

Innovative, High Resolution and Energy Efficient Solutions for Smart Display Applications

As OLED display technology and its manufacturing process become mature, more and more applications have adopted OLED as a smart display. In addition, as self-emissive OLED display comes with a wide range of operating temperatures, it is suitable for outdoor applications even under severe weather conditions. Solomon Systech offers a wide range of OLED display driver ICs for various kinds of applications.

Passive Matrix OLED Display Driver IC

Solomon Systech continues to be the market leader in the Passive Matrix OLED ("PMOLED") display driver IC, with a competitive edge in small size mobile display applications. Besides providing a full range of PMOLED display driver ICs from icon, mono and gray scale to full color with highly integrated features, Solomon Systech further expands its product portfolio by launching new display driver ICs which support higher resolution and display brightness for the fast-growing wearables market, particularly for health and fitness trackers. In addition, our portrait PMOLED display driver ICs support curved or bendable displays, making them ideal display solutions for wearable devices.

Solomon Systech's PMOLED display driver ICs employ a proprietary driving scheme to reduce system power consumption and enhance display performance. They are the ideal display solutions for devices which require high display brightness and low power consumption.

Active Matrix OLED Display Driver IC

Nowadays, Active Matrix OLED ("AMOLED") display is widely adopted for high resolution handheld devices. Solomon Systech has rich experience in amorphous, LTPS and metal oxide driver design. To capitalize on the surging demand for AMOLED displays, Solomon Systech provides innovative AMOLED custom display driver IC solutions to fulfil the needs of our customers.

OLED Lighting Driver IC

OLED lighting offers the lighting market a new and revolutionary light source that saves energy and improves light quality and performance. To capitalize on this potential market, Solomon Systech is developing OLED lighting driver ICs that feature high constant current, smooth and wide-range dimming control capability for different OLED lighting panels and applications.

Solomon Systech Limited welcomes enquiries on the development of custom OLED IC.

Applications

Wearable Health and Fitness Devices, Healthcare Devices, Smart Wristwear for Kids, Smart Watches, Head-up Displays, LTE Mobile Hotspots, Bank Keys, Bluetooth Headsets, Smartphones, Home Audio and Home Appliances, Optical View Finders, Smart Meters, Industrial Appliances and IoT Applications, etc.

Applications

Smartphones, Tablet PC, Digital Cameras, Consumer Appliances, Portable Game Consoles, etc.

Applications

Decorative Lighting, Residential or Office Lighting, Sign Display Lighting, Medical Lighting, Automotive Lighting, Agricultural Lighting, etc.



* All the images are for reference only.

Selection Guide

Gray Scale

| Part Number | SSD1320 | SSD1322 | SSD1326 | SSD1327 | SSD1329 | SSD1362 | SSD1363 |
|--|--------------------|-------------------------|------------------------|--------------------|------------------------|-------------------------|--------------------|
| Display Features | | | | | | | |
| Maximum panel resolution | 160 x 160 | 480 x 128 | 256 x 32 | 128 x 128 | 128 x 128, 64 icons | 256 x 64 | 320 x 160 |
| Embedded SRAM display buffer | 160 x 160 x 4 bits | 480 x 128 x 4 bits | 256 x 32 x 4 bits | 128 x 128 x 4 bits | 128 x 128 x 4 bits | 256 x 64 x 4 bits | 320 x 160 x 4 bits |
| Display color | 16 gray scale | 16 gray scale | 16 gray scale | 16 gray scale | 16 gray scale | 16 gray scale | 16 gray scale |
| Contrast control | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps |
| DC Characteristics | | | | | | | |
| Segment maximum source current | 600uA | 300uA | 100uA | 300uA | 350uA | 600uA | 500uA |
| Common maximum sink current | 96mA | 80mA | 25mA | 40mA | 40mA | 128mA | 120mA |
| MCU interface Voltage Supply (V _{DDIC}) | - | 1.65V - V _{CI} | 1.7V - V _{DD} | - | 1.7V - V _{DD} | 1.65V - V _{CI} | - |
| Core V _{DD} power supply (V _{DD}) | 1.65V - 3.5V | 2.4V - 2.6V | 2.4V - 3.5V | 1.65V - 2.6V | 2.4V - 3.5V | 1.65V - 2.6V | 1.65V - 3.5V |
| Logic Voltage Supply (V _{CI}) | - | 2.4V - 3.5V | - | 1.65V - 3.5V | 3.2V - 4.2V (for icon) | 1.65V - 3.5V | - |
| High Voltage Supply (V _{CC}) | 8V - 18V | 10.0V - 20.0V | 9.0V - 15.0V | 8.0V - 18.0V | 9.0V - 18.0V | 10V - 20V | 8V - 18V |
| IC Orientation on Panel | Portrait | Landscape | Landscape | Landscape | Landscape | Portrait | Landscape |
| MCU Host Interface Supported | | | | | | | |
| 8-bit parallel interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Serial peripheral interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| I ² C interface | ✓ | - | ✓ | ✓ | - | ✓ | ✓ |
| Package Information | | | | | | | |
| COF | - | UR1(256 x 64) | - | - | - | - | - |
| COG | Z | ZA | Z | ZB | Z | Z | Z2 |
| High Integration Controller Function | | | | | | | |
| On-chip oscillator | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| On-chip DC-DC booster | - | - | - | - | for 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 | - | - | - | - | ✓ | - | - |

