

AND064VT5N1-WVHB

6.4" VGA

Color TFT LCD Module

The AND064VT5N1-WVHB is a compact full color amorphous silicon TFT LCD module, that is suitable for applications such as computers, industrial, and test equipment, image communication and multi-media. This device consists of a twisted nematic (TN) liquid crystal cell, that incorporates a TFT-array that has 640 x 480 pixels on a 6.4 inch diagonal screen, X and Y drivers, an LSI controller, and a built-in CCFL backlight.

Features

- High aperture ratio
- High brightness
- High contrast ratio
- RoHS compliant
- Image Reversion: Up/Down & Left/Right
- Backlight lamps are replaceable
- Compatible w/VGA-480, VGA-400, VGA-350 & free format

• RoHS Compliant

- Single 5V input for LCD
- Thin and light weight
- High image quality
- Active/outline area=62.3%

Mechanical Characteristics

| Item | Specification | Unit |
|----------------------|----------------------------------|------|
| Screen Size | 6.4 inch (17 cm) diagonal | inch |
| Outline Dimensions | 175.0 (H) x 126.5 (V) x 12.5 (D) | mm |
| Active Area | 129.60 (H) x 97.44 (V) | mm |
| Input Signal | 6-bit Digital | |
| Pixel No. (RGB trio) | 640 (H) x 480 (V) | dot |
| Dot Pitch | 0.0675 (H) x 0.203 (V) | mm |
| Pixel Configuration | Stripe | - |
| Pixel Pitch | 0.203 (H) x 0.203 (V) | mm |
| Weight | 340±10 | g |

Absolute Maximum Rating

| Item | Symbol | Conditions | Absolute Max. Rating | | Unit |
|-------------------------------------|------------------|------------|----------------------|----------------------|------|
| | | | Min. | Max. | |
| +5V Supply Voltage | V _{CC} | Ta=25°C | -0.3 | 7.0 | V |
| Input Signals Voltage | V _{sig} | Ta=25°C | -0.3 | V _{CC} +0.3 | V |
| Operating Temperature | Top | - | -20 | +70 | °C |
| Storage Temperature | T _{stg} | - | -30 | +70 | °C |
| Humidity (No condensation of water) | - | ≤40°C | - | 95% | RH |

Electrical Specification

| Item | Symbol | Conditions | Specifications | | | Units |
|------------------------------|-------------------|------------|----------------|------|------|------------------|
| | | | Min. | Typ. | Max. | |
| Supply Voltage | V _{CC} | Ta=25°C | 4.75 | 5.0 | 5.25 | V |
| Current Dissipation | I _{CC} | Ta=25°C | - | 500 | 600 | mA |
| Supply Input Ripple Voltage | V _{CCRP} | Ta=25°C | - | - | 0.1 | Vp-p |
| Input Signals Voltage (High) | V _{IH} | Ta=25°C | 2.6 | - | - | V |
| Input Signals Voltage (Low) | V _{IL} | Ta=25°C | - | - | 0.5 | V |
| Tube Current | I _E | Ta=25°C | - | 6 | - | mA |
| Tube Voltage | V _L | Ta=25°C | - | 380 | - | V _{RMS} |

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.

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Power Consumption

| Parameters | Symbol | Specifications | | Unit | Remark |
|------------------------------|-----------------|----------------|------|------|----------------------|
| | | Typ. | Max. | | |
| +5V Current Dissipation | I _{CC} | 260 | 300 | mA | – |
| Input Signals Current (High) | I _{IH} | – | 100 | μA | V _{IH} =+5 |
| Input Signals Current (Low) | I _{IL} | – | 100 | μA | V _{IL} =0V |
| LCD Panel Power Consumption | – | 1.3 | – | W | – |
| Backlight Power Consumption | – | 4.56 | – | mA | 380 V _{RMS} |

