Display Elektronik GmbH

DATA SHEET

OLED MODULE

DEP 5681210A-RGB

4,39“ AM-OLED

Product Specification

Version: 1

10.05.2025

Revision History

Date	Rev. No.	Page	Summary
27.04.2025	0	ALL	FIRST ISSUE
10.05.2025	1	6	UPDATE DRAWING

Contents

* Description

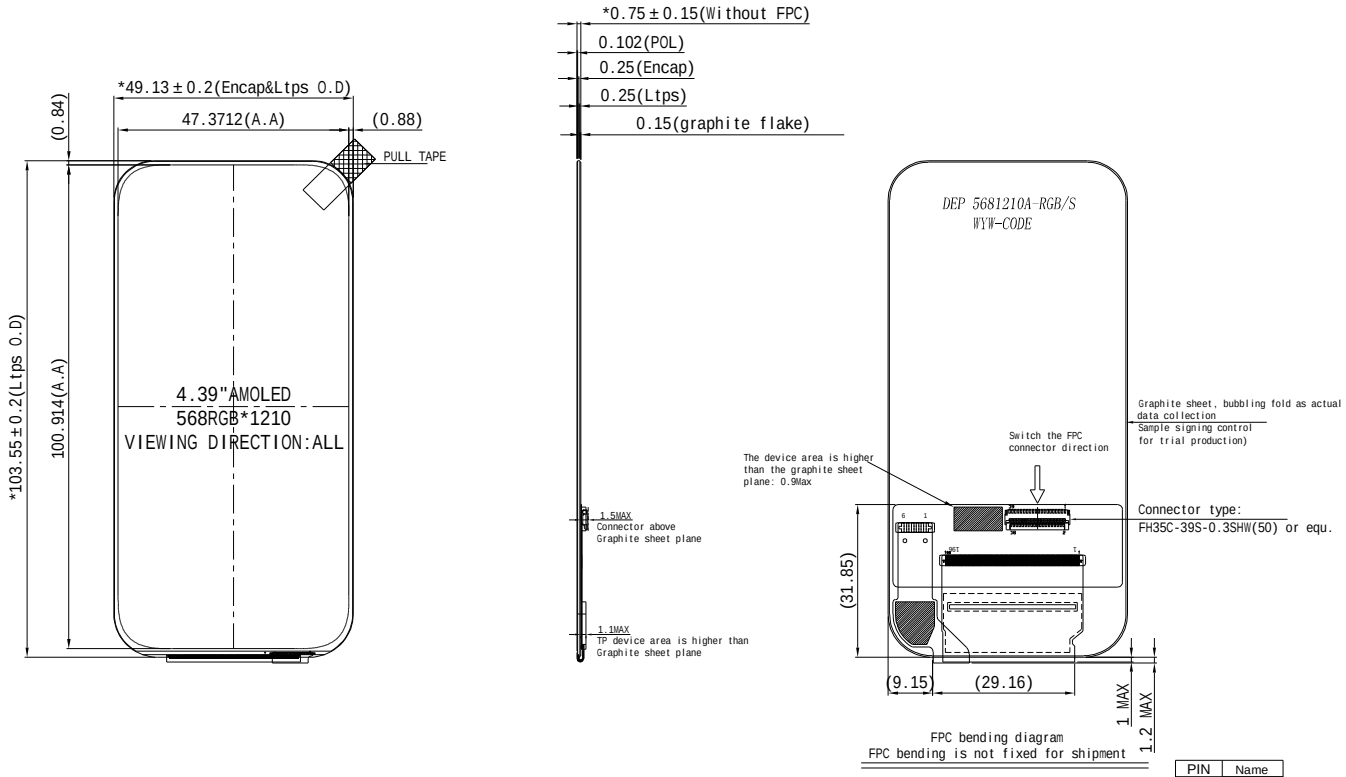
4.39” is a color active matrix AMOLED module using Low Temperature Poly-silicon Thin Film Transistors as active switching devices. The resolution of a 4.39” AMOLED contains 568xRGBx1210 Pixels and can display up to 16.7 Million colors.

1. General Specifications

Feature		Spec	Remark
Display Specification	Screen Size (Inch)	4.39	-
	Display Mode	AMOLED	-
	Resolution (Dot)	568 x 1210	-
	Active Area (mm)	47.3712 x 100.914	-
	Pixel Pitch (mm)	0.0834 x 0.0834	-
	Technology Type	LTPS	-
	Color Depth	16.7 Million	-
	Interface	MIPI 2-LANE	-
Mechanical Characteristics	Polarizer Surface Treatment	HC Coating	-
	With TP/Without TP	With TP(on Cell)	-
	Module Outline Dimension(W x H x D) (mm)	49.13 x 103.55 x 0.75	-
Electronic	Driver IC(Type)	SD5207	-
	Touch IC(Type)	CST3530	-
	Frame Rate	60Hz	-

Note 1: Requirements on Environmental Protection: RoHS

2. Outline Dimension



NOTE:
1.DISPLAY TYPE: AMOLED 4.39',16.7M COLORS
2.VIEWING DIRECTION: ALL
3.RESOLUTION RATIO: 568(RGB) X 1210 DOTS
4.DRIVER IC: SD5207; Touch IC:CST3530
5.Interface: MIPI 2 lanes
6.OPERATING TEMP: -20°C TO 70°C
STORAGE TEMP: -30°C TO 80°C
7.Tape * is the key size8.RoHS COMPLIANT.
9.It is recommended to reserve a gap of 0.3mm between the back of the module and the housing in the thickness direction.10.It is recommended that the VA window be 0.3mm larger than the AA side of the module.

