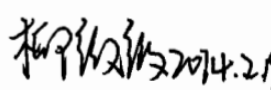
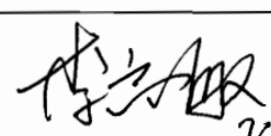
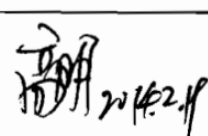
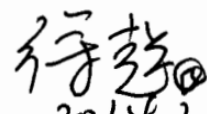


Product Specification

Product Name: VGM096096A2F05

Product Code: M00794

Customer
Approved by Customer
Approved Date:

Designed By	Checked By	Approved By	
		R&D	QA
 2014.2.19	 2014.2.19	 2014.2.19	 2014.2.19

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1 Overview

VGM096096A2F05 is a full color OLED display module with 96(RGB)×96 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 colors
- Dot Matrix:96(RGB)×96
- Driver IC: LD7134
- Interface: 8-bit 8080
- Wide range of operating temperature: -40°C to 70°C

3 Mechanical Data

NO.	ITEM	SPECIFICATION	UNIT
1	Dot Matrix	96(W)(RGB)×96(H)	-
2	Dot Size	0.045(W)×0.19(H)	mm ²
3	Dot Pitch	0.07(W)×0.21(H)	mm ²
4	Aperture Rate	58	%
5	Active Area	20.135(W)×20.14 (H)	mm ²
6	Panel Size	27(W)×30.1 (H) ×1.05(T)	mm ³
7	Module Size	27(W)×55.1 (H) ×1.28(T)	mm ³
8	Diagonal A/A Size	1.12	inch
9	Module Weight	2±10%	gram

4 Mechanical Drawing

如本印章非红色, 则表明该文件为非受控版本, 不会受到控制和更新. 请使用受控文件.
分发号:

受控章

Dots: 96*3*96
1.12"

Specification

1. Display: OLED (Full Color)
2. Format: 96*3*96
3. Driver IC: LD7134
4. General Tolerance: ±0.3
5. Operate temp: -40°C~70°C
6. Storage temp: -40°C~85°C
7. RoHS Compliant

Customer Approval	Part Name	Module Ass'y		Date
Signature	Project Code	00794		2012.03.01
	Part No.	00794-MA1-A		DES'D BY
				CHK'D BY
				CHK'D BY
				APPROVED

Rev.	Date	Note
1	2012.02.23	Based on 00790- 1. Modify the Size of PROXY tape
2	2012.03.01	2. Modify the Pin Assignment of PFC 3. Remove the Black Foam tape
3		Modify the UV Tape

Pin Assignment

NO.	SYMBOL
1	VSS
2	NC
3	VCC_R
4	VCC_C
5	VDDL
6	VDD
7	RSTB
8	WRB
9	RDB
10	CSB
11	A0
12	D0
13	D1
14	D2
15	D3
16	D4
17	D5
18	D6
19	D7
20	NC
21	NC
22	NC
23	PRERGB
24	VSS

Com & Seg layout

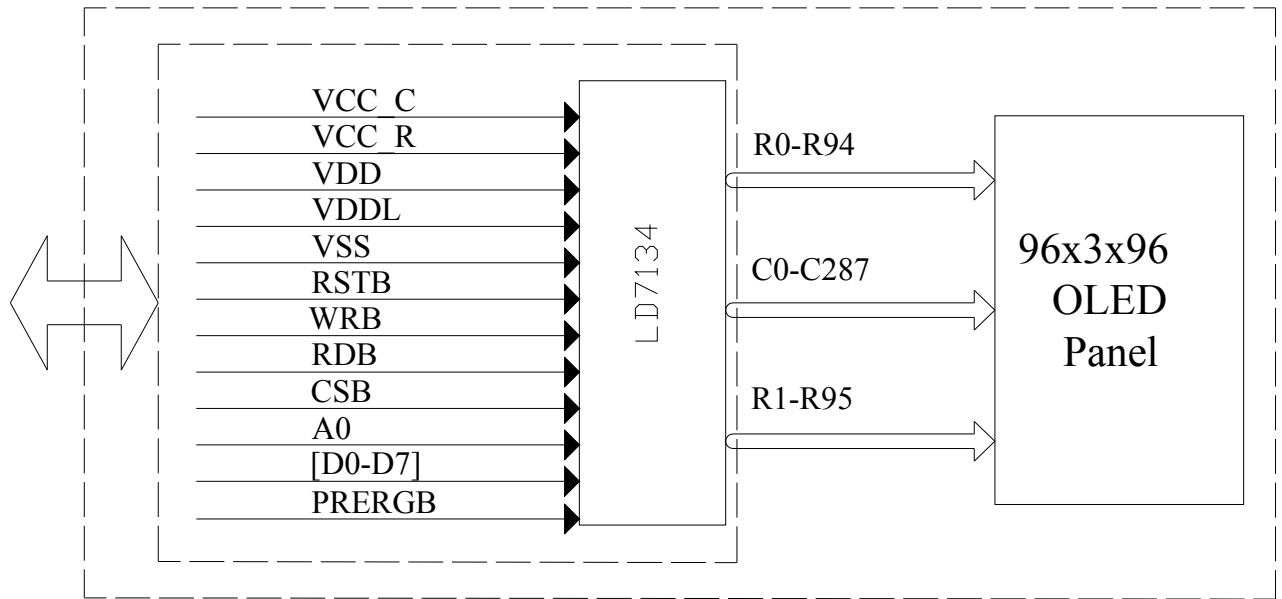
Detail A (30:1)

