

SPECIFICATION FOR APPROVAL

DESCRIPTION: 6.0"AMOLED Module
CUSTOMER: BR600108-A1 V.1
Product No:
Released Date: 2023.03.20
Revision: v1

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APPROVED SIGNATURES		

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RecordofRevision

Rev	IssueDate	Description	Editor
A1	2023-03-20	Draft	WuJiaWei

1 General Specifications

Feature		Spec	Remark
DisplaySpec	Screen Size (inch)	6.0	
	DisplayMode	AMOLED	
	Resolution(dot)	1080(W)×2160(H)	
	ActiveArea(mm)	68.256(W)×136.512 (H)	
	PixelPitch (um)	63.2 (W)×63.2(H)	
	TechnologyType	LTPS	
	ColorDepth	16.7M	
	Interface	MIPI 4LANE	
	Surface Treatment	Hard Coating	
Mechanical Characteristics	TP Outline	76.40(W)x156.60(H)x2.0(D)	
	ModuleOutline Dimension(WxHxD)(mm)	70.066(W)x142.297(H)x0.773(D)	
	Weight (g)	TBD	
Electronic	DriverIC(Type)	CH13721C	
	TouchIC(Type)	CST148	

Note 1: Requirements on Environmental Protection: RoHS.

2 Input/output Terminals

2.1 Main FPC Pin Assignment

FPC connector: FH26-39S-0.3 SHW.

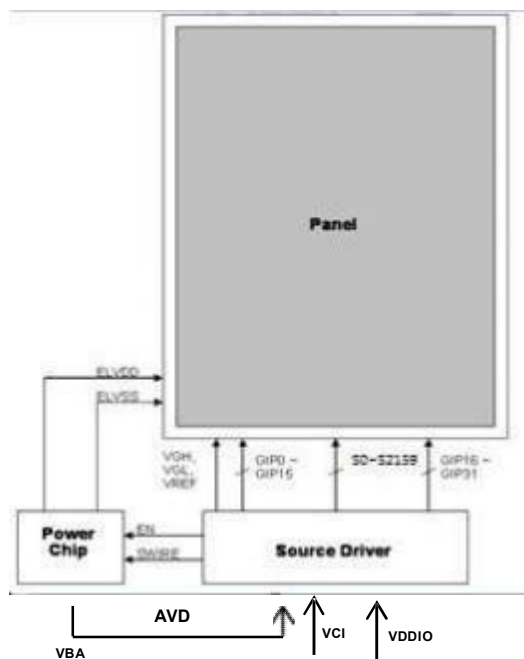
No	Symbol	I/O	Description
1	ELVDD	P	Positive Powersupply for EL
2	ELVSS	P	Negative Powersupply for EL
3	ELVDD	P	Positive Powersupply for EL
4	ELVSS	P	Negative Powersupply for EL
5	ELVDD	P	Positive Powersupply for EL
6	ELVSS	P	Negative Powersupply for EL
7	TP_INT	I	INT Pin or TP
8	GND	GND	GND
9	TP_RST	I	Reset Pin for TP, Active
10	D3N	I/O	MIPI data lane
11	TP_SCL	I	SCL Pin for TP
12	D3P	I/O	MIPI data lane
13	TP_SDA	I/O	SDA pin for TP
14	GND	GND	GND

15	TP3V3	P	AnalogPowerforTP
16	D0N	I/O	MIPIdatalane
17	NC		NC
18	D0P	I/O	MIPIdatalane
19	VCI	P	Power Supply for analogCircuit
20	GND	GND	GND
21	AVDD	P	External Power inputforAVDD
22	CLKN	I	MIPIclocklane
23	VDDIO	P	Power Supply for displaylogiccircuit
24	CLKP	I	MIPIclocklane
25	RESET	I	Display reset. Activelow
26	GND	GND	GND
27	ERR_FG	O	Error status of MIPI'sHSDT
28	D1N	I/O	MIPIdatalane
29	TE	I	Sync SignalforpreventingTearingEffect
30	D1P	I/O	MIPIdatalane

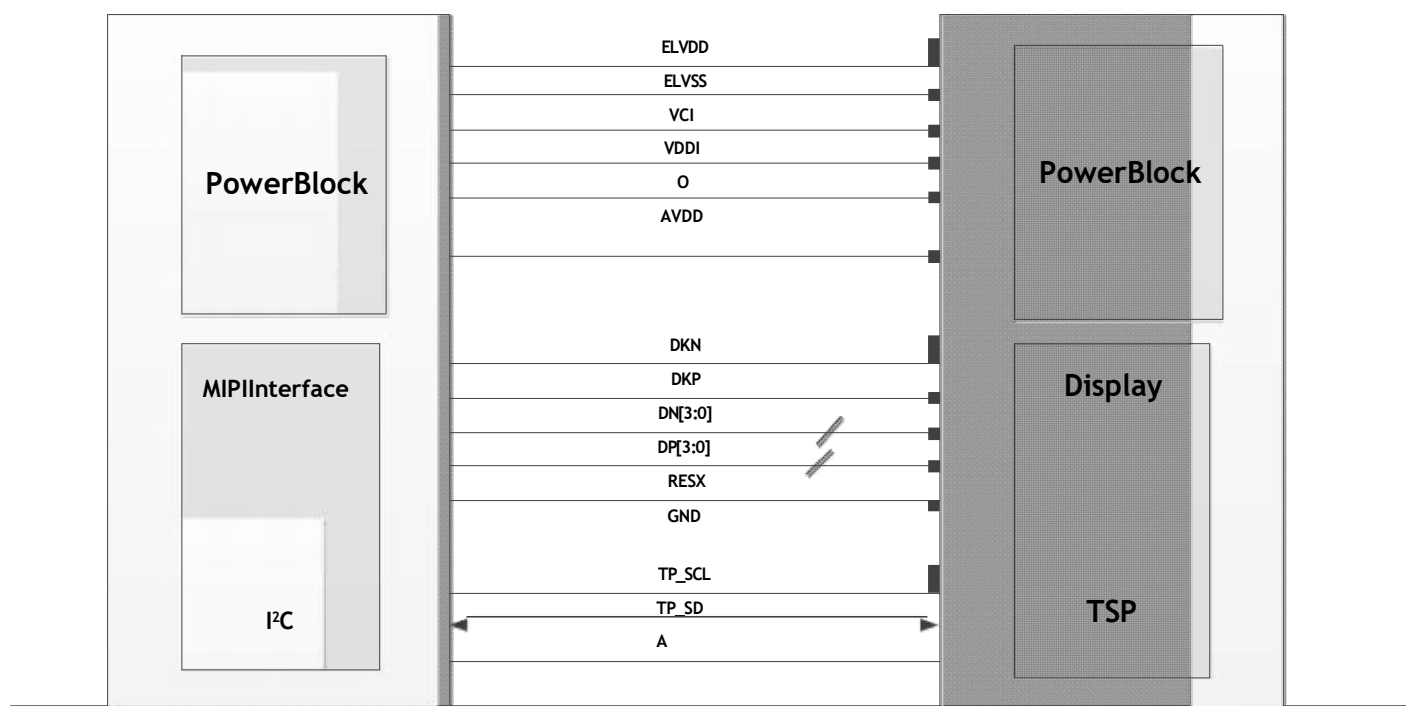
31	AVDD_EN	O	DC/DC Power EnablePin
32	GND	GND	GND
33	SWIRE	O	DC/DC Power IC S-WireCTRLPin
34	D2N	I/O	MIPIdata lane
35	NC		NC
36	D2P	I/O	MIPIdata lane
37	NC		NC
38	GND	GND	GND
39	MTP	P	Power supply for MTP Programming or Erase. If it is not used, please let it open

