

## Features

- RoHS Compliant
- High Luminance
- Dual CCFL, Sidelight type
- Replaceable structure of lamp units
- LVDS interface system
- Slim (5.2mmMAX)
- WSVGA (1024 x 600 pixels color display)
- Applications: 8.9 " wide display size for Industrial/Medical applications


## Mechanical Characteristics

| Item | Specification | Unit |
| :--- | :---: | :---: |
| Dimensional <br> Outline (Typ.) | $219.5(\mathrm{~W}) \times 134.5(\mathrm{H}) \times 8.4 \mathrm{max}(\mathrm{D})$ | mm |
| Number of <br> Pixels | $1024(\mathrm{~W}) \times 600(\mathrm{H})$ | pixels |
| Active Area | $195.07(\mathrm{~W}) \times 113.40(\mathrm{H})$ | mm |
| Pixel Pitch | $0.1905(\mathrm{~W}) \times 0.1890(\mathrm{H})$ | mm |
| Weight (approx.) | 180 | gram |
| Backlight | Dual CCFL, Sidelight type | - |

## Absolute Maximum Ratings

| Item |  | Min. | Max. | Unit |
| :--- | :---: | :---: | :---: | :---: |
| Supply Voltage | $\mathrm{V}_{\mathrm{DD}}$ | -0.3 | +4.0 | V |
|  | $\mathrm{~V}_{\mathrm{FL}}$ | - | 2.0 | $\mathrm{kV}(\mathrm{rms})$ |
| FL Driving Frequency | $\mathrm{f}_{\mathrm{FL}}$ | - | 100 | kHz |
| Input Signal Voltage | $\mathrm{V}_{\mathrm{IN}}$ | -0.3 | $\mathrm{V}_{\mathrm{DD}}+$ <br> 0.3 | $\%(\mathrm{RH})$ |
| Operating Temperature |  | 0 | 50 | ${ }^{\circ} \mathrm{C}$ |
| Storage Temperature | -20 | 60 | ${ }^{\circ} \mathrm{C}$ |  |
| Storage Humidity | 10 | 90 | $\%(\mathrm{RH})$ |  |

## ANDpSi089C362S-4HB

 8.90" WSVGA Color p-Si TFT LCD ModuleThe ANDpSi089C362S-4HB is $1024 \times 600$ Color TFT display that utilizes new poly-silicon ( $\mathrm{p}-\mathrm{Si}$ ) technology to provide a brighter, thinner and lighter display with high-resolution. The p-Si TFT technology allows the row and column LCD drivers to be fabricated directly on the LCD glass. This eliminates the need for discrete TAB drivers and also reduces the thickness, weight and overall size of the display. The 8.90" WSVGA resolution expands applications in mini-notebook PC's.

Electrical Characteristics ( $\mathrm{Ta}=\mathbf{2 5}{ }^{\circ} \mathrm{C}$ )

| Item | Symbol | Min. | Typ. | Max. | Unit |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Supply Voltage <br> $\mathrm{I}_{\mathrm{FL}}=3.0 \mathrm{~mA}(\mathrm{rms})$ | $\left(\mathrm{V}_{\mathrm{DD}}\right)$ | 3.0 | 3.3 | 3.6 | V |
|  | $\left(\mathrm{~V}_{\mathrm{FL}}\right)$ | 520 | 570 | 620 | $\mathrm{~V}(\mathrm{rms})$ |
| FL Start Voltage <br> $\left(\mathrm{Ta}=0^{\circ} \mathrm{C}\right)$ | - | 1300 | - | - | $\mathrm{V}(\mathrm{rms})$ |
| Differential Input <br> Voltage | $\left(\mathrm{V}_{\mathrm{ID}}\right)$ | 100 | - | 600 | mV |
| Common Mode <br> Input Voltage | $\left(\mathrm{V}_{\mathrm{CM}}\right)$ | 1.0 | - | $2.4-$ <br> $\mathrm{V}_{\mathrm{ID}} / 2$ | V |
| Current <br> Consumption | ${ }^{*} 1\left(\mathrm{I}_{\mathrm{DD}}\right)$ | - | 180 | 250 | mA |
|  | ${ }^{*}\left(\mathrm{I}_{\mathrm{FL}}\right)$ | 2.0 | 3.0 | 4.2 | $\mathrm{~mA}(\mathrm{rms})$ |
| *1 *2 Power <br> Consumption <br> $\mathrm{I}_{\mathrm{FL}}=7.5 \mathrm{~mA}(\mathrm{rms})$ | - | - | 7.68 | - | W |

