CF017-04

EPSON

LCD Controller

MobiLe Communication Display Controller

April / 2001

SEIKO EPSON CORPORATION

EPSON's LCD controllers, will lead the field in 21st century!

Worldwide

In the mid 1980s, we started to forcus on the LCD controller business, and we now supply many customers around the world.
We work in partnership with companies that produce CPUs, LCD panels, and operation systems (OS) and develop products to meet our customer's needs.

There are many fans for our LCD controllers all over the world.

Reliability

EPSON's LCD controllers are of high-quality and low power consumption, because they are produced with original architecture and utilize EPSON's energy-saving technology. They are designed to be compatible with many types of CPUs and LCD panels, so they can be used in many types of products. To achieve greater power saving and smaller chips, a VRAM embedded LCD controller designed to integrate video RAM is presently being developed. In the future, we plan to produce LCD controllers of IP (intellectual property) and to develop more powerful system LSIs.

The high-quality of EPSON's LCD controllers is well known around the world.

Up-to-date

In recent years, LCD panels have been utilized in all kinds electronic equipment, and developed to produce a variety of man-machine interface. These products always use their own hardware and software, so they are very different from personal computers designed on standard specifications. Therefore, as there is strong demand for the latest interface for many types of CPUs and LCD panels, we are always striving to develop new products to meet our customers' needs in a timely manner.

State-of-the art systems can be constructed with EPSON's LCD controllers.

Windows®CE

EPSON's LCD controller can be used in equipment operated by Windows® CE, which is the new OS supplied for consumers by Microsoft Corp. and used for H/PC (Hand held PC), P/PC (Palm-size PC), A/PC (Auto PC) and so on. EPSON is in partnership with Microsoft Corp., so we can supply not only LCD controllers but also device drivers for Windows® CE. This enables us to provide timely support when customers are developing a new product.

EPSON's LCD controllers can be used in equipment operated by Windows® CE.

LCD Controller

Line-up of Products

EPSON's LCD controllers are supplied to correspond with monochromatic and color LCD panels from small capacity to large capacity, as shown in the following tables. They can therefore be used for many applications.

LCD Controllers for Small Capacity

These LCD controllers are low power consumption products utilizing our own saving energy technology. They match to be used in operation panels, for example, smalle-sized portable, OA and FA equipments and so on.

Product (Previous number)		S1D13503 (SED1353)	S1D13704 (SED1374)	S1D13705 (SED1375)	S1D13706 (SED1376)
Features		Low Power Consumption Design	40KB built-in SRAM Hardware rotation	80KB built-in SRAM Hardware rotation	80KB built-in SRAM Hardware rotation
CPU I/F	SH3/SH4	No	Yes	Yes	Yes
	MC68K	Yes	Yes	Yes	Yes
	ISA Bus	Yes	Yes	Yes	Yes
	MIPS RISC	No	Yes	Yes	Yes
Available LCD Panels (maximum)	Monochrome	16tones (640×400)	16tones (320×240)	16tones (640×480)	64tones (320×240)
	Color (STN)	256colors (640×200)	256colors (240×160)	256colors (320×240)	64Kcolors (240×160)
	Color (TFT)	No	256colors (240×160)	256colors (320×240)	64Kcolors (240×160)
Power Voltage		2.7 to 5.5V	Core : 2.7 to 3.6V I/O : 2.7 to 5.5V	Core : 2.7 to 3.6V I/O : 2.7 to 5.5V	Core : 1.8 to 3.6V HIO : 1.8 to 3.6V NIO : 3.0 to 3.6V
Maximum Display Memory		128KB SRAM	40KB built-in SRAM	80KB built-in SRAM	80KB built-in SRAM
Packages		F0A : QFP5-100pin F1A : QFP15-100pin	QFP14-80pin	QFP14-80pin	F0A : TQFP15-100pin B0A : CFLGA-104pin

Large Capacity LCD Controllers

These LCD controllers are designed to be compatible with LCDs from small capacity to large capacity. As they correspond to the operating system of Windows® CE, they are used in H/PC (Hand held PC), A/PC (Auto PC) and so on.

Product (Previous number)		S1D13504 (SED1354)	S1D13505 (SED1355)	S1D13506 (SED1356)	S1D13806 (SED1386)
Features		High-resolution	Built-in RAMDAC Hardware rotation	Built-in RAMDAC Hardware rotation 2D Accelerator Ghost mode NTSC/PAL output	Built-in RAMDAC Hardware rotation 2D Accelerator Ghost mode 1280KB DRAM NTSC/PAL output
CPU I/F	SH3/SH4	Yes	Yes	Yes	Yes
	MC68K	Yes	Yes	Yes	Yes
	ISA Bus	Yes	Yes	Yes	Yes
	MIPS RISC	Yes	Yes	Yes	Yes
	ARM	No	Yes	Yes	Yes
	PowerPC	No	Yes	Yes	Yes
Available LCD Panels (maximum)	Monochrome	16tones (800×600)	16tones (800×600)	64tones (800×600)	64tones (800×600)
	Color (STN)	4K colors (800×600)	4K colors (800×600)	64K colors (800×600)	64K colors (800×600)
	Color (TFT)	64K colors (800×600)	64K colors (800×600)	64K colors (800×600)	64K colors (800×600)
	CRT	64K colors (800×600)	64K colors (800×600)	64K colors (800×600)	64K colors (800×600)
	Simultaneous display	Yes (CRT&LCD)	Yes (CRT&LCD)	Yes (CRTorTV&LCD)	Yes (CRTorTV&LCD)
Power Voltage		Core : 2.7 to 3.6V I/O : 2.7 to 5.5V	2.7 to 5.5V	2.7 to 5.5V	3.0 to 3.6V
Maximum Display Memory		2MB DRAM (EDO/FPM)	2MB DRAM (EDO/FPM)	2MB DRAM (EDO/FPM)	1280KB Built-in DRAM
Package		QFP15-128pin	QFP15-128pin	QFP15-128pin	QFP20-144pin

Target Applications

EPSON's LCD controllers are of high-quality and low power consumption, because they utilize original architecture based on the saving energy of Epson. Therefore, they can be used for many types of products including the products drove by the galvanic cell.

System Configuration Diagram

The LCD controllers can be easily connected to many types of CPUs and displayed on LCD panel and CRT monitor simultaneously. Also, they correspond to the hardware rotation and ghost mode.

Products Road Map

EPSON's LCD Controllers (LCDC) are lined up the middle or small capacitance type of LCDCs supported SRAM as using VRAM and the large capacitance type of LCDC supported DRAM. We are going to develop a built-in VRAM and embedded LCDC, and lower power consumption and minimized mounting space of embedded LCDCs will be produced.

Evaluation Circumstance

To evaluate all of EPSON's LCD controllers (LCDC), the evaluation board are supported to match the image on LCD panel or CRT monitor[1] used by customers. Customers can display an image data on their LCD panel or CRT monitor by only mounting the evaluation board on the ISA bus slot in the personal computer[2] and starting the utility software for each type of LCDC.

1. An image depends on each CRT monitor.
2. PC/AT compatible

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