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

2.2 Circuitblock diagram (Display)



2.3 MCU and Display Module Interface Configuration



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
Analog Powersupply	VCI	-0.3	+5.5	V
Logic Powersupply	VDDIO	-0.3	+5.5	V
Positive Power Input	ELVDD	-0.3	+6.6	V
Negative Power Input	ELVSS	-6.6	+0.3	V
Analog Powersupply	AVDD	4.5	6.5	V

Note: Functional operations 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

Item		Symbol	MIN	TYP	MAX	Unit
Logic Powersupply		VDDIO	1.65	1.80	3.3	V
Analog Powersupply		VCI	2.75	3	3.30	V
ELVDD Supply Voltage		ELVDD	4.3	4.4	4.5	V
ELVSS Supply Voltage		ELVSS	-2.7	-2.6	-2.5	V
Interface operating voltage		AVDD	6.3	6.4	6.5	
Input Signal Voltage	High Level	VIH	0.80*VDDIO	-	VDDIO	V
	Low Level	VIL	0.00	-	0.20*VDDIO	V
Output Signal Voltage	High Level	VOH	0.80*VDDIO	-	VDDIO	V
	Low Level	VOL	0.00	-	0.20*VDDIO	V
Normal		I _{ELVDD}	-	-	147	mA
		I _{ELVSS}	-	-	114	mA
		I _{VCI}	-	-	3	mA
		I _{VDDIO}	-	-	27	mA
		I _{avdd}	-	-	12	mA
Stand-by		I _{VCI}	-	-	TBD	uA
		I _{VDDIO}	-	-	TBD	uA

Ta=25°C

Note1: The input digital voltage is the I/O reference voltage.

Note2: VDDIO usually ranges from 1.65V to 3.3 V. If VDDIO is changed, the remaining voltage needs to be changed to the same voltage as VDDIO.

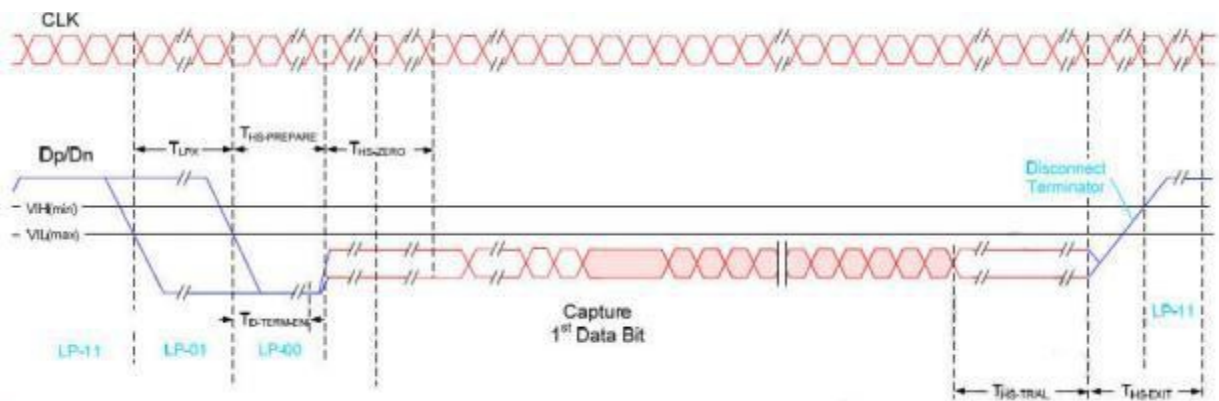
Note3: Under full white pattern, Video Mode 60.5Hz.

