Next Vision Display
Brighten The Future

NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT015RN001MI

Version	1.0
Engineer	
Date	2024-03-20

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Customer:
Approved by

NEXT VISION DISPLAY CO., LTD.

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■ GENERAL INFORMATION

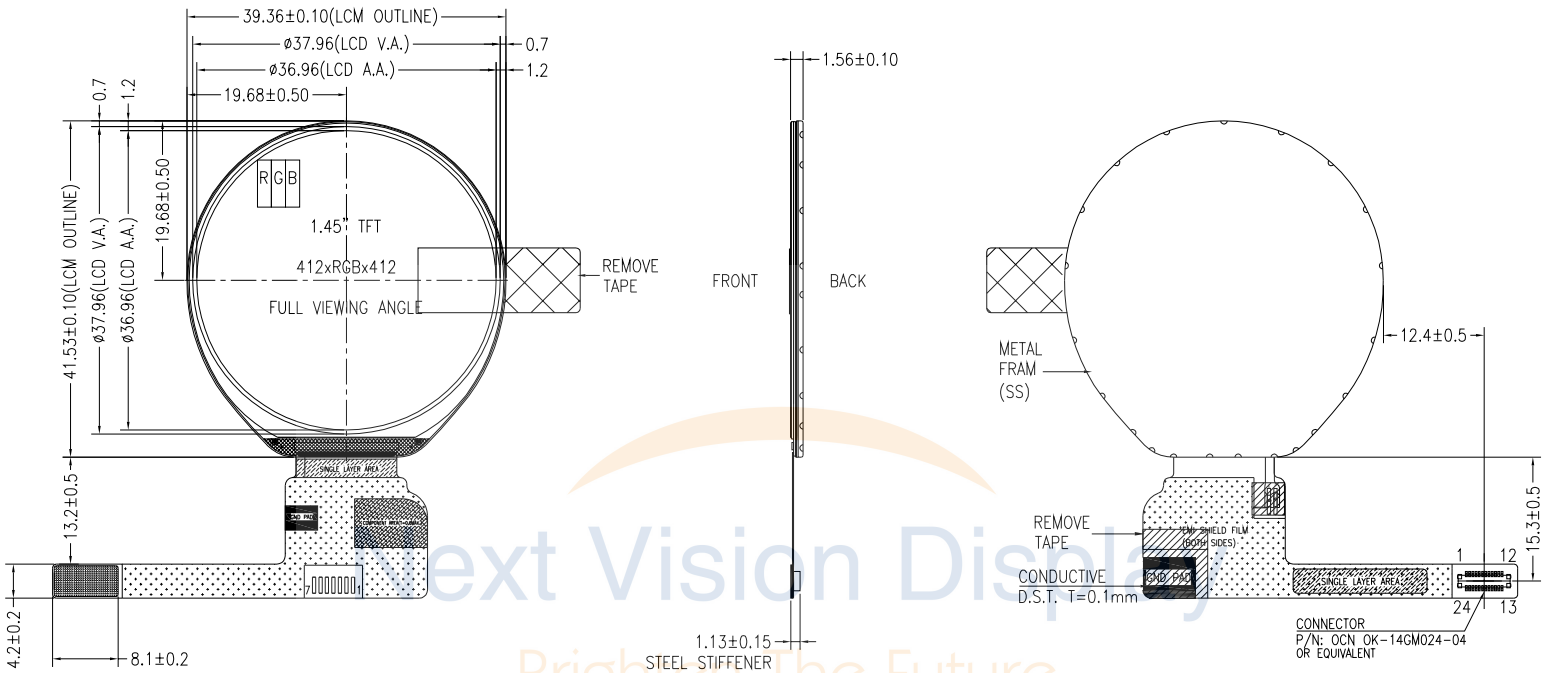
Item	Specification	Unit
LCD Type	TFT / Transmissive / Normally Black	/
Size	1.45	Inch
Viewing Direction	Full Viewing Angle	O'clock
Gray Scale Inversion Direction	-	O'clock
LCM (W × H × D)	39.36 × 41.53 × 1.56	mm³
Active Area (W × H)	Ø36.96	mm²
Pixel Pitch	0.0897 × 0.0897	mm²
Number of Dots	412 (RGB) × 412	/
Driver IC	SPD2010	/
Backlight Type	3-chip LED	/
Interface Type	QSPI	/
Color Depth	16.7M	/
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	4.3	g

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

■ EXTERNAL DIMENSIONS

FOR ANY TOUCH PANEL OR OTHER ACCESSORIES ASSEMBLED WITH FRAME GLUE, A PERMANENT AND RELIABLE MECHANICAL STRUCTURE NEEDS TO BE DESIGNED ON CUSTOMER'S WHOLE MACHINE TO HOLD THEM IN PLACE TO AVOID LOOSE.

