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Optical Bonding

Cover glass

System solutions

OEM Solutions

Custom Display

Mechanical design



MODEL NO : ET032NV01-OTMODEL VERSION: 01SPEC VERSION : 1.0ISSUED DATE: 2021-03-12

- ☒ Preliminary Specification
☐ Final Product Specification

Customer : _____

Approved by	Notes

Youri Confirmation

Prepared by	Reviewed by	Approved by
John	Johnny	Wang

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1 General Specifications

Feature		Spec
Display Spec.	Size	3.2 inch
	Resolution	360 X 640
	Technology Type	AMOLED
	Pixel Configuration	Rendering
	Pixel pitch(um)	36.5*109.5
	Viewing Direction	ALL
Mechanical Characteristics	MODEL (W x H x D) (mm)	42.50 *77.70*2.30
	LCD Active Area(mm)	39.42 * 70.08
	With /Without TSP	On cell
	Weight (g)	TBD
Electrical Characteristics	LCD Interface	MIPI 1 lane
	Color Depth	16.7M(24BIT)

Note 1: Viewing direction for best image quality is different from TFT definition. There is a 180 degree shift.

Note 2: Requirements on Environmental Protection: Q/S0002

Note 3: LCM weight tolerance: $\pm 5\%$

2 Terminals

Pin No.	Symbol	Description
1~4	GND	Ground
5	DO-	MIPI DSI DATA0-
6	DO+	MIPI DSI DATA0+
7	GND	Ground
8	CLK-	MIPI DSI Clock-
9	CLK+	MIPI DSI Clock+
10~13	GND	Ground
14	TE	Tearing effect output, it can be NC
15	tGND	Ground
16-19	VPNL	POWER IC INPUT VOLTAGE(+3.7V)
20~21	N/C	NC
22	VDD	Analog power, 3.3V
23	N/C	NC
24	VDDI	Digital I/O power supply1.8V
25	N/C	NC
26	RESX	OLED RESET, Low active
27	SCL	IIC_SCL for TP driver IC
28	SDA	IIC_SDA for TP driver IC
29	INT1	Interrupt signal for TP driver IC
30	PDI_SCL	NC

3 Absolute Maximum Ratings

Characteristics	Symbol	Min.	Max.	Unit	Notes
Analog power voltage	VDD	-0.3	5.5	V	-
Digital I/O voltage	VDDI	-0.3	5.5	V	-
Power IC Input voltage	VPNL	-0.3	5.5	V	-
Operating temperature	TOP	-15	70	°C	
Storage temperature	Tstg	-40	85	°C	