Mono/Area Color

| Part Number | SSD1305* | SSD1306 | SSD1307 | SSD1309 | SSD1310 | SSD1311 |
|--|------------------------|---------------|---------------|---------------|-----------------------------|---|
| Display Features | | | | | | |
| Maximum panel resolution | 132 x 64 | 128 x 64 | 128 x 39 | 128 x 64 | 160 x 72 | 20 Char x 4 Lines |
| Embedded SRAM display buffer | 132 x 64 bits | 128 x 64 bits | 128 x 39 bits | 128 x 64 bits | 160 x 72 bits | 80 x 8 bits |
| Display color | Mono | Mono | Mono | Mono | Mono with Dynamic Grayscale | Mono |
| Contrast control | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps |
| DC Characteristics | | | | | | |
| Segment maximum source current | 320uA | 240uA | 320uA | 320uA | 480uA | 450uA |
| Common maximum sink current | 45mA | 30mA | 40mA | 40mA | 76.8mA | 45mA |
| MCU interface Voltage Supply (V _{DDIO}) | 1.6V - V _{DD} | - | - | - | - | 2.4V - 3.6V / 4.4V - 5.5V |
| Core V _{DD} power supply (V _{DD}) | 2.4V - 3.5V | 1.65V - 3.3V | 1.65V - 3.3V | 1.65V - 3.3V | 1.65V - 3.5V | 2.4V - V _{DDIO} / internally regulated |
| High Voltage Supply (V _{CC}) | 7.0V - 15.0V | 7.0V - 15.0V | 7.0V - 15.0V | 7.0V - 16.0V | 7V - 18V | 8.0V - 15.0V |
| Touch Driving Voltage Supply (VCI) | - | - | - | - | - | - |
| IC Orientation on Panel | Landscape | Landscape | Portrait | Landscape | Portrait | Portrait |
| MCU Host Interface Supported | | | | | | |
| 4-bit parallel interface | - | - | - | - | - | ✓ |
| 8-bit parallel interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Serial peripheral interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| I ² C interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Package Information | | | | | | |
| COG | Z | BZ | ZC / ZD | ZC / ZD | Z2 / ZD | M1Z8 |
| Touch Support | | | | | | |
| Touch Key | - | - | - | - | - | - |
| Touch Gesture | - | - | - | - | - | - |
| High Integration Controller Function | | | | | | |
| On-chip oscillator | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Programmable frame rate | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Programmable display MUX | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Row/Column re-mapping | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Horizontal scrolling | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Vertical scrolling by RAM | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Content scrolling | - | ✓ | - | ✓ | ✓ | - |
| Internal charge pump regulator | - | ✓ | - | - | ✓ | - |
| Internal IREF selection | - | - | - | - | ✓ | - |
| On-chip Character ROM | - | - | - | - | - | ✓ |