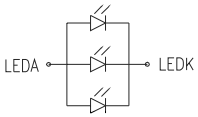


PIN ASSIGNMENT FOR LCM	
PIN	SYMBOL
1	NC
2	D3
3	D2
4	D1
5	D0(SDA)
6	SCL
7	CS
8	RESET
9	TE
10	GND
11	LEDK
12	LEDK
13	LEDA
14	VCC
15	VCC
16	GND
17	NC
18	NC
19	NC
20	NC
21	GND
22	IOVCC
23	IOVCC
24	NC

Next Vision Display
Brighten The Future

NOTES:

1. DISPLAY TYPE: TFT, TRANSMISSIVE, NORMALLY BLACK
2. OPERATING VOLTAGE: VDD=2.8V (TYP.)
3. VIEWING DIRECTION: FULL VIEWING ANGLE
4. DRIVER IC: SPD2010
5. OPERATING TEMP.: -20°C ~ 70°C
6. STORAGE TEMP.: -30°C ~ 80°C
7. LED BACKLIGHT: WHITE LED, IF=60MA, VF=2.9V~3.1V
8. SURFACE LUMINANCE: 450CD/M^2 (TYP.)
9. TOP POLARIZER SURFACE TREATMENT: ANTI-GLARE
10. CONNECTOR: OCN OK-14GM024-04 OR EQUIVALENT
11. ONLY THE SINGLE LAYER AREA ON FPC IS BENDABLE AND THE MINIMUM BEND RADIUS IS 1.5MM
12. GENERAL TOLERANCE: ±0.2MM
13. ROHS COMPLIANT



BACKLIGHT CIRCUIT DIAGRAM

VER.	REVISED DESCRIPTION	REVISER	DATE
01	FIRST ISSUE	RITA	2024.03.20

DRAWN BY:	RITA	2024.03.20	MODULE P/N: NT015RN001MI
CHECKED BY:			SCALE : 1/1
APPROVED BY:			UNIT: mm
VERSION NO:	01		SHEET NO.: 1/1
			DESCRIPTION: TFT MODULE

■ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.3	3.3	V
	IOVCC	-0.3	3.3	V
Operating Temperature	TOP	-20	70	℃
Storage Temperature	TST	-30	80	℃

■ ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	VCC	2.5	2.8	3.3	V	
	IOVCC	1.65	1.8	3.3	V	
Supply Current for VCC	ICC	-	TBD	-	mA	
Gate Driver “H” Level	VGH	6	-	15	V	
Gate Driver “L” Level	VGL	-14	-	-5	V	

■ BACKLIGHT CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	Vf	2.9	3.0	3.1	V	Ta=25±2℃, 60%RH±5%
Forward Current	If	-	60	-	mA	
Power Consumption	WBL	-	180	-	mW	
Operating Life Time	-	20000	30000	-	Hrs.	

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.

Next Vision Display
Brighten The Future

■ ELECTRO-OPTICAL CHARACTERISTICS

Ta=25℃±2℃. VCC=2.8V, If=60mA.

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Notes
Response Time		Tr + Tf	θ=0°	-	35	40	ms	FIG 1, 2	4
Contrast Ratio		Cr		1200	1500	-	---	FIG 1, 3	1
Luminance Uniformity		δ White		75	80	-	%	FIG 1, 3	3
Surface Luminance		Lv		400	450	-	cd/m²	FIG 1, 3	2
Viewing Angle Range		θ	Ø = 90°	80	-	-	deg	FIG 1, 4	1, 6
			Ø = 270°	80	-	-	deg		
			Ø = 0°	80	-	-	deg		
			Ø = 180°	80	-	-	deg		
CIE (x, y) Chromaticity	Red	x	θ=0°	0.588	0.638	0.688	---	FIG 1, 3	5
		y		0.312	0.362	0.412			
	Green	x		0.274	0.324	0.374			
		y		0.590	0.640	0.690			
	Blue	x		0.099	0.149	0.199			
		y		0.041	0.091	0.141			
	White	x		0.251	0.301	0.351			
		y		0.273	0.323	0.373			
NTSC		-	-	-	69.9	-	%	-	-

Next Vision Display
Brighten The Future

Note 1. Contrast Ratio (CR) is defined by following formula. For more information see FIG 3.

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

Note 2. Surface luminance is the LCD surface luminance with all pixels displaying white state. For more information see FIG 3.

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 3.

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

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 (Fall Time, Tf). For additional information see FIG 2.

Note 5. CIE (x,y) chromaticity, color coordinates measured at center point of LCD.

Note 6. Viewing angle is the angle at which the contrast ratio is greater than a specific value. For TFT module, the specific value of contrast ratio is 10. For monochrome module, the specific value of contrast ratio is 2. 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 4.

■ INTERFACE DESCRIPTION

Pin No.	Symbol	Description
1	NC	No connection.
2	D3	Serial input signal in QSPI serial data interface.
3	D2	Serial input signal in QSPI serial data interface.
4	D1	Serial input signal in QSPI serial data interface.
5	D0 (SDA)	Serial input signal in QSPI serial data interface.
6	SCL	This pin is used to be serial interface clock.
7	CS	Chip selection pin; Low enable, high disable.
8	RESET	Reset pin, active low.
9	TE	Tearing effect signal is used to synchronize MCU to frame memory writing.
10	GND	Ground.
11	LEDK	Cathode for LED backlight.
12	LEDK	Cathode for LED backlight.
13	LEDA	Anode for LED backlight.
14	VCC	Power supply.
15	VCC	Power supply.
16	GND	Ground.
17	NC	No connection.
18	NC	No connection.
19	NC	No connection.
20	NC	No connection.
21	GND	Ground.
22	IOVCC	Power supply for I/O system.
23	IOVCC	Power supply for I/O system.
24	NC	No connection.

Next Vision Display
Brighten The Future