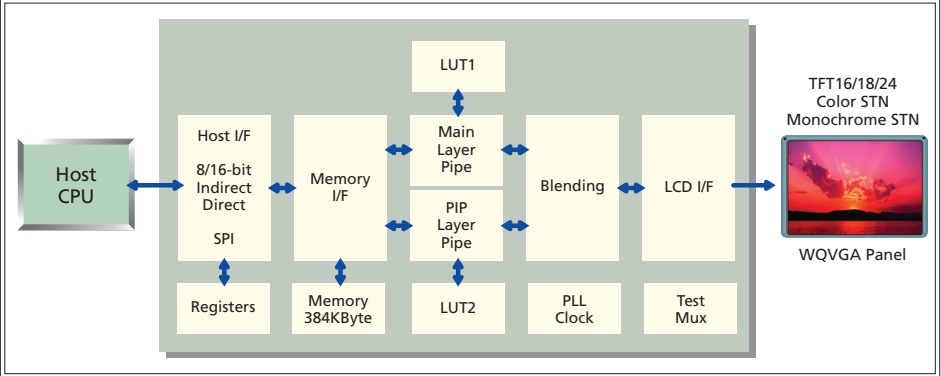


■ LCD Controller with Built-in VRAM

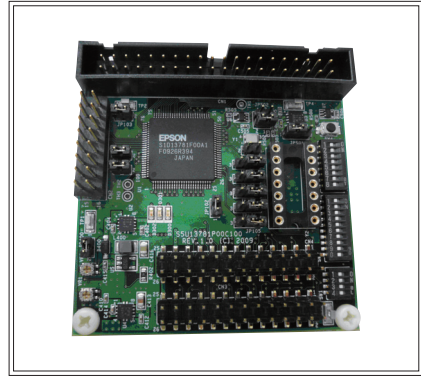
A single-chip LCD controller with built-in display memory allowing for low power consumption, low noise, and space-saving ability. This product is most suitable for the display control of mobile terminals and operation panels.

Product	CPU Interface Support	LCD Interface Support				Color Depth (Max.)	Internal Memory Capacity	Supply Voltage		Additional Features	Package
		Monochrome STN	Color STN	TFT	Typical Resolution			Core	IO		
S1D13700F02A	8-bit I/F, Direct addressing Indirect addressing	4-bit	n/a	n/a	QVGA	16 grayscale	32KB, SRAM	3.0V to 3.6V	3.0V to 5.5V	3 overlay screens	TQFP13-64
S1D13705F00A	8-bit I/F (with external logic) 16-bit I/F, Direct addressing	4-bit / 8-bit	4-bit / 8-bit	9-bit / 12-bit	QVGA	MSTN:16 grayscale CSTN:256 colors TFT:256 colors	80KB, SRAM	2.7V to 3.6V	2.7V to 5.5V	SwivelView	QFP14-80
S1D13706F00A	8-bit I/F(with external logic), 16-bit I/F, Direct addressing	4-bit / 8-bit	4-bit / 8-bit / 16-bit	9-bit / 12-bit / 18-bit	QVGA	MSTN:64 grayscale CSTN:64K colors TFT:64K colors	80KB, SRAM	1.8V to 3.6V	1.8V to 3.6V	SwivelView, PinP	TQFP15-100
S1D13742F01A	8-bit / 16-bit I/F Indirect addressing	n/a	n/a	18-bit	VGA	256K colors	768KB, SRAM	1.4V to 1.6V	1.65V to 3.60V	SwivelView	QFP20-144
S1D13743F00A	8-bit / 16-bit I/F Indirect addressing	n/a	n/a	18-bit / 18-bit	WQVGA	16M colors	464KB, SRAM	1.4V to 1.6V	1.65V to 3.60V	SwivelView	QFP20-144
S1D13748F00A S1D13748B00B	16-bit I/F, Indirect addressing	n/a	n/a	18-bit / 24-bit	WVGA	64K colors	1024KB, SRAM	1.35V to 1.65V	1.62V to 3.60V	PinP	QFP20-144 PFBGA10U-121
S1D13781F00A	8-bit / 16-bit I/F, Direct addressing Indirect addressing, SPI	4-bit / 8-bit	8-bit / 16-bit	16-bit / 18-bit / 24-bit	WQVGA	MSTN:64 grayscale CSTN:64K colors TFT:16M colors	384KB, SRAM	1.35V to 1.65V	1.62V to 3.60V	PinP, a-Blend, 2D BitBLT	QFP15-100
S1D13A04F00A B00B	8-bit I/F (with external logic) 16-bit I/F, Direct addressing	4-bit / 8-bit	4-bit / 8-bit / 16-bit	9-bit / 12-bit / 18-bit	QVGA	MSTN:64 grayscale CSTN:64K colors TFT:64K colors	160KB, SRAM	1.8V to 2.75V	3.0V to 3.6V	2D BitBLT, SwivelView, USB client 1.1	TQFP15-128 PFBGA10U-121
S1D13A05B00B	8-bit I/F (with external logic) 16-bit I/F, Direct addressing	4-bit / 8-bit	4-bit / 8-bit / 16-bit	9-bit / 12-bit / 18-bit	QVGA	MSTN:64 grayscale CSTN:64K colors TFT:64K colors	256KB, SRAM	1.8V to 2.75V	3.0V to 3.6V	2D BitBLT, SwivelView, USB client 1.1	PFBGA10U-121

