


TFT

DISPLAY MODULE

Product Brief Specification

Customer	Standard		
Product Number	DMT090YXNLNT0-1A		
Customer Part Number	UReady-29000D		
Customer Approval		Date:	

Internal Approvals		
Product Mgr	Doc. Control	Electr. Eng
Luo Luo	Luo Luo	Eric Wan
Date: 19/03/18	Date: 19/03/18	Date: 19/03/18



Revision Record

Rev.	Date	Page	Chapt.	Comment	ECR no.
A	19/03/18	--	--	Initial Release	

1.0 Main Features

Item	Contents
Screen Size	9.0" Diagonal
Display Format	1280 x RGB x 240 Dots
N° of Colour	16.7M
Active Area	223.68 mm (H) x 42.00 mm (V)
LCD Type	TFT
Mode	Transmissive / Normally Black
Viewing Direction	ALL
Interface	LVDS interface
Backlight Type	LED
Operating Temperature	-30°C ~ +85°C
Storage Temperature	-40°C ~ +95°C
RoHS compliant	Yes

2.0 Mechanical Specification

2.1 Mechanical Characteristics

Item	Characteristic	Unit
Overall Dimensions	237.0 mm (H) x 58.95 mm (V) x 4.00 mm (D)	mm
pixel Pitch	175 (H) x 175 (V)	μm
Weight	TBD	g

3.0 Electrical Specification

3.1 LCM Interface Pin Assignment

No.	Symbol	Function
1	NC	No connection
2	SHLR	Horizontal scan direction control
3	UPDN	Vertical scan direction control
4	VDD	Digital Power Supply Voltage
5	GND	Digital Ground
6	GRB	Global reset pin (Low active)
7	NC	No connection
8	GND	Digital Ground
9	CLKP	Positive LVDS differential clock input
10	CLKN	Negative LVDS differential clock input
11	GND	Digital Ground
12	PIND0	Positive LVDS differential input
13	NIND0	Negative LVDS differential input
14	GND	Digital Ground
15	PIND1	Positive LVDS differential input
16	NIND1	Negative LVDS differential input
17	GND	Digital Ground
18	PIND2	Positive LVDS differential input
19	NIND2	Negative LVDS differential input
20	GND	Digital Ground
21	PIND3	Positive LVDS differential input
22	NIND3	Negative LVDS differential input

No.	Symbol	Function
23	GND	Digital Ground
24	GND	Digital Ground
25	VDD	Digital Power Supply Voltage
26	VDD	Digital Power Supply Voltage
27	GND	Digital Ground
28	NC	No connection
29	VDDA	Analog Power Supply Voltage
30	VDDA	Analog Power Supply Voltage
31	VDDA	Analog Power Supply Voltage
32	VDDA	Analog Power Supply Voltage
33	VDDA	Analog Power Supply Voltage
34	NC	No connection
35-40	GND	Digital Ground

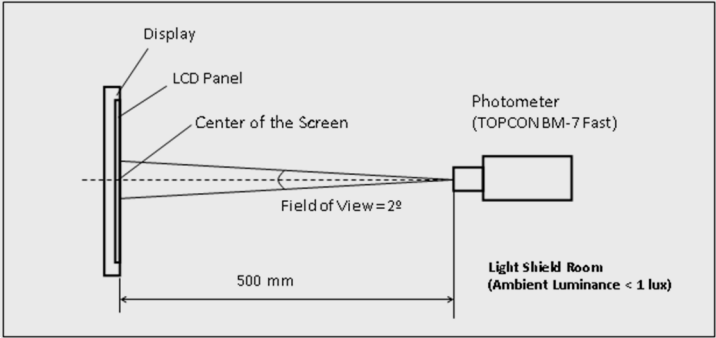
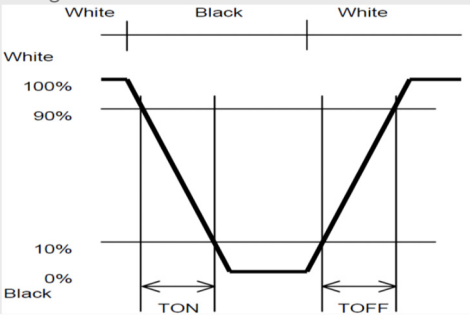
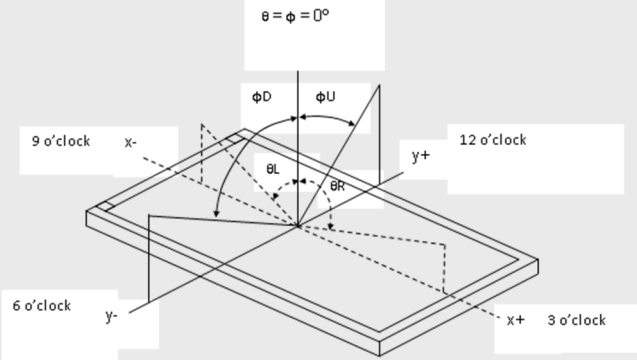
4.0 Optical Specification

