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NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT024RN001ML

Version	02
Engineer	
Date	2019/7/6

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Customer:
Approved by

NEXT VISION DISPLAY CO., LTD.

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Documents Revision History:

Rivision	Date	Description	Changed By
01	2018/3/23	New released	
02	2019/7/6	Revised viewing area size	

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General Description

- The NT024RN001ML model is a Color TFT LCD supplied by Next Vision Display.
- This Module has a 2.4 inch diagonally measured active display area with 320(RGB)X320 resolution. Each pixel is divided into Red, Green and Blue sub-pixels and dots, which are arranged in vertical stripes. It is octagon sizes that cut from 3.34 inch tft lcd.
- LCD color is determined with 16 M colors signal for each pixel.
- The NT024RN001ML has been designed to apply the MIPI interface method that enables low power, high speed, and high contrast.

Mechanical Specification

ITEM	Standard Value	Unit
Display Size	2.4 inch	--
Display Mode	Normally White, Transmissive LCD	--
Module Dimension	66.20(W)*69.30(H)*2.66(T)	mm
Resolution	320(RGB)X 320	Pixels
Active Display Area	60.00(W)×60.00(H)	mm
Viewing Direction	12 O'clock	--
Gray Scale Inversion Direction	6 O'clock	--
LED Backlight Color	White	--
Interface	MIPI	--
LCD driver	ST7796SI	--
Touch panel	Without touch	--

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Absolute Max Ratings & Electrical Specification

- **Absolute Max Rating(Ta=25 GND=0V)**

Item	Min.	Typ	Max	Unit	Remark
Power Supply Voltage (VDD)	-0.3	--	4.0	V	
Logic Signal Input /Output Voltage (VDDIO)	0.3	--	4.0	V	
Operating Temperature	-20		70	℃	
Storage temperature	-30		80	℃	

Note:
*1) Liquid Crystal driving voltage.
Due to the characteristics of LC Material, this voltage vary with environmental temperature.
*2) Temp.>60℃, Absolute humidity shall be less than 90%RH at 60℃
*3) Temp.≤60℃, 90%RH MAX.
*4) The recommended operating conditions refer to a range in which operation of this product is guaranteed. Should this range is exceeded, the operation cannot be guaranteed even if the values may be without the absolute maximum ratings.
Accordingly, please make sure that the module is used within this range.
And these current values are measured under the condition that all devices are stopped, each component is stable and logic signal is input.

■ DC Electrical Specification

GND=0V， Ta=25℃

Item	Min.	Typ	Max	Unit	Remark
Power Supply (VDD)	2.5	2.8	3.6	V	
IO Supply Voltage (VDDIO)	1.65	2.8	3.6	V	
Input High Voltage(VIH)	0.7VDDI	--	VDDIO	V	
Input Low Voltage(VIL)	0	--	0.3VDDIO	V	
Output High Voltage(VOH)	0.8VDDI	--	VDDIO	V	
Output Low Voltage(VOL)	DGND	--	0.2VDDI	V	
Current Consumption(ICC1)	--	15	30	mA	Normal mode
Current Consumption(ICC2)	--	0.05	0.1	mA	Sleep mode

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■ LED Backlight Characteristic(VSS=0V ,Ta=25℃)

Ta=25℃

Item	Min.	Typ	Max	Unit	Remark
Supply voltage (VF)	16.8	18.0	19.2	V	
Forward Current(IF)	18	20	25	mA	
LED Life Time(T)	20,000	--	--	HRS	
LCM Luminance(Lv)	600	--	--	cd/m2	

Note:
*1) The LED driving condition is defined for each LED module (6 LED Serial,).For

each
LED: IF =20mA, VF (1/6) =3.2V.
*2) Under LCM operating, the stable forward current should be inputted. And forward voltage is for reference only.
*3) IF is defined for one channel LED. Optical performance should be evaluated at Ta=25℃ only If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.
*4)The LED driving condition is defined for each LED.



