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Brighten The Future

NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT021RC001ML

Version	01
Engineer	
Date	2022/10/28

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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	2022/10/28	New released	

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General Specifications

NT021RC001ML is a TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC,a back light unit. The 2.1'' display area contains 480X(RGB)x480 pixels and can display up to 16.7M colors. This product accords with ROHS environmental criterion.

Item	Contents	Unit	Note
LCD Type	TFT	-	
Display color	16.7M	Color	1
Viewing Direction	ALL	O'Clock	
Operating temperature	-20~+70	℃	
Storage temperature	-30~+80	℃	
Module size	56.18X59.71X1.16	mm	2
Active Area(W×H)	53.28X53.28	mm	
Number of Dots	480×480	dots	
Controller	ST7701S	-	
Power Supply Voltage	2.8	V	
Backlight	4P-LEDs (white)	pcs	
Backlight	4 White LEDs In Parallels	g	
Interface	MIPI	-	

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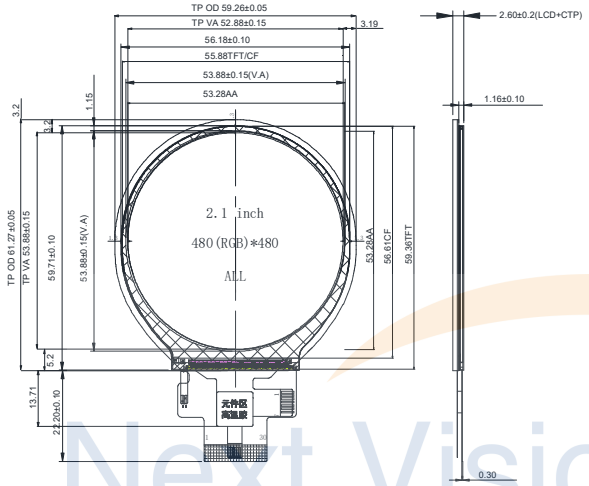
Note 1: Color tune is slightly changed by temperature and driving voltage.

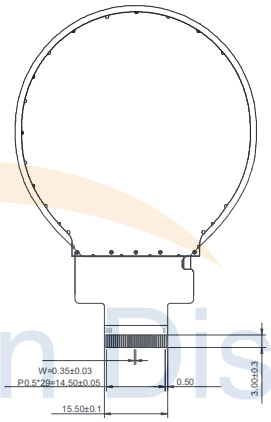
Note 2: Without FPC and Solder.

Outline.Drawing

ALL PAGES OF THIS VERSION APPROVED			
SIGNATURE:		DATE:	

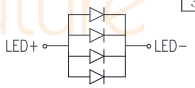
REV.	Description	Date
01	New released	





PIN	Symbol
1	A
2	K
3	K
4	VCC
5	IOVCC
6	RST
7	TE
8	PWM
9	GND
10	DOP
11	DON
12	GND
13	D1P
14	D1N
15	GND
16	CP
17	CN
18	GND
19	NC
20	NC
21	GND
22	NC
23	NC
24	GND
25	TPINT
26	TPSDA
27	TPSCL
28	TPRST
29	TPVCC
30	TPIOVCC

TP	
1	GND
2	TPINT
3	TPSDA
4	TPSCL
5	TPRST
6	TPVCC
7	TPIOVCC



VF:2.8-3.0V IF:80MA

NOTES:
1. VIEWING DIRECTION : ALL O'CLOCK
2. POLARIZER MODE : TRANSMISSIVE
3. DRIVER IC : ST7701S+BOE2.1
4. CONNECTOR :
5. GENERAL TOLERANCE : ±0.2
6. CRITICAL DIMENSION : *
7. REFERENCE DIMENSION : ()
8. OPERATING TEMP : -20° C~+70° C
9. STORAGE TEMP : -30° C~+80° C
10. 图中LCD VA/TP VA为推荐机壳视窗开窗位置，建议机壳开窗位置不要超过LCD VA及比TP VA单边小0.3以上

CTP NOTES:
1. COVER GLASS+ITO FILM+FPC
ITO FILM: 0.25MM
COVER GLASS: 0.95MM
2. IC: FT6336U(S12)
3. TRANSMITTANCE: ≥85%
4. SURFACE HARDNESS: ≥6H
5. GENERAL TOLERANCE : ±0.2

Next Vision Display
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GENERAL TOL 0.30	ALL UNITS: MM	DATE	MODEL NUMBER : NT021RC001ML		SHEET: 1 OF 1
DWN:					
CHK:					DATE:
APP:			DO NOT SCALE THIS DRAWING.	PROJECTION	

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Absolute Maximum Ratings(Ta=25℃)

Electrical Absolute Maximum Ratings.(Vss=0V ,Ta=25℃)

Item	Symbol	Min.	Max.	Unit	Note
Supply Voltage	IOVCC	-0.3	3.6	V	1,2
Supply Voltage	VCI	-0.3	3.6	V	
TFT Gate On voltage	VGH	-0.3	30	V	
TFT Gate Off voltage	VGL	-0.3	30	V	
Humidity	RH	-	90	%	Max. 60 °C

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.
2. $V_{CI} > V_{SS}$ must be maintained.
3. Please be sure users are grounded when handing LCD Module.

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3.2 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30℃	80℃	-20℃	70℃	1,2

Notes:

1. The response time will become lower when operated at low temperature.
2. Background color changes slightly depending on ambient temperature.
   The phenomenon is reversible.
3. Ta<=40℃:85%RH MAX.

