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PRODUCT SPECIFICATION

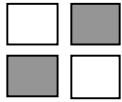
MONOCHROME LCD MODULE

PART NUMBER : FGD192032B

DESCRIPTION : 32x192Graphic

REVISION : Rev A

| | | | |
|--------------------------|---------------------------------|-------------------------------------|------------------------------|
| <input type="checkbox"/> | Approval for Specification only | <input type="checkbox"/> | Approval for Sample Only |
| <input type="checkbox"/> | Approval for Pre-production | <input checked="" type="checkbox"/> | Approval for Mass Production |



FGD192032B (192 DOTS X 32 DOTS)

FEATURES

- ◆ BUILT-IN CONTROLLER (SED1520 OR EQUIVALENT)
- ◆ +5 V POWER SUPPLY
- ◆ 1/32 DUTY CYCLE
- ◆ 8-BIT PARALLEL INTERFACE
- ◆ 4.2 V LED FORWARD VOLTAGE

MECHANICAL DATA

| ITEM | DIMENSIONS | UNIT |
|---------------------------|---------------------------------|------|
| Module Size (W x H x T) | 116.0 x 37.0 x 9.4 (10.8 LED) | mm |
| Viewing Area (W x H) | 88.0 x 19.0 | mm |
| Active Area (W x H) | 80.6 x 16.28 | mm |
| Dot Size (W x H) | 0.38 x 0.47 | mm |
| Dot Pitch (W x H) | 0.42 x 0.51 | mm |

INTERFACE PIN CONNECTIONS

| NO. | SYMBOL | LEVEL | FUNCTION |
|------|-----------------|-------|-----------------------------|
| 1 | V _{SS} | 0V | Power Supply Ground |
| 2 | V _{DD} | 5V | Power Supply Voltage |
| 3 | V _o | - | Contrast Adjustment Voltage |
| 4 | A _o | H/L | Data Type Select Signal |
| 5 | R/W | H/L | H : Read / L : Write |
| 6 | E | H→L | Enable Signal |
| 7-14 | DB0-DB7 | H/L | Data Bus Line |
| 15 | A | 4.2V | LED Power (+) |
| 16 | K | 0V | LED Power (-) |
| 17 | CS1 | H | Chip Select Signal For IC1 |
| 18 | CS2 | H | Chip Select Signal For IC2 |
| 19 | CS3 | H | Chip Select Signal For IC3 |
| 20 | CL | H/L | Clock Input (2 KHz) |

