



**SOLOMON
SYSTECH**
晶門科技

DISPLAY IC

solutions in silicon

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Company Profile

Be the dominant provider of display IC products

Solomon Systech Limited is a leading semiconductor company providing display IC products and system solutions on an international basis under its own global brand. Adopting a "fabless" business model, the company specializes in the design, development and sales of proprietary IC products that enable a wide range of display applications for mobile phones, portable devices, LCD TVs, consumer electronic products, industrial appliances and lighting.

Solomon Systech has a high caliber and experienced design team in Mixed Mode High Voltage System-On-Chip (HV-SoC) IC design that produces highly integrated display IC products for mobile display, OLED display and new display applications. It has also pioneering design teams in multimedia SoC IC design, embedded software development and LED lighting system design that provides total display system solutions for multimedia applications as well as green power products. Thanks to its ability to quickly and successfully commercialize new product ideas, the company has a competitive edge over its rivals in the fast-moving consumer electronics market.



Mobile

Display

Bringing us closer and brighter

- Smart TFT LCD Driver Controller
- AV TFT LCD Driver Controller
- Capacitive Touch Panel Controller
- STN/CSTN LCD Driver Controller
- MIPI / MDDI Solution



More than just a display, it's our integrated display IC technology that brings us a better tomorrow.

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Mobile Display

Smart TFT LCD Driver Controller

Introduction

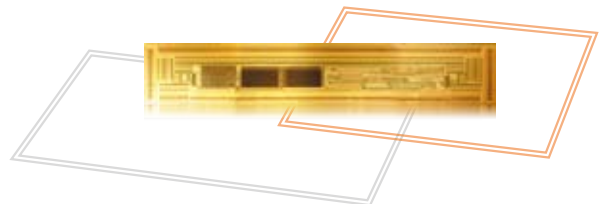
Solomon Systech offers a series of single chip **TFT LCD Driver Controllers** to support TFT mobile displays. All TFT drivers have embedded source/gate driver, voltage generator and controller block supporting display resolutions from QVGA to WVGA (480x864). These products offer not only RGB interface, common parallel and serial interface, but also MIPI and MDDI to support high data rate transfer. They can work with advanced image processors in the smart phone systems to optimize the use of CCD/CMOS camera when displaying high quality graphics and video. These highly integrated single chip solutions provide many features, such as dynamic backlight control (DBC), low power consumption, minimal external components and up to 16M colors support.

Applications:

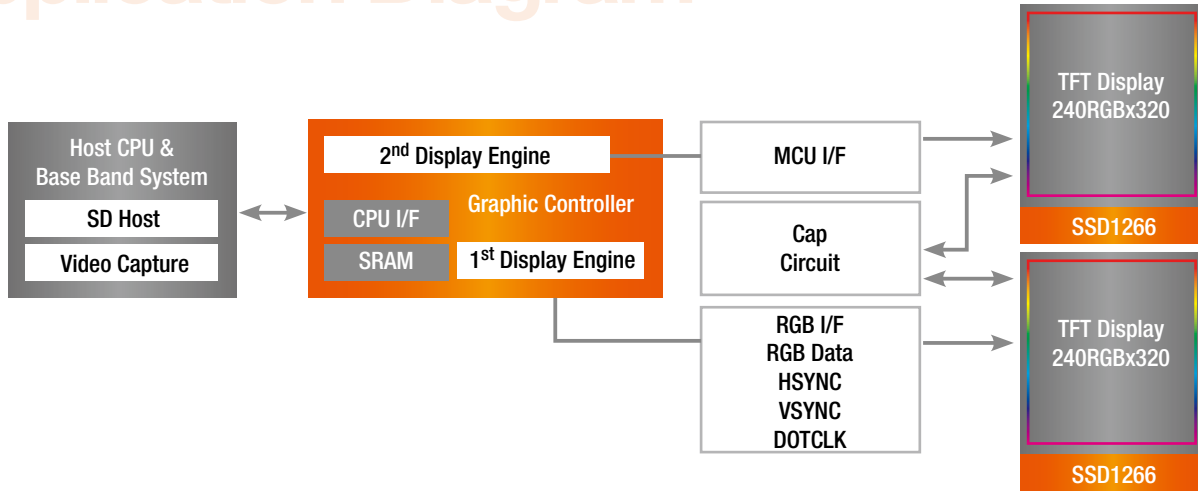
Mobile phones, 3G phones, portable game consoles, PMP, mobile TV, GPS and etc.

Features

- ▣ 65K, 262K or 16M Color Depth
- ▣ OTP or MTP Memory for V_{COM} Calibration
- ▣ Programmable Gamma Correction Curve
- ▣ Low Current Sleep Mode and 8-color Display Mode for Power Saving
- ▣ Reduced External Component Count
- ▣ SPI, 8080/6800 PPI, RGB Interface, MIPI, MDDI
- ▣ On-chip DC-DC Converter
- ▣ On-chip Voltage Generator
- ▣ Support Frame and Line Inversion
- ▣ Source and Gate Scan Direction Control
- ▣ Programmable Common Electrode Voltage Amplitude
- ▣ Dynamic Backlight Control (DBC)
- ▣ Standard Panels Available
- ▣ DC V_{COM} for Large V_{COM} Loading Panel Display
- ▣ Support Wide Viewing Angle Panel
- ▣ Very Thin Die to Support Slim Module Design



Application Diagram



Application Example – Dual Display Phone System

Selection Guide

Portrait Driver Controller

Part Number	Display Size (Source x Gate)	Color Depth	RAM	DBC	Interface
SSD1297C	240RGB x 320	65K/262K	Yes	-	SPI / MCU / RGB Interface
SSD1266	240RGB x 320	65K/262K	Yes	Yes	SPI / MCU / RGB Interface
SSD2206	240RGB x 320	16M	Yes	Yes	SPI / MCU / RGB Interface / MIPI
SSD2220	240RGB x 432	262K	Yes	-	SPI / MCU / RGB Interface
SSD2119	320RGB x 240	262K	Yes	-	SPI / MCU / RGB Interface
SSD2113	320RGB x 240	262K	Yes	Yes	SPI / MCU / RGB Interface
SSD2066	480RGB x 864	16M	Yes	Yes	SPI / RGB Interface / MIPI
SSD2085	480RGB x 864	16M	Yes	Yes	SPI / RGB Interface / MIPI / MDDI



Mobile Display

AV TFT LCD Driver Controller

Introduction

Solomon Systech offers a series of single chip **TFT LCD Driver Controllers** to support middle-size AV TFT displays up to 8 inches. All TFT drivers have embedded source/gate driver, voltage generator and controller block supporting from 4.3" to 8" display resolutions. These products offer RGB interface, CCIR, common parallel and serial interface. They work with advanced CPU to display high quality graphics and video. These highly integrated single chip solutions provide many features, such as dynamic backlight control (DBC), low power consumption, minimal external components and up to 16M colors support.

