Product Name: OLED4.3

Product Code: A0013

Customer
Approved by Customer
Approved Date:

Designed By	Checked By	Approved By	
		R&D	QA
沈倩 11/22.13	2013.11.22	王龙 2013.11.22	2013.11.22

CONTENT

REVISION RECORD

REV.	REVISION DESCRIPTION	REV. DATE	REMARK
A01	Initial Release	2013-11-22	

1 Overview

KAM043AN02 is a AMOLED display module with 540×RGB×960 dot matrix. The characteristics of this display module are high brightness, self-emission, high contrast ratio, slim/thin outline, wide viewing angle, wide temperature range, and low power consumption.

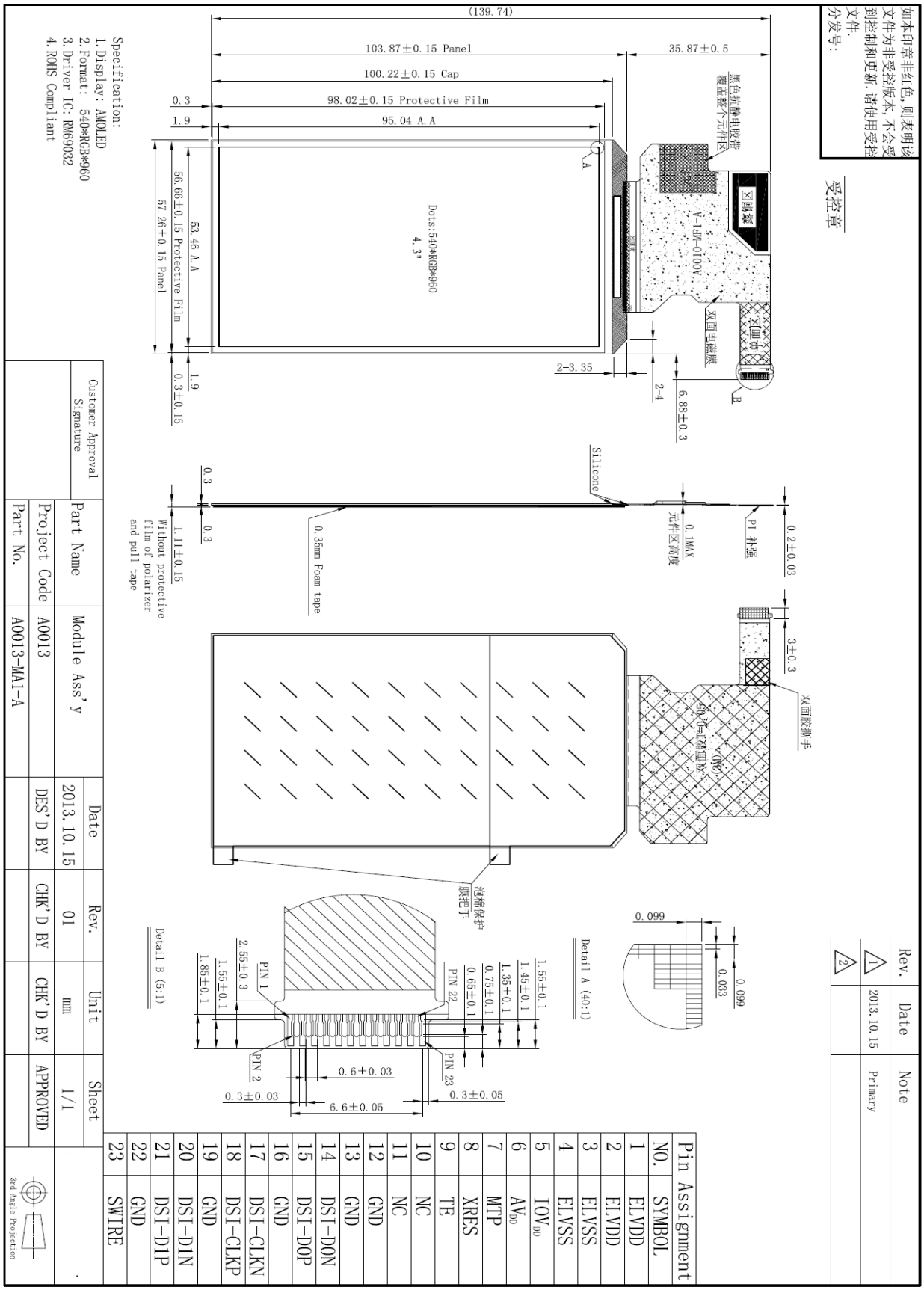
2 Features

- Display Color: Full Color (16.7M)
- Dot Matrix: 540×RGB×960
- Interface: MIPI 2lane
- Wide range of operating temperature: -40℃ to 85℃

3 Mechanical Data

NO.	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	540×RGB×960	-
2	Dot Pitch	0.033(W)×0.099(H)	mm
3	Active Area	53.46 (W)×95.04 (H)	mm
4	Module Size	57.26(W)×103.87(H)×1.11(T)	mm
5	Diagonal A/A Size	4.3	inch
6	Module Weight	12.8	gram

