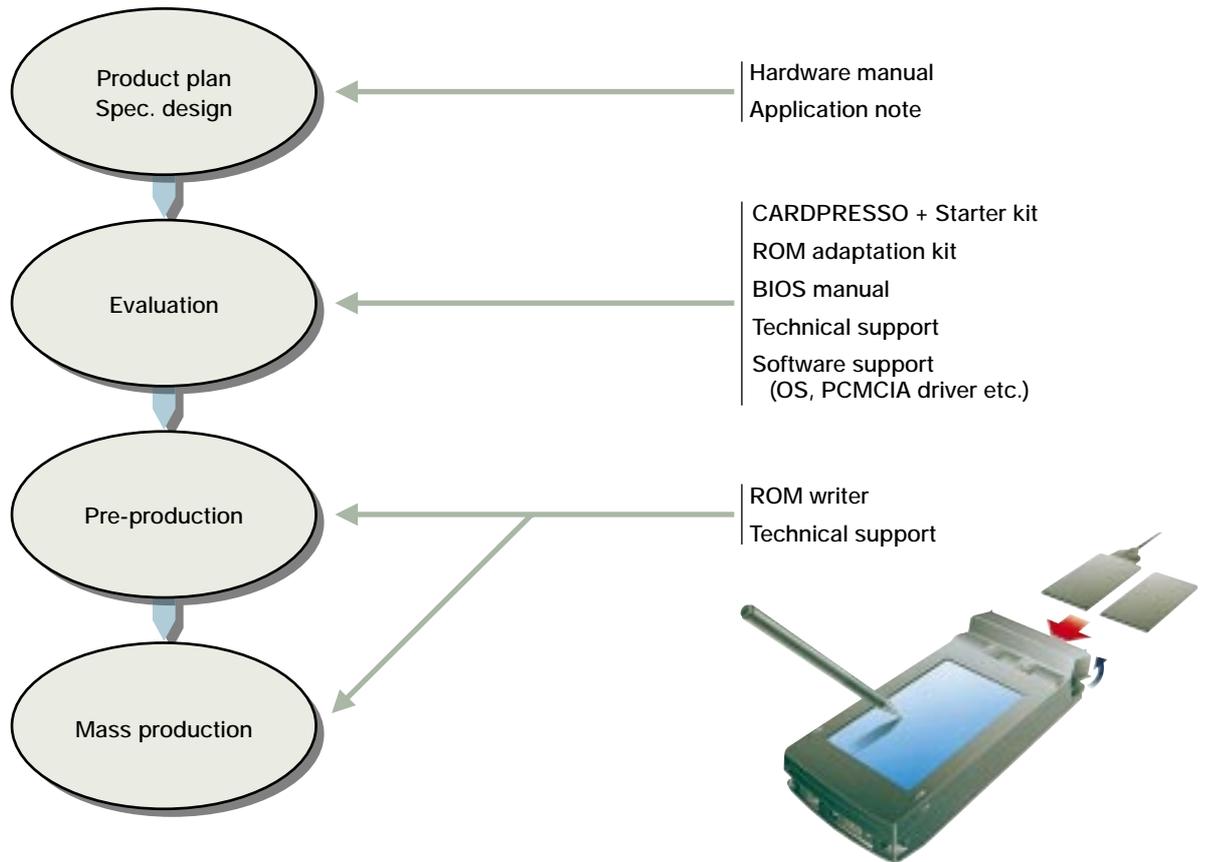
| Series name              | CARD-486HB<br>(SCE86436 Series) |               | CARD-486HBL<br>(SCE86406 Series) |
|--------------------------|---------------------------------|---------------|----------------------------------|
| Parts number             | SCE8643605                      | SCE8643603/00 | SCE8640603/00                    |
| CPU                      | Intel 486SXSF                   |               |                                  |
| Clock speed              | 33MHz                           | 16MHz         |                                  |
| RAM                      | 4MB                             | 4/1MB         |                                  |
| BIOS FLASH               | 256KB                           |               |                                  |
| System interface         | EASI                            |               |                                  |
| LCD*1                    | (Max.) 800×600, 256 color       |               | not applicable                   |
| CRT*1                    | (Max.) 800×600, 256 color       |               | not applicable                   |
| Power management support | applicable                      |               |                                  |
| Power consumption (ope.) | 1.9W                            | 1.4W          | 0.6W                             |
| (Suspend mode)           | 4mW                             |               | 3mW                              |
| Dimensions               | 85.6×54.0×5.5mm                 |               |                                  |
| Operating temp. range    | Tcase=70°C                      |               |                                  |