For above 7-inch AV TFT displays, Solomon Systech provides a combination of TFT Source Drivers and Gate Drivers, suitable for 16M color applications. These products support wide-viewing-angle panels with high driving voltages. They may be cascaded to provide the flexibility to support high definition. Furthermore, the high pin count feature enables a compact panel design at an optimized cost.

Applications:

Netbook, mobile TV, GPS, MID and etc.

Features

Single Chip Driver (for up to 8-inch displays)

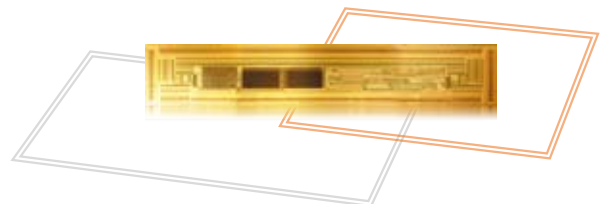
- ❑ 65K, 262K or 16M Color Depth
- ❑ OTP or MTP Memory for VCOM Calibration
- ❑ Programmable Gamma Correction Curve
- ❑ Low Current Sleep Mode and 8-color Display Mode for Power Saving
- ❑ Reduced External Component Count
- ❑ SPI, 8080/6800 PPI, RGB Interface, CCIR
- ❑ On-chip DC-DC Converter
- ❑ On-chip Voltage Generator
- ❑ Support Frame and Line Inversion
- ❑ Source and Gate Scan Direction Control
- ❑ Programmable Common Electrode Voltage Amplitude
- ❑ Dynamic Backlight Control (DBC)

Source Driver (for above 7-inch displays)

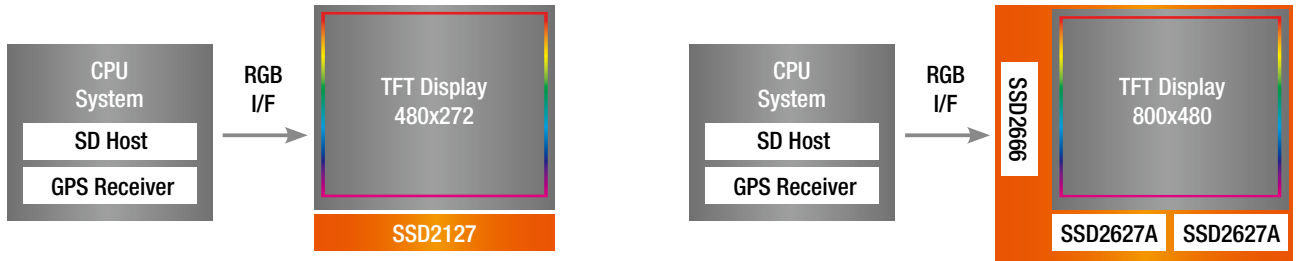
- ❑ On-chip Timing Controller (TCON) Which Provides Timing Control Signal for Source/Gate Drivers
- ❑ 256 Gray Level
- ❑ RGB Interface
- ❑ Dot Inversion
- ❑ Cascade Function with Bi-direction Shift Control
- ❑ Dynamic Backlight Control (DBC)

Gate Driver (for above 7-inch displays)

- ❑ Maximum Gate Voltage: 40V
- ❑ Selective Shift Direction
- ❑ Cascade Function for Resolution Expansion



Application Diagram



Application Examples – Personal Navigation Device System

Selection Guide

AV TFT LCD Driver Controller

Part Number	Display Size (Source x Gate)	Color Depth	DBC	Interface
SSD2118A	320RGB x 240	262K	-	SPI / CCIR / RGB Interface
SSD2118B	320RGB x 240	16M	Yes	SPI / CCIR / RGB Interface
SSD2123	480 x 272RGB	16M	-	SPI / RGB Interface
SSD2127	480 x 272RGB	16M	Yes	SPI / RGB Interface
SSD2128	480 x 272RGB	16M	Yes	SPI / RGB Interface
SSD2125	272RGB x 480	16M	-	SPI / RGB Interface
SSD2166	800 x 480RGB	16M	-	LVDS / RGB Interface

Source Driver

Part Number	Number of Output Channels	Gray Scale Level	DBC	Interface
SSD2627A	1200	256	Yes	RGB Interface

Gate Driver

Part Number	Number of Output Channels	Select Shift Direction	Cascade
SSD2666	320 / 384 / 400 / 480	Yes	Yes
SSD2667	600	Yes	Yes

Resolution		Source Driver (TCON)	Gate Driver
WVGA	800 x 480	2 x SSD2627A	1 x SSD2666
SVGA	800 x 600	2 x SSD2627A	1 x SSD2667



Mobile Display

Capacitive Touch Panel Controller

Introduction

Touch Panel is a common user interface which is widely used on computing device such as cashier machine, PC, PDA and smart phone. The most common touch panel technology is resistive touch panel but its poor durability and transparency enforce the market to shift to a new technology - Capacitive Touch Panel. Unlike resistive touch panel, the capacitive touch panel requires a controller to compute and transform the touch signal to a simple data format for the system. To fulfill the market needs, Solomon Systech proudly presents SSD2521, a **Capacitive Touch Panel Controller** with multi touch support.

SSD2521 is an all-in-one capacitive touch panel controller that integrates the power circuits, panel driving and sensing circuits, high resolution ADC, signal processor and finger tracking unit into a single chip. It can drive capacitive touch panel with channel number up to 21 driving and 12 sensing.

SSD2521 has implemented several arithmetic algorithms for finger extraction and tracking. It can track up to a maximum 4 fingers concurrently and report to user the absolute coordinate of each finger. In addition, it can detect incidents and events based on the tracked finger coordinates.