PIN	Name
1	ELVDD
2	ELVDD
3	ELVDD
4	ELVSS
5	ELVSS
6	ELVSS
7	GND
8	AVDD
9	NC
10	GND
11	GND
12	D0P
13	NC
14	D0N
15	GND
16	GND
17	GND
18	CLKP
19	NC
20	CLKN
21	GND
22	GND
23	GND
24	D1P
25	NC
26	D1N
27	GND
28	GND
29	IOVCC
30	RESX
31	VCI
32	AVDD_EN
33	TP_VCI
34	SWIRE
35	TP_RST
36	TE1
37	TP_SCL
38	TP_SDA
39	TP_INT

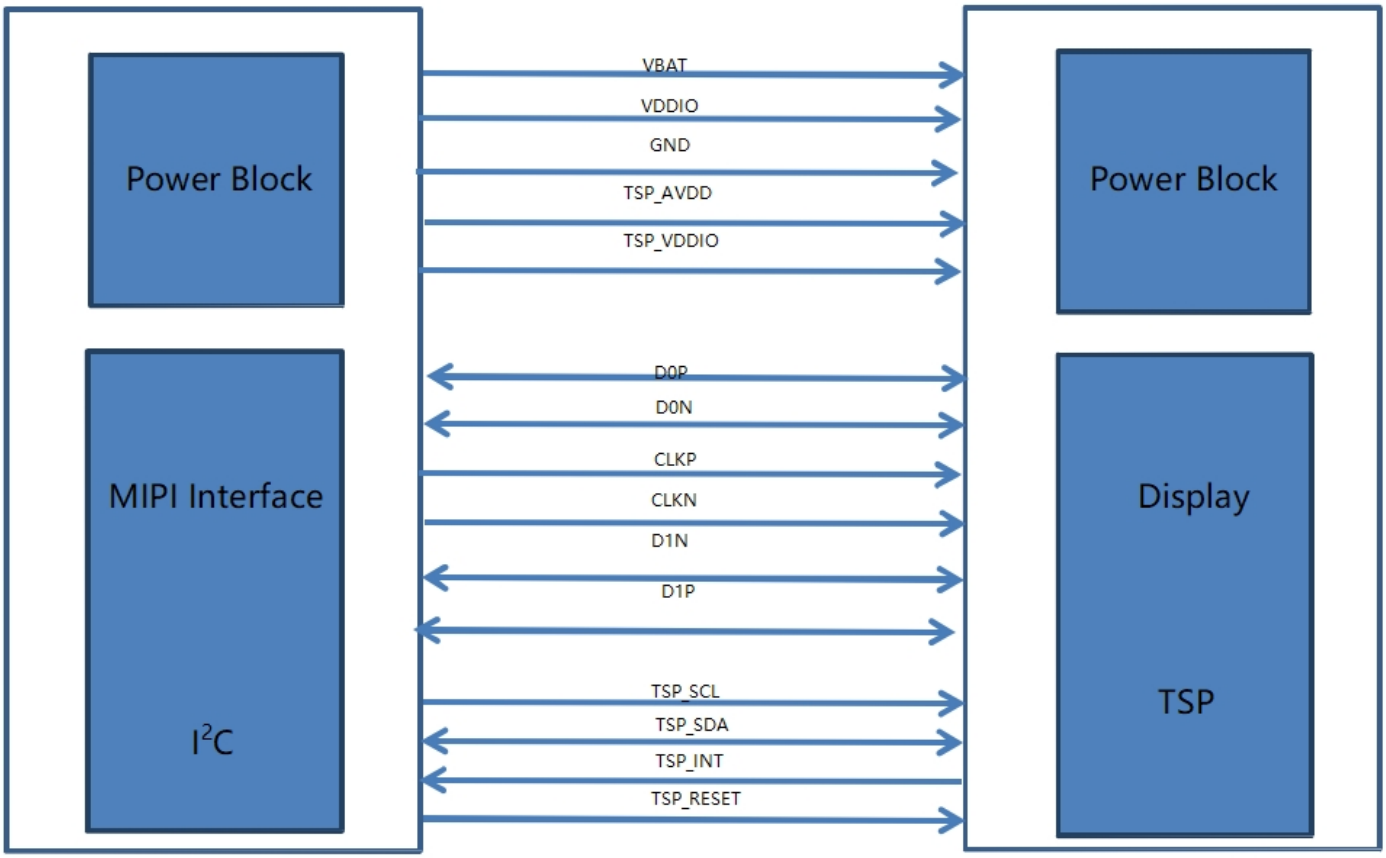
3. Input/output Terminals

3.1 Main TP-FPC Pin Assignment

Number	Signal	Description	I/O
1	ELVDD	AMOLED EL Positive power	P
2	ELVDD		
3	ELVDD		
4	ELVSS	AMOLED EL Negative power	P
5	ELVSS		
6	ELVSS		
7	GND	Ground	P
8	AVDD	AMOLED charge pumping power for DDIC	P
9	NC	No Connection	--
10	GND	Ground	P
11	GND	Ground	P
12	D0P	MIPI Data Line	I
13	NC	No Connection	--
14	D0N	MIPI Data Line	I
15	GND	Ground	P
16	GND	Ground	P
17	GND	Ground	P
18	CLKP	MIPI CLK Line	I
19	NC	No Connection	--
20	CLKN	MIPI CLK Line	I
21	GND	Ground	P
22	GND	Ground	P
23	GND	Ground	P
24	D1P	MIPI Data Line	I
25	NC	No Connection	--
26	D1N	MIPI Data Line	I
27	GND	Ground	P
28	GND	Ground	P
29	IOVCC	AMOLED logic power for DDIC	P
30	RESX	Drive IC reset	I
31	VCI	AMOLED logic power for DDIC	P
32	AVDD_EN	AVDD enable	I
33	TP_VCI	Analog Power for Touch Panel	P
34	SWIRE	Control the PMIC	I

35	TP_RST	Reset Pin for Touch Panel	I
36	TE1	Tear Effect	I
37	TP_SCL	Serial Clock Signal for Touch Panel I2C I/F	I
38	TP_SDA	Serial Data Signal for Touch Panel I2C I/F	I
39	TSP_INT	Interrupt Signal for Touch Panel	I

3.2 MCU and Display Module Interface Conflagration



4. AMOLED Optical Characteristics

4.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max.	Unit.	Note
Contrast Ratio		CR	Θ=0 Normal Viewing Angle	--	100000:1	--		(1)(2)
Response Time	Rising	$T_{R+}T_F$		--	-	2	msec	(1)(3)
	Falling			--				
Color Gamut		S(%)		97	100	--	%	
Brightness Uniformity		W255		85			%	(5)
Brightness		Bp		550	600		cd/m2	
Color Filter Chromacicity	White	W_X		-0.02	0.300	+0.02	--	(1)(4)
		W_Y			0.310			
	Red	R_X		-0.03	0.682	+0.04		
		R_Y			0.315			
	Green	G_X			0.236			
		G_Y			0.722			
	Blue	B_X			0.138			
		B_Y			0.046			
Viewing Angle	Hor.	ΘL	CR>10	75	80	--	Degree	(1)(4)
		ΘR		75	80	--		
	Ver.	ΘU		75	80	--		
		ΘD		75	80	--		
Lifetime			Ta=25°C	20000	--	--	hrs	--