*1) 8 color bars pattern
*2) Excepting the efficiency FL inverter
Optical Characteristics ( $\mathbf{T a}=\mathbf{2 5}{ }^{\circ} \mathrm{C}$ )

| Item |  | Min. | Typ. | Max. | Unit |
| :--- | :--- | :---: | :---: | :---: | :---: |
| Contrast Ratio (CR) |  | 100 | - | - | - |
| Response Time | $\left(\mathrm{t}_{\mathrm{ON}}\right)$ | - | - | 50 | ms |
|  | $\left(\mathrm{t}_{\mathrm{OFF}}\right)$ | - | - | 50 | ms |
| Luminance (L) <br> $\mathrm{I}_{\mathrm{FL}}=3.0 \mathrm{~mA}(\mathrm{rms})$ |  | - | $800^{*}$ | - | $\mathrm{cd} / \mathrm{m}^{2}$ |
| Viewing Angle | $\mathrm{L} / \mathrm{R}$ | - | $40 / 40$ | - | $0^{\circ}$ |
|  | U/D | - | $20 / 30$ | - | $0^{\circ}$ |

* Luminance measured with UDT instument 371 optical power meter

Product specifications contained herein may be changed without prior notice.
It is therefore advisable to contact Purdy Electronics before proceeding with the design of equipment incorporating this product.

Dimensional Outline

Front View
Unit: mm
Standard Tolerance: 0.5 mm


ANDpSi089C362S-4HB
Dimensional Outline


ANDpSi089C362S-4HB
Timing Specifications (see Notes below)

| Signal | Item | Symbol | Min | Typ | Max | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NCLK | Frame Period | ts | 19.0 | 19.84 | - | ns |
|  | Frequency | 1/ts | - | 50.4 | 52.6 | MHz |
|  | high Time | tsh | 6 | - | - | ns |
|  | Low Time | tsl | 7 | - | - | ns |
| HSYNC | Setup to NCLK | tls | 7 | - | - | ns |
|  | Pulse Width | t/w | $8 \times$ ts | - | - | - |
| VSYNC | Pulse Width | tfw | $3 \times$ tlpd | - | $7 \times$ tlpd | - |
|  | VSYNC to DATA | $t f d$ | $7 \times$ tlpd | - | - | - |
|  | Setup to HSYNC | $t f l$ | 16 | - | - | ns |
| - | Line Period | $t / p d=t / p /$ | $\begin{gathered} 1320 \times t s \\ 25.08 \end{gathered}$ | $\begin{gathered} 1344 \times t s \\ 26.67 \end{gathered}$ | $1344 \times$ ts | $\mu \mathrm{s}$ |
|  | Horizontal Display Time | thd | $1024 \times$ ts | $1024 \times$ ts | $1024 \times$ ts | - |
| - | Frame Frequency | 1/tfpd | 56 | 60 | - | Hz |
|  | Frame Period | tfpd=tfpf | $610 \times$ tlpd | $625 \times$ tlpd | $635 \times$ tlpd | - |
|  | Vertical Display Time | tvd | $600 \times$ tlpd | $600 \times$ tlpd | $600 \times$ tlpd | - |
| DATA | Setup | $t d s$ | 5 | - | - | ns |
|  | Hold | $t d h$ | 7 | - | - | ns |
| DE | Setup | tdrs | 10 | - | - | ns |
|  | Hold | tdrh | 10 | - | - | ns |
|  | Display Start | tdrds | - | - | $400 \times$ ts | - |

Notes:
Refer to "Timing Chart" below. If NCLK is fixed to " H " or " L " level for certain period while VDD is supplied, the panel may be damaged. Please adjust LCD operating signal timing and FL driving frequency, to optimized the display quality. There is a possibility that flicker is observed by the interference of LCD operating signal firing and FL driving condition (especially driving frequency), even if the condition satisfied above timing specifications. Do not make tv, tvhd and tvds fluctuate. If tv, tvhd, and tvds are fluctuating, the panel displays black. In case of using the long frame period, the deterioration of display quality, noise, etc., may be occurring. NCLK count of each Horizontal Scanning Time should always be the same. V-Blanking period should be " $n$ " X "Horizontal Scanning Time". ( $n$ :integer) Frame period should always be the same.