Applications:

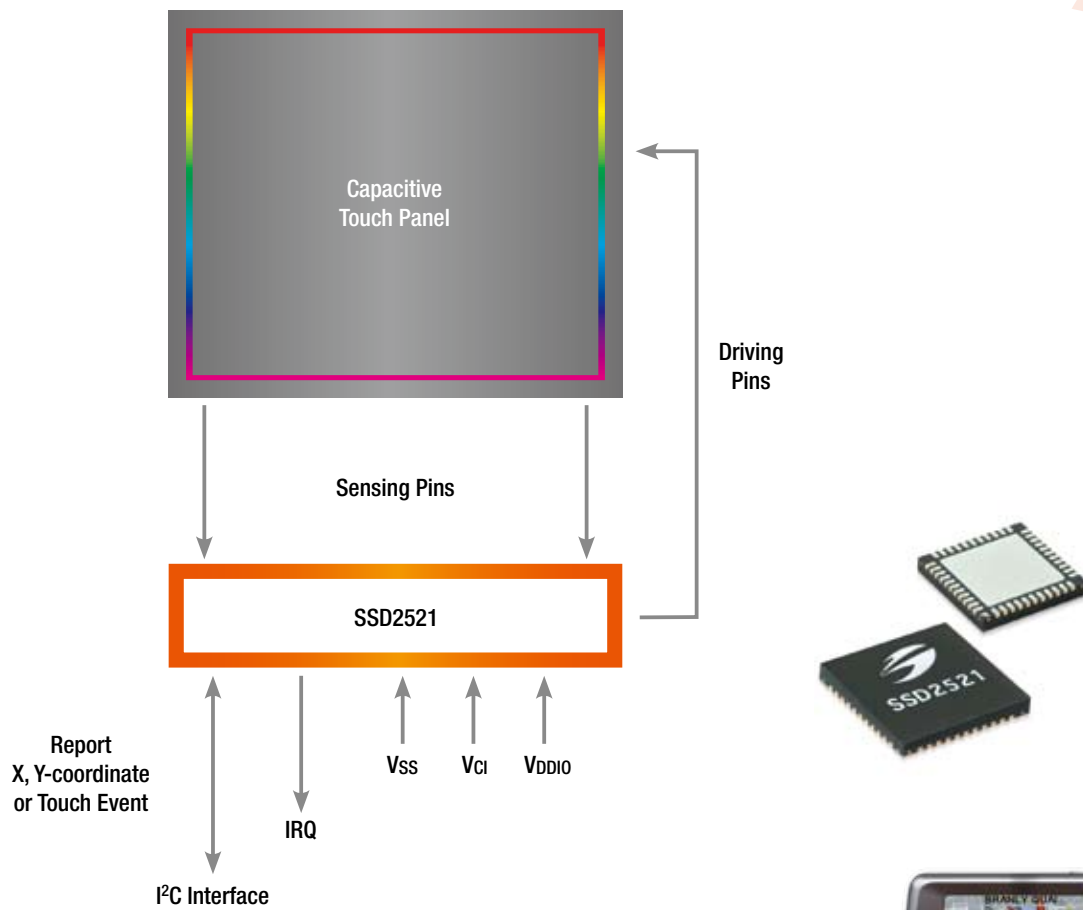
Mobile headset, PND, UMPC, MP4, PMP, gaming device, digital photo frame and etc.

Features

- ▣ High Voltage Driving Signal for Better Sensing Performance
- ▣ On-Chip DC-DC Converter
- ▣ 21 Driving and 12 Sensing Pins Support Touch Panel with 33 Channels Max.
- ▣ Support 640x352 Touch Resolution and Capable to Support Up to WVGA Panel
- ▣ Support 200Hz¹ Max. Scan Rate
- ▣ Support Multi Touch Application with Max. 4 Points
- ▣ Support 5 Types Touch Event Report
- ▣ Support Automatic Scan Rate Control for Power Saving
- ▣ Support Auto Calibration
- ▣ Embedded Noise Rejection Correlator for Better SNR
- ▣ Support I²C with Data Rate Up to 400kbit/s
- ▣ Package: 68/48 Pins QFN

¹ For application with less than 15 driving channels.

Application Diagram



Mobile Display

STN/CSTN LCD Driver Controller

Introduction

Whether a cellular phone, handheld game console or MP3 display design; whether content rich or simple but compact, Solomon Systech offers abundant choices of **STN/CSTN LCD Driver Controllers** with different display resolutions, in various package forms for any unique display style.

The STN/CSTN LCD driver controllers are all highly integrated single chip solutions, with low power consumption and minimal external components for high performance and compact design mobile display, from monochrome, gray scale to color.

Applications:

Mobile phone, dect phone, learning machine, health care product, industrial equipment, pager, walkie-talkie and etc.

Features

High Intergration for Minimizing External Components

- ❑ Single Supply Voltage
- ❑ On-chip Oscillator
- ❑ On-chip Bias Divider
- ❑ On-chip DC-DC Converter for LCD Driving Output Voltage
- ❑ On-chip Display Data RAM
- ❑ On-chip Capacitor
- ❑ On-chip OTP / Dual OTP / MTP

Ultra Low Power Consumption for System Power Saving

- ❑ Low Current Sleep Mode
- ❑ Programmable Bias Ratio

Compatible for Most Popular MCUs

- ❑ 8/16-bit 68/80-series Parallel Interface and Serial Peripheral Interface or I²C-bus

Powerful Command Set for Easy Programming

- ❑ Re-mapping of Row and Column Drivers
- ❑ Various Powerful Scrolling Modes
- ❑ Internal Contrast Control
- ❑ Programmable Partial Display
- ❑ Programmable LCD Driving Voltage Temperature Coefficients
- ❑ Programmable Color Look Up Table

