EPSON

● 32-bit RISC Microcontroller

CMOS

EPSON 32-bit RISC Single-Chip Microcomputer Family Delivers High Performance And Optimized Architecture For Embedded Applications. The first family device to be offered immediately is the E0C33A104 32-bit single chip Microcontroller featuring voice synthesis and voice recognition capabilities. The device incorporates the EPSON E0C33 CMOS RISC core. The internal MAC (multiplication and accumulation) provides DSP capabilities.

The E0C33A104 is an ideal one-chip solution for portable consumer electronics and voice applications such as handheld PCs, personal digital assistant, digital cameras, toys and automation products.

The E0C33A104 tool set includes an optimized C compiler, which allows faster coding and reducing time to market, and a full in-circuit emulator (ICE) development system.

● Specifications

Supply Voltage	3,0 V to 3,6 V
	4,5 V to 5,5 V
Internal RAM	6 KB
Clock timer	1 ch.
Programmable Timer	16 bit x 6 ch.
	8 bit x 4 ch.
10 bit A/D converter	Input 8 ch.
8 bit D/A converter	Output 2 ch.
I/O port	Input 13 bit, output 12 bit, I/O 15 bit
External bus	address 24 bit, data 16 bit, chip enable
	pin 7, direct connection to DRAM and Burst ROM
Interrupt controller	External: 6 types
	Internal: 39 types
Package	QFP5-128, die

The E0C33A104 and the E0C33 family of products is supported by EPSON's own ROS33, realtime OS, based on ulTron 3.0 (level S). ROS33 is royality-free and complete source code is available. Additionally, the E0C33A104 is backed by robust, linkable voice compression technology (VOX) which provides voice compression and decompression at high ratios.

Voice speed can also be changed from x2 to x1/4, and the voice pitch can be changed from x2 (high) to 1/3 (low). Speaking and listening capabilities are also included in the library.
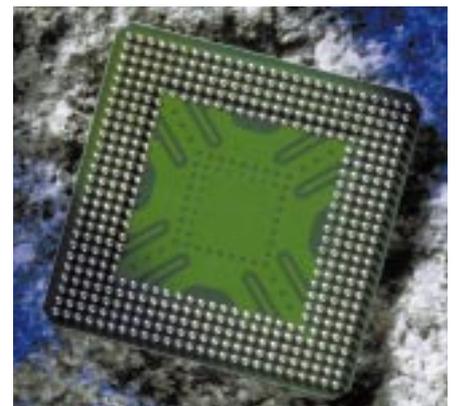
● EPSON Microprocessor based on SH3

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The E0C37109 is an Application-Specific Standard Product (ASSP) that contains Hitachi 32-bit RISC SH7709-compatible chip as the CPU. In addition to the existing peripheral functions of the SH7709, the chip has a built-in LCD controller compatible with EPSON SED1354 and incorporates various interface functions as companion functions such as PCMCIA, compact flash, keyboard and mouse, and ISA bus subset. These peripheral functions make it possible to configure an application system for portable information equipment using LCD or POS and other terminal equipment by adding only a few external circuits (e.g. memory and buffer). Furthermore, the low-power design of these devices helps to maximise the battery life of portable and mobile equipment. With all the functions necessary for embedded systems in portable information equipment, multimedia equipment, etc. integrated on a single chip, the E0C37109 is a 32-bit, single-chip RISC microcomputer with an excellent cost-performance ratio.
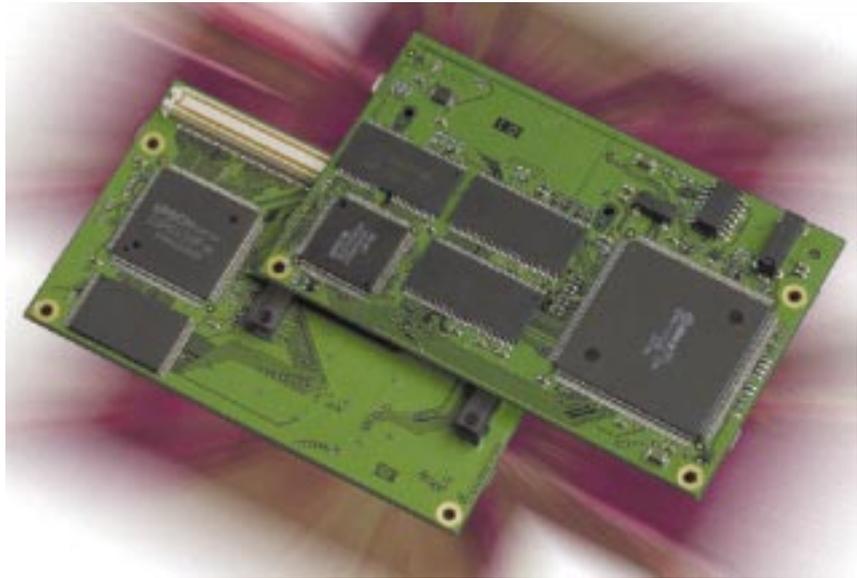
● Specifications