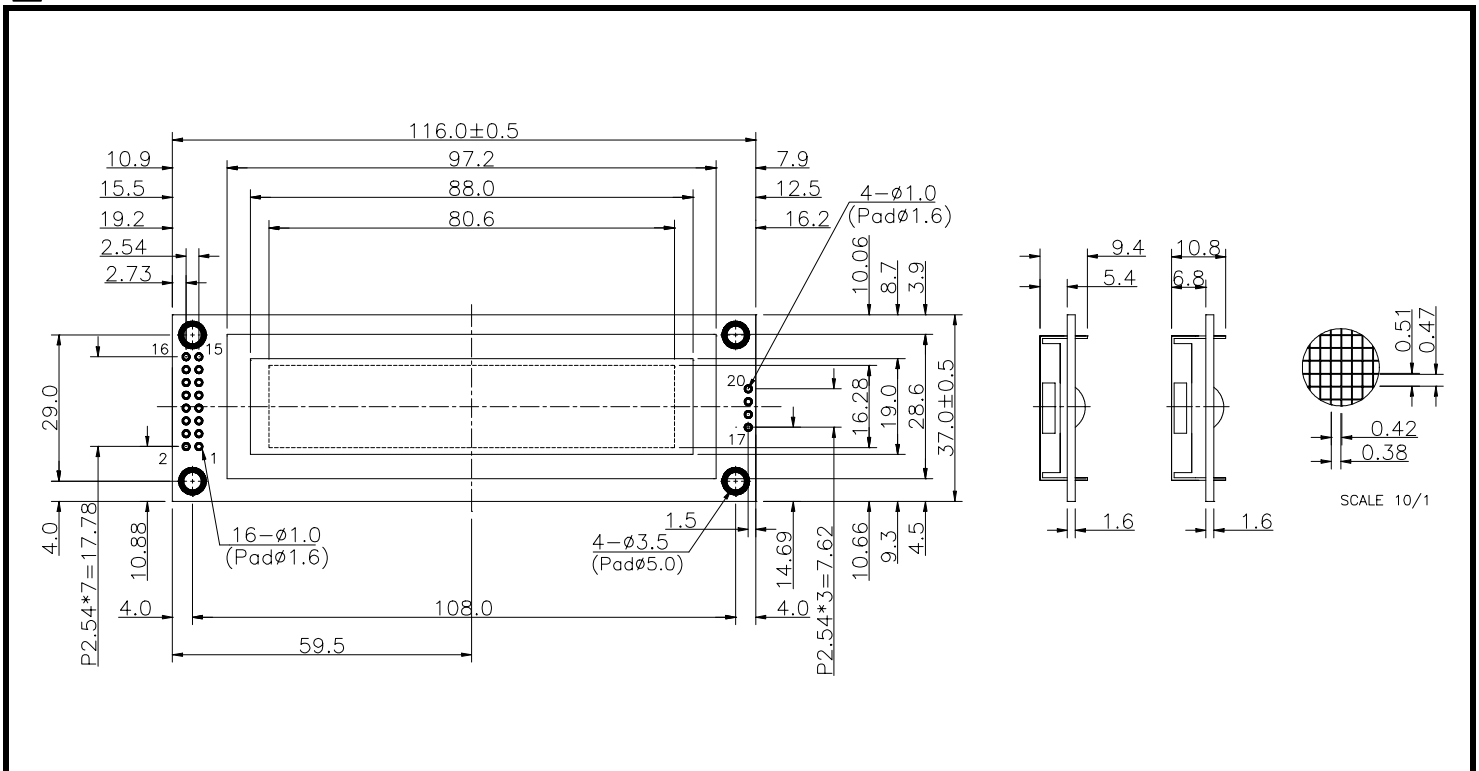
ABSOLUTE MAXIMUM RATINGS

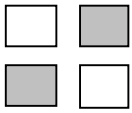
| ITEM | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|------------------------------|----------------------------------|-----------------|------|-----------------|------|
| Supply Voltage For Logic | V _{DD} -V _{SS} | 0 | - | 7 | V |
| Supply Voltage For LCD Drive | V _{DD} -V _o | 0 | - | 12 | V |
| Input Voltage | V _I | V _{SS} | - | V _{DD} | V |

ELECTRICAL CHARACTERISTICS

| ITEM | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT | |
|--------------------------|----------------------------------|-----------------------------|------|------|------|-----------------|---|
| Supply Voltage For Logic | V _{DD} -V _{SS} | - | 4.5 | 5 | 5.5 | V | |
| Supply Voltage For LCD | V _{DD} -V _o | V _{DD} =5V Ta=25°C | 4.4 | 4.8 | 5.2 | V | |
| Supply Current | I _{DD} | V _{DD} =5V | - | 3 | 4.5 | mA | |
| Input Voltage | "HIGH" Level | V _{IH} | - | 2.2 | - | V _{DD} | V |
| | "LOW" Level | V _{IL} | - | - | - | 0.6 | V |
| Output Voltage | "HIGH" Level | V _{OH} | - | 2.4 | - | V | V |
| | "LOW" Level | V _{OL} | - | - | - | 0.4 | V |