4.1 Optical Characteristics

Measuring instruments: LCD-5100, Eldim, Topcon BM-7
 Driving condition: VDD = 3.3V, VSS = 0V
 Backlight: IF=40mA
 Measured temperature: Ta = 25 °C

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Response Time	TR+TF	$\theta=\phi=0^\circ$	-	25	35	ms	2
Contrast Ratio	CR	Normal Viewing Angle	-	800	-		3
Viewing Angle	Left	θ_L	CR \geq 10	80	-	deg	4
	Right	θ_R		80	-	deg	
	Up	ϕ_U		80	-	deg	
	Down	ϕ_D		80	-	deg	
Centre Brightness			500	600	-	cd/m ²	6
Brightness Distribution			80	-	-	%	7

4.1.1 Test Method

Note	Item	Test Method
1	Setup	<p>The display should be stabilised at a given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilise the luminance, measurements should be executed after lighting the backlight for 30 minutes in a windless room.</p> 
2	Response time	<p>Measure output signal waveform by the luminance meter when raster of window pattern is changed from white to black and from black to white.</p> 
3	Contrast ratio	<p>Measure maximum brightness and minimum brightness at the centre of the screen by displaying raster or window pattern. Then calculate the ratio between these two values.</p> $\text{Contrast Ratio (CR)} = \frac{\text{Brightness of unselected position (white)}}{\text{Brightness of selected position (black)}}$
4	Viewing angle Horizontal θ Vertical ϕ	<p>Move the luminance meter from right to left and up and down and determine the angles where contrast ratio is 10</p> 
5	Colour chromaticity	Measure chromaticity coordinates x and y of CIE1931 colorimetric system
6	Centre brightness	Measure the brightness at the centre of the screen
7	Brightness distribution	<p>(Brightness distribution) = $100 \times B/A \%$ A: max. brightness of the 9 points B: min. brightness of the 9 points</p>

5.0 Backlight Specification

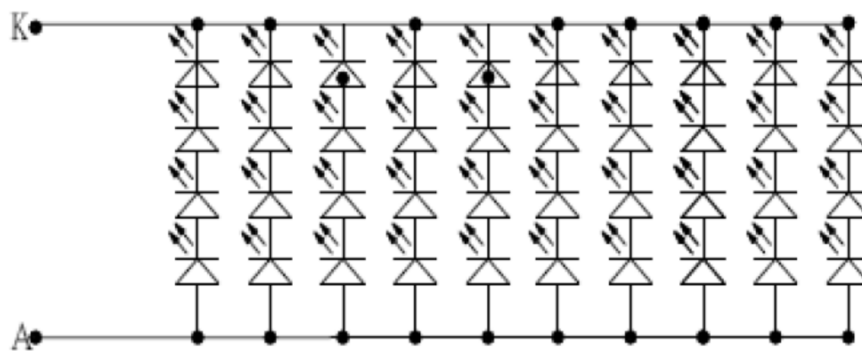
5.1 LED Driving Conditions

Item	Symbol	Condition	Min	Typ	Max	Unit
Forward Current	IF	Ta=25 °C	-	200	-	mA
Forward Voltage	VF	Ta= 25°C	11.5	12.8	14.1	V
LED life time	Hr			25k		hour

Note:

- The lifetime of the LED is defined as a period till the brightness of the LED decreases to the half of its initial value.
- This figure is given as a reference purpose only, and not a guarantee.
- This figure is estimated for an LED operating alone.
The performance of an LED may differ when assembled as a monitor together with a TFT panel due to different environmental temperature.
- Estimated lifetime could vary on a different temperature and usually higher temperature could reduce the life significantly.

5.2 LED Circuit



LED Circuit Drawing