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Brighten The Future

NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT050RC001ML

Version	
Engineer	
Date	

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Customer:
Approved by

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1. General Specifications

MLT050F50-CT2 is a TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC, a back light unit. The 5.0′′ display area contains 1080 x 1080 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		
Viewing Direction	ALL	O'Clock	
Operating temperature	-20~+60	℃	
Storage temperature	-30~+75	℃	
Module size	148.10x148.10x3.205	mm	
Active Area(W×H)	127.008(H) x 127.008(V)	mm	
Number of Dots	1080×1080	dots	
Controller	HX8399	-	
Outline Dimensions	Refer to outline drawing	-	
Backlight	6-LEDs (white)	pcs	
Touch Panel	With CTP	g	
Interface	MIPI	-	

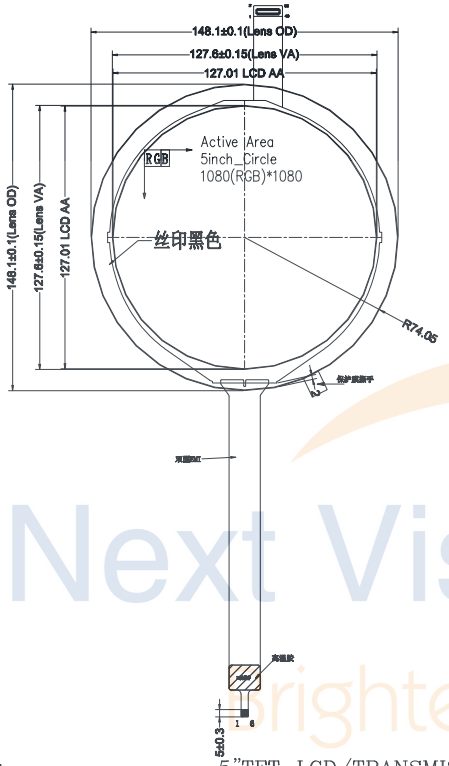
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2. Outline Drawing

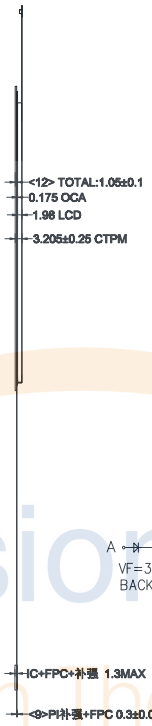
ALL PAGES OF THIS VERSION APPROVED			
SIGNATURE:		DATE:	

REV.	Description	Date
01	New released	

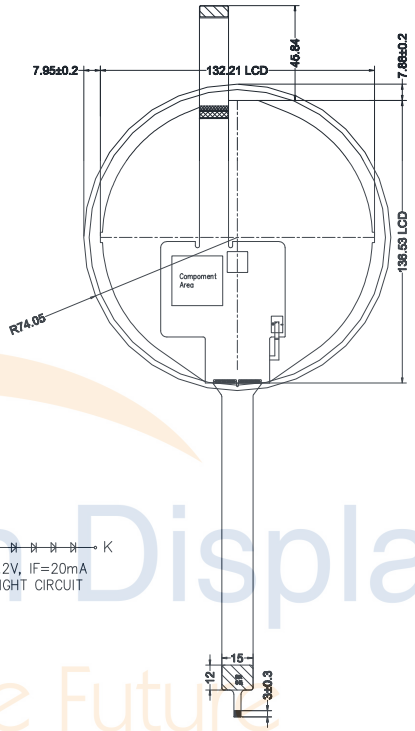
正视图



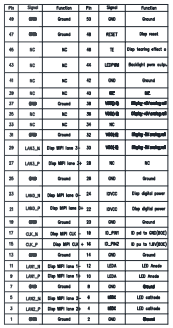
侧视图



背视图



PIN#	ASSIGNMENT
1	VDD(2.8V)
2	GND
3	INT(1.8V)
4	SCL(1.8V)
5	SDA(1.8V)
6	RST(2.8V)



NOTES:

1. DISPLAY TYPE: 5”TFT_LCD/TRANSMISSIVE
2. OPERATING TEMPERATURE: −20°C~60°C
3. STORAGE TEMPERATURE: −30°C~75°C
4. VIEWING ANGLE: ALL
5. BACKLIGHT BRIGHTNESS: 400CD/M2
6. DRIVER: /
7. RESOLUTION: 1080(RGB)X1080
8. CONNECTOR: FPC
9. UNMARK TOLERANCES: ±0.2MM

特殊工艺：

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GENERAL TOL 0.30	ALL UNITS: MM	DATE	MODEL NUMBER : NT050R001ML		SHEET: 1 OF 1
DWN:					DATE:
CHK:					
APP:			DO NOT SCALE THIS DRAWING.	PROJECTION	

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3. Absolute Maximum Ratings(Ta=25℃)

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

Item	Symbol	Min.	Max.	Unit	Note
Logic Power Supply Voltage	IOVCC	-0.3	3.6	V	
Analog Positive Power Supply	VDD+/VSP	-0.3	+6.6	V	
Analog Negative Power Supply	VDD-/VSN	0	+6.6	V	

3.2 Environmental Absolute Maximum Ratings.

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30℃	75℃	-20℃	60℃	1,2
Humidity	-	-	-	-	3

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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℃.