Advanced Features

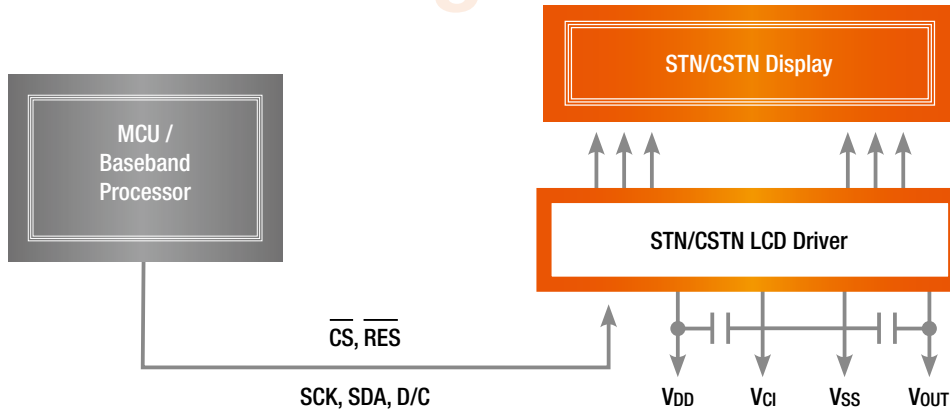
- ❑ Built-in Graphic Engine to Speed Up Graphic Animation
- ❑ Implemented APT Driving Scheme for Crosstalk Improvement and Reduce Power Consumption
- ❑ 8 Color Mode for Power Saving

Package

- ❑ Gold Bump Die, TAB and COF Package



Application Diagram



Selection Guide

CSTN	Display Size (Seg X Com)	Feature
SSD1777	98RGB x 68	65K Color, Built-in Capacitor, Dual OTP
SSD1797	130RGB x 132	65K Color, APT Driving Scheme, MTP
SSD1793	132RGB x 160	65K/262K Color, APT Driving Scheme, MTP
Gray Scale Driver	Display Size (Seg X Com)	Feature
SSD1848	130 x 130	4 Gray Level Graphic, Built-in Divider Capacitor, Dual OTP
Monochrome Graphic Driver	Display Size (Seg X Com)	Feature
SSD1829	96 x 68	Built-in Capacitor, OTP (PPI/SPI)
SSD1838	132 x 65	Built-in Capacitor, OTP, $V_{DDIO}=3V$, Drive Up to 3" Panel Size
SSD1805	132 x 68	Built-in Capacitor, OTP
SSD1808	132 x 68	Built-in Capacitor, OTP, $V_{DDIO}=3V/5V$, Drive Up to 3.5" Panel Size
SSD1809	160 x 64	Built-in Divider
SSD1816	130 x 130	Built-in Divider Capacitor, Dual OTP
Monochrome Character Driver	Character Support (Char X Line)	Feature
SSD1801	16 Char x 3 Lines	2 or 3 Lines with 5x8 Dot Format Display and 80 Icons
SSD1803	Up to 20 Char x 4 Lines	1, 2 or 4 Lines with 5x8 or 6x8 Dot Format Display

APT – Alt-Pleshko Technique
MTP – Multi Time Programming
OTP – One Time Programming

Mobile Display

MIPI / MDDI Solution

Introduction

Pioneering in MIPI solutions for display, Solomon Systech is proud to present its **MIPI IC family, MIPI Master Bridge Chip SSD2805C and Integrated MIPI / MDDI TFT Driver Controller SSD2085** that supports the worldwide interface standard recognized by mobile industry leaders.

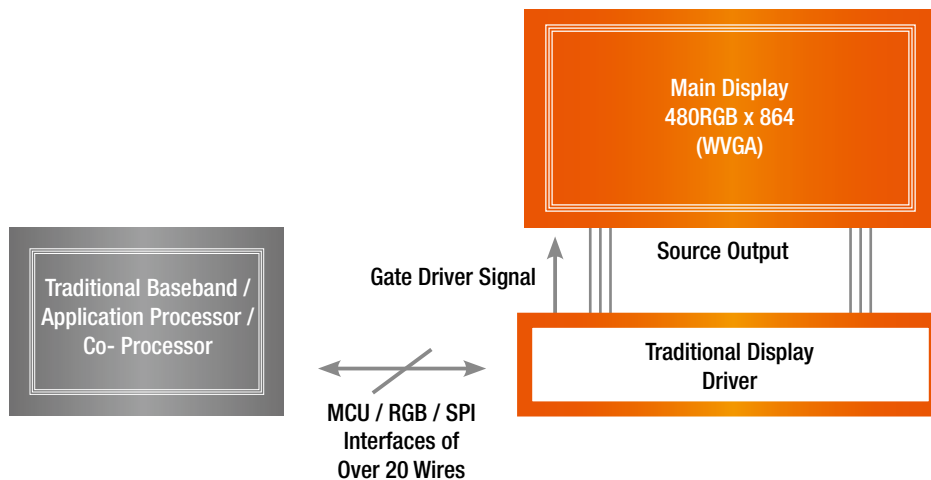
Advantages

With an integrated MIPI / MDDI interface, the number of signal connections between the host processor and the LCD driver is significantly reduced from commonly used MCU/RGB/SPI interface of over 20 wires to only 6 wires*. Not only will the solution save on interconnect costs; it will reduce electromagnetic interference (EMI) and enhance reliability, also enabling higher flexibility in the mechanical design of end products. More importantly, it expedites time-to-market, as the use of MIPI compliant product reduces the complexity of handset integration.

Applications:

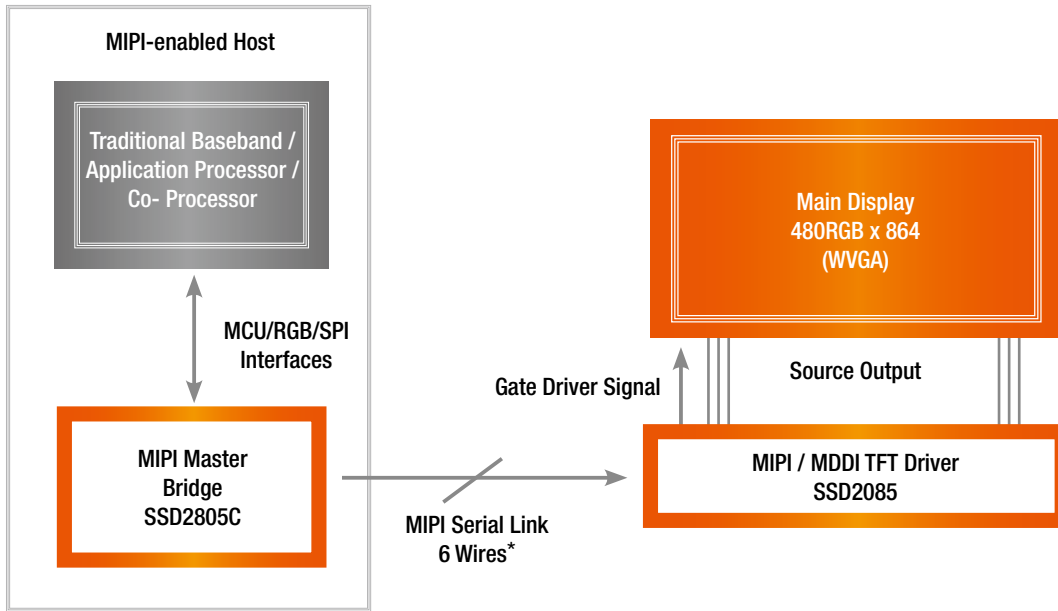
Solomon Systech's MIPI family includes: SSD2805C and SSD2085. They provide seamless connectivity for displays in mobile phones.