■ S1D13781 Block Diagram



■ S1D13781 Evaluation Board (S5U13781P00C100)



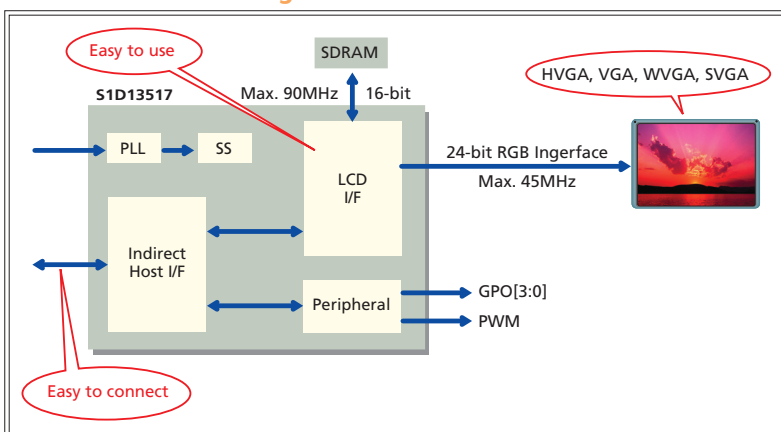
■ LCD Controller with External VRAM

An LCD controller for application in a wide range of small- to large-size panel types.

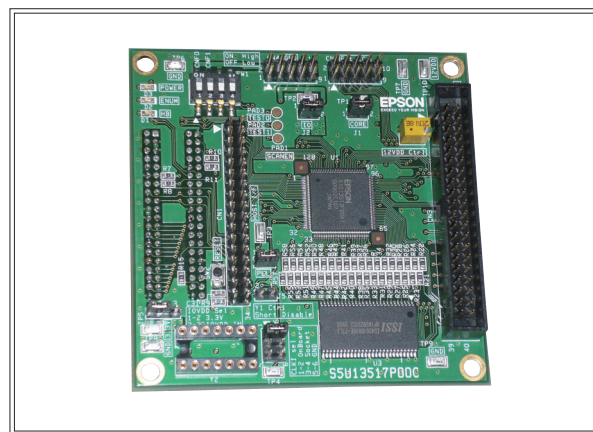
This product is most suitable for the display control of OA or FA equipment operation panels as well as for in-vehicle devices.