4 Mechanical Drawing



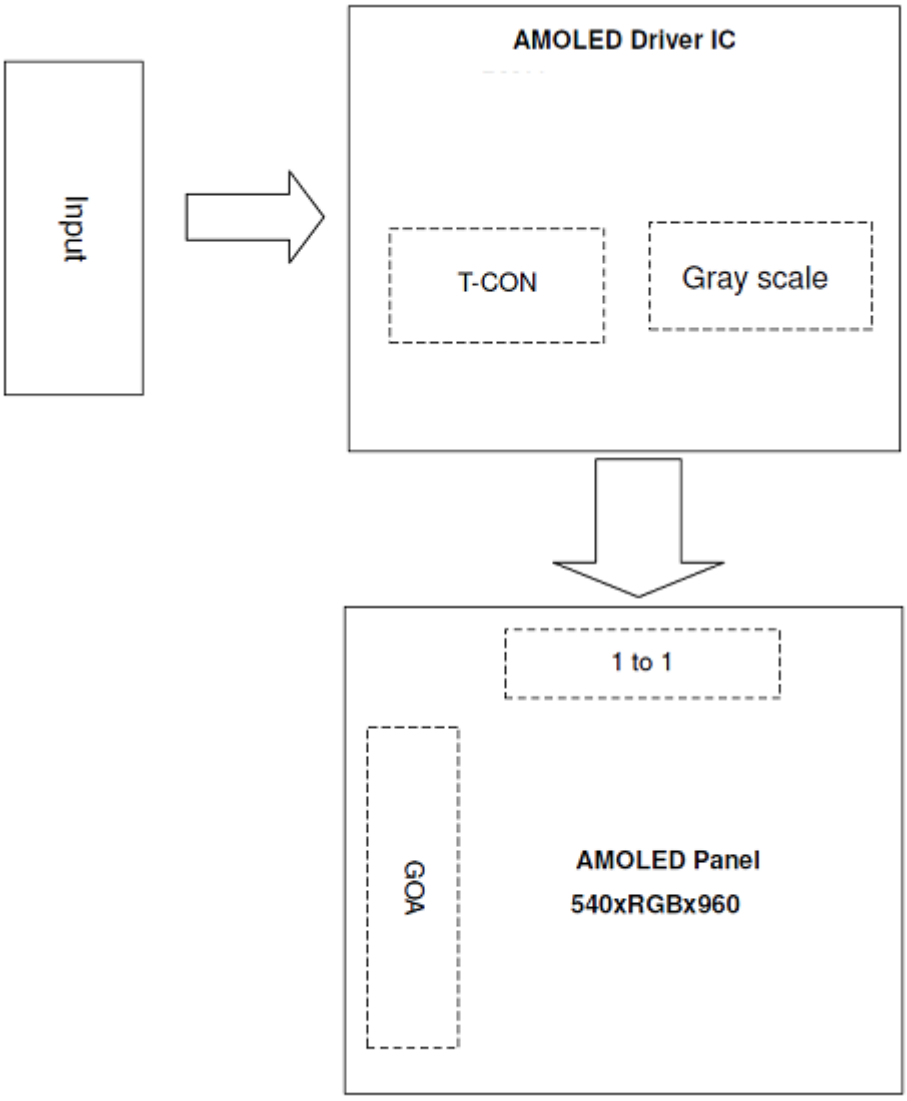
Pin Assignment	
NO.	SYMBOL
1	ELVDD
2	ELVDD
3	ELVSS
4	ELVSS
5	IOV_{DD}
6	AV_{DD}
7	MTP
8	XRES
9	TE
10	NC
11	NC
12	GND
13	GND
14	DSI-D0N
15	DSI-D0P
16	GND
17	DSI-CLKN
18	DSI-CLKP
19	GND
20	DSI-D1N
21	DSI-D1P
22	GND
23	SWIRE

5 Module Interface

5.1 AMOLED Panel Interface

PIN N	PIN NAME	DESCRIPTION
1	ELVDD	AMOLED power positive
2	ELVDD	AMOLED power positive
3	ELVSS	AMOLED power negative
4	ELVSS	AMOLED power negative
5	IOVDD	Power supply for I/O
6	AVDD	Power supply for analog
7	MTP	MTP pin , No connection
8	RES	Reset signal
9	TE	Vsync signal output from the panel to avoid tearing effect
10	NC	No connection
11	NC	No connection
12	GND	Ground signal
13	GND	Ground signal
14	DSI_D0N	MIPI data negative signal
15	DSI_D0P	MIPI data positive signal
16	GND	Ground signal
17	DSI_CLKN	MIPI clock negative signal
18	DSI_CLKP	MIPI clock positive signal
19	GND	Ground signal
20	DSI_D1N	MIPI data negative signal
21	DSI_D1P	MIPI data positive signal
22	GND	Ground signal
23	SWIRE	Swire protocol setting pin of power IC, if not used, open this pin

6 Function Block Diagram



7 Absolute Maximum Ratings

ITEM	SYMBOL	MIN	MAX	UNIT	REMARK
Input Power Supply	IOVDD	-0.3	5.5	V	-
Analog Power Supply	AVDD	-0.3	5.5	V	-
Operating Temp.	Topr	-40	85	℃	-
Storage Temp	Tstg	-55	105	℃	-

Note (1): All of the voltages are on the basis of "VSS = 0V".

Note (2): Permanent breakage of module may occur if the module is used beyond the maximum rating. The module can be normal operated under the conditions according to Section 8 "Electrical Characteristics". Malfunctioning of the module may occur and the reliability of the module may deteriorate if the module is used beyond the conditions.

8 Electrical Characteristics

8.1 DC Electrical Characteristics

ITEM	SYMBOL	TEST CONDITION	MIN	TYPE	MAX	UNIT
IOVDD Power Supply	IOVDD	22±3°C, 55±15%R.H	1.65	1.8	AVDD	V
IOVDD Power Supply	AVDD	22±3°C, 55±15%R.H	2.5	2.85	3.6	V
ELVDD power supply	ELVDD	22±3°C, 55±15%R.H	4.54	4.6	4.66	V
ELVSS power supply	ELVSS	22±3°C, 55±15%R.H	-3.78	-4.4	-4.44	V
High-level Input Voltage	V_{IH}	-	0.8×IOVDD	-	-	V
Low-level Input Voltage	V_{IL}	-	-	-	0.2×IOVDD	V
High-level Output Voltage	V_{OH}	-	0.8×IOVDD	-	-	V
Low-level Output Voltage	V_{OL}	-	-	-	0.2×IOVDD	V

8.2 Electro-optical Characteristics

8.2.1 Current consumption

ITEM		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	REMARK
Panel Power		P_{NL}	ELVDD=4.6V ELVSS=-4.4V	-	418	1255	mW	Note1
		I_{NL}		-	46.5	139.5	mA	Note1
IC	Normal	P_{AVDD}	AVDD=2.85V IOVDD=1.8V	-	65.12	85.5	mW	Note2
		I_{AVDD}		-	22.85	30	mA	Note2
		P_{IOVDD}		18.5	23.2	27.8	uW	Note2
		I_{IOVDD}		9.8	12.3	14.7	uA	Note2
	Stand-by	P_S		2.0	2.5	3.0	mW	Note2
	Deep Stand-by	P_D		0.02	0.03	0.036	mW	Note3

Note 1: Typ value of panel power is tested at 30% typical brightness.

Note 2: Tested in white pattern

Note 3: Display off

8.2.2 Optical specifications

ITEM		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT	REMARK
Response time	Rise	Tr	θ =0°	-	-	1	ms	Note 4
	Fall	Tf		-	-	1	ms	
Contrast Ratio	CR	-	θ =0°	5000	10000	-	-	Note 5
Gamma		-	-	1.9	2.2	2.5	-	-
Crosstalk		%	-	-	-	5%	-	-
Flicker		DB	53-63Hz	-	-	-30	-	-
NTSC		%	θ =0°	90	98		-	-
Viewing Angle	Top	-	CR≧200	70	-	-	Deg.	Note 7
	Bottom			70	-	-		
	Left			70	-	-		
	Right			70	-	-		
Brightness	w/TP	Y_L	θ =0°	200	250	300	cd/m²	Note 4
Liminance Uniform		U_L	Display:white	70	-	-	%	Note 6
chromaticity	Wx	-	θ =0°	0.290	0.310	0.330	-	Note 8
	Wy			0.300	0.320	0.340		
	Rx			0.631	0.661	0.691		
	Ry			0.308	0.338	0.368		
	Gx			0.186	0.236	0.286		
	Gy			0.660	0.710	0.760		
	Bx			0.094	0.134	0.174		
	By			0.020	0.060	0.100		

Note 1: Ambient temperature =25℃±2℃.

