



DM-TFTR128-449

1.28" IPS 240 X 240 TFT TRANSMISSVIE  
ROUND DISPLAY MODULE-MCU

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## 1 Revision History

Date	Changes
2022-7-1	First release

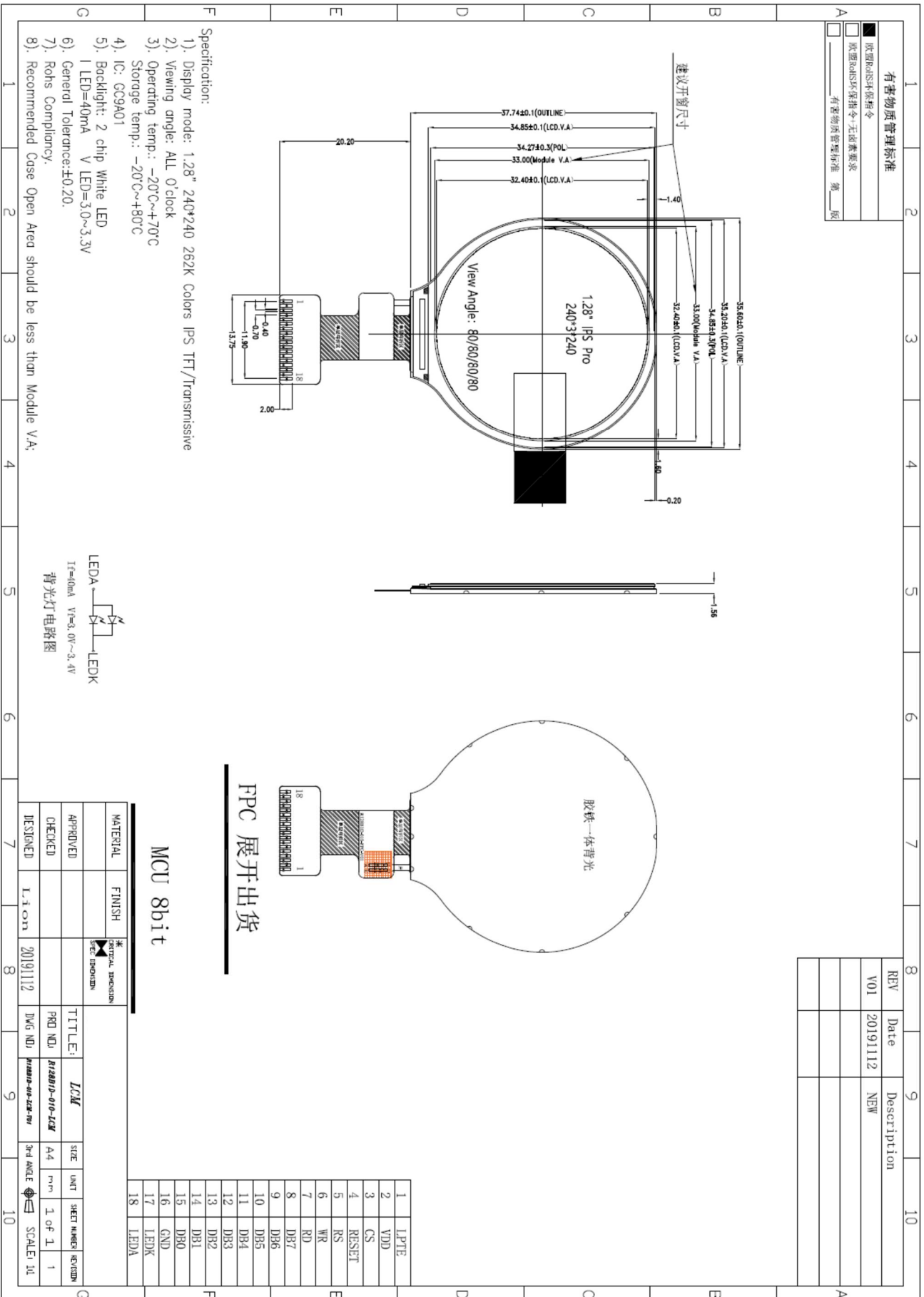
## 2 Main Features

Item	Specification	Unit
Diagonal Size	1.28	inch
Resolution	240 RGB x 240	pixel
Dot pitch	0.135(H) x 0.135(V)	mm
Drive IC	GC9A01	-
Interface	MCU 8bit Interface	-
Active Area	32.4 x 32.4	mm
Module Dimension	35.6(H) x 37.74(V) x 1.56(D)	mm
Luminance	400	cd/m <sup>2</sup>
View angle	ALL	-
Backlight	2 LED Parallel	
Operating Temp	-20°C ~ +60°C	°C
Storage Temp	-30°C ~ +70°C	°C
Weight	TBD	g