Measuring Condition

Measuring surrounding: dark room

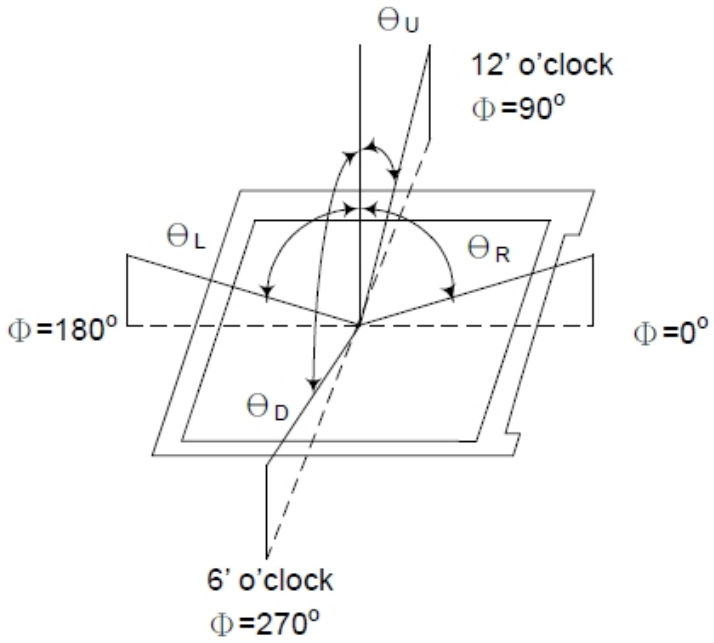
Ambient temperature: 25°C±2°C

15min. warm-up time.

Measuring Equipment

FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

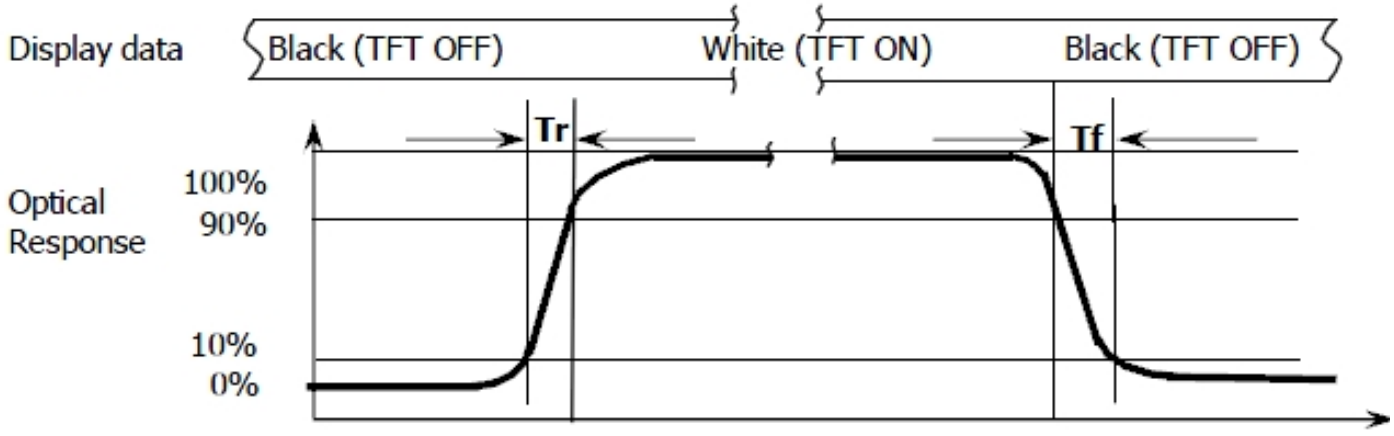
Note (1): Definition of Viewing Angle:



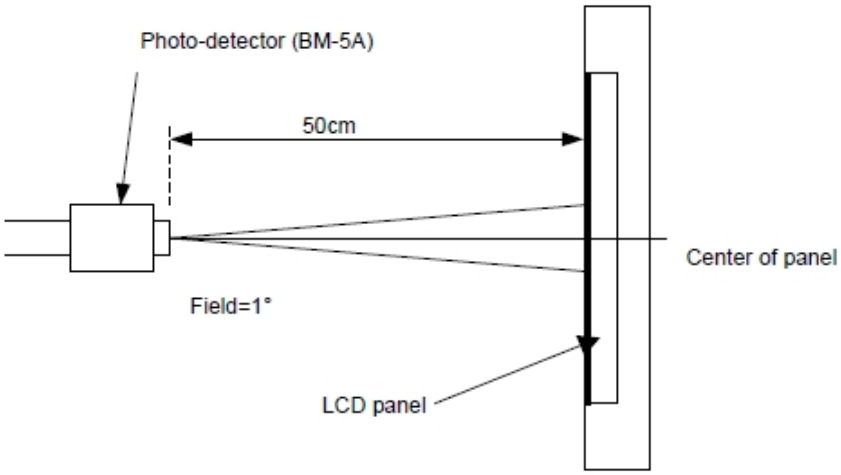
Note (2): Definition of Contrast Ratio (CR): measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

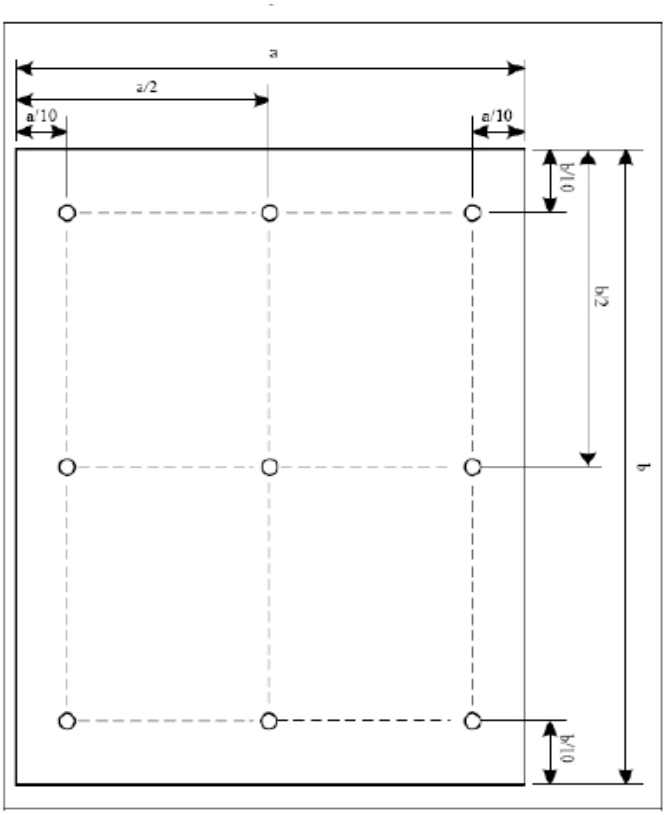
Note (3): Response Time:



Note (4): Definition of optical measurement setup



Note (5): Luminance Uniformity of these 9 points is defined as below:



$$\text{Uniformity} = \frac{\text{minimum luminance in 9 points (1-9)}}{\text{maximum luminance in 9 points (1-9)}}$$

$$\text{Luminance} = \frac{\text{Total Luminance of 9 points}}{9}$$

5. Electrical Characteristics

5.1 Absolute Maximum Rating

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

Item	Symbol	Min.	Max.	Unit	Note
Analog Power Supply	VCI	0	+4	V	Note1
Logic Power Supply	VDDIO=IOVCC	0	+4	V	-
Analog Power Supply	AVDD	0	+10	V	-
Positive Power Input	ELVDD	-	+5.0	V	-
Negative Power Input	ELVSS	-5.0	-	V	-

NOTE1: If the absolute maximum rating of even is one of the above parameters is exceeded even momentarily, the quality of the product may be degraded. Absolute maximum ratings, therefore, specify the values exceeding which the product may be physically damaged.
Be sure to use the product within the range of the absolute maximum ratings.

5.2 DC Electrical Characteristics

Item		Symbol	Min.	Typ.	Max.	Unit
Logic Power Supply		VDDIO=IOVCC	1.65	1.80	1.98	V
Analog Power Supply		VCI	2.65	3.0	3.60	V
Analog Power Supply		AVDD	-	7.6	-	V
Default Positive Output Voltage		ELVDD		4.60		V
Positive Output Voltage Total Variation				-		%
Default Negative Output Voltage		ELVSS		-3.50		V
Negative Output Voltage Total Variation				-		%
Input Signal Voltage	High Level	VIH	0.70*V_{DDIO}	-	VDDIO	V
	Low Level	VIL	GND	-	0.30*V_{DDIO}	V
Output Signal Voltage	High Level	VOH	0.80*V_{DDIO}	-	VDDIO	V
	Low Level	VOL	GND	-	0.20*V_{DDIO}	V

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

6. AC Characteristics

6.1 MIPI DC Characteristics

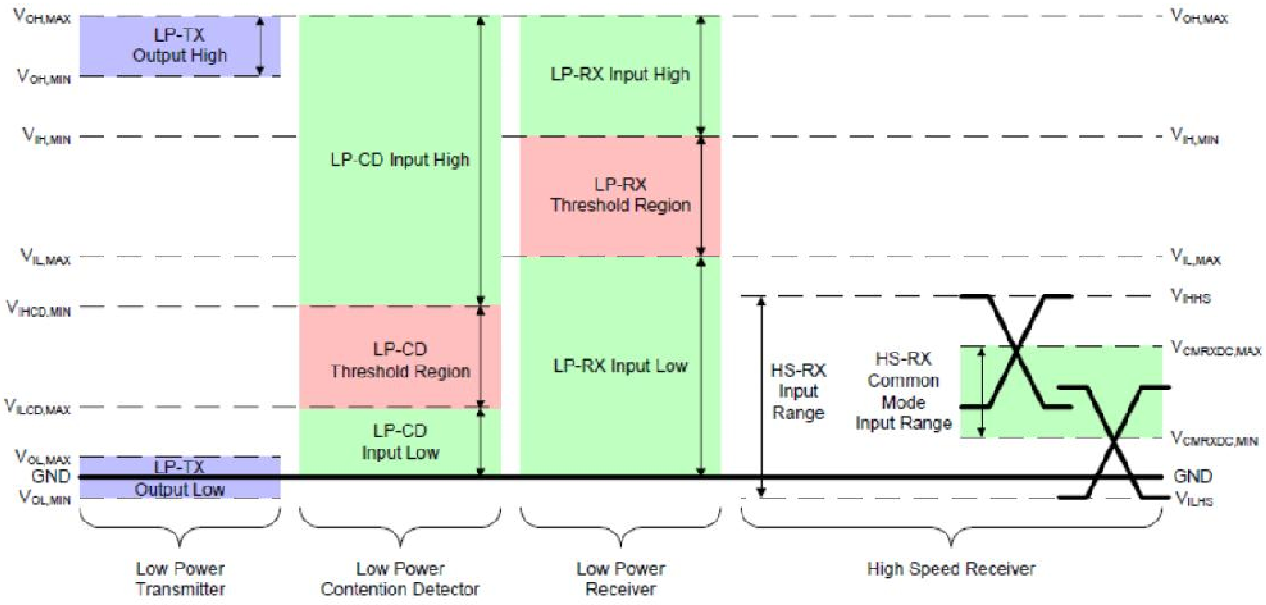


Figure 8-4-1-1 MIPI DC Characteristics

DC characteristics for MIPI LP mode:

Parameter	Description	Min	Nom	Max	Unit
VIH	Logic 1 input voltage	880			mV
VIL	Logic 0 input voltage			550	mV
VOH	Logic 1 output voltage	1	1.1	1.15	V
VOL	Logic 0 output voltage	-50	-	50	mV

DC characteristics for MIPI HS mode:

Parameter	Description	Min	Nom	Max	Unit
VCMRX(DC)	Common-mode voltage HS receive mode	70		330	mV
VIDTH	Differential input high threshold			70	mV
VIDTL	Differential input low threshold	-70			mV
VIHHS	Single-ended input high voltage			460	mV
VILHS	Single-ended input low voltage	-40			
ZID	Differential input impedance	80	100	120	Ω

6.2 MIPI AC Characteristics

[mipi_D-PHY_specification_2.1]