\*1:256 color display driver is available through your sales agent.  
\*2:Under development

# Design support

## System design with CARD-PC

System design with CARD-PC can be completed in short time because of development circumstances which SEIKO EPSON provides. Many documents, development tools, OS support and technical support will help your system development.



| Model name         | Parts number          |          |                | Contents                         |
|--------------------|-----------------------|----------|----------------|----------------------------------|
|                    | CARD-686              | CARD-586 | CARD-486HB/HBL |                                  |
| Evaluation         | CARDPRESSO            |          |                | Details at page 12               |
| ROM writer         | DIO5302               |          |                | Details at page 13               |
| ROM adaptation kit | Available on web site |          |                | Details at page 13               |
| Hardware manual    | MF1162                | MF1024   | MF997          | Hardware specification           |
| BIOS manual        | MF1059                | MF1059   | MF1059         | BIOS manual (Basic functions)    |
|                    | MF1178                | MF1082   | MF1052         | BIOS manual (Extended functions) |
| Application note   | MF1204                | MF1123   | MF1065         | Example circuit, etc             |

# Expansion board

## CARDPRESSO (SEK0630B)

PC/AT Slot half-size board (177×115mm)

### ■Description

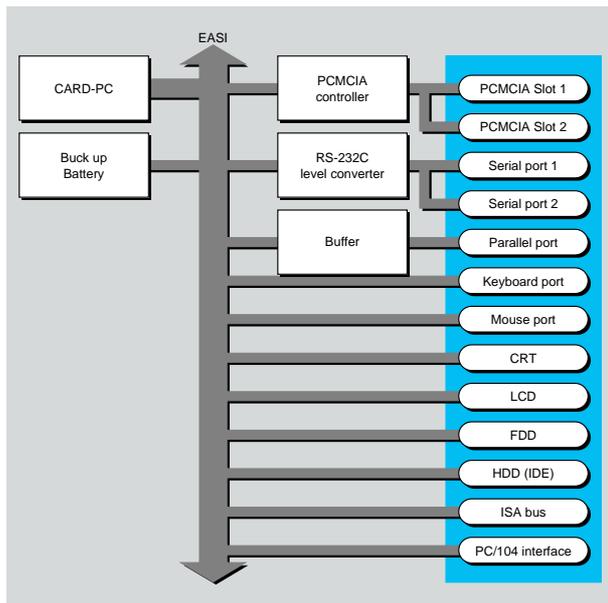
CARDPRESSO (SEK0630B) equipped with PCMCIA slots (×2) and PC/104 interface, it is very easy to construct your target system with PC Card and PC/104 board.

### ■Features

- Core .....CARD-586/486HB/486HBL
- PCMCIA Controller
- PCMCIA Slot .....Type II Slot, Type IV Slot
- Other interface .....PC/104 interface  
PC/AT standard interface  
(Serial ×2, Parallel, Keyboard, Mouse, CRT, FDD, IDE, LCD)
- Power supply .....DC-IN connector or ISA bus
- Back up battery .....A coin sized lithium battery is installed
- Software .....PCMCIA Card driver is provided
- Back plane board with ISA 3 slots (SEK0621B0A) is available for farther expansion. (Option)
- DIO5361 is necessary when CARDPRESSO is purchased first time. (see details at 9 page)
- CARDPRESSO is evaluation only for CARD-686.
- CARD-PC Fixing plate is attached.

| Model name | Specification     |
|------------|-------------------|
| SEK0630B0G | PCMCIA controller |

### ■Block diagram



Front side



Back side

# Tool kit

## Starter kit for CARDPRESSO (DIO5361)

It is development tool for CARDPRESSO (SEK0630B). Following contents enables you to make a quick construction of your system.

- Manuals  
CARDPRESSO hardware manual  
PCM plus users manual, etc.
- Software  
PCMCIA driver software (PCM plus)  
CARDPRESSO flash utility
- Conversion cable for evaluation  
(Serial, Parallel, HDD, FDD, Power supply, LCD, etc.)
- Hexagonal spacer
- Software license agreement of "Phoenix CARD Manager Plus".



