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NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT070-C001ML

Version	01
Engineer	
Date	2017.7.28

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Customer:
Approved by

NEXT VISION DISPLAY CO., LTD.

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1. General Description

- The NT070-C001ML model is a Color TFT LCD supplied by Next Vision Display.
- This main Module has a 7.0 inch diagonally measured active display area with 1024(RGB)X600 resolution. Each pixel is divided into Red, Green and Blue sub-pixels and dots, which are arranged in vertical stripes.
- The NT070-C001ML has been designed to apply the HDMI interface method that enables low power, high speed, and high contrast.

2. Mechanical Specification

ITEM	Standard Value	Unit
Display Mode	Normally White, Transmissive LCD	
Module Dimension	165.3(W)*121.0(H)*7.75(T)	mm
Resolution	1024(RGB)X 600	Pixels
Active Display Area	154.21(W)×85.92(H)	mm
Viewing Direction	12 O'clock	--
Gray inversion direction	6 O'clock	
LED Backlight Color	White	--
Interface	LCD：HDMI， CTP：USB	--
Power supply	USB(5.0V)	
Support system	Win/7/Win8/Win10(plug and play)	
	Android,Linux (configured in requests)	
Power Consumption	485(Typ)	mA

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3. Absolute Max Ratings & Electrical Specification

- **Absolute Max Rating**

Item	Min.	Typ	Max	Unit	Remark
Operating temperature	-20	--	70	° C	
Storage temperature	-30	--	80	° C	
Humidity	--	--	80%	RH	@60° C

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.

■ TFT Electrical Specification

Item	Min.	Typ	Max	Unit	Remark
PCB operating voltage	-	5.0	-	V	USB input
LCD I/O voltage(VDD)	3.0	3.3	3.6	V	
Input signal ” H”	0.7*DVdd	--	DVdd	V	
Input signal ” L”	VSS	--	0.3*DVdd	V	
Output signal ” H”	VDD-0.4		VDD	V	
Output signal ” L”	VSS		VSS+0.4	V	

■ CTP Electrical Specification

Item	Specification	Unit	Remark
CTP type	Glass cover+glass sensor	--	
Resolution	1024x600	Pixel	
Surface Hardness	6H(min)	--	
Transparency ratio	80%(min)	--	
CTP interface	USB	--	
Supply voltage	3.3	V	
Sampling rate	20~100	Hz	

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4. Optical Specification

Item	Symbol	**Condition**	Min.	Typ.	Max.	Unit	Note
Brightness	Bp	θ=0°	150	200	-	cd/m^2	
Uniformity	△Bp	Φ=0°	70	75	-	%	
Viewing Angle	θ1 (Φ=90° or270°)	12 o'clock	50	60	-	Deg	Cr≥10
		6 o'clock	60	70	-		
	θ2 (Φ=0° or 180°)	9 o'clock	60	70	-		
		3 o'clock	60	70	-		
CIE	Wx	θ=0° Φ=0°	0.26	0.30	0.36		
	Wy		0.28	0.33	0.38		
Contrast Ratio	Cr		400	500		-	
Response Time	t_{on}		-	25	50	ms	
	t_{off}		-			ms	

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Note.1 These items are measured by C light.
Note.2 Definition of Viewing Angle(θ,ψ),refer to Fig.1 as below :