5 Module Interface

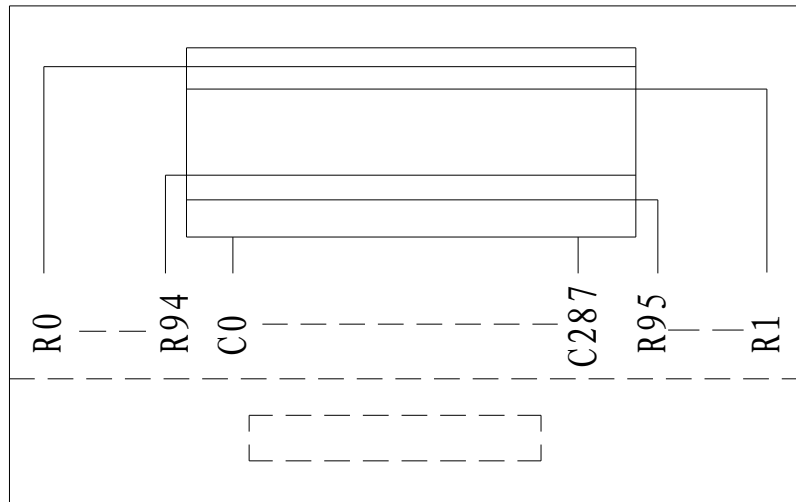
PIN NO.	PIN NAME	DESCRIPTION
1	VSS	Ground.
2	NC	No connection.
3	VCC_R	This pin is the power output pin of internal row power regulator. A 4.7uF capacitor is recommended to connect between VCC_R and VSS. If internal row power regulator is disabled, It must be connected to the external high voltage source.
4	VCC_C	Column Driver Power.
5	VDDL	Internal Logic Power. Refer to application guide. A capacitor is connected between VDDL and VSS.
6	VDD	Interface Power & Analog Power.
7	RSTB	Reset (Active Low).
8	WRB	Write(Active Low) for 80 Series.
9	RDB	Read (Active Low) for 80 Series.
10	CSB	Chip Select (Active Low).
11	A0	Address (L:command,H:Parameter).
12~19	D0~D7	Data Bus.
20~22	NC	No connection.
23	PRERGB	Column Driver Pre-Charge Power for Red/Green/Blue.
24	VSS	Ground.

6 Function Block Diagram

6.1 Function Block Diagram



6.2 Panel Layout Diagram



Com & Seg layout

7 Absolute Maximum Ratings

ITEM	SYMBOL	MIN	MAX	UNIT	REMARK
Logic supply voltage	VDDL	-0.3	+2.4	V	IC maximum rating
OLED Operating voltage	VCC_C	-0.3	+18.3	V	IC maximum rating
Operating Temp.	Top	-40	70	°C	-
Storage Temp	Tstg	-40	85	°C	-

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

(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	TYP	MAX	UNIT
Supply voltage	VCC_C	(1)	14.5	15	15.5	V
	VDD	(2)	2.1	3.0	3.3	
	VDDL	(2)	1.65	1.9	2.1	V
High-level Input Voltage	V _{IH}	Logic Input Terminals	0.8×VDD	-	VDD	V
Low-level Input Voltage	V _{IL}	Logic Input Terminals	VSS	-	0.2×VDD	V
High-level Output Voltage	V _{OH}	Logic Output Terminals VDD=3V (I _{out} = -200uA)	0.9×VDD	-	VDD	V
Low-level Output Voltage	V _{OL}	Logic Output Terminals VDD=3V (I _{out} = -200uA)	VSS	-	0.1×VDD	V
Input Leakage Current (High)	I _{IH}	Logic Input Terminals	-1.0	-	+1.0	uA
Input Leakage Current (Low)	I _{IL}	Logic Input Terminals	-1.0	-	+1.0	uA

Note : (1)VCC_C must be kept in a stable value; ripple and noise are not allowed.

(2) Application Guide for VDD & VDDL

The pin of “PSEL” that defined in the IC specification of LD7134 enable/disable internal logic power regulator. It’s tied with VDD in this module’s FPC which is showed as below:So VDDL is Internal Generated and it doesn't support external voltage supply. A capacitor should be connected between VDDL and VSS.

8.2 Electro-optical Characteristics

ITEM	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Normal Mode Brightness	L _{br}	All pixels ON(1)	60	80	-	cd/m ²
Stand-By Current	IDD1	PSEL=VDD	-	-	60	uA
Stand-By Current	ICC1	-	-	-	1.0	uA
Normal Mode Power Consumption	Pt	All pixels ON(1)	-	300	375	mW
C.I.E(White)	(x)	x,y(CIE1931)	0.26	0.30	0.34	-
	(y)		0.29	0.33	0.37	-
C.I.E(Red)	(x)	x,y(CIE1931)	0.61	0.65	0.69	-
	(y)		0.30	0.34	0.38	-
C.I.E(Green)	(x)	x,y(CIE1931)	0.25	0.29	0.33	-
	(y)		0.54	0.58	0.62	-
C.I.E(Blue)	(x)	x,y(CIE1931)	0.10	0.14	0.18	-
	(y)		0.13	0.17	0.21	-
Dark Room Contrast	CR	-	≥2000:1	-	-	-
Response Time	-	-	-	10	-	μs
View Angle	-	-	≥160	-	-	Degree

Note(1): Normal Mode test conditions are as follows:

- Driving voltage : 15V
- Red contrast setting : 0x3f
- Green contrast setting : 0x24
- Blue contrast setting : 0x38
- Frame rate : 105Hz
- Duty setting : 1/96