## ROM adaptation kit

It is a tuning software for CARD-PC BIOS and easy to make following BIOS tuning and modification.

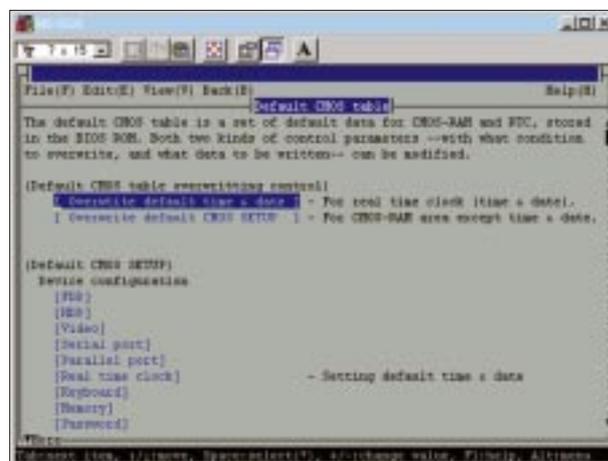
- Setting proper LCD parameter according to LCDs.
- Setting proper LCD parameter according to your system. This best fit BIOS can start at power on.
- Writing tuned BIOS or OS on Flash ROM in CARD-PC.
- Download (<http://www.epson.co.jp/epson/english/device/cardpc/cp-bios.htm>)

Since it is SEIKO EPSON owned BIOS, it can be customized to your applications.

Example of customization

- Special LCD panel support
- Modification of hardware initial routine

\*BIOS Customization requires of you some charge.



## ROM writer (DIO5302)

ROM writer writes tuned BIOS or application soft on FLASH ROM in CARD-PC.

Tuned BIOS is made by ROM Adaptation Kit  
When CARD-PC is frequently inserted/drawn (more than one thousand times), replaceable connector for ROM writer (DIO5312) is necessary.



# Accessory selection guide

## Card fixing plate

Fixing plate for CARD-PC

●SEK6675P01

Fixing plate for CARD-486HB/HBL

●SEK6676P01

Fixing plate for CARD-586



SEK6675P01



SEK6676P01

## Connector for EASI (SEK6669P01)

236 pin dedicated receiving connector for CARD-PC.



# Software supply

## Software support

SEIKO EPSON and its overseas affiliated companies (Epson Electronics America, Inc., Epson Europe Electronics GmbH) supply following softwares as sublicense.

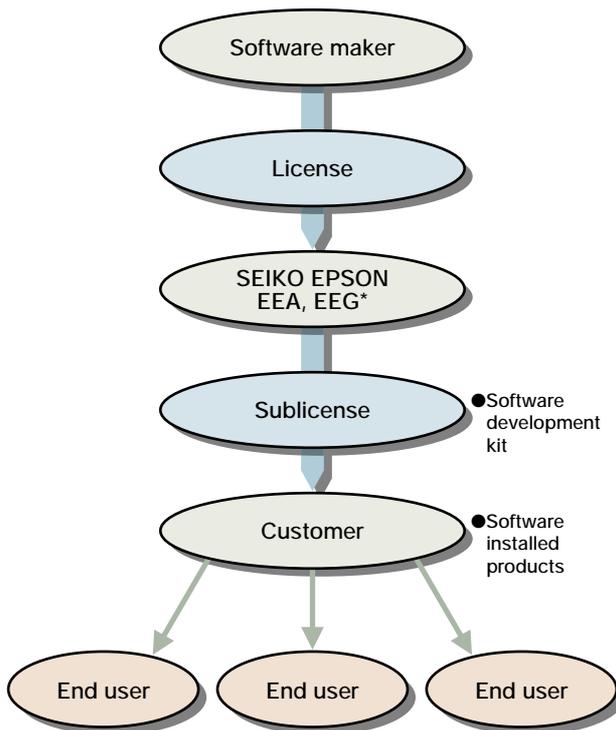
And we will offer OS of Microsoft Corporation which will be newly released in the future.