Note 2: To be measured in the dark room.

Note 3: To be measured at the center area of panel with a aperture of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module) at I_L=18mA

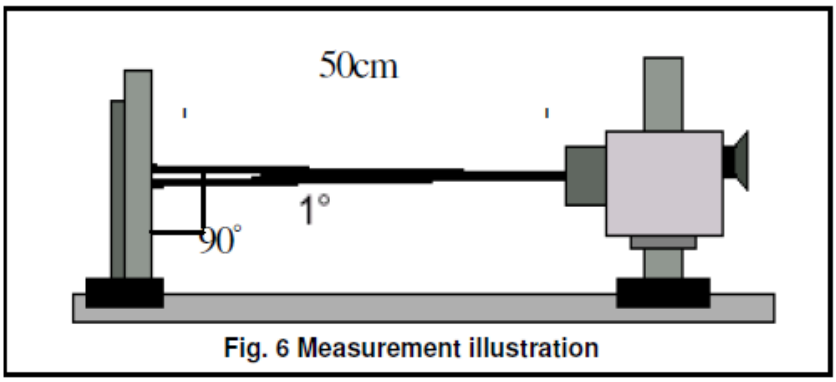
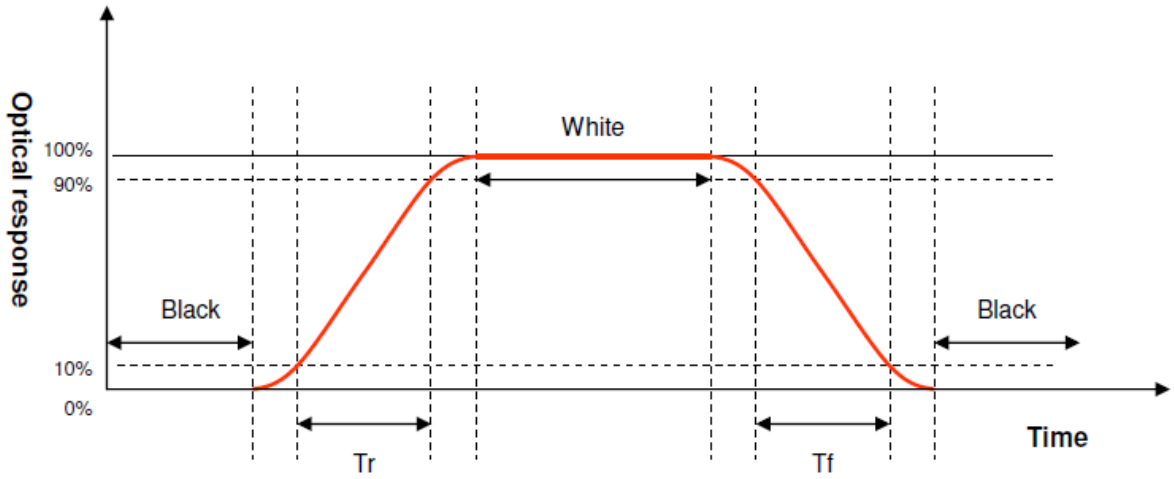


Fig. 6 Measurement illustration

Note 4: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "black" to "white"(rising time) and from "white" to "black"(falling time), respectively.

The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.

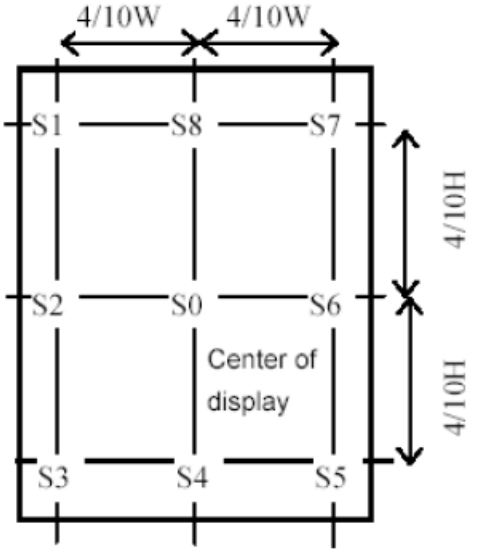


Note 5. Definition of contrast ratio:

Contrast ratio is calculated with the following formula:

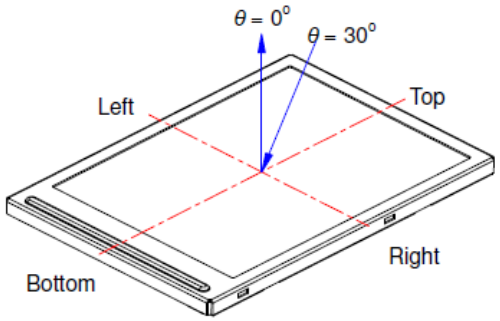
$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when OLED is at "White"}}{\text{Photo detector output when OLED is at "Black}}$$

Note 6. Uniformity➔Refer to figure as below.



$$\text{Luminance uniformity} = \frac{\text{Minimum value from S0 to S8}}{\text{Maximum value from S0 to S8}} \times 100(\%)$$

Note 7. Definition of viewing angle :



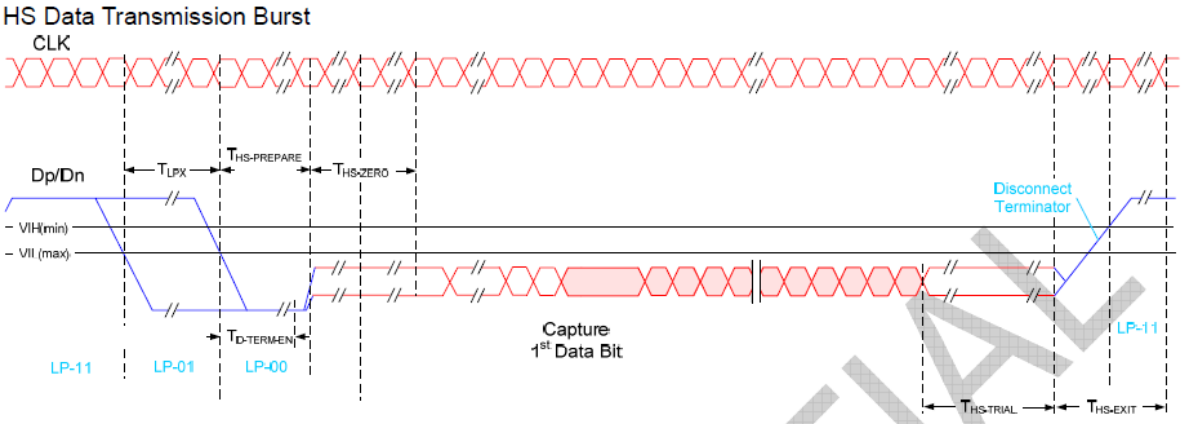
Note 8: The color chromaticity should be based on sample performance because new OLED material should be verified later.