Traditional Approach



* 1 pair clock pins + 2 pairs data pins

MIPI Solution



About The MIPI Alliance

The Mobile Industry Processor Interface (MIPI®) Alliance is an open membership organization that includes leading companies in the mobile industry that share the objective of defining and promoting open specifications for interfaces in mobile terminals. MIPI Specifications establish standards for hardware and software interfaces typically found in mobile terminal systems. By defining such standards and encouraging their adoption throughout the industry value chain, the MIPI Alliance intends to reduce fragmentation and improve interoperability among system components, benefiting the entire mobile industry.

The MIPI Alliance is intended to complement existing standards bodies such as the Open Mobile Alliance and 3GPP, with a focus on microprocessors, peripherals and software interfaces.

www.mipi.org



Mobile Display

MIPI / MDDI Solution

MIPI Master Bridge Chip

Solomon Systech **MIPI Master Bridge Chip** SSD2805C supports high-speed, low-power VGA resolution displays in application-rich mobile devices.

The SSD2805C is able to support display resolutions of up to VGA at video speed and can support a main panel and a sub panel simultaneously. Furthermore, it adopts the physical layer of low-voltage differential signaling as defined by MIPI specifications.

The SSD2805C is versatile enough to interface to most baseband processors, application processors, or co-processors now deployed in most mobile products. The SSD2805C is able to operate in both High-Speed (HS) and Low-Power (LP) modes for data transmission to provide optimum power consumption and will consume ultra-low power in the idle state. It contains an on-chip PLL for clock generation and is packaged in a mini 5x5mm BGA package.

Features

- Support MIPI Specification
- Transmission Rates Up to 480Mbps Via Dual Links. Maximum Support for VGA Panel at 60 fps
- Supports MCU Interface of 8/16 Bits (6800 and 8080), RGB Interface (16/18/24 Bits) and SPI Interface (8-bit 3-wire, 8-bit 4-wire, or 24-bit 3-wire)
- Support 16/18/24 Bit-per-pixel
- Support Dual Panel Update
- Support High-Speed (HS) and Low-Power (LP) Mode for Data Transmission
- Support Ultra-low Power Mode in Idle State
- Support Both Command Mode and Video Mode in MIPI DSI Standard
- Support Bi-directional Data Transfer
(Forward Link in High-Speed and Low-Power Modes and Reverse Link in Low-Power Mode)
- On-chip PLL: Reference Input Clock Frequency: 10-20 MHz
- Power Supply: 1.8V +/- 10% for Internal Circuit: 3.3V/1.8V +/- 10% for I/Os
- Package: 64-pin BGA



Mobile Display

MIPI / MDDI Solution

Integrated MIPI / MDDI TFT Driver Controller

Solomon Systech's SSD2085 **MIPI / MDDI TFT Driver Controller** alone can work with MIPI-compliant processors. Together with the SSD2805C MIPI Master Bridge Chip, non-MIPI processors can also take advantage of the MIPI interface.

The SSD2085 is an all-in-one TFT LCD driver controller that integrates power circuits, a source driver and a high speed MIPI / MDDI interface into a single chip. The SSD2085 can drive a 262K / 16M color LTPS panel with a resolution of 480RGB x 864. The SSD2085 embeds a highly efficient DC-DC converter and a voltage regulator to generate all necessary voltage levels to the LTPS panel with minimum external components. It provides an 8-color power-saving mode to reduce the energy consumption in portable devices. The source and gate scan direction can be controlled by software commands. The SSD2085 supports the MIPI 18/24-bit/pixel interface and contains two differential pairs for differential data transfer and one pair for differential clock, and also supports a 480RGB x 864 x 18/24-bit x 60Hz real-time display.

Features

- ▣ 480RGB x 864 Single Chip Driver Controller for 262K / 16.7M Color LTPS TFT LCD with Integrated MIPI / MDDI Interface
- ▣ Support Low Power Consumption:
 - ▣ Low Voltage Supply
 - ▣ Low Current Sleep Mode
 - ▣ 8-color Display Mode for Power Saving
 - ▣ Charge Sharing Function for Step-up Circuits
- ▣ Internal Power Supply Circuit
- ▣ Built-in Internal Oscillator
- ▣ Support Source and Gate Scan Direction Control
- ▣ TFT Storage Capacitance: Cs on Common and Cs on Gate
- ▣ Programmable Gamma Correction Curve
- ▣ 4 Preset Gamma Correction Curve
- ▣ Built-in Non Volatile Memory for V_{COM} Calibration
- ▣ Support Flexible Arrangement of Gate Circuits on Both Sides of the Glass Substrate
- ▣ Available in COG Package



New

Display

Inspiring our life with a new look

- Passive Matrix OLED Driver Controller
- Active Matrix OLED Driver Controller
- Bistable Display Driver Controller



We blend good ideas and innovative technologies into reality.

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New Display

Passive Matrix OLED Driver Controller

Introduction

With the success of Solomon Systech's OLED driver technology, the mobile phone display industry is being transformed into fast response self-emissive video display. More and more applications adopted OLED as a smart display.

Solomon Systech provides a full range product family of single chip **OLED Driver Controllers** for mono, area color, gray scale and full color OLED display in different resolutions. The OLED drivers employ a proprietary driving scheme to reduce system power consumption and enhance display performance. They are ideal display solutions for portable devices.

