

TFT-Display Datenblatt

Modell OT084ASUDDV-00

Kurzdaten

Hersteller	ONation
Diagonale	8,4" / 21,3 cm
Format	4:3
Auflösung	800 x 600
Backlight	LED / 400 cd/m ²
Interface	RGB
Touchscreen	nein
Temperatur	-20... +70°C (Betrieb)

ONation Corporation

CUSTOMER' S APPROVAL SPECIFICATIONS

MODEL: OT084ASUDDV-00
(Complied with RoHS)

CUSTOMER: _____

Version:P0.6

C O N T E N T S

ISSUE:JAN.14.2013

Spec Condition:preliminary

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CUSTOMER	ONATION		
APPROVAL	APPROVAL	CHECKER	PREPARE
	<i>ch lee</i>	<i>ch lee</i>	<i>Carl</i>

2.RECORD OF REVISION

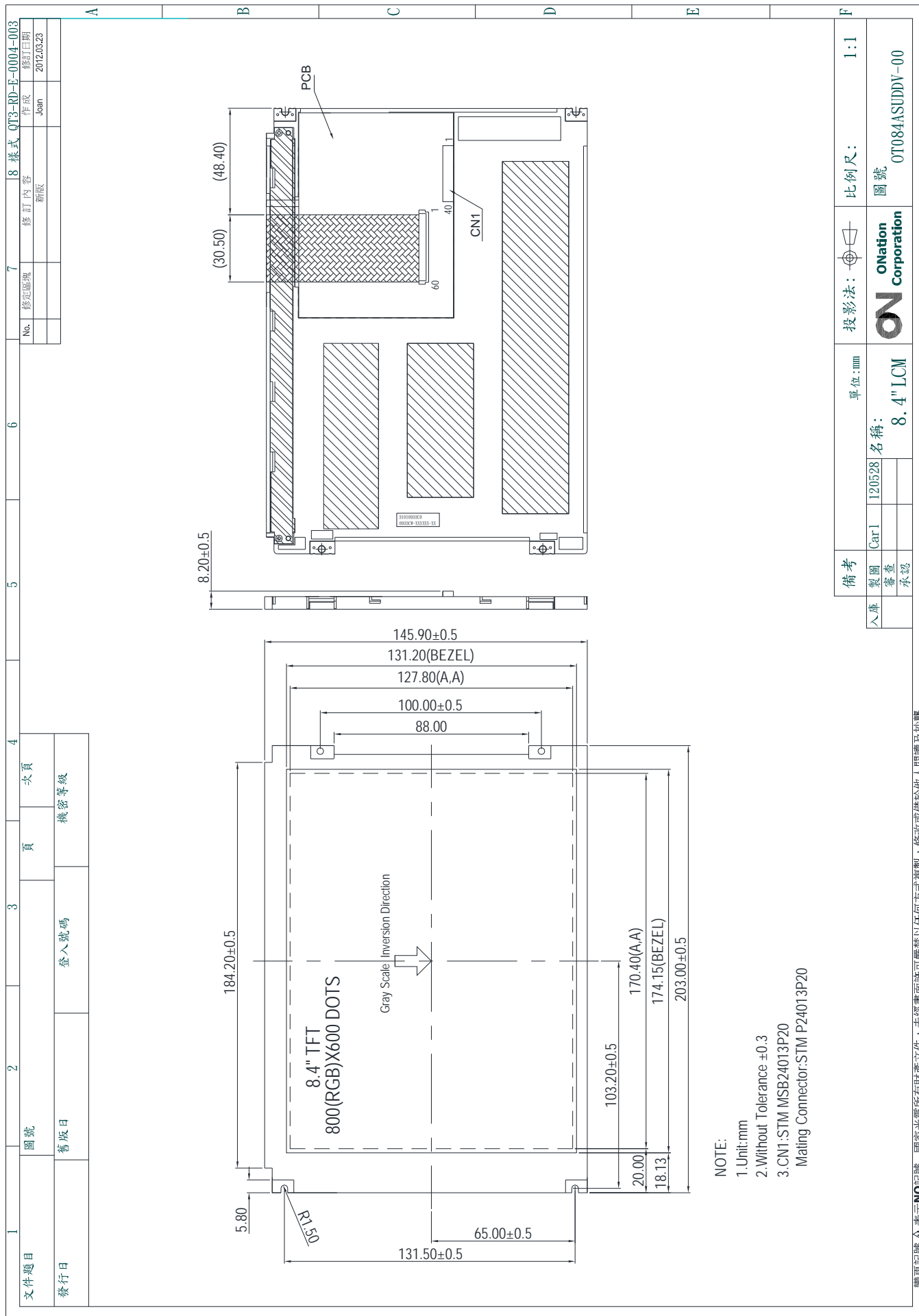
REV	DATE	PAGE	SUMMARY																							
0.1	2011.02.14	ALL	Preliminary specification was first issued.																							
0.2	2011.02.24	2	Modify 4.OUTLINE DIMENSIONS																							
		13~17	Add 12. LCM INSPECTION																							
0.3	2011.03.23	2	Modify 4.OUTLINE DIMENSIONS																							
0.4	2012.05.10	1	Modify (7) Viewing Direction 12O'clock -> 6 O'clock Add (8) Gray Scale Inversion Direction 12 O'clock Modify (10) Module Weight(g) TBD->227±2% Modify (11) Power Consumption Logic System TBD->0.7W (MAX.) Modify (11) Power Consumption B/L System 3.4W(MAX.)->1.6W (MAX.)																							
		2	Modify 4. OUTLINE DIMENSIONS																							
		5	Modify 6. BLOCK DIAGRAM																							
		6	Modify I _{CC} :TBD->210mA Modify I _{LED} (650mA)->(320mA)																							
		6	Modify LED Number 42→35																							
		7	MODIFY 9.OPTICAL CHARACTERISTICS Luminance MIN. : 360 cd/m ² →400 cd/m ²																							
		7	MODIFY 9.OPTICAL CHARACTERISTICS Luminance uniformity : 70%→80%																							
		7	<table border="1"> <tr> <td rowspan="2">Chromaticity</td> <td rowspan="2">White</td> <td>x</td> <td>0.26</td> <td>0.30</td> <td>0.34</td> <td rowspan="2">→</td> <td>x</td> <td>(0.28)</td> <td>(0.32)</td> <td>(0.36)</td> </tr> <tr> <td>y</td> <td>0.28</td> <td>0.32</td> <td>0.38</td> <td>y</td> <td>(0.32)</td> <td>(0.36)</td> <td>(0.40)</td> </tr> </table>	Chromaticity	White	x	0.26	0.30	0.34	→	x	(0.28)	(0.32)	(0.36)	y	0.28	0.32	0.38	y	(0.32)	(0.36)	(0.40)				
		Chromaticity	White			x	0.26	0.30	0.34		→	x	(0.28)	(0.32)	(0.36)											
				y	0.28	0.32	0.38	y	(0.32)	(0.36)		(0.40)														
13~18	Add 12.LCM INSPECTION																									
19	Add 13.PRECAUTIONS FOR USE																									
0.5	2012.05.29	2	Modify 4. OUTLINE DIMENSIONS																							
		6	8.2 ELECTRICAL CHARACTERISTICS OF BACKLIGHT I _{LED} TYP. : (320)mA->(650) mA																							
		7	Modify 9.OPTICAL CHARACTERISTICS Viewing Angle : <table border="1"> <tr> <td>Θ_{x+}</td> <td>65</td> <td>75</td> <td rowspan="4">→</td> <td>Θ_{x+}</td> <td>65</td> <td>75</td> </tr> <tr> <td>Θ_{x-}</td> <td>65</td> <td>75</td> <td>Θ_{x-}</td> <td>65</td> <td>75</td> </tr> <tr> <td>Θ_{y+}</td> <td>50</td> <td>60</td> <td>Θ_{y+}</td> <td>60</td> <td>70</td> </tr> <tr> <td>Θ_{y-}</td> <td>60</td> <td>70</td> <td>Θ_{y-}</td> <td>50</td> <td>60</td> </tr> </table>	Θ _{x+}	65	75	→	Θ _{x+}	65	75	Θ _{x-}	65	75	Θ _{x-}	65	75	Θ _{y+}	50	60	Θ _{y+}	60	70	Θ _{y-}	60	70	Θ _{y-}
Θ _{x+}	65	75	→	Θ _{x+}	65	75																				
Θ _{x-}	65	75		Θ _{x-}	65	75																				
Θ _{y+}	50	60		Θ _{y+}	60	70																				
Θ _{y-}	60	70		Θ _{y-}	50	60																				
0.6	2013.01.14	1	Modify Module Size 5.70(D)->8.2(D)																							
		2	Modify 4.OUTLINE DIMENSIONS																							
		6	Modify ICC→MAX:230mA 、ILED→MAX:700mA																							

3.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	800(R.G.B) X 600	
(2)	Module Size(mm)	203.00(W) X 145.90(H) X 8.2(D) With PCB Board	
(3)	Active Area(mm)	170.40(H) X 127.80(V)	
(4)	Pixel Pitch(mm)	0.213 (H) X 0.213(V)	
(5)	LCD / Polarizer Model	TFT , Transmissive, Normally/White, Anti-glare	
(6)	Backlight Color	White LED	
(7)	Viewing Direction	6 O'clock	
(8)	Gray Scale Inversion Direction	12 O'clock	
(9)	Color Configuration	R.G.B Stripe	
(10)	Module Weight(g)	227±2%	
(11)	Power Consumption	Logic System	0.7W (MAX.)
		B/L System	1.6W (MAX.)

Note 1: Viewing direction for best image quality is different from TFT definition,there is 180 degree shift.

4. OUTLINE DIMENSIONS



NOTE:
 1. Unit:mm
 2. Without Tolerance ±0.3
 3. CN1:STM MSB24013P20
 Mating Connector:STM P24013P20

變更記號 ▲ 表示 NO 記號 國家光電所有財產文件，未經書面許可嚴禁以任何方式複製，修改或借於他人閱讀及抄襲

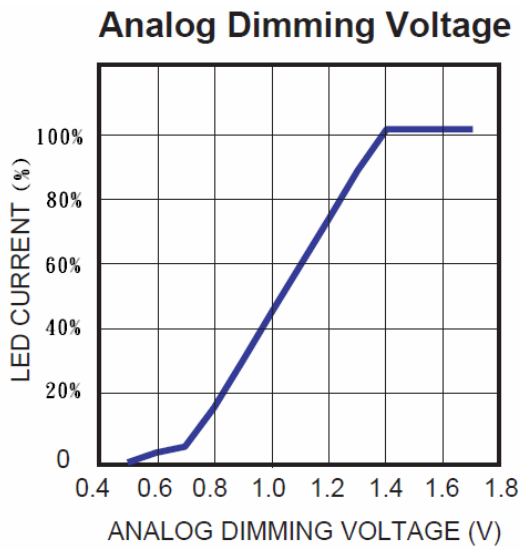
5.INTERFACE PIN CONNECTION

5.1 LCM PANEL DRIVING SECTION

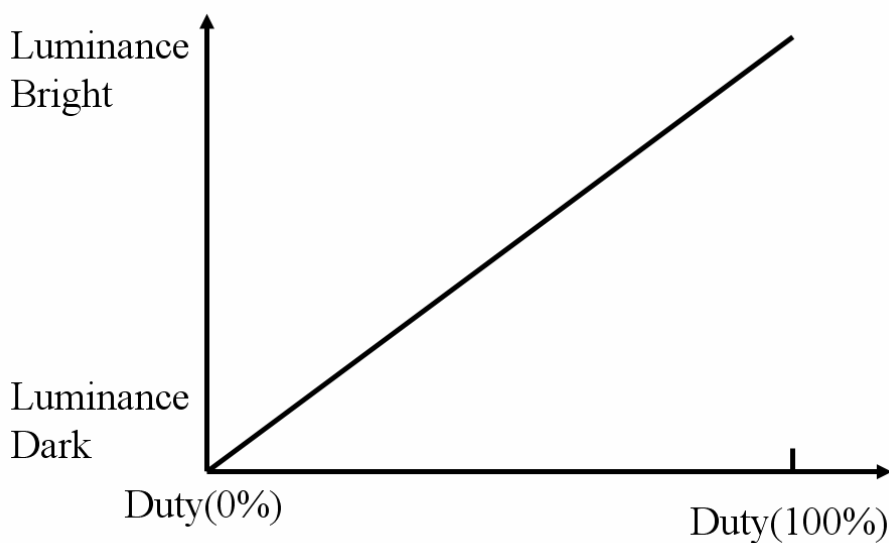
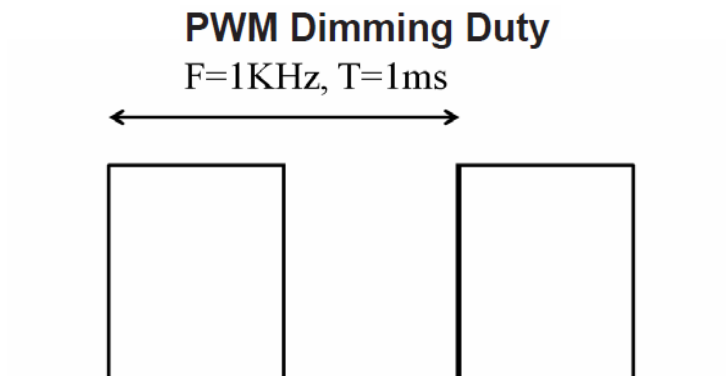
CN1: STM MS2406P40M

PIN NO.	SIGNAL	FUNCTION	REMARK
1	GND	GROUND	
2	GND	GROUND	
3	ADJ	ADJUST THE BACK LIGHT BRIGHTNESS	Note1,2
4	VLED	POWER SUPPLY FOR LED DRIVER CIRCUIT (5V)	
5	VLED	POWER SUPPLY FOR LED DRIVER CIRCUIT (5V)	
6	VLED	POWER SUPPLY FOR LED DRIVER CIRCUIT (5V)	
7	VCC	POWER SUPPLY FOR DIGITAL DRIVER	
8	VCC	POWER SUPPLY FOR DIGITAL DRIVER	
9	DE	DATA ENABLE	
10	GND	GROUND	
11	GND	GROUND	
12	GND	GROUND	
13	B5	BLUE DATA SIGNAL(MSB)	
14	B4	BLUE DATA SIGNAL	
15	B3	BLUE DATA SIGNAL	
16	GND	GROUND	
17	B2	BLUE DATA SIGNAL	
18	B1	BLUE DATA SIGNAL	
19	B0	BLUE DATA SIGNAL(LSB)	
20	GND	GROUND	
21	G5	GREEN DATA SIGNAL(MSB)	
22	G4	GREEN DATA SIGNAL	
23	G3	GREEN DATA SIGNAL	
24	GND	GROUND	
25	G2	GREEN DATA SIGNAL	
26	G1	GREEN DATA SIGNAL	
27	G0	GREEN DATA SIGNAL(LSB)	
28	GND	GROUND	
29	R5	RED DATA SIGNAL(MSB)	
30	R4	RED DATA SIGNAL	
31	R3	RED DATA SIGNAL	
32	GND	GROUND	
33	R2	RED DATA SIGNAL	
34	R1	RED DATA SIGNAL	
35	R0	RED DATA SIGNA(LSB)	
36	GND	GROUND	
37	GND	GROUND	
38	DCLK	CLOCK SIGNALS	
39	GND	GROUND	
40	GND	GROUND	

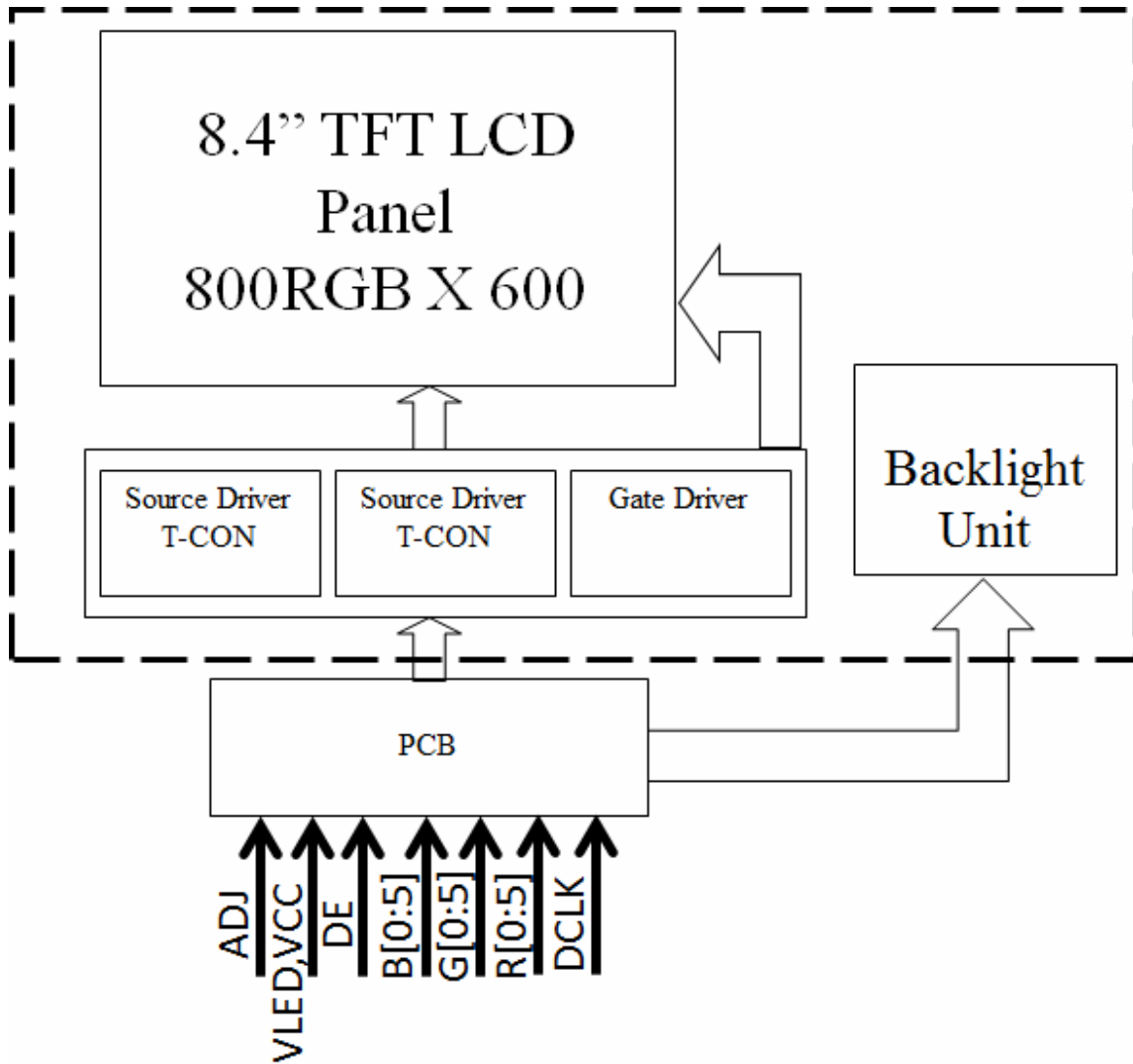
Note1: When the ADJ pin voltage rises from 0.7VDC to 1.4VDC, the LED current will change from 0% to 100% of the maximum LED current.



Note2: ADJ signal $V_{p-p} = 1.4 \sim 5.0V$, operation frequency: 100Hz ~ 1kHz



6. BLOCK DIAGRAM



7. ABSOLUTE MAXIMUM RATINGS

7.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
Digital Supply Voltage	VCC	-0.3	+5.0	V	
LED Driving Voltage	VLED	-0.3	+17	V	
Logic Input Voltage	V _{IN}	-0.3	VCC+0.3	V	
Logic Output Voltage	V _{OUT}	-0.3	VCC+0.3	V	

7.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(°C)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	-	90	-	90	Note 4

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Operation Ta=70°C & -20°C ≤ 240Hrs.

Note 4 : Operation Ta=60°C & H=90% ≤ 240Hrs.

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8.ELECTRICAL CHARACTERISTICS

8.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage for LCD	VCC	3.0	3.3	3.6	V	
	ICC	-	210	230	mA	Note 1
Input signal voltage	V _{IH}	0.7VCC		VCC	V	Note 2
	V _{IL}	0		0.3VCC	V	

Note1:Test Pattern: all black.

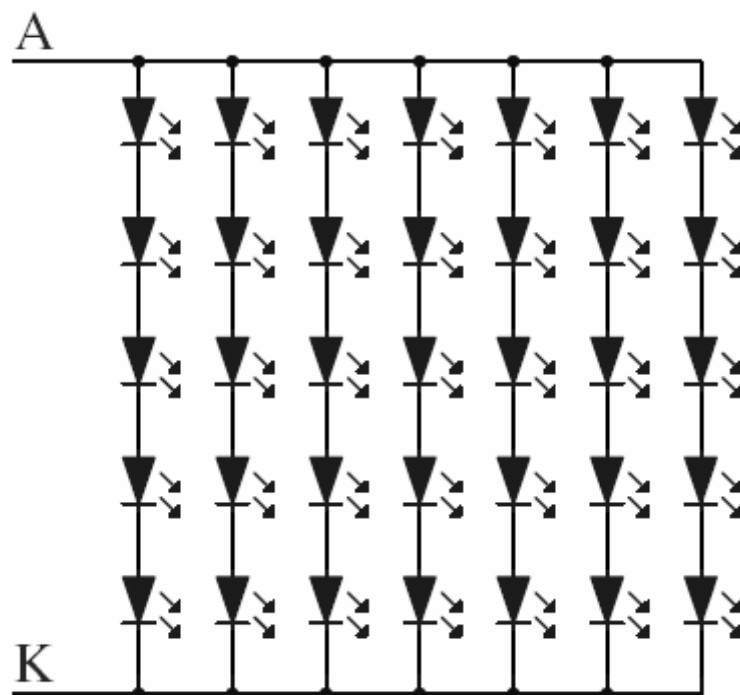
Note2: HSYNC, VSYNC, DE, Digital data.

8.2 ELECTRICAL CHARACTERISTICS OF BACKLIGHT

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage	VLED	-	5	-	V	
	ILED	-	650	700	mA	
ADJ Input Analog Dimming	-	0.7	-	1.4	V _{DC}	
ADJ Input PWM Dimming Voltage	-	1.4	-	5.0	V _{p-p}	
ADJ frequency	-	100	-	1000	Hz	

Note1: LED Number



9.OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	SPECIFICATIONS				REMARK
			MIN.	TYP.	MAX.	UNIT	
Response Time	TR	T=0	-	2	4	ms	Note 2
	TF		-	6	12	ms	
Contrast Ratio	CR	Viewing Normal	450	600	-	-	Note 1
Chromaticity	White	Angle $\Theta_x = \Theta_y = 0^\circ$	(0.28)	(0.32)	(0.36)	-	Note 4
			(0.32)	(0.36)	(0.40)	-	
Viewing Angle	Hor.	Viewing Angle $\Theta_x = \Theta_y = 0^\circ$ $CR \geq 10$	65	75	-	Deg.	Note 3
			65	75	-		
	Ver.		60	70	-		
			50	60	-		
Luminance	L	ADJ=1.4V _{DC}	400	-	-	cd/m ²	
Luminance uniformity	YU		80	-	-	%	Note 5

Note 1: Definition Of Contrast Ratio(CR):

The contrast ratio can be calculated by the following expression

$$\text{Contrast Ratio (CR)} = L_{63}/L_0$$

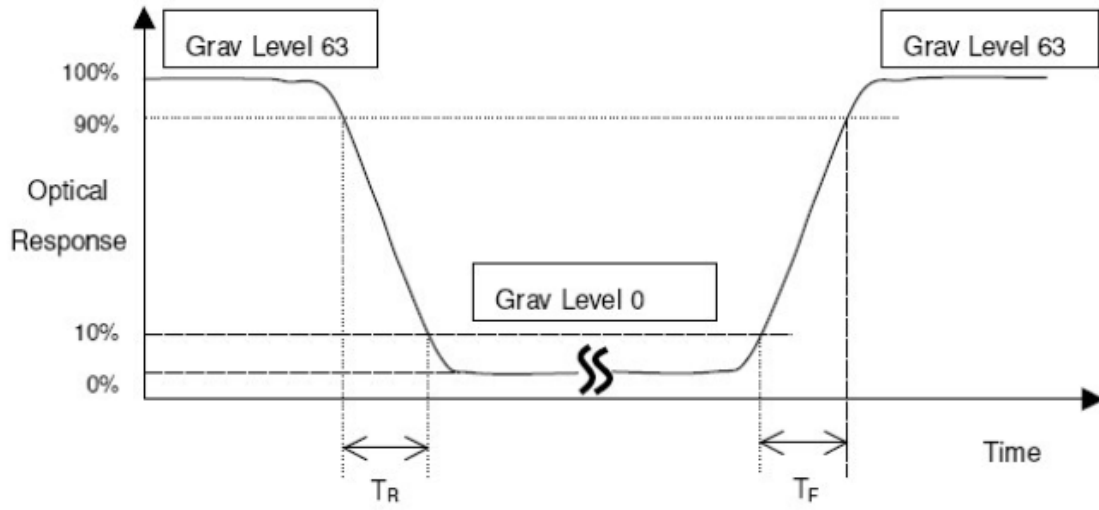
L63:Luminance of gray level 63

L0:Luminance of gray level 0

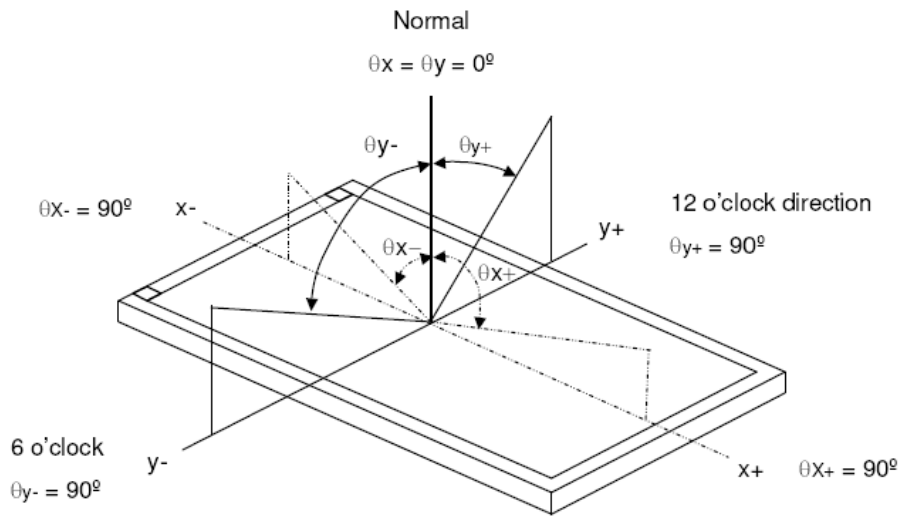
$$CR = CR(5)$$

CR(X) is corresponding to the contrast ratio of the point X at figure in Note(5)

Note 2: Definition Of Response Time(T_R , T_F):

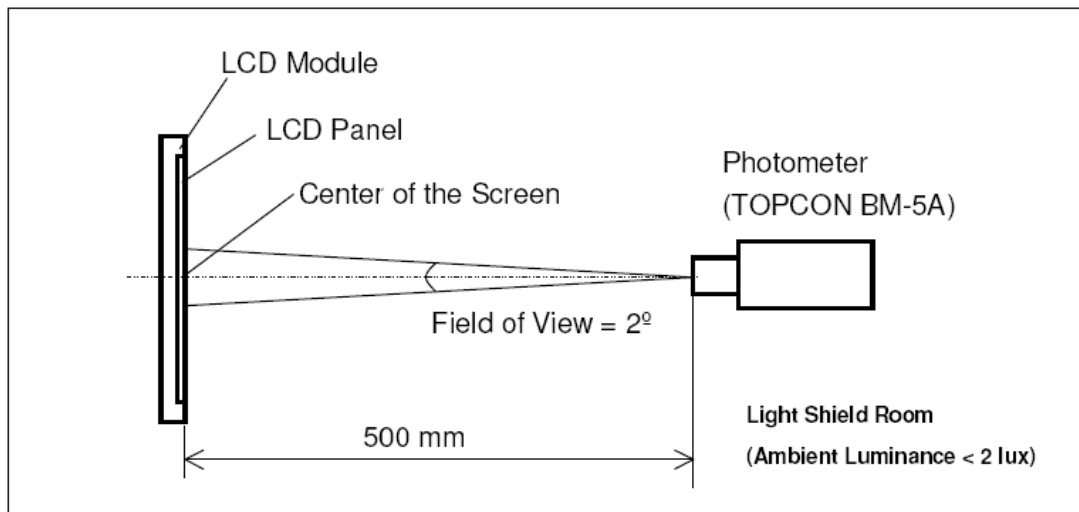


Note 3: Definition Of Viewing Angle

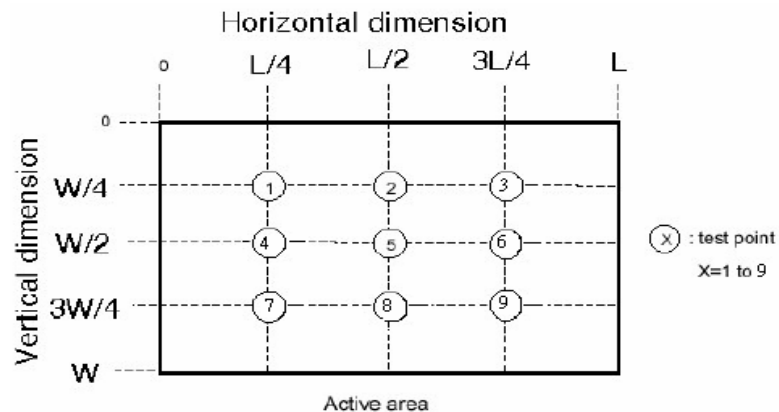


Note 4: Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note 5:



$$\left(1 - \frac{\text{MAX Luminance} - \text{Average Luminance}}{\text{Average Luminance}} \right) \times 100\% \geq 80\%$$

10. TIMING SPECIFICATIONS

10.1 POWER SIGNAL SEQUENCE

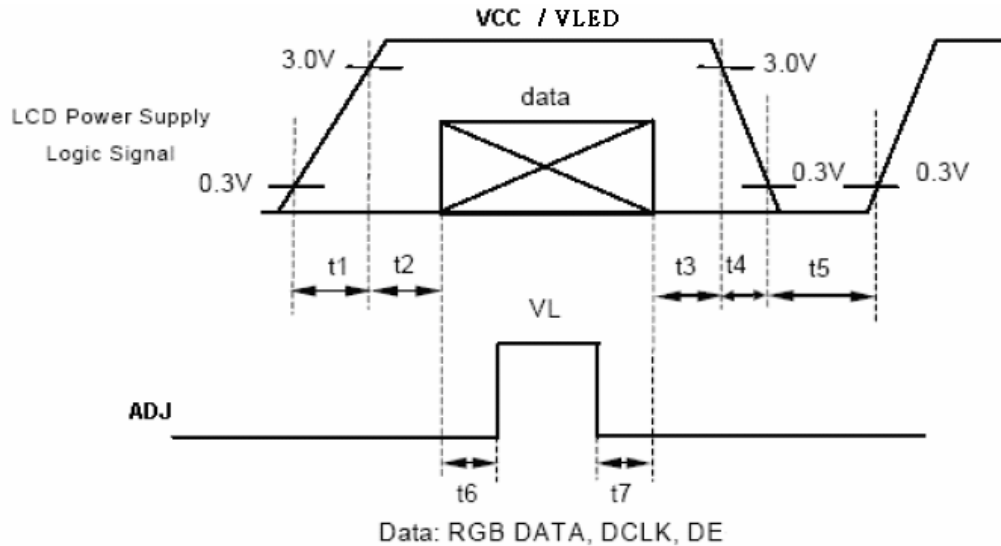
Power Signal Sequence:

$$t1 \leq 10\text{ms} \quad ; \quad 1\text{sec} \leq t5$$

$$200\text{ms} \leq t2 \quad ; \quad 200\text{ms} \leq t6$$

$$0 \leq t3 \leq 50\text{ms} \quad ; \quad 200\text{ms} \leq t7$$