### 3 Pin Description

Pin No.	Symbol	Function Description
1	LPTE	Frame head pulse signal
2	VDD	Power supply to the internal Analog
3	CS	Chip selection pin
4	RESET	Reset signal pin
5	RS	Data/Command select pin. H:Data; L:Command
6	WR	Power Ground
7	RD	Read enable in 8080 MCU parallel interface
8-15	DB7-DB0	MCU parallel interface data bus.
16	GND	Ground
17	LEDK	Power supply Cathode input for backlight
18	LEDA	Power supply Cathode input for backlight

# 4 Mechanical Drawing

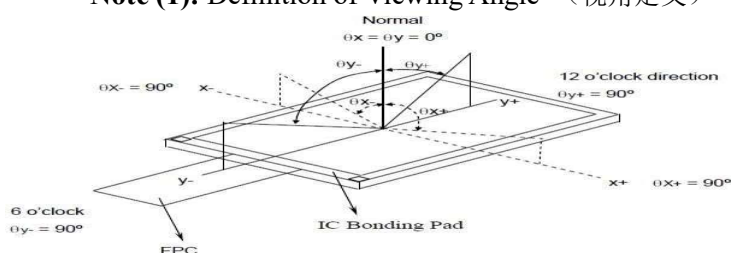


## 5 Optics & Electrical Characteristics

### 5.1 Optics Characteristics

Item	Symbol	Min	Typ	Max	Unit	Remark
View Angles TOP	∅U	80	85	-	deg	Note 1
View Angles Bottom	∅D	80	85	-	deg	
View Angles Right	∅R	80	85	-	deg	
View Angles Left	∅L	80	85	-	deg	
C.I.E(Red)	(x) (y)	-	TBD	-	-	Note 4 Note 5
C.I.E(Green)	(x) (y)		TBD		-	
C.I.E(Blue)	(x) (y)		TBD		-	
C.I.E(White)	(x) (y)		TBD		-	
Response Time	$T_R + T_F$	-	30	40	ms	Note 3
Contrast Ratio	CR	-	900	-	--	Note 2
LCM Surface Luminance	$L_V$		400			Note 4

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



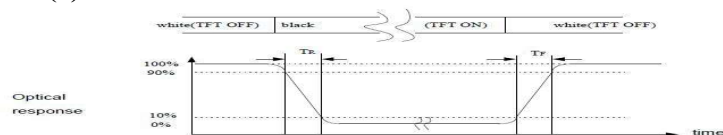
**Note (2):** Definition of Contrast Ratio(CR) (对比度定义)

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

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

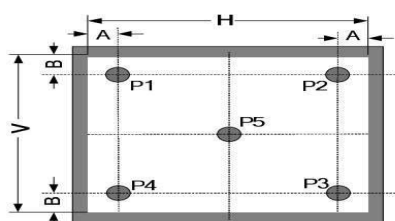
显示白色画面时平均表面亮度  
对比度 =  $\frac{\text{显示白色画面时平均表面亮度}}{\text{显示黑色画面时平均表面亮度}}$

**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)

A : 5 mm  
B : 5 mm  
H,V : Active Area  
Light spot size  $\varnothing=5\text{mm}$ , 500mm distance from the LCD surface to detector lens  
measurement instrument is TOPCON's luminance meter BM-7



**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 <sub>OP</sub>	-20	+70	°C
Storage Temperature	T <sub>ST</sub>	-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 Current	Normal Mode IOVCC+VDD	-	9		mA
	Sleep Mode IOVCC+VDD	-	20		uA
Input Voltage 'H' level	V <sub>ih</sub>	0.7VDDIO	-	VDDIO	V
Input Voltage 'L' level	V <sub>il</sub>	0	-	0.3VDDIO	V
Output Voltage 'H' level	I <sub>oh</sub>	0.8VDDIO	-	VDDIO	V
Output Voltage 'L' level	V <sub>ol</sub>	0	-	0.2VDDIO	V