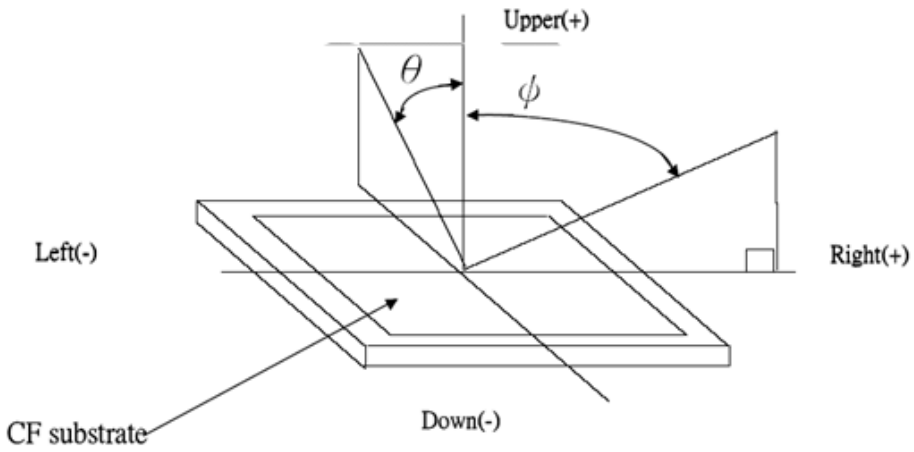
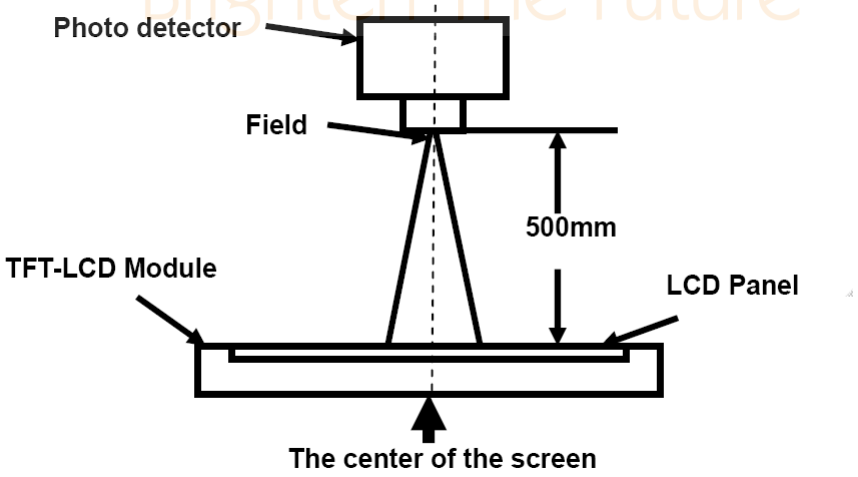


Fig.1 Definition of Viewing Angle

Note.3 Using LC+ EWV Polarizer+Corresponding Backlight, reference only, Measure device：BM-5A (TOPCON)，viewing cone= 1 °，I_L=20mA。

Electro-optical characteristics test method:

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Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

“White state “:The state is that the LCD should driven by Vwhite.

“Black state”: The state is that the LCD should driven by Vblack.

Vwhite: To be determined

Vblack: To be determined.

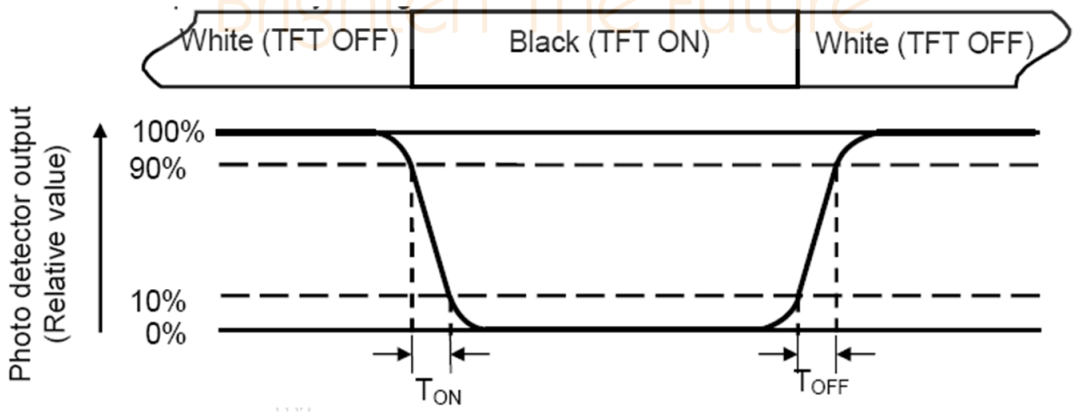
Definition of Response Time:

The response time is defined as the LCD optical switching time interval between “White” state and

“Black” state. Rise time (TON) is the time between photo detector output intensity changed from

90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from10% to 90%.

