



DM-TFT104-427

**10.4" IPS 800x600 R.G.B VERTICAL
STRIPE TFT LCD DISPLAY PANEL**

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1 Revision History

Date	Changes
2020-09-18	First release

2 Main Features

Item	Specification	Unit
Diagonal Size	10.4	inch
Display Mode	TN, Normally White	-
Resolution	800*3(RGB)*600	-
Active Area	211.2 x 158.4	mm
Module Dimension	230 x 180.2 x 10.5	mm
Pixel Pitch	0.264*0.264	mm
Pixel Arrangement	R.G.B. Vertical Stripe	-
Nominal Input Voltage VDD	3.3(typ.)	Volt
Typical Power Consumption	2.88W All black pattern	Watt
Weight	365(Typ.)	Grams
Physical Size	243.0H*184.0V*6.5D(Typ.)	mm
Electrical Interface	1 channel LVDS	-
Surface Treatment	Anti-glare, Hardness	-
Support Color	16.2M/262K color	-
Temperature Rane	-30 to +80	°C
Operating	-30 to +80	°C
Storage (Non-Operating)		
RoHS Compliance	RoHS Compliance	-

3 Pin Description

3.1 Interface Signal

Pin No.	Symbol	Function Description
1	VDD	+3.3V power supply
2	VDD	+3.3V power supply
3	GND	GND
4	DPS	Reverse Scan Function [H:Enable; L/NC:Disable]
5	RxIN0-	LVDS receiver signal channel 0
6	RxIN0+	LVDS Differential Data Input (R0,R1,R2,R3,R4,R5,G0)
7	GND	GND
8	RxIN1-	LVDS receiver signal CH1(-)
9	RxIN1+	LVDS Differential Data Input(G1,G2,G3,G4,G5,B0,B1)
10	GND	GND
11	RxIN2-	LVDS receiver signal CH2(-)
12	RxIN2+	LVDS Differential Data Input(B2,B3,B4,B5,DE)
13	GND	GND
14	CK IN1-	LVDS receiver signal clock
15	CK IN1+	
16	GND	GND
17	RxIN3-	LVDS receiver signal channel 3, pin17=3.3V&pin 18=GND for 6bit LVDS Input
18	RxIN3+	LVDS Differential Data Input (R6,R7,G6,G7,B6,B7,RSV)
19	RSV	Reserved for AUO internal test. Please treat it as NC.
20	SEL68	6/8bits LVDS data input selection [H:8bits L/NC:6bit]

Note 1:Input Signals shall be low status when VDD is off.

Note 2:High stands for “3.3V”,Low stands for “0V”,NC stands for “No Connection”.

Note 3:RSV stands for “Reserved”.

3.2 Backlight LED

Symbol	Parameter	Min	Typ	Max	Unit	Remark
VCC	Input Voltage	10.8	12	12.6	[Volt]	
IVCC	Input Current	-	0.32	-	[A]	100%PWM Duty
PVCC	Power Consumption	-	2.88	-	[Watt]	100%PWM Duty
FPWM	Dimming Frequency	200	-	20K	[Hz]	
	Swing Voltage	3	3.3	5.5	[Volt]	
	Dimming duty cycle	5	-	100	%	
IF	LED Forward Current	-	50	-	[mA]	Ta = 25°C
VF	LED Forward Voltage	-	27.2	-	[Volt]	IF=50mA,Ta=-30°C
		-	26.4	28.8	[Volt]	IF=50mA,Ta=25°C
		-	25.6	-	[Volt]	IF=50mA,Ta=85°C
PLED	ED Power Consumption	-	2.72	-	[Watt]	
Operation Life		50,000	-	-	Hrs	IF=50mA,Ta=25°C

Note 1:Ta means ambient temperature of TFT-LCD module.

Notel 2:VCC,IVCC,Irush LED,PVCC are defined for LED backlight.(100% duty of PWM dimming)

Notel 3:IF,VF are defined for one channel LED .There are two LED channel in back light unit.