Optical Specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp	θ=0° Φ=0°	600	-	-	cd/m^2	
Uniformity	△Bp		70	-	-	%	
Viewing Angle	θ1 (Φ=90° or270°)	12 o'clock	-	80	-	Deg	Cr≥10
		6 o'clock	-	70	-		
	θ2 (Φ=0° or 180°)	9 o'clock	-	80	-		
		3 o'clock	-	80	-		
Contrast Ratio	Cr	θ=0° Φ=0°	600	800		-	
Response Time	t_{on}		-	20	30	ms	
	t_{off}		-			ms	

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ITEM		SYMBOL	CONDITION	Min.	TYP.	Max.
Color Filter Chromacicity (Note.1)	White	x	θ = ϕ = 0°	0.287	0.307	0.327
		y		0.321	0.341	0.361
		Y		29.0	32.0	35.0
	Red	x	θ = ϕ = 0°	0.633	0.653	0.673
		y		0.312	0.332	0.352
		Y		15.55	18.55	21.55
	Green	x	θ = ϕ = 0°	0.294	0.314	0.334
		y		0.555	0.575	0.595
		Y		58.71	61.71	64.71
	Blue	x	θ = ϕ = 0°	0.117	0.137	0.157
		y		0.113	0.133	0.153
		Y		13.79	15.79	18.79
Transmittance(%) (Note.3)		T	θ = ϕ = 0°	--	5	--

Definition of viewing angle:

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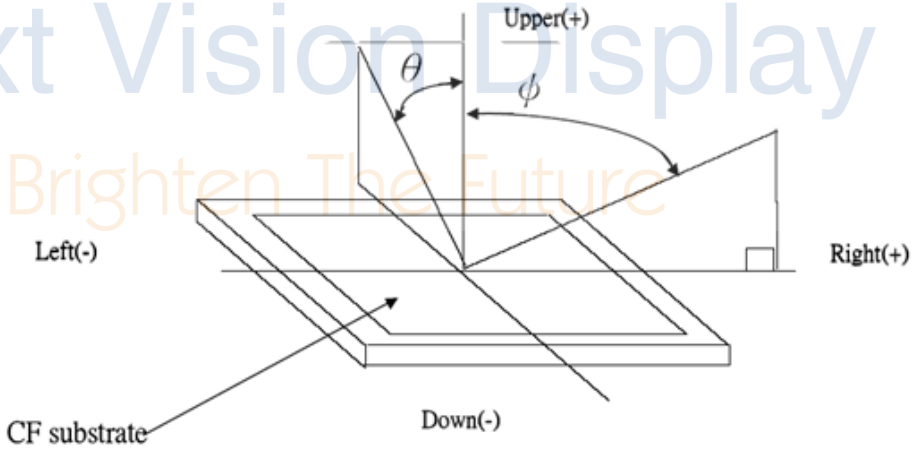
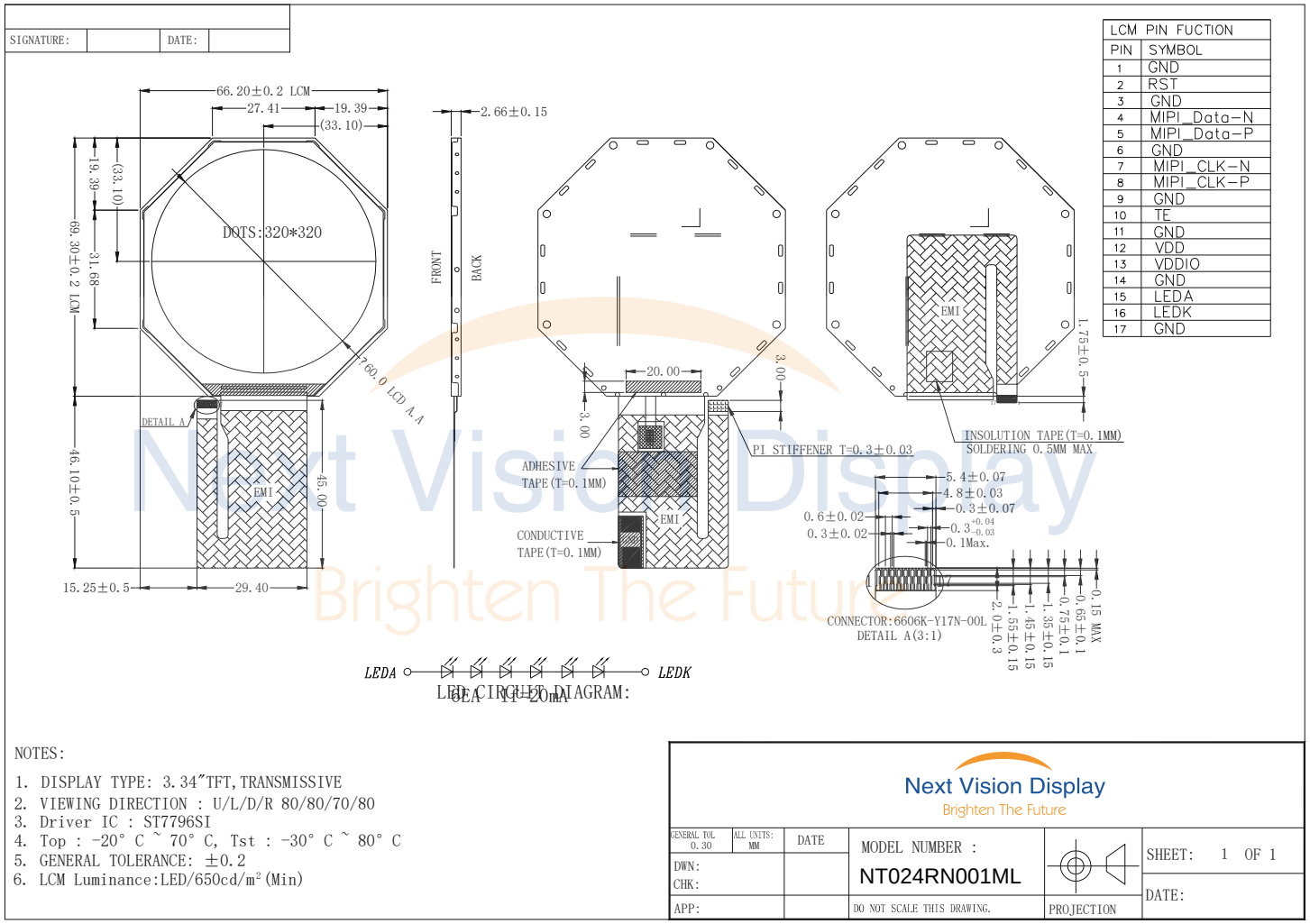