Product	CPU Interface Support	LCD Interface Support				Color Depth (Max.)	External Memory Capacity	Supply Voltage		Additional Features	Package
		Monochrome STN	Color STN	TFT	Typical Resolution			Core	IO		
S1D13505F00A	8-bit / 16-bit I/F Direct addressing	4-bit / 8-bit	4-bit / 8-bit / 16-bit	9-bit / 12-bit / 18-bit	VGA	MSTN:16 grayscale CSTN:4K colors TFT:64K colors	Up to 2MB EDO-RAM	2.7V to 5.5V	2.7V to 5.5V	CRT support	QFP15-128
S1D13506F00A	8-bit / 16-bit I/F Direct addressing	4-bit / 8-bit	4-bit / 8-bit / 16-bit	9-bit / 12-bit / 18-bit	VGA	MSTN:64 grayscale CSTN:64K colors TFT:64K colors	Up to 2MB EDO-RAM	2.7V to 5.5V	2.7V to 5.5V	CRT or NTSC/ PAL support, 2D BitBLT	QFP15-128
S1D13513F01A	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F	8-bit	8-bit	18-bit	VGA	MSTN:64 grayscale CSTN:256K colors TFT:256K colors	Up to 16MB SDRAM	1.65V to 1.95V	3.0V to 3.6V	2D Sprite, 2D BitBLT	QFP22-208
S1D13513B01B	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F	8-bit	8-bit	18-bit / 24-bit	VGA	MSTN:64 grayscale CSTN:256K colors TFT:16M colors	Up to 16MB SDRAM	1.65V to 1.95V	3.0V to 3.6V	2D Sprite, 2D BitBLT	PBGA1UC256
S1D13515F00A B00B	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F	n/a	n/a	18-bit / 24-bit	XGA	16M colors	Up to 64MB SDRAM	1.65V to 1.95V	3.0V to 3.6V	Prewarping Embedded RISC CPU	QFP22-256 PBGA1UC256
S1D13517F00A	8-bit / 16-bit I/F Indirect addressing	n/a	n/a	18-bit / 24-bit	SVGA	16M colors	Up to 16MB SDRAM	2.3V to 2.7V	3.0V to 3.6V	PinP α -Blend	QFP15-128

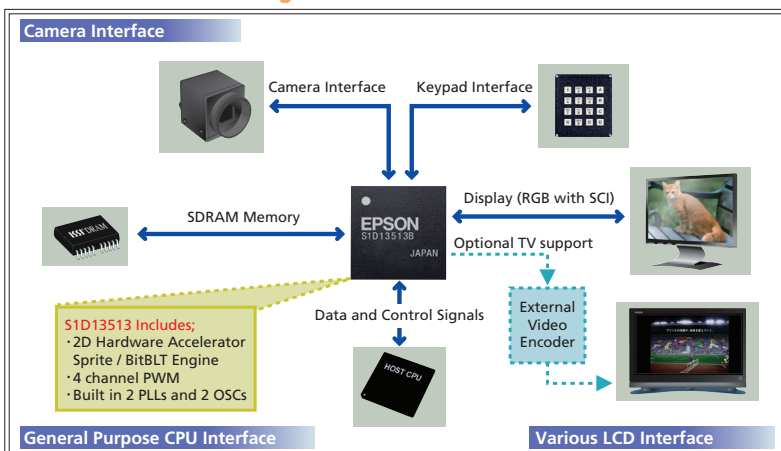
■ S1D13517 Block Diagram



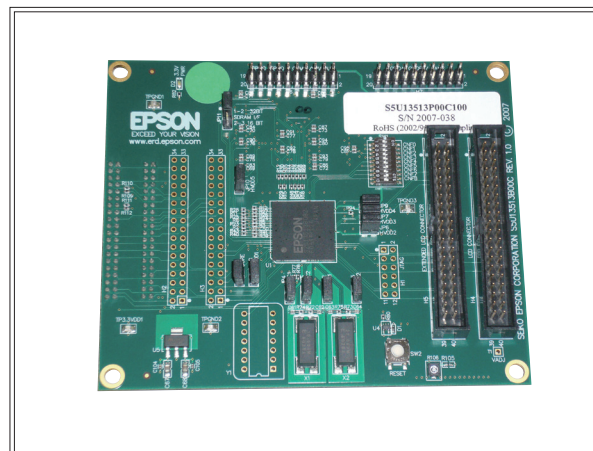
■ S1D13517 Evaluation Board (S5U13517P00C100)



■ S1D13513 Block Diagram



■ S1D13513 Evaluation Board (S5U13513P00C100)



■ LCD Controller Supporting Camera Interface

With the installation of a camera interface, this LCD controller can display camera images on the panel without placing load on the CPU. This product is most suitable for the display control of a wide variety of applications such as mobile terminals and security devices.

