SPECIFICATION FOR APPROVAL

DESCRIPTION: 7.0"AMOLED Module
CUSTOMER: BR1700WX101GG-002
Product No:
Released Date: 2024.11.14
Revision: v1

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APPROVED SIGNATURES		

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Record of Revision

Rev	Issue Date	Description	Editor
A0	2024-09-05	Draft	Yang XiaoMing
A0	2024-10-09	Drawing update	Yang XiaoMing
A0	2024-11-14	EE update	Yang XiaoMing

1 General Specifications

Feature		Spec	Remark
Display Spec	Screen Size (inch)	7.0	
	Display Mode	AMOLED	
	Display method	Active Matrix TFT	
	Resolution(dot)	1280(W) x 800(H)	
	Active Area(mm)	150.72(W)×94.2 (H)	
	Pixel Pitch (um)	117.75	
	Pixel Configuration	V-Style3	
	Technology Type	LTPS	
	Color Depth	16.7M	
	Interface	LVDS	
Mechanical Characteristics	Polarizer Surface Treatment	HC	
	With TP/Without TP	Without TP	
	Module Outline Dimension(W x H x D) (mm)	155.22 (W) x101.75 (H) x TBD(D)	including COF protrusion amount
Electronic	Driver IC(Type)	RM69C00	
	Frame Rate	60HZ	

Note 1: Requirements on Environmental Protection: RoHS 2.0

2 Input/output Terminals

2.1 Main FPC Pin Assignment

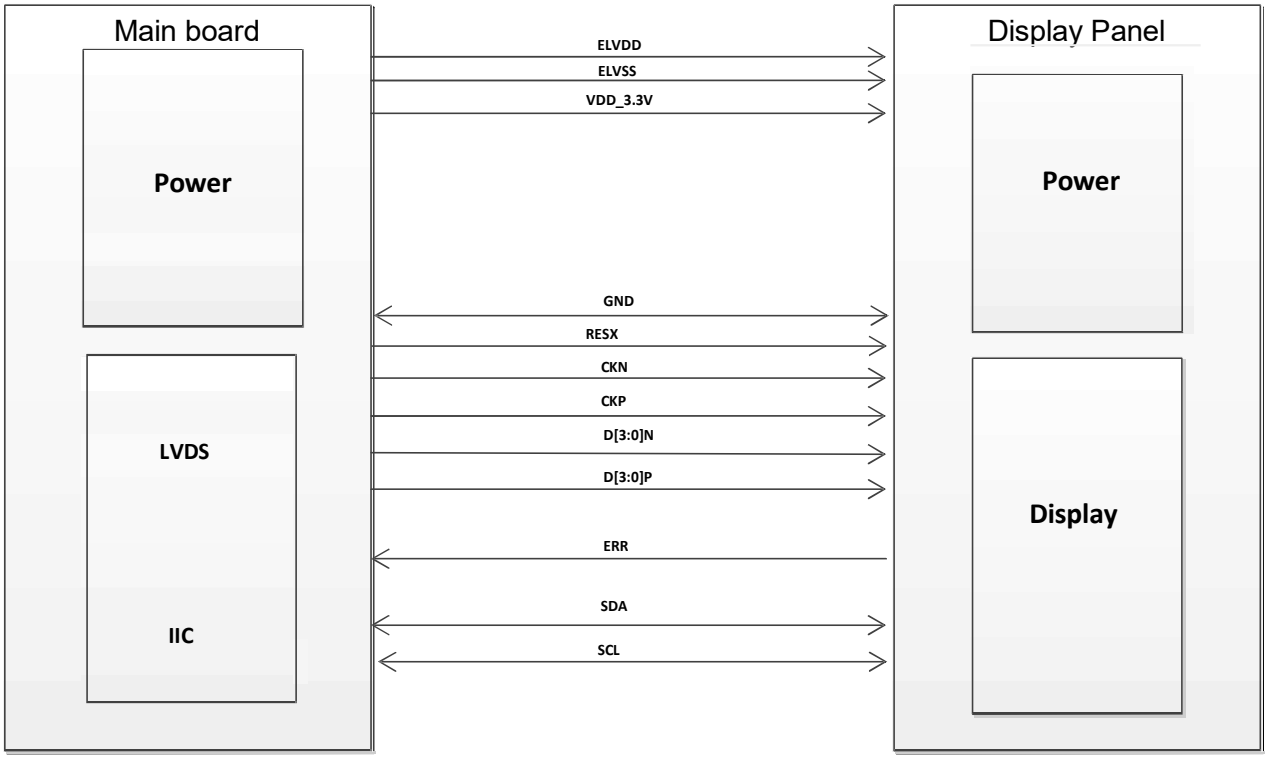
FPC connector : 101049-206050(北极大)
ZIF finger: 101049-206050(北极大)

No	Symbol	I/O	Description
1	CON_TEST	I/O	CON / FPC state check
2	NC	/	/
3	ELVSS	POWER	OLED negative power supply
4	ELVSS	POWER	OLED negative power supply
5	ELVSS	POWER	OLED negative power supply
6	ELVSS	POWER	OLED negative power supply
7	ELVSS	POWER	OLED negative power supply
8	NC	/	/
9	ELVDD	POWER	OLED positive power supply
10	ELVDD	POWER	OLED positive power supply
11	ELVDD	POWER	OLED positive power supply
12	ELVDD	POWER	OLED positive power supply
13	ELVDD	POWER	OLED positive power supply
14	NC	/	/
15	VDD_3.3V	POWER	Power supply for PMIC and DDIC
16	VDD_3.3V	POWER	Power supply for PMIC and DDIC
17	NC	/	/
18	NC	/	/
19	NC	/	/
20	PWR_WP	I	PMIC MTP portect（NC）
21	PM_SCL	I/O	IIC SCL for PMIC（NC）
22	PM_SDA	I/O	IIC SDA for PMIC（NC）
23	GND	POWER	Ground
24	SPI_IO1_SO	I/O	SPI SO for flash（NC）
25	SPI_IO0_SI	I/O	SPI SI for flash（NC）
26	SPI_CS	I/O	SPI CS for flash（NC）
27	SPI_SCLK	I/O	SPI CLK for flash（NC）
28	QSPI_M	I/O	SPI Ctrl for flash（NC）
29	NC	/	/
30	NC	/	/
31	PCD	O	Panel crack detect
32	NC	/	/
33	GND	POWER	Ground
34	D3N	I	LVDS D3N

35	D3P	I	LVDS D3P
36	GND	POWER	Ground
37	CKN	I	LVDS CKN
38	CKP	I	LVDS CKP
39	GND	POWER	Ground
40	D2N	I	LVDS D2N
41	D2P	I	LVDS D2P
42	GND	POWER	Ground
43	D1N	I	LVDS D1N
44	D1P	I	LVDS D1P
45	GND	POWER	Ground
46	D0N	I	LVDS D0N
47	D0P	I	LVDS D0P
48	GND	POWER	Ground
49	RESX	I	Panel reset
50	ELON_SWIRE	O	Enable for EL PMIC
51	GND	POWER	Ground
52	THE_OUT	O	Thermal power out
53	THE_IN	I	Thermal power in
54	GND	POWER	Ground
55	SDA	I/O	IIC SDA for DDIC
56	SCL	I/O	IIC SCL for DDIC
57	ESD_FG	O	ESD error flag
58	ERR_FG	O	Error flag
59	TE	O	Vsync Output
60	CON_TEST	I/O	CON / FPC state check

Note: I=Input; O=Output; P=Power; I/O=Input / Output

2.2 MCU and Display Module Interface Conflagration



3 Absolute Maximum Ratings

3.1 Driving AMOLED Panel

Maximum Ratings (Voltage Referenced to VSS) VSS=0V, Ta=25°C

Item	Symbol	MIN	MAX	Unit
Power supply for PMIC&DDIC	VDD_3.3V	+2.7	+3.6	V
Positive power for OLED	ELVDD	+2.8	+4.6	V
Negative power for OLED	ELVSS	-0.6	-5	V

Note: Functional operation should satisfy the limits in the Electrical Characteristics tables or Pin Description section. If the module exceeds the absolute maximum ratings, permanent damage may occur. Besides, if the module is operated with the absolute maximum ratings for a long time, the reliability may also drop.

4 Electrical Characteristics

4.1 Driving AMOLED Panel

(Ta=25℃)

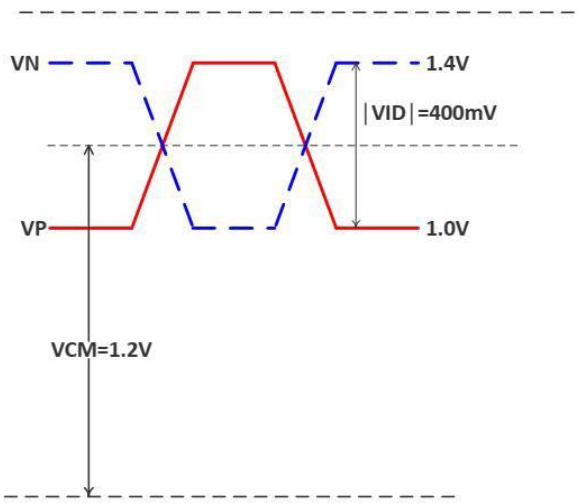
Item		Symbol	MIN	TYP	MAX	Unit
Power supply for PMIC&DDIC		VDD_3.3V	+2.7	+3.3	+3.6	V
Default Positive Output Voltage		ELVDD		4.6		V
Positive Output voltage total variation			-0.02	-	+0.02	%
Default Negative Output Voltage		ELVSS		-4		V
Negative Output voltage total variation			-0.03	-	+0.03	%
Differential Input high threshold Voltage	|VTH|	/	100			mV
Differential Input low threshold Voltage	|VTL|	/	100			mV
Differential Input Voltage	|VID|	/	/	400	/	mV
Common mode Voltage	Vcm	/	/	1.2	/	V
Power consumption (White 255) HBM mode		P				mW
Power consumption (White 255) Normal mode		P				mW
Power consumption (Black) Normal mode		P				mW