Note 9: The display module is at the abnormal power off and waiting 5 mins condition; there is no flicker and image stricking issue when the display module is power on again

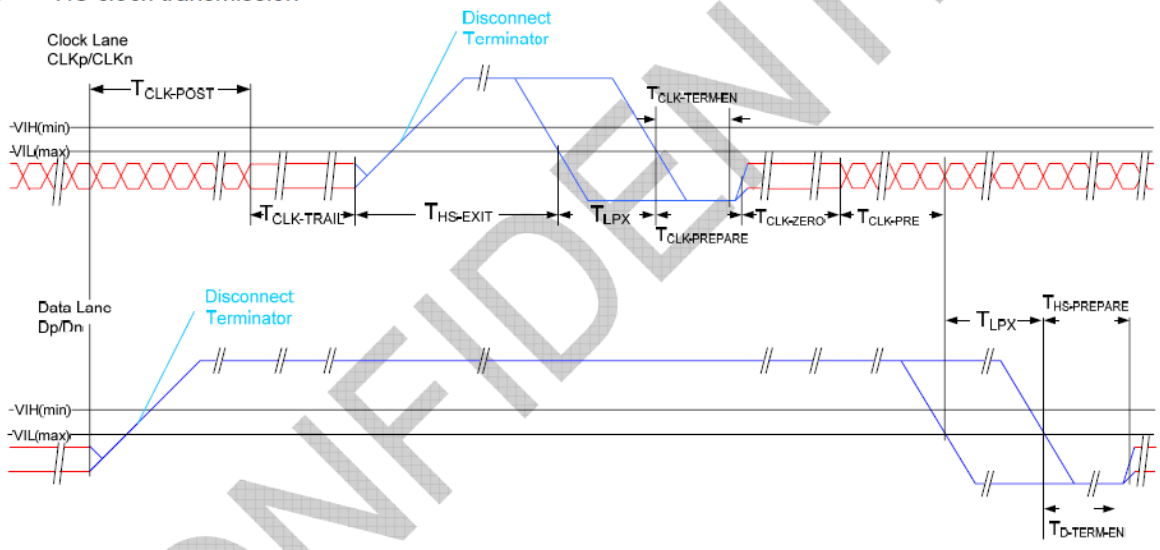
8.3 AC Electrical Characteristics

(1) MIPI Interface Characteristics

HS Data Transmission Burst



➢ HS clock transmission



Timing Parameters

Parameter	Description	MIN	TYP	MAX	Unit	Note
$T_{CLK-POST}$	Time that the transmitter shall continue sending HS clock after the last associated Data Lane has transitioned to LP mod	60 ns + 52*UI			ns	
$T_{CLK-PRE}$	Time that the HS clock shall be driven prior to any associated Data Lane beginning the transition from LP to HS mode	8			UI	
$T_{CLK-PREPARE}$	Time to drive LP-00 to prepare for HS clock transmission	38		95	ns	
$T_{CLK-TERM-EN}$	Time to enable Clock Lane receiver line termination measured from when Dn crosses VIL,MAX			38	ns	
$T_{CLK-TRAIL}$	Time to drive HS differential state after last payload clock bit of a HS transmission burst	60			ns	
$T_{CLK-PREPARE}$ + $T_{CLK-ZERO}$	TCLK-PREPARE + time for lead HS-0 drive period before starting Clock	300			ns	
$T_{D-TERM-EN}$	Time to enable Data Lane receiver line termination measured from when Dn crosses VIL,MAX.			35 ns + 4*UI	ns	
T_{EOT}	Time from start of $T_{HS-TRAIL}$ or $T_{CLK-TRAIL}$ period to start of LP-11 state			105 ns + 12*UI	ns	
$T_{HS-EXIT}$	Time to drive LP-11 after HS burst	100			ns	
$T_{HS-PREPARE}$	Time to drive LP-00 to prepare for HS transmission	40 ns + 4*UI		85 ns + 6*UI	ns	
$T_{HS-PREPARE}$ + $T_{HS-ZERO}$	$T_{HS-PREPARE}$ + Time to drive HS-0 before the Sync sequence	145 ns + 10*UI			ns	
$T_{HS-SKIP}$	Time-out at RX to ignore transition period of EoT	40		55 ns + 4*UI	ns	
$T_{HS-TRAIL}$	Time to drive flipped differential state after last payload data bit of a HS transmission burst	max(8*UI, 60 ns+ 4*UI)			ns	
T_{TA-GET}	Time to drive LP-00 by new TX	5*TLPX			ns	
T_{TA-GO}	Time to drive LP-00 after Turnaround Request	4*TLPX			ns	
$T_{TA-SURE}$	Time-out before new TX side starts driving	TLPX		$2*T_{LPX}$	ns	

(2) REST Timing Characteristics

Reset input timing:
IOVCC=1.65 to 3.6V, VCI=2.5 to 3.6V, AGND=DGND=0V, Ta=-40 to 85℃

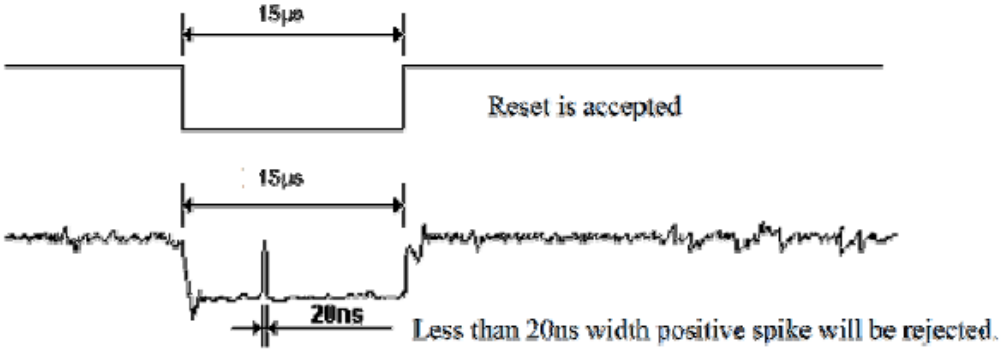
Note 1) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5μs	Reset Rejected
Longer than 15μs	Reset
Between 5μs and 15μs	Reset starts (It depends on voltage and temperature condition.)

Note 2. During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode) and then return to Default condition for H/W reset.

Note 3. 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 (tREST) within 5ms after a rising edge of RESX.