Notel 4:If G104STN01.0 module is driven by high current or at high ambient temperature & humidty condition. The operating life will be reduced.

Notel 5:Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is rstimated data.

5 Optics & Electrical Characteristics

5.1 Optical Characteristics

Item	Conditions	Min	Typ	Max	Remark
View Angles	Horizontal(Right)	70	80	-	6
	CR=10(Left)	70	80	-	
	Vertical(Upper)	50	60	-	
	CR=10(Lower)	60	70	-	
C.I.E. (White)	(x)	0.26	0.31	0.36	
	(y)	0.28	0.33	0.38	
C.I.E(Red)	(x)	0.543	0.593	0.643	
	(y)	0.285	0.335	0.385	
C.I.E(Green)	(x)	0.29	0.34	0.39	
	(y)	0.541	0.591	0.641	
C.I.E(Blue)	(x)	0.102	0.152	0.202	
	(y)	0.062	0.112	0.162	
Response time Rising	Rising	-	10	20	5
Response time Falling	Falling	-	5	15	
Response time Rising+Falling	Rising+Falling	-	15	35	
Contrast Ratio		500	700	-	4
White Luminance	IF=50mA/1 LED Line (center point)	300	400	-	1
Uniformity	5 Points	65	75	-	2,3
Color Gamut			50	-	

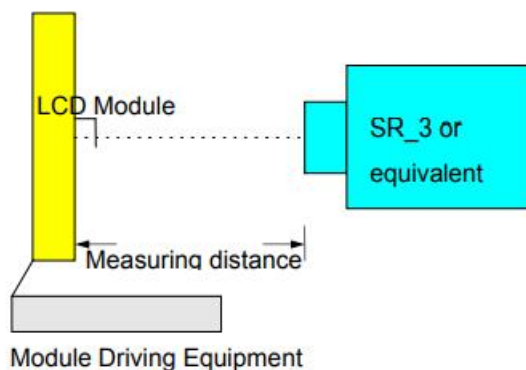
Note 1: Measurement method

Equipemnt Pattern Generator,Power Supply,Digital Voltmeter,Luminance meter (SR_3 or equivalent)

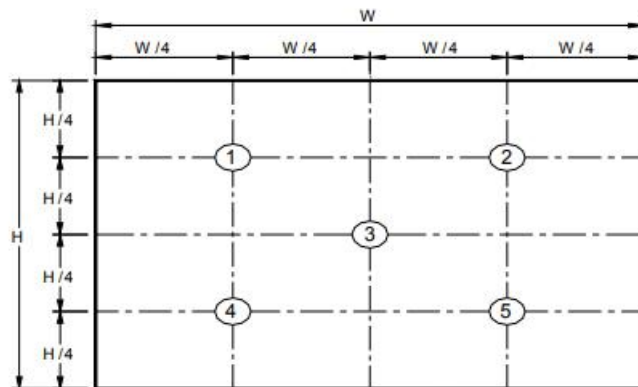
Aperture 1° with 50cm Viewing distance

Test Point Center

Environment <1 lux



Note 2: Definition of 5 points position (Display active area: 211.2mm (H) x 158.4mm (V))



Note 3: The luminance uniformity of 5 points is defined by dividing the minimum luminance values by the maximum test point luminance

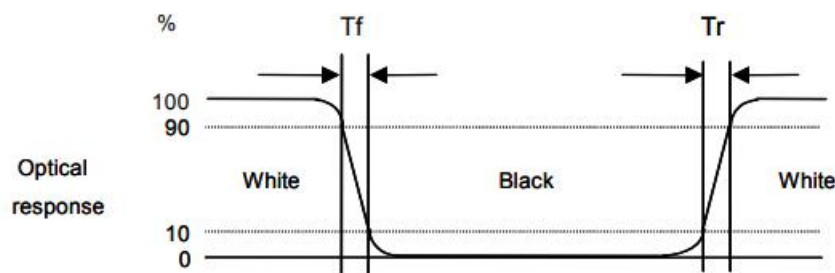
$$\delta_{wb} = \frac{\text{Minimum Brightness of five points}}{\text{Maximum Brightness of five points}}$$

