PRODUCT	:	AMOLED MODULE
MODEL NO.	:	A1D3T-001
SUPPLIER	:	
DATE	:	Sept. 30,2017

SPECIFICATION

Revision: 0.1

A1D3T-001

This module uses ROHS material

CUSTOMER:

Quality Assurance Department: Approved by: Technical Department:	Approved by:

REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
0.1	2017-9-30	First release	Preliminary

CONTENTS

WRITTEN BY	CHECKED BY	APPROVED BY
ZHU XIAOYONG	YW WANG	HU JUNWEN

n SCOPE

n FEATURES

1) Display color：16.7M colors(24bits)
2) Display format：1.3 Inch Circle 360×360
3) Interface：MIPI 1lane/2lane
4) Driver IC：RM67162F82
5) Polarizer：Hard Coating Polarizer

n APPLICATION

Smart Watch

n GENERAL INFORMATION

Item	Contents	Unit
Display Mode	AMOLED	/
LTPS Glass Outline (W´ H)	35.34 × 36.84	mm
Encapsulation Glass Outline (W´ H)	35.34 ×35.34	mm
Active area	ϕ 32.94	mm
Number of Dots	360×3(RGB)×360	/
Diagonal Inch	1.3	inch
Pixel pitch (W´ H)	91.5 × 91.5	um
Glass Thickness	0.2 (LTPS) 0.205 (Encap) 0.678(Total)	mm

n ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply voltage (Display)	VCC	-0.3	5.5	V
	IOVCC	-0.3	5.5	V
	ELVDD	0.0	6.0	V
	ELVSS	-6.5	0.0	V
Operating temperature	T_{OP}	-20	70	°C
Storage temperature	T_{ST}	-30	80	°C
Humidity	RH	-	90	%RH

Note: Absolute maximum ratings means the product can withstand short-term, NOT more than 120 hours. If the product is a long time to withstand these conditions, the life time would be shorter.

n ELECTRICAL CHARACTERISTICS

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Supply voltage (Display)		VCC		2.7	3.3	3.6	V
		IOVCC		1.65	1.8	3.3	V
		ELVDD	-	4.55	4.6	4.65	V
		ELVSS	-	-2.25	-2.2	-2.15	V
Input voltage	'L' level	VIL	IOVCC=1.65V ~3.3V	0.0	-	0.2*IOVCC	V
	'H' level	VIH		0.8*IOVCC	-	IOVCC	V
Output voltage	'L' level	VOL	I(OH)=-1mA I(OL)=+1mA	0.0	-	0.2*IOVCC	V
	'H' level	VOH		0.8*IOVCC	-	IOVCC	V
Current (Display)	Sleep out mode	I_{VCI}	Full white display	-	3	6	mA
		I_{IOVCC}		-	2	4	mA
		$I_{ELVDD/ELVSS}$		-	15	23	mA
	Sleep in mode	I_{VCI}		-	20	40	uA
		I_{IOVCC}		-	50	100	uA
	Deep Standby Mode	I_{VCI}		-	1	3	uA
		I_{IOVCC}		-	1	3	uA
		$I_{ELVDD/ELVSS}$		-	-	-	mA
Frame Frequency		f_{FRM}		-	60	-	Hz

n OPTICAL CHARACTERISTICS

Item	Symbol	Condition	Min	Type	Max	Unit	Note
Surface Luminance	Lv	θ=0° Æ=0° Ta=25℃	300	350	400	cd/m2	Note1
Luminance uniformity	d WHITE		80	-	-	%	Note2
Contrast Ratio	Cr		10000	-	-	-	Note3
Viewing Angle	q	Up/Down/Right/Left Cr≥10	88	-	-	deg	Note4
Color Coordinate of CIE1931	Red x	θ=0° Æ=0° Ta=25℃	0.635	0.665	0.695	-	Note 5
	Red y		0.309	0.339	0.369	-	
	Green x		0.169	0.219	0.269	-	
	Green y		0.673	0.723	0.773	-	
	Blue x		0.100	0.140	0.180	-	
	Blue y		0.008	0.048	0.088	-	
	White x		0.275	0.295	0.315	-	
	White y		0.295	0.315	0.335	-	
NTSC ratio	-	-	85	100	-	%	CIE1931
Gamma	-	θ=0° Æ=0° Ta=25℃ V(Gray)=44,68,100, 132,164,196,228,25 2,255	2.0	2.2	2.4	-	
Lifetime	T95	25℃	240			h	

Note1. Surface Luminance

- Measurement equipment: CS2000 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The data are measured after OLEDs are lighted on for more than 5 minutes and all pixels are fully white.
- The Surface Luminance is the average value of 5 measured spots (Fig-1):

  Lv = Average Luminance with all white pixels (P_1, P_2, P_3, P_4, P_5)

