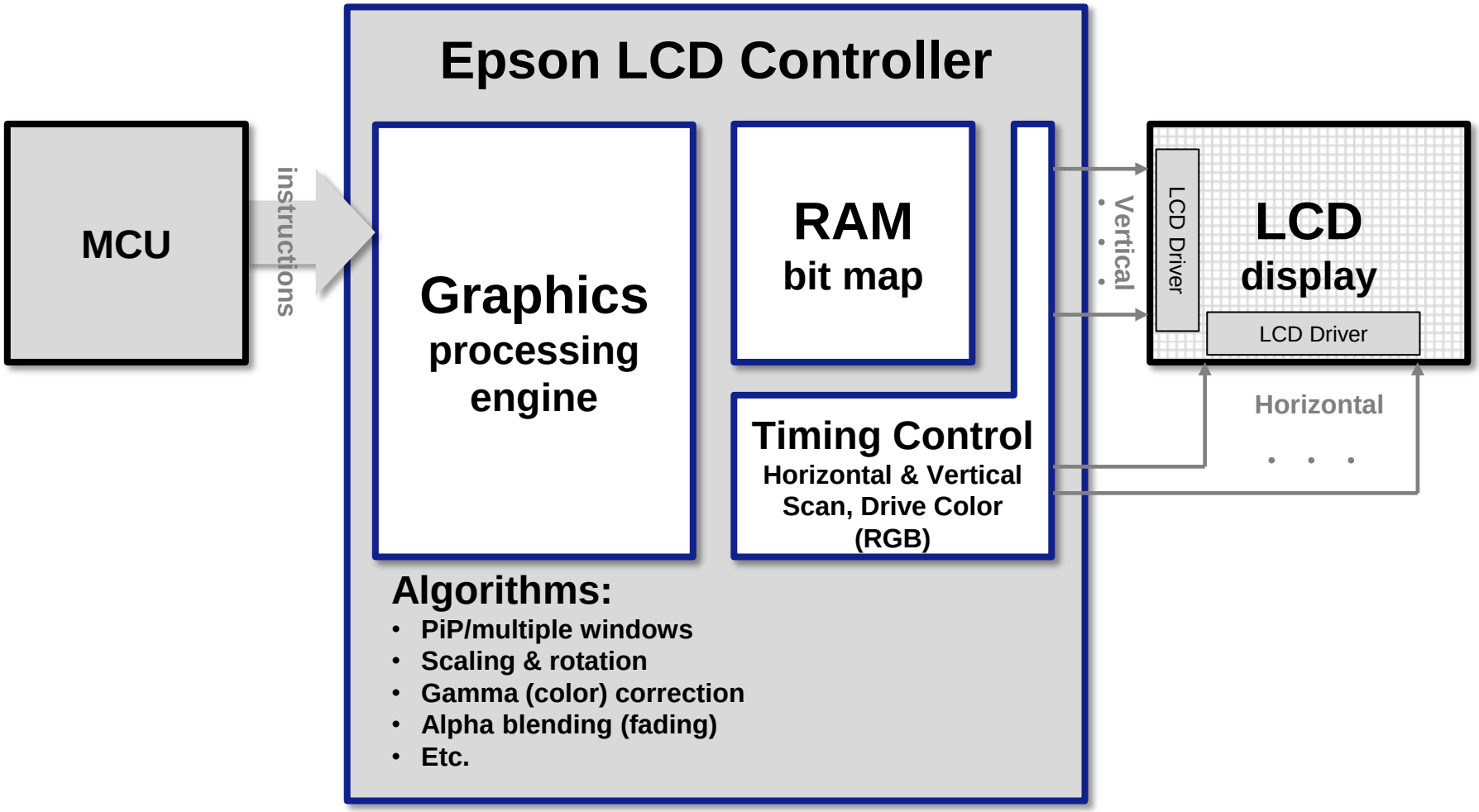
EPSON
EXCEED YOUR VISION

EPSON LCD Controller

