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NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT028-N001MI

Version	1.1
Engineer	
Date	2021/02/24

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Customer:
Approved by

NEXT VISION DISPLAY CO., LTD.

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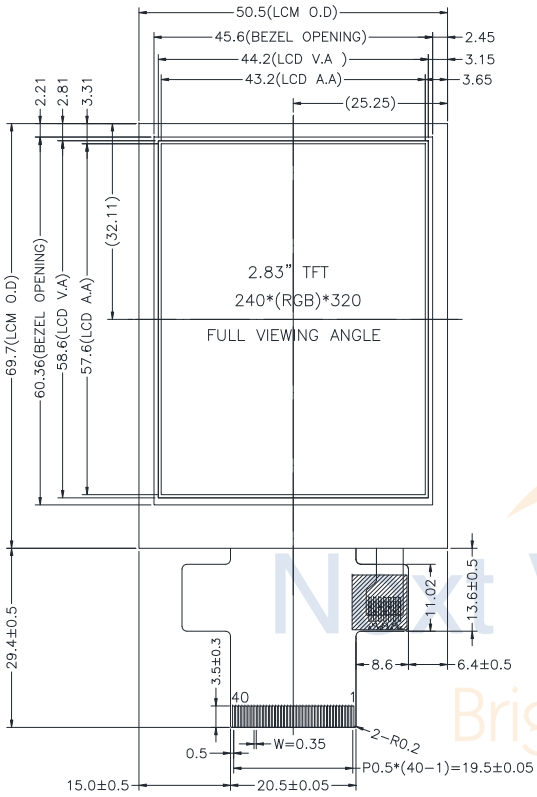
Represented by:

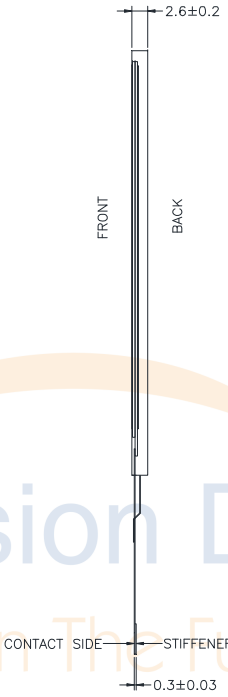
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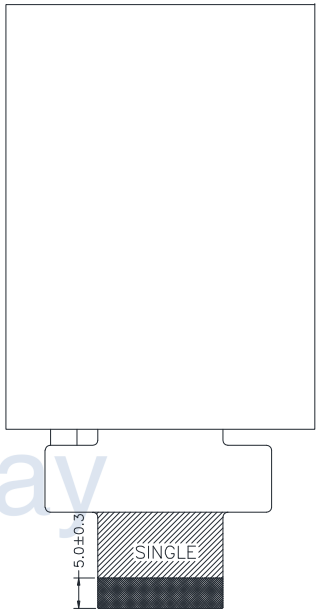
Item	Specification	Unit
LCD Type	IPS TFT / Transmissive / Normally Black	/
Size	2.83	Inch
Viewing Direction	Full Viewing Angle	O'clock
Gray Scale Inversion Direction	-	O'clock
LCM (W × H × D)	50.50 × 69.70 × 2.60	mm^3
Active Area (W × H)	43.20 × 57.60	mm^2
Pixel Pitch	0.18 × 0.18	mm^2
Number of Dots	240 (RGB) × 320	/
Driver IC	ST7789V2	/
Backlight Type	6LEDs	/
Interface Type	(1) 3-wire SPI	/
	(2) 3-wire SPI + 6- / 16- / 18-bit Parallel RGB	
Color Depth	65K / 262K	/
Pixel Configuration	R.G.B Vertical Stripe	/
Top Polarizer Surface Treatment	Anti-glare	/
Input Voltage	2.8	V
With / Without TSP	Without TSP	/
TP Surface Treatment	-	/
Weight	TBD	g

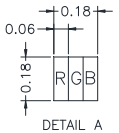
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Note 1: ROHS compliant;
Note 2: LCM weight tolerance: ±5%.

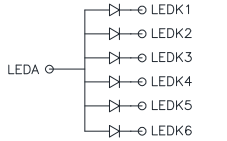








DETAIL A
(SCALE 40:1)



BACKLIGHT CIRCUIT DIAGRAM

TFT FPC ASSIGNMENT	
1	GND
2	VCI
3	RESET
4	CS
5	SPI-SCL
6	SDA
7	GND
8	VSYNC
9	HSYNC
10	ENABLI
11	DOTCLK
12	GND
13	DB0
14	DB1
15	DB2
16	DB3
17	DB4
18	DB5
19	GND
20	DB6
21	DB7
22	DB8
23	DB9
24	DB10
25	DB11
26	GND
27	DB12
28	DB13
29	DB14
30	DB15
31	DB16
32	DB17
33	GND
34	LEDA
35	LEDK1
36	LEDK2
37	LEDK3
38	LEDK4
39	LEDK5
40	LEDK6

NOTES FOR TFT:

1. DISPLAY TYPE: IPS TFT/TRANSMISSIVE/NORMALLY BLACK.
2. OPERATING VOLTAGE: VCI=2.8V.
3. VIEWING DIRECTION: FULL VIEWING ANGLE.
4. ⚠ DRIVER IC: ST7789V2.
5. OPERATING TEMP.: -20°~70°.
6. STORAGE TEMP.: -30°~80°.
7. BACKLIGHT: 6-CHIP LED, IF=120mA, VF=5.6V~6.8V.
8. SURFACE LUMINANCE: 800CD/M^2(TYP.).
9. TREATMENT OF TOP SURFACE: ANTI-GLARE.
10. GENERAL TOLERANCE: ±0.2mm.
11. ROHS COMPLIANT.