Note2. Luminance Uniformity

- Measurement equipment: CS2000 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The data are measured after OLEDs are lighted on for more than 5 minutes and all pixels are fully white.
- The Luminance Uniformity is calculated by using following formula:

  d **WHITE** = Lp (Min.) / Lp (Max.)×100 (%)

  Lp (Min.) = Minimum Luminance with all white pixels (P1, P2, P3, P4, P5)

  Lp (Max.) = Maximum Luminance with all white pixels (P1, P2, P3, P4, P5)

Note3. Contrast Ratio

- Measurement equipment: CS2000 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The data are measured after OLEDs are lighted on for more than 5 minutes.
- The Contrast Ratio is calculated by using following formula:

Contrast Ratio(Cr) = Lw / Lb

Lw = Average Luminance with all **white** pixels (P_1, P_2, P_3, P_4, P_5)

Lb = Average Luminance with all **black** pixels (P_1, P_2, P_3, P_4, P_5)

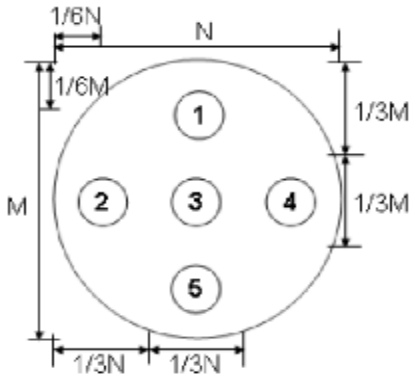


Fig-1

Note4. Viewing Angle

- Measurement equipment: DMS803 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The Viewing Angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the display surface.

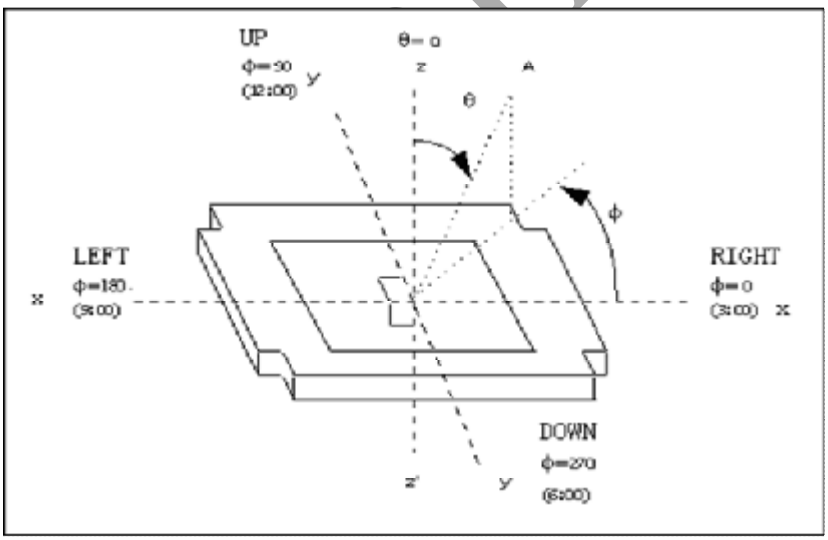


Fig-3

Note5. Color Coordinate of CIE1931

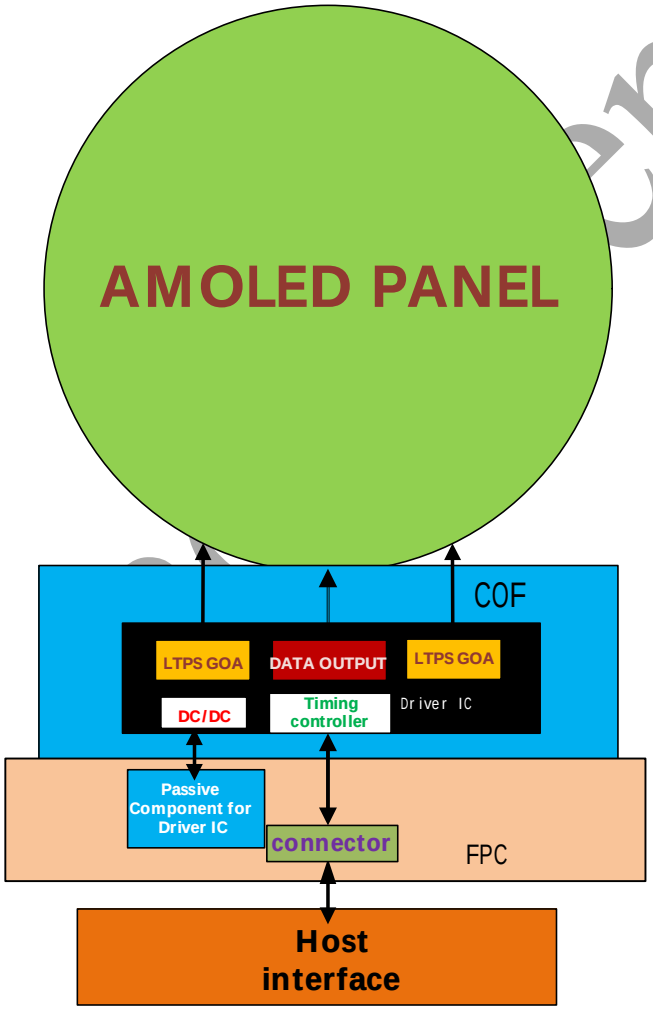
- Measurement equipment: CS2000 or similar equipment.
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- The x, y value of Color Coordinate is determined by measuring at center position of the display panel.

