



DM-TFTR132-454

1.32" IPS 360 X 360 TFT TRANSMISSVIE
ROUND DISPLAY MODULE-MCU

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1 Revision History

| Date | Changes |
|-----------|---------------|
| 2022-8-11 | First release |

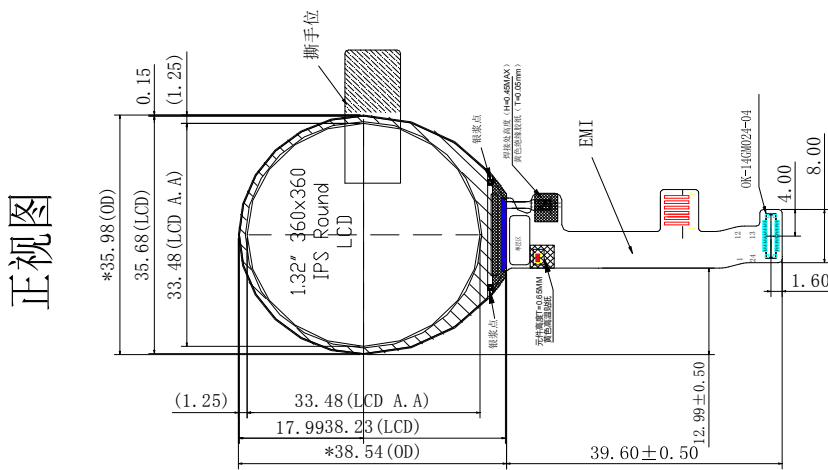
2 Main Features

| Item | Specification | Unit |
|------------------|-------------------------------|-------------------|
| Diagonal Size | 1.32 | inch |
| Resolution | 360 RGB x 360 | pixel |
| Dot pitch | 0.093(H) x 0.093(V) | mm |
| Drive IC | GC9C01 | - |
| Interface | MCU 8bit Interface | - |
| Active Area | 33.48 x 33.48 | mm |
| Module Dimension | 35.98(H) x 38.54(V) x 1.56(D) | mm |
| Luminance | 450 | cd/m ² |
| View angle | FREE | - |
| Backlight | 2 LED Parallel | |
| Operating Temp | -20°C ~ +70°C | °C |
| Storage Temp | -30°C ~ +80°C | °C |
| Weight | TBD | g |

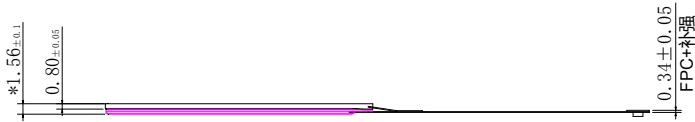
3 Pin Description

| Pin No. | Symbol | Function Description |
|---------|--------|--|
| 1-8 | D7-D0 | 8bit data bus. |
| 9 | RST | Reset signal Input pin |
| 10 | WR | Write enable in MCU parallel interface |
| 11 | DC | Display data/command selection pin |
| 12 | CS | Chip selection LOW enable |
| 13 | GND | Ground |
| 14 | TE | Tearing effect signal |
| 15 | VCC+RD | Power supply voltage |
| 16 | LEDK | LED backlight - |
| 17 | LEDA | LED backlight + |
| 18 | GND | Ground |
| 19 | TP_SCL | Touch panel I2C clock |
| 20 | TP_SDA | Touch panel I2C clock |
| 21 | TP_RST | Touch panel I2C clock |
| 22 | TP_INT | Touch panel I2C clock |
| 23 | TP_VDD | Touch panel I2C clock |
| 24 | GND | Ground |

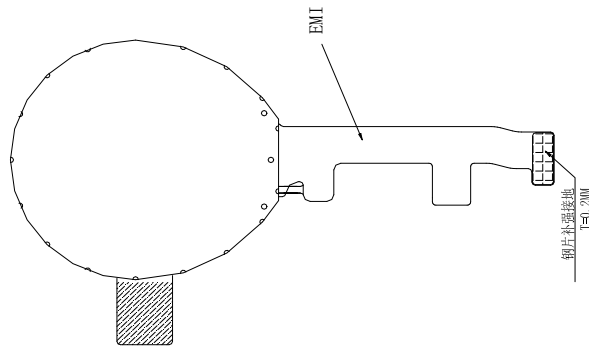
4 Mechanical Drawing



侧视图



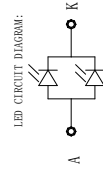
背视图



24 PIN定义 8080

| PIN | NAME |
|-----|--------|
| 1 | D7 |
| 2 | D6 |
| 3 | D5 |
| 4 | D4 |
| 5 | D3 |
| 6 | D2 |
| 7 | D1 |
| 8 | D0 |
| 9 | RST |
| 10 | WR |
| 11 | DC |
| 12 | CS |
| 13 | GND |
| 14 | TE |
| 15 | VCC+R0 |
| 16 | LEDK |
| 17 | LEDA |
| 18 | GND |
| 19 | TP_SCL |
| 20 | TP_SDA |
| 21 | TP_RST |
| 22 | TP_INT |
| 23 | TP_VDD |
| 24 | GND |

| NO. | SYMBOL |
|-----|----------|
| 1 | TP-SCL |
| 2 | TP-SDA |
| 3 | TP-RESET |
| 4 | TP-INT |
| 5 | TP-VDD |
| 6 | GND |