Note: The current and power consumption were tested under White pattern，25℃

5 LVDS Characteristics

5.1 DC Characteristics

Typical Input VID & VCM

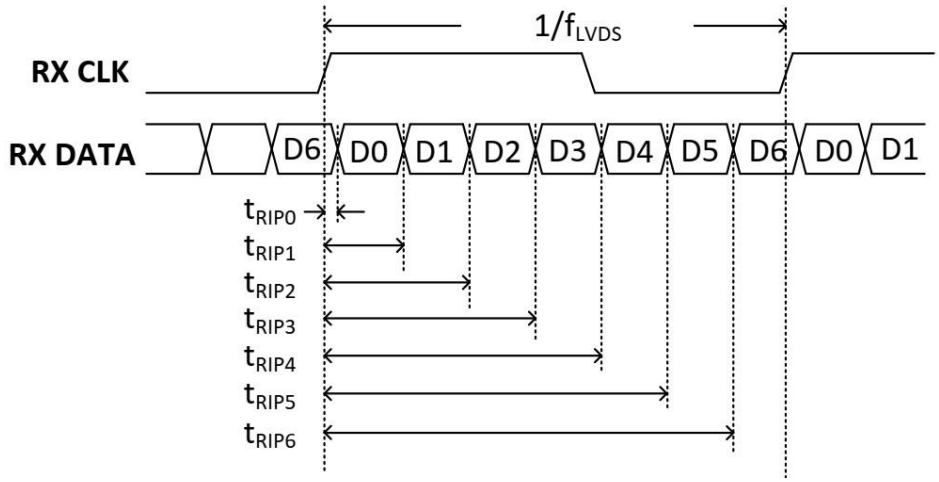


- DC Characteristics

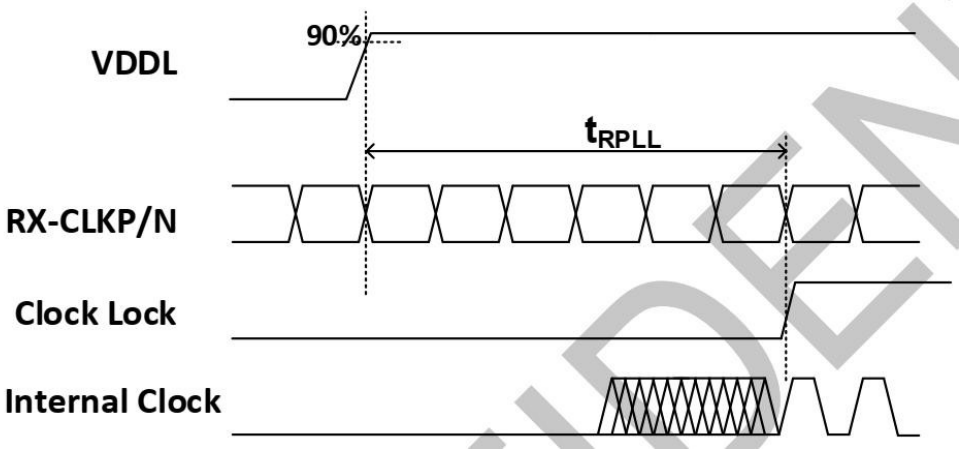
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	VDDL	Write	2.7	3.3	4.5	V
Differential Input common-mode range	VCM			1.2		V
Differential Input voltage	|VID|			400		mV

5.2 AC Characteristics

- Timing spec for input bit stream with reference to the rising edge of RX-clock



- PLL wake-up timing

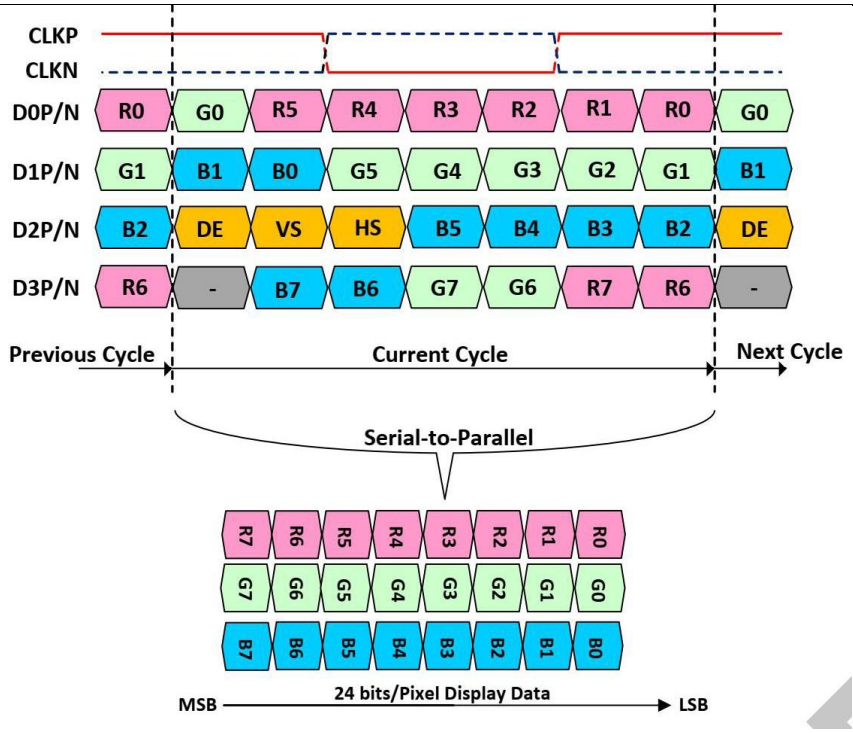


- AC Characteristics for 5-Lane Application

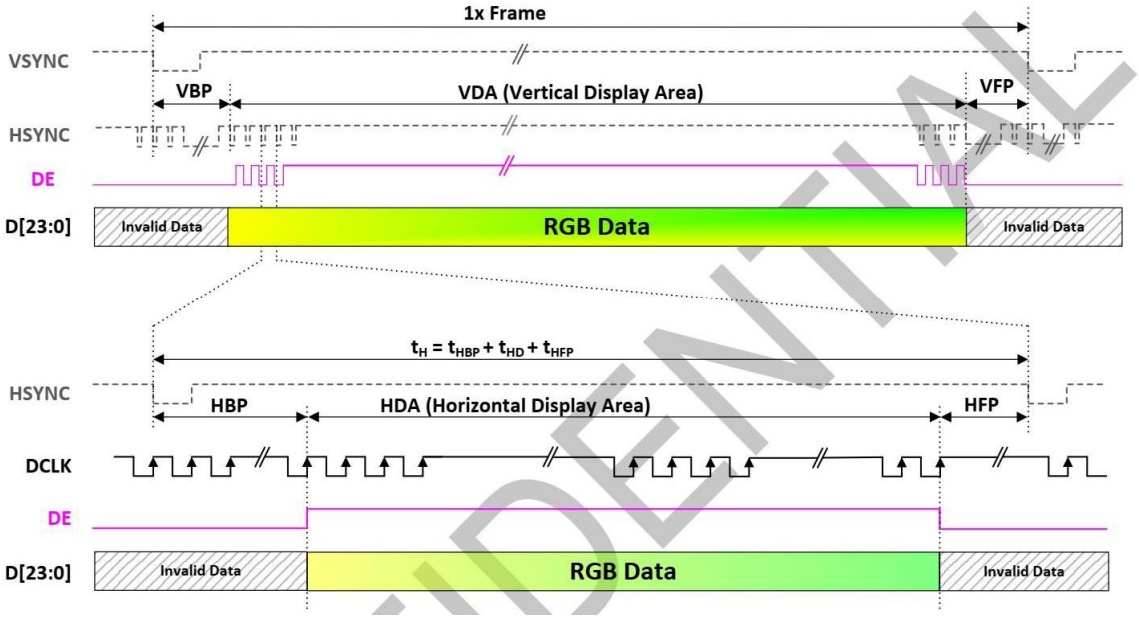
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operation frequency	f_{LVDS}		20		125	MHz
1 Unit interval	UI			1/7		1/ f_{LVDS}
D0 position	t_{RIP0}		-0.2	0	0.2	UI
D1 position	t_{RIP1}		0.8	1	1.2	UI
D2 position	t_{RIP2}		1.8	2	2.2	UI
D3 position	t_{RIP3}		2.8	3	3.2	UI
D4 position	t_{RIP4}		3.8	4	4.2	UI
D5 position	t_{RIP5}		4.8	5	5.2	UI
D6 position	t_{RIP6}		5.8	6	6.2	UI
Input data skew margin	t_{RSKM}	|VID|=400mV, VCM=1.2V	0	-	0.2	UI
PLL wake-up time	t_{RPLL}				600	us

5.3 LVDS timing

- VESA mode data Mapping-4-lane 24bits(RGB 888)



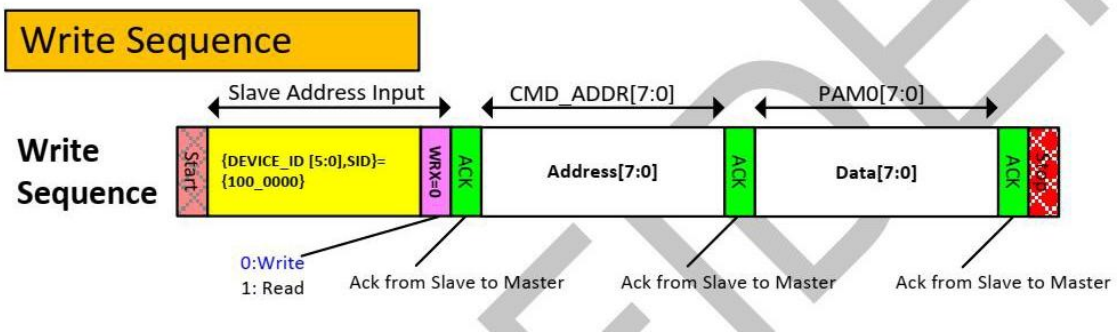
- LVDS DE mode
  Under LVDS DE mode,there is no HSYNC or VSYNC information transmitted into the display module through LVDS interface.The HSYNC and VSYNC depicted in the following figure are generated internally.