HS clock transmission

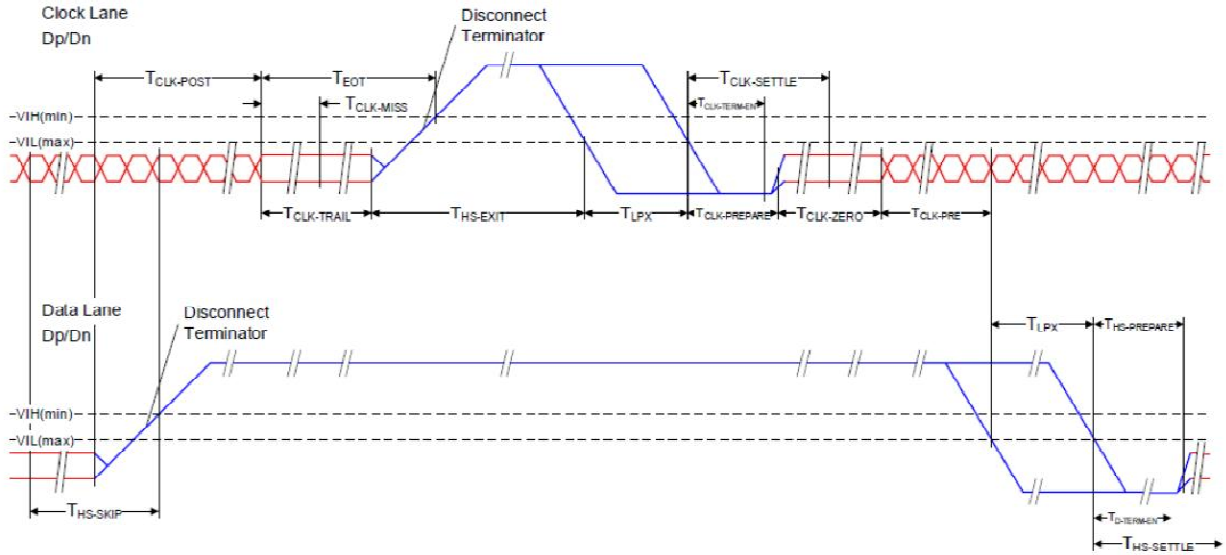


Figure 8-4-2-2 HS Clock Transmission

HS Data Transmission Burst

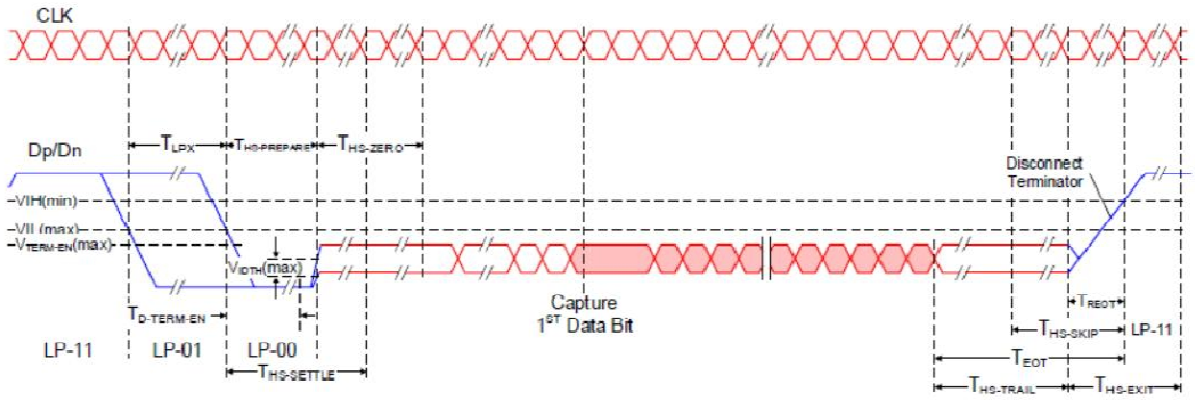


Figure 8-4-2-1 HS Data Transmission

Turnaround Procedure

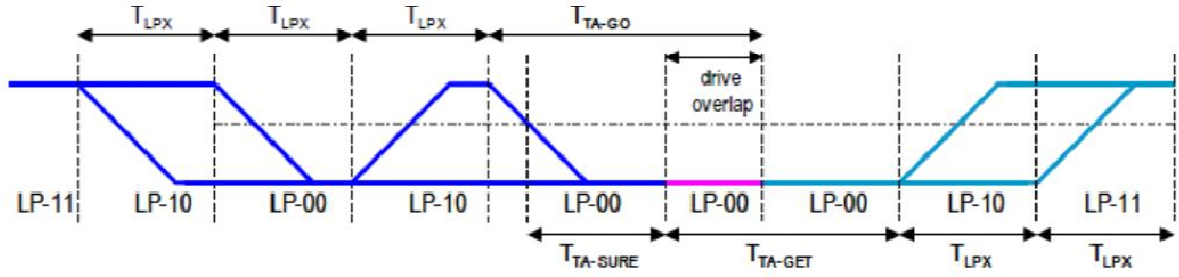


Figure 8-4-2-3 Turnaround Procedure

Parameter	Description	Min	Typ	Max	Unit	Notes
$T_{CLK-MISS}$	Timeout for receiver to detect absence of Clock transitions and disable the Clock Lane HS-RX.			60	ns	1, 5
$T_{CLK-POST}$	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 $T_{CLK-TRAIL}$.	60 ns + 52*UI			ns	5
$T_{CLK-PRE}$	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	5
$T_{CLK-PREPARE}$	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	5
$T_{CLK-SETTLE}$	Time interval during which the HS receiver should ignore any Clock Lane HS transitions, starting from the beginning of $T_{CLK-PREPARE}$.	95		300	ns	6, 7
$T_{CLK-TERM-EN}$	Time for the Clock Lane receiver to enable the HS line termination, starting from the time point when Dn crosses $V_{IL,MAX}$.	Time for Dn to reach $V_{TERM-EN}$		38	ns	6
$T_{CLK-TRAIL}$	Time that the transmitter drives the HS-0 state after the last payload clock bit of a HS transmission burst.	60			ns	5
$T_{CLK-PREPARE} + T_{CLK-ZERO}$	$T_{CLK-PREPARE}$ + time that the transmitter drives the HS-0 state prior to starting the Clock.	300			ns	5
$T_{D-TERM-EN}$	Time for the Data Lane receiver to enable the HS line termination, starting from the time point when Dn crosses $V_{IL,MAX}$.	Time for Dn to reach $V_{TERM-EN}$		35 ns + 4*UI		6
T_{EOT}	Transmitted time interval from the start of $T_{HS-TRAIL}$ or $T_{CLK-TRAIL}$, to the start of the LP-11 state following a HS burst.			105 ns + n*12*UI		3, 5
$T_{HS-EXIT}$	Time that the transmitter drives LP-11 following a HS burst.	100			ns	5