   Ta>=40℃:Absolute humidity must be lower than the humidity of 85%RH at 40℃

Electrical Specifications

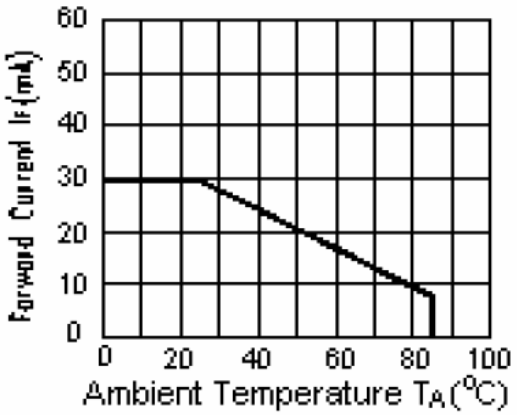
Electrical characteristics(Vss=0V ,Ta=25℃)

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Note
Power voltage		IOVCC	Ta=25℃	1.65	1.8	3.3	V	
Power voltage		VCI	Ta=25℃	2.5	2.8	3.6	V	
Input voltage	'H'	V_{IH}	Ta=25℃	0.7*IOVCC	-	IOVCC	V	
	'L'	V_{IL}	Ta=25℃	-0.3	-	0.3*IOVCC	V	

LED backlight specification(VSS=0V ,Ta=25℃)

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage	V_f	If=80mA	-	3.0	-	V	
Forward current	I_L		-	80	-	mA	
Uniformity	ΔBp	If=80mA	85	-	-	%	
Life Time	time	If=80mA	20K	25K	-	hours	1

Next Vision Display
Brighten The Future



Note 1: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25℃

Interface signals

Pin No.	Symbol	Function
1	LEDA	LED back light(Anode)
2-3	LEDK	LED back light(Cathode)
4	VCC	Power supply for I/O block. 2.8-3.3V
5	IOVCC	Power supply
6	RESET	Reset pin,active “L”
7	TE	Mainly plays the role of data synchronization
8	PWM	frequency output for LCD driver control.
9	GND	Power Ground
10	D0P	MIPI DSI differential data pair (DSI-Dn+).
11	D0N	MIPI DSI differential data pair (DSI-Dn-).
12	GND	Power Ground
13	D1P	MIPI DSI differential data pair (DSI-Dn+)
14	D1N	MIPI DSI differential data pair (DSI-Dn-)
15	GND	Power Ground
16	CP	MIPI DSI differential clock pair (DSI-CLK+)
17	CN	MIPI DSI differential clock pair (DSI-CLK-)
18	GND	Power Ground
19-20	NC	NC
21	GND	Power Ground
22-23	NC	NC
24	GND	Power Ground
25	TP_INT	TP
26	TP_SDA	TP
27	TP_SCL	TP
28	TP_RST	TP
29	TP_VCC	TP
30	TP_IOVCC	TP

Next Vision Display
Brighten The Future

AC Characteristics

DSI system interface

The MIPI DSI is enabled or disabled by external IM[3:0] pin.

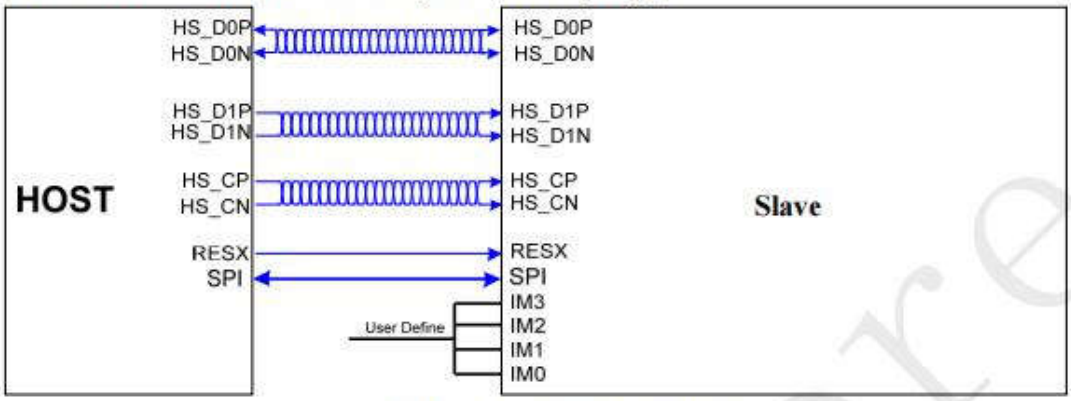


Figure 13 DSI system interface diagram

IM3	IM2	IM1	IM0	MPU Interface	Data Pin in Use
0	1	0	1	DSI interface	HS_CP, HS_CN, HS_D0P,HS_D0N, HS_D1P,HS_D1N,

The communication is separated into two different levels between the MPU and the display module:

Low level communication is done on the interface level.

High level communication is done on the packet level.

Next Vision Display
Brighten The Future

Optical Characteristics

Item	Symbol		**Condition**	Min.	Typ.	Max.	Unit	Note
Brightness	Bp		θ=0° Φ=0°	-	350	-	Cd/m^2	1
Uniformity	⊿Bp			85	-	-	%	1,2
Viewing Angle	3:00		Cr≥10	-	85	-	Deg	3
	6:00			-	85	-		
	9:00			-	85	-		
	12:00			-	85	-		
Contrast Ratio	Cr		θ=0° Φ=0°	800	1000	-	-	4
Response Time	$T_{r+}T_f$			-	30	35	ms	5
Color of CIE Coordinate	W	x	θ=0° Φ=0°	Typ. -0.05	TBD	Typ. +0.05	-	1,6
		y			TBD		-	
	R	x			TBD		-	
		y			TBD		-	
	G	x			TBD		-	
		y			TBD		-	
	B	x			TBD		-	
		y			TBD		-	
NTSC Ratio	S			60	69	-	%	

Next Vision Display
Brighten The Future