Fig.1 Definition of Viewing Angle

Mechanical Diagram



LCM PIN FUCTION	
PIN	SYMBOL
1	GND
2	RST
3	GND
4	MIPI_Data-N
5	MIPI_Data-P
6	GND
7	MIPI_CLK-N
8	MIPI_CLK-P
9	GND
10	TE
11	GND
12	VDD
13	VDDIO
14	GND
15	LEDA
16	LEDK
17	GND

NOTES:

1. DISPLAY TYPE: 3.34″TFT, TRANSMISSIVE
2. VIEWING DIRECTION : U/L/D/R 80/80/70/80
3. Driver IC : ST7796SI
4. Top : -20° C ~ 70° C, Tst : -30° C ~ 80° C
5. GENERAL TOLERANCE: ±0.2
6. LCM Luminance:LED/650cd/m² (Min)

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GENERAL TOL 0.30	ALL UNITS: MM	DATE	MODEL NUMBER : NT024RN001ML		SHEET: 1 OF 1
DWN:					DATE:
CHK:					
APP:			DO NOT SCALE THIS DRAWING.	PROJECTION	

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Interface Pin Connections

Pin NO.	Symbol	I/O	Function
TFT LCD PANEL			
1	GND	P	Ground
2	RST	I	Global reset signal
3	GND	P	Ground
4	MIPI_Data-N	I	MIPI Data
5	MIPI_Data-P	I	MIPI Data
6	GND	P	Ground
7	MIPI_CLK-N	I	MIPI Clock
8	MIPI_CLK-P	I	MIPI Clock
9	GND	P	Ground
10	TE	I	Tearing effect output
11	GND	P	Ground
12	VDD	P	Analog power supply
13	VDDIO	P	Digital power supply
14	GND	P	Ground
15	LEDA	P	LED Anode
16	LEDK	P	LED Cathode
17	GND	P	Ground

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