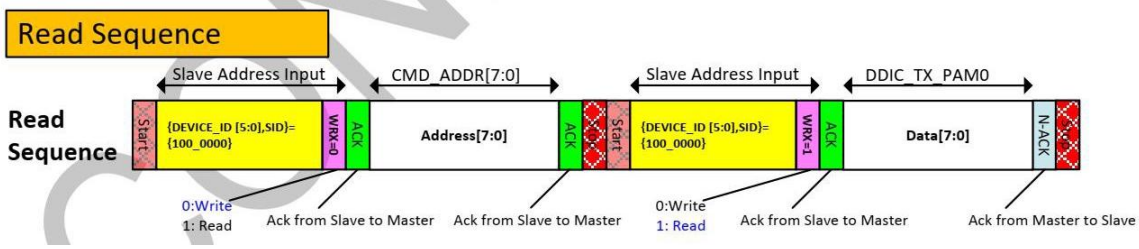
6 IIC Characteristics

6.1 IIC write and read sequence

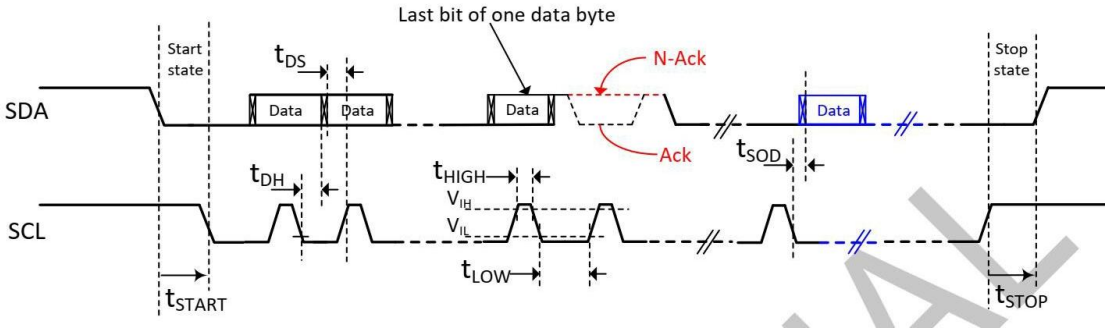
- IIC write sequence



- IIC read sequence



6.2 IIC timing characteristics



- I2C Timing Specifications:

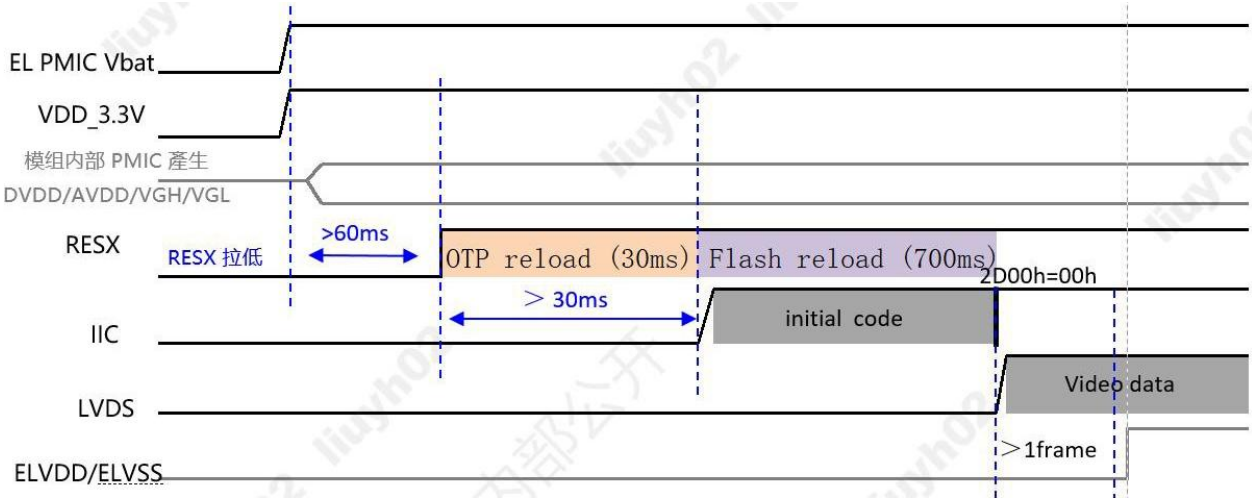
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
I2C SCL frequency	f_{SCL}		100		400	kHz
Start Sequence	t_{START}	SDA falling to SCL falling	0.6			us
Stop sequence	t_{STOP}	SDA rising to SDA falling	0.6			us
Low period of SCL	t_{LOW}		1.3			us
High period of SCL	t_{HIGH}		0.6			us
Data setup time	t_{DS}	To V_{IH} of SCL's rising edge	100			ns
Data hold time	t_{DH}	From V_{IL} of SCL's falling edge	120			ns
Access time of output data	t_{SOD}	(1) Output data is "low" (2) Output Capacitance < 15pF	15			ns
Clock rise time	$t_{R\text{-}SCL}$	0.2*VDDI -> 0.8*VDDI	2		300	ns
Clock fall time	$t_{F\text{-}SCL}$	0.8*VDDI -> 0.2*VDDI	2		300	ns
Capacitive Load	C_b	For each bus line			400	pF

Notes:
(1) Logic high and low levels are specified as 80% and 20% of VDDI for Input signals.
(2) During the read sequence, the transition time of SDA from low to high depends on the wire capacitance loading and pull-high resistance of the data bus. For example, the RC time constant of 4kΩ pull-high resistance and 400pF bus capacitance is around 1.6us.