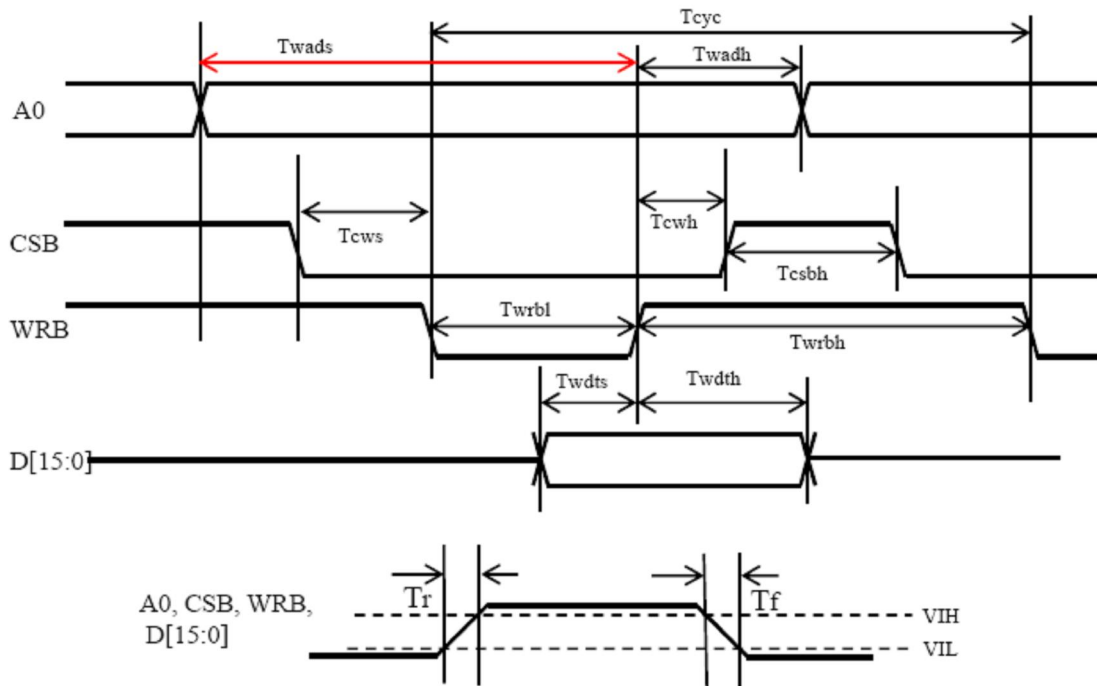
8.3 AC Electrical Characteristics

System Bus Read/Write Timing (8080 series CPU interface)

Writing Timing for 80Series CPU

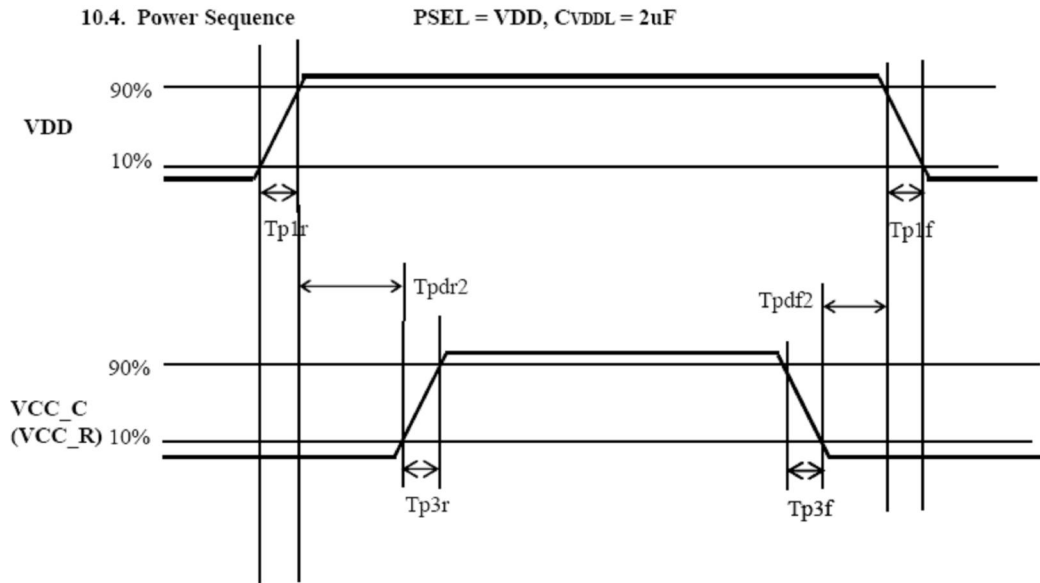
($T_a = -40 \sim +85^\circ\text{C}$, $V_{SSA}=V_{SSD}=0\text{V}$, $V_{DD}=2.8\text{V}$, $V_{CC_C}=V_{CC_R}=18\text{V}$, $R/G/BPRE=0\text{V}$, $CL=100\text{pF}$)

Parameter	Symbol	Related Pins	Specification		Unit
			MIN	MAX	
Write Cycle Time	Tcyc	WRB	100	-	ns
Address Setup Time	Twads	A0	50		ns
Address Hold Time	Twadh	A0	20		ns
Select Setup Time	Tcws	CSB	10		ns
Select Hold Time	Tcwh	CSB	20		ns
Write Low Pulse Width	Twrbl	WRB	30		ns
Write High Pulse Width	Twrbh	WRB	40		ns
Select High Pulse Width	Tcsbh	CSB	10		ns
Data Setup Time	Twdts	D15 ~ D0	10		ns
Data Hold Time	Twdth	D15 ~ D0	30		ns
Rising Time	Tr	A0, CSB, WRB, D15 ~ D0	-	30	ns
Falling Time	Tf	A0, CSB, WRB, D15 ~ D0	-	30	ns