LED CIRCUIT DIAGRAM:
IF=40MA, VF= [2.8V~3.2V]

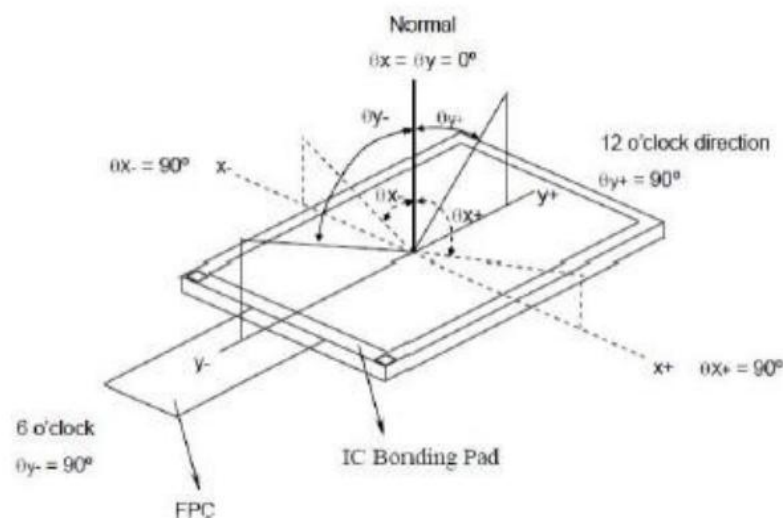
- NOTES: 模组亮度: 360CD/M2(MIN)/450CD/M2(TYP)
1. DISPLAY TYPE: LCD 360*360 262K 1.32" LTPS
 2. OPERATING TEMP: -20° C~70° C; STORAGE TEMP: -30° C~80° C
 3. MAIN LCD DRIVER IC: GC9C01
 4. OPTIMUM VIEWING ANGLE: FREE
 5. BACKLIGHT: 2 CHIP WHITE LED; (IF=40mA; VF=2.8~3.2V)
 6. UNMARKED TOLERANCE: ±0.2mm
 7. WITH* * MARK DIMENSIONS ARE IMPORTANT DIMENSIONS.
 8. WITH() MARK DIMENSIONS ARE REFERENCE DIMENSIONS.
 9. REQUIREMENTS ON ENVIRONMENTAL PROTECTION: ROHS .

5 Optics & Electrical Characteristics

5.1 Optics Characteristics

| Item | Symbol | Min | Typ | Max | Unit | Remark | | | |
|-----------------------|---------------------------------|-------|----------------|-------|------|------------------|----|-------------------|--------|
| View Angles TOP | ∅U | - | 80 | - | deg | Note 1 | | | |
| View Angles Bottom | ∅D | - | 80 | - | deg | | | | |
| View Angles Right | ∅R | - | 80 | - | deg | | | | |
| View Angles Left | ∅L | - | 80 | - | deg | | | | |
| C.I.E(Red) | (x) (y) | -0.03 | 0.680 0.310 | +0.03 | - | Note 4 Note 5 | | | |
| C.I.E(Green) | (x) (y) | | 0.293 0.672 | | - | | | | |
| C.I.E(Blue) | (x) (y) | | 0.153 0.090 | | - | | | | |
| C.I.E(White) | (x) (y) | | 0.315 0.330 | | - | | | | |
| Response Time | T _R + T _F | | - | | 35 | | 40 | ms | Note 3 |
| Contrast Ratio | CR | | 1200 | | 1500 | | - | - | Note 2 |
| LCM Surface Luminance | L _v | | 350 | | 450 | | | cd/m ² | Note 4 |

Note (1): Definition of Viewing Angle (视角定义)

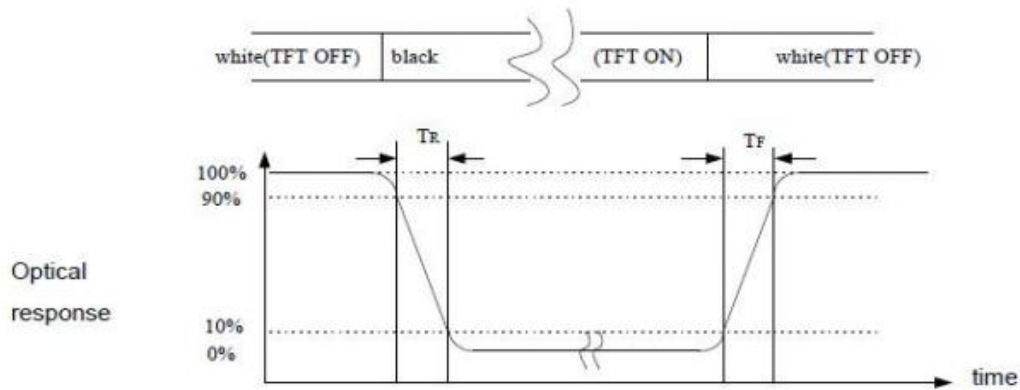


Note (2): Definition of Contrast Ratio(CR) (对比度定义)

