Next Vision Display
Brighten The Future

NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT024-N001MI

Version	1.0
Engineer	
Date	2024-05-28

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Customer:
Approved by

NEXT VISION DISPLAY CO., LTD.

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■ GENERAL INFORMATION

Item	Specification	Unit
LCD Type	TFT / Transflective / Normally Black	/
Size	2.4	Inch
Viewing Direction	Full Viewing Angle	O'clock
Gray Scale Inversion Direction	-	O'clock
LCM (W × H × D)	42.72 × 60.40 × 2.87	mm^3
Active Area (W × H)	36.72 × 48.96	mm^2
Pixel Pitch	0.153 × 0.153	mm^2
Number of Dots	240 (RGB) × 320	/
Driver IC	ST7789T3	/
Backlight Type	4LEDs	/
Interface Type	8- / 16-bit MCU	/
Color Depth	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%.

■ INTERFACE DESCRIPTION

Pin No.	Symbol	I/O/P	Description	When not in use
1	GND	P	Ground.	-
2	NC(YD)	-	No connection.	-
3	NC(XL)	-	No connection.	-
4	NC(YU)	-	No connection.	-
5	NC(XR)	-	No connection.	-
6	LCD_ID	-	No connection.	-
7	VCC	P	Power supply of analog.	-
8	IOVCC	P	Power supply of logic.	-
9	FMARK	O	Tearing effect output pin to synchronize MPU to frame writing.	-
10	CS	I	Chip select signal.	-
11	RS	I	Register select signal.	-
12	WR	I	Write enables signal.	IOVCC or GND
13	RD	I	Read enable signal.	IOVCC or GND
14	DB0	I/O	Data input.	IOVCC or GND
15	DB1	I/O	Data input.	IOVCC or GND
16	DB2	I/O	Data input.	IOVCC or GND
17	DB3	I/O	Data input.	IOVCC or GND
18	DB4	I/O	Data input.	IOVCC or GND
19	DB5	I/O	Data input.	IOVCC or GND
20	DB6	I/O	Data input.	IOVCC or GND
21	DB7	I/O	Data input.	IOVCC or GND
22	DB8	I/O	Data input.	IOVCC or GND
23	DB9	I/O	Data input.	IOVCC or GND
24	DB10	I/O	Data input.	IOVCC or GND
25	DB11	I/O	Data input.	IOVCC or GND
26	DB12	I/O	Data input.	IOVCC or GND
27	DB13	I/O	Data input.	IOVCC or GND
28	DB14	I/O	Data input.	IOVCC or GND
29	DB15	I/O	Data input.	IOVCC or GND
30	RESET	I	Reset signal input, active low.	-
31	IM0	I	Mode select signal. (Note 2)	IOVCC or GND
32	NC	-	No connection.	-
33	GND	P	Ground.	-
34	LEDK1	P	Cathode of LED backlight.	-
35	LEDK2	P	Cathode of LED backlight.	-
36	LEDK3	P	Cathode of LED backlight.	-
37	LEDK4	P	Cathode of LED backlight.	-
38	LEDA	P	Anode of LED backlight.	-
39	GND	P	Ground.	-
40	NC	-	No connection.	-

Note 1: I/O/P definition: I----Input O----Output P----Power/Ground

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■ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage for Analog	VCC	-0.3	4.6	V
Supply Voltage for Logic	IOVCC	-0.3	4.6	V
Operating Temperature	TOP	-20	70	℃
Storage Temperature	TST	-30	80	℃

■ ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage for Analog	VCC	2.4	2.8	3.3	V	
Supply Current for VCC	ICC	-	TBD	-	mA	
Supply Voltage for Logic	IOVCC	1.65	1.8/2.8	3.3		
Input Voltage “H” Level	VIH	0.7IOVCC	-	IOVCC	V	
Input Voltage “L” Level	VIL	GND	-	0.3IOVCC	V	
Output Voltage “H” Level	VOH	0.8 IOVCC	-	IOVCC	V	
Output Voltage “L” Level	VOL	GND	-	0.2 IOVCC	V	

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■ BACKLIGHT CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	Vf	-	3.1	3.4	V	Ta=25±2℃, 60%RH±5%
Forward Current	If	-	80	-	mA	
Power Consumption	WBL	-	248	-	mW	
Operating Life Time	-	30000	50000	-	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.

■ ELECTRO-OPTICAL CHARACTERISTICS

DRIVING THE BACKLIGHT CONDITION Ta=25°C±2°C. VCC=2.8V, If=80mA.

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Notes
Response Time		Tr + Tf	θ=0°	-	25	30	ms	FIG 1, 2	4
Contrast Ratio		Cr		50	80	-	---	FIG 1, 3	1
Luminance Uniformity		δ White		80	-	-	%	FIG 1, 3	3
Surface Luminance		Lv		80	100	-	cd/m²	FIG 1, 3	2
Viewing Angle Range		θ	Ø = 90°	30	60	-	deg	FIG 1, 4	1, 6
			Ø = 270°	25	55	-	deg		
			Ø = 0°	30	60	-	deg		
			Ø = 180°	30	60	-	deg		
CIE (x, y) Chromaticity	Red	x	θ=0°	TBD	TBD	TBD	---	FIG 1, 3	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	-	%	-	-