Parameter	Description	Min	Typ	Max	Unit	Notes
$T_{HS-PREPARE}$	Time that the transmitter drives the Data Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission	40 ns + 4*UI		85 ns + 6*UI	ns	5
$T_{HS-PREPARE} + T_{HS-ZERO}$	$T_{HS-PREPARE}$ + time that the transmitter drives the HS-0 state prior to transmitting the Sync sequence.	145 ns + 10*UI			ns	5
$T_{HS-SETTLE}$	Time interval during which the HS receiver shall ignore any Data Lane HS transitions, starting from the beginning of $T_{HS-PREPARE}$. The HS receiver shall ignore any Data Lane transitions before the minimum value, and the HS receiver shall respond to any Data Lane transitions after the maximum value.	85 ns + 6*UI		145 ns + 10*UI	ns	6
$T_{HS-SKIP}$	Time interval during which the HS-RX should ignore any transitions on the Data Lane, following a HS burst. The end point of the interval is defined as the beginning of the LP-11 state following the HS burst.	40		55 ns + 4*UI	ns	6
$T_{HS-TRAIL}$	Time that the transmitter drives the flipped differential state after last payload data bit of a HS transmission burst	max(n*8*UI, 60 ns + n*4*UI)			ns	2, 3, 5
T_{INIT}	See Section 6.11.	100			µs	5
T_{LPX}	Transmitted length of any Low-Power state period	50			ns	4, 5
Ratio T_{LPX}	Ratio of $T_{LPX(MASTER)}/T_{LPX(SLAVE)}$ between Master and Slave side	2/3		3/2		
T_{TA-GET}	Time that the new transmitter drives the Bridge state (LP-00) after accepting control during a Link Turnaround.	5*T_{LPX}			ns	5
T_{TA-GO}	Time that the transmitter drives the Bridge state (LP-00) before releasing control during a Link Turnaround.	4*T_{LPX}			ns	5
$T_{TA-SURE}$	Time that the new transmitter waits after the LP-10 state before transmitting the Bridge state (LP-00) during a Link Turnaround.	T_{LPX}		2*T_{LPX}	ns	5
T_{WAKEUP}	Time that a transmitter drives a Mark-1 state prior to a Stop state in order to initiate an exit from ULPS.	1			ms	5

6.3 Display RESET Timing

Reset Input Timing:

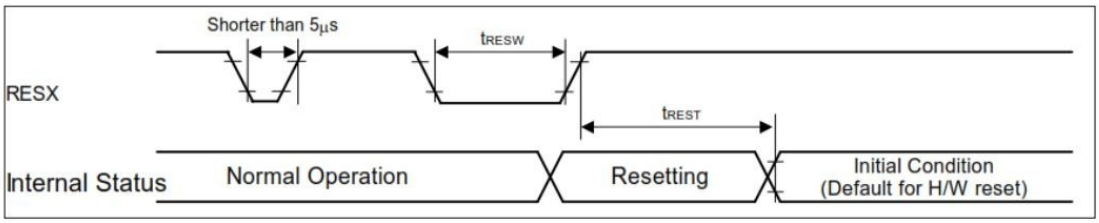


Figure 8-6-1 Reset Function

Symbol	Parameter	Related Pins	Min.	Typ.	Max.	Note	Unit
tRESW	*1) Reset low pulse width	RESX	10	-	-	-	us
tREST	*2) Reset complete time				5	When reset applied during sleep in mode	ms
					120	When reset applied during Sleep out mode	ms

7. Recommended Operating Sequence

7.1 Display Power On / Off Sequence

7.1.1 Power On Sequence

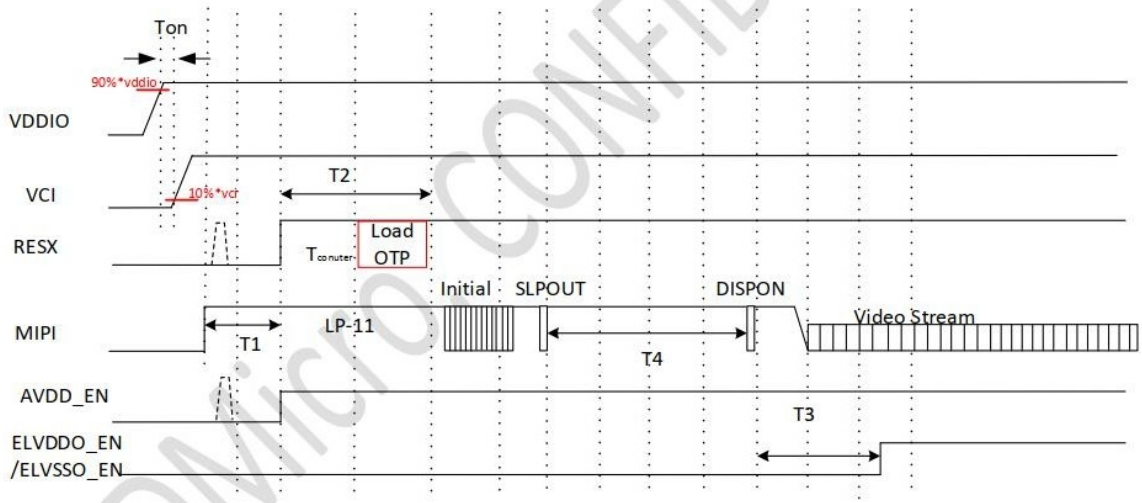


Figure 8-3-1-1 Power on sequence

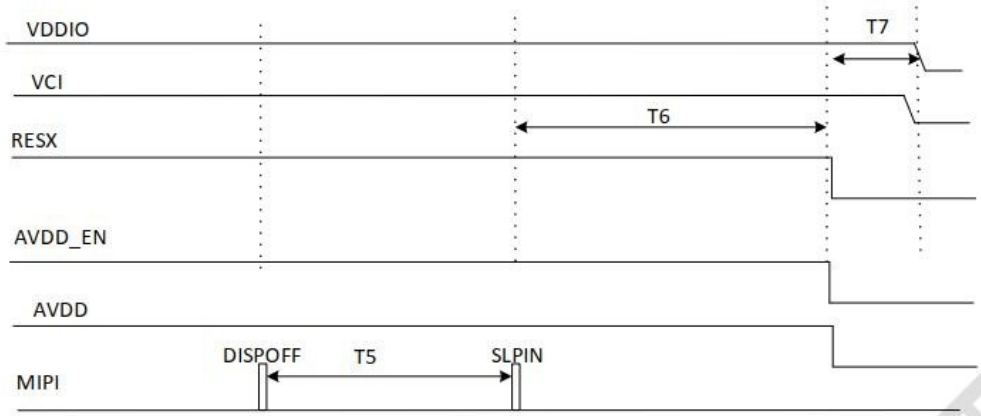
Note: 1.Ton: The time between the VDDIO and the VCI power on, Ton≥0 ms

2.Dotted line is optional.