9 Functional Specification and Application Circuit

9.1 Power Sequence

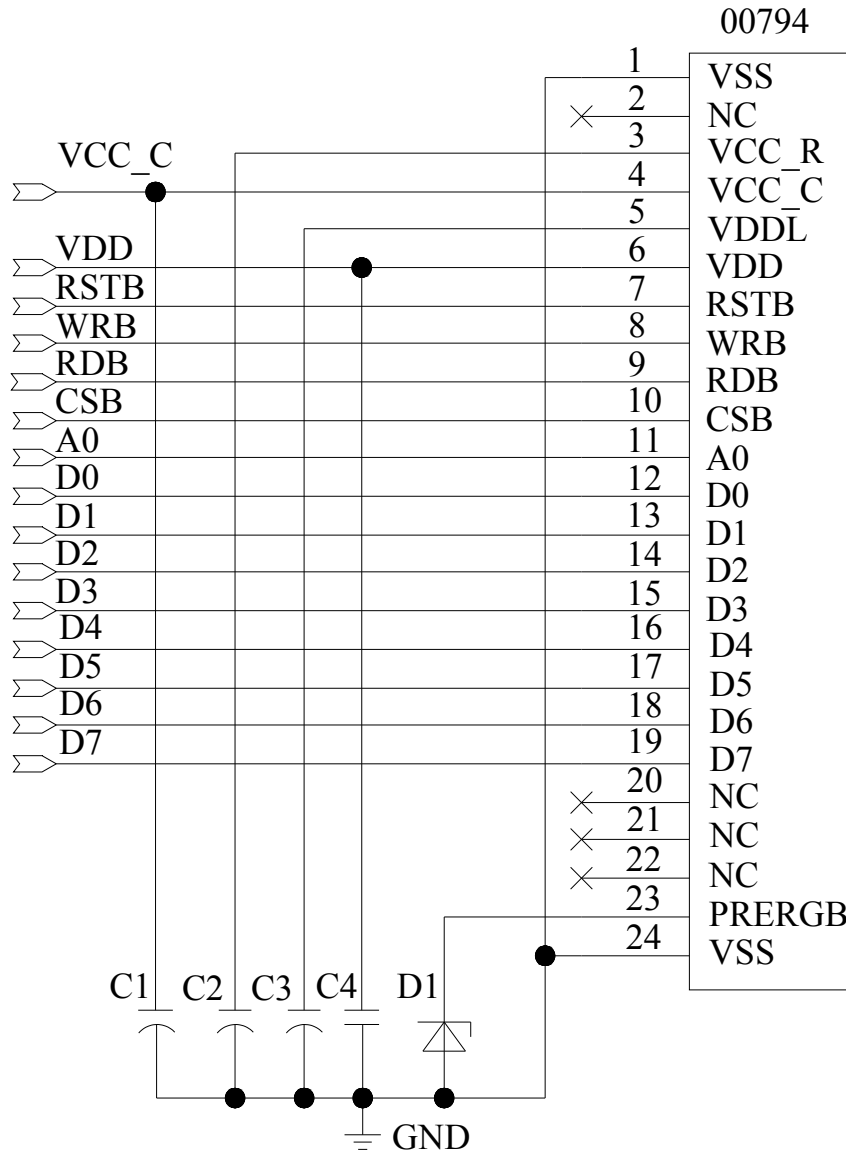


($T_a = -40 \sim +85^\circ\text{C}$, $V_{SSA} = V_{SSD} = 0\text{V}$, $V_{DD} = 2.8\text{V}$, $V_{CC_C} = V_{CC_R} = 18\text{V}$, $R/G/BPRE = 0\text{V}$, $C_L = 100\text{pF}$)

Parameter	Symbol	Related Pins	Specification			Unit
			MIN	TYP	MAX	
VDD On Slope VDD Off Slope	Tp1r Tp1f	VDD	0.2	1	5	ms/V
VCC_C(VCC_R) On Slope VCC_C(VCC_R) Off Slope	Tp3r Tp3f	VCC_C(VCC_R)	0.2	1	5	ms/V
From VDD to VCC_C(VCC_R) Delay	Tpdr2	VDD, VCC_C(VCC_R)	2	-	-	ms
From VCC_C(VCC_R) to VDD Delay	Tpdf2	VDD, VCC_C(VCC_R)	2	-	-	ms

9.2 Application Circuit

The configuration for 8080-parallel interface mode, external VCC is shown in the following diagram:



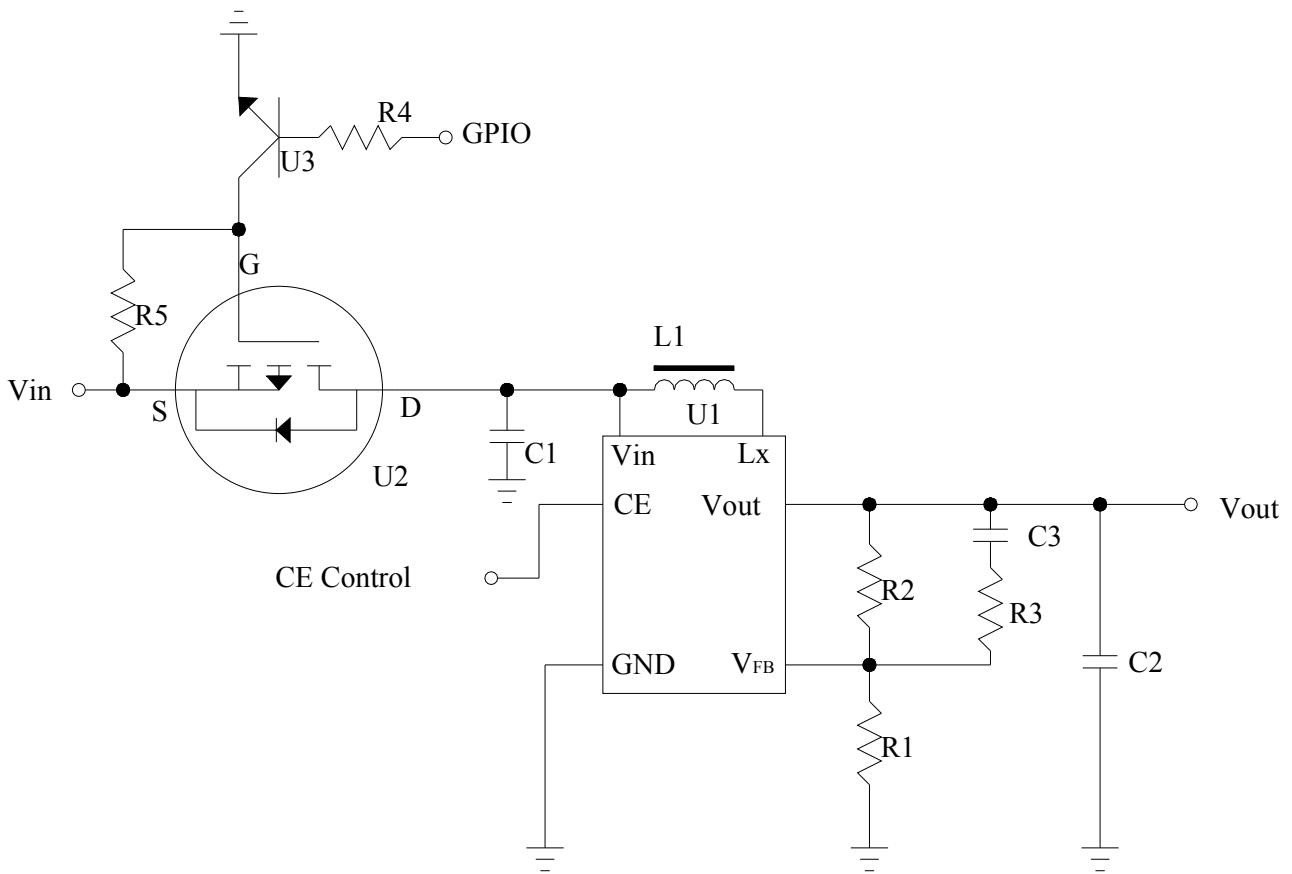
Recommended components

C1,C2, C3: 4.7μF/25V.ROHS (Tantalum Capacitors)

C4: 0.1uF-0603-X7R±10%.ROHS

D1: KDZ2.7-EV 2.7V (zener diode)

9.3 External DC-DC application circuit



Recommend component

The C1	: 1 uF-0603-X7R±10%.ROHS
The C2	: 1 uF-0603-X7R±10%.ROHS
The C3	: 220pF-0603-X7R±10%.ROHS
The R1	: 0603 1/10W +/-5% 10Kohm.ROHS
The R2	: 0603 1/10W +/-1% 140Kohm.ROHS
The R3	: 0603 1/10W +/-5% 2Kohm.ROHS
The R4	: 0603 1/10W +/-5% 1Kohm.ROHS
The R5	: 0603 1/10W +/-5% 10Kohm.ROHS
The L1	: 22uH
The U1	: R1200
The U2	: FDN338P
The U3	: 8050

9.4 Display Control Instruction

Refer to LD7134 IC Specification.