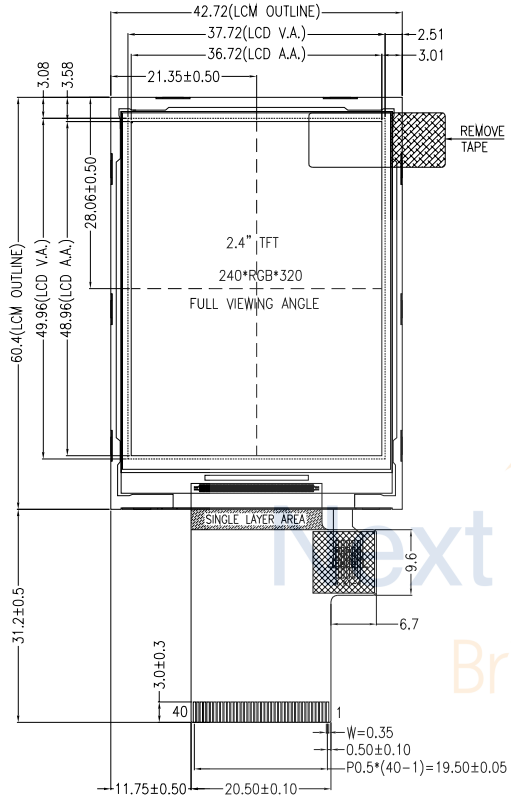
NO DRIVING THE BACKLIGHT CONDITION Ta=25°C±2°C. VCC=2.8V.

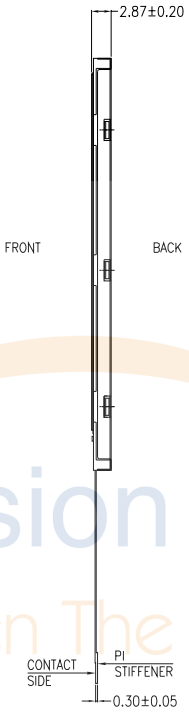
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	Notes
Contrast Ratio		Cr	θ=0°	4.0	6.0	-	---	FIG 2.	1
Reflectance		δ White		5.6	7.5	-	%	---	8
Viewing Angle Range		θ	Ø = 90°	50	70	-	deg	FIG 3.	6
			Ø = 270°	50	70	-	deg		
			Ø = 0°	50	70	-	deg		
			Ø = 180°	50	70	-	deg		
CIE (x, y) Chromaticity	Red	x	θ=0°	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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■ EXTERNAL DIMENSIONS

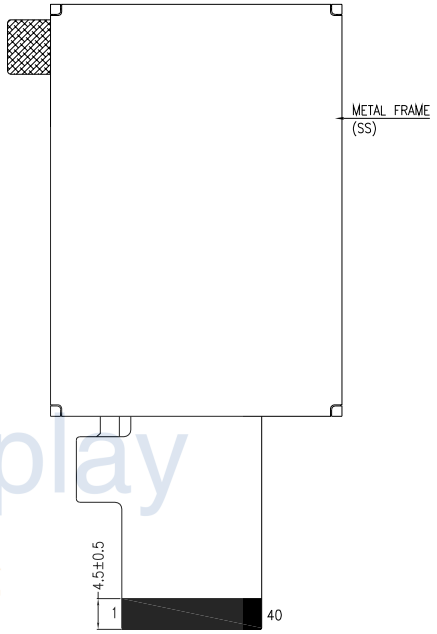
NO MECHANICAL HOUSING TO HOLD THE TFT AND THE BACKLIGHT UNIT ON THIS PRODUCT, SO THE END UNIT'S MECHANICAL DESIGN MUST INCLUDE A HOUSING FOR PREVENTING THE SEPARATION OF THE TFT AND THE BACKLIGHT UNIT.



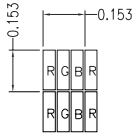


IM0	MCU INTERFACE MODE	DATA PIN
0	80-16BIT PARALLEL I/F II	DB [17:10] DB [8:1]
1	80-8BIT PARALLEL I/F II	DB [17:10]

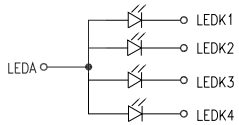
THE MCU INTERFACE MODE SELECT



PIN ASSIGNMENT	
PIN	SYMBOL
1	GND
2	NC
3	NC
4	NC
5	NC
6	NC
7	VCC
8	IOVCC
9	FMARK
10	CS
11	RS
12	WR
13	RD
14	DB0
15	DB1
16	DB2
17	DB3
18	DB4
19	DB5
20	DB6
21	DB7
22	DB8
23	DB9
24	DB10
25	DB11
26	DB12
27	DB13
28	DB14
29	DB15
30	RESET
31	IM0
32	NC
33	GND
34	LEDK1
35	LEDK2
36	LEDK3
37	LEDK4
38	LEDA
39	GND
40	NC



PIXEL DETAIL
(SCALE 40:1)



BACKLIGHT CIRCUIT DIAGRAM

NOTES:

1. DISPLAY TYPE: TFT, TRANSFLECTIVE, NORMALLY BLACK
2. OPERATING VOLTAGE: VCC=2.8V (TYP.), IOVCC=1.8V/2.8V
3. VIEWING DIRECTION: FULL VIEWING ANGLE
4. DRIVER IC: ST7789T3
5. OPERATING TEMP.: -20°C ~ 70°C
6. STORAGE TEMP.: -30°C ~ 80°C
7. LED BACKLIGHT: WHITE LED, IF=80mA, VF=2.8V~3.4V
8. SURFACE LUMINANCE: 100CD/M^2 (TYP.)
9. TOP POLARIZER SURFACE TREATMENT: ANTI-GLARE
10. RECOMMEND MATCHING CONNECTOR: HRS FH19SC-40S-0.5SH 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

VER.	REVISED DESCRIPTION	REVISER	DATE
01	FIRST ISSUE	RITA	2024.05.23

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DRAWN BY: RITA 20240523			MODULE P/N: NT024-N001MI
CHECKED BY:		SCALE : 1/1	
APPROVED BY:		UNIT: mm	DESCRIPTION: TFT MODULE
VERSION NO: 01		SHEET NO.: 1/1	

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