4 Electrical Characteristics

4.1 DC Characteristics

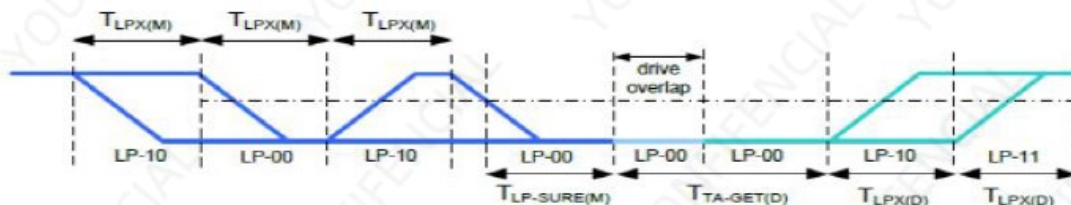
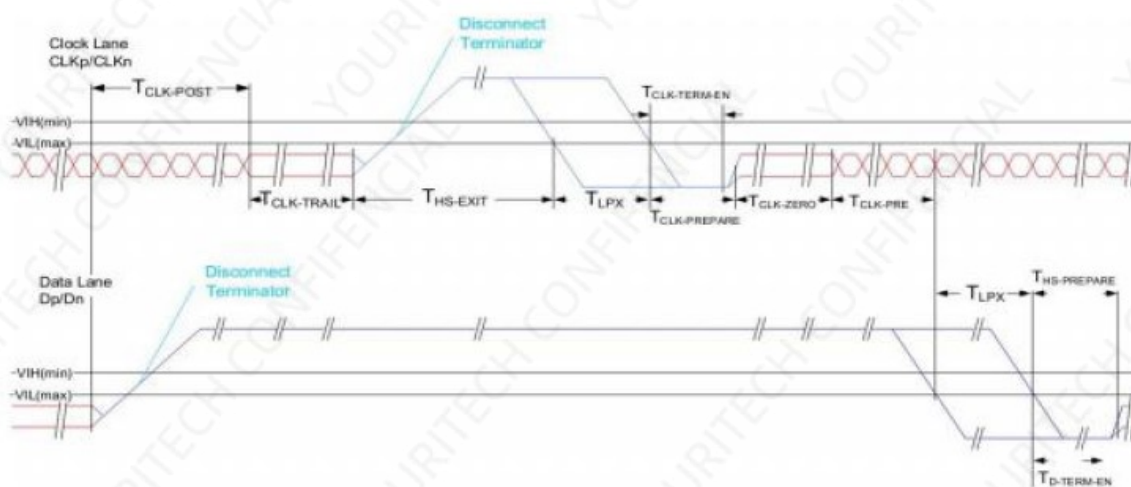
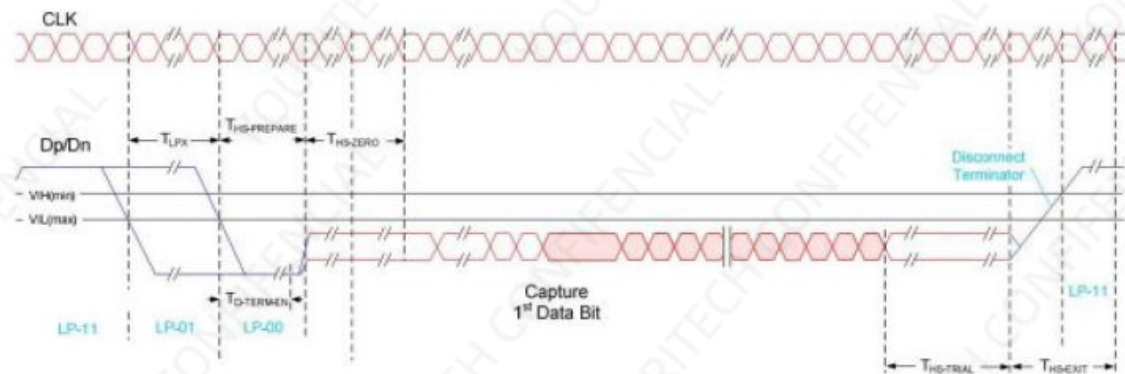
Item	Symbol	Min.	Typ.	Max.	Unit	Notes
Analog power voltage	VDD	2.6	2.8	3.6	V	-
Digital I/O voltage	VDDI	1.65	1.8	1.95	V	-
Power IC Input voltage	VPNL	3.2	3.7	4.8	V	-