n INTERFACE DESCRIPTION

Interface NO.	Symbol	I/O or Connected to	Description	When not in use
1	TSP_VCC	Power	TP Power Supply	/
2	TSP_IOVCC	Power	TP Power Supply	
3	TP_GND	Power	TP Ground.	/
4	TSP_SCL	I	Touch I2C clock	
5	TSP_SDA	I/O	Touch I2C data	/
6	TSP_HSYNC	I/O	Multi-chip synchronization signal	
7	TSP_INT	I	Touch State change interrupt	
8	TSP_RESET	I	TSP Reset signal. Active low.	/
9	GND	Power	Ground.	/
10	MTP_PWR	I	MTP programming power supply pin. (8V typical) Must be left open or connected to DVSS in normal condition.	
11	TE	O	Tearing effect output pin to synchronize MCU to frame writing, activated by S/W command. When this pin is not activated, this pin is output low. If not used, please open this pin.	/
12	GND	Power	Ground.	
13	D3P/NC	NC	No connection	
14	D3N/NC	NC	No connection	
15	GND	Power	Ground.	
16	DOP	I/O	- These pins are DSI –D0+/- differential data signals if MIPI interface is used	
17	DON	I/O	These pins are DSI –D0+/- differential data signals if MIPI interface is used	/
18	GND	Power	Ground.	/
19	CLKP	I	- These pins are DSI –CLK+/- differential data signals if MIPI interface is used	
20	CLKN	I	These pins are DSI –CLK+/- differential data signals if MIPI interface is used	
21	GND	Power	Ground.	/
22	D1P	I	These pins are DSI –D1+/- differential data signals if MIPI interface is used	
23	D1N	I	These pins are DSI –D1+/- differential data signals if MIPI interface is used	
24	GND	Power	Ground.	
25	D2P/NC	NC	No connection	
26	D2N/NC	NC	No connection	/
27	GND	Power	Ground.	
28	RESET	I	This signal will reset the device and must be applied to properly initialize the chip. Signal is active low.	
29	OLED_EN	O	Power IC enable control pin (Note: “H” = VDDI level, “L” = VSSI level.)	
30	SWIRE	O	Swire protocol setting pin (Note: “H” = VDDI level, “L” = VSSI level.)	
31	PCD	O	PCD (Panel Crack Detection) output pin.	
32	VCC	Power	Input Voltage for analog power supply	/
33	IOVCC	Power	Input voltage for logic/interface power supply	/
34	GND	Power	Ground	/
35	AVDD	NC	No connection	/
36	GND	Power	Ground	

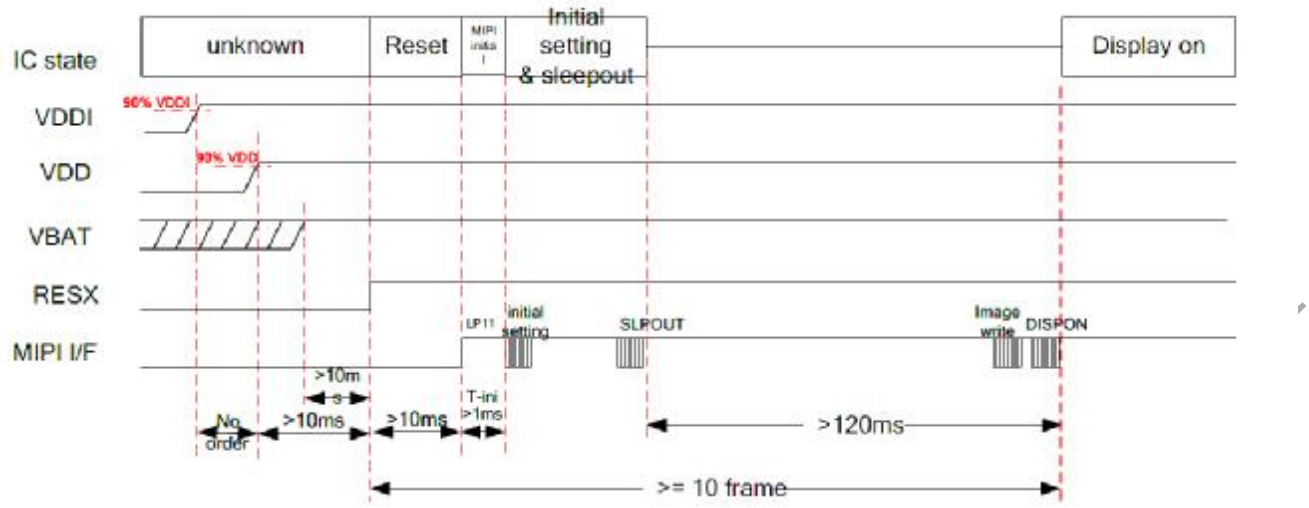
37	ELVDD	Power	Power supply for pixel circuit.	
38	ELVDD			
39	ELVDD			/
40	GND	Power	Ground	/
41	ELVSS	Power	Power supply for pixel circuit.	/
42	ELVSS			/
43	ELVSS			/
44	GND	Power	Ground	/
45	GND			/