Note4: 60Hz command mode at 896 Mbps

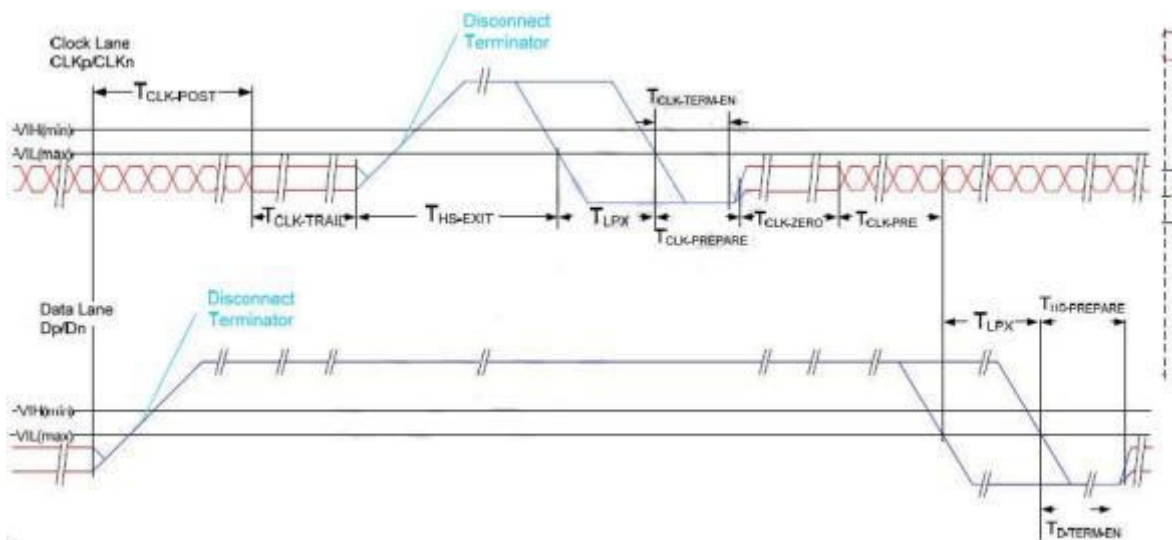
5ACCharacteristics

5.1 MIPIInterfaceCharacteristics

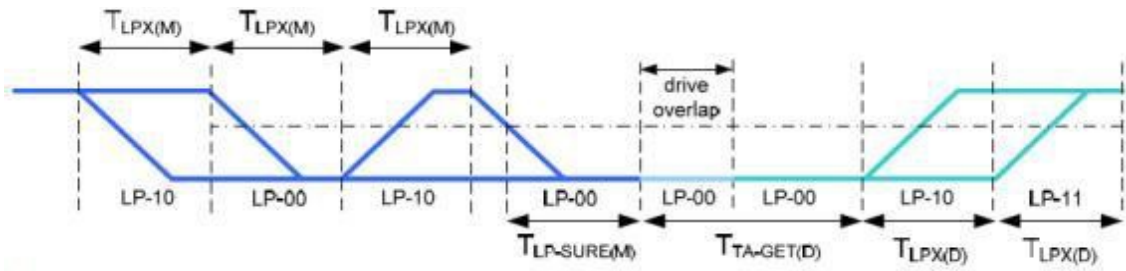
HS Data TransmissionBurst



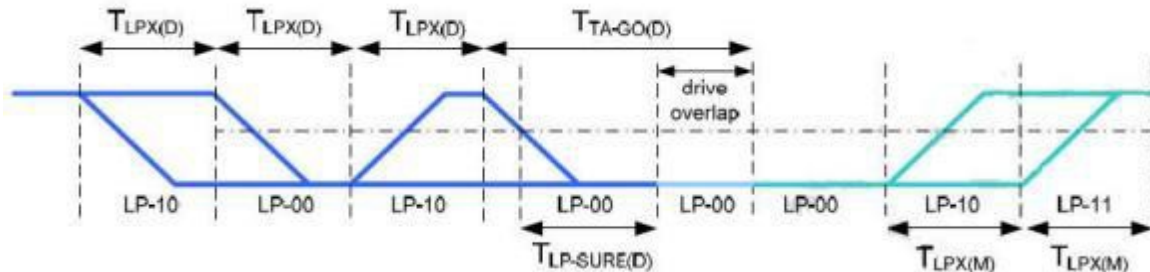
HS clock transmission



TurnaroundProcedure



Bus turnaround (BAT) from MPU to display module timing



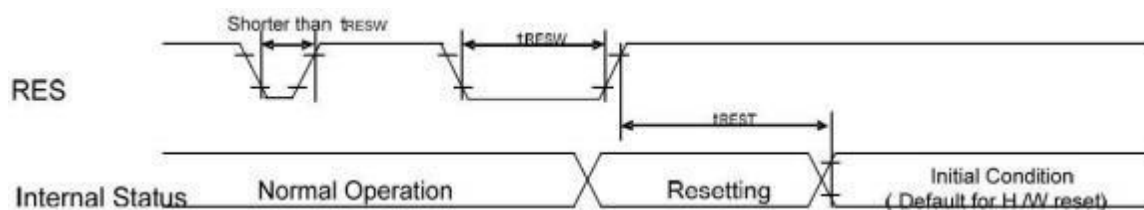
Timing Parameters:

Parameter	Description	Min	Typ	Max	Unit
$T_{CLK-POST}$	Time that the transmitter continues to send HS clock after the last associated Data Lane has transitioned to LP Mode. Interval is defined as the period from the end of $T_{HS-TRAIL}$ to the beginning of $T_{CLK-TRAIL}$.	$60ns + 52 \cdot UI$			ns
$T_{CLK-TRAIL}$	Time that the transmitter drives the HS-0 state after the last payload clock bit of a HS transmission burst.	60			ns
$T_{HS-EXIT}$	Time that the transmitter drives LP-11 following a HS burst.	300			ns
$T_{CLK-TERM-EN}$	Time for the Clock Lane receiver to enable the HS line termination, starting from the time point when D_n crosses $V_{IL,MAX}$.	Time for D_n to reach $V_{TERM-EN}$		38	ns
$T_{CLK-PREPARE}$	Time that the transmitter drives the Clock Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission.	38		95	ns
$T_{CLK-PRE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	8			UI
$T_{CLK-PREPARE} + T_{CLK-ZERO}$	$T_{CLK-PREPARE}$ + time that the transmitter drives the HS-0 state prior to starting the Clock.	300			ns
$T_{D-TERM-EN}$	Time for the Data Lane receiver to enable the HS line termination, starting from the time point when D_n crosses $V_{IL,MAX}$.	Time for D_n to reach $V_{TERM-EN}$		$35 ns + 4 \cdot UI$	
$T_{HS-PREPARE}$	Time that the transmitter drives the Data Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission	$40ns + 4 \cdot UI$		$85 ns + 6 \cdot UI$	ns
$T_{HS-PREPARE} + T_{HS-ZERO}$	$T_{HS-PREPARE}$ + time that the transmitter drives the HS-0 state prior to transmitting the Sync sequence.	$145ns + 10 \cdot UI$			ns
$T_{HS-TRAIL}$	Time that the transmitter drives the flipped differential state after last payload data bit of a HS transmission burst	$60ns + 4 \cdot UI$			ns

Parameter	Description	Min	Typ	Max	Unit	Notes
$T_{LPX(M)}$	Transmitted length of any Low-Power state period of MCU to display module	50		150	ns	1,2
$T_{TA-SURE(M)}$	Time that the display module waits after the LP-10 state before transmitting the Bridge state (LP-00) during a Link Turnaround.	$T_{LPX(M)}$		$2 \cdot T_{LPX(M)}$	ns	2
$T_{LPX(D)}$	Transmitted length of any Low-Power state period of display module to MCU	50		150	ns	1,2
$T_{TA-GET(D)}$	Time that the display module drives the Bridge state (LP-00) after accepting control during a Link Turnaround.		$5 \cdot T_{LPX(D)}$		ns	2
$T_{TA-GO(D)}$	Time that the display module drives the Bridge state (LP-00) before releasing control during a Link Turnaround.		$4 \cdot T_{LPX(D)}$		ns	2
$T_{TA-SURE(D)}$	Time that the MPU waits after the LP-10 state before transmitting the Bridge state (LP-00) during a Link Turnaround.	$T_{LPX(D)}$		$2 \cdot T_{LPX(D)}$	ns	2

5.2 Display RESET Timing Characteristics

Reset input timing:



VDDIO=1.65 to 3.3V, VDD=2.7 to 3.6V, AGND=DGND=0V, Ta=-40 to 85°C

Timing Parameters

Symbol	Parameter	Related Pins	MIN	TYP	MAX	Note	Unit
t_{RESW}	*1) Reset low pulse width	RESX	10	-	-	-	μs
t_{REST}	*2) Reset complete time	-	-	-	5	When reset applied during Sleep in mode	ms
		-	-	-	120	When reset applied during Sleep out mode	ms

Note 1. Spike caused by an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

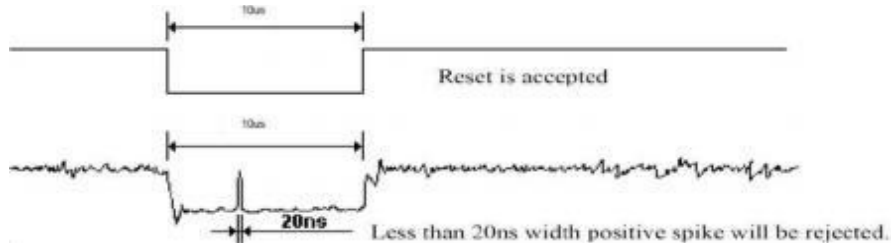
RESX Pulse	Action
Shorter than 5μs	Reset Rejected
Longer than 10μs	Reset
Between 5μs and 10μs	Reset starts (It depends on voltage and temperature condition.)

Note 2. During the resetting period, the display will be blank (The display is entering blanking sequence).

whose maximum time is 120 ms, when Reset starts in Sleep Out mode. The display remains blank in Sleep In mode) and then returns to Default condition for H/W reset.

Note3. During Reset Complete Time, data in OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (t_{REST}) within 5 ms after a rising edge of RESX.

Note4. Spike Rejection also applies during a valid reset pulse as shown below:



Note5. It is necessary to wait 5 msec after releasing RESX before sending commands. Also Sleep Out command can not be sent for 120 msec.

5.3 TETimingCharacteristics

Mode1, The Tearing Effect Output line consists of V- Blanking information only.