Product	CPU Interface Support	LCD Interface Support		Color Depth (Max.)	Internal Memory Capacity	External Memory Capacity	Camera (pixel)	JPEG Codec	Supply Voltage		Additional Features	Package
		TFT	Typical Resolution						Core	IO		
S1D13513F01A	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F	18-bit	VGA	MSTN:64 grayscale CSTN:256K colors TFT:256K colors	0	Up to 16MB SDRAM	0.3MP	n/a	1.65V to 1.95V	3.0V to 3.6V	2D Sprite, 2D BitBLT	QFP22-208
S1D13513B01B	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F	18-bit / 24-bit	VGA	MSTN:64 grayscale CSTN:256K colors TFT:16M colors	0	Up to 64MB SDRAM	0.3MP	n/a	1.65V to 1.95V	3.0V to 3.6V	2D Sprite, 2D BitBLT	PBGA1UC256
S1D13515F00A B00B	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F	18-bit / 24-bit	XGA	16M colors	0	Up to 64MB SDRAM	0.3MP	n/a	1.65V to 1.95V	3.0V to 3.6V	Prewarping Embedded RISC CPU	QFP22-256 PBGA1UC256
S1D13717F00A B00B	16-bit I/F, Direct addressing, Indirect addressing, Serial port I/F for LCD	18-bit	176x 220	64K colors	224KB, SRAM	n/a	0.3MP	Encode/Decode	1.65V to 1.95V	2.75V to 3.25V	SD memory card I/F	QFP21-176 PFBGA12U-180
S1D13715F01A B00B	16-bit I/F, Direct addressing, Indirect addressing, Serial port I/F for LCD	18-bit / 24-bit	QVGA	16M colors	320KB, SRAM	n/a	1.3MP	Encode/Decode	1.65V to 1.95V	2.75V to 3.25V	2D BitBLT, SwivelView	QFP21-176 PFBGA10U-160
S1D13719B00B	16-bit I/F, Direct addressing, Indirect addressing	18-bit / 24-bit	QVGA	16M colors	512KB, SRAM	n/a	2.0MP	Encode/Decode	1.65V to 1.95V	2.30V to 3.25V	2D BitBLT, SwivelView, SD memory card I/F	PFBGA10U-180

■ In-vehicle LCD Controller

In our line-up of display controller products, this controller complies with in-vehicle quality.

Product	CPU Interface Support	LCD Interface Support				Color Depth (Max.)	Internal Memory Capacity	External Memory Capacity	Camera (pixel)	JPEG Codec	Supply Voltage		Temperature Range	Additional features	Package
		Monochrome STN	Color STN	TFT	Typical Resolution						Core	IO			
S2D13513F01A	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F,	8-bit	8-bit	18-bit	VGA	64 grayscale 256K colors	0	Up to 16MB SDRAM	0.3MP	n/a	1.65V to 1.95V	3.0V to 3.6V	-40 to +105°C	2D Sprite, 2D BitBLT	QFP22-208
S2D13513B01B	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F,	8-bit	8-bit	18-bit / 24-bit	VGA	64 grayscale 16M colors	0	Up to 64MB SDRAM	0.3MP	n/a	1.65V to 1.95V	3.0V to 3.6V	-40 to +105°C	2D Sprite, 2D BitBLT	PBGA1UC256
S2D13515F00A B00B	16-bit I/F, Direct addressing, Indirect addressing, Serial I/F,	n/a	n/a	18-bit / 24-bit	XGA	16M colors	0	Up to 64MB SDRAM	0.3MP	n/a	1.65V to 1.95V	3.0V to 3.6V	-40 to +105°C	Prewarping Embedded RISC CPU	QFP22-256 PBGA1UC256
S2D13719F00A	16-bit I/F, Direct addressing, Indirect addressing	n/a	n/a	18-bit / 24-bit	QVGA	16M colors	512KB, SRAM	n/a	2.0MP	Encode/Decode	1.65V to 1.95V	2.3V to 3.6V	-40 to +105°C	2D BitBLT, SwivelView, SD memory card I/F	QFP22-208