VER.	REVISED DESCRIPTION	REVISER	DATE
02	CORRECT DRIVER IC FROM ST7789V TO ST7789V2.	CAROL	2021.02.24
01	FIRST ISSUE	CAROL	2019.04.03

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DRAWN BY:	CAROL 2019.04.03	SCALE : 1/1	MODULE P/N: NT028-N001MI
CHECKED BY:		UNIT: mm	
APPROVED BY:			DESCRIPTION: TFT MODULE
VERSION NO:	02		

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■ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCI	-0.3	4.6	V
Operating Temperature	TOP	-20	70	℃
Storage Temperature	TST	-30	80	℃

Note: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

■ ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	VCI	2.5	2.8	3.3	V	
Input Voltage “H” Level	VIH	0.7VCI	-	VCI	V	
Input Voltage “L” Level	VIL	GND	-	0.3VCI	V	

■ BACKLIGHT CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	Vf	-	6.4	6.8	V	Ta=25±2℃, 60%RH±5%
Forward Current	If	-	120	-	mA	
Power Consumption	WBL	-	768	-	mW	
Operating Life Time	-	30000	50000	-	Hrs	

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Note: Operating life time means brightness goes down to 50% initial brightness;
The life time of LED will be reduced if LED is driven by high current, high ambient temperature and humidity conditions;
Typical operating life time is an estimated data.

■ ELECTRO-OPTICAL CHARACTERISTICS

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Notes
Response Time		Tr + Tf	θ=0° Ø=0° Ta=25°C	-	30	40	ms	FIG 1.	4
Contrast Ratio		Cr		600	800	-	---	FIG 2.	1
Luminance Uniformity		δ White		80	-	-	%	FIG 2.	3
Surface Luminance		Lv		640	800	-	cd/m²	FIG 2.	2
Viewing Angle Range		θ	Ø = 90°	80	-	-	deg	FIG 3.	6
			Ø = 270°	80	-	-	deg		
			Ø = 0°	80	-	-	deg		
			Ø = 180°	80	-	-	deg		
CIE (x,y) Chromaticity	Red	x	θ=0° Ø=0° Ta=25°C	TBD	TBD	TBD	---	FIG 2.	5
		y		TBD	TBD	TBD			
	Green	x		TBD	TBD	TBD			
		y		TBD	TBD	TBD			
	Blue	x		TBD	TBD	TBD			
		y		TBD	TBD	TBD			
	White	x		TBD	TBD	TBD			
		y		TBD	TBD	TBD			
NTSC		-	-	-	TBD	-	-	-	-

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Note 1. Contrast Ratio(CR) is defined mathematically as for more information see FIG 2.

$$\text{Contrast Ratio} = \frac{\text{Average Surface Luminance with all white pixels (P1,P2,P3,P4,P5)}}{\text{Average Surface Luminance with all black pixels (P1,P2,P3,P4,P5)}}$$

Note 2. Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information see FIG 2.

Lv = Average Surface Luminance with all white pixels (P1,P2,P3,P4,P5)

Note 3. The uniformity in surface luminance, δ White is determined by measuring luminance at each test position 1 through 5, and then dividing the maximum luminance of 5 points luminance by minimum luminance of 5 points luminance. For more information see FIG 2.

$$\delta \text{ White} = \frac{\text{Minimum Surface Luminance with all white pixels (P1,P2,P3,P4,P5)}}{\text{Maximum Surface Luminance with all black pixels (P1,P2,P3,P4,P5)}}$$

Note 4. Response time is the time required for the display to transition from white to black (Rise Time, Tr) and from black to white (Decay Time, Tf). For additional information see FIG 1. The test equipment is Autronic-Melcher's ConoScope. Series.

Note 5. CIE (x,y) chromaticity, The x,y value is determined by measuring luminance at each test position 1 through 5, and then make average value.

Note 6. Viewing angle is the angle at which the contrast ratio is greater than 2. For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 3.

■ INTERFACE DESCRIPTION

Pin No.	Symbol	Description
1	GND	Power ground.
2	VCC	Power supply.
3	RESET	Reset pin, active low.
4	CS	Chip selection pin.
5	SCL	SPI interface clock signal input pin.
6	SDA	SPI interface data input pin.
7	GND	Power ground.
8	VSYNC	Vertical (Frame) synchronizing input signal for RGB interface operation.
9	HSYNC	Horizontal (Line) synchronizing input signal for RGB interface operation.
10	ENABLE	Data enable signal for RGB interface operation.
11	DOTCLK	Dot clock signal for RGB interface operation.
12	GND	Power ground.
13	DB0	Data bus.
14	DB1	Data bus.
15	DB2	Data bus.
16	DB3	Data bus.
17	DB4	Data bus.
18	DB5	Data bus.
19	GND	Power ground.
20	DB6	Data bus.
21	DB7	Data bus.
22	DB8	Data bus.
23	DB9	Data bus.
24	DB10	Data bus.
25	DB11	Data bus.
26	GND	Power ground.
27	DB12	Data bus.
28	DB13	Data bus.
29	DB14	Data bus.
30	DB15	Data bus.
31	DB16	Data bus.
32	DB17	Data bus.
33	GND	Power ground.
34	LEDA	Anode of LED backlight.
35	LEDK1	Cathode of LED backlight.
36	LEDK2	Cathode of LED backlight.
37	LEDK3	Cathode of LED backlight.
38	LEDK4	Cathode of LED backlight.
39	LEDK5	Cathode of LED backlight.
40	LEDK6	Cathode of LED backlight.

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