EXTERNAL DIMENSIONS

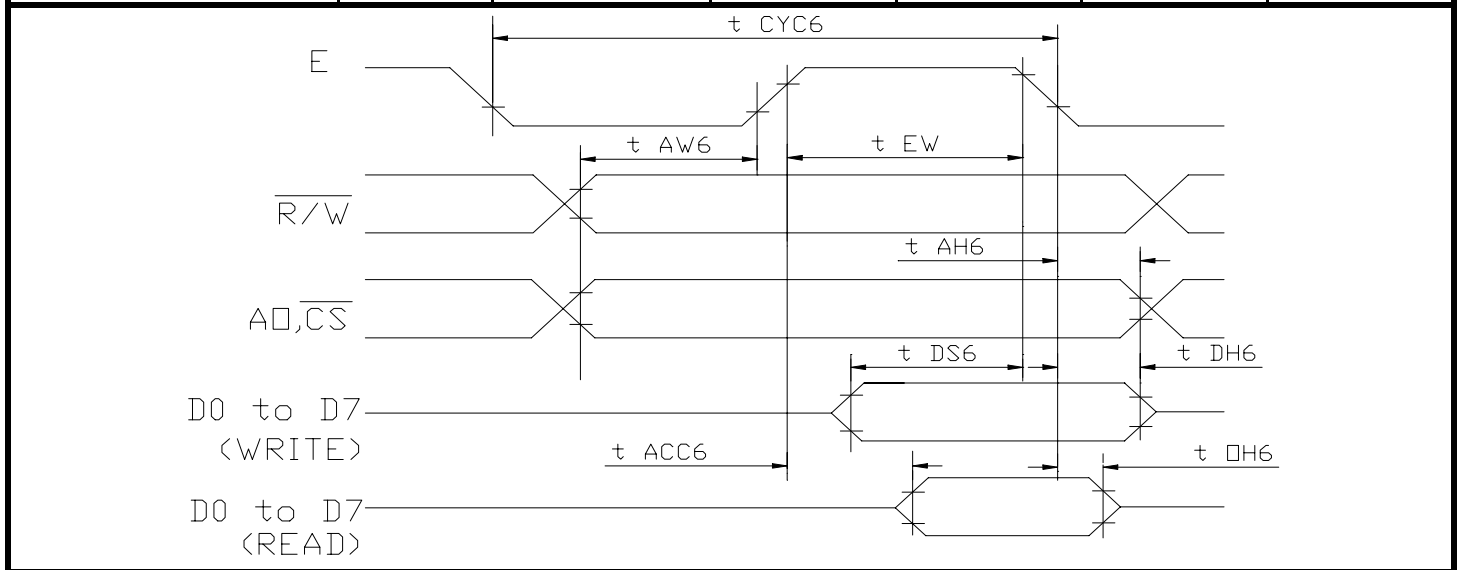