Module Block Diagram

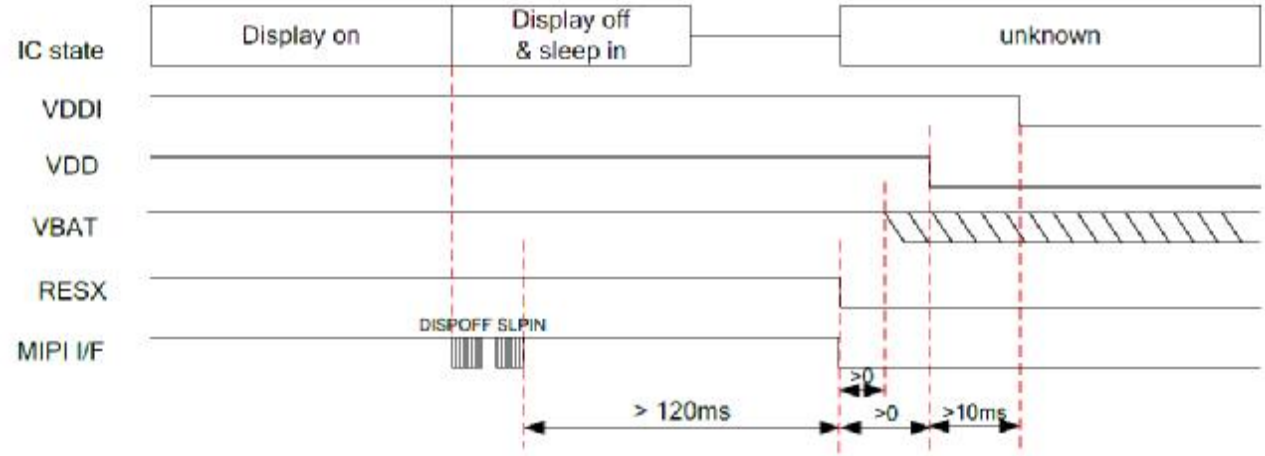


Recommended Operating Sequence

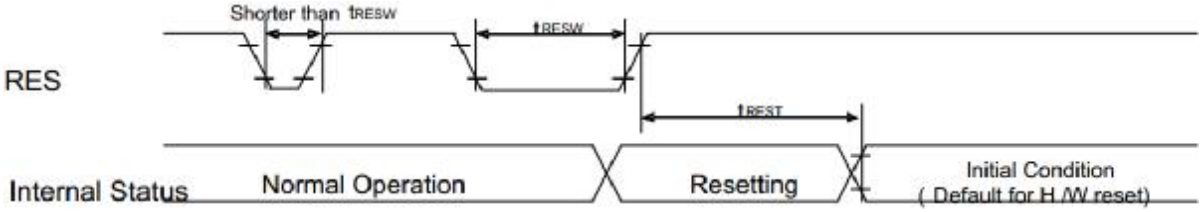
Power on sequence



Power off sequence



Reset Timing

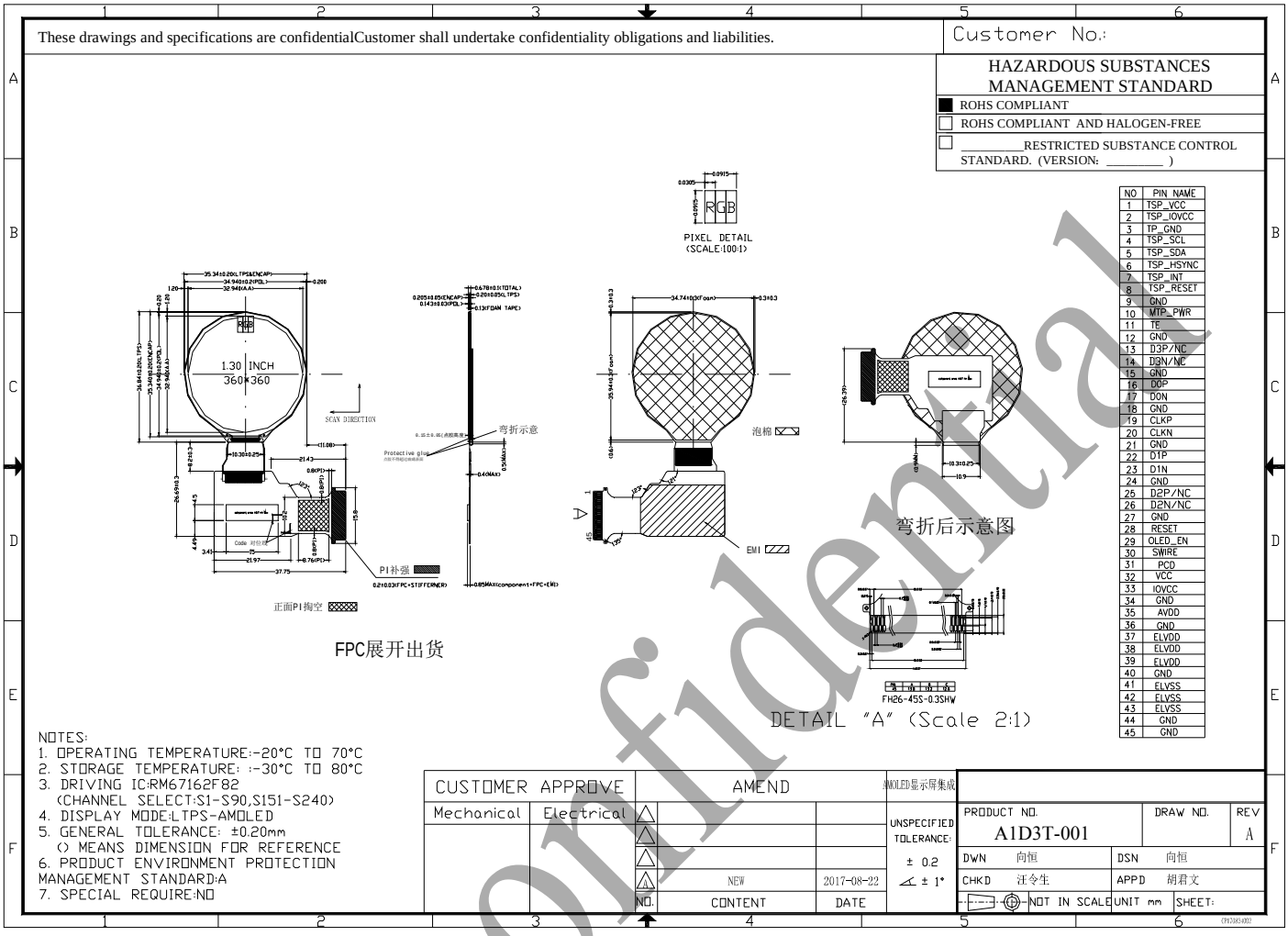


Reset input timing:

IOVCC=1.65 to 3.3V，VCC=2.7 to 3.6V，AGND=DGND=0V，Ta=-40 to 85℃

Symbol	Parameter	Related Pins	MIN	TYP	MAX	Note	Unit
tRESW	Reset low pulse width	RESX	10	-	-	-	Us
tREST	Reset complete time	-	-	-	5	When reset applied during Sleep in mode	ms
		-		-	120	When reset applied during Sleep out mode	ms

n EXTERNAL DIMENSIONS



n RELIABILITY TEST CONDITIONS

No.	Test Item	Test Condition	Qty	Inspection after test
1	High Temperature Storage	80℃±2℃/240 hours	5	Inspection after 2 hours storage at room temperature, the sample shall be free from defects: 1. Remarkable deterioration of No clearly visible defects or display quality. However, any polarizer's deteriorations by the high temperature/ High humidity Storage test and the High temperature/ High humidity Operation test are permitted. 2. No function-related abnormalities. 3. Optical criteria : .White △u'v' ≤0.02 4. No visible defects .(optical / mechanical) . 5. No function-related abnormalities
2	Low Temperature Storage	-30℃±2℃/240 hours	5	
3	High Temperature Operating	70℃±2℃/240 hours	5	
4	Low Temperature Operating	-20℃±2℃/240 hours	5	
5	Temperature Cycle storage	-30℃±2℃~25~80℃±2℃×30cycles (30min.) (5min.) (30min.)	5	
6	High Temperature Humidity Storage	60℃±5℃×90%RH/240 hours	5	
7	ESD test	Voltage:±8KV R: 330Ω C: 150pF Air discharge, 10time	5	
8	Vibration Test	Frequency：10Hz~55Hz~10Hz Amplitude：1.5mm, X，Y，Z direction for total 3hours (Packing condition)	5	
9	Dropping test	Drop to the ground from 75cm height, one time,every side of carton. (Packing condition)	5	