| Model name                               | Parts number<br>Development kit number  | Maker     | Contents*, language            |
|--|---|-----------|--------------------------------|
| MS-DOS® Ver.5.0                          | SEK0622B <sub>0A</sub><br>DIO5103/13*   | Microsoft | R/D, English                   |
| MS-DOS® Ver.6.22                         | SEK0623B <sub>0A</sub><br>DIO5123/33*   | Microsoft | R/D, English                   |
| Microsoft Windows® Ver.3.1               | SEK0625B <sub>0A</sub><br>DIO5153/63*   | Microsoft | R/D, English                   |
| Microsoft Windows® 95                    | SEK0631B <sub>0A</sub><br>DIO51B3   | Microsoft | D, English                     |
| Microsoft WindowsNT®<br>Workstation 3.51 | SEK0633B <sub>0A</sub><br>DIO51E3   | Microsoft | D, English                     |
| Microsoft WindowsNT®<br>Workstation 4.0  | SEK0644B <sub>0A</sub><br>DIO51G3   | Microsoft | D, English                     |
| Windows® CE                              | SEK0654B <sub>0A</sub> (Kernel)<br>SEK0653B <sub>0A</sub> (Limited)<br>SEK0652B <sub>0A</sub> (Full)<br>DIO51L3 | Microsoft | D, English                     |
| Phoenix CARD Manager Plus                | SEK0628B <sub>0A</sub><br>DIO5193   | Phoenix   | PCMCIA2.1 driver<br>D, English |

\*ROM version/DISK version

\*Device installed R : ROM version (ROM execution)  
D : DISK version (HDD, RAM DISK, etc)  
R/D : ROM and DISK version are identical.  
(Development tools are different)

You can construct and sell the software-installed product to end user.



\* EEA : Epson Electronics America, Inc. in U.S.A.  
EEG : Epson Europe Electronics GmbH in Germany

## OS, Software development kit

SEIKO EPSON offers development kit for each OS and software. It consists of Manuals, installation tool and original FD.  
(Contents differ according to the model)



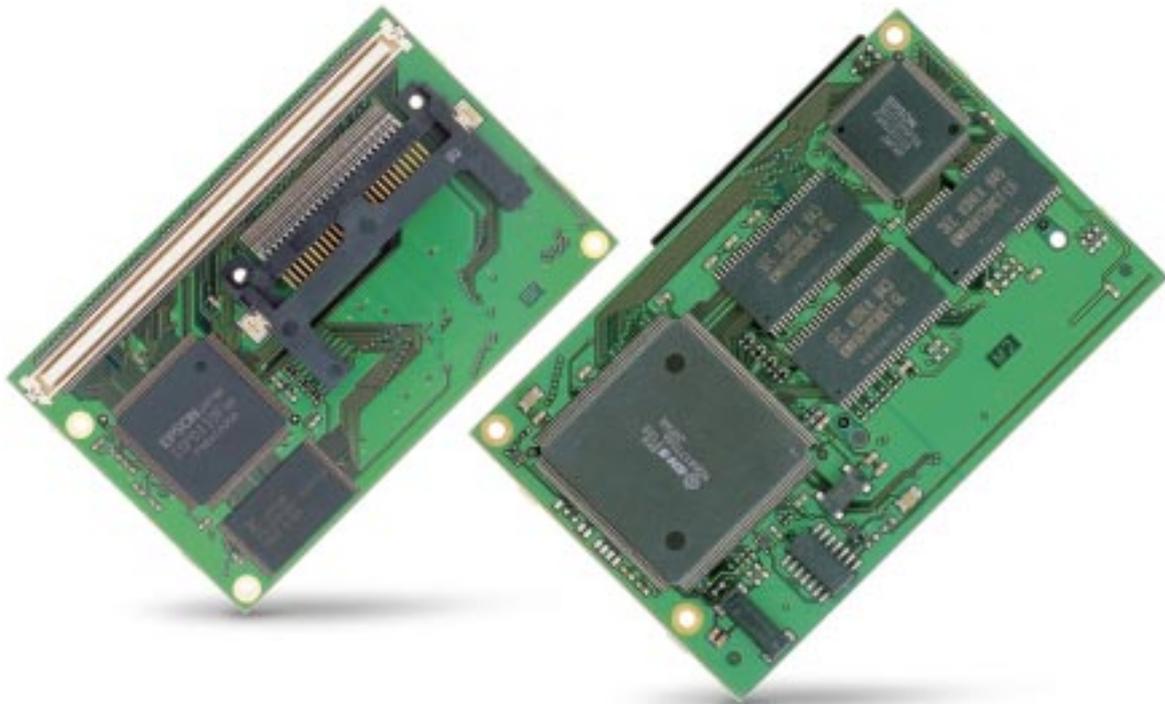
Development kit for MS-DOS Ver. 5.0 (DIO5103)