Optical Specification

| Item | Symbol | Conditions | Specifications | | | Unit | |
|----------------|------------|--|----------------|--------|------|-------------------|-----|
| | | | Min. | Typ. | Max. | | |
| Luminance | LUM | | 300 | 350 | – | cd/m ² | |
| Contrast Ratio | CR | <u>Luminance when LCD is White</u> <u>Luminance when LCD is Black</u> | 100 | 180 | – | – | |
| Viewing Angle | Horizontal | θ | CR≥10 | ±55 | ±60 | – | deg |
| | Vertical | θ (to 12 o'clock) | | 35 | 40 | – | – |
| | | θ (to 6 o'clock) | | 50 | 55 | – | – |
| Lamp Life | +25°C | Time | – | 20,000 | – | hr | |

Interface Pin Assignment
CN1 Input Signal (DF9A-31P-1V)

| Pin No. | Symbol | Function |
|---------|--------|--|
| 1 | GND | Ground (0V) |
| 2 | CLK | Clock sig. for sampling image digital data |
| 3 | Hsync | Horizontal synchronous signal |
| 4 | Vsync | Vertical synchronous signal |
| 5 | GND | Ground (0V) |
| 6 | R0 | Red Image data signal (LSB) |
| 7 | R1 | Red Image data signal |
| 8 | R2 | Red Image data signal |
| 9 | R3 | Red Image data signal |
| 10 | R4 | Red Image data signal |
| 11 | R5 | Red Image data signal (MSB) |
| 12 | GND | Ground (0V) |
| 13 | G0 | Green Image data signal (LSB) |
| 14 | G1 | Green Image data signal |
| 15 | G2 | Green Image data signal |
| 16 | G3 | Green Image data signal |

| Pin No. | Symbol | Function |
|---------|--------|--|
| 17 | G4 | Green Image data signal |
| 18 | G5 | Green Image data signal (MSB) |
| 19 | GND | Ground (0V) |
| 20 | B0 | Blue Image data signal (LSB) |
| 21 | B1 | Blue Image data signal |
| 22 | B2 | Blue Image data signal |
| 23 | B3 | Blue Image data signal |
| 24 | B4 | Blue Image data signal |
| 25 | B5 | Blue Image data signal (MSB) |
| 26 | GND | Ground (0V) |
| 27 | DENB | Signal to select horiz. display position |
| 28 | VCC | DC +5.0V power supply |
| 29 | VCC | DC +5.0V power supply |
| 30 | R/L | Horiz. image shift-direction select signal |
| 31 | U/D | Vert. image shift-direction select signal |

CN2 & CN3 CCFL Power Supply

| Pin No. | Symbol | Description |
|---------|--------|----------------------|
| 1 | VL | Input (High Voltage) |
| 2 | NC | No Connect |
| 3 | GL | Input (Low Voltage) |

Note: Low voltage side of backlight inverter connects with ground of inverter circuits.

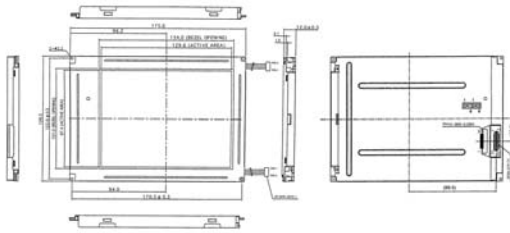
Input/Output Connector

(A) LCD module connector
Hirose DF9A-31P-1V

(B) Backlight connector
JST BHR-03VS-1
Pin No.: 3
Pitch: 4 mm
Red: High voltage
White: Low voltage