Measured point 1 through 5 of panel. (测试 P1 到 P5 的亮度)

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}} \quad \text{对比度} = \frac{\text{显示白色画面时平均表面亮度}}{\text{显示黑色画面时平均表面亮度}}$$

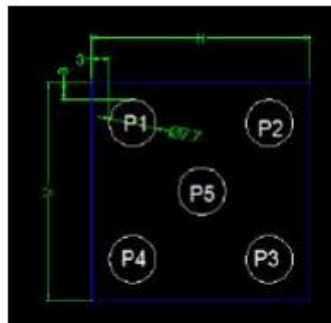
Note (3): Definition of Response Time: sum of TR and TF (响应时间定义)



Note (4): Measuring method for Contrast ratio, Surface Luminance, Luminance uniformity, CIE(x,y) Chromaticity (对比度, 表面亮度, 均匀度, CIE 坐标测试方法)

亮度测试标准

1. 检测方法: 如下图 5 点, BM-7 使用 1° 测试点
距离发光面 $500\text{mm} \pm 20\text{mm}$ 测试
2. 均匀性 $= \text{MIN} \div \text{MAX} * 100\%$



Note (5): CIE(x,y) Chromaticity, The X,Y value is determined by screen active area position 5. (CIE 坐标测试测试点为显示屏中心点 P5)

5.2 Absolute Maximum Ratings

| Item | Symbol | Min | Max | Unit |
|-----------------------|-----------------|------|--------------|------|
| Supply Voltage | VDD | -0.3 | 4.6 | V |
| Analog Supply Voltage | VDDIO | -0.3 | 4.6 | V |
| Humidity | RH | / | 90%(Max60°C) | RH |
| Operating Temperature | T _{OP} | -20 | +70 | °C |
| Storage Temperature | T _{ST} | -30 | 80 | °C |

5.3 Operating Conditions

| Item | Symbol | Min | Typ | Max | Unit |
|-----------------------------|-----------------|---------|-----|----------|------|
| System Voltage | VDD | 2.5 | 2.8 | 3.3 | V |
| Interface Operation Voltage | VDDIO | 1.65 | 2.8 | 3.3 | V |
| Input Voltage 'H' level | V _{ih} | 0.7VDDI | - | VDD | V |
| Input Voltage 'L' level | V _{il} | 0 | - | 0.3*VDDI | V |
| Output Voltage 'H' level | I _{oh} | 0.8VDD | - | VDD | V |
| Output Voltage 'L' level | V _{ol} | 0 | - | 0.2*VDDI | V |

5.4 Backlight Unit

| Item | Symbol | Min | Typ | Max | Unit | Remark |
|----------------------|------------------|-----|-----|-----|-------|---------|
| Forward voltage | V _f | 2.8 | 3.0 | 3.3 | V | If=40mA |
| Number of LED | - | 2 | | | Piece | - |
| Connection mode | S/P/M | 2P | | | - | - |
| Backlight uniformity | No Less than 80% | | | | hr | 3 |

6 Reliability

| Test Item | Content of Test | Test Condition | Note |
|---|---|--|------|
| High Temperature Storage | Endurance test applying the high storage temperature for a long time. | 90°C 96hrs | 2 |
| Low Temperature Storage | Endurance test applying the high storage temperature for a long time. | -40°C 96hrs | 1,2 |
| High Temperature Operation | Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time. | 85°C 96hrs | - |
| Low Temperature Operation | Endurance test applying the electric stress under low temperature for a long time. | -30°C 96hrs | 1 |
| High Temperature/ Humidity Operation | The module should be allowed to stand at 60°C,90%RH max, for 96hrs under no-load condition excluding the polarizer. Then taking it out and drying it at normal temperature. | 60°C,90%RH 96hrs | 1,2 |
| Thermal Shock Resistance | The sample should be allowed stand the following 10 cycles of operation. | -30°C/85°C 20 cycles | - |
| Vibration Test | Endurance test applying the vibration during transportation and using. | Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55 Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition). | 3 |
| Static Electricity Test | Endurance test apply the electric stress to the terminal. | C=150pF, R=330,5points /panel Air:±8KV, 5times; Contact:±6KV, 5 times; (Environment: 15°C~35°C, 30%~60%). | - |

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal. Temperature and humidity after remove from the rest chamber.

Note3: Test performed on product itself, not inside a container

7 Warranty and Conditions

<http://www.displaymodule.com/pages/faq>