# SH-CARD

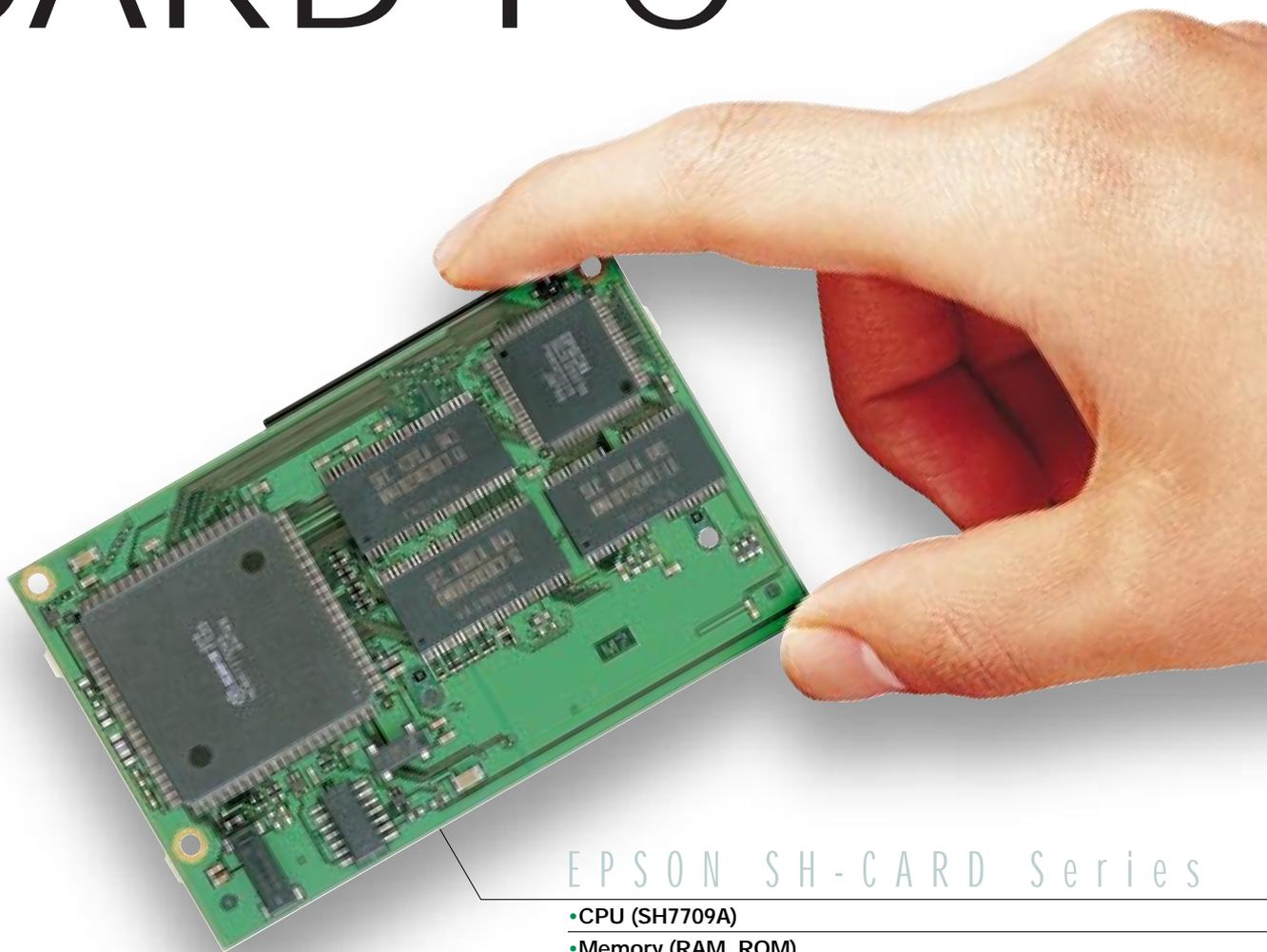
series

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CARD-E09A



# Brand New CARD-PC



## EPSON SH-CARD Series

- CPU (SH7709A)
- Memory (RAM, ROM)
- Keyboard Interface
- Mouse Interface
- Video Controller/VRAM
- Serial I/O Ports
- PCMCIA I/O Ports
- Parallel I/O Port
- A/D, D/A Port