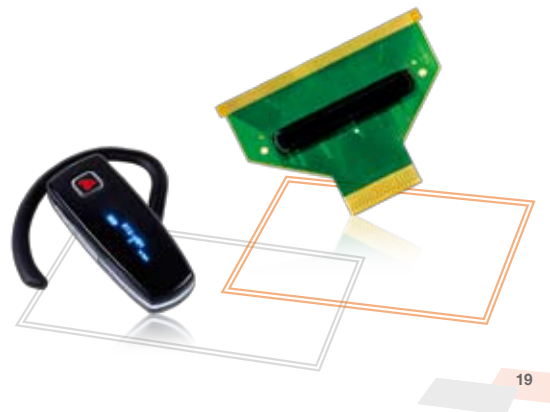
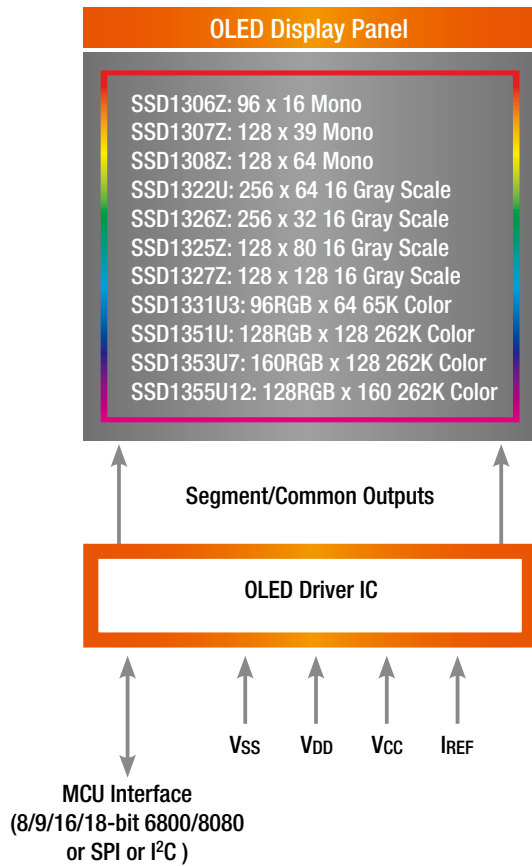
Applications:

WAP/Communicators, mobile phones, 3G phones, consumer appliances, portable game consoles, MP3, instruments, health care products, keypad, switches and etc.

Features

- ❑ Full Range of Resolution (Dot Matrix Panel)
 - 160RGB x 128
 - 128RGB x 160
 - 128RGB x 128
 - 128RGB x 96
 - 128RGB x 68
 - 96RGB x 64
 - 480 x 128 16 Gray Scale
 - 256 x 64 16 Gray Scale
 - 128 x 80 16 Gray Scale
 - 128 x 128 16 Gray Scale
 - 128 x 64 Mono Color
 - 128 x 39 Mono Color
 - 128 x 32 Mono Color
 - 96 x 16 Mono Color
- ❑ Support Low Voltage MCU Interface
- ❑ 256 Steps Brightness Current Control
- ❑ Pin Selectable MCU Interfaces
 - 8/16/18 Bits 6800-series Parallel Interface
 - 8/16/18 Bits 8080-series Parallel Interface
 - 3-wire and 4-wire Serial Peripheral Interface
 - I²C Interface
- ❑ Support Various Color Depths
 - 262K Color (6:6:6)
 - 65K Color (5:6:5)
 - 16 Gray Scale
 - Mono Color
- ❑ Programmable Gamma Look Up Tables
- ❑ RAM Write Synchronization Signal to Avoid Flickering When Updating New Image
- ❑ On-chip Charge Pump
- ❑ Content Scrolling for Infinite Content Update
- ❑ Non-volatile Memory (OTP) for Panel Calibration
- ❑ Row Re-mapping and Column Re-mapping
- ❑ Horizontal and Vertical Scrolling
- ❑ Programmable Frame Rate and Multiplexing Ratio
- ❑ On-Chip Oscillator
- ❑ Slim Chip Layout for COF and COG

Application Diagram






Selection Guide

Part Number	Mono/Area Color			
	SSD1305	SSD1306	SSD1307	SSD1308
Display Feature - Maximum Panel Resolution - Embedded SRAM Display Buffer - Display Color - Contrast Control	132 x 64 132 x 64 Bits Mono and 4 Colors Selections for Area Color 256 Steps	128 x 64 128 x 64 Bits Mono 256 Steps	128 x 39 128 x 39 Bits Mono 256 Steps	128 x 64 128 x 64 Bits Mono 256 Steps
DC Characteristic - Segment Maximum Source Current - Common Maximum Sink Current - MCU Interface Voltage Supply (V_{DDIO}) - Core V_{DD} Power Supply (V_{DD}) - High Voltage Supply (V_{CC})	320uA 45mA 1.6V - V_{DD} 2.4V - 3.5V 7.0V - 15.0V	100uA 15mA - 1.65V - 3.3V 7.0V - 15.0V	320uA 40mA - 1.65V - 3.3V 7.0V - 15.0V	150uA 20mA - 1.65V - 3.3V 7.0V - 15.0V
MCU Host Interface Supported - 8-bit Parallel Interface - Serial Peripheral Interface - I ² C Interface	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Package Information - TAB - COG	T7(132 x 64) Z(132 x 64)	- Z(128 x 64)	- Z(128 x 39)	T(104 x 48) Z(128 x 64)
High Integration Controller Function - On-chip Oscillator - Programmable Frame Rate - Programmable Display MUX - Row/Column Re-mapping - Horizontal Scrolling - Vertical Scrolling by RAM - On-chip Charge Pump - Content Scrolling	✓ ✓ ✓ ✓ ✓ ✓ - -	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ - ✓	✓ ✓ ✓ ✓ ✓ ✓ - ✓