9.5 Recommended Software Initialization

```
void init_LD7134()
{
write_com(0x02);
write_dat(0x00); //turn OFF
write_com(0x01); //software reset The OSC.is stopped.
write_com(0x03);
write_dat(0x00); //Ste Dot Matrix Display Stand-by OFF
write_com(0x04); //Set OSC Control
write_dat(0x03); //105Hz
write_com(0x05); //Set Graphic RAM Writing Direction
write_dat(0x01); //RGB 0x08 BGR
write_com(0x06); //Set Row Scan Direction
write_dat(0x01);
write_com(0x07); //Set Diplay Size
write_dat(0x00); //X start 1
write_dat(0x00); //X start 2
write_dat(0x04); //X end 1
write_dat(0x1f); //X end 2
write_dat(0x00); //Y start 1
write_dat(0x00); //Y start 2
write_dat(0x05); //Y end 1
write_dat(0x0f); //Y end 2
write_com(0x08); //Set Interface Bus Type
write_dat(0x01); //8Bit I/F Bus
write_com(0x09); //Set Masking Data
write_dat(0x07); //Data AND Pallet(R,G,B)-->Output Data
write_com(0x0a); //Set Read/Write Box Data
write_dat(0x00); //X start 1
write_dat(0x00); //X start 2
write_dat(0x05); //X end 1
write_dat(0x0f); //X end 2
write_dat(0x00); //Y start 1
write_dat(0x00); //Y start 2
write_dat(0x05); //Y end 1
write_dat(0x0f); //Y end 2
```

```

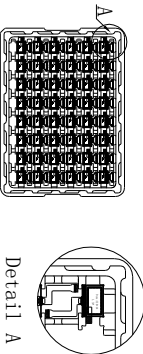
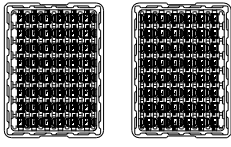

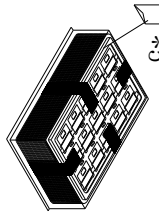
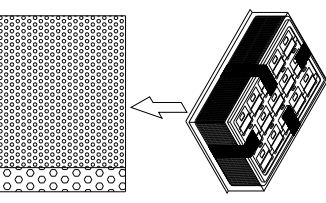
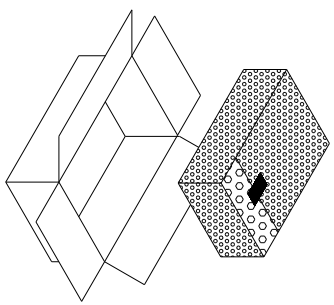
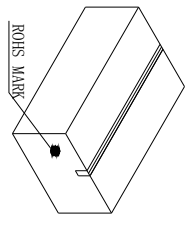
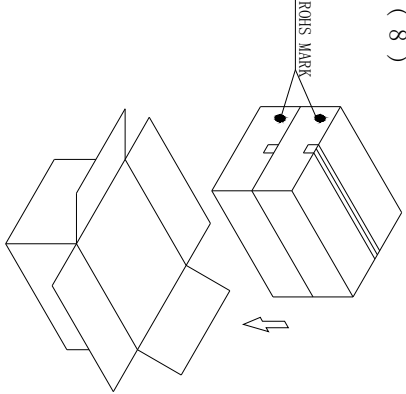
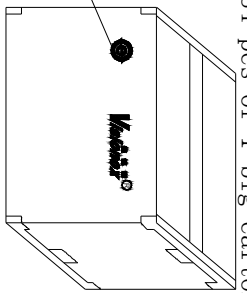

write_com(0x0b);    //Set Diplay Start Address
write_dat(0x00); //1st Parameter
write_dat(0x00); //2st Parameter
write_dat(0x00); //3st Parameter
write_dat(0x00); //4st Parameter
write_com(0x0e);    //Set Dot Matrix Current Level
write_dat(0x03); //1st Paramenter R[7:4]
write_dat(0x0f); //2st Paramenter R[3:0]
write_dat(0x02); //3st Paramenter G[7:4]
write_dat(0x04); //4st Paramenter G[3:0]
write_dat(0x03); //5st Paramenter B[7:4]
write_dat(0x08); //6st Paramenter B[3:0]
write_com(0x0f);    //Set Dot Matrix Peak Current Level
write_dat(0x0a); //PR[5:0] 16uA Step
write_dat(0x0a); //PG[5:0] 16uA Step
write_dat(0x0a); //PB[5:0] 16uA Step
write_com(0x1c);    //Set Pre-Charge Width
write_dat(0x08); //0x08 //Parameter Range :01h-3fh
write_com(0x1d);    //Set Peak Pulse Width;Parameter Range :01h-3fh
write_dat(0x00); //for Red
write_dat(0x00); //for Green
write_dat(0x00); //for Blue
write_com(0x1e);    //Set Peak Pulse Delay
write_dat(0x05); //01h-0fh
write_com(0x1f);    //Set Row Scan Operation
write_dat(0x00);
write_com(0x30);    //Set Internal Regulator for Row Scan
write_dat(0x10); //VCC_R =0.85 VCC_C
write_com(0x3b);    //Set Gamma Correction Table Initialize
write_com(0x3c);    //Set VDD Selection
write_dat(0x00); //VDD=2.8V; 0x01:VDD=1.8V
write_com(0x3d);    //Set DMODE Selection
write_dat(0x00); //Resolution=96*96,65k Color
write_com(0x02);
write_dat(0x01); //turn ON
}