revolutionizes mid-sized displays

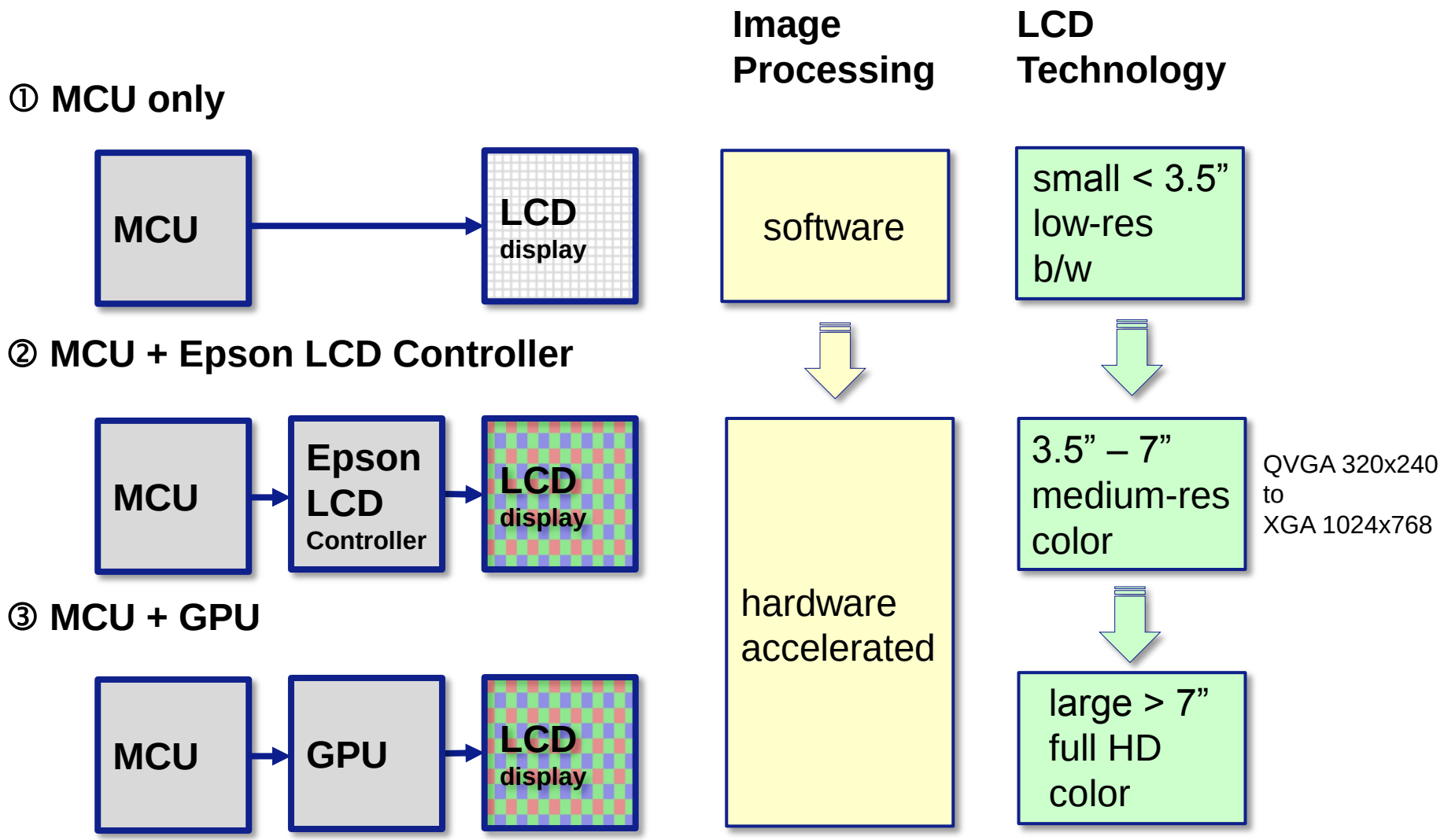
What is a LCD Controller?