* Legacy Product

Color

| Part Number | SSSD1331 | SSD1333 | SSD1351 | SSD1352 | SSD1353 | SSD1355 | SSD1357 |
|---|------------------------|----------------------------------|-------------------------|-------------------------|------------------------|------------------------|----------------------------------|
| Display Features | | | | | | | |
| Maximum panel resolution | 96RGB x 64 | 176RGB x 176 | 128RGB x 128 | 160RGB x 128 | 160RGB x 132 | 128RGB x 160 | 128RGB x 128 |
| Embedded SRAM display buffer | 96 x 64 x 16 bits | 176 x 176 x 16 bits | 128 x 128 x 18 bits | 160 x 128 x 18 bits | 160 x 132 x 18 bits | 128 x 160 x 18 bits | 128 x 128 x 16 bits |
| Display color | 65k colors | 65k colors/Pseudo 262k colors | 262k colors | 262k colors | 262k colors | 262k colors | 65k colors/Pseudo 262k colors |
| Contrast control | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps |
| DC Characteristics | | | | | | | |
| Segment maximum source current | 200uA | 320uA | 200uA | 300uA | 160uA | 200uA | 320uA |
| Common maximum sink current | 60mA | 160mA | 70mA | 80mA | 60mA | 80mA | 80mA |
| MCU interface Voltage Supply (V _{DDIO}) | 1.6V - V _{DD} | - | 1.65V - V _{CI} | 1.65V - V _{CI} | 1.6V - V _{CI} | 1.6V - V _{CI} | - |
| Core VDD power supply (V _{DD}) | 2.4V - 3.5V | 1.65V - 3.5V | - | - | 2.4V - 2.6V | 2.4V - 2.6V | 1.65V - 3.5V |
| Logic Voltage Supply (V _{CS}) | - | - | 2.4V - 3.5V | 2.4V - 3.5V | 2.4V - 3.5V | 2.4V - 3.5V | - |
| High Voltage Supply (V _{CC}) | 8.0V - 18.0V | 8V - 18V | 10.0V - 18.0V | 10.0V - 18.0V | 10.0V - 21.0V | 10.0V - 21.0V | 8.0V - 18.0V |
| IC orientation on panel | Landscape | Landscape | Landscape | Landscape | Landscape | Landscape | Landscape |
| MCU Host Interface Supported | | | | | | | |
| 8-bit parallel interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 9-bit parallel interface | - | - | - | ✓ | ✓ | - | - |
| 16-bit parallel interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 18-bit parallel interface | - | - | ✓ | ✓ | ✓ | ✓ | - |
| Serial peripheral interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| I ² C interface | - | ✓ | - | - | - | - | ✓ |
| Package Information | | | | | | | |
| COF | - | - | U (128 x 128) | - | U7 (160 x 128) | U8 (128 x 128) | - |
| COG | Z | Z/Z8 | Z | Z | Z | Z | Z |
| High Integration Controller Function | | | | | | | |
| On-chip oscillator | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| On chip V _{DD} regulator | - | - | ✓ | ✓ | ✓ | ✓ | - |
| Non-Volatile Memory (OTP) for calibration | - | - | - | ✓ | ✓ | ✓ | - |
| Programmable frame rate | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 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 | ✓ | - | - | - | ✓ | - | - |
| Content Scrolling | - | ✓ | - | - | - | - | ✓ |
| I-MUX Mode for segment display | - | ✓ | - | - | - | - | ✓ |

| SSD1312 | SSD1313 | SSD1315 | SSD1316 | SSD1317 | SSD1319 | SSD7317 |
|-----------------------------|----------------------|-----------------------------|---------------|-----------------------------|-----------------------------|---|
| 128 x 64 | 128 / 256 Icon Lines | 128 x 64 | 128 x 39 | 128 x 96 | 160 x 160 | 128 x 96 |
| 128 x 64 bits | - | 128 x 64 bits | 128 x 39 bits | 128 x 96 bits | 160 x 160 bits | 128 x 96 bits |
| Mono with Dynamic Grayscale | Mono | Mono with Dynamic Grayscale | Mono | Mono with Dynamic Grayscale | Mono with Dynamic Grayscale | Mono with Dynamic Grayscale |
| 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps | 256 steps |
| 480uA | 320uA | 240uA | 160uA | 600uA | 600uA | 600uA |
| 61.5mA | 40mA | 30mA | 20mA | 76.8mA | 96mA | 76.8mA |
| - | - | - | - | - | - | - |
| 1.65V - 3.5V | 1.65V - 3.3V | 1.65V - 3.5V | 1.65V - 3.3V | 1.65V - 3.3V | 1.65V - 3.5V | 1.65V - 3.5V |
| 7.5V - 16.5V | 7.0V - 16.0V | 7.5V - 16.5V | 7.0V - 15.0V | 7.0V - 16.5V | 8.0V - 18.0V | 8V - 18V |
| - | - | - | - | - | - | 3V - 3.5V |
| Portrait | Landscape | Landscape | Portrait | Portrait | Portrait | Portrait |
| - | - | - | - | - | - | - |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | (display/touch) |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | (display/touch) |
| Z2 / ZD | ZC | Z | Z2 | Z | Z | Z / ZD |
| - | - | - | - | - | - | 4 key In-cell + 4 key Out-cell / 8 key Out-cell |
| - | - | - | - | - | - | Single-Tap / Double-Tap / Long-Tap / Slide |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| - | - | - | - | - | - | - |

Key Features

Character

- Up to 20 Char x 4 Lines

Icon

- Up to 256 Icon Lines

Full Range of Resolution (Dot Matrix Panel)

- 176RGB x 176
- 160RGB x 128
- 128RGB x 160
- 128RGB x 128
- 96RGB x 64
- 480 x 128 16 Grayscale
- 320 x 160 16 Grayscale
- 256 x 64 16 Grayscale
- 160 x 160 Grayscale
- 160 x 160 Mono Color with Dynamic Grayscale
- 128 x 128 16 Grayscale
- 160 x 72 Mono Color with Dynamic Grayscale