```

10 Package Specification

Controlled Seal

Packing Process (1)~(9)

<p>(1) Tray Type:00790-MT6-A</p> 	<p>(2)</p>  <p>normal ①</p> <p>180° revers ②</p>	<p>(3) order ①、② ① ②</p> <p>fix trays with tape</p> <p>792 pcs of 1 small carton</p> <p>1 tray contain 36 pcs</p> <p>22 contained trays, 1 empty tray</p> 	<p>(4) Use vacuum bag to package the tray and add 5 bags of desiccant into the vacuum bag *5</p> 
<p>(5) After tray be packaged, wrap the package in a bubble bag and seal with scotch tape.</p> 	<p>(6)</p> 	<p>(7)</p> <p>small carton package</p> <p>L390*W290*L120 mm</p> 	<p>(8)</p>  <p>2 small cartons in 1 big carton</p>
<p>(9) 44 contained trays, 2 empty trays, Package quantity products: 1584 pcs of 1 big carton</p>  <p>Package finished L410*W310*L272 mm</p>	<p>NOTE:1、 The inner carton and master carton must be sealed with adhesive tape.</p> <p>2、 Fill up the gap with tray.</p> <p>3、 If the customer has special needs with the RoHS making, the inner carton and master carton need adhesive new RoHS marking at  .</p>		

11 Reliability

11.1 Reliability Test

NO.	ITEM	CONDITION	QUANTITY
1	High Temperature (Non-operation)	85,240hrs	4
2	Low Temperature (Non-operation)	-40°C,240hrs	4
3	High Temperature (Operation)	70°C,240hrs	4
4	Low Temperature (Operation)	-40°C,240hrs	4
5	High Temperature / High Humidity (Operation)	60°C,90%RH,240hrs	4
6	Thermal shock (Non-operation)	-40°C~85°C(-40°C/30min;transit/3min;85°C/30min;transit/3min) 1cycle: 66min,30cycles	4
7	Vibration	Frequency: 5~50Hz,0.5G Scan rate: 1 oct/min Time: 2 hrs/axis Test axis: X,Y, Z	1 Carton
8	Drop	Height: 100 cm Sequence: 1 angle, 3 edges and 6 faces	1 Carton

Test and measurement conditions

1. All measurements shall not be started until the specimens attain to temperature stability, the stable time is at least 15 minutes.
2. The degradation of polarizer is ignored for item 5.
3. The tolerance of temperature is $\pm 3^{\circ}\text{C}$, and the tolerance of relative humidity is $\pm 5\%$.

Evaluation criteria

1. The function test is OK.
2. No observable defects.
3. Luminance: $\geq 50\%$ of initial value.
4. Current consumption: within $\pm 50\%$ of initial value.

11.2 Lifetime

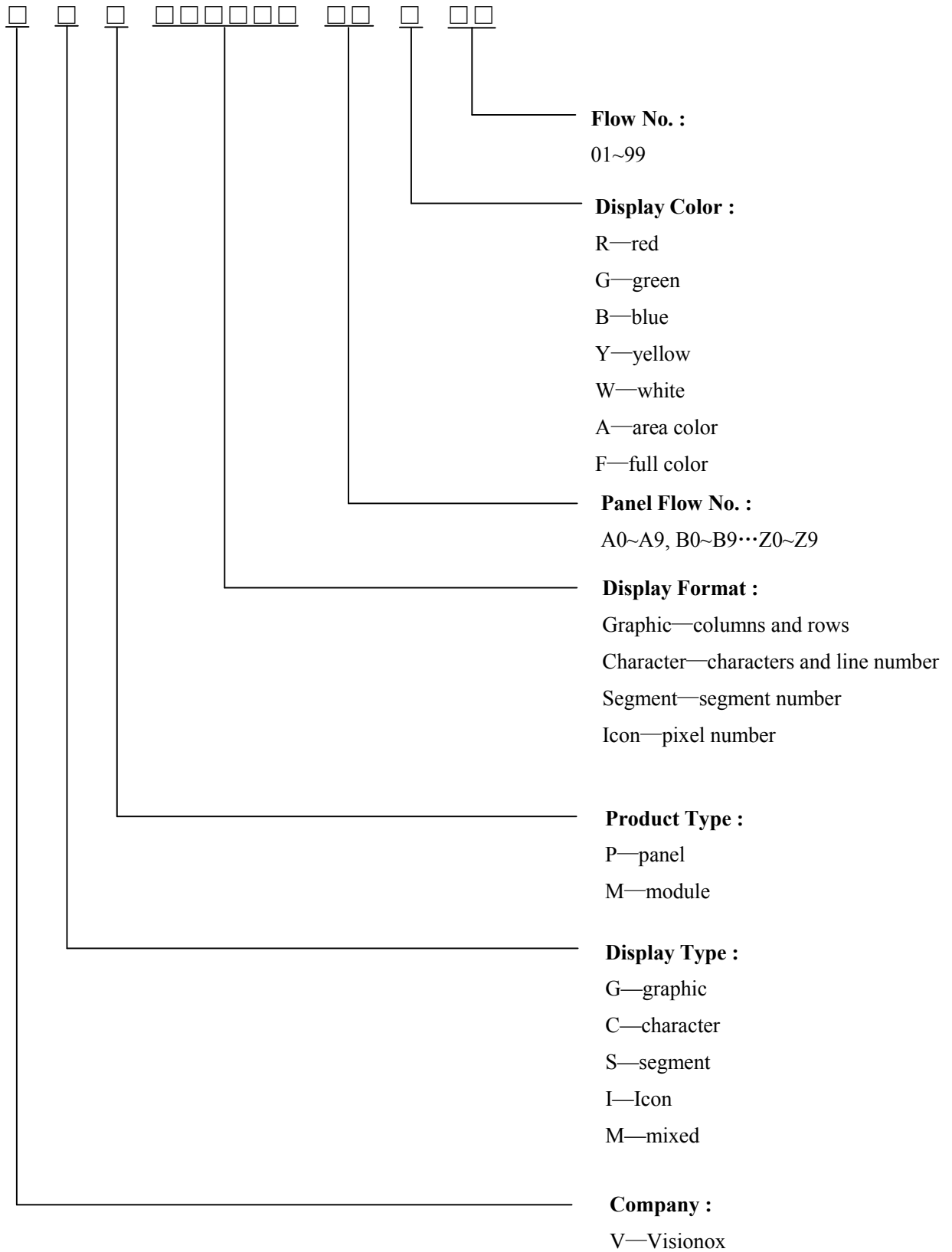
End of lifetime is specified as 50% of initial brightness and the test pattern at operating condition is 50% alternating checkerboard.