An LCDC receives an image (bitmap) to be displayed from the host CPU as input. It outputs the image data and timing signals to the LCD module, in the format and with the data rate required by the LCD module. The data rate is determined by the frame rate (also called refresh rate) of the LCD module.

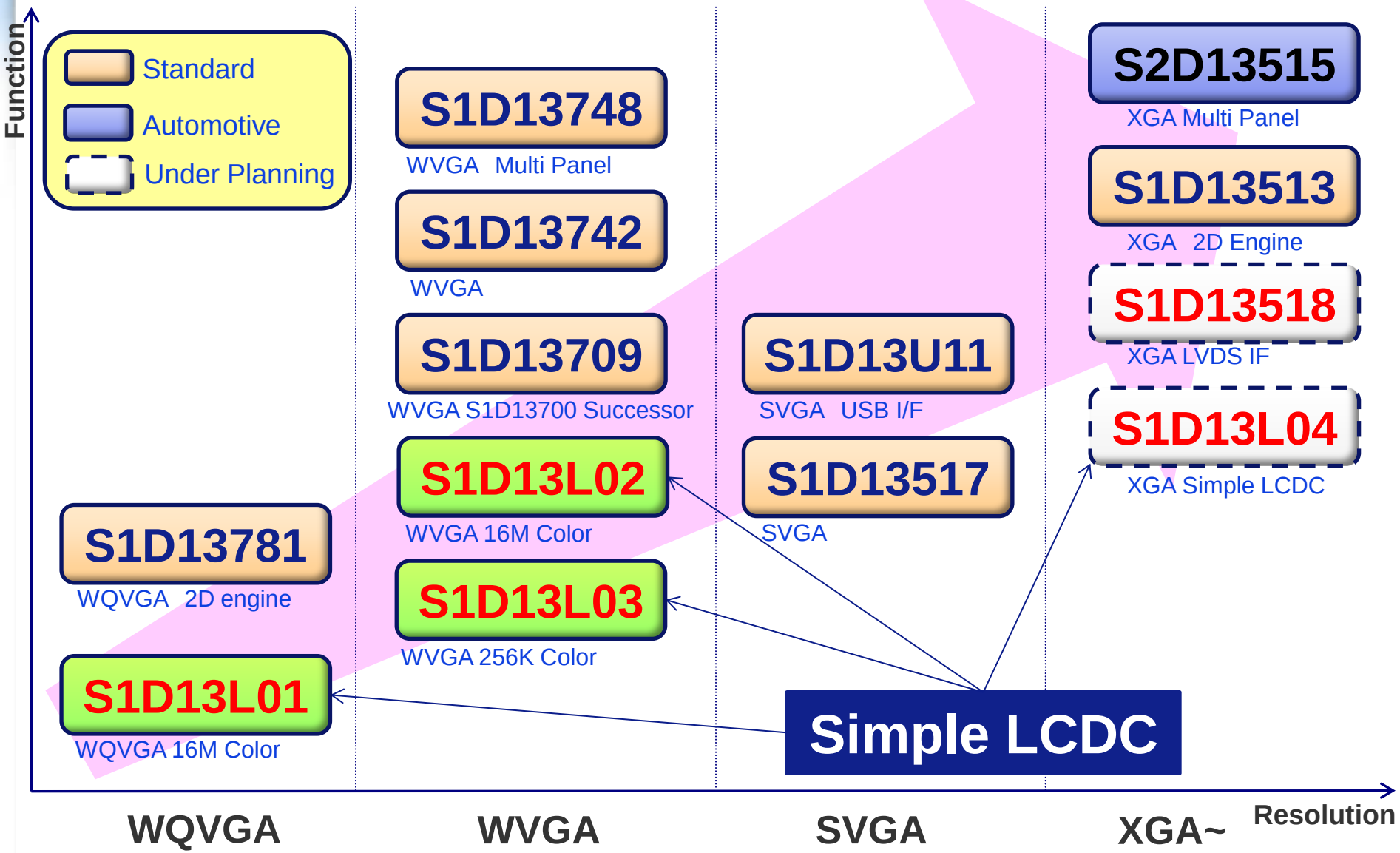
Where do we fit in the market?