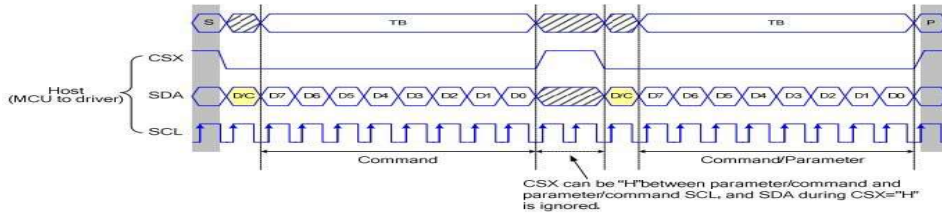
## 5.4 Backlight Unit

Item	Symbol	Min	Typ	Max	Unit	Remark
Forward voltage	V <sub>f</sub>	2.8	3.0	3.3	V	If=40mA
LCM Luminance	L <sub>v</sub>	-	200	-	cd/m <sup>2</sup>	If=40mA
Number of LED	-	2			Piece	-
Connection mode	S/P/M	parallel			-	-
Backlight uniformity		No Less than 80%			hr	3

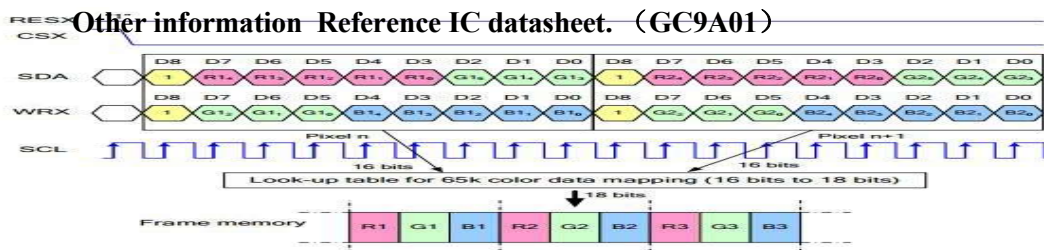
## 5.5 Timing Characteristics

### 5.5.1 AC Electrical Characteristics

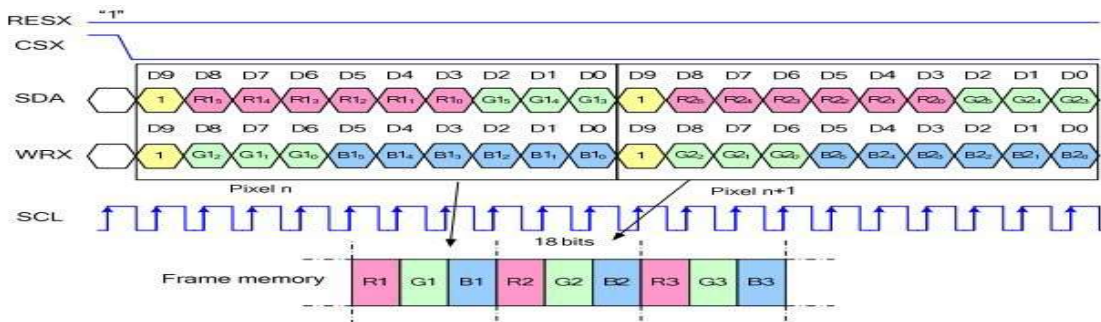
Command write mode:



Write data for 16-bit/pixel(RGB 565 bit input), 65K Colors, 3AH='05h'



Write data for 18-bit/pixel(RGB 666 bit input), 262K Colors, 3AH='06h'



### 5.5.2 Reset Timing

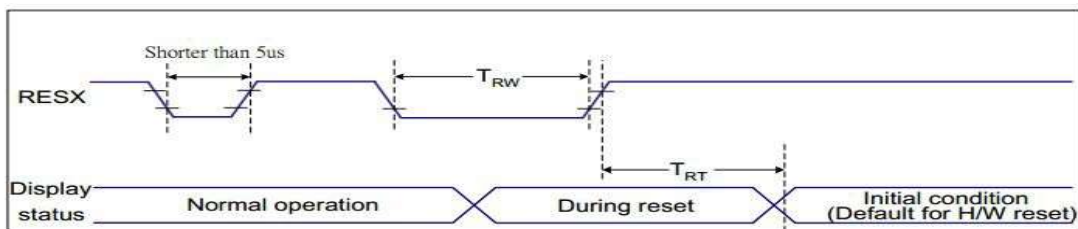


Figure 7 Reset Timing

VDDI=1.65 to 3.3V, VDD=2.4 to 3.3V, AGND=DGND=0V, Ta=-30 ~ 70 °C

Related Pins	Symbol	Parameter	MIN	MAX	Unit
RESX	TRW	Reset pulse duration	10	-	us
	TRT	Reset cancel	-	5 (Note 1, 5) 120 (Note 1, 6, 7)	ms

Other information Reference IC datasheet. (GC9A01)



## 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>