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Definition of color chromaticity (CIE1931)

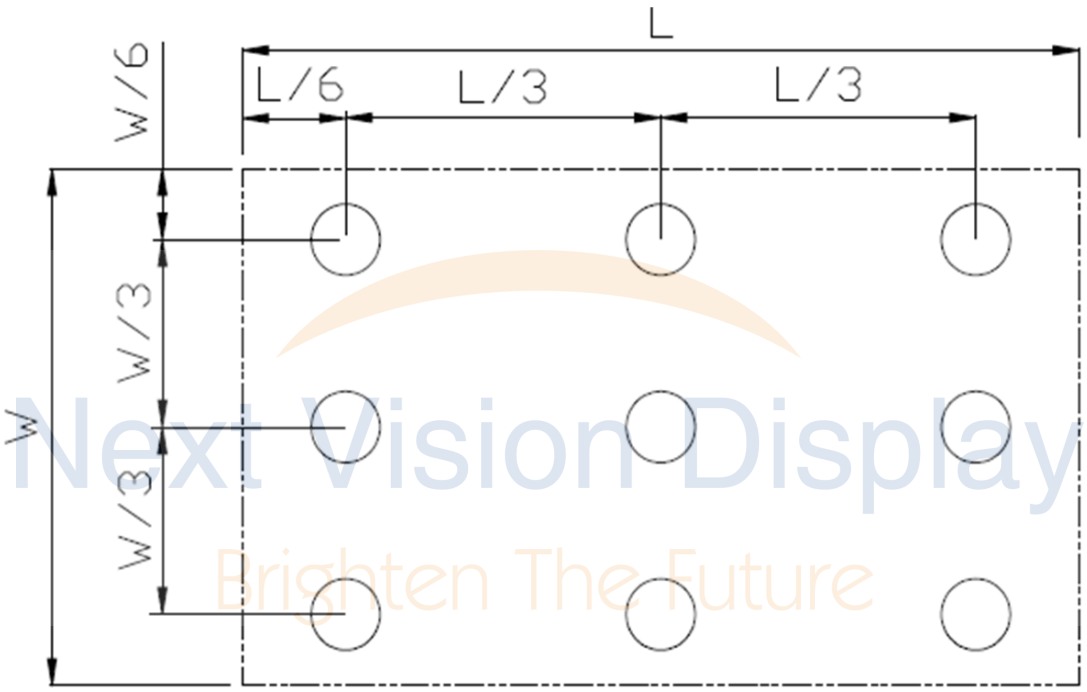
Color coordinates measured at center point of LCD

Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity(U) = Lmin/ Lmax

L-------Active area length W----- Active area width



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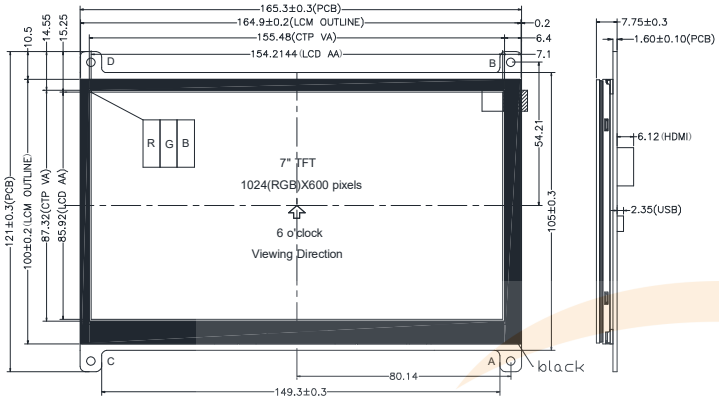
Lmax: The measured maximum luminance of all measurement position.

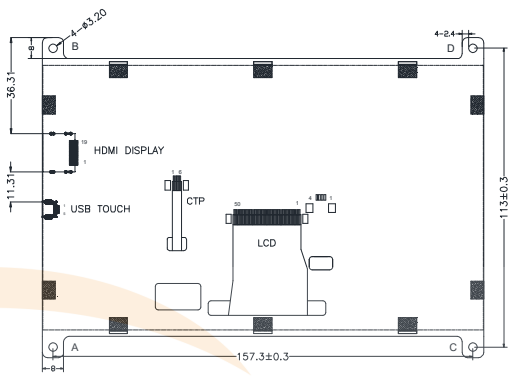
Lmin: The measured minimum luminance of all measurement position.