ITEM	MIN	MAX	UNIT	CONDITION
Operation Life Time	10,000	-	hrs	80cd/m ² , 50% alternating checkerboard, 22 \pm 3°C, 55 \pm 15% RH

11.3 Failure Check Standard

After the completion of the described reliability test, the samples were left at room temperature for 2 hrs prior to conducting the failure test at 22 \pm 3°C; 55 \pm 15% RH.

12 Illustration of OLED Product Name



13 Outgoing Quality Control Specifications

13.1 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

13.2 Inspection Conditions

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

Temperature: $22 \pm 3^{\circ}\text{C}$

Humidity: $55 \pm 15\% \text{R.H}$

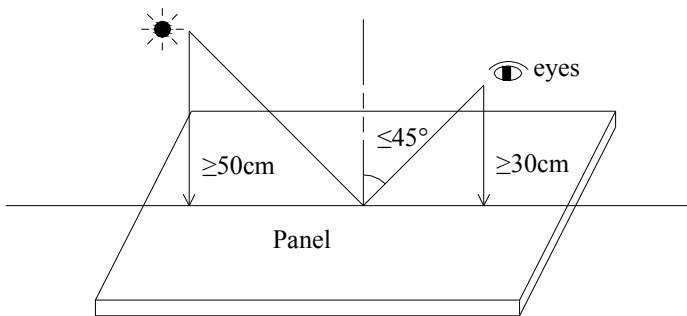
Fluorescent Lamp: 30W

Distance between the Panel & Lamp: $\geq 50\text{cm}$

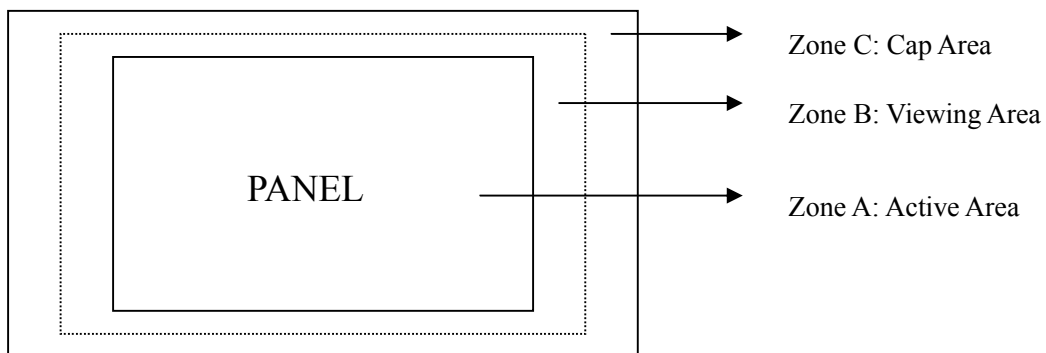
Distance between the Panel & Eyes: $\geq 30\text{cm}$

Viewing angle from the vertical in each direction: $\leq 45^{\circ}$

(See the sketch below)

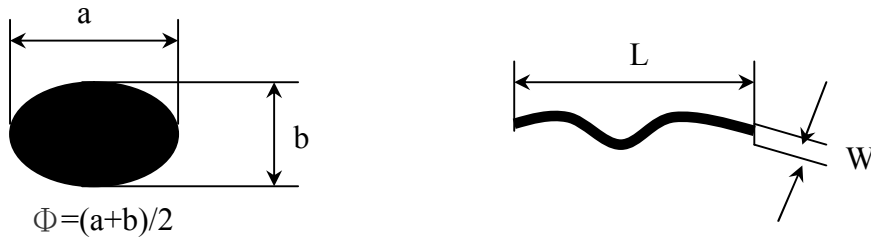


13.3 Quality Assurance Zones

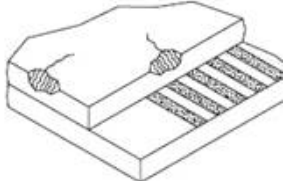


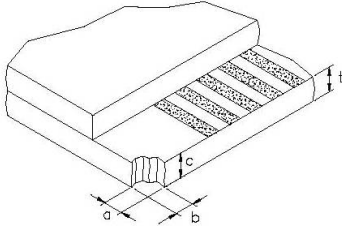
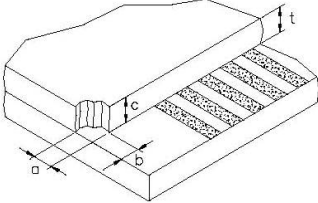
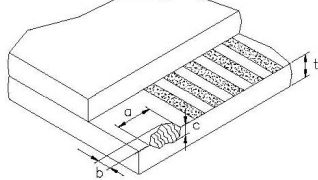
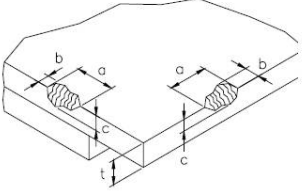
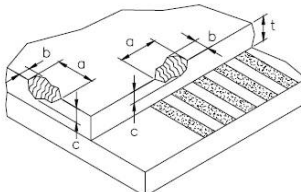
13.4 Inspection Standard

Definition of Φ &L&W (Unit: mm)