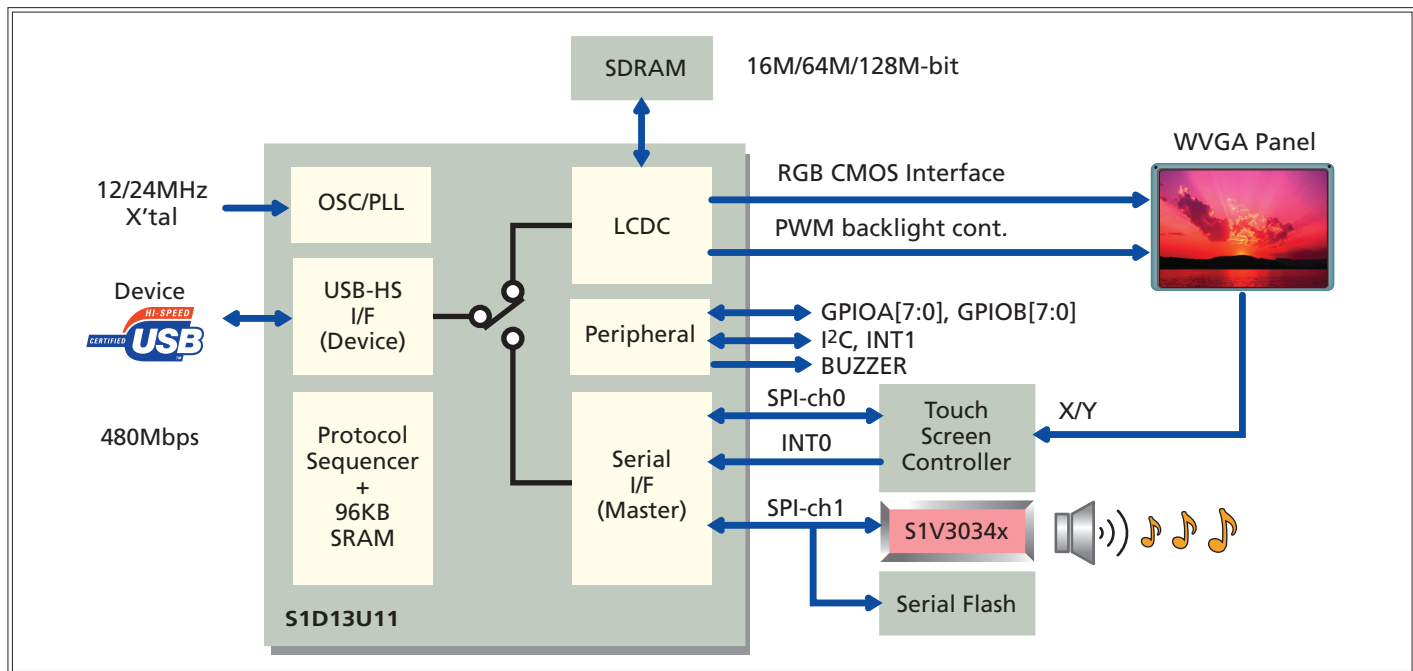
■ USB Interface LCD Controller

An LCD controller allowing for reception of display data and transmission of touch-screen coordinate data at high speed via USB2.0-HS.

Most suitable for application to OA equipment such as multi-functional printers with long lengths of cabling between the host CPU and LCD panel, and to in-vehicle devices such as rear entertainment displays.

Product	CPU Interface Support	LCD Interface Support				Color Depth (Max.)	Internal Memory Capacity	External Memory Capacity	Supply Voltage		Additional Features	Package
		Monochrome STN	Color STN	TFT	Typical Resolution				Core	IO		
S1D13U11F00A	USB2.0 HS	n/a	n/a	18-bit / 24-bit	SVGA	16M colors	0	Up to 16MB SDRAM	1.65V to 1.95V	3.0V to 3.6V	PinP α-Blend	QFP20-144