Power Supply	3.3 V± 0.3 V (5 V I/F for PCMCIA)
Operating Frequency	80 MHz max.
Package	T-BGA 420 pin (35 x 35 x 1.7 mm; 1.27 mm pitch)
Process	0.35 mm CMOS 3-layer metal
Others	LCD Controller SED 1354, PCMCIA Interface

EPSON SH-CARD for Windows® CE OS

A system solution with less than 1 W Power Consumption

For 10 years EPSON has provided technology, which based mainly on a x86 architecture. Today, a new product line based on the SH3 RISC processor is available, the EPSON SH-Card (see figure 1). The EPSON SH-CARD - or SCE8700C0x - is a card size product that provides full system integration: all necessary chipset and hardware is built into the SH-Card. A 240 pin connector is used as interface. The SH-Card integrates the 133 MHz Hitachi SH3 processor (SH7709A), an EPSON SED1355 video display controller, 2 MB video memory, a I/O controller companion chip, a synchronous DRAM memory (16 MB or 32 MB) and a connector of compact flash on the board.

The companion chip in the SH-Card provides additional serial ports, a parallel port, a keyboard-and-mouse port, a PCMCIA controller and an ISA-bus controller. An analog interface is also available. The SH-Card has a very low-power consumption rate: 1.8 V, 3.3 V or less than 1 W. In addition, board and software solutions are also available and provide total technical support. This development kit SCE88J0X01 includes an evaluation board, a bus extension board, a cable set, an AC power supply, a compactflash card with Windows® CE demo image, an ATA card and manuals.

The SH-Card is designed for Microsoft Windows® CE 2.11 applications outside the typical PC arena: handheld computing devices, portable medical equipment, portable measuring devices, network-connected equipment, data gathering systems and other portable devices which require low power consumption.

EPSON provides a Windows® CE 2.11 Development Kit for SH-CARD architecture (SCE88J4X01) as well. It includes all drivers for devices (video, mouse, serial communication, IDE, PCMCIA and Ethernet/NE2000), template drivers for ISA-Bus devices, sample demo program with Windows® CE image, EPSON Driver Installer and Loader. This EPSON Development Kit for SH-Card is one of the shortest ways to build up a Windows® CE system.

Specifications

CPU	Hitachi SH7709A (SH-3)
Frequency	133 MHz
Memory	RAM (16 or 32 MB) / Flash (256 KB)
Interface	SH-bus & ISA-bus
LCD/CRT	up to 800*600
Connector	240 pins
Dimensions (outside)	86.6*55.0*10.0 mm

Product Line

SCE8700C01	SH-Card 133 MHz at 16 MB
SCE8700C02	SH-Card 133 MHz at 32 MB
SCE88JOX01	Hardware development kit for SH-Card
SCE88J4X01	Windows® CE 2.11 development kit for SH-Card

SED13A0 Companion IC

The SED13A0 is the first companion chip offered by EPSON. The target market of the SED13A0 is the Windows®CE "Rapier" platform. Related to the requirements of "Rapier", the SED13A0 offers the following features:

The SED13A0 was designed in partnership with Toshiba America and Toshiba Japan.

Features

- Toshiba TX39xx processor interface
- embedded SED1375 LCDC includes 80 KB SRAM
- embedded Compact Flash Controller (support for two compact flash devices)
- embedded USB Controller
- embedded SmartMedia Controller

⬤ Flash Memory built into 0.35 µm ASIC !

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Flash memory is electronically erasable, non-volatile semiconductor memory, and is used for items such as flash memory cards that store data instead of on a hard disk for the PC field and the like.

We have made it possible to build in this flash memory as macro cells in our 0.35 µm process embedded array SSL50000 Series and standard cell SCB50000 Series. This not only makes it possible to have external EEPROM, OTP, mask ROM and ASIC in a single chip, but also realizes high speed access of systems as well as lower power consumption. Flash memory can also be programmed for each product, so you can develop high level general purpose LSIs.