4. Electrical Specifications and Instruction Code

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

Parameter		Symbol	Min	Typ	Max	Unit	Note
Power Supply Input Voltage		IOVCC	1.65	1.8	3.3	V	
Analog Positive Power Supply		VDD+/VSP	4.8	5.0	6.0	V	
Analog Negative Power Supply		VDD-/VSP	-6.0	-5.0	-4.8	V	
Level input voltage	'H'	V_{IH}	0.7IOVCC	-	IOVCC	V	
	'L'	V_{IL}	0	-	0.3IOVCC	V	
Power Consumption		PD	-	-	-	W	
		PBL	-	0.744	0.768	W	
		PToal	-	-	-	W	

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Note:

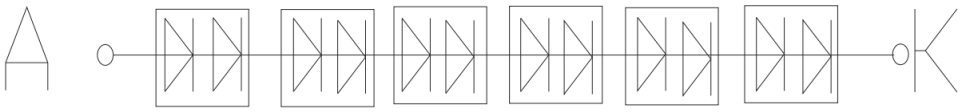
Frame rate=60HZ, Typ. Pattern White pattern, worst case pattern 1×1 checker 25℃.

Item	Symbol	Min	Typ	Max	Unit	Note
Forward Voltage	V_F	-	37.2	38.4	V	
Forward Current	I_F	-	20	-	mA	
Luminance for LCD	Lv	350	400		Cd/m2	Note 3
LED life time	Hr	-	30,000	-	Hours	Note 1,2
Uniformity	Avg	80	-	-	%	Note 3

4.2 LED backlight specification

Note1: LED life time (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25±3 ℃, typical IL value indicated in the above table until the brightness becomes less than 50%.

Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL=40mA. The LED lifetime could be decreased if operating IL is larger than 40mA. The constant current driving method is suggested



BACKLIGHT CIRCUIT

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4.3 Interface signals

Pin No.	Symbol	Description
1~2	GND	Ground.
3	LAN2_P	Disp MIPI lane2+.
4	LEDK	LED cathode.
5	LAN2_N	Disp MIPI lane2-.
6	LEDK	LED cathode.
7~8	GND	Ground.
9	LAN1_P	Disp MIPI Blane 1+.
10	LEDA	LED Anode.
11	LAN1_N	Disp MIPI lane 1-.
12	LEDA	LED Anode.
13~14	GND	Ground.
15	CLK_P	Disp MIPICLK+.
16	ID_PIN2	ID pu to1.8V(LCM). If not used open.
17	CLK_N	Disp MIPICLK-.
18	ID_PIN1	ID pd to GND(LCM). If not used open.
19~20	GND	Ground.
21	LAN0_P	Disp MIPI lane 0+.
22	IOVCC	Disp digital power(1.8V).
23	LAN0_N	Disp MIPI lane0-.
24	IOVCC	Disp digital power(1.8V).
25~26	GND	Ground.
27	LAN3_P	Disp MIPI lane 3+.
28	NC	NC
29	LAN3_N	Disp MIPI lane 3-.
30	VSN/VDD-	Display -5V analog rail.
31	GND	Ground.
32	VSN/VDD-	Display -5V analog rail.
33-35	NC	NC
36	VSP/VDD+	Disp +5V analog rail.
37	GND	Ground.
38	VSP/VDD+	Disp +5V analog rail .
39-41	NC	NC
42	GND	Ground.
43	NC	NC
44	LEDPWM	Backlight pwm output, If not used open.
45	NC	NC
46	TE	Disp tearing effect out, If not used open.
47	GND	Ground.
48	RESET	Disp reset.
49~50	GND	Ground.

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5. Optical Characteristics

Item	Symbol		Condition	Min.	Typ.	Max.	Unit	Note
Brightness	Bp		θ=0° Φ=0°	350	400	-	Cd/m^2	1
Uniformity	⊿Bp			70	-	-	%	1,2
Viewing Angle	3:00		Cr≥10	-	80	-	Deg	3
	6:00			-	80	-		
	9:00			-	80	-		
	12:00			-	80	-		
Contrast Ratio	Cr		θ=0° Φ=0°	800	1300		-	4
Response Time	T_r			-	-	40	ms	5
	T_f						ms	
Color of CIE Coordinate	W	x	θ=0° Φ=0°	0.23	0.28	0.33	-	1,6
		y		0.28	0.33	0.38	-	
	R	x		0.46	0.51	0.56	-	
		y		0.29	0.34	0.39	-	
	G	x		0.26	0.31	0.36	-	
		y		0.51	0.56	0.61	-	
	B	x		0.14	0.15	0.20	-	
		y		0.09	0.14	0.19	-	
NTSC Ratio	S			65	70	-	%	

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Note：The parameter is slightly changed by temperature, driving voltage and materiel

Note 1: The data are measured after LEDs are turned on for 5 minutes. LCM displays full white. The brightness is the average value of 9 measured spots. Measurement equipment PR-705 (Φ8mm)

Measuring condition:

- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- Adjust operating voltage to get optimum contrast at the center of the display.

Measured value at the center point of LCD panel after more than 5 minutes while backlight turning on.

8. Reliability Test Items and Criteria

NO.	Test Item	Test Condition
1	High Temp Operation	60 ℃ for 240 hours
2	Low Temp Operation	-20 ℃ for 240 hours
3	High Temp/ High humidity Operation	60 ℃/ 90% RH for 100 hours
4	High Temp Storage	75 ℃ for 240 hours
5	High Temp/ High Humidity Storage	65 ℃/ 90% RH for 100 hours
6	Low Temp Storage	-30 ℃ for 240 hours
7	Thermal Shock	-30 ℃ for 45min and then 75 ℃ for 45 min, 27 cycles
8	ESD test	Contact=4KV,Air=8KV

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Remark:
1.The test samples should be applied to only one test item.
2.Sample size for each test item is 5~10pcs.
3.For Damp Proof Test, Pure water(Resistance＞ 10MΩ) should be used.
4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be
judged as a good part.
5.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

9. Precautions for Use of LCD Modules

9.1 Handling Precautions

9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.