Dimensional Outline

General mechanical tolerance = 0.5mm

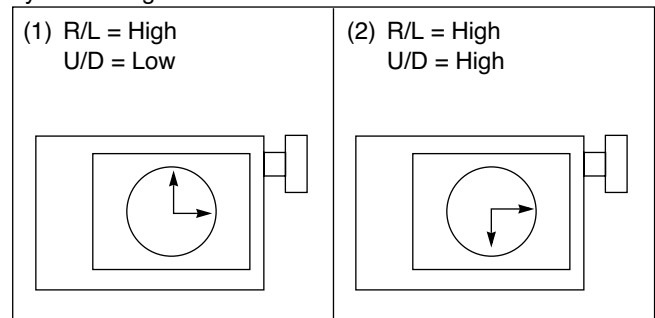
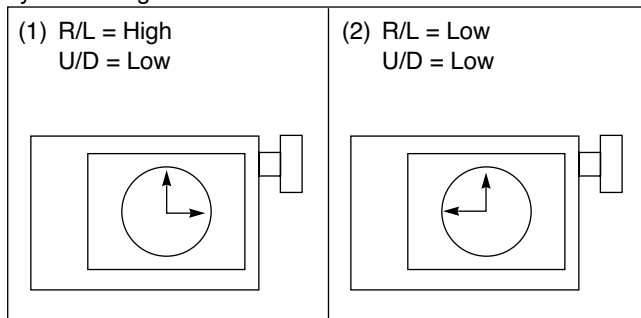


Note: The TFT-LCD module is compatible with four kinds of VGA timing. They are VGA-480, VGA-400, VGA-350 and freedom mode. The polarization of Hsync and Vsync determine the timing.

| | VGA-480 | VGA-400 | VGA-350 | Freedom Mode |
|---------------------------|----------|----------|----------|--------------|
| Hsync Polarization | Negative | Negative | Positive | Positive |
| Vsync Polarization | Negative | Positive | Negative | Positive |

R/L is the Right/Left shift signal. The default value of the system is High.

U/D is the Up/Down shift signal. The default value of the system is High.


Input/Output Signal Timing Chart

| Parameters | | Symbol | Format | Min | Typ | Max | Unit |
|------------|-------------------|-------------|--------|-----|--------|-----|------|
| Clock | Frequency | $F_c=1/T_c$ | All | – | 25.175 | – | MHz |
| | High Time | Tckh | All | 10 | – | – | ns |
| | Low Time | Tckl | All | 10 | – | – | ns |
| | Periodic = 1 line | Thp | All | – | 31.778 | – | us |

| Parameters | | Symbol | Format | Min | Typ | Max | Unit |
|------------------------------|---------------------|--------|--------------|-----|-----|-------|-------|
| Hsync | | | | – | 800 | 1024 | clock |
| | Pulse Width | Thpw | All | 2 | 96 | 200 | clock |
| | Back Porch | Thbp | All | 2 | 48 | 64 | clock |
| Vsync | Periodic = Frame | Typ | VGA-480 | 515 | 525 | 1024 | line |
| | | | VGA-400 | 447 | 449 | 1024 | line |
| | | | VGA-350 | 447 | 449 | 1024 | line |
| | | | Freedom Mode | – | – | 1024 | line |
| | Pulse Width | Tvpw | All | 1 | 2 | – | line |
| | Back Porch | Tvbp | All | 1 | – | 64 | line |
| Data | Setup Time | Tds | All | 10 | – | – | ns |
| | Hold Time | Tdh | All | 10 | – | – | ns |
| DENB | Periodic = Line | Tep | All | – | 800 | 1024 | clock |
| | Pulse Width (H) | Tepw | All | 2 | 640 | 800 | clock |
| | Display Line No (V) | Tvd | VGA-480 | 480 | 480 | – | line |
| | | | VGA-400 | 400 | 400 | – | line |
| | | | VGA-350 | 350 | 350 | – | line |
| | | | Freedom Mode | – | 480 | – | line |
| Horizontal Display Periodic | | Thd | All | 640 | 640 | 640 | clock |
| Hsync-CLK Phase Difference | | Thc | All | 10 | – | Tc-10 | ns |
| Vsync-Hsync Phase Difference | | Tvh | All | 1 | – | Thp-1 | clock |

AND064VT5N1-WV HB Block Diagram