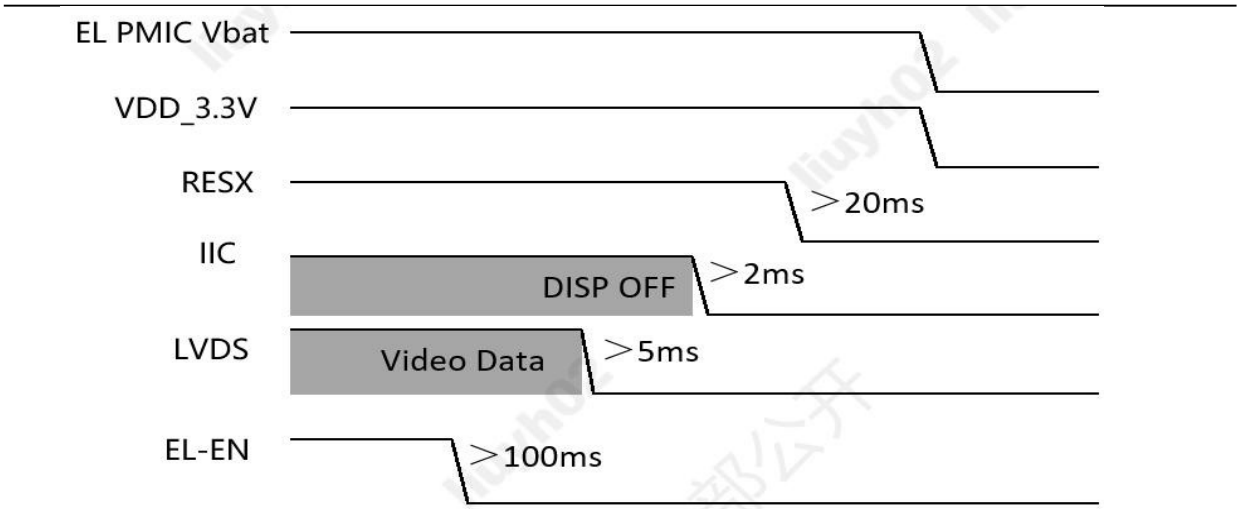
7 Recommended Operating Sequence

7.1 Display Power on / off Sequence

7.1.1 Power On Sequence

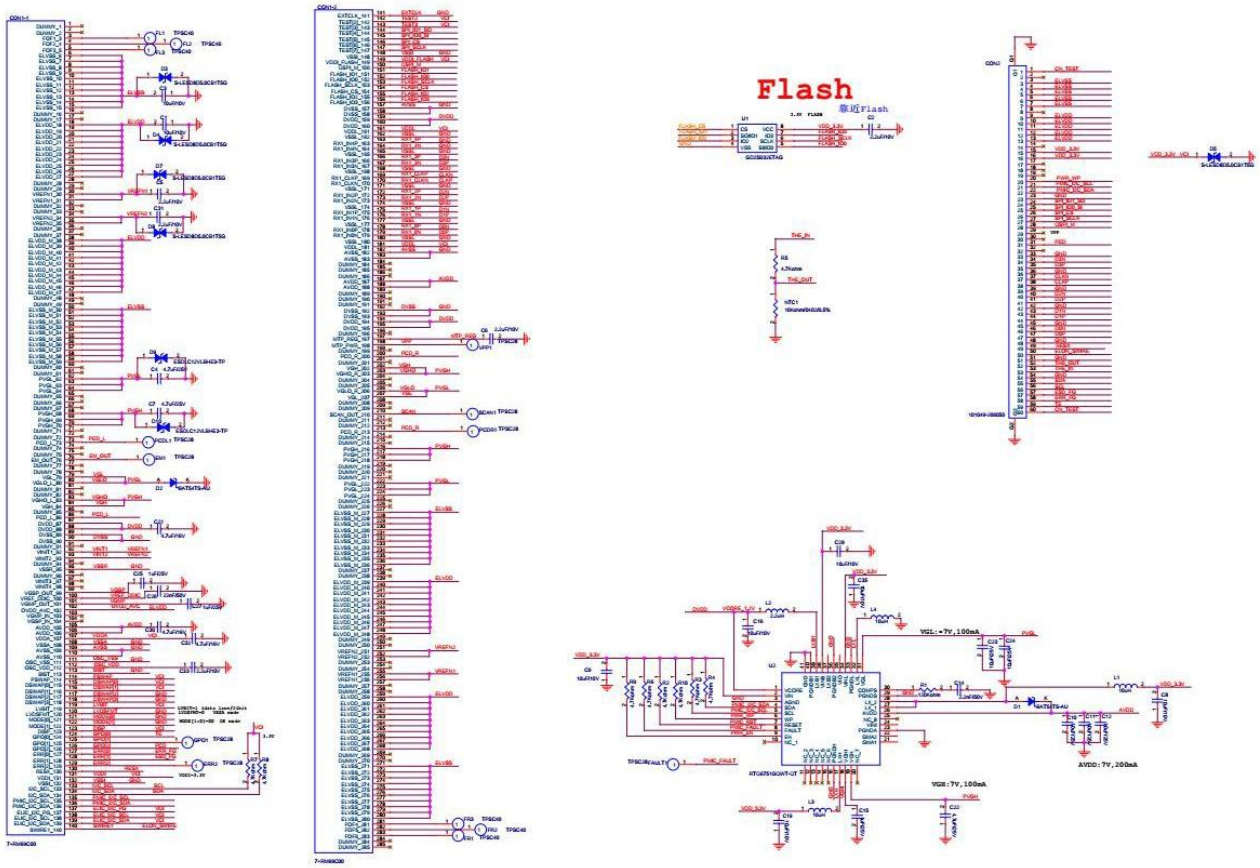


7.1.2 Power Off Sequence



7.2 Input timing (Optional Item)

Interface	LVDS 4lane
H-active	1280
HBP	36
HFP	40
HSW	4
V-active	800
VBP	6
VFP	416
VSW	2
Frame rate	60Hz
Display mode	VESA+DE
Interface	IIC
Level	3.3V
Adress	0x40


Flash

9 Optical Characteristics Optical Specification

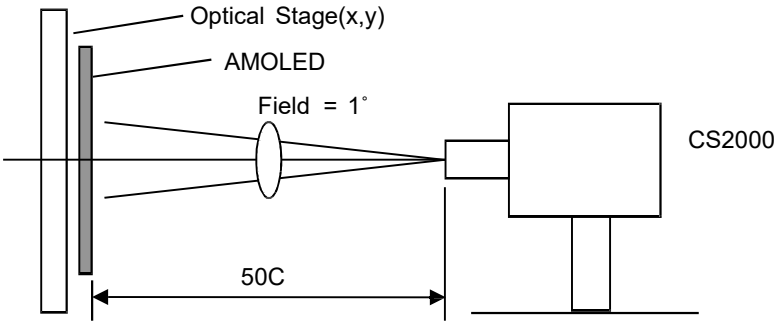
Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
Luminance(W255)		L	Normal	800	840	-	cd/m^2	Note1 Test Equipment：CS2000A&CA31
Contrast Ratio		CR	θ=0° at darkroom	200000	-	-		Note 3 Test Equipment：CS2000A&CA31
Chromaticity	White	x		(0.300)	(0.310)	(0.320)		Note 4 Test Equipment：CS2000A Note: Chromaticity can be modified according to customer demand
		y		(0.320)	(0.330)	(0.340)		
	Red	x		(0.669)	(0.679)	(0.709)		
		y		(0.287)	(0.317)	(0.347)		
	Green	x		(0.200)	(0.240)	(0.280)		
		y		(0.683)	(0.723)	(0.763)		
	Blue	x		(0.107)	(0.137)	(0.167)		
		y		(0.013)	(0.043)	(0.073)		
Uniformity (W255)		U		80	-	-	%	Note6 any two points of total 15 points@NBM max. DBV, OPR 100%
NTSC@1931		%		93	103	-	%	Note4
Response Time			T_{G2G}	-	-	3	Ms	Note9
Gamma		L	W32~W255 @800nit white	2.0	2.2	2.4		Test Equipment：CA310 Reference point:W255@NBM max.DBV,OPR100%
Image sticking1			2h@65℃	-	-	5	Min	Criteria: not visible，or ND5% Note9
Lifetime(25℃)		Hours	800nit	5000	-	-	Hour	T80
Lifetime(85℃)		Hours	@400nit(50%derating)	1000	-	-	Hour	
Absorption Axis Angle					0		degree	

Test Conditions:

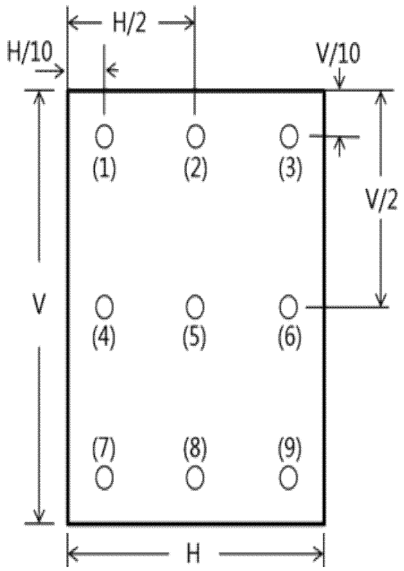
1. the ambient temperature is 25℃.
2. The test systems refer to Note1 and Note2.

Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. The optical properties are measured at the center point of the AMOLED screen. All input terminals AMOLED panel must be ground when measuring the center area of the panel.



Optical Characteristic Measurement Equipment and Method



Measuring point for surface luminance (15points)

Note 2: Definition of contrast ratio

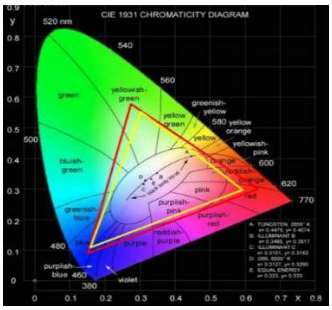
$$\text{Contrast ratio CR} = \frac{\text{Luminance measured when AMOLED is on the “white”state}}{\text{Luminance measured when AMOLED is on the“Black"state}}$$

“White state “: A state where the AMOLED should be driven by Vwhite.

“Black state”: A state where the AMOLED should be driven by Vblack.

Note 3: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of AMOLED.

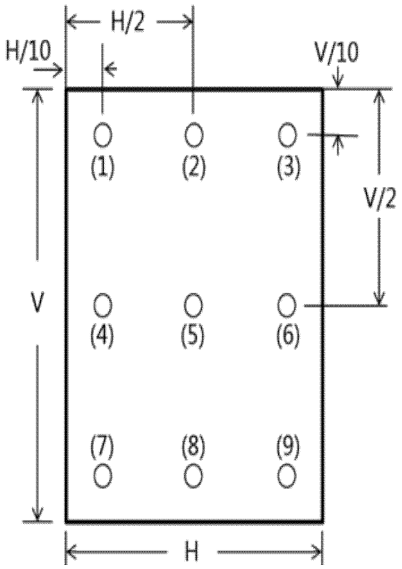


Note 4 Definition of luminance uniformity

Active area is divided into 15 measuring areas. Every measuring point is placed at the center of each measuring area.

Luminance Uniformity(U) = Lmin/ Lmax

V-------Active area length H----- Active area width



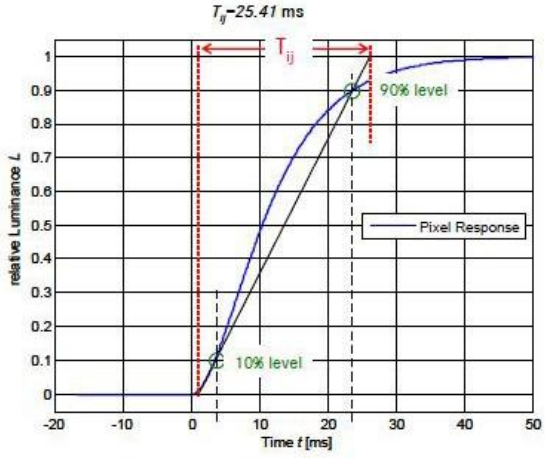
Definition of uniformity

Lmax: The measured maximum luminance of all measurement position.

Lmin: The measured minimum luminance of all measurement position.

Note 5: Definition of response time

Response time measurement according “MPRT estimation standard for displays from 29.03.2011, ©OEM Work group displays”



Example of a typical response of an OLED pixel

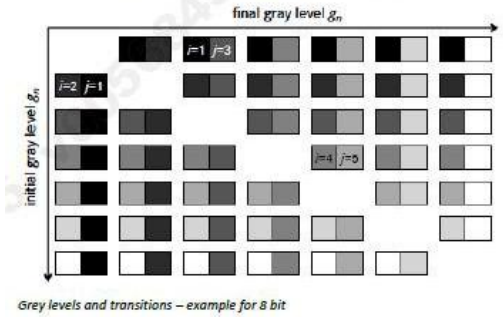
The pixel response time T_{ij} describes the time required to switch from grey level i to grey level j. It is defined by $T_{ij}=1.25 \times [\tau_{ij,90\%}-\tau_{ij,10\%}]$

$\tau_{ij,10\%}$: time to achieve 10% level of luminance change $\Delta L=L_j-L_i$ switching from grey level i to grey level j

$\tau_{ij,90\%}$: time to achieve 90% level of luminance change $\Delta L=L_j-L_i$ switching from grey level i to grey level j

To check grey to grey response time, 42 transitions between 7 equidistant grey levels must be measured.

n	1	2	3	4	5	6	7
gn	0	43	85	128	170	212	255



Grey levels and transitions – example for 8 bit

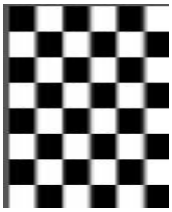
Definition of pixel response times: Ton=T1,7=Tblack→white Toff=T7,1=Twhite→black TG2G=Grey to grey response time for all other 40 combinations of i,j
Maximum grey to grey switching time: Max(TG2G)=Maximum grey to grey response time of all 40 combinations of i,j

Average grey to grey switching time: $\mathrm{Mean}(T_{G2G})=140\{(\Sigma T_{iji\neq j})-T_{on}-T_{off}\}$ with i,j∈{1,2,3,4,5,6,7}

Note 6 Image sticking

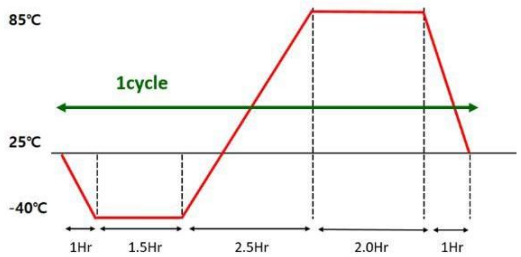
Image sticking1

Place the sample in a 65 ℃ environment ,Set 8*6 Checkerboard image to the display for 2H and change the pattern to Gray 127, report recorded time



10 Environmental / Reliability Test

Test Item		Condition	Criteria	Remark
Operating	HTOL	85 ℃	1,000hrs	
	LTOL	-30 ℃	120hrs	
	THB	60 ℃, 93%	1000hrs	
	Life time 1	25℃, 5000hrs decide	5000hrs	
	Life time 2	85℃, With 50% Derating	1000hrs	
Storage	HTS	95 ℃	1000hrs	
	LTS	-40 ℃	120hrs	
	TC	-40 ℃/30min ~ 95 ℃/30min	500 cycles	
ESD		Contact : ± 8kV, 150 pF, 330Ω	Center 1 point	
		Contact : ±6kV, 150 pF, 330Ω	corner 4point	
		Air : ± 15kV, 150 pF, 330Ω	Center 1 point	
		Contact : ± 8kV, 150 pF, 330Ω	corner 4point	
VIBRATION		- 1Hz to 2000Hz, -40℃~85℃, peak 20G, each	1 CYCLE	

	X, Y, Z, axes /8hrs - 10Hz: The acceleration is 1.0G 0-pk. - 10Hz to 100Hz: The acceleration is 1.0G 0-pk to 20G 0-pk - 100Hz to 2000Hz: Hold 2.0G 0-pk 		

11 Quality Level

11.1 Definition and description

11.1.1 Critical Defect: Any defect that directly or indirectly affects personal health and safety, or causes a loss of functionality in the product's function list.

11.1.2 Major Defects: Defects that directly or indirectly affect the functionality of the product, or result in partial loss of functionality, and other defects that cannot be accepted by customers (including a collection of three or more minor defects).

11.1.3 Minor Defects: Appearance defects that do not affect product functionality and are still acceptable to customers.

11.2 Execution level

11.2.1 Sampling standard：The sampling scheme of (GB/T211211.1 2012) normal inspection was adopted。

11.2.2 Check item and frequency

category	Inspection content	Standard	Sampling standard	remark
General item	telecommunication /appearance	Telecommunication inspection standard& Visual inspection criteria	Critical Defect（CR Not allowed）； Major Defects（MA AQL	/

			0.65）； Minor Defects（MI AQL 1.0）；	
Special item	Optical test	Product specification	5PCS/ work order or according to customer requirements	-
	Dimensional measurement	drawing	5PCS/ work order or according to customer requirements	Meet the requirements of drawings (spot check key dimensions); Meet the requirements of the sample acknowledgment.

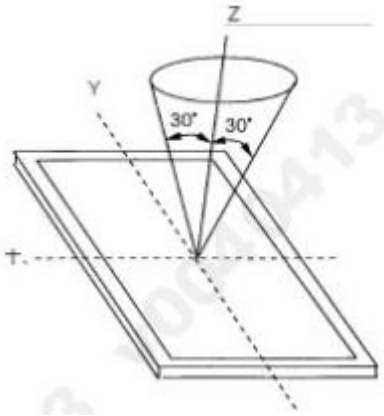
11.3content

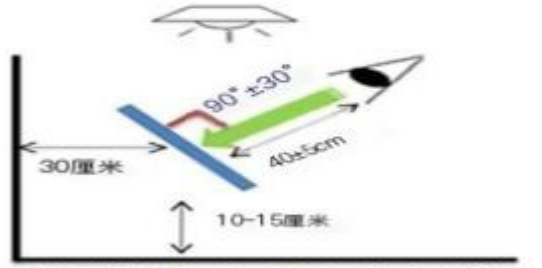
11.3.1 Inspector qualification：Inspectors must be trained and obtain a job certificate before they can inspect products。

11.3.2 Inspection condition：OLED does not light the light source 1100-2000lux ；OLED light source is 110±50LUX · Surrounded by a black background

11.3.3 Inspection distance：The standard viewing distance for all surfaces of the detected object is 40CM±5CM。

11.3.4 Inspection perspective ：90±45°





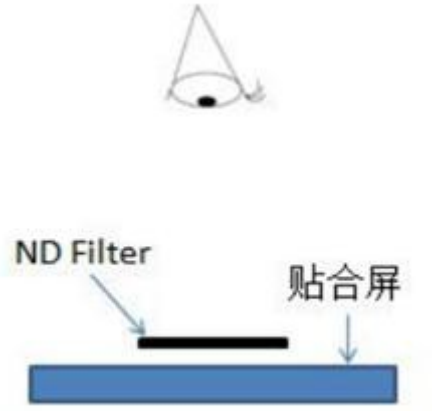
11.3.5 Inspection time：the inspection time without lighting is at least 11-12 seconds; The time of OLED lighting inspection for each picture is 1~3 seconds。

11.3.6 Test temperature：room temperatuer23±2℃，ambient humidity:60±20%RH。

11.3.7 Inspection picture：If there are no special requirements, refer to the pass Angle inspection screen library, if each model has special requirements, it is combined with customer requirements and the needs of the factory process assessment.。

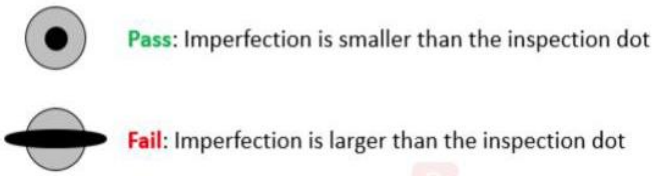
11.4 Inspection tools：

11.4.1 ND Filter：The ND filter is placed at a distance of 2-3cm above the defect for2-3S to judge whether the defect is visible. As Figure below:(ND Filter is used to test mura isochromatic and light unevenness) 。



11.4.2 Point gauge(point gauge in the figure below is recommended),determination method: as shown in the figure, the point gauge film can cover is pass, and the point gauge film can not cover is Fail。For example, a maximum of 0.2mm same-color spot defect is allowed on the

Class A surface, and the pass that can be covered by 0.2mm on the film, The one that can be covered is Fail



11.4.3 Microscopic examination: use 20-50 times adjustable microscope and 11-30 times test eyepiece.

11.4.4 Digital caliper: resolution 0.01mm.

11.4.5Projector: anime microscope,3D projector.

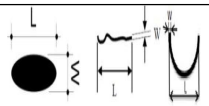
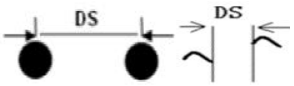
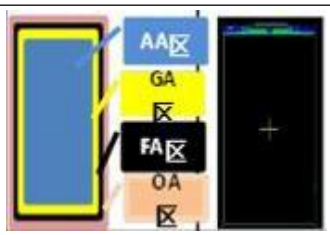
11.5 Judgment description

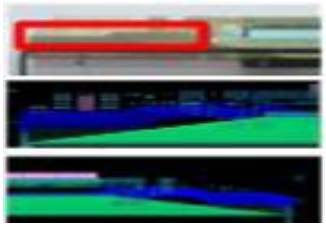
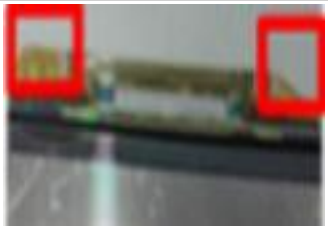
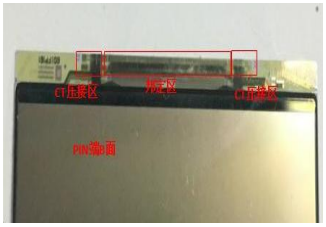
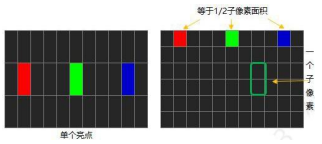
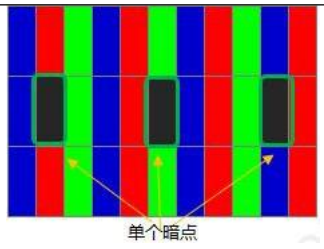
11.5.1 The measurement accuracy shall refer to the specification definition. When the measurement equipment accuracy is higher than the specification definition, the measured value needs to be rounded to the size of edge collapse is 0.20mm,and the thousandth is the reference position, which is rounded to 0.200~0.204mm is ok, ≥0.205mm, it is judged al NG.

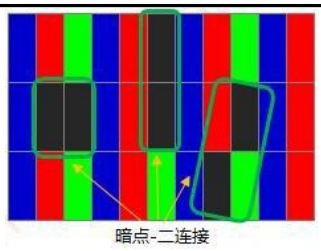
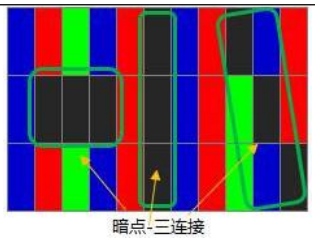
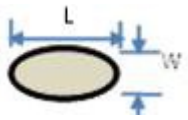
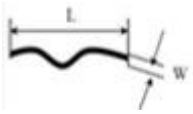
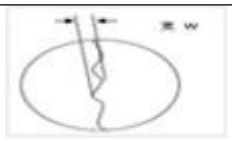
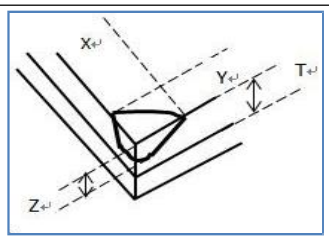
11.5.2 In addition to the tools used above, if additional inspection tools are needed to assist the judgment, they can only be carried out after the coordination of both parties.

11.5.3 Bad code and definition

Code and name		legend	Instructions
N	Number	-	Visually calculate the number; The statistics of the total unmber of defects does not include the completely “omitted”part. For the column defined as “omitted” and “omitted”.it is not counted as the

			number of defects if it meets the requirements, otherwise it is calculated as an independent defect.
L	length (mm)		Dot line distinguishing rule: L is the long side, W is the short side. A. When L>3W，handle as per line, otherwise handle as per point. When it is judged as line defect, S-shaped or C-shaped line appears, and the enclosed amount is less than 3/4 circle, it shall be treated as line defect; otherwise. It shall be treated as point defect, and the inner tangent circle shall simulate the size of point.
W	Width (mm)		
S	Area (mm^2)	-	Surface gauge
D	Diameter(mm)D=(L+W)/2	-	Point diameter calculation: calculated by half of the sum of the long side and the short side, that is, D=(L+W)/2, where D represents the diameter of the point, L is the long side, and W is the short side.
H	Depth (mm)	-	Digital micrometer
DS	Distance (mm)		Distance between two points or between two lines
Schematic diagram of screen area			AA area：display area； GA area：GIP circuit area； FA area：Frit area； OA area：outside FA area

Leader area		Screen GIP circuit area, screen data circuit area
PAD Bonding District		COG/FOG Bonding alignment mark and Bonding Pad on LTPS substrate
PAD Non-state area		Screen test pad, cutting area and lead-free area on LTPS substrate.
CT crimp area		PIN side screen body test PAD
Bright		A single sub-pixel of 1 pixel (either red, green, or blue) is called a dot; The definition of highlight is that in the environment of 200±50Lux, the pixels or points seen by employees with the naked eye are usually high, and the highlight is checked under the black screen.
scotoma		A single sub-pixel of 1 pixel (either red, green, or blue) is called a dot; Dark spot is defined as a single sub-pixel that is not bright seen by the naked eye under a 110% white screen at an environment of 200±50Lux.

Dark spot-two connection		Two adjacent sub-pixels under the magnifying glass are not bright at the same time (horizontal, vertical and oblique
Dark spot –three Links		The adjacent R,G and B sub-pixels under the magnifying glass are not bright at the same time (horizontal, vertical and oblique)
Foreign matter highlights	-	Due to the foreign matter in the polarizer, the phenomenon that appears as a bright spot is called a foreign matter bright spot.
Point defect		There are bright spots and black spots in local positions, including but not limited to the internal dirt of the screen itself, pinholes, serrations, concave-convex spots, color spots, tiny bubbles, white spots, stains on the fitting of the polarizer, poor polarizer itself and other spot-like defects. Point defects are judged by diameter.
Linear defect		Linear impurities in the screen, including filaments, fibers, polarizer fitting impurities in the screen, and scratches on the surface of polarizer, etc. Linear defects are judged by length and width.
Serrated defect		W: Distance from sawtooth crest to trough
崩边/崩角		In the process of screen production, especially in the process of molding and cutting, the small glass missing at the glass edge is caused. X direction: parallel to FOG Pad or glass edge; Y direction: perpendicular to FOG Pad or glass

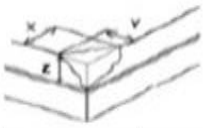
		edge; Z direction: screen thickness direction;T：Thickness of single glass；
pockmark	-	In the unit area of 11mm * 11mm, the defect point with D ≤ 0.1mm, DS ≥ 2mm, and the number N ≥ 5. If the customer has other requirements, follow the customer's requirements.
Dirty	-	Including handprints, oil stains, fingerprints, stains, white fog and other undesirable phenomena. It is divided into erasable dirt and non-erasable dirt. Use a dust-free cloth dipped in alcohol, which can not be erased as non-erasable dirt. Wipable dirt is determined as follows: A. Dry dust-free cloth can be directly erased; B. Wipe with clean cloth dipped with anhydrous alcohol Press the alcohol-stained dust-free cloth on the dry dust-free cloth twice to absorb excess alcohol; Wipe back and forth with a dust-free cloth twice, and the dirt can be removed.

11.6 Inspection standard

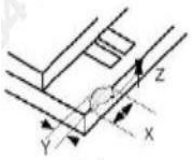
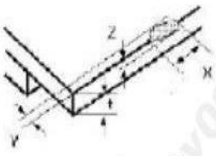
Type	No	Inspection Items	Inspection Specifications	Defect type	Inspection Tool	Inspection Method
Insufficient function	1	Abnormal display	None allowed	CR	Tester	Naked Eye
	2	No display	None allowed	CR		
TP function	3	TP test NG	None allowed	CR	TP Tester	Naked Eye
Dot	4	Bright dot	None allowed	MA	Tester	Naked Eye

	5	Dark dot	Single pixel dark spot N≤3， DS>40mm Distance btw 2 defects > 40mm	MA	Tester	Naked Eye
	6	Partial Bright dot	Pixel brighter than L0, but not visually detected from L48; 1 max	MI	Tester Magnifier	Naked Eye
Line	7	Bright lines	None allowed	CR	Tester	Naked Eye
	8	Dark lines	None allowed	CR		
	9	Slightly bright line	None allowed	CR		
Mura	10	ELA mura	The 5% ND Filter screen determines that the invisible is OK and the visible is NG. or refer to limit samples if necessary (Collect specification edge samples during production and agree with the customer (2pcs standard samples and specification edge samples))	MI	T Tester Limit Sample/ ND Filter	Naked Eye
	11	Color mura		MI		Naked Eye
	12	Stripe Mura (horizontal, vertical, oblique)		MI		Naked Eye
	13	Black 、White spot		MI		Naked Eye
	14	Newtonian ring		MI		Naked Eye
	15	Others mura		MI		Naked Eye

Dot/line defect	16	Linear defect (scratch, fiber)	1、W≤0.03mm，L≤0.1,不计； 2、0.03<W≤0.05mm，0.1mm＜L≤1.0mm，N≤2，DS>40mm； 3、W>0.05mm，L＞1.0mm,不允许；	MI	Tester Film card	Naked Eye
	17	Dot like foreign object: Impurity, foreign material, ink, dent, or air bubble (Dent in ink area refers to the spec. of dot)	1、D≤ 0.1 mm，忽略； 2、 0.1 mm ＜D ≤0.30mm，N≤3，DS>40mm； 3、D＞ 0.3mm，不允许；	MI	Tester Film card	Naked Eye
Glass	18	Screen soiled/handwriting	1.The front side (B side) can wipe dirt wipe, not wipe dirt is not allowed; 2.Back (side A):not controlled;	MI	/	Naked Eye
	19	Broken glass	None allowed	CR	/	Naked Eye
	20	Crack	None allowed	MA	/	Naked Eye

<table>
<tr>
<td rowspan="3"></td>
<td rowspan="3">21</td>
<td rowspan="3">Chipping</td>
<td>Corner: PAD non bonding Corner ：X≤1.0mm,Y≤1.5mm, Z≤t；
PAD bonding Corner：X≤2.0mm,Y≤1.2mm, Z≤t；
- Corner
 
<table>
<tr><th>Location</th><th>X(mm)</th><th>Y(mm)</th><th>Z(mm)</th></tr>
<tr><td>No Pad</td><td>≤1.0</td><td>≤1.5</td><td>≤t*</td></tr>
<tr><td>Pad</td><td>≤2.0</td><td>≤1.2</td><td>≤t*</td></tr>
</table>
</td>
<td rowspan="3">MI</td>
<td rowspan="3">Film
Card</td>
<td rowspan="3">Naked
Eye</td>
</tr>
<tr>
<td>Side: X≤1.0mm,Y≤1.5mm, Z≤t
Side
 
<table>
<tr><th>Location</th><th>X(mm)</th><th>Y(mm)</th><th>Z(mm)</th></tr>
<tr><td>No Pad</td><td>≤1.0</td><td>≤1.5</td><td>≤t*</td></tr>
</table>
</td>
</tr>
<tr>
<td>PAD: PAD non bonding area ：X≤5.0mm,Y≤0.5mm, Z≤t， does not damage the PAD and the circuit;

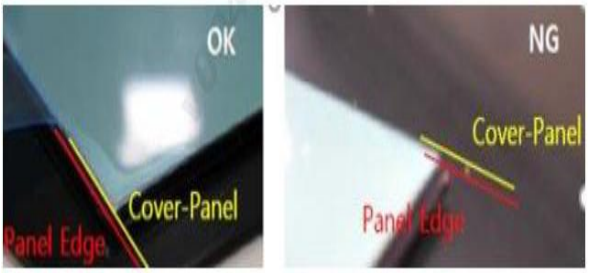
PAD bonding area ： X≤5.0mm,Y≤0.6mm, Z≤t，does not damage the PAD and the circuit;</td>
</tr>
</table>

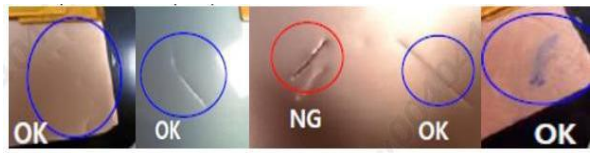
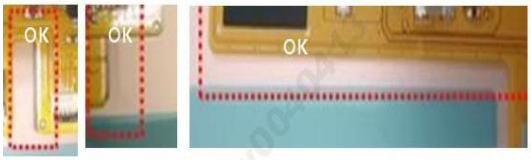
			- PAD  Pad  Rear side Location / X(mm) / Y(mm) / Z(mm) Pad (No pattern) / ≤5.0 / ≤0.5 / ≤t* Pad (Rear side) / ≤5.0 / ≤0.6 / ≤t*			
	22	Salient point	Touch is not allowed	MI	/	Naked
	23	Flange	1.Y≤0.1mm,X No control; 2.Y>0.1mm,Not allowed;	MI	Film Card	Eye
	24	Mark colobom a	Mark defects that affect machine alignment are not allowed.	MI	/	Naked
	25	Screen body warping	ide A and side B of the product are laid flat respectively, and one end is raised to a height(Pluggauge)≤0.6mm.	MI	Film Card	Naked Eye
Protection Film	26	The protective film body is faulty	Invalid function, damage, leakage is not allowed; Bubbles, folds, bumps, dirt, raw edges, overflow D<5mm, N≤5, DS≥10;	MI	Film Card	Naked Eye
	27	skewing	Meet the design drawings and other specifications, the protective film can not exceed any side of the screen, and the protective film is evenly attached to the four sides of the screen, the protective film and the single side of the screen≤1mm	MI	/	Naked Eye
POL	28	POL Edge overflow	Excess glue on the edge of the polarizer Ink area can be covered, according to the limit template to determine	MI	/	Naked Eye

	29	POL scratch	No damage body is not controlled, damage body according to the point, line specifications;	MI	/	Naked Eye
	30	POL Salient point /Dent	Reference point/line class specifications;	MI	/	Naked Eye
	31	POL bubble line	Not allowed outside AA zone within 0.25mm;	MI	/	Naked Eye
	32	POL crease/in dentation	Does not affect CG fit OK or reference limit sample;	MI	/	Naked Eye
	33	The edge of the polarizer overflow s and warps	Cannot be extended to AA area;	MI	/	Naked Eye
IC/COF	34	IC damage	Visually not allowed	MA	/	Naked Eye
	35	COF	PI surface scratches shall not affect the front line (such as deformation, loss, crease), limited sample reference limit sample. Refer to other raw material specifications	MI	/	Naked Eye
FPC	36	FPC defect	1, capacitor and inductance polarity welding, package size, component direction error is not allowed; 2, misuse of components, cracks, damage, falling off, warping, deviation is not allowed; Component welding distortion does not affect the function and assembly is not controlled; 3. Scratches/scratches are based on no exposed copper;	MI	/	Naked Eye

			4, FPC parts need to be consistent with the product BOM table, there are wrong parts, more pieces, less pieces, not allowed; 5, the connector can not be stained with tin or residual tin beads, connector welding feet can not have tin phenomenon; 6, the surface should not be visually visible pollutants, after wiping can be removed judged acceptable, but the ratio of the number of bad and the total number of sampling more than 2% is judged NG; 7. FPC raw edges and burrs are not controlled; 8, FPC screen printing poor: content error is not allowed; Unable to identify is not allowed; 9, FPC shape damage: damage more than the edge of the board edge to the nearest conductor spacing s 1/2, not allowed; Damage >2.5mm, not allowed; 3 10, FPC punching poor: miss punching positioning hole or positioning hole break is not allowed; 11, FPC indentation/crease: can not lead to FPC damage; Line area indentation can not lead to white cover film back; Non-line area indentation should not cause FPC damage; 12, FPC ink welding does not allow bubbles, covering film bubbles are not allowed to lead to metal conductor exposure or bridge; FPC reinforcing board is poor: reinforcing board cracking, falling off is not allowed 14, the reinforcement board missed paste, reverse paste and FPC lamination separation; 15.Reinforcing plate puncture, convex point: D≤0.25mm mm, and can not affect the overall thickness and function; 16, bubbles: non-metal/cover FPC surface			

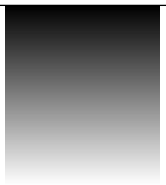
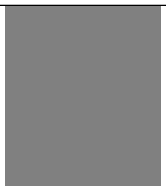
			ignore.			
	37	FPC Goldfinger	1.Goldfinger cracked: The length and width of the cracked/broken tip of the goldfinger ≤ line width ; 2.Gold finger copper leakage: W≤1/3 line width, L≤ line width，N ignore; 3.Goldfinger notch W1≤1/3 line width W, length L1≤1/2 line width W, unlimited quantity, all the above conditions are allowed. 4.Gold finger crush/scratch can not expose copper, can not have concave and convex, no visual depth, does not affect the assembly acceptable. 5.Golden fingers should not have sharp Angle folds and dead folds 6.FPC gold finger should not be oxidized black, scald, brown, electroplating should not be oxidized discoloration phenomenon	MI	/	
	38	connector	There should be no tin or residual tin bead phenomenon on the connector, and there should be no chain phenomenon on the connector welding foot; PIN deformation should not exceed 0.05mm control; Does not affect the point function: visually watch pin folding, pin falling off, extrusion deformation of the outer frame is not allowed;	MI	/	
	39	Other	Other raw material inspection standards signed by reference suppliers and customers	MI	/	Naked Eye
Insulating tape	40	Bonding area	No obvious folds and bubbles	MI	\	Naked Eye
	41	Component area	1. Scratches and glue flowers are not controlled;	MI	\	Naked Eye

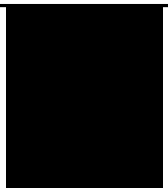
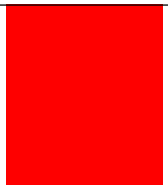
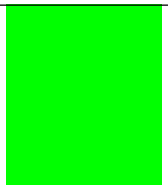
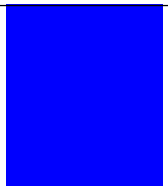
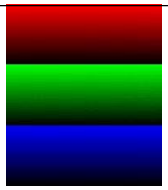
			2. Do not wipe dirt is not allowed； 3. The deviation of insulation tape shall not exceed the edge of the product, and the rest shall be determined according to the requirements of the drawing； 4. Raw edge, overflow is not controlled； 5. Broken, incomplete, missing stickers not allowed；			
Composite tape	42	Composite tape	1, composite tape leakage screen edge is not allowed;  2. Folding and assembly of composite tape produce light leakage or affect assembly and thickness are not allowed; 3, composite tape damage is not allowed; 4, the compound tape punching bad size meets the requirements of the drawing is not controlled; 5, the raw edge of the composite tape does not exceed the edge of the screen body is not controlled; 6. Glue flower and overflow of composite tape are not controlled; 7, composite tape bubbles, folds, peeling, stains/foreign bodies and other appearance: ignore. 8, the color difference of the protective film in	MI	\	Naked Eye

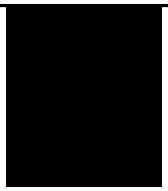
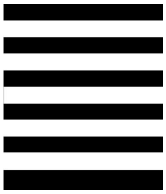
			the composite tape is not controlled; 9, the copper foil indentation in the composite tape is not allowed, does not affect the assembly and thickness is not controlled; Or reference limit sample; 10, composite tape copper foil foreign body/concave point is not controlled;  			
sealant	43	sealant	1.Bonding area: The bonding area should not be broken, the bubbles on IC and FPC are not controlled, and the thickness of the gel should not exceed the POL level. 2.Other areas: line area is not allowed to break glue, do not expose the line, bubble diameter < 1mm, the colloidal thickness shall not be higher than the POL plane. 3.IC ontology: need to be fully covered (customer requirements to meet customer requirements); 4.FPC body: No banded colloid with a width greater than 1mm or point-like colloid with a diameter greater than 2mm.	MI	\	Naked Eye
Silicone glue/high tempe	44	Silicone glue/high temperature glue	1.Silicone rubber overflow should not exceed 0.2mm 2.High temperature glue can exceed FPC, but not on the release film	MI	\	Naked Eye

rature glue						
ACF attached	45	ACF attached	ACF adhesive length exceeds both ends of the FPC by 0.2mm ~ 1mm, Do not go beyond the edge of the screen, Lead area ACF effective lap width greater than 2/3 FPC goldfinger width,， No bubbles, folds, etc	MI	\	Naked Eye
Copper foil,	46	Copper foil,	Copper foil patch leakage screen edge is not allowed; Abnormal color of steel foil reference standard sample/seal sample, damage is not allowed. Soft scratches on the surface are not controlled	MI	\	Naked Eye
Fold Back warping	47	Fold Back warping	The flexing height between FPC and bubble wool≤0.5mm	MI	\	Naked Eye
Two-dimensional code	48	Two-dimensional code	It is not allowed to be unable to scan or not easy to scan (more than three consecutive scans can be identified), the appearance is clear, no blur, printing loss and other bad	MI	/	Naked Eye/ Barcode scanner
Defects in outer packin	49	Mixed product	not allowed	-	-	-
	50	Dirt, handwriting	Handwriting residue and handwriting impressions are not allowed; Water/oil residue is not allowed	-	-	-
	51	Package	Refer to the specification of packing pattern book and process SOP	-	-	-
Overall dimension	52	Overall dimension NG	Not allowed to exceed the dimensions and tolerances required by the specification drawings	-	-	-

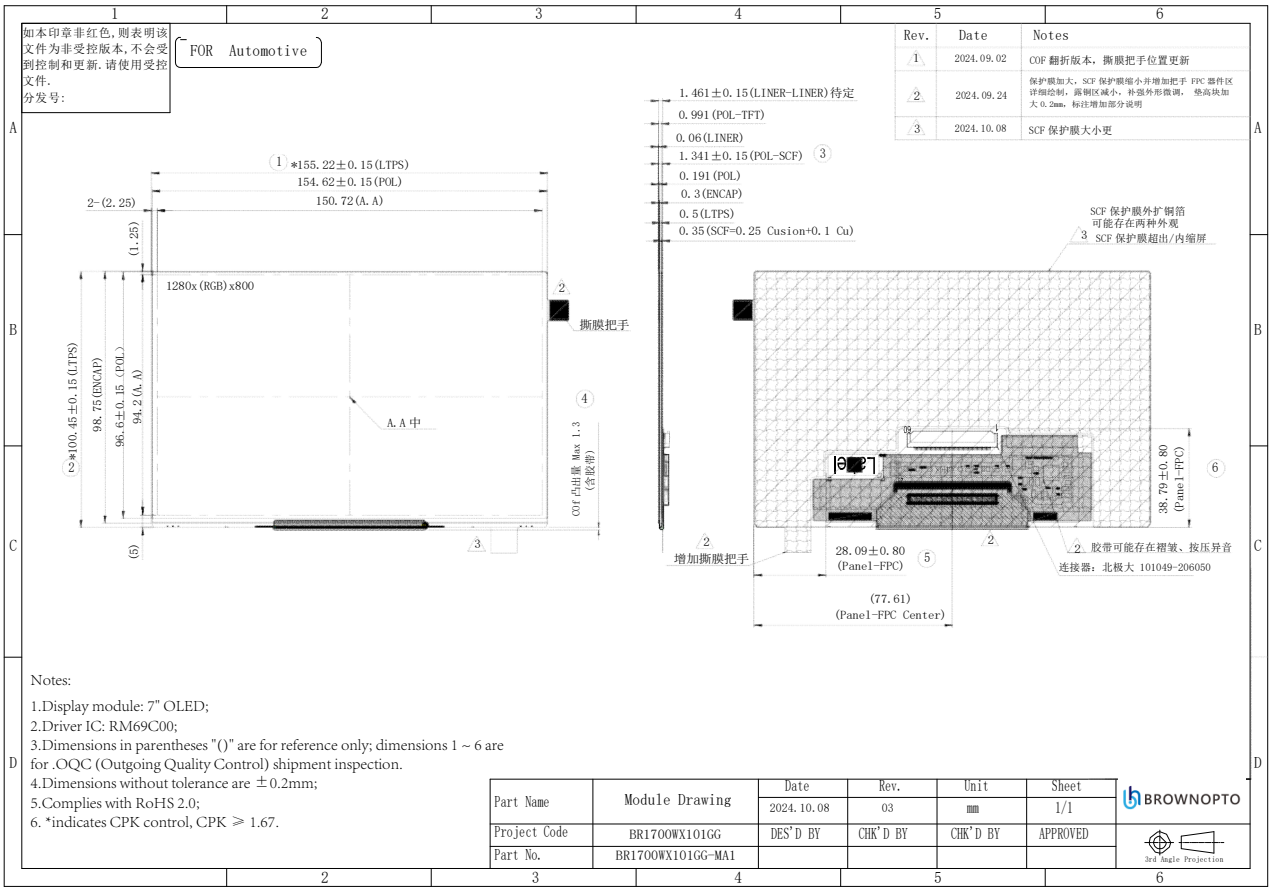
11．7Inspection picture library

Serial number	picture	Picture name	Check item	remark
1		Image	Picture exception	/
2		HSCALE	OTP NG、Abnormal function	/
3		VSCALE	OTP NG、Abnormal function	/
4		W_GRAD(32)	mura poor auxiliary decision screen	/
5		W_GRAD(64)	Point, line, foreign body/line, mura	/
6		W_GRAD(128)	Point, line, foreign body/line, mura	/
7		WHITE	Point, line, foreign body/line, mura	/

8		Black	Bright spot class, bright line class, dark state mura class	/
9		HBM WHITE	Points, lines, foreign body points/lines	/
10		RED	Points, lines, foreign body points/lines	/
11		GREEN	Points, lines, foreign body points/lines	/
12		BLUE	Points, lines, foreign body points/lines	/
13		RGB3H	OTP NG、Abnormal function	/
14		1080_Word	Display exception (word distortion, blurring, failure to display, etc.)	/
15		Complex	Microbright line	/

16		WAKU	Assembly offset	/
17		Black and white bar screen + low 51 values Note: The low 51 value is assigned to the 51 register, 51, 00, 02, which is the state when the brightness bar of the analog client is pulled to the lowest.	Splash screen	/

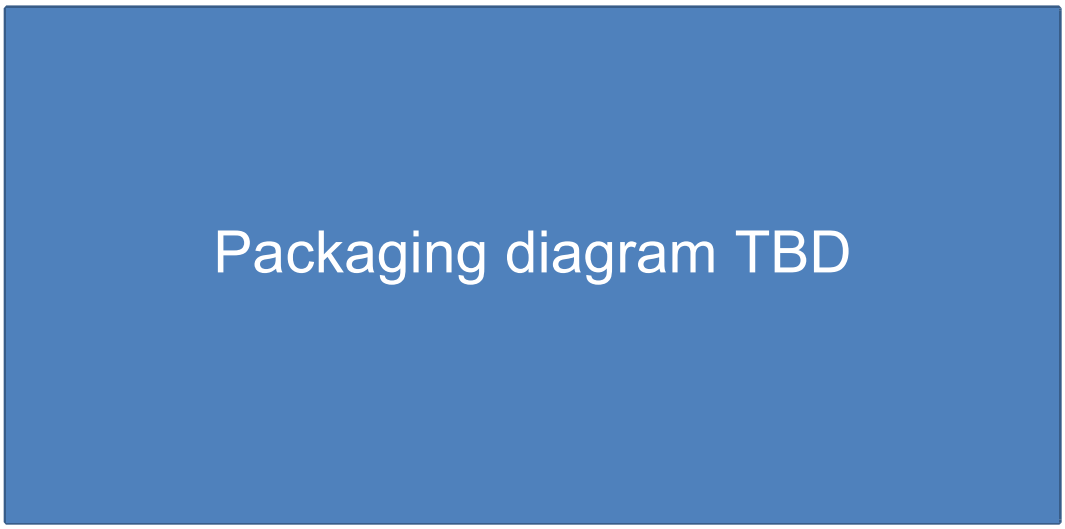
12 Mechanical Drawing



Packing Drawing

Packing Condition	Contents
Packing Type	TBD
TRAY material model	TBD
Tray packing type	TBD
Number of panels per tray	TBD
Number of Tray per carton	TBD
Number of panels per carton	TBD

Picture 1



13 Precautions for Use of AMOLED Modules

13.1 Handling Precautions:

13.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from height.

13.1.2 Do not press down the screen or the adjoining areas too hard because the color tone may be shifted.

13.1.3 The polarizer covering the display surface of the AMOLED module is soft and easily scratched. Handle this polarizer carefully.

13.1.4 If the display surface is contaminated, blow on the surface and gently wipe it with a soft dry cloth. If it is still not completely clear, moisten the cloth with ethyl alcohol.

13.1.5 Solvents may damage the polarizer. Do not use water, ketone or aromatic solvents except ethyl alcohol.
Do not attempt to disassemble the AMOLED Module.

13.1.6 If the logic circuit power is off, do not apply the input signals.

13.1.7 To prevent destruction from static electricity, be careful to maintain an optimum working environment.

13.1.8 Be sure to make yourself in contact with the ground when handling with the AMOLED Modules.

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

13.1.10 To reduce the generation of static electricity, do not conduct assembly or other work under dry conditions.

13.1.11 To protect the display surface, the AMOLED Module is coated with a film. Be careful when peeling off this protective film, because static electricity may generate.

13.2 Storage Precautions:

13.2.1 When storing the AMOLED modules, be sure that they are not directly exposed to the sunlight or the light of fluorescent lamps.

13.2.2 The AMOLED modules should be stored under the storage temperature range. If the AMOLED modules will be stored for a long time, the recommended condition is:
Temperature: 0℃~40℃ Relatively humidity: ≤80%

13.2.3 The AMOLED modules should be stored in the room without acid, alkali or harmful gas.

13.3 Transportation Precautions:

13.3.1 The AMOLED modules should not be suffered from falling and violent shocking during transportation. Besides, excessive press, water, damp and sunshine, should be avoided.