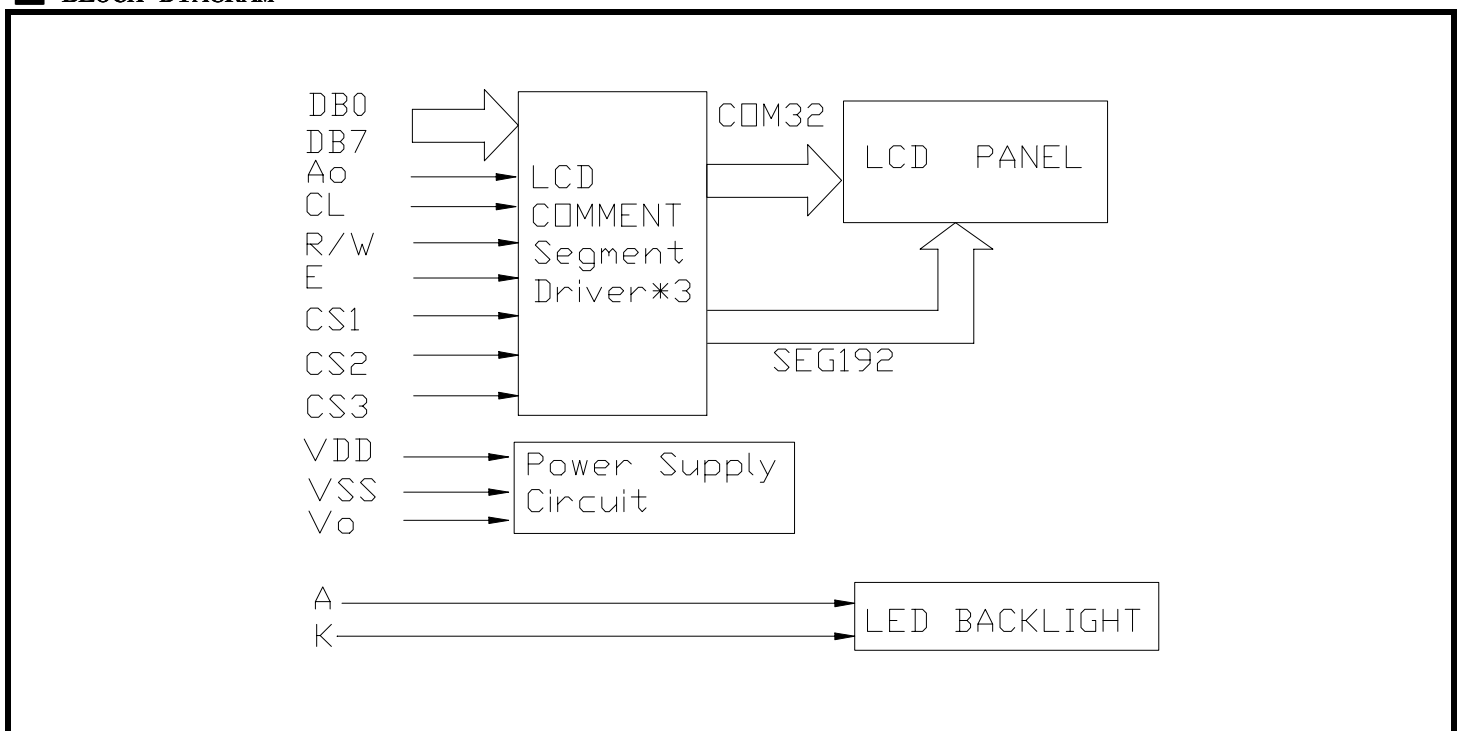
FGD192032B (192 DOTS X 32 DOTS)