Timing Chart



## Block Diagram



Connector Pin Assignment for Interface
CN1 Input Signal
Connector: DF19L-14P-1H / Hirose
Matching Connector: DF19G-14S-1C / Hirose

| Terminal <br> No. | Symbol | Function |
| :---: | :---: | :--- |
| 1 | V $_{\text {DD }}$ | Power Supply Voltage; +3.3V |
| 2 | V $_{\text {DD }}$ | Power Supply Voltage; +3.3V |
| 3 | GND | GND |
| 4 | GND | GND |
| 5 | RxIN0- | Negative LVDS differential clock input <br> (R0-R5, G0) |
| 6 | RxIN0+ | Positive LVDS differential clock input <br> (R0-R5, G0) |
| 7 | RxIN1- | Negative LVDS differential clock input <br> (G1-G5, B0-B1) |
| 9 | RxIN1+ | Positive LVDS differential clock input <br> (G1-G5, B0-B1) |
| 10 | RxIN2- | Negative LVDS differential clock input <br> (B2-B5, HS, VS, DE) |
| 11 | Cositive LVDS differential clock input <br> (B2-B5, HS, VS, DE) | Clock Signal (-) |
| 12 | CLK+ | Clock Signal (+) |
| 13 | GND | GND |
| 14 | GND | GND |

Note: Please connect GND pin to ground. Don't use it as no-connect nor connection with high impedance.

## CN2,CN3 CCFL Power Source

Connector: BHSR-02VS-1 / Japan Solderless Terminal
Mfg. Co., Ltd.
Matching Connector: SM02B-BHSS-1 / Japan Solderless Terminal Mfg, Co., Ltd.

| Terminal <br> No. | Symbol | Function |
| :---: | :---: | :--- |
| 1 | $\mathrm{~V}_{\text {FLH }}$ | CCFL Power Supply (High Voltage) |
| 2 | $\mathrm{~V}_{\text {FLL }}$ | CCFL Power Supply (Low Voltage) |

256k (k+1024) Colors Combination Table

|  | Display | R5 | R4 | R3 | R2 | R1 | R0 | G5 | G4 | G3 | G2 | G1 | G0 | B5 | B4 | B3 | B2 | B1 | B0 | Gray Scale Level |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Basic Color | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | - |
|  | Blue | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | - |
|  | Green | L | L | L | L | L | L | H | H | H | H | H | H | L | L | L | L | L | L | - |
|  | Lt. Blue | L | L | L | L | L | L | H | H | H | H | H | H | H | H | H | H | H | H | - |
|  | Red | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | - |
|  | Purple | H | H | H | H | H | H | L | L | L | L | L | L | H | H | H | H | H | H | - |
|  | Yellow | H | H | H | H | H | H | H | H | H | H | H | H | L | L | L | L | L | L | - |
|  | White | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | - |
| Gray <br> Scale of Red | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
|  | Dark | L | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L1 |
|  | $\stackrel{\Delta}{\nabla}$ | L | L | L | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | L3~L60 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | H | H | H | H | L | H | L | L | L | L | L | L | L | L | L | L | L | L | L61 |
|  |  | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | L | L62 |
|  | Red | H | H | H | H | H | H | L | L | L | L | L | L | L | L | L | L | L | L | Red L63 |
| Gray Scale of Green | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
|  | Dark | L | L | L | L | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L1 |
|  | $\nabla$ <br> Light | L | L | L | L | L | L | L | L | L | L | H | L | L | L | L | L | L | L | L2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | L3~L60 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | L | L | L | L | L | L | H | H | H | H | L | H | L | L | L | L | L | L | L61 |
|  |  | L | L | L | L | L | L | H | H | H | H | H | L | L | L | L | L | L | L | L62 |
|  | Green | L | L | L | L | L | L | H | H | H | H | H | H | L | L | L | L | L | L | Green L63 |
| Gray Scale of Blue | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
|  | Dark | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L1 |
|  | $\stackrel{\nabla}{\nabla}$ | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | H | L | L2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | L3~L60 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | L | H | L61 |
|  |  | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | L | L62 |
|  | Blue | L | L | L | L | L | L | L | L | L | L | L | L | H | H | H | H | H | H | Blue L63 |
| Gray Scale of White \& Black | Black | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L0 |
|  | Dark | L | L | L | L | L | H | L | L | L | L | L | H | L | L | L | L | L | H | L1 |
|  |  | L | L | L | L | H | L | L | L | L | L | H | L | L | L | L | L | H | L | L2 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | L3~L60 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | H | L61 |
|  |  | H | H | H | H | H | L | H | H | H | H | H | L | H | H | H | H | H | L | L62 |
|  | White | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | H | White L63 |