3. All the power supplies should be stable during display on status.

4. Current of VDDIO, VCI, AVDD should be less than 150mA respectively.

7.1.2 Power Off Sequence



7.2 Brightness Control

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

8. Touch Specification

8.1 Touch Design

Item		Description	Notes
Touch Design	Sensor Structure	Oncell (Pls contact us if you need any cover glass to realize a touch	-
	Sensor Pitch	Tx:4.742mm · Rx:5.048mm	-
	Sensor Pattern	Diamond	-
	CH Number	10(Tx) / 20(Rx)	-
	CTP IC	CST3530	-

8.2 Electrical Characteristics

8.2.1 Maximum Ratings

Item	Symbol	MIN	MAX	Unit
TP Power Supply Input	TP_VCI	2.7	3.6	V

8.2.2 Power supply DC characteristics

Item	Symbol	MIN	TYP	MAX	Unit
TP Power Supply Input	TP_VCI	2.8	2.8/3.0/3.3	3.6	V

8.3 TP FPC Pin Assignment

No	Symbol	I/O	Description
1	GND	GND	Ground
2	TP_VCI	Power	Analog Power for Touch Panel
3	TP_RESET	I	Reset Pin for Touch Panel
4	TP_SDA	I/O	SDA pin for Touch Panel
5	TP_SCL	I	SCL pin for Touch Panel
6	TP_INT	O	Interrupt signal for Touch Panel

9. AMOLED Module Out-Going Quality Level

9.1 VISUAL & FUNCTION INSPECTION STANDARD

9.1.1 Inspection Conditions

Inspection performed under the following conditions is recommended.

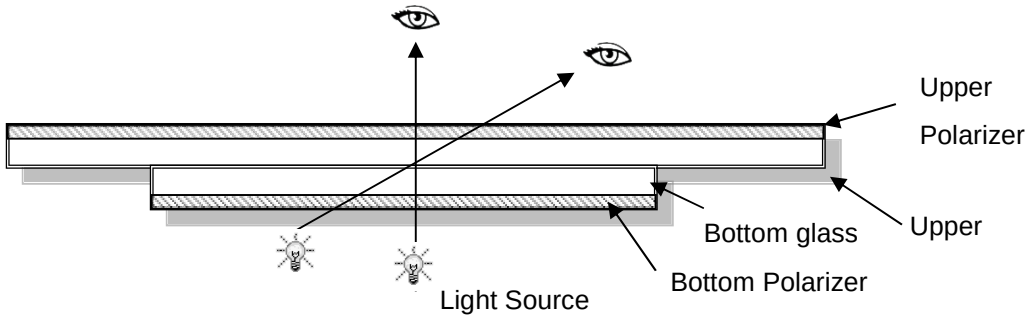
Temperature: 25°C±5°C

Humidity: 65%±10%RH

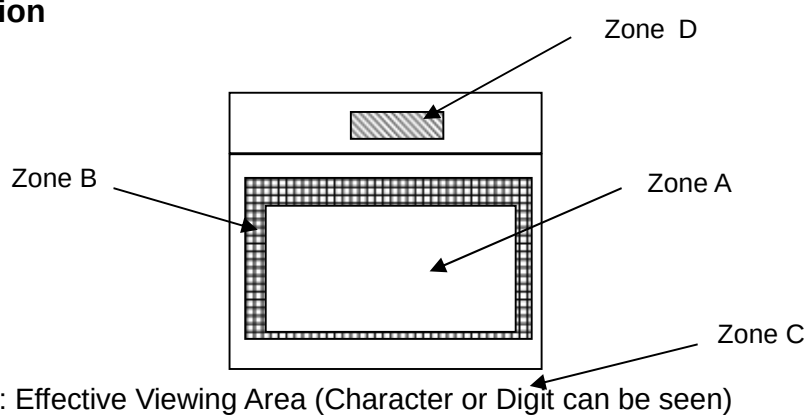
Viewing Angle: Normal viewing Angle.

Illumination: Single fluorescent lamp (300 to 700Lux)

Viewing Distance: 30cm-50cm



9.1.2 Definition



Zone A: Effective Viewing Area (Character or Digit can be seen)

Zone B: Viewing Area except Zone A

Zone C: Outside (Zone A+Zone B) which can not be seen after assembly by customer .)

Zone D: IC Bonding Area

Note: As a general rule ,visual defects in Zone C can be ignored when it doesn't effect product function or appearance after assembly by customer

9.1.3 Sampling Plan

According to GB/T 2828-2003; Normal Inspection, Class Ⅱ

AQL:

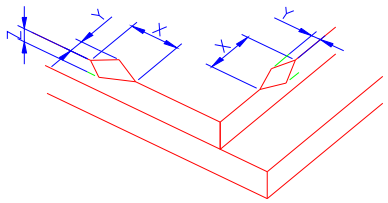
Major Defect	Minor Defect
0.65	1.5

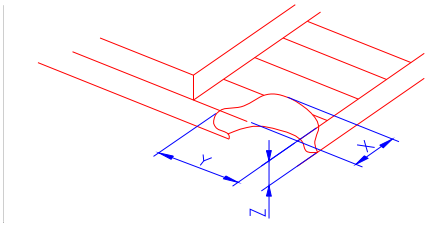
No	Items to be inspected	Criteria	Classification of Defects
1	Functional defects	1) No display, Open or miss line 2) Display abnormally, Short 3) Backlight no lighting, abnormal lighting. etc	Major
2	Missing	Missing components and etc	
3	Outline dimension	Overall outline dimension beyond the drawing is not allowed,deformation and etc	
4	Color tone	Color unevenness, refer to limited sample	Minor
5	Spot/Line defect	Light dot,Dim spot,(Note1) Polarizer Air Bubble, Polarizer accidented spot and etc	
6	Soldering appearance	Good soldering , Peeling off is not allowed and etc	
7	AMOLED /Polarizer	Black/White spot/line, scratch, crack, etc.	

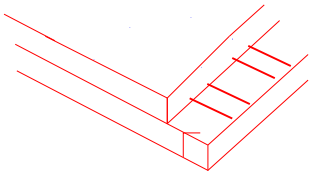
Note1: a) Light dot: Dots appear bright and unchanged in size in which AMOLED panel is displaying under black pattern.

b) Dim dot: Dots appear dark and unchanged in size in which AMOLED panel is displaying under pure red, green, blue picture.