EPSON
EXCEED YOUR VISION



Epson’s LCD Controller brings graphics acceleration to mid-sized color displays.

Latest Product Line-up



Display Features - Embedded SRAM type

~WVGA

Features	S1D13L01	S1D13781	S1D13L02	S1D13748	S1D13L03	S1D13742	S1D13709
Panel	TFT	STN/TFT	TFT	TFT	TFT	TFT	STN/TFT
Colors (Max.)	24bpp(WQVGA) 8bpp(WVGA)	24bpp(WQVGA) 8bpp(WVGA)	16bpp	16bpp	16bpp(WVGA) 18bpp(VGA)	16bpp(WVGA) 18bpp(VGA)	4bpp(HQVGA)* 1bpp(HVGA)*
Multi-Window (Layers)	2	2	3	3	-	-	3
Rotation	90˚	90˚	90˚ Mirror***	90˚ Mirror***	-	90˚ Mirror	-
Gamma LUT	✔	✔	✔	✔	✔	✔	-
Pixel Doubling	-	-	Doubling	Doubling	Doubling Halving	Doubling Halving	-
Scaling	-	-	x1/8 ~ x8	x1/8 ~ x8	-	-	x1~WVGA**
Alpha Blending	✔	✔	✔	✔	-	-	-
Transparency	✔	✔	✔	✔	-	-	-
Pseudo Color Expansion	-	-	✔	✔	-	-	-
Others	-	BitBLT****	-	YUV input	-	-	CG-ROM

* 4bpp(WVGA) for TFT
** Only for TFT
*** Only at Host Writing
**** Move(Color Expansion) and Solid Fill

Display Features - External SDRAM type

~ XGA

Features	S1D13517	S1D13U11	S1D13513	S1D13L04**	S1D13518**
Panel	TFT	TFT	STN/TFT	TFT	TFT
Colors (Max.)	24bpp(SVGA)	24bpp(SVGA)	24bpp(XGA)	24bpp(XGA)	24bpp(XGA)
Multi-Window (Layers)	3	3	3	3	3
Rotation	180˚,Mirror*	180˚,Mirror*	180˚,Mirror	180˚,Mirror	90˚,Mirror
Gamma LUT	-	-	✔	✔	✔
Pixel Doubling	-	-	-	-	Doubling
Scaling	-	-	-	-	x1/8 ~ x8
Alpha Blending	✔	✔	✔	✔	✔
Transparency	✔	✔	✔	✔	✔
Scroll	✔	✔	✔	✔	✔
Pseudo Color Expansion	-	-	✔	✔	✔
Others	-	USB host I/F	BitBLT***, Spite****	-	LVDS panel I/F

* Only at Host Writing
** Under Planning
*** Write, Read, Solid Fill, Move, Pattern Fill
**** 16 objects, Transparent, Alpha Blending, Arbitrary Rotation

Features of product under planning

EPSON
EXCEED YOUR VISION

	Features	S1D13L04	S1D13518
Display	**Resolution**	~ XGA	~ XGA
	Multi-Window (Layers)	3	3
	Rotation	180˚,Mirror	90˚,Mirror
	Gamma LUT	✔	✔
	Pixel Doubling	-	Doubling
	Scaling	-	x1/8 ~ x8
	Alpha Blending	✔	✔
	Transparency	✔	✔
	Scroll	✔	✔
	Pseudo Color Expansion	✔	✔
Peripherals	**GPIO**	24 pins	24 pins
Host IF	**Serial host IF**	✔	-
	Direct /Indirect parallel host IF	16-bit	16-bit
Panel IF	**RGB digital panel IF**	✔	-
	LVDS panel IF	-	✔
Memory	**External SDRAM capacity**	16MB	16MB
Package	**Package**	QFP	QFP