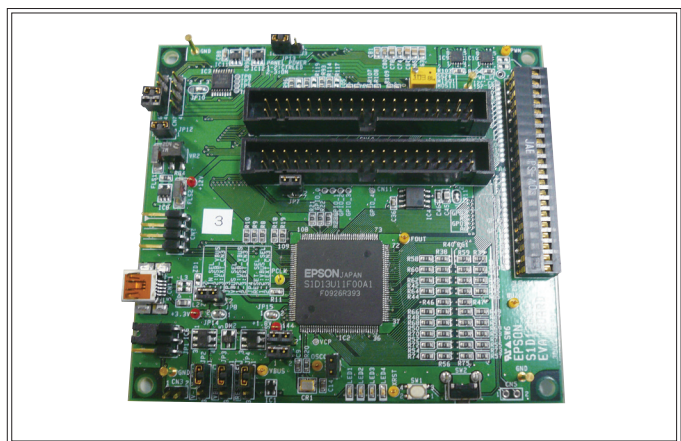
■ S1D13U11 Block Diagram



■ S1D13U11 Evaluation Board (S5U13U11P10C100)



■ S1D13U11 Evaluation Board (S5U13U11P00C100)

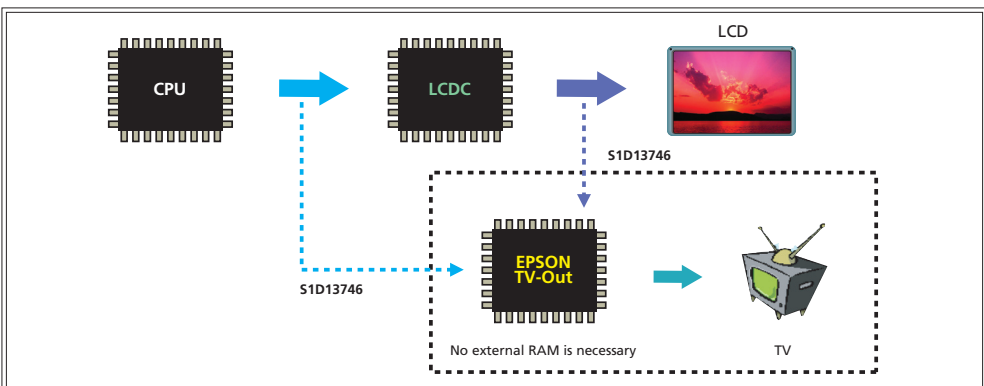


Video Encoder

A video encoder with built-in VRAM, able to be connected directly with the host CPU bus and TFT panel interface. This product is most suitable for various applications that display images on televisions, because it supports a wide array of input formats and complies with NTSC/PAL standards.

Product	CPU Interface Support	TV Output	TV Standard	Input Data Format		Internal Memory Capacity	External Memory Capacity	Supply Voltage			Additional Features	Package
				RGB	YUV			Core	IO	DAC		
S1D13506F00A	8-bit / 16-bit I/F Direct addressing	Composite / S-video	PAL NTSC	5:6:5 8bpp 4bpp	n/a	0	Up to 2MB EDO-RAM	2.7V to 5.5V	2.7V to 5.5V	2.7V to 5.5V	LCD support 2D BitBLT	QFP15-128
S1D13746F01A B01B	8-bit / 16-bit I/F Direct addressing, Serial I/F (only for register access)	Composite / S-video	PAL: B, D, G, H, I, M, N, Nc NTSC: M, J	8:8:8 6:6:6 5:6:5 3:3:2	4:2:2 4:2:0	312KB, SRAM	n/a	1.35V to 1.65V	1.62V to 3.6V	2.7V to 3.3V	SwivelView, Image Enhancement Engine	QFP15-128 PFBGA7U-100