Remark:
1.The test samples should be applied to only one test item.
2.For Damp Proof Test, Pure water(Resistance＞10MΩ) should be used.
3.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.
4.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

nINSPECTION CRITERION

OUTGOING QUALITY STANDARD	Edition: A
TITLE:FUNCTIONAL TEST & INSPECTION CRITERIA	AMOLED Product

This specification is made to be used as thestandard acceptance/rejection criteria for AMOLED Product

1.Sample plan

Sampling plan according to GB/T2828.1-2003/ISO 2859-1：1999 and ANSI/ASQC Z1.4-1993,normal level 2and based on:

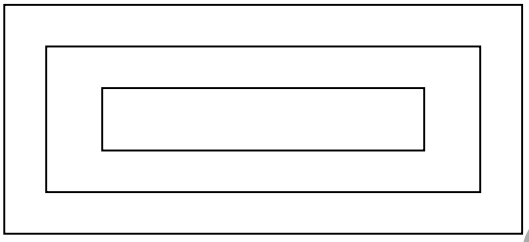
Major defect: AQL 0.65

Minor defect: AQL 1.5

2. Inspection condition

Viewing distance for cosmetic inspection is about 30cm with bare eyes, and under an environmentof 20~40W light intensity, all directions for inspecting the sample should be within 45° against perpendicular line.

3. Definition of inspection zone in AMOLED



Zone A: character/Digit area

Zone B: viewing area except Zone A (ZoneA+ZoneB=minimum Viewing area)

Zone C: Outside viewing area (invisible area after assembly in customer's product)

Fig.1 Inspection zones in an LCD.

Note: As a general rule, visual defects in Zone C are permissible, when it is no trouble for quality and assembly of customer's product.

4. Inspection standards

4.1 Major Defect

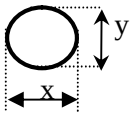
Item No	Items to be inspected	Inspection Standard	Classification of defects
4.1.1	All functional defects	1) No display 2) Display abnormally 3) Missing vertical，horizontal segment 4) Short circuit	Major
4 1.2	Missing	Missing component	
4.1.3	Outline dimension	Overall outline dimension beyond the drawing is not allowed.	

4.2 Cosmetic Defect

Item No	Items to be inspected	Inspection Standard	Classification of defects

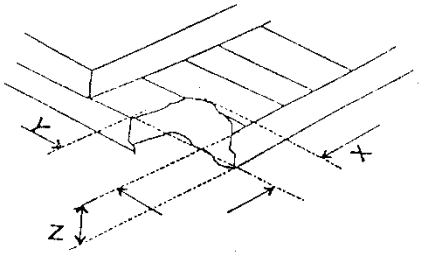
For dark/white spot, size Φ is defined as:

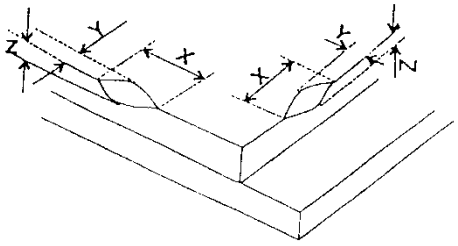
$$\Phi = \frac{(x+y)}{2}$$

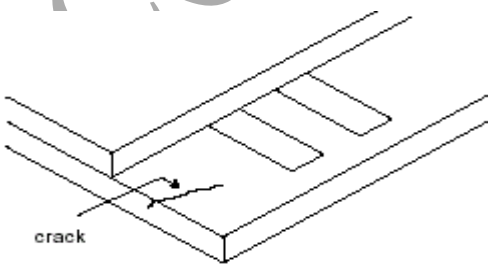


4.2.1	Clear Spots Black and white Spot defect Pinhole, Foreign Particle, Dirt under polarizer	Zone / Size(mm)	A / B / C	Minor
		Φ ≤ 0.1	Ignore	
		0.10 < Φ ≤ 0.20	2 / Ignore	
		0.20 < Φ ≤ 0.25	1	
		0.25 < Φ	0	
4.2.2	Dim Spots Circle shaped and dim edged defects	Zone / Size(mm)	A / B / C	Minor
		Φ ≤ 0.2	Ignore	
		0.20 < Φ ≤ 0.40	2 / Ignore	
		0.40 < Φ ≤ 0.60	1	
		0.60 < Φ	0	
4.2.3	Line defect Black line, White line, Foreign material under polarizer	Size(mm)	Acceptable Qty	Minor
		L(Length) / W(Width)	Zone A / B / C	
		Ignore	W ≤ 0.02	Ignore
		L ≤ 5.0	0.02 < W ≤ 0.03	2
		L ≤ 3.0	0.03 < W ≤ 0.05	1 / Ignore
			0.05 < W	Define as spot defect

<table>
<tr>
<td>4.2.4</td>
<td>Polarizer scratch</td>
<td>If the Polarizer scratch can be seen after mobile phone cover assembling or in the operating condition, judge by the line defect of 4.2.2.
If the Polarizer scratch can be seen only in non-operating condition or some special angle, judge by the following.
<table>
<tr><th colspan="2">Size(mm)</th><th colspan="3">Acceptable Qty</th></tr>
<tr><th rowspan="2">L(Length)</th><th rowspan="2">W(Width)</th><th colspan="3">Zone</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Ignore</td><td>W≤0.03</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>5.0＜L≤10.0</td><td>0.03＜W≤0.05</td><td colspan="2">2</td></tr>
<tr><td>L≤5.0</td><td>0.05＜W≤0.08</td><td colspan="2">1</td></tr>
<tr><td></td><td>0.08＜W</td><td colspan="2">0</td></tr>
</table>
</td>
<td>Minor</td>
</tr>
<tr>
<td>4.2.5</td>
<td>PolarizeAir bubble</td>
<td>Air bubbles between glass & polarizer
<table>
<tr><th>Zone
Size(mm)</th><th colspan="2">Acceptable Qty</th><th>C</th></tr>
<tr><th></th><th>A</th><th>B</th><th></th></tr>
<tr><td>Φ≤0.2</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>0.20＜Φ≤0.30</td><td colspan="2">2</td></tr>
<tr><td>0.30＜Φ≤0.50</td><td colspan="2">1</td></tr>
<tr><td>0.50＜Φ</td><td colspan="2">0</td></tr>
</table>
</td>
<td>Minor</td>
</tr>
</table>

<table>
<tr><td rowspan="3">4.2.6</td><td rowspan="3">Glass defect</td><td>(i) Chips on corner
 

<table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>⩽2.0</td><td>⩽S</td><td>Disregard</td></tr></table>Notes: S=contact pad length
Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal.</td><td>Minor</td><td rowspan="3"></td></tr>
<tr><td>(ii) Usual surface cracks
 

<table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>⩽5.0</td><td><Inner border line of the seal</td><td>Disregard</td></tr></table></td><td>Minor</td></tr>
<tr><td>(iii) Crack
Cracks tend to break are not allowed.
 
</td><td>Major</td></tr>
<tr><td>4.2.7</td><td>ELA Stain</td><td>Follow the limit sample which is fixed with a customer.
(Judgment condition : 127Gray) ------- note 1</td><td>Minor</td><td></td></tr>
<tr><td>4.2.8</td><td>Uneven color stain</td><td>Follow the limit sample which is fixed with a customer.
(Judgment condition : full white pattern)</td><td>Minor</td><td></td></tr>
</table>

[note1] ELA(Excimer Laser Annealing) stain

: Vertical or horizontal dim lines which are caused by laser annealing process.

nPRECAUTIONS FOR USING AMOLED MODULES

Handing Precautions

1 The display panel is made of glass and polarizer. As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.

2 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).

3 The polarizer covering the display surface is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming in to contact with room temperature air.

4 If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents

- Isopropyl alcohol
- Ethyl alcohol

Do not scrub hard to avoid damaging the display surface.

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

- Water
- Ketone
- Aromatic solvents

Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contact with oil and fats.

6 Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.

7 Do not attempt to disassemble or process the AMOLED module.

8 NC terminal should be open. Do not connect anything.

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

10 Electro-Static Discharge Control， Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- Before removing AMOLED from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the AMOLED modules.

- Tools required for assembling, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach AMOLED modules, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.

- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work is not too dry. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.

- The AMOLED module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

11 Since AMOLED has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

- Do not alter, modify or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend or twist the AMOLED.

Handling precaution for AMOLED

1 AMOLED is easy to be damaged. Please note below and be careful for handling.

2 Correct handling:

3 Incorrect handling:

Storage Precautions

1 When storing the AMOLED modules, the following precaution are necessary.
   1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
   2) Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C, and keep the relative humidity between 40%RH and 60%RH.
   3) The polarizer surface should not come in contact with any other objects (We advise you to store them in the anti-static electricity container in which they were shipped).

2 Transportation Precautions
   1) During shipment, please handle with care. The packaging bag can not be broken, step on trap. Packaging Carton layer height can not be over two meters.
   2) The transportation process should pay attention to the waterproof and moisture-proof measures. Product can not be watering. Ethylene sealed bags can not be unsealed.

3 Others
   1) To minimize the performance degradation of the AMOLED modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.
      a) - Exposed area of the printed circuit board.
      b) -Terminal electrode sections.

USING AMOLED MODULES

1 Installing AMOLED Modules

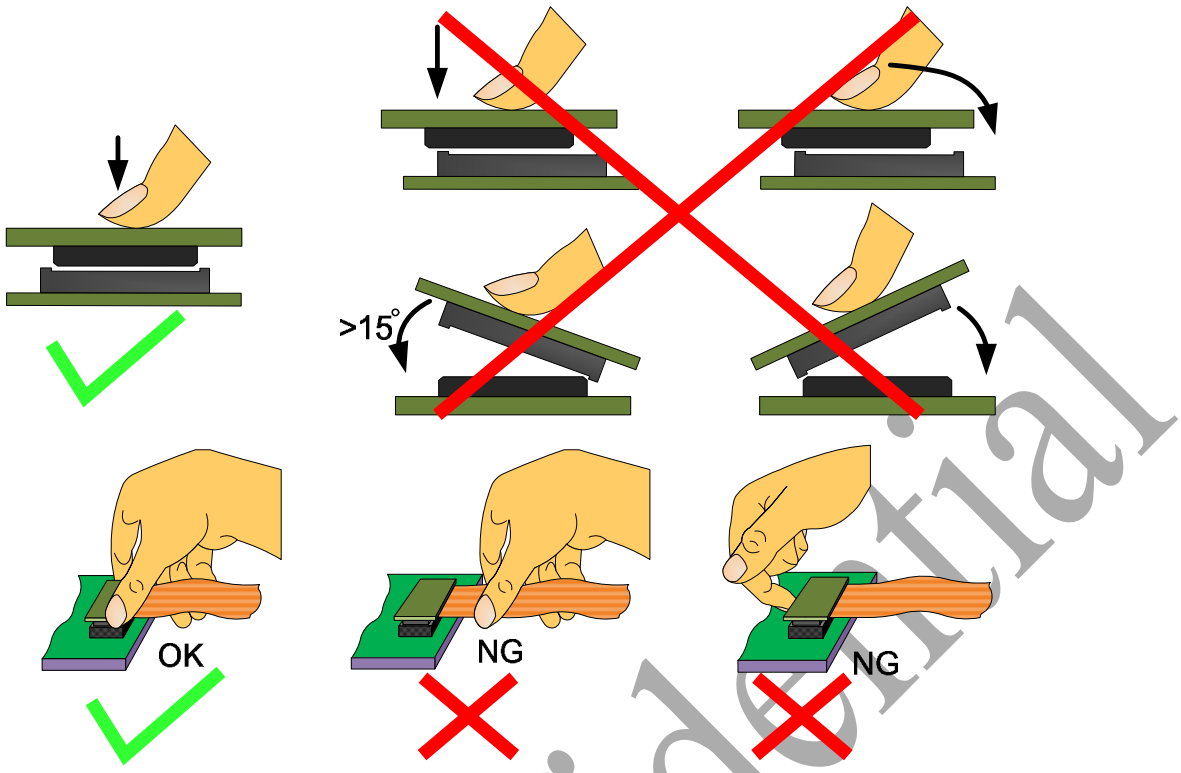
The hole in the printed circuit board is used to fix AMOLED as shown in the picture below. Attend to the following items when installing the AMOLED.

   1) Cover the surface with a transparent protective plate to protect the polarizer.

   2) When assembling the AMOLED into other equipment, the spacer to the bit between the AMOLED and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The measurement tolerance should be ±0.1mm.

2 Precaution for assemble the module with BTB connector:

Please note the position of the male and female connector position, don’t assemble or assemble like the method which the following picture shows



3 Precaution for soldering the AMOLED

	Manual soldering	Machine drag soldering	Machine press soldering
No RoHS Product	290°C ~350°C. Time : 3-5S.	330°C ~350°C. Speed : 4-8 mm/s.	300°C ~330°C. Time : 3-6S. Press: 0.8~1.2Mpa
RoHS Product	340°C ~370°C. Time : 3-5S.	350°C ~370°C. Time : 4-8 mm/s.	330°C ~360°C. Time : 3-6S. Press: 0.8~1.2Mpa

1) If soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation (This does not apply in the case of a non-halogen type of flux). It is recommended that you protect the AMOLED surface with a cover during soldering to prevent any damage due to flux spatters.
2) When soldering the PC board, the board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

4 Precautions for Operation

1) If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.
2) A slight dew depositing on terminals is a cause for electro-chemicalreaction resulting in terminal open circuit.Usage under the maximum operating temperature,50%RH or less is required.
3) Input logic voltage before apply analog high voltage such as AMOLED driving voltage when power on. Removeanalog high voltage before logic voltage when power off the module. Input each signal after the positive/negative voltage becomes stable.
4) Please keep the temperature within the specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.

5 Safety

1) It is recommended to crush damaged or unnecessary AMOLEDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.

6 Limited Warranty

7 Return AMOLED under warranty

1) No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :
   a) - Broken AMOLED glass.
   b) - PCB eyelet is damaged or modified.
   c) -PCB conductors damaged.
   d) - Circuit modified in any way, including addition of components.
   e) - PCB tampered with by grinding, engraving or painting varnish.
   f) - Soldering to or modifying the bezel in any manner.
2) Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB eyelet, conductors and terminals.

n PACKING SPECIFICATION

Please consult our technical department for detail information.