Part Number	Gray Scale				
	SSD1322	SSD1325	SSD1326	SSD1327	SSD1329
Display Feature					
- Maximum Panel Resolution	480 x 128	128 x 80	256 x 32	128 x 128	128 x 128, 64 Hard Icons
- Embedded SRAM Display Buffer	480 x 128 x 4 Bits	128 x 80 x 4 Bits	256 x 32 x 4 Bits	128 x 128 x 4 Bits	128 x 128 x 4 Bits
- Display Color	16 Gray Scale	16 Gray Scale	16 Gray Scale	16 Gray Scale	16 Gray Scale
- Contrast Control	256 Steps	128 Steps	256 Steps	256 Steps	256 Steps
DC Characteristic					
- Segment Maximum Source Current	300uA	300uA	100uA	300uA	350uA
- Common Maximum Sink Current	80mA	40mA	25mA	40mA	40mA
- MCU Interface Voltage Supply (V _{DDIO})	1.65V - V _{CI}	-	1.7V - V _{DD}	-	1.7V - V _{DD}
- Core V _{DD} Power Supply (V _{DD})	2.4V - 2.6V	2.4V - 3.5V	2.4V - 3.5V	1.65V - 2.6V	2.4V - 3.5V
- Logic Voltage Supply (V _{CI})	2.4V - 3.5V	-	-	1.65V - 3.5V	3.2V - 4.2V (For Icon)
- High Voltage Supply (V _{CC})	10.0V - 20.0V	8.0V - 16.0V	9.0V - 15.0V	8.0V - 18.0V	9.0V - 18.0V
MCU Host Interface Supported					
- 8-bit Parallel Interface	√	√	√	√	√
- Serial Peripheral Interface	√	√	√	√	√
- I ² C Interface	-	-	√	√	-
Package Information					
- TAB	-	T2/T6(128 x 80)	-	-	-
- COF	U(256 x 64)	-	-	-	-
- COG	-	Z(128 x 80)	Z(256 x 32)	Z(128 x 128)	Z(128 x 128, 64 Icon)
High Integration Controller Function					
- On-chip Oscillator	√	√	√	√	√
- On-chip DC-DC Booster	-	-	-	-	For Hard Icon
- On-chip V _{DD} Regulator	√	-	-	√	-
- Programmable Frame Rate	√	√	√	√	√
- Programmable Display MUX	√	√	√	√	√
- Row/Column Re-mapping	√	√	√	√	√
- Horizontal Scrolling	-	-	√	√	√
- Vertical Scrolling by RAM	√	√	√	√	√
- Graphic Acceleration Command Set: e.g. Draw Rectangle & Copy	-	-	-	-	√

Part Number	Color			
	SSD1331	SSD1351	SSD1353	SSD1355
Display Feature - Maximum Panel Resolution - Embedded SRAM Display Buffer - Display Color - Contrast Control	96RGB x 64 96 x 64 x 16 Bits 65K Colors 256 Steps	128RGB x 128 128 x 128 x 18 Bits 262K Colors 256 Steps	160RGB X 132 160 x 132 x 18 Bits 262K Colors 256 Steps	128RGB x 160 128 x 160 x 18 Bits 262K Colors 256 Steps
DC Characteristic - Segment Maximum Source Current - Common Maximum Sink Current - MCU Interface Voltage Supply (V_{DDIO}) - Core V_{DD} Power Supply (V_{DD}) - Logic Voltage Supply (V_{Cl}) - High Voltage Supply (V_{CC})	200uA 60mA 1.6V - V_{DD} 2.4V - 3.5V - 8.0V - 18.0V	200uA 70mA 1.65V - V_{Cl} 2.4V - 2.6V 2.4V - 3.5V 10.0V - 18.0V	160uA 60mA 1.6V - V_{Cl} 2.4V - 2.6V 2.4V - 3.5V 10.0V - 21.0V	200uA 80mA 1.6V - V_{Cl} 2.4V - 2.6V 2.4V - 3.5V 10.0V - 21.0V
MCU Host Interface Supported - 8-bit Parallel Interface - 9-bit Parallel Interface - 16-bit Parallel Interface - 18-bit Parallel Interface - Serial Peripheral Interface	✓ ✓ ✓ - ✓	✓ - ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ - ✓ ✓ ✓
Package Information - COF - COG	U3(96 x 94) Z(96 x 64)	U(128 x 128) Z(128 x 128)	U7(160 x 128) Z(160 x 132)	U12(128 x 160) -
High Integration Controller Function - On-chip Oscillator - On-chip V_{DD} Regulator - Non-volatile Memory (OTP) for Calibration - Programmable Frame Rate - Programmable Display MUX - Row/Column Re-mapping - Horizontal Scrolling - Vertical Scrolling by RAM - Color Swapping Function - Graphic Acceleration Command Set: Draw Line & Rectangle, Copy & Dim Window, Clear Window, etc	✓ - - ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ - ✓ ✓ ✓ ✓ ✓ ✓ ✓ -	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ -

Full coverage on all OLED modules and support various applications:

Color	Gray Scale	Mono
		



New Display

Active Matrix OLED Driver Controller

Introduction

In response to the demand for active matrix OLED (AMOLED) displays, Solomon Systech proudly presents two **true color AMOLED drivers** for handheld devices with high resolution, fast-response displays. They are SSD2383 and SSD2388; two single chip driver ICs for the color active matrix PLED/OLED panel. These two drivers reveal realistic color of images, by providing 262K true color.

SSD2383 drives LTPS PLED/OLED dot matrix panel in handheld applications with resolution up to 132RGB x 132 and 262K colors. It has 132 source outputs multiplexed by three (RGB), source control and gate control signals for driving on glass 3:1 demultiplexer and gate driver. The fully integrated 262K RAM and 10 difference CPU interfaces with up to an 18-bit data width, allow SSD2383 to support colorful and fast-response display.

SSD2388 AMOLED Driver is all-in-one driver that integrates the controller, power circuits, gate driver, source driver and RAM into single chip. It can drive a 262K-color AMOLED main panel with resolution of 176RGB x 220. Designed as a highly integrated device, the SSD2388 is embedded with DC-DC converter; oscillator and voltage generator to provide all necessary voltage required by the driver with minimum external components; an embedded SRAM display buffer and flexible MCU interfaces.

These two Solomon Systech AMOLED drivers are further enhanced with the scrolling and gamma correction function. To facilitate precise RGB calibration, SSD2388 offers 3 programmable gamma correction curves for red, green and blue channels. An integrated gamma control circuit is also included in SSD2383. This circuit can be programmed by software commands to provide maximum flexibility and optimal display quality.