S1D13746 System Block Diagram



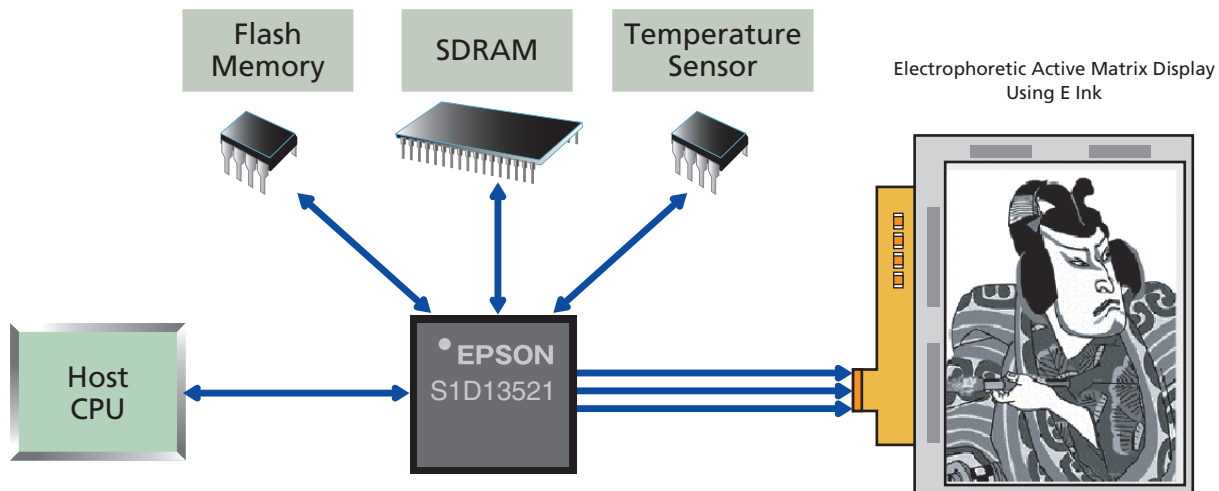
■ EPD Controller

A controller IC dedicated to the electronic paper product from E Ink Corporation.

This is an epoch-making product equipped with an architecture that maximizes the characteristics of electronic paper, allowing for pen input, text input, and other features that have thus far been difficult to achieve.

Product	CPU Interface Support	Built-in Memory	External Memory	Maximum Resolution	Grayscale	Supply Voltage		Additional Features	Package
						Core	IO		
S1D13521B01B	16-bit I/F Indirect addressing	-	SDRAM I/F (for frame buffer)	4096 x 4096	2/3/4/5bpp	1.65V to 1.95V	1.65V to 1.95V 2.70V to 3.60V	16 area partial update	PFBGA8U-181 PFBGA12U-180
S1D13522A00B	16-bit I/F Indirect addressing or Serial I/F	2MB	-	1024 x 768	2/3/4bpp	1.65V to 1.95V	1.65V to 3.60V	15 area partial update, Picture in Picture with Transparency	PFBGA10U-144
S1D13524B01B	16-bit TFT I/F, 16-bit I/F Indirect addressing or Serial I/F	-	Mobile DDR I/F (For frame buffer)	2560 x 2048	Color:RGB565 Gray Scale: to 4bpp	1.40V to 1.60V	1.65V to 3.60V	Color Processor, 15 area partial update	PFBGA11UK-241

■ S1D13521 System Block Diagram



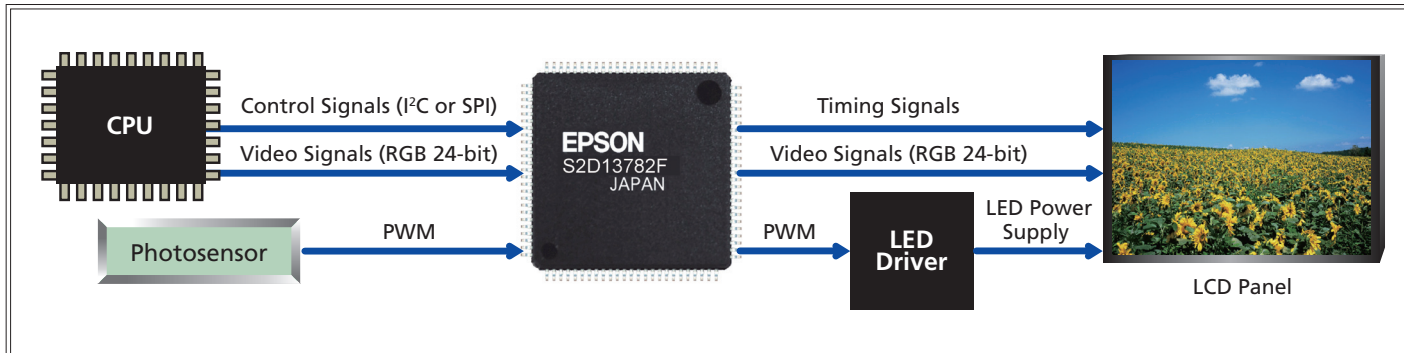
■ Image Enhancement IC

This is the image correction IC, which has been developed based on the Epson's unique image enhancement technologies, for medium- and small-size liquid crystal display panels.