### ●Features

▶ **Use of generic RISC CPU (SH-3)**

This module contains Hitachi's SH-3 processor, which has proved itself to be the best for real-life applications. It is now far easier to use a RISC system.

▶ **Windows<sup>®</sup> CE porting**

Released from the vital but time-consuming work of porting the OS itself, the developer can concentrate on developing applications.

▶ **Superlative total cost-performance**

Products can be released earlier, by reducing the development costs of both hardware and software and shortening the development cycle.

▶ **Flexible adjustment to OS size**

The use of CompactFlash<sup>™</sup> for storage enables flexible support of the resources required by the system. Setting information can be preserved by using dedicated utilities.

▶ **Lineup of evaluation tools**

The developer can start in on development immediately, because tools for developing SH-CARD products are already available from Seiko Epson.

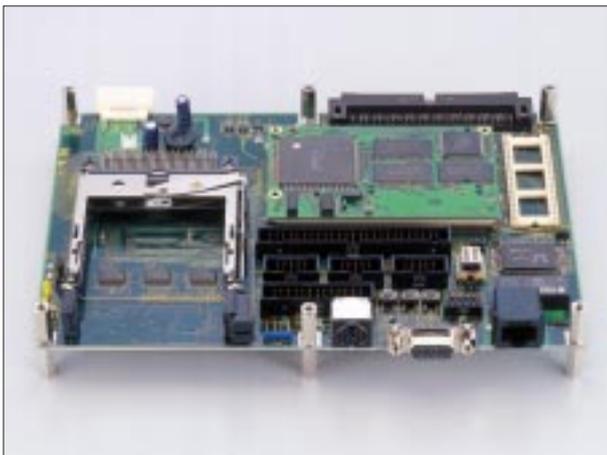
## Evaluation kit (SCE88J0X01)

### ■ Outline

This evaluation board comes complete with standard connectors for peripheral devices, all power circuitry, and Ethernet (10BASE-T) support-in fact, everything needed for evaluation with SH-CARD, which uses the SH37709A (SH-3), or the SCE8700C series (CARD-E09A).

### ■ Main Features

- 240-pin connector for connection to CARD-E09A
- Two PCMCIA slots
- ISH expansion bus (SH-bus, ISA-bus, etc.)
- 50-pin connector for LCD monitor and D-SUB 15-pin connector for CRT monitor
- MiniDIN connector for PS/2 mouse and keyboard
- Parallel interface
- Serial interface (16550-compatible, RS-232C): two channels
- Serial interface (SCI with internal SH, FIFO, RS-232C): one channel
- Serial interface (SCI with internal SH, without FIFO): one channel
- Serial interface for IrDA 1.0
- Ethernet (10BASE-T) interface
- Touch-panel connector
- Speaker connector
- PROM socket
- Backup battery

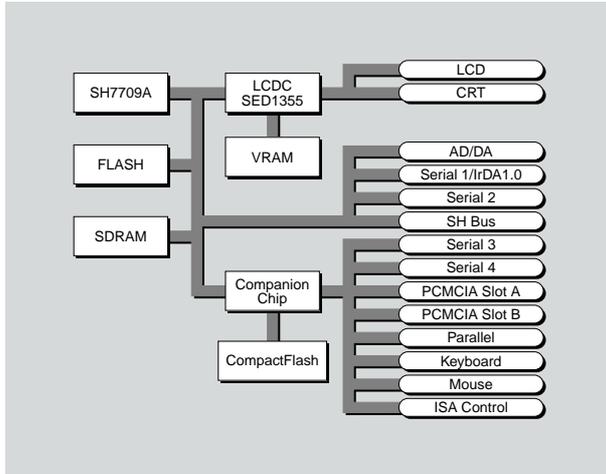


Evaluation Board



The complete kit

# Line up



## CARD-E09A



(CPU side)