4.2 DISPLAY POWER CONSUMPTION

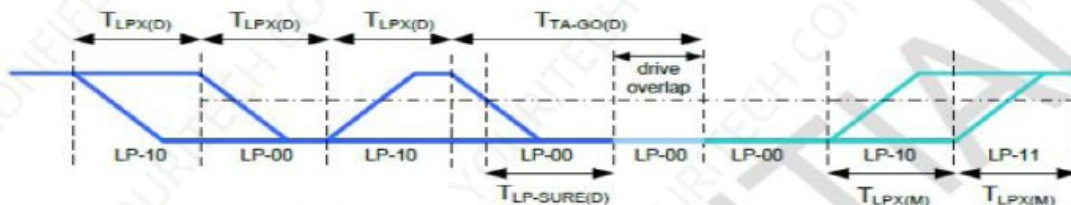
MODE OF OPERATIONS	IMAGE	CURRENT CONSUMPTION							
		NOMINAL			MAXIMUM			PEAK	
		IDDI [mA]	IPNL [mA]	Power [mW]	IDDI [mA]	IPNL [mA]	Power [mW]	IDDI [mA]	IPNL [mA]
Normal Mode	All pixels black	3	11	46	8	19	68	11	23
	All pixels white ⁽¹⁾	3	315	1169	8	588	1719	11	706
Sleep In Mode ⁽²⁾	N/A	0.03	0.01	0.09	0.2	0.2		0.28	0.28
Video data	16.7M colors ⁽¹⁾ CPU access @ 60 fps	8	326	1219	20	606	1792	28	727
NOTES					NOMINAL CONDITIONS:				
1. Worst case pattern is all pixels white.					T _A = 25 °C				
2. CPU access is inactive.					VPNL = 3.7 V				
DSI interface in ULPS.					VDDI = 1.8 V				
					MAXIMUM CONDITIONS:				
					T _A = -15 to 70 °C				
					VPNL = 2.9 V to 4.8 V				
					VDDI = 1.65 V to 1.95 V				
					Includes Process Variance				