Note 4. Spike Rejection also applies during a valid reset pulse as shown below:

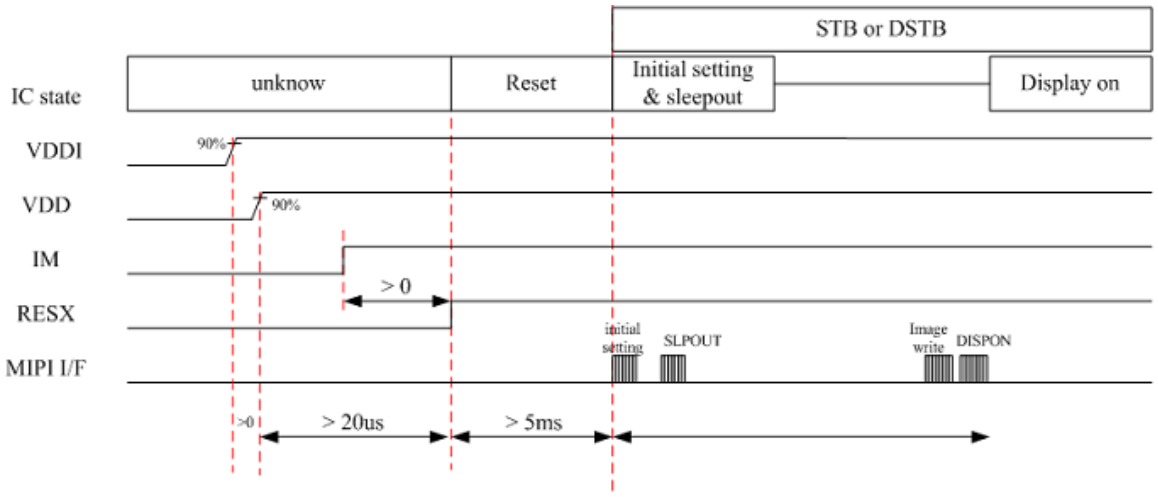


Note 5. It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

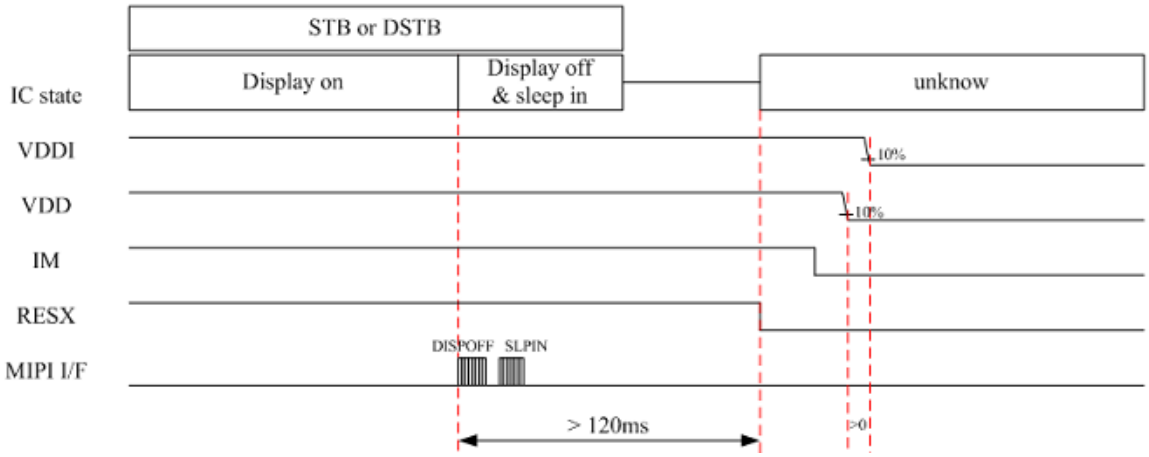
9 Functional Specification and Application Circuit

9.1 Power ON and Power OFF Sequence

Power ON Sequence:



Power OFF Sequence:



9.2 Recommended Software Initialization

Instruction/Parameters	Delay time	R/W	MIPI Data Type	Address		Data hex.	Description
				MIPI	Others		
Turn on V_{DDIO}							VDD=1.8V
Turn on VDD							VDDI=3.0V
Delay	no limit						
REST pin low	20us						
[1:0] IM setting							
REST pin high							
Delay	5 ms						
		W	0x39	F0	F000	55	
		W			F001	AA	
		W			F002	52	
		W			F003	08	
		W			F004	00	
		W	0x39	BD	BD00	01	
		W			BD01	2C	
		W			BD02	14	
		W			BD03	14	
		W			BD04	00	
		W	0x39	C8	C800	80	
		W			C801	12	
		W			C802	00	
		W			C803	00	
		W			C804	01	
		W			C805	00	
		W			C806	0E	
		W	0x39	C9	C900	80	
		W			C901	12	
		W			C902	00	
		W			C903	00	
		W			C904	01	
		W			C905	00	
		W			C906	0E	
		W	0x39	CA	CA00	83	
		W			CA01	D6	

		W			CA02	00	
		W			CA03	00	
		W			CA04	01	
		W			CA05	00	
		W			CA06	0E	
		W			CB00	83	
		W			CB01	D5	
		W			CB02	00	
		W	0x39	CB	CB03	00	
		W			CB04	01	
		W			CB05	00	
		W			CB06	0E	
					D100	80	
		W	0x39	D1	D101	10	
					D102	20	
					D200	80	
		W	0X39	D2	D201	09	
					D202	24	
		W	0x15	D0	D000	22	
		W			F000	55	
		W			F001	AA	
		W	0x39	F0	F002	52	
		W			F003	08	
		W			F004	02	
		W		FE	FE00	08	
		W			FE01	50	
		W			ED00	48	
		W			ED01	00	
		W			ED02	E0	
		W		ED	ED03	13	
		W	0x39		ED04	08	
		W			ED05	00	
		W			ED06	0C	
		W		EE	EE00	1D	
		W			C300	F2	
		W		C3	C301	95	
		W			C302	04	
		W	0x15	CA	CA00	04	
		W	0x39	F0	F000	55	
		W			F001	AA	

		W			F002	52	
		W			F003	08	
		W			F004	01	
		W			B000	05	
		W	0x39	B0	B001	05	
		W			B002	05	
		W			B400	07	
		W	0x39	B4	B401	07	
		W			B402	07	
		W			B500	07	
		W	0x39	B5	B501	07	
		W			B502	07	
		W			B600	34	
		W	0x39	B6	B601	34	
		W			B602	34	
		W			B900	04	
		W	0x39	B9	B901	04	
		W			B902	04	
		W			BA00	34	
		W	0x39	BA	BA01	34	
		W			BA02	34	