(Connector side)

| Series name                          | CARD-E09A                 |
|--------------------------------------|---------------------------|
| Model name                           | SCE8700C01/02*            |
| CPU                                  | SH7709A                   |
| Frequency                            | 133MHz                    |
| RAM                                  | 16MB/32MB                 |
| LCD                                  | (Max.) 800×600, 64K color |
| CRT                                  | (Max.) 800×600, 64K color |
| Power management support             | Applicable                |
| Power consumption (During operation) | 0.88W/0.94W               |
| (Suspend mode)                       | 5mW/7mW                   |
| Dimensions                           | 86.6×55.0×11.5mm          |
| Operating temperature range          | Ta=0-60°C                 |

\* CompactFlash™ is not included.

## Software supply

SEIKO EPSON supplies the following operating systems as sublicense:

| Model name       | Parts number,<br>Development kit number | Maker     | Contents, Language                |
|------------------|---|-----------|-----------------------------------|
| Windows® CE      | SEK0654B0A<br>SCE88J4X01                | Microsoft | English, Kernel                   |
|                  | SEK0653B0A<br>SCE88J4X01                | Microsoft | English, Limited                  |
|                  | SEK0652B0A<br>SCE88J4X01                | Microsoft | English, Full                     |
| Platform builder | DIO51N3                                 | Microsoft | Windows® CE 2.11 platform builder |

The sublicense contract procedures are the same as those of EASI Series.

# Windows® CE development kit

## Outline of EPSON's Windows® CE Development Kit

The use of EPSON CARD-PCs (EASI Series or SH-CARD Series) makes this kit a shortcut to Windows® CE system development.

Microsoft has provided a Windows® CE platform builder for the development of Windows® CE applications. However, it is usually necessary to develop drivers and other software for the proposed hardware, before starting to develop a Windows® CE system itself. To develop such drivers and other software, the developer must have a strong background and plenty of experience in Windows® CE. (See Fig.1.)

With EPSON's Windows® CE development kit for CARD-PCs, all of the drivers and other software necessary for running Windows® CE are provided beforehand. This means that someone without high levels of know-how can start developing for Windows® CE. We also provide a wide range of expansion capabilities for dramatically improving the ease of use of Windows® CE. (See Fig.2.)

In addition, the developer can utilize systems that use existing CARD-PCs (EASI Series), as the hardware. In other words, existing systems can be used, making it possible to use the wide range of development tools for CARD-PCs to develop products reliably within a short time.

Use the EPSON utilities provided on the Development CD-ROM to construct Windows® CE applications rapidly.