Target Application

- Medical Devices
  - Handheld & Portable
  - Patient Monitors
  - Defibrillators
  - Insulin Pumps
- Factory Automation
  - Timers & Process Control
  - Human Machine Interface
- Home Automation
  - Thermostats
  - Irrigation
  - Lighting
  - Entry/Exit
- Test & Measurement
- Payment Terminals
- Educational

LCDC Reference Design

EPSON
EXCEED YOUR VISION

- Reference designs with major industry standard microcontrollers:

• Microchip	S1D13517 + PIC32
• ST-Micro	S1D13781 + STM32 VL discovery (ARM Cortex-M3)
	S1D13781 + STM32 F4 discovery (ARM Cortex-M4)
• TI	S1D13781 + Tiva C series (ARM Cortex-M4), MSP430
• Infineon	S1D13781 + XMC4700

Software library and examples available on the website:

S1D13781 Reference Designs Website

Arduino S1D13781 Shield Board – NEW!!!

EASY

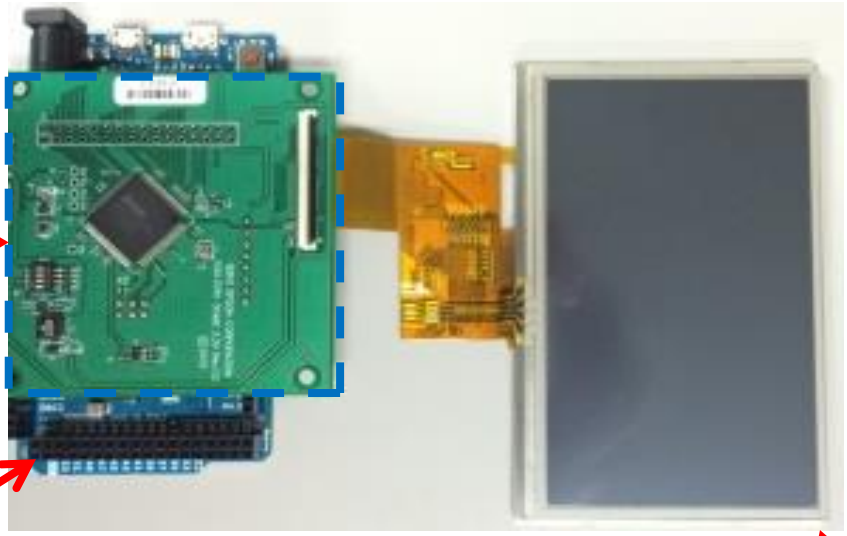
CUSTOMER

DEVELOPMENT

S5U13781R01C100 Shield TFT Board Overview

The **Epson S5U13781R01C100 Shield TFT Board** connects to an Arduino Due board to provide support for up to WQVGA TFT graphics. It includes two FPC connectors (40-pin and 54-pin) which can be used to connect to a WQVGA or QVGA TFT panel available separately. Epson provides a software library for use with the Arduino Sketch IDE with hardware IO, simple graphics, and text drawing functions.

S5U13781R01C100 Shield



Typical Assembled Platform
S1D13781 Shield
+
Arduino Due
+
TFT Panel

Arduino Due
(sold separately)

LCD Panel Options
(sold separately)

(3.5", 320x240 QVGA, 54-Pin)

OR

(4.3", 480x272 WQVGA, 40-Pin)

Epson P/N: ***S5U13781R01C100***
Available: August 2015

Web Contents for Customer Support

Panel setting sheet

Panel setting sheet for S1D13L01, S1D13L02, S1D13L03, S1D13513, S1D13517, S1D13709 and S1D13781 are available.

*Latest panel setting sheet is available on Epson LCDC web site: http://vdc.epson.com/

For example, panel setting sheet of S1D13781 is available on following page of Epson LCDC web site.

LCD Controllers -> Standard LCD Controllers -> S1D13781 ->Documentation-> S1D13781 Panel Setting

Product selection guide

Product selection guide is prepared for the purpose of searching suitable LCDC for customer ‘s specific requirement.


EPSON
EXCEED YOUR VISION