VGSP		W	0x39	BC	BC00	00
		W			BC01	A0
		W			BC02	BC
VREFN		W	0x39	BE	BE00	22
		W			BE01	75
		W			BE02	70
TE		W	0x15	35	3500	00
Horizontal Flip		W	0x15	36	3600	02
Power IC Set		W	0x15	C0	C000	20
OVSS Set		W	0x39	C2	C200	17
		W			C201	17
		W			C202	17
		W			C203	17
		W			C204	17
		W			C205	15
Turn on peripheral packet			0x32			
Sleep out		W	0x05	11	1100	00
Delay	300 ms					
Display on		W	0x05	29	2900	00

Recommended Power off Mode Sequence								
Step	Instruction/Parameters	Delay time	R/W	MIPI Data Type	Address		Data hex.	Description
					MIPI	Others		
1	DIPOFF		W	0x05		2800	00	
2	SLPIN		W	0x05		1000	00	
3	delay	120ms						
4	Power off							

10 Package Specification

Controlled Seal

Packing Process(1)~(9)

(1) Tray Type:A0010-MT1-A

(2)

(3) order ①、②、①、②
fix trays with tape
96 pcs of 1 small carton
1 tray contain 6 pcs
16 contained trays, 1 empty tray

(4) Use vaccum bag to package the tray and add 5 bags of desiccant into the vacuum bag

(5) After tray be packaged, wrap the package in a bubble bag and seal with scoth tape.

(6)

(7)

small carton package
L390*W290*L120 mm

(8)

2 small cartons in 1 big carton

(9) 32 contained trays, 2 empty trays,
Package quantity products:
192 pcs of 1 big carton

Package finished
L410*W310*L272 mm

NOTE:1、The inner carton and master carton must be sealed with adhesive tape.

2、Fill up the gap with tray.

3、If the customer has special needs with the RoHS making, the inner carton and master carton need adhesive new RoHS marking at ◎.

11 Reliability

Category	No.	Test items	Conditions	Remark
Reliability (Environment)	1	High Temp. Operation	Ta= 60℃ 168hrs	Ta: Ambient temperature.
	2	High Temp. Storage	Ta= 70℃ 168hrs	Non-operation
	3	Low Temp. Operation	Ta= -20℃ 168hrs	
	4	Low Temp. Storage	Ta= -30℃ 168hrs	Non-operation
	5	High Temp./Humi. Operation	Ta= 40℃. 95% RH 168hrs	
	6	Thermal Shock	-30℃~70℃, Dwell for 30 min. 50 cycles.	Non-operation

12 Outgoing Quality Control Specifications

12.1 Sampling Method

(1) GB/T 2828.1-2003/ISO2859-1：1999, inspection level Ⅱ, normal inspection, single sample inspection

(2) AQL: Major 0.65; Minor 1.0

12.2 Inspection Conditions

The environmental conditions for test and measurement are performed as follows.

Temperature: 22±3°C

Humidity: 55±15%R.H

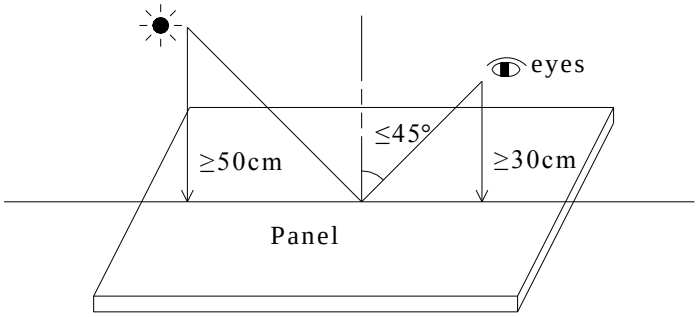
Fluorescent Lamp: 30W

Distance between the Panel & Lamp: ≥50cm

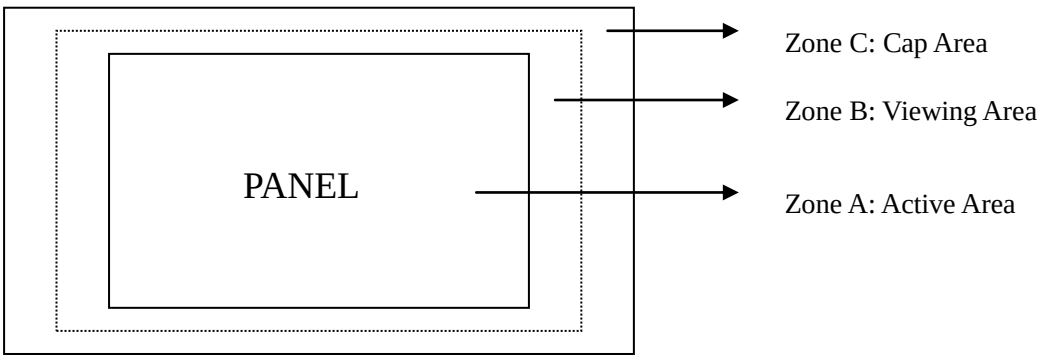
Distance between the Panel & Eyes: ≥30cm

Viewing angle from the vertical in each direction: ≤45 °

(See the sketch below)



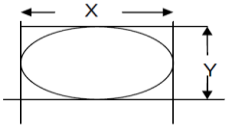
12.3 Quality Assurance Zones



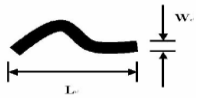
12.4 Inspection Standard

Ⅰ. Scratches and extraneous substances

Note 1. The definition of D is defined as follows:
Average diameter D=(X+Y)/2, where

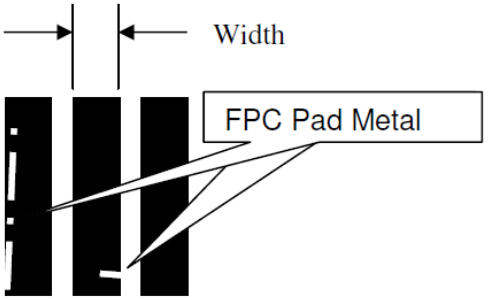


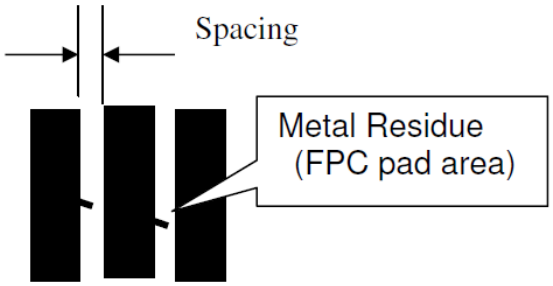
2. The definition of L and W are defined as follows:



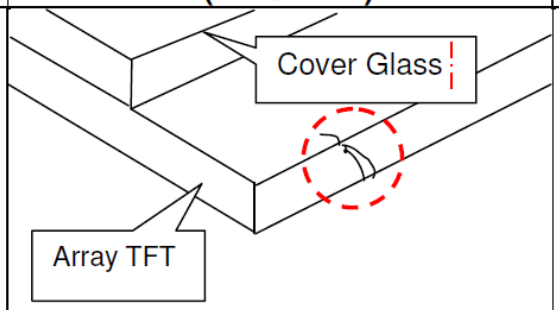
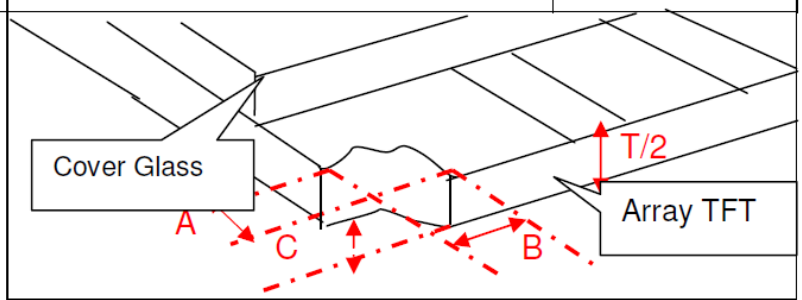
3. The Dimple is caused by glass thining process.