⦿ Features

- Command type and pulse input type prepared for program/erase

- 4 Mbit Large capacity:
  Maximum 4 Mbit (command type),
  2 Mbit (pulse input type)

- 3.3 V single power supply
  (high voltage generating circuit built in)

- Low power consumption:
  10 µA (during standby)

⦿ Specifications

Program/erase interface	Pulse Input Type	Command Type
Memory size	64 K, 128 K, 256 K, 512 K, 1 M, 2 M	256 K, 512 K,1M, 2 M, 4 M
Chip erase time	100 ms (Typ.)	70 ms (Typ.)
Read access time	50 ns (Max.)	
Standby current	10 µA (Max.)	
Endurance time	1000 times (Min.)	
Data retention	10 years (Min.)	
Operating temperature	0 to 70 ˚C	

* 0.35 µm flash memory is under technical license from Silicon Storage Technology, Inc. of the U.S.

⬤ SMD Model of a 32 kHz Crystal Oscillator debuted
-SG-3032JC Series-

In response to the market demand for high-density mounting capability, the SMD (surface mount) type 32.768 kHz crystal oscillator SG-3032JC is appearing on the market.

While making high-density mounting possible with automatic equipment, the SG-3032JC makes it possible to ease the burdens of development because there is absolutely no need for troublesome circuit design such as frequency and circuit constant adjustments when using crystal units.

The SG-3032JC has been released at the end of July.

⦿ Features

- Compact SMD package with same shape as the SG-636
- Low operating voltage
- Frequency pre-adjusted

⦿ Applications

- PCs, OA equipment, etc.

⦿ Specifications

Output frequency	32.768 kHz
Frequency tolerance	5 ± 23 ppm* (at 25˚C)
Operating temperature	-20 to +70 ˚C
Operating voltage	1.8 to 3.6 V
External dimensions	10.5 x 5.8 x 2.7 (W x D x H mm : Max.)

*: Equivalent ±1 minuit per month.

◉ A new breakthrough in miniaturized Crystal Units

Out of the latest designs, EPSON's FC-255 is one of the smallest crystal units ever made. The FC-255 comes in a ceramic package with outer dimensions of only 5,0 x 1,9 x 0,9 mm. The extremely low profile makes it ideal for all applications where the crystal used to be a nuisance for designers as the highest component of their circuit. This crystal was developed after intensive research and design activities with extremely small tuning fork crystals, resulting in a unique coating technology for the crystal electrodes. This technology dramatically reduces the danger of electrode shorting, which is always inherent in the very small electrode structures on a tuning fork.

Reliability as well as yield are greatly enhanced due to this patented technology.

Like the previously released MC-146 in a plastic package, the MC-255 in its ceramic package is designed especially for portable equipment like cellular phones where small component height is important.

◉ Specifications

Frequencies	32.768 kHz
Operating temperature	-40 to +85°C
Serial resistance	65 kΩ
Frequency tolerance	± 10 ppm, ±20 ppm
Load capacity	7.0 pF
External dimensions	5.0 x 1.9 x 0.9 mm

◉ Lead-Free Activities Started

In recent years, it has been pointed out that with penetration into the soil of lead that has dissolved from solder of products that were not disposed of properly, due to the effect of acid rain, there is a possibility of contamination of underground water resources, and a movement has started to regulate the use of lead, with Europe at the center of this movement.

In response to this issue, Seiko Epson has inaugurated a Lead Free Promotion Committee, and with a goal of reducing lead solder gradually and then totally abolishing lead solder by the end of the fiscal year 2001, we have started activities throughout the whole company. At this point, we are focusing on printed board mounting processes which use a large volume of lead, and have started activities moving towa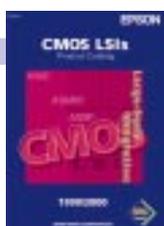rd total abolition of lead solder use. In terms of materials other than solder, we are also planning to move toward replacing lead with materials that do not contain lead while taking into consideration their functions and characteristics.

At Seiko Epson, based on new corporate General Environmental Policy (created in 1998), seven expert committees of "Environmental Products", "Energy Saving", "Zero Emissions", "Product Recycling", "Chemical Substance Control", "Green Purchasing", and the newly inaugurated "Lead-Free Promotion" are active for preservation of earth environment. "Co-existence with Nature" is an important theme for Seiko Epson.

Introduction of new catalogues

The following catalogues are available.

Please contact us.

ISO 14001

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