The Epson's image correction technologies, developed for cellular phone display controllers, have been improved to the Auto Movie Enhancement 2 Extended (AME2EX) technologies. They can realize both the small power consumption of LCD panel and the colorful image display.

Product	Supported CPU Interface	Image I/O Format	Operating Temperature	Power Voltage		Package
				Core	IO	
S2D13782F00A	I ² C SPI (3 or 4-wired)	RGB-16-bit/18-bit/24-bit, YUV-16-bit,YUV-8-bit (ITU-R BT.656)	-40 to +105°C	1.65V to 1.95V	1.65V to 1.95V 3.0V to 3.6V	QFP15-100

■ S2D13782 System Configuration Example



■ Image Expression Enhancement Examples

The AME2EX technologies can reduce the backlight power consumption but enhance the texture and vividness of dark picture.



Before Correction (at 100% Backlight Level)

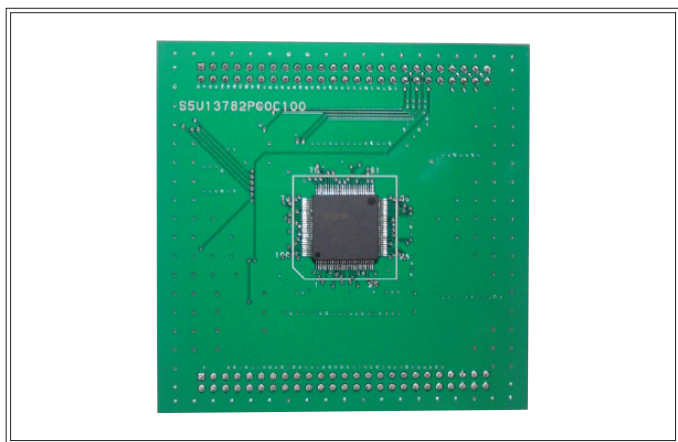


Before Correction (at 50% backlight level)

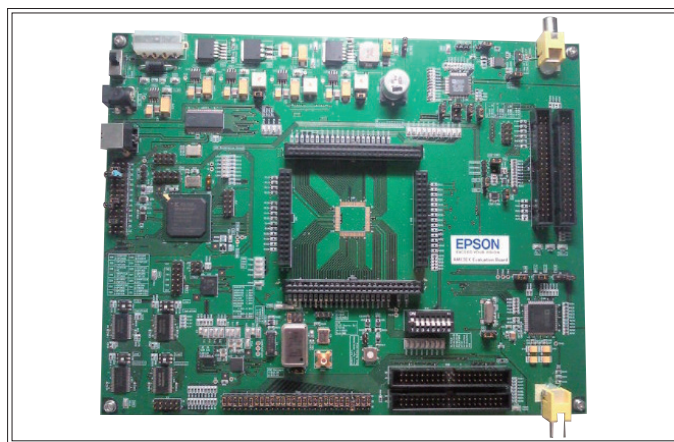


After Correction (at 50% Backlight Level)

■ S2D13782 Evaluation Board (S5U13782P00C100)



■ S2D13782 Motherboard (S5U13A00P00C100)



■ In-vehicle Multi-Camera Interface IC

An interface IC that synthesizes input images from multi-channel analog cameras and outputs the images.

This product complies with in-vehicle quality requirements. Most suitable for security-related applications such as monitoring cameras and in-vehicle camera systems.

Product	Host CPU Interface	Function	Temperature Range	Supply Voltage		Package
				Core	IO / Analog	
S2D13P04F00A S2D13P04B00B	I ² C SPI	Including four channels of NTSC/PAL decoders 8-bit digital output (supporting ITU-R BT656) Equipped with multi-image synthesis mode Distortion correction function	-40°C to +85°C	1.65V to 1.95V	3.0V to 3.6V	QFP15-100 PFBGA10U-121
S2S65P10F00A	I ² C	Camera I/F x 4 I/P converter Image synthesis / Automatic change	-40°C to +105°C	1.65V to 1.95V	2.4V to 3.6V	QFP15-100