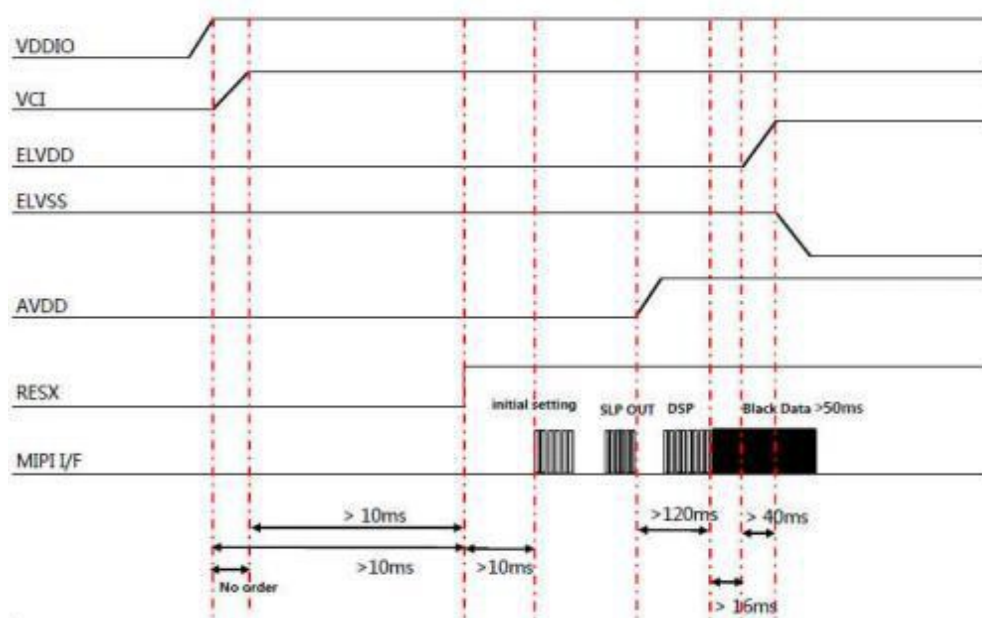
Tvdh = The display is not updated from the frame memory.

TvdI = The display is updated from the frame memory.

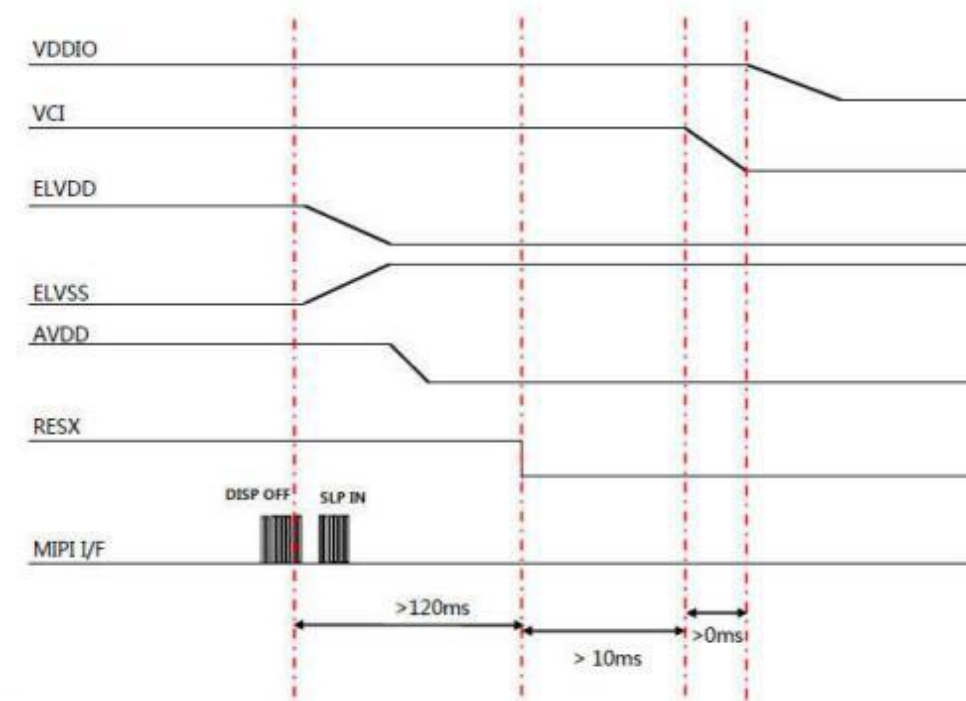
6 Recommended Operating Sequence

6.1 Display Power on / off Sequence

6.1.1 Power On Sequence



6.1.2 Power Off Sequence



6.2 2 Brightnesscontrol

Use“ command5 1 0 0 h, dataxxh” toadjusttheManualBrightnessvalueofthedisplay:

Inprinciplerelationshipisthat 0 0 hvaluemeansthelowestbrightnessandFFhvalue meansthehighestbrightness.

Inst/Para	R/W	Address		Date Type	Description
		MIPI	Other		
BRTCTRL	W	51h	5100h	Hex	Valueform 0~255(FF)

7OpticalCharacteristicsOpticalSpecification

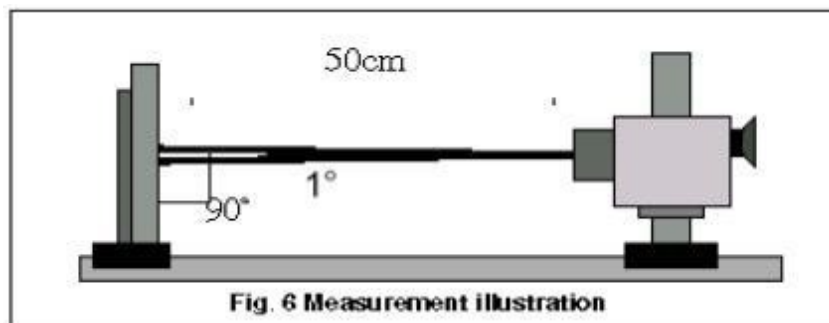
Item	Symbol	Condition	Min	Typ	Max	Unit	Remark
ViewAngle	θT	$CR \geq 10$	80	-		Degree	Note2 TestEquipment: CS2000A
	θB		80	-			
	θL		80	-			
	θR		80	-			
Contrast Ratio	CR	$\theta = 0^\circ$	100000				Note1 Note3 Test Equipment: CS2000A
ResponseTime	T_{ON}	25°C			1	ms	Note1 Note4 TestEquipment: AdmesyMSE
	T_{OFF}						
Chromaticity	White	x	(0.280)	(0.305)	(0.320)		Test Equipment: CS2000A Note: Chromaticitycan be modified accordingtocustomer demand
		y	(0.295)	(0.315)	(0.335)		
	Red	x	(0.625)	(0.655)	(0.685)		
		y	(0.315)	(0.345)	(0.375)		
	Green	x	(0.210)	(0.250)	(0.290)		
		y	(0.670)	(0.710)	(0.750)		
	Blue	x	(0.105)	(0.135)	(0.165)		
		y	(0.030)	(0.060)	(0.090)		
Uniformity	U		75			%	Note1 Note6 Test Equipment: CS2000A
NTSC			90	100		%	Note5
Luminance	L	Normal	320	360		Cd/m ²	Note1 Note7 Test Equipment: CS2000A
Cross-talk					1.5	%	Note8 Test Equipment: CS2000A

Gamma			2.0	2.2	2.4		Gamma=2.2±0.2 TestEquipment: CS2000A
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TestConditions:
theambienttemperatureis 2 5 C.
1. ThetestsystemsrefertoNote1 andNote2.

Note1: Definition of optical measurement system.