5 Timing Chart

5.1 System Bus Read/Write Characteristics.

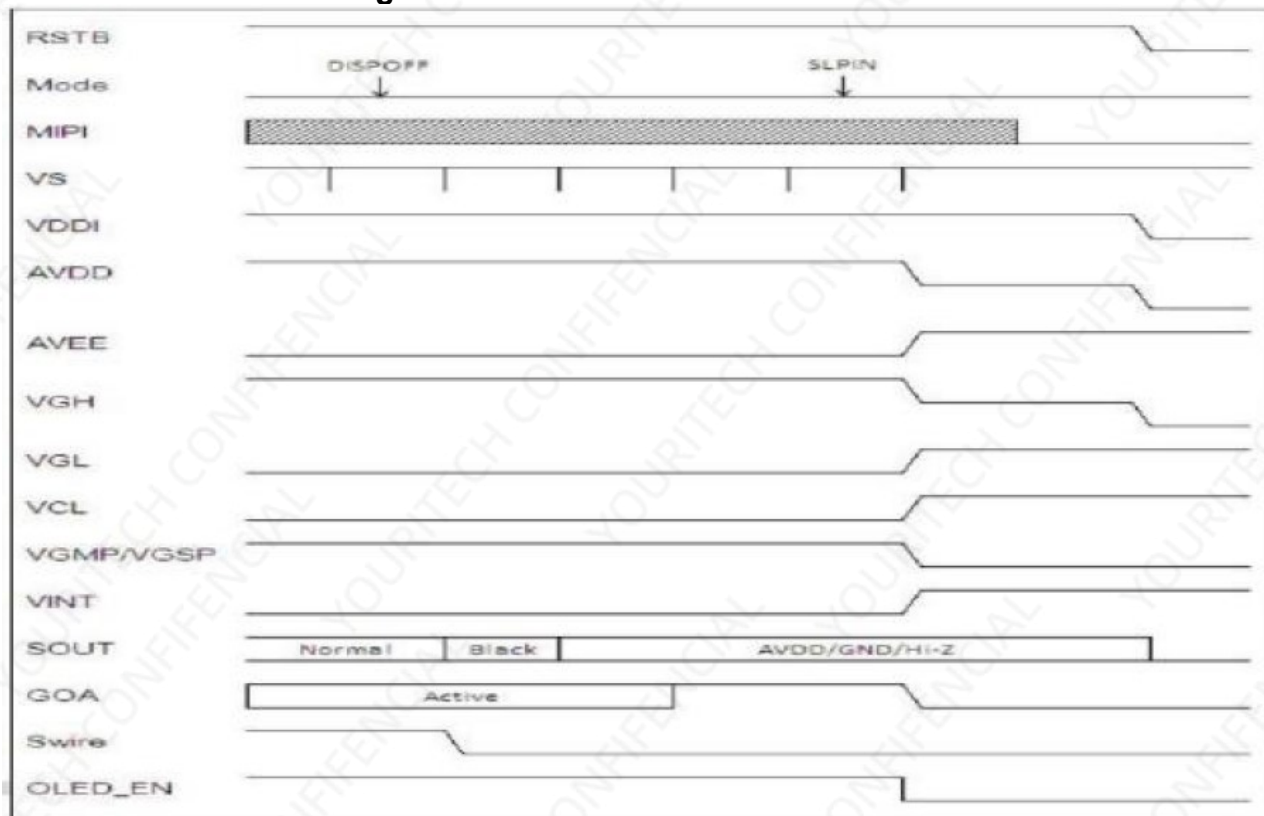


Bus turnaround (BAT) from MPU to display module timing



Bus turnaround (BAT) from display module to MPU timing

5.2 Power ON/OFF Timing



6 Optical Characteristics

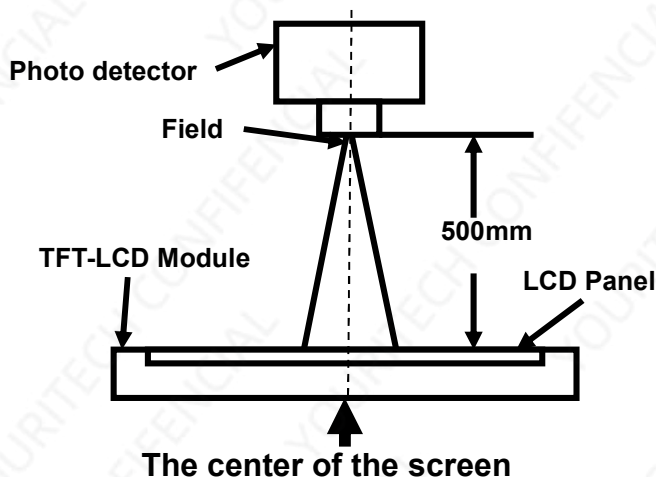
Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	80	-	-	Degree	Note2,3
		θB		80	-	-		
		θL		80	-	-		
		θR		80	-	-		
Contrast Ratio		CR	θ=0°	1000	>1300	-		Note 3
Response Time		T _{ON}	25℃	-	-	-	ms	Note 4
		T _{OFF}						
Chromaticity	White	x	Normal to surface	-	0.197	-		Note 1,5
		y		-	0.461	-		
	Red	x		0.446	0.482	0.518		Note 1,5
		y		0.511	0.526	0.536		
	Green	x		0.055	0.078	0.108		Note 1,5
		y		0.560	0.078	0.590		
	Blue	x		0.134	0.172	0.200		Note 1,5
		y		0.097	0.147	0.202		
Color Gamut		-	vs. NTSC	90	110	--	%	-
Gamma				2.0	2.2	2.4	-	-
Luminance		L		270	300	375	cd/m ²	Note 6

Test Conditions:

1. The ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

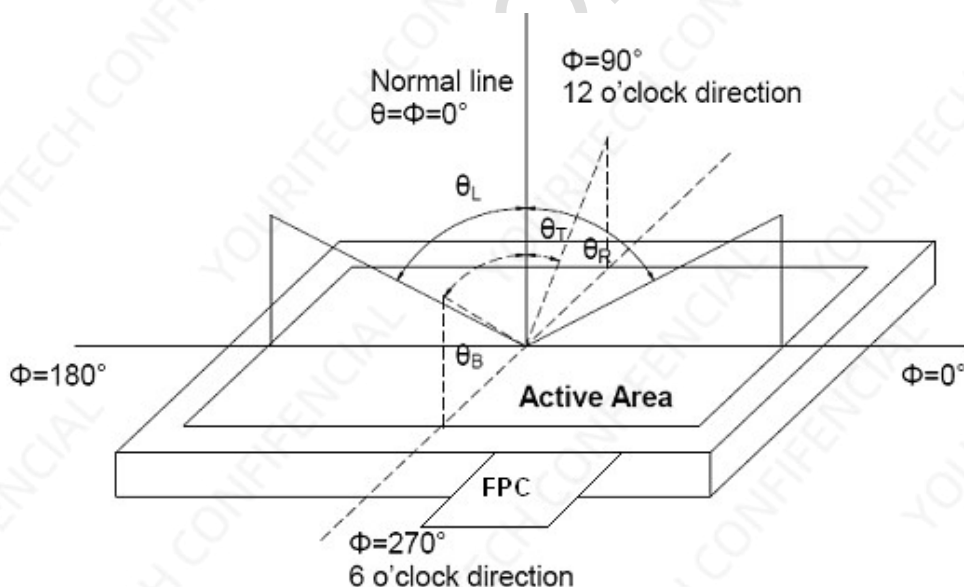
Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD.



Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

"White state ": The state is that the LCD should drive by V_{white} .

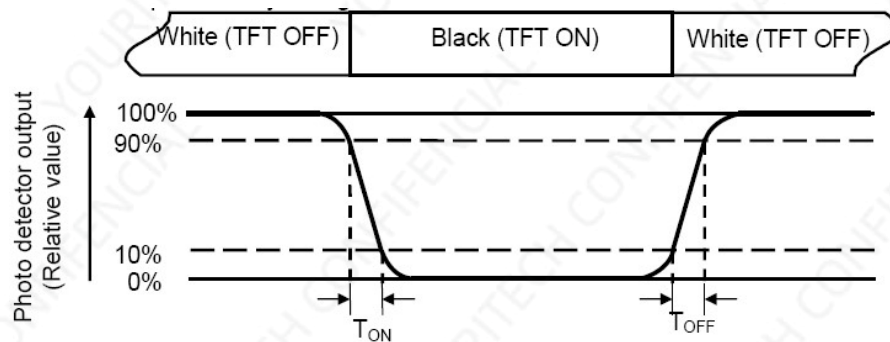
"Black state": The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

Note 4: Definition of Response time

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The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance:

Measure the luminance of white state at center point.

7 Environmental / Reliability Test

No	Test Item	Condition	Remarks
1	High Temperature Operation	70℃, 120Hours	IEC60068-2-1:2007 GB2423.2-2008
2	Low Temperature Operation	-15℃, 120Hours	IEC60068-2-1:2007 GB2423.1-2008
3	High Temperature Storage	85℃, 120Hours	IEC60068-2-1:2007 GB2423.2-2008
4	Low Temperature Storage	-40℃, 120Hours	IEC60068-2-1:2007 GB2423.1-2008
5	Storage at High Temperature and Humidity	60℃, 90%RH, 120Hours	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-40℃ ↔ 85℃, ON/OFF, 10CYC	Start with cold temperature, End with high temperature, IEC60068-2-14:1984,G B2423.22-2002