Combined with their compact design the Solomon Systech AMOLED drivers are the ultimate AMOLED display driver solutions for handheld applications, including mobile phones, MP3 players, portable multimedia players and digital cameras.

Applications:

WAP/Communicators, mobile phones, 3G phones, consumer appliances, portable game consoles, MP3, instruments and etc.

Selection Guide

Part Number	SSD2383	SSD2388
Display Feature - Max. Display Size - Display Color - Source Driver Output Voltage Level	132RGB x 132 262K / 65K / 4K 64 Levels	176RGB x 220 262K / 65K 64 Levels
DC Characteristic - Core Voltage Supply - Interface Voltage Supply - Analog Voltage Supply - Gate Driver Output Voltage - Source Driver Output Voltage - On-chip DC-DC Charge Pump	2.3V - 2.6V (Internal Generated / External Supply) 1.65V - 3.0V 2.3V - 3.3V - 0V - 5.2V For Source High Voltage: 2X, 3X	Connected to Analog Voltage Supply 1.8V - 3.6V 2.5V - 3.6V 0V - 18V 0V - 11.5V For Gate High Voltage: 5X, 6X For Source High Voltage: 4X, 5X
MCU Host Interface - Parallel Interface - Serial Peripheral Interface	8/9/16/18-bits ✓	8/16-bits ✓
Controller Feature - Programmable Gamma Correction Curve - Programmable Duty Cycle - On-chip Memory - On-chip Oscillator - Gate & Source Scan Direction - Vertical Scrolling - Horizontal Scrolling - Graphic Acceleration Command Set	Curves for Each RGB Component 1/16 to 1/132 132 x 132 x 18 Bits ✓ ✓ (No Gate) ✓ ✓ -	Curves for Each RGB Component 1/16 to 1/220 176 x 220 x 18 Bits ✓ ✓ ✓ ✓ ✓



New Display

Bistable Display Driver Controller

Introduction

Bistable display is a non-traditional display method. It is a display device illuminated by reflecting ambient light. The image is retained on the display even after the panel power supply has been removed. Bistable display offers paper-like readability, with features such as high contrast, a wide viewing angle, reflective, and readable under sunlight. It is ultra thin and lightweight. Some bistable displays can even be twisted out of shape. Moreover, the system power can be saved by bistability characteristics, since the image remains on display even without power.

Solomon Systech developed the specialized **Bistable Display Driver Controllers** SSD1603 and SSD1623 to make this novel display technology become a reality. These highly integrated drivers consist of MCU interface for command and image data input, display RAM to buffer image data, high voltage driving outputs. To minimize the system cost and space, the drivers have built-in DC/DC converter to supply high voltage to drive bistable display. These drivers can be applied to different bistable displays technology such as Cholesteric and Electrophoretic displays.

Applications:

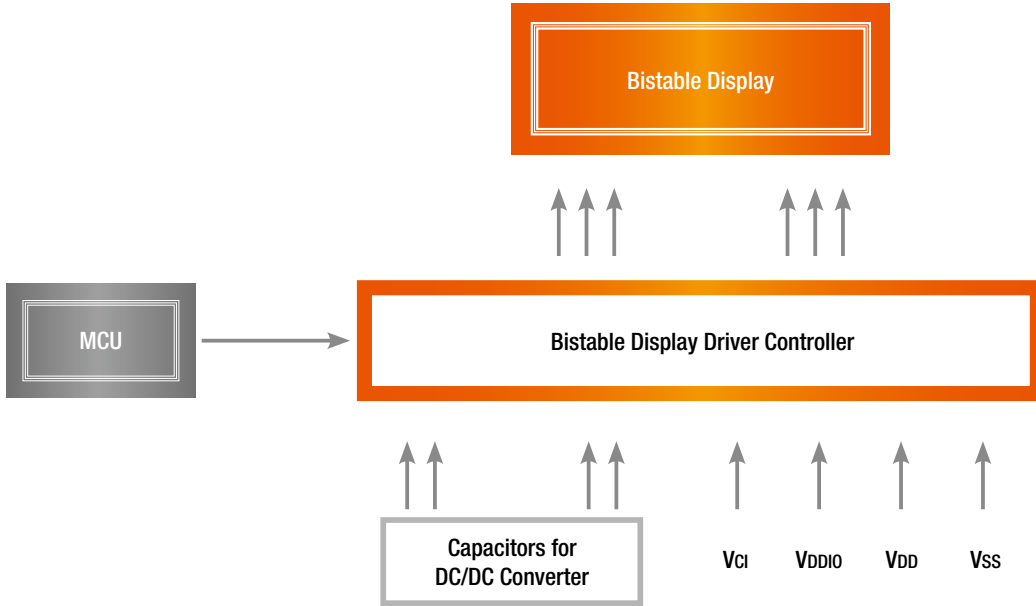
Mobile displays, memory cards, electronic shelf labels, electronic signs, digital clocks and watches, smart cards and etc.

Solomon Systech Limited welcomes enquires of custom IC development for new display technologies.

Selection Guide

Part Number	SSD1603	SSD1623
Panel Type	Passive Dot-matrix for Cholesteric Display	Segment/Icon Type Direct Drive Display for Different New Display Technologies such as Cholesteric, Electrophoretic, Electrowetting
Resolution	132 Segments x 64 Commons	95 Segments 1 Background Segment 1 Common
Embedded Display Memory	132 x 64 Bits	96 x 2 Bits
Logic Supply Voltage	V _{DD} : 2.4V - 3.5V (Logic & Analog) V _{DDIO} : 1.6V to V _{DD} (MCU Interface)	V _{DD} : 2.0V - 3.6V (Logic) V _{DDIO} : 2.0V - V _{DD} (MCU Interface) V _C : 2.4V - 3.6V (Analog/Booster)
Output Voltage	V _O = 10V - 35V	V _O = 10V - 40V
No. of Voltage Output Level	6 Levels	3 Levels V _O , V _I (=1/2 V _O), V _{SS}
Built-in DC/DC Converter	8X/16X Charge Pump	4X/6X/8X/12X/16X Charge Pump
Package	Gold Bump Die and COF	Bare Die, Gold Bump Die and COF

Application Diagram



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