- 128 x 96 Mono Color with Dynamic Grayscale
- 128 x 64 Mono Color with Dynamic Grayscale
- 128 x 39 Mono Color
- 128 x 32 Mono Color
- 120 x 16 Mono Color
- 96 x 16 Mono Color

Support Low Voltage MCU Interface

256 Steps Brightness Current Control

Pin Selectable MCU Interfaces

- 4/8/9/16/18 Bits 6800-series Parallel Interface
- 4/8/9/16/18 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

On-chip Charge Pump

- Support Minimum 2.2V VBAT Input Voltage

Programmable Gamma Look Up Tables

RAM Write Synchronization Signal Available

Content Scrolling

Non-volatile Memory (OTP) for Panel Calibration

Row Re-mapping and Column Re-mapping

Horizontal and Vertical Scrolling

Programmable Frame Rate and Multiplexing Ratio

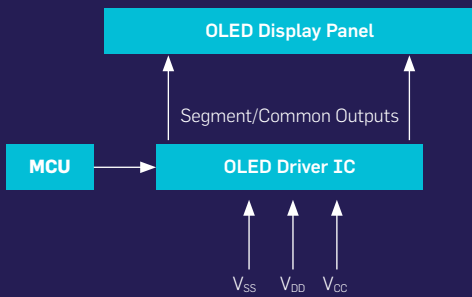
On-chip Oscillator

Slim Chip Layout for COF and COG

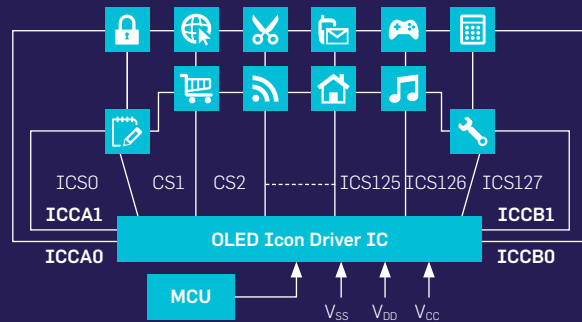
PMOLED TDDI to support In-cell and Out-cell touch keys

Application Diagram

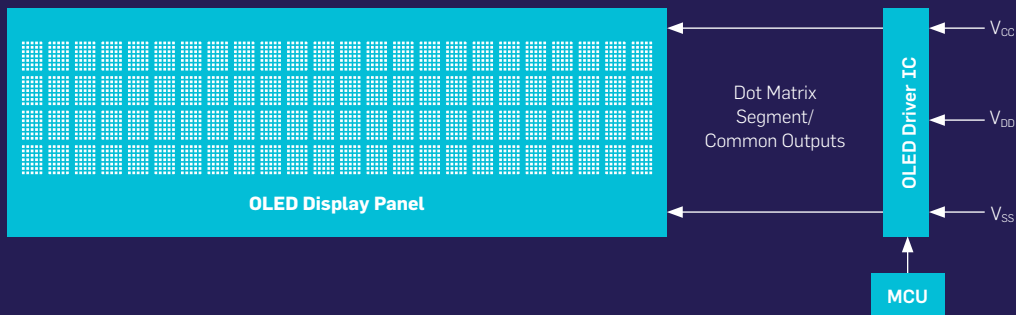
Dot Matrix Panel



256 Icon Mode Connections

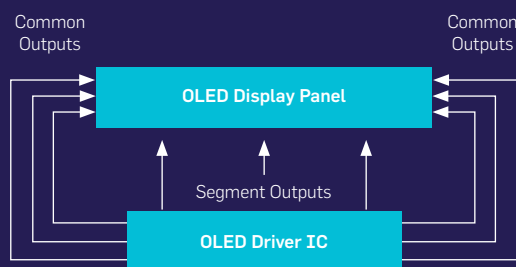


Dot Matrix Panel Connections Diagram

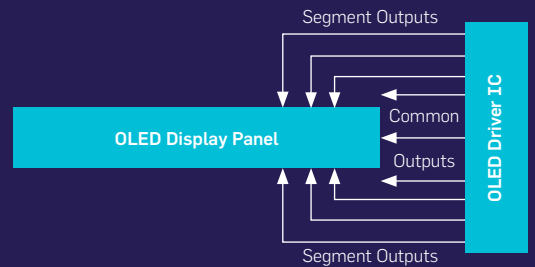


COG IC Placement On Display

Landscape IC (placed on long side of display)



Portrait IC (placed on short side of display)



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For regional sales contacts, please visit our website.

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