■ TIMING CHARACTERISTICS

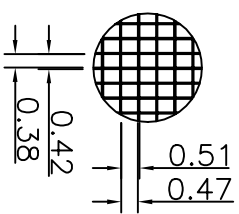
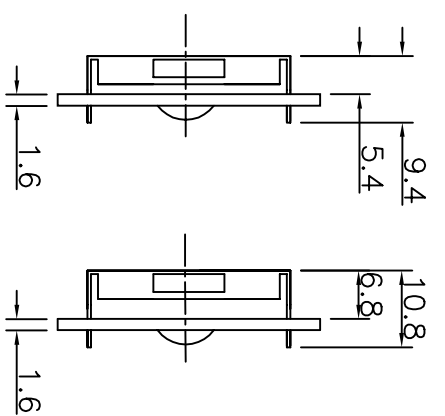
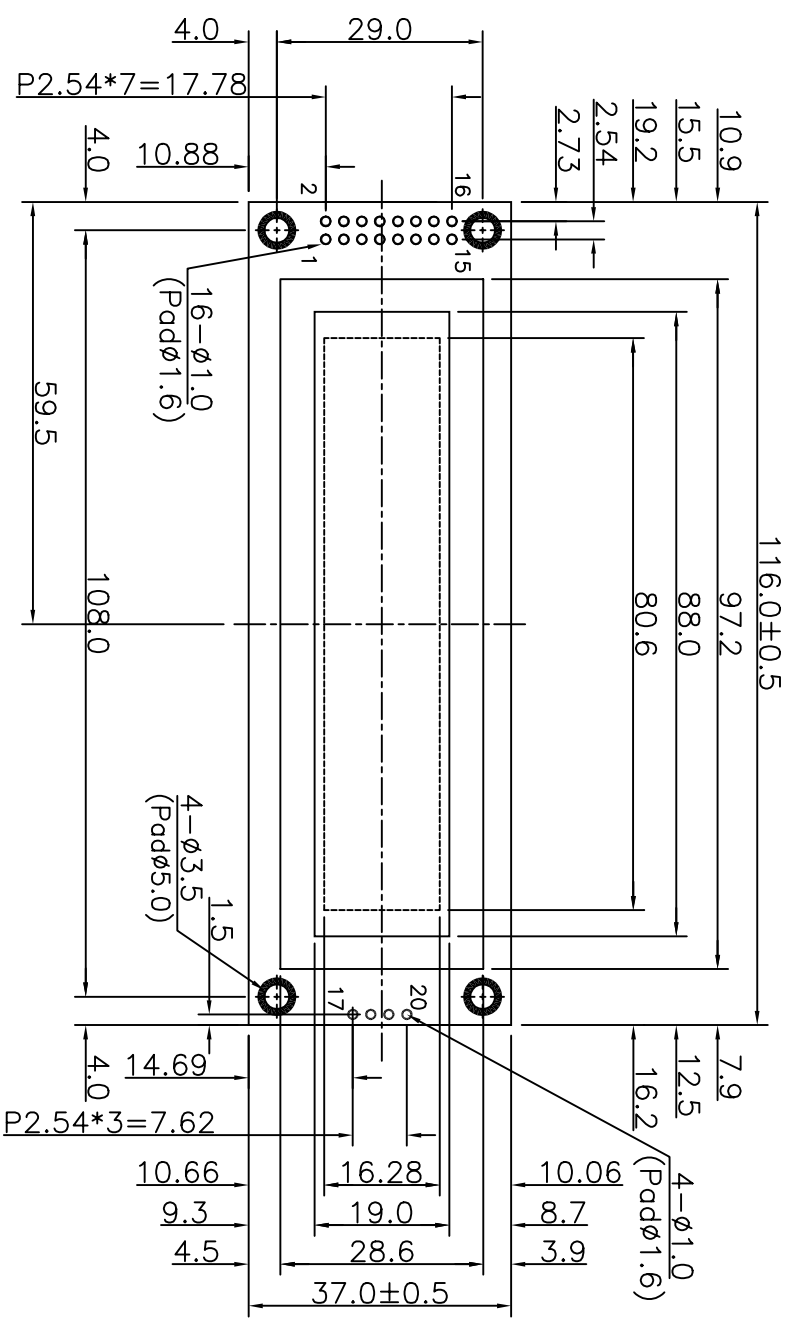
| ITEM | SYMBOL | MIN. | TYP. | MAX. | UNIT. |
|---------------------|------------|----------|------|------|-------|
| System Cycle Time | t_{CYC6} | 1000 | - | - | ns |
| Address Set-up Time | t_{AW6} | 20 | - | - | ns |
| Address Hold Time | t_{AH6} | 10 | - | - | ns |
| Data Set-up Time | t_{DS6} | 80 | - | - | ns |
| Data Hold Time | t_{DH6} | 10 | - | - | ns |
| Output Disable Time | t_{OH6} | 10 | - | 60 | ns |
| Access Time | t_{ACC6} | - | - | 90 | ns |
| Enable Pulse Width | Read | t_{EW} | - | - | ns |
| | Write | | | | 80 |



■ BLOCK DIAGRAM



| PIN NO | SIGNAL |
|--------|--------|
| 1 | VSS |
| 2 | VDD |
| 3 | V0 |
| 4 | A0 |
| 5 | R/W |
| 6 | E |
| 7 | DB0 |
| 8 | DB1 |
| 9 | DB2 |
| 10 | DB3 |
| 11 | DB4 |
| 12 | DB5 |
| 13 | DB6 |
| 14 | DB7 |
| 15 | A |
| 16 | K |
| 17 | CS1 |
| 18 | CS2 |
| 19 | CS3 |
| 20 | CL |



SCALE 10:1

| NOTE | ITEM | CONTENT | DATA | REV | TOLERANCE | SCALE | UNIT | DWYN | DATE | CUSTOMER APVL | TITLE | MODEL | DWG. NO | PAGE |
|------------------------|------|---------------|------------|-----|-----------|-------|------|------|------|---------------|--------|----------|-----------|------|
| | | CHANGE NUMBER | 2004.03.01 | 0 | X. ±0.30 | 1/1 | mm | CHKD | | | MODULE | SG19232B | A-A2-0026 | 1/1 |
| | | | | | X. ±0.20 | | | | | | | | | |
| | | | | | .XX±0.05 | | | | | | | | | |
| SUNLIKE DISPLAY | | | | | | | | | | | | | | |