Dimensional unit: mm

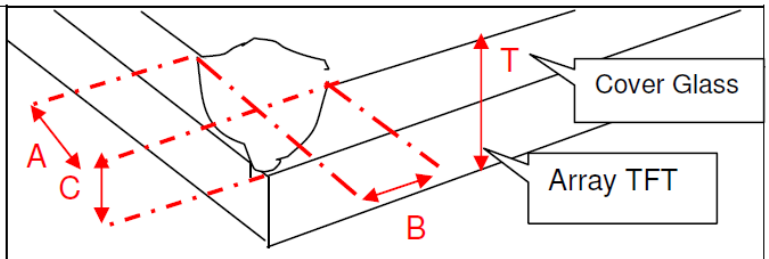
<table>
<tr><th colspan="2">Item</th><th>Dimension (unit: mm)</th><th>Criteria/Judgment</th></tr>
<tr><td rowspan="2">Scratch / Dent</td><td>Surface of Glass in Display Area</td><td colspan="2">Dot Type Dent/Bubble
<table><tr><td>D ≦0.1</td><td>Ignore</td></tr><tr><td>0.1<D≦0.2</td><td>N≦3</td></tr><tr><td>0.2<D≦0.3</td><td>N≦2</td></tr><tr><td>D＞0.3</td><td>Not allowed</td></tr></table>
Line Type Dent/Bubble
<table><tr><td>W≦0.02</td><td>Ignore</td></tr><tr><td>L≦2.5 mm,
0.02＜W≦0.03</td><td>N≦3</td></tr><tr><td>L≦2.5 mm,
0.03＜W≦0.05</td><td>N≦2</td></tr><tr><td>W＞0.05</td><td>Not allowed</td></tr></table></td></tr>
<tr><td>FPC Pad</td><td colspan="2">Pad Metal Scratch(Judgment by backlight OM)
<table><tr><td>≦1/2 Pad width</td><td>Ignore</td></tr><tr><td>＞1/2 Pad width</td><td>Not allowed</td></tr></table>
 
Note : Unavailable pad & circuit → Ignore</td></tr>
</table>

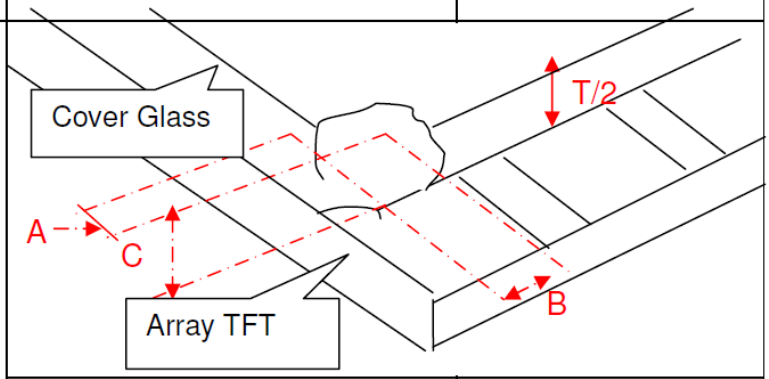
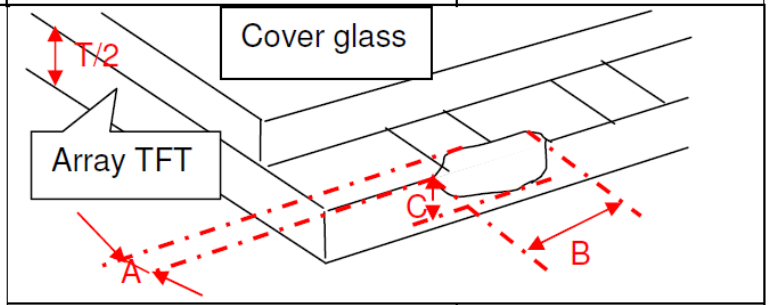
<table>
<tr><td rowspan="2">Scratch
(Continued)</td><td></td><td colspan="2">Metal residue between 2 pads(Judgment by backlight OM)
<table><tr><td>≦1/3 Pad Spacing</td><td>Ignore</td></tr><tr><td>＞1/3 Pad Spacing</td><td>Not allowed</td></tr></table> 
Note: Unavailable pad & circuit → Ignore</td></tr>
<tr><td rowspan="12">Extraneous Substances/ Foreign Material (Inside the Cell)</td><td rowspan="4">Particle</td><td>D ≦0.1</td><td>Ignore</td></tr>
<tr><td>0.1<D≦0.2</td><td>N≦3</td></tr>
<tr><td>0.2<D≦0.3</td><td>N≦2</td></tr>
<tr><td>D＞0.3</td><td>Not allowed</td></tr>
<tr><td rowspan="4">Black/ White spot</td><td>D ≦0.1</td><td>Ignore</td></tr>
<tr><td>0.1<D≦0.2</td><td>N≦3</td></tr>
<tr><td>0.2<D≦0.3</td><td>N≦2</td></tr>
<tr><td>D＞0.3</td><td>Not allowed</td></tr>
<tr><td rowspan="4">Black/ White lines
L: Length
W: Width</td><td>W≦0.02</td><td>Ignore</td></tr>
<tr><td>L≦2.5 mm,
0.02＜W≦0.03</td><td>N≦3</td></tr>
<tr><td>L≦2.5 mm,
0.03＜W≦0.05</td><td>N≦2</td></tr>
<tr><td>W＞0.05</td><td>Not allowed</td></tr>
<tr><td rowspan="2">Foreign Particle on the Glass</td><td>Display area</td><td>Could not be wiped by alcohol</td><td>Ignore</td></tr>
<tr><td>Bonding area</td><td>Could not be wiped by alcohol</td><td>Not allowed</td></tr>
<tr><td colspan="2">POL Particle / POL Dirty</td><td>Could be wiped by alcohol</td><td>Apply to “Extraneous Substances” spec</td></tr>
</table>

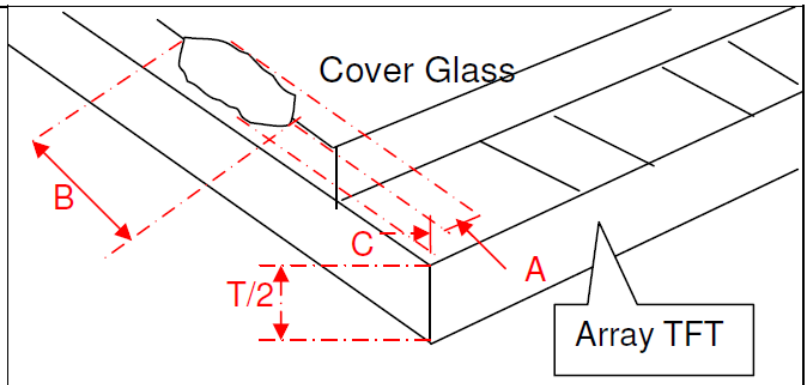
Ⅱ. Glass broken and chipping

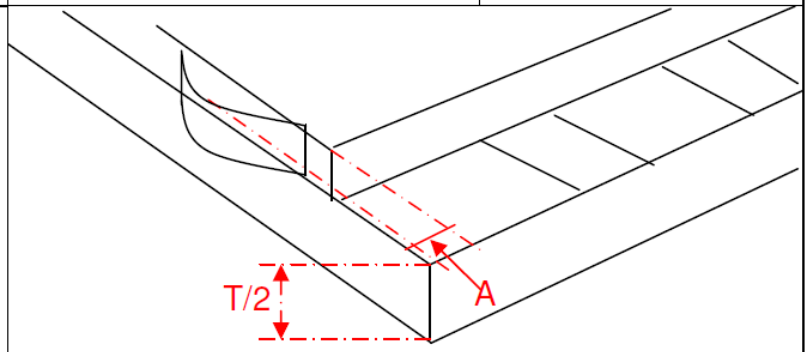
<table>
<tr><th colspan="2">Item</th><th colspan="2">Dimension
(unit: mm)</th><th>Criteria/
Judgment</th></tr>
<tr><td>Glass Crack</td><td>Extensive
Crack</td><td colspan="2"> 
</td><td>Not allowed</td></tr>
<tr><td rowspan="3"></td><td rowspan="3">Corner
Broken (I)</td><td colspan="2"> 
</td><td></td></tr>
<tr><td>A≦1.2, B≦2.0, C≦T/2</td><td>Ignore</td></tr>
<tr><td>A>1.2 or B>2.0</td><td>Not allowed</td></tr>
</table>

<table>
<tr><td rowspan="5">Glass Broken

(Continued)</td><td rowspan="3">Corner Broken (II)</td><td colspan="2"> 

Note: To be applied to both CG and Array TFT Glass</td></tr>
<tr><td>A≦1.0, B≦1.0, C≦T/2</td><td>Ignore</td></tr>
<tr><td>A>1.0 or B>1.0</td><td>Not allowed</td></tr>
<tr><td rowspan="3">Corner Broken (III)</td><td colspan="2"> 
</td></tr>
<tr><td>A≦1.0, B≦1.0, C≦T/2</td><td>Ignore</td></tr>
<tr><td>A>1.0 or B>1.0</td><td>Not allowed</td></tr>
<tr><td rowspan="3">Pad Broken</td><td colspan="2"> 
</td></tr>
<tr><td>A≦0.4, B≦5.0, C≦T/2</td><td>Ignore</td></tr>
<tr><td>A>0.4 or B>5.0</td><td>Not allowed</td></tr>
</table>

<table>
<tr><td rowspan="3"></td><td rowspan="3">Side
Broken</td><td colspan="2"> 

Note: To be applied to both Cover glass and Array.</td></tr>
<tr><td>A≦0.5, B≦5.0, C≦T/2</td><td>Ignore</td></tr>
<tr><td>A>0.5 or B>5.0</td><td>Not allowed</td></tr>
<tr><td rowspan="3">Projection</td><td rowspan="3">Side
Projection</td><td colspan="2"> 

Note: To be applied to both Cover glass and Array.</td></tr>
<tr><td>A≦0.2</td><td>Ignore</td></tr>
<tr><td>A>0.2</td><td>Not allowed</td></tr>
</table>

Note: 1. “T” stands for “Thickness” of the cover glass and array TFT glass.
2. Corner broken can not damage sealant.

13 Precautions for operation and Storage

13.1 Precautions for Operation

(1) Since OLED panel is made of glass, do not apply any mechanical shock or impact or excessive force to it when installing the OLED module. Any strong mechanical impact due to falling dropping etc. may cause damage (breakage or cracking).

(2) The polarizer on the OLED surface is made of soft material and is easily scratched. Please take most care when handing. When the surface of the polarizer of OLED Module is contaminated, please wipe it off gently by using moisten soft cloth with isopropyl alcohol, do not use water, ketone or aromatics. If there is saliva or water on the OLED surface, please wipe it off immediately.

(3) When handling OLED module, please be sure that the body and the tools are properly grounded. And do not touch I/O pins with bare hands or contaminate I/O pins, it will cause disconnection or defective insulation of terminals.

(4) Do not attempt to disassemble or process the OLED module.

(5) OLED module should be used under recommended operating conditions shown in the specification. Since the higher voltage leads to the shorter lifetime, be sure to use the specified operating voltage.

(6) Foggy dew, moisture condensation or water droplets deposited on surface and contact terminals will cause polarizer stain or damage, the deteriorated display quality and electrochemical reaction then leads to shorter life time and permanent damage to the module probably. Please pay attention to the environmental temperature and humidity.

(7) An afterimage is created by the difference in brightness between unused dot and the fixed dot, according to the decrease of brightness of the emitting time. Therefore, to avoid having an afterimage, the full set should be thoroughly used instead of using a fixed dot. When the fixed dot emits, an afterimage can be created.

(8) Flicker could be come out at full on display. And it disappears when frame frequency increase, but brightness decreases too.

13.2 Soldering

(1) Soldering should be performed only on the I/O terminals.

(2) Use soldering irons with proper grounding and no leakage.

(3) Iron: no higher than 300℃ and 3~4 sec during soldering.

13.3 Precautions for Storage

(1) Please store OLED module in a dark place. Avoid exposure to sunlight, the light of fluorescent lamp or any ultraviolet ray.

(2) Keep the environment temperature between 10℃ and 35℃ and the relative humidity less than 60%. Avoid high temperature and high humidity.

(3) Keep the OLED modules stored in the container when shipped from supplier before using them is recommended.

(4) Do not leave any article on the OLED module surface for an extended period of time.

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