9.1.4 Criteria (Visual)

<table>
<tr><th>Number</th><th>Items</th><th>Criteria(mm)</th></tr>
<tr><td rowspan="3">1.0 AMOLED Crack/Broken
NOTE:
X: Length
Y: Width
Z: Height
L: Length of ITO,
T: Height of AMOELD</td><td>(1) The edge of AMOLED broken</td><td> 

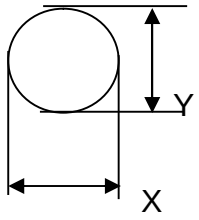
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≤3.0mm</td><td><Inner border line of the seal</td><td>≤T</td></tr>
</table></td></tr>
<tr><td>(2)AMOLED corner broken</td><td> 

<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≤3.0mm</td><td>≤L</td><td>≤T</td></tr>
</table></td></tr>
<tr><td>(3) AMOLED crack</td><td> 

Crack
Not allowed</td></tr>
</table>

2.0

Spot defect



Φ=(X+Y)/2

① light dot（ black/white spot , pinhole, stain，etc.）

Zone / Size (mm)	Acceptable Qty		
	A	B	C
Φ≤0.10	Ignore	Ignore	
0.10<Φ≤0.25	4(distance≧10mm)		
0.25<Φ≤0.35	3		
Φ>0.4	0		

② Dim spot（light leakage、dent、dark spot，etc）

Zone / Size (mm)	Acceptable Qty		
	A	B	C
Φ≤0.1	Ignore	Ignore	
0.10<Φ≤0.25	4(distance≧10mm)		
0.25<Φ≤0.35	3		
Φ>0.4	0		

③ Polarizer accidented spot

Zone / Size (mm)	Acceptable Qty		
	A	B	C
Φ≤0.2	Ignore		Ignore
0.3<Φ≤0.5	3(distance≧10mm)		
Φ>0.5	1		

④Polarizer Bubble

Zone / Size (mm)	Acceptable Qty		
	A	B	C
Φ≤0.1	Ignore		Ignore
0.10<Φ≤0.25	2(distance≧10mm)		
0.25<Φ≤0.35	1		
Φ>0.4	0		

3.0 AMOLED Pixel defect

Pixel bad points

Item	Zone A	Acceptable Qty
Bright dot	Random	N≤2
	2 dots adjacent	N≤0
	3 dots adjacent	N≤0
Dark dot	Random	N≤3
	2 dots adjacent	N≤0
	3 dots adjacent	N≤0
Distance	1. Minimum Distance Between Bright dots. 2. Minimum Distance Between dark dots 3. Minimum Distance Between dark and bright dot.	5mm
Total bright and dark dot		N≤4

Note:

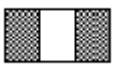
A) Bright dot：Dots appear bright and unchanged in size in which AMOLED panel is displaying under black pattern.

B) Dark dot: Dots appear dark and unchanged in size in which AMOLED panel is displaying under pure red, green, blue picture.

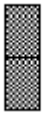
C) 2 dot adjacent = 1 pair = 2 dots

Picture:

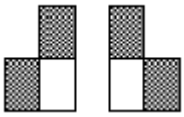
2 dot adjacent



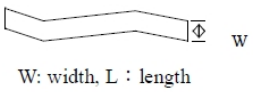
2 dot adjacent



2 dot adjacent (vertical)



2 dot adjacent (slant)

<table>
<tr>
<td>4.0</td>
<td>Line defect (AMOLED /Polarizer backlight black/white line, scratch, stain)
 

N：Count</td>
<td>
<table>
<tr><th rowspan="2">Width(mm)</th><th rowspan="2">Length(mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Φ≤0.05</td><td>Ignore</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.05<W≤0.06</td><td>L≤5.0</td><td colspan="2">N≤3</td></tr>
<tr><td>0.07<W≤0.08</td><td>L≤4.0</td><td colspan="2">N≤2</td></tr>
<tr><td>W>0.08</td><td colspan="4">Define as spot defect</td></tr>
</table>
</td>
</tr>
<tr>
<td>5.0</td>
<td>Electronic Components SMT.</td>
<td>Not allow missing parts，solderless connection，cold solder joint，mismatch，The positive and negative polarity opposite</td>
</tr>
<tr>
<td>6.0</td>
<td>Display color& Brightness.</td>
<td>1. Color：Measuring the color coordinates, The measurement standard according to the datasheet or samples.
2. Brightness：Measuring the brightness of White screen, The measurement standard according to the datasheet or Samples.</td>
</tr>
</table>

Criteria (functional items)

Number	Items	Criteria (mm)
1	No display	Not allowed
2	Missing segment	Not allowed
3	Short	Not allowed
4	Backlight no lighting	Not allowed

10. Reliability Test Result

Item	Condition	Inspection after test
High Temperature Operating	70°C, 96h	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 1. Air bubble in the AMOLED; 2. Non-display; 3. Missing segments/line; 4. Glass crack; 5. Current IDD is twice higher than initial value.
Low Temperature Operating	-20°C, 96h	
High Temperature Storage	80°C, 96h	
Low Temperature Storage	-30°C, 96h	
High Temperature & High Humidity Operating	+60°C, 90% RH ,96h	
Thermal Shock (Non-operation)	-10°C, 30 min ↔ 60°C, 30 min, Change time: 5min 20CYC.	
ESD Test	C=150pF, R=330,5points/panel Air:±8kV, 5times; Contact:±4kV, 5 times; (Environment: 15°C~35°C, 30%~60%).	
Vibration (Non-operation)	Frequency Range: 10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition).	
Box Drop Test	1 Corner 3 Edges 6 faces,80㎝(MEDIUM	

Remark:

1. The test samples should be applied to only one test item.
2. Sample size for each test item is 3~10pcs.
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.
6. The color fading mura of polarizing filter should not care.

11. Cautions and Handling Precautions

11.1 Handling and Operating the Module

When the module is assembled, it should be attached to the system firmly.
Do not warp or twist the module during assembly work.
Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.
Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.
Do not allow drops of water or chemicals to remain on the display surface.
If you have the droplets for a long time, staining and discoloration may occur.
If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane.
Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.
Protect the module from static; it may cause damage to the CMOS ICs.
Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
Do not disassemble the module.
Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
Pins of I/F connector shall not be touched directly with bare hands.
Do not connect, disconnect the module in the “Power ON” condition.

11.2 Storage and Transportation.

Do not leave the panel in high temperature, and high humidity for a long time.
It is highly recommended to store the module with temperature from 0°C to 35°C
and relative humidity of less than 70%
Do not store the AMOLED module in direct sunlight.
The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.
It is recommended that the modules should be stored under a condition where no condensation is allowed.
Formation of dewdrops may cause an abnormal operation or a failure of the module.
In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.

This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.