I . Appearance Defects

NO.	ITEM	CRITERIA	CLASSIFICATION																
1	Polarizer Black or White spot, Dirty spot, Foreign matter, Dent on the polarizer	<table border="1"> <thead> <tr> <th rowspan="2">Average Diameter (mm)</th> <th colspan="2">Acceptable Number</th> </tr> <tr> <th>Zone A,B</th> <th>Zone C</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.15$</td> <td>Ignore</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.30$</td> <td>3</td> </tr> <tr> <td>$\Phi > 0.30$</td> <td>0</td> </tr> </tbody> </table>	Average Diameter (mm)	Acceptable Number		Zone A,B	Zone C	$\Phi \leq 0.15$	Ignore	Ignore	$0.15 < \Phi \leq 0.30$	3	$\Phi > 0.30$	0	Minor				
Average Diameter (mm)	Acceptable Number																		
	Zone A,B	Zone C																	
$\Phi \leq 0.15$	Ignore	Ignore																	
$0.15 < \Phi \leq 0.30$	3																		
$\Phi > 0.30$	0																		
2	Scratch/line on the glass/Polarizer	<table border="1"> <thead> <tr> <th rowspan="2">Width (mm)</th> <th rowspan="2">Length (mm)</th> <th colspan="2">Acceptable Number</th> </tr> <tr> <th>Zone A,B</th> <th>Zone C</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.03$</td> <td>---</td> <td>Ignore</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.03 < W \leq 0.08$</td> <td>$L \leq 5.0$</td> <td>3</td> </tr> <tr> <td>$W > 0.08$</td> <td>---</td> <td>0</td> </tr> </tbody> </table>	Width (mm)	Length (mm)	Acceptable Number		Zone A,B	Zone C	$W \leq 0.03$	---	Ignore	Ignore	$0.03 < W \leq 0.08$	$L \leq 5.0$	3	$W > 0.08$	---	0	Minor
Width (mm)	Length (mm)	Acceptable Number																	
		Zone A,B	Zone C																
$W \leq 0.03$	---	Ignore	Ignore																
$0.03 < W \leq 0.08$	$L \leq 5.0$	3																	
$W > 0.08$	---	0																	
3	Polarizer Bubble	<table border="1"> <thead> <tr> <th rowspan="2">Average Diameter (mm)</th> <th colspan="2">Acceptable Number</th> </tr> <tr> <th>Zone A,B</th> <th>Zone C</th> </tr> </thead> <tbody> <tr> <td>$\Phi > 0.5$</td> <td>0</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.2 < \Phi \leq 0.5$</td> <td>3</td> </tr> <tr> <td>$\Phi \leq 0.2$</td> <td>Ignore</td> </tr> </tbody> </table>	Average Diameter (mm)	Acceptable Number		Zone A,B	Zone C	$\Phi > 0.5$	0	Ignore	$0.2 < \Phi \leq 0.5$	3	$\Phi \leq 0.2$	Ignore	Minor				
Average Diameter (mm)	Acceptable Number																		
	Zone A,B	Zone C																	
$\Phi > 0.5$	0	Ignore																	
$0.2 < \Phi \leq 0.5$	3																		
$\Phi \leq 0.2$	Ignore																		
4	Any Dirt & Scratch on Polarizer's Protective Film	Ignore for not affect the polarizer.	Acceptable																
5	Glass Crack	 <p>Propagation crack is not acceptable.</p>	Major																

6	Corner Chip	 <p>t= Glass thickness Accept $a \leq 2.0\text{mm}$ or $b \leq 2.0\text{mm}$, $c \leq t$</p>	Minor
7	Corner Chip on Cap Glass	 <p>t= Glass thickness Accept $a \leq 1.5\text{mm}$ or $b \leq 1.5\text{mm}$, $c \leq t$</p>	Minor
8	Chip on Contact Pad	 <p>t= Glass thickness Accept $a \leq 3.0\text{mm}$ or $b \leq 0.8\text{mm}$, $c \leq t$ (on the contact pin) $a \leq 3.0\text{mm}$ or $b \leq 1.5\text{mm}$, $c \leq t$ (outside of the contact pin)</p>	Minor
9	Chip on Face of Display	 <p>t= Glass thickness Accept $a \leq 1.5\text{mm}$ or $b \leq 1.5\text{mm}$, $c \leq t$</p>	Minor
10	Chip on Cap Glass	 <p>t= Glass thickness Accept $a \leq 3.0\text{mm}$ or $b \leq 3.0\text{mm}$, $c \leq t/2$ $a \leq 1.5\text{mm}$ or $b \leq 1.5\text{mm}$, $t/2 \leq c \leq t$</p>	Minor
11	Stain on Surface	Stain removable by soft cloth or air blow is acceptable.	Minor
12	TCP/FPC Damage	<p>(1) Crack, deep scratch, deep hole and deep pressure mark on the TCP/FPC are not acceptable. (2) Terminal lead twisted or broken is not allowable. (3) Copper exposed is not allowed by naked eye inspection.</p>	Minor
13	Dimension Unconformity	Checking by mechanical drawing.	Major

II. Displaying Defects

NO.	ITEM	CRITERIA	CLASSIFICATION										
1	Black/White spot Dirty spot Foreign matter	<table border="1"> <thead> <tr> <th data-bbox="517 367 794 439">Average Diameter (mm)</th> <th colspan="2" data-bbox="794 367 1219 405">Pieces Permitted</th> </tr> <tr> <td data-bbox="517 439 794 472">$\Phi \leq 0.10$</td> <td data-bbox="794 405 1002 439">Zone A,B</td> <td data-bbox="1002 405 1219 439">Zone C</td> </tr> <tr> <td data-bbox="517 472 794 506">$0.10 < \Phi \leq 0.20$</td> <td colspan="2" data-bbox="794 439 1219 506" rowspan="2">Ignore</td> </tr> <tr> <td data-bbox="517 506 794 539">$\Phi > 0.20$</td> </tr> </thead> </table>	Average Diameter (mm)	Pieces Permitted		$\Phi \leq 0.10$	Zone A,B	Zone C	$0.10 < \Phi \leq 0.20$	Ignore		$\Phi > 0.20$	Minor
Average Diameter (mm)	Pieces Permitted												
$\Phi \leq 0.10$	Zone A,B	Zone C											
$0.10 < \Phi \leq 0.20$	Ignore												
$\Phi > 0.20$													
2	No Display	Not allowable.	Major										
3	Irregular Display	Not allowable.	Major										
4	Missing Line (row or column)	Not allowable.	Major										
5	Short	Not allowable.	Major										
6	Flicker	Not allowable.	Major										
7	Abnormal Color	Refer to the SPEC.	Major										
8	Luminance NG	Refer to the SPEC.	Major										
9	Over Current	Refer to the SPEC.	Major										

14 Precautions for operation and Storage

14.1 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.

14.2 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°C and 3~4 sec during soldering.

14.3 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°C and 35°C 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.

14.4 Warranty period

Visionox warrants for a period of 12 months from the shipping date when stored or used under normal condition.

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