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



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

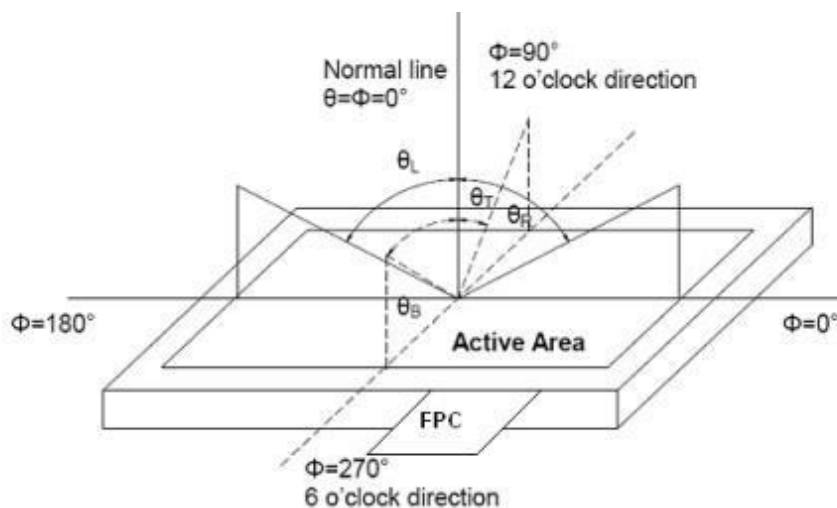


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

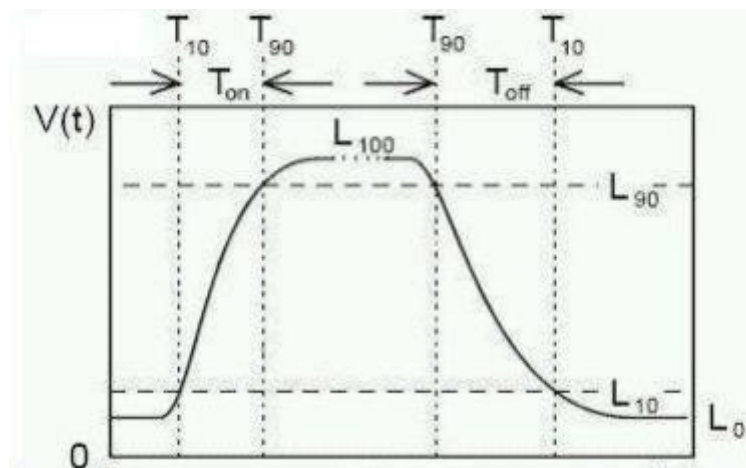
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "white" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

"White state": A state where the AMOLED should be driven by V_{white} .

"Black state": A state where the AMOLED should be driven by V_{black} .

Note 4: Definition of response time

The response time is defined as the AMOLED optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photodetector output intensity changing from 10% to 90%. And fall time (T_{OFF}) is the time between photodetector output intensity changing from 90% to 10%.



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates are measured at the center point of AMOLED.

Note 6: Definition of luminance uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity}(U) = L_{\min} / L_{\max}$$

L-----Active area length W----- Active area width

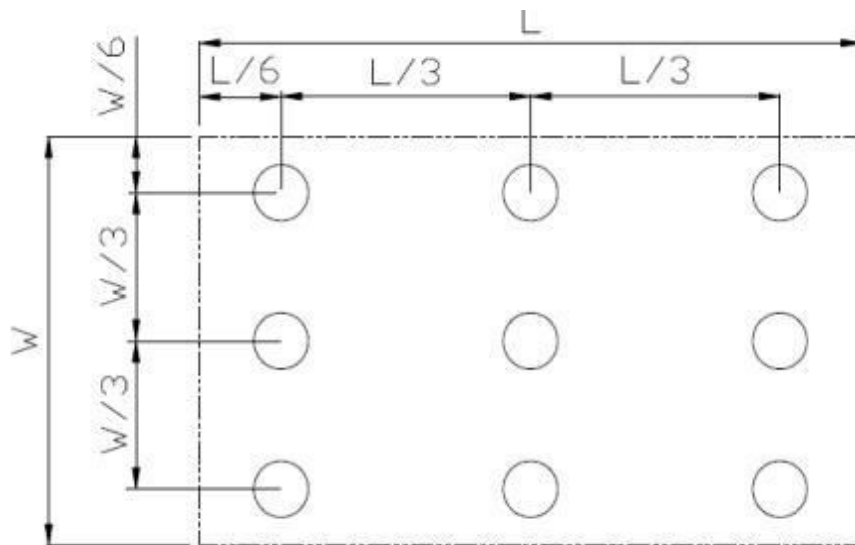


Fig. 2 Definition of uniformity

$L_{\max}$: The measured maximum luminance of all measurement position.

$L_{\min}$: The measured minimum luminance of all measurement position.

Note 7: Definition of luminance:

Measure the luminance of white state at the center point.

Note 8: Cross Talk

A. Measure luminance at the position, P0.

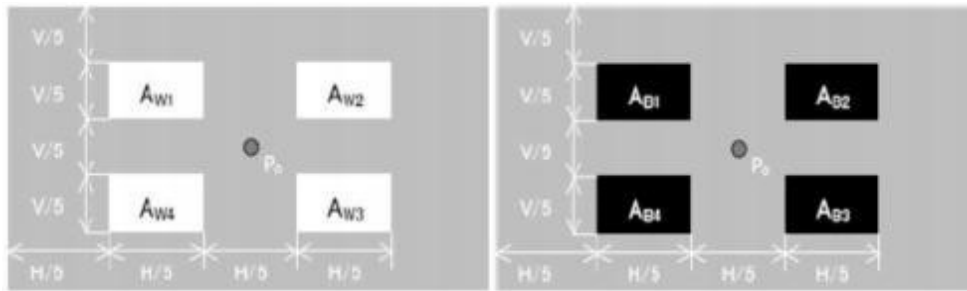
B. Calculate crosstalk as below equation.

$$L_{W_OFF} = \frac{W1}{4} \frac{L1 + L2 + L3 + L4}{W2 + W3 + W4}$$

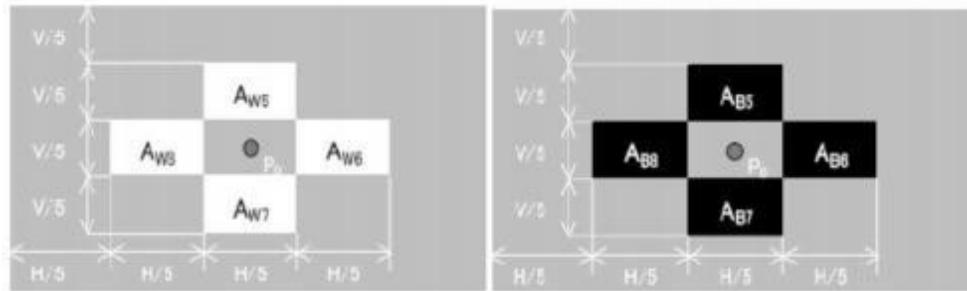
$$L_{B_OFF} = \frac{B1}{4} \frac{L1 + L2 + L3 + L4}{B2 + B3 + B4}$$

$$\text{crosstalk} = \frac{|L_{Wi_ON} - L_{W_OFF}|}{L_{W_OFF}} \times 100\% \quad (i=5 \text{ to } 8)$$

$$\text{crosstalk} = \frac{|L_{Bi_ON} - L_{B_OFF}|}{L_{B_OFF}} \times 100\% \quad (i=5 \text{ to } 8)$$