## Flow of System development

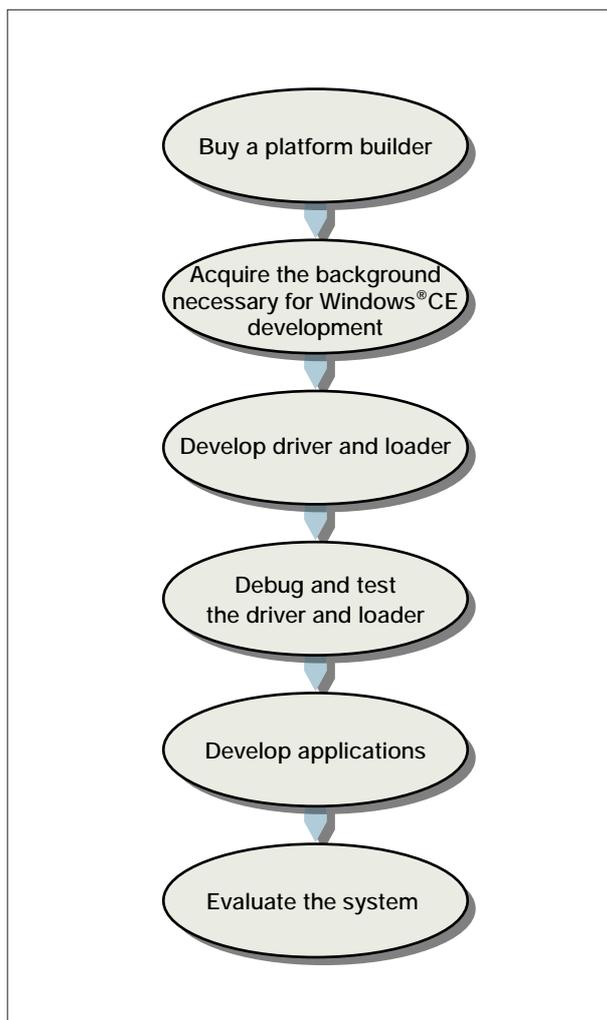


Fig. 1 Conventional Windows® CE System development

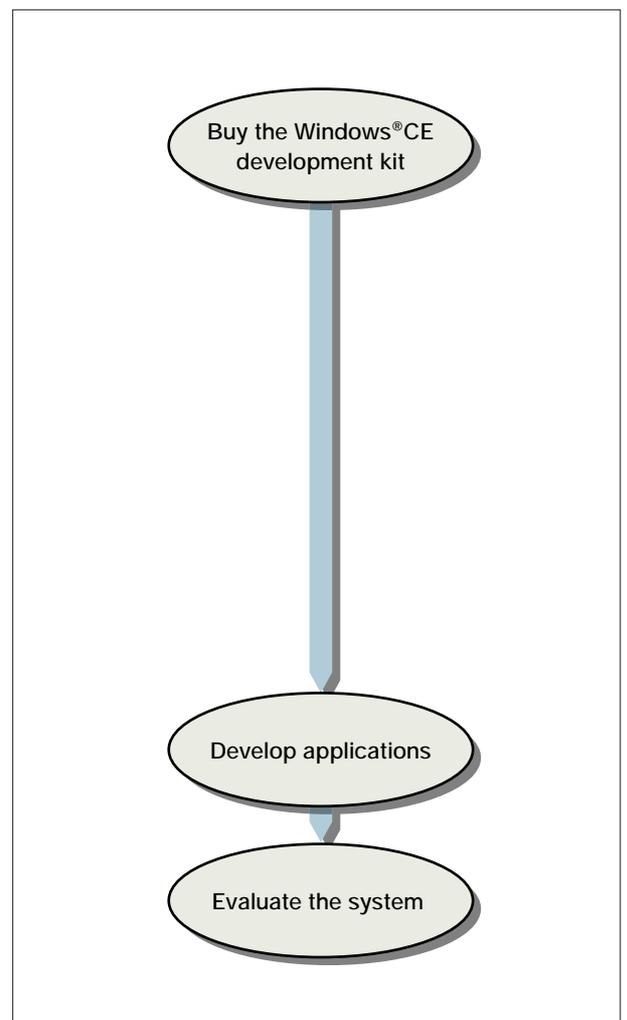


Fig. 2 Windows® CE development with CARD-PC

## Development kit for EASI Series (DIO51L3)

- Platform builder (1 License)
- Development kit CD
  - Device drivers
  - Debugging tool
  - EPSON utility software
- Cable (PPSH, Serial)
- Instruction manual
- License agreement



Windows® CE development kit (DIO51K3)

## Development kit for SH-CARD Series (SCE88J4X01)

- Platform builder (1 License)
- Development kit CD
  - Device drivers
  - Debugging tool
  - EPSON utility software
- Cable (PPSH, Serial)
- Instruction manual
- License agreement

## Expansion functions

- Adaptations for LCDs (TFT, STN) .... Changing LCDs and resolutions are done without Rebuild WCE.
- Data store when the power is off .... RAM contents can be stored to storage devices when power is off.
- LOGO display function.....Your company LOGO is displayed when Windows® CE is boot up.
- Development environment.....Applicable to monitoring function at the boot up, multi-boot, etc.

## Line up of development kit

| Model name | Language | Applicable Model      | Features   |
|------------|----------|-----------------------|--|
| DIO51L3    | English  | CARD-586              | Enables to construct a system with PC/AT architecture.           |
| SCE88J4X01 | English  | CARD-E09A             | Enables to construct a compact system of less power consumption. |
| DIO51N3    | English  | CARD-586<br>CARD-E09A | Windows® CE 2.11 Platform builder                                |

# ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.



Our concept of Energy Saving technology conserves resources by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter the greenhouse effect by reducing CO<sub>2</sub>, measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving technology developed by EPSON may appear insignificant, we seek to contribute to the development of energy-saving products by our customers through the utilization of our electronic devices. EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.

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