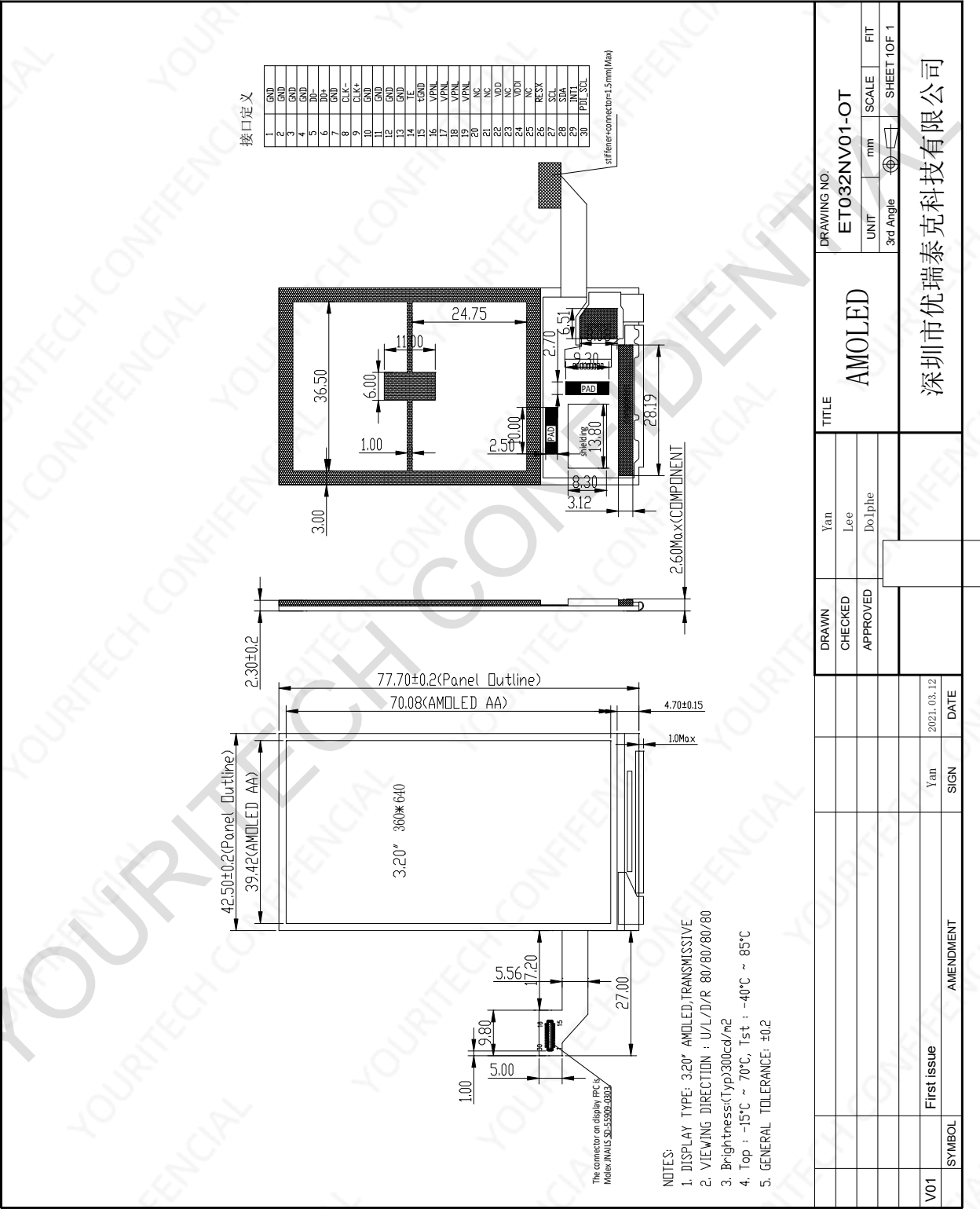
Note1: Ts is the temperature of panel' s surface.

Note2: Ta is the ambient temperature of sample.

Note3: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Note 4: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don' t guarantee all of the cosmetic specification.

8 Outline Dimension



DRAWING NO.		ET032NV01-OT		UNIT		SCALE		FIT		SHEET 1 OF 1	
TITLE		AMOLED		3rd Angle							
DRAWN		Yan		Lee		Do Iphe					
CHECKED											
APPROVED											
SYMBOL		First issue		AMENDMENT							
V01											
SIGN		Yan		DATE							
				2021.03.12							

深圳市优瑞泰克科技有限公司

9 Packing Drawing

TBD

10 Precautions for Use of LCD Modules

a) Handling Precautions

- i. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- ii. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- iii. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- iv. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- v. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
 - Ketone
 - Aromatic solvents
- vi. Do not attempt to disassemble the LCD Module.
 - vii. If the logic circuit power is off, do not apply the input signals.
 - viii. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1 Be sure to ground the body when handling the LCD Modules.

10.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

b) Storage precautions

- i. When storing the LCD modules, avoid exposure to direct sunlight or to the light of

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fluorescent lamps.

ii. The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ~ 40℃ Relatively humidity: ≤80%

iii. The LCD modules should be stored in the room without acid, alkali and harmful gas.

c) Transportation Precautions

i. The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.