5. Mechanical Diagram

ALL PAGES OF THIS VERSION APPROVED

SIGNATURE: DATE:





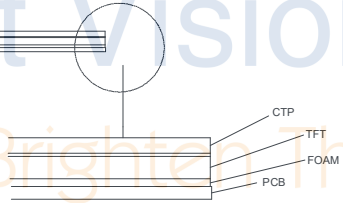
HDMI INTERFACE

PIN	Symbol
1	TMDS Data2+
2	TMDS Data2 Shield
3	TMDS Data2-
4	TMDS Data1+
5	TMDS Data1 Shield
6	TMDS Data1-
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0-
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock-
13	CEC
14	Reserved
15	SCL
16	SDA
17	DDC/CEC Ground
18	+5V Power
19	Hot Plug Detect



Pixels Detail

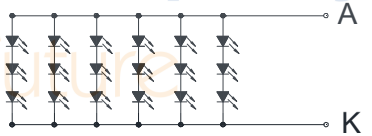
SCALE 100:1



Structure Detail

SCALE 3:1

Backlight Circuit



VF=9.3V±0.6V;IF=120mA(Typ.)

USB TOUCH INTERFACE

PIN	Symbol
1	VBUS
2	USB D-
3	USB D+
4	NC
5	GND

NOTES:

1.	DISPLAY TYPE:	7.0"TFT_LCD/TRANSMISSIVE
2.	OPERATING TEMPERATURE:	−20°C~ 70°C
3.	STORAGE TEMPERATURE:	−30°C~ 80°C
4.	VIEWING ANGLE:	6:00_0'CLOCK
5.	BACKLIGHT BRIGHTNESS:	200CD/M2
6.	TOUCH PANEL:	CAPACITIVE TOUCH PANEL:
7.	RESOLUTION:	1024(RGB)X600
8.	INTERFACE:	TFT: HDMI, CTP:USB
9.	UNMARK TOLERANCES:	±0.03MM

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GENERAL TOL 0.30	ALL UNITS: MM	DATE	MODEL NUMBER : NT070-C001ML		SHEET: 1 OF 1
DWN:					
CHK:					DATE:
APP:			DO NOT SCALE THIS DRAWING.	PROJECTION	

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6. Interface Pin Connections

HDMI interface：

NO.	Symbol	DESCRIPTION
1	TMDS Data2+	Positive side of channel 2 TMDS low-voltage signal differential input pair
2	TMDS Data2 Shield	Ground
3	TMDS Data2-	Negative side of channel 2 TMDS low-voltage signal differential input pair
4	TMDS Data1+	Positive side of channel 1 TMDS low-voltage signal differential input pair
5	TMDS Data1 Shield	Ground
6	TMDS Data1-	Negative side of channel 1 TMDS low-voltage signal differential input pair
7	TMDS Data0+	Positive side of channel 0 TMDS low-voltage signal differential input pair
8	TMDS Data0 Shield	Ground
9	TMDS Data0-	Negative side of channel 0 TMDS low-voltage signal differential input pair
10	TMDS Clock+	Positive side of reference clock. TMDS low-voltage signal differential input pair
11	TMDS Clock Shield	Ground
12	TMDS Clock-	Negative side of reference clock. TMDS low-voltage signal differential input pair
13	CEC	No Connection
14	Reserved(N.C.)	No Connection
15	SCL	DDC SCL
16	SDA	DDC SDA
17	DDC/CEC Ground	Ground
18	+5V Power	+5V Power
19	Hot Plug Detect	Hot Plug Detect

CTP USB interface：

NO.	Symbol	DESCRIPTION
1	VUSB	USB Power
2	D-	USB Data-
3	D+	USB Data+
4	NC	No connection
5	GND	Power Ground

Application note: please connected USB interface first, then next connect HDMI interface.

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7. Timing Characteristics

7.1 Horizontal input timing:

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency@ Frame rate=60Hz	DCLK	44.9	51.2	63	MHz
Horizontal display area	thd		1024		DCLK
1 Horizontal Line	th	1200	1344	1400	DCLK
HSYNC pulse width	thpw	1	-	140	DCLK
HSYNC Blanking	thb	160	160	160	DCLK
HSYNC Front Porch	thfp	16	160	216	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	-	20	H
VSYNC Blanking	tvb	23	23	23	H
VSYNC Front Porch	tvfp	1	12	127	H

7.2 Vertical input timing

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Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency@ Frame rate=60Hz	DCLK	40.8	51.2	67.2	MHz
Horizontal display area	thd		1024		DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC Blanking	thb + thfp	90	320	376	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	610	635	800	H
VSYNC Blanking	tvb + tvfp	10	35	200	H

8. Inspection Standard

A. Sampling Method

Unless otherwise agreed upon in writing, the sampling inspection shall be applied to theCustomer's incoming inspection.

1) Lot size: Quantity per shipment lot
2) Sampling type: Normal inspection , single sampling
3) Inspection level: II