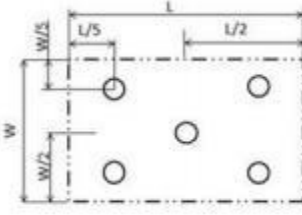


(a) L_{W_OFF} , L_{B_OFF} measuring pattern



(b) L_{W_ON} , L_{B_ON} measuring pattern

8Environmental/ReliabilityTest

No	TestItem	Condition	Remark
1	HighTemperature Operation	+70C, 120hrs	Accordingto the customer request
2	Low TemperatureOpe ration	-20C, 120hrs	Accordingto the customer request
3	HighTemperature Storage	+80C, 120hrs	Accordingto the customer request
4	Low TemperatureStor age	-30C, 120hrs	Accordingto the customer request
5	High Temperature &High Humidity Operation	60C, 90% RH,120hrs	Accordingto the customer request
6	High Temperature &High Humidity Storage	60C, 90% RH,120hrs	Accordingto the customer request
7	ThermalShock (Non-operation)	-30C(30 min)~+70C(30 min),Change time:10min, 30Cycles	Accordingto the customer request
8	ElectroStatic Discharge (Operation)	C=150pF, R=330Ω , 5points/panel Air:±8KV, 5times; Contact: ± 4 KV, 5 times; (Environment: 1 5 C~ 3 5 C, 30 %~60 % , 86 Kpa~1 0 6 Kpa) . 	IEC61000-4-2 GB/T17626.2

9 Quality Level

9.1 AMOLED Module of Characteristic Inspection

The environmental condition and visual inspections shall be conducted as below:

- (1) Ambient temperature: $23 \pm 3^{\circ}\text{C}$
- (2) Humidity: $55 \pm 10\%\text{RH}$
- (3) Ambient light intensity of visual inspection: $800 \sim 1200 \text{ lux}$
- (4) Ambient light intensity of function inspection: $\leq 200 \text{ lux}$
- (5) Viewing Distance: $30 \pm 5 \text{ cm}$
- (6) Viewing angle (tolerance): the front side $45^{\circ} (\text{Z}) \pm 15^{\circ}$
- (7) Inspection time: $10 \pm 5 \text{ sec}$

9.2 2 Sampling Procedures for each item acceptance table

Defect type	Sampling Procedures	AQL
Major defect	GB/T2828.1-2003 Inspection level II normal inspection single sample inspection	0.65
Minor defect	GB/T2828.1-2003 Inspection level II normal inspection single sample inspection	1.0

Major defect:

Any defect may result in functional failure, or reduce the usability of product for its purpose.
For example, electrical failure, deformation and etc.

Minor defect

A defect does not reduce the usability of product for its intended purpose and non-uniformity,
such as dot defect and etc.

The criteria on major and/or minor judgment will be according with the classification of defects.

9.3 Inspection Item

No.	Item	Area	Criterion of Defect			Defect type
1	Dot Defect	AA	Type	DS	Acceptable number	Minor
			Bright Dot	$\geq 10 \text{ mm}$	0	
			Dark Dot	$\geq 10 \text{ mm}$	4	
			Dark Dot ($\geq$ two)	$\geq 10 \text{ mm}$	2	

			connections)				
2	No Display	AA	/			Not allowed	Fatal
3	AbnormalDisplay	AA	/			Not allowed	Fatal
4	Normallywhite	AA	/			Not allowed	Fatal
5	LineDefect	AA	single line	Brightline		Not allowed	Fatal
				Dark line		Not allowed	
			Multiplelines	Brightline		Not allowed	
				Dark line		Not allowed	
			Half-Line	Brightline		Not allowed	
				Dark line		Not allowed	
6	Image sticking	AA	Switchtothenextscreenanddisplaytheimageofthe previous picture				Major
7	Color&Edge Mura	AA	Seelimitsample(under full white screen)				Major
8	Colorcrast	AA	Seelimitsample(underfullwhitescreen)				Major
9	WaterRipple	AA	Notallowed				Major
10	Othermura(Low gray- scalewhite spot、S- Line Mura)	AA	Notallowed(underfullwhitescreen) orSeelimit sample(underlowgray- scalewhitescreen)				Major
11	TP	AA	TPfunctionNG			Not allowed	Fatal
12	Glass crack	AA、 OA	/			Not allowed	Fatal
13	Screen bump	AA、 OA	EncapsurfaceisnotallowedandLTPSdoesnotaffect assembly				Major
14	Linesefects (light visible)	AA	W (mm)	L (mm)	DS (mm)	Acceptabl enumber	Minor
			W≤0.03	-	-	Ignore	
			0.03<W≤0.05	L≤5.0	≥10	2	
			0.05<W	-	-	0	
			-	L>5.0	-	0	
15	Pointsefects (lightvisible)	AA	D (mm)	DS (mm)		Acceptabl enumber	Minor
			D≤0. 1	/		Ignore	

			$0.1 < D \leq 0.25$	≥ 1 0		2	
			$0.25 < D$			0	
16	Glass scratch	AA	W (mm)	L (mm)	DS (mm)	Acceptabl enumber	Minor
			$W \leq 0.03$	$L < 5.0$	≥ 10	Ignore	
			$0.03 < W \leq 0.05$	$L \leq 2.0$	≥ 10	Ignore	
				$2.0 < L \leq 5.0$	≥ 10	2	
			$0.05 < W$	-	0	0	
				$L > 5.0$	0	0	
17	FritEncapsulation	FA	Fritwidthuniformity. Itshouldnothavebubbleor breakage.				Major
18	Polarizercrease / indentation	AA	See limitsample				Minor
19	Protectivefilm starved/ overflow glue/ burr	Except AA	No control under $W \leq 0.3\text{mm}$				Minor
20	Polarizerbump point	Whole area	Bump: $D \leq 0.25\text{mm}$, dent $\leq 1\text{mm}$ orSeelimitsample		Allow 3		Minor
21	Polarizerbubble line	Outof AA, $\leq 0.25\text{m}$ m	Encap surface		Not allowed		Minor
22	Scratchesonthe surfaceof polarizer	Whole area	No harm subject regardless of control				Minor
23	Concavedot、 Blackandwhite dot、Polarizer Dent/ Bubble	AA	Front (Encap surface)	D (mm)	DS (mm)	Acceptabl enumber	Minor
				$D \leq 0.1$	≥ 10	Ignore	
				$0.1 < D \leq 0.2$	≥ 10	3	
				$0.2 < D$	≥ 10	0	
				Metalmaterial foreignmaterial	/	≥ 10	Not allowed
24	PolarizerScratch/ Fiber(Linear)	AA	W (mm)	L (mm)	DS (mm)	Acceptabl enumber	Minor
			$W \leq 0.03$	$L \leq 5.0$	≥ 10	Ignore	
			$0.03 < W \leq 0.05$	$L \leq 2.0$	≥ 10	Ignore	
				$2.0 <$	≥ 10	3	