Note 4: Definition of contrast ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

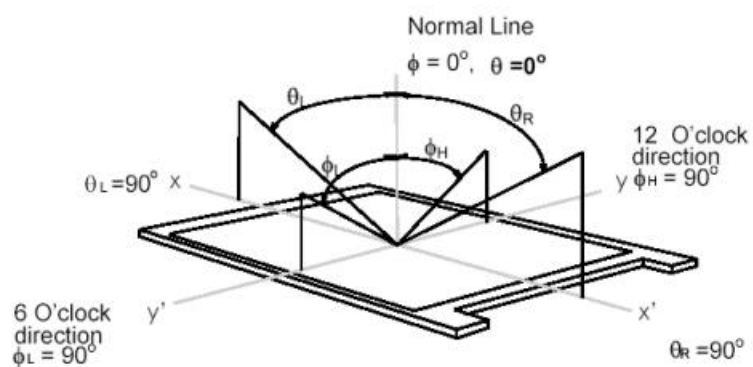
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "White" to "Black" (falling time) and from "Black" to "White" (rising time), respectively. The response time interval is between 10% and 90% of amplitudes. Please refer to the figure as below.



Note 6: Definition of viewing angle

Viewing angle is the measurement of contrast ratio 210, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as below: 90° (e) horizontal left and right, and 90° (Φ) vertical high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated to its center to develop the desired measurement viewing angle.



5.2 Absolute Maximum Ratings

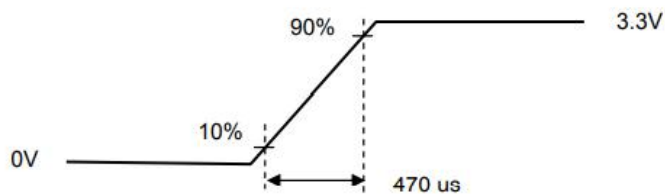
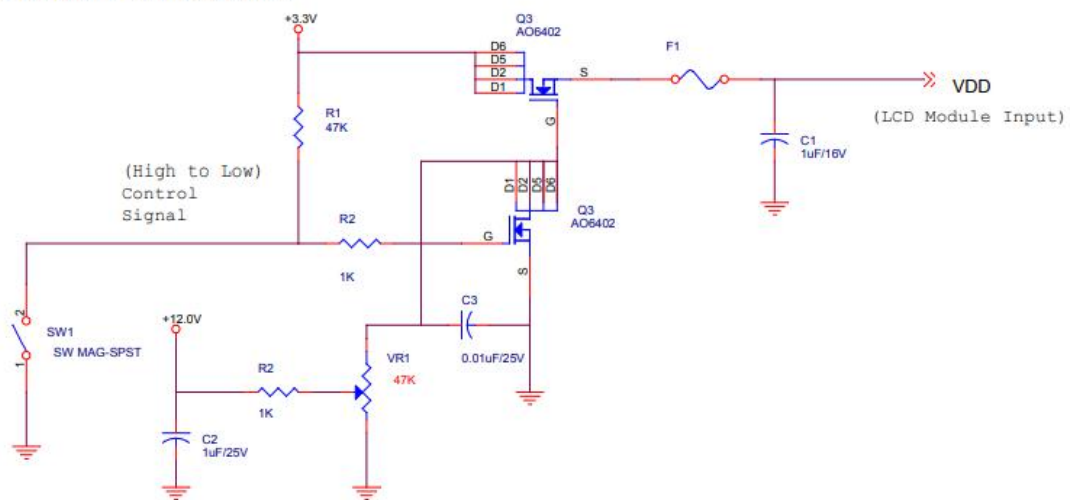
Item	Symbol	Min	Max	Unit
Logic/LCD Drive Voltage	V_{in}	-0.3	+4.0	[Volt]

Item	Symbol	Min	Max	Unit
Operating Temperature	TOP	-30	+80	[°C]
Storage Temperature	TST	-30	+80	[°C]

5.3 Electrical Characteristics

Symbol	Parameter	Min	Typ.	Max	Units	Remark
V _{DD}	Logic/LCD Input Voltage	3.0	3.3	3.6	[Volt]	
I _{DD}	LCD Input Current	-	320	-	[mA]	V _{DD} =3.3V at 60 HZ,all Black Pattern
P _{VDD}	LCD Power consumption	-	-	1.5	[Watt]	V _{DD} =3.3V at 60 HZ,all Black Pattern
I _{RUSH LCD}	LCD Inrush Current	-	1.06	-	[A]	Note 1;V _{DD} =3.3V Black Patten, Rising time=470us
V _{DDrp}	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	[mV] p-p	V _{DD} =3.3V at 60 HZ,all Black Pattern

Note 1: Measurement condition:



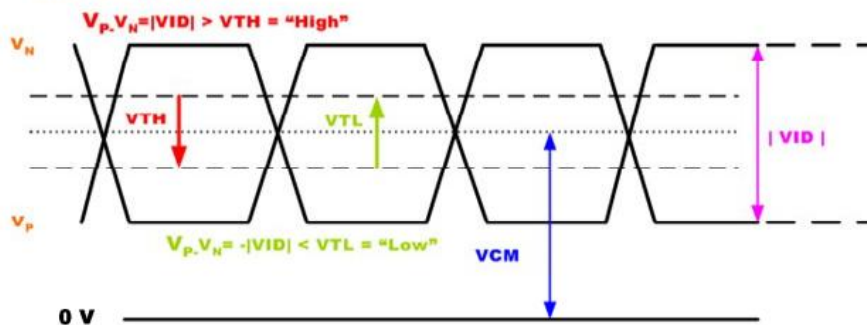
VDD rising time

Input signals shall be low or Hi-Z state when VDD is off.

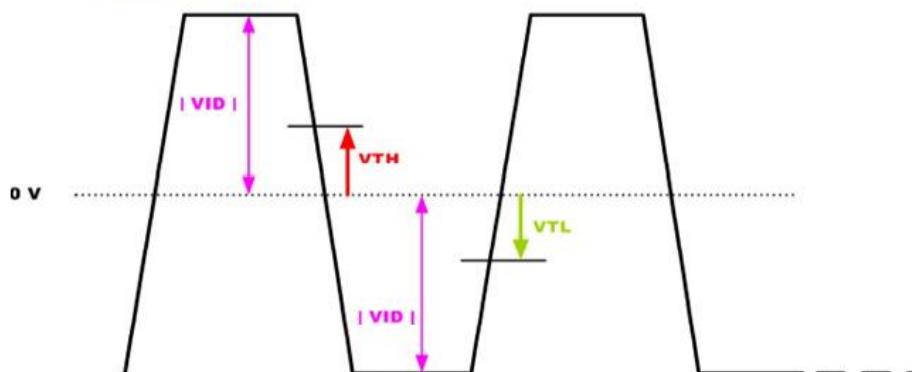
Symbol	Item	Min	Typ	Max	Unit	Remark
VTH	Differential Input High THreshold	-	-	100	[mV]	VCM=1.2V
VTL	Differential Input Low THreshold	100	-	-	[mV]	VCM=1.2V
VID	Input Differetial Voltage	100	400	600	[mV]	
VICM	Differetial Input Common Mode Voltage	1.125	1.25	1.375	[V]	VTH/VTL=+-100mv

Note: LVDS Signal Waveform.

Single-end Signal



Differential Signal



5.4 LED Backlight Characteristics

Following characteristics are measured under a stable condition using a inverter at 25°C. (Room Temperature):

Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
VCC	Input Voltage	10.8	12	12.6	[Volt]	
I_{VCC}	Input Current	-	0.32	-	[A]	100% PWM Duty
P_{VCC}	Power Consumption	-	2.88	-	[Watt]	100% PWM Duty
F_{PWM}	Dimming Frequency	200	-	20K	[Hz]	
	Swing Voltage	3	3.3	5.5	[Volt]	
	Dimming duty cycle	5	-	100	%	
I_F	LED Forward Current	-	50	-	[mA]	Ta = 25°C
V_F	LED Forward Voltage	-	27.2	-	[Volt]	I _F = 50mA, Ta = -30°C
		-	26.4	28.8	[Volt]	I _F = 50mA, Ta = 25°C
		-	25.6	-	[Volt]	I _F = 50mA, Ta = 85°C
P_{LED}	LED Power Consumption	-	2.72	-	[Watt]	
Operation Life		50,000	-	-	Hrs	I _F =50mA, Ta= 25°C

Note 1: Ta means ambient temperature of TFT-LCD module.

Note 2: VCC, I_{VCC}, I_{ush} LED, P_{VCC} are defined for LED backlight.(100% duty of PWM dimming)

Note 3: I_s, V are defined for one channel LED. There are two LED channel in back light unit

Note 4: If G104STNO1.0 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 5: Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

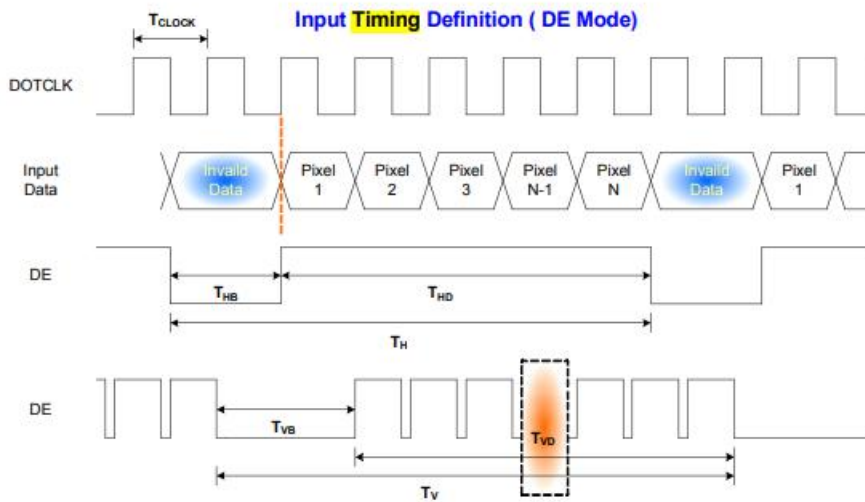
6 Input timing characteristics

6.1 Timing characteristics

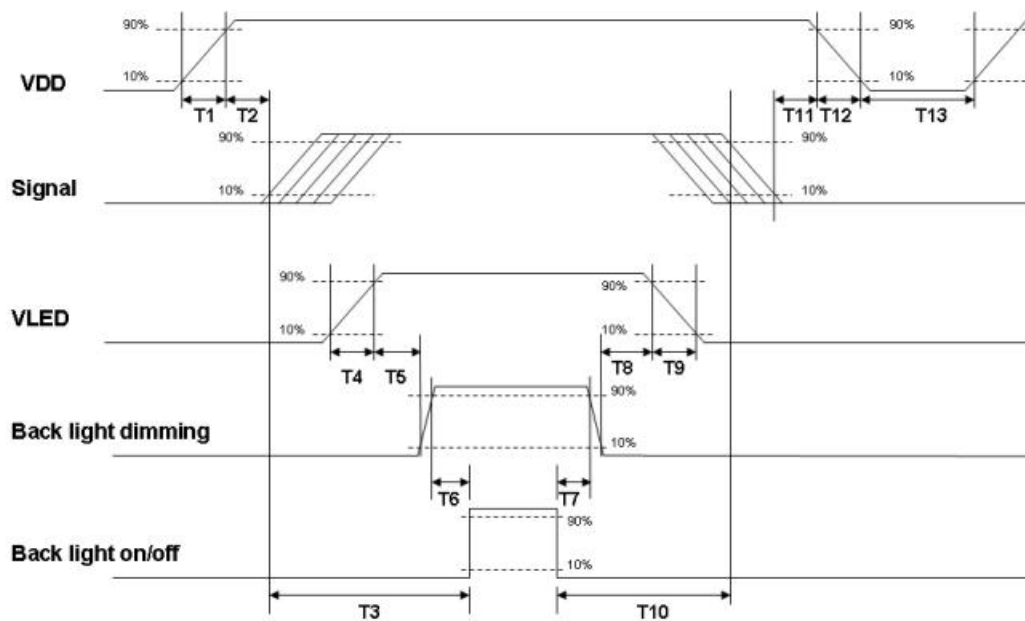
Item		Symbol	Min	Typ	Max	Unit
Clock (CK) Frequency		1/Tc	30	40	50	MHz
Vertical Section	Period	TV	608	628	1,024	TLine
	Active	TVD	--	600	--	
	Blanking	TVB	8	28	424	
Horizontal Section	Period	TH	960	1056	1060	TClock
	Active	THD	--	800	--	
	Blanking	THB	160	256	260	
Frame Rate		F	50	60	75	Hz

Note:DE mode.

6.2 Input Timing Diagram



VDD power and lamp on/off sequence is as below. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Power ON/OFF sequence timing

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.5	-	10	[ms]
T2	30	40	50	[ms]
T3	200	--	--	[ms]
T4	0.5	--	10	[ms]
T5	10	-	-	[ms]
T6	10	-	-	[ms]
T7	0	-	-	[ms]
T8	10	-	-	[ms]
T9	--	--	10	[ms]
T10	110	--	--	[ms]
T11	0	16	50	[ms]
T12	-	-	10	[ms]
T13	1000	-	-	[ms]

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

7 Reliability

Test Item	Test Condition	Note
Temperature Humidity Bias	40°C,90%RH 300Hours	
Hot Start Test	80°C/1 Hr min. Power on/off per 5 minutes, 5times	
Cold Start Test	-30°C/1Hr min. Power on/off per 5 minutes,5 times	
Hot Storage	80°C,300 hours	
Cold Storage	-30°C,300 hours	
Thermal Shock Test	-20°C/30min,60°C/30min,100cycles, 40°C minimum ramp rate	
Shock Test(Non-Operating)	50G,20ms,Half-sine wave,(\pm X, \pm Y, \pm Z)	
High Temperature Operation	80°C 300hrs	-
Low Temperature Operation	-30 °C 300hrs	1
Vibration Test (Non-Operating)	1.5G,(10~200Hz,Sine Wave) 30 mins/axis, 3 direction(X,Y,Z)	1,2
On/off test	On/10 sec, Off/10 sec,30,000 cycles	-
ESD	Contact Discharge: \pm 8KV,150pF(330 Ω)1 sec,8 points,25 times/ point Air Discharge: \pm 15KV,150pF(330 Ω)1 sec,8points,25 times/point	
EMI	30-230MHz,limit 40 dBu V/m,230-1000 MHz,limit 47 dBu V/m	

Note1: According to EN61000-4-2,ESD class B:Some performance degradation allowed. No data lose
Self-recoverable.No hardware failures.

Note2:

- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module.Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- To inspect TFT-LCd module after reliability test, please syore it at room temperature and room humidity for 24 hours at least in advance.

8 Warranty and Conditions

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

"http://www.displaymodule.com/pages/faq"