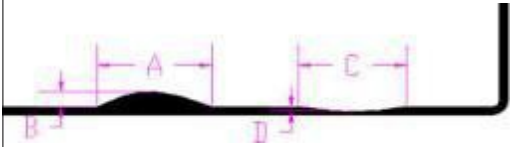
			0.05<W		-	≥10	0	
					L>5.0	≥10	0	
25	Edge/Side breakage	OA	ThefollowingCriterionisapplicabletoanyside (unit: mm)					Minor
			Z	X	Y	Acceptable number		
			≤ T	≤2.0	not extendedto circuitArea orFrit	<5		
26	UVglue	NotIC side	Over coating				Not allowed	Minor
		IC side	ThecoatingofICsideisnothigherthan POL.				Not allowed	
		IC side	ThecoatingofICsideisnothigherthan POL.				Not allowed	
27	Tuffy glue	ICand FPC bondin garea	ThecoatingshouldnothavebreakageorBubble.					Minor
			ThecoatingisnothigherthanPOL.					
		Other area	Tuffyglueisnotallowedtointerruptandthediameter ofBubbleisnotmorethan 0.5 mm.					
			ThecoatingisnothigherthanPOL.					
		IC	Notallowed					
		FPC	Ribbonglue: thewidthisnotmorethan 1 mm. Dotglue: thediameterisnotmorethan 2 mm.					
28	Rear reinforcement glueofFPC	FPC	Thewidthisnotmorethan 1mm . TheheightislowerthanLTPS.					Minor
29	ACF	Bondin gArea	Thelengthofattachmentismorethanbotheends of FPC,whichshouldberange from 0.2 to 1mm. Don't gobeyondtheedgeofpanel. EffectivelapwidthofwiringACFismorethan 2/3, whichiscomparedwiththewidthofthegoldfinger of FPC. Don't have bubble or wrinkle.					Minor
30	FPCA	FPC	Thecomponentcannotreversepolarity					Minor
			Nowronginsertion					
			FPCshouldnothaveseriouscreasewhichdestroythe line, prickandspotsdamage. Scratchisnotallowedif Culayerisexposed.					
			Thegoldfingersshouldnotbeoxidized, scraped, folded, impressed, broken, spottedordissymmetry.					
			MakesureFPCisnotscalded, withitslocationholes nothavingdeficiencyorobviouslyshift.					
			ThecomponentofFPCshouldbethesameasBOM					

			list.	
			NoremainingsolderingSn	
			Novisualparticleonthepadline	
31	FPC bonding	Bonding area	Bubble: Visible bubble is not allowed	Minor
	FPC skew		Overhang: The size above 1 / 2 of soldering electrode of the part overhang to the LAND is prohibited. The tilt height less than 0.5 mm between FPC and foam.	
			Not allowed	
32	Package	Other	Products should put into the anti-static trays, with non-overlapping, and the trays should be staggered placed	Minor
			Different products cannot be mixed into the same inner package.	
			The packages should not have obvious deformation or breakage. The printing label type and quantity are correct.	
			The packages should have QC signature. ROHS label is needed if the product is under ROHS control.	

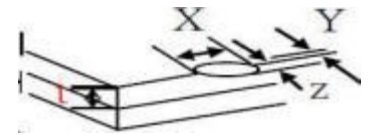
Inspection standard for cover

No	Item	Area	Criterion of Defect				Defect type
33	Cover dot, Black and white dot, Polarizer Dent/Bubble	Whole area	D (mm)	DS (mm)	Acceptable number		Minor
			$D \leq 0.15 \text{ mm}$	/	Ignore (specks is not allowed)		
			$0.15 \text{ mm} < D < 0.25 \text{ mm}$	$DS \geq 10 \text{ mm}$	2		
			$D > 0.25 \text{ mm}$	/	Not allowed		
			Specks: $D < 0.15 \text{ mm}$, $N > 5$ in $10 \text{ mm} \times 10 \text{ mm}$ area				
34	Cover Scratch/Fiber (Linear)	AA	W (mm)	L (mm)	DS (mm)	Acceptable number	Minor
			$W \leq 0.03 \text{ mm}$	$L \leq 10 \text{ mm}$	≥ 10	Ignore	
			$0.03 \text{ mm} < W \leq 0.05 \text{ mm}$	$L \leq 5.0 \text{ mm}$	≥ 10	2	
			$W > 0.05$	/	/	Not allowed	
			/	$L > 5.0 \text{ mm}$	/	Not allowed	
			Not allowed to scratch				
35	Edge pinhole	Edge of cover	D (mm)	DS (mm)	Acceptable number		Minor
			$D < 0.1 \text{ mm}$	$DS \geq 10 \text{ mm}$	one is allowed on each side		

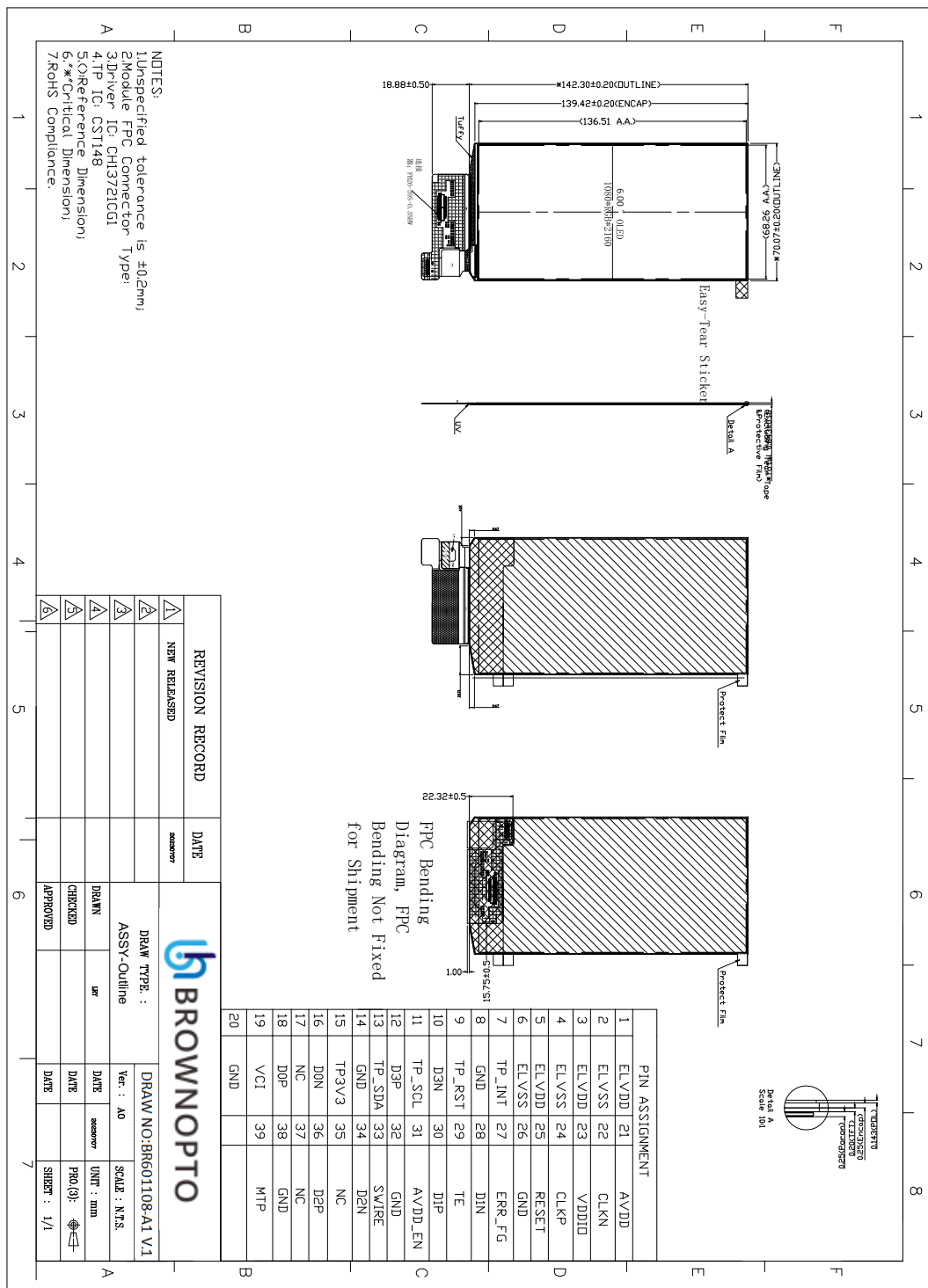


36	Uneven edge of the ink	Edge of cover	W (BorD)	L (AorC)	Acceptable number	Minor
			W≤0. 15mm	L≤3mm	≤2	
						
37	ink silk screen serrated	OA area	D (mm)	DS (mm)	Acceptable number	Minor
			D≤0.2	DS≥10mm	2	
38	Camera Hole	OA area	breakage or crack: D≤0. 1mm			Minor
			Hole is not round: Refer to the limit sample			
			Dot Defect: D≤0. 1mm, and N≤1, heterochromism and line defect are not allowed;			
			Camera hole mud: not allowed			
39	Printing defect	OA area	Wrongly、Missing、Ghosting and incomplete printing : not allowed			Minor
			Fonts consistent with the standard characters, no significant difference in visualization			
			Penetrating scratch is not allowed			
40	IR Hole/ Black spots/ Line scratch foreign matter/ Residue	OA area	DS(mm)	Acceptable number		Minor
			DS<0.1	Ignore		
			0.1≤DS≤0.15	1		
			Note: Not visible on black background, don't affect the transmission rate			
			Foreign body, dirty in IR hole: not allowed			
			Scratched\ Line defects in IR hole: W≤0. 03mm, L≤1mm, N≤1, Not visible on black background, don't affect the transmission rate.			
			Residual glue in IR hole: not allowed			
41	Cover lens deformation	OA area	Raised height< 0. 15 mm, and the area is less than 25% of the entire non-display area in the cover lens			Minor
		AA area	Deformation is not allowed in AA area			

42	Poor penetration of icons	OA area	DS≤0.15 and N≤1		Minor
43	Cover dirt	Whole area	Not allowed		Minor
44	Cover crack				Fatal flaw
45	Cover paint chips				
46	Burr	Edge of cover	L≤0.05mm, W<0.2mm accept (The premise does not affect the assembly and function and user operation)		Minor
47	colour difference	OA area	No significant difference in visualization (refer to the limit sample if necessary)		
48	Overfill	Whole area	Not allowed in AA area		Minor
			The visible part of the periphery cannot be seen after assembly, and cannot affect the assembly		
49	Protective film	Whole area	Film position deviation≤0.15mm		Minor
			Scratch: no control when don't damage the body		
			Overfill/ lack of plastic/ Burr: no control		
			Not control the bubble inside the cover protection film		
50	Easy to tear	Cover surface	Function failure\ damaged\ Missing label: not allowed		
			Wrinkle\ Convex- concave point\ dirty\ punching\ burr\ squeeze out: not control		
51	Composite tape	LTPS	Don't go beyond the edge of panel.		
			Folds\ Light leakage\ Impact assembly or thickness: not allowed		
			Damaged: not allowed		
			Bump does not affect the assembly: not control		
			Punching the bad size meet the drawings requirements: not control		
			Non- wipe dirty\ foreign body: not allowed		
			Foreign objects in accordance with the standard line/ point		
			Burr does not exceed the screen edge: not control		
			Do not have obvious bubbles		
Gum flower\ Overfill: no control					
52	Film warpage	Whole area	Warpage≤0.2mm		Minor
53	ICON hole	OA area	chromatic aberration、double image、dot defect、line defect: not allowed (or refer to limited sample)		Minor
54	Ear piece hole	OA area	left- right asymmetry, Hole Rather large/ small or off normal(Out of specification) No chamfer, Uneven polishing: not allowed		
55	Ink bumps	OA area	Positive side reference point defects; The backside does not affect the assembly; Ink overflow or		

			accumulation: notallowed					
56	Coverconcave convexpoint	Whole area	Front:Height&depth ≤ 0. 15 mm, size ≤ 0.4 mm, if necessaryreferencelimitsample					
			Back: Don'taffectthefitprocessisnotcontrolled					
57	InsulationTape	Bondin garea	Obvious wrinklesandbubbles: notallowed				Minor	
		Compo nenta rea	Scratch/ Gumflower: notcontrol					
			Non- wipedirty: notallowed					
			Offsetcannotexceedtheedgeoftheproduct, Others arerequiredtothedrawings					
			Burr\ Overfill: notcontrol					
			Damaged/ incomplete/ missingpaste: notallowed					
58	Cover edge/side breakage	Edgeof cover	X	Y	Z	D S	Accepta ble number	Minor
			X<0.2mm	Y<0.2mm	Z≤1/2 t	D S > 5 m m	Unilateral ≤2	
			X>0.2mm	/	/	notallowed		
			/	Y>0.2mm	/	notallowed		
			/	/	Z>1/2T	notallowed		
			Cracksare notallowed					
59	Blunt	Whole area	Not allowed				Fatal flaw	
60	Fitbubble	AA	Accordingtothepunctatespecifications				Minor	
61	Visionareaedge defect	OA	D≤0.2mm, DS>10,N≤2 (hole saw tusk less than 2) , ifnecessaryreferencelimitsample.				Minor	
62	Cover heterochrosis	OA	Heterochrosisideexecuteaccordingtopointdefect size,bulk/stickrefertoLimitedsample				Minor	

10MechanicalDrawing



11 Precautions for Use of AMOLED Modules

11.1 Handling Precautions:

- 11.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from height. Do not press down the screen on the adjoining areas too hard because the color tone may be shifted. The polarizer covering the display surface of the AMOLED module is soft and easily scratched.
- 11.1.2 Handle this polarizer carefully.
- 11.1.3 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.
- 11.1.4 Solvents may damage the polarizer. Do not use water, ketone or aromatic solvents except ethyl alcohol. Do not attempt to disassemble the AMOLED module.
- 11.1.5 If the logic circuit power is off, do not apply the input signals. To prevent destruction from static electricity, be careful to maintain an optimum working environment. Be sure to make yourself in contact with the ground when handling the AMOLED modules.
- 11.1.6 Tools required for assembly, such as soldering irons, must be properly grounded.
- 11.1.7 To reduce the generation of static electricity, do not conduct assembly or other work
- 11.1.8 dry conditions. 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 be generated.
- 11.1.9
- 11.1.10

Storage Precautions:

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

11.2.2 The AMOLED modules should be stored under the recommended storage temperature range.

If the AMOLED modules will be stored for a long time, the recommended conditions are:

Temperature: 0 °C ~ 40 °C

Relative humidity: ≤ 80%

11.2.3 The AMOLED modules should be stored in a room without acid, alkali, or harmful gases.

11.3 Transportation Precautions:

11.3.1 The AMOLED modules should not be subjected to falling or violent shocks during transportation.

In addition, excessive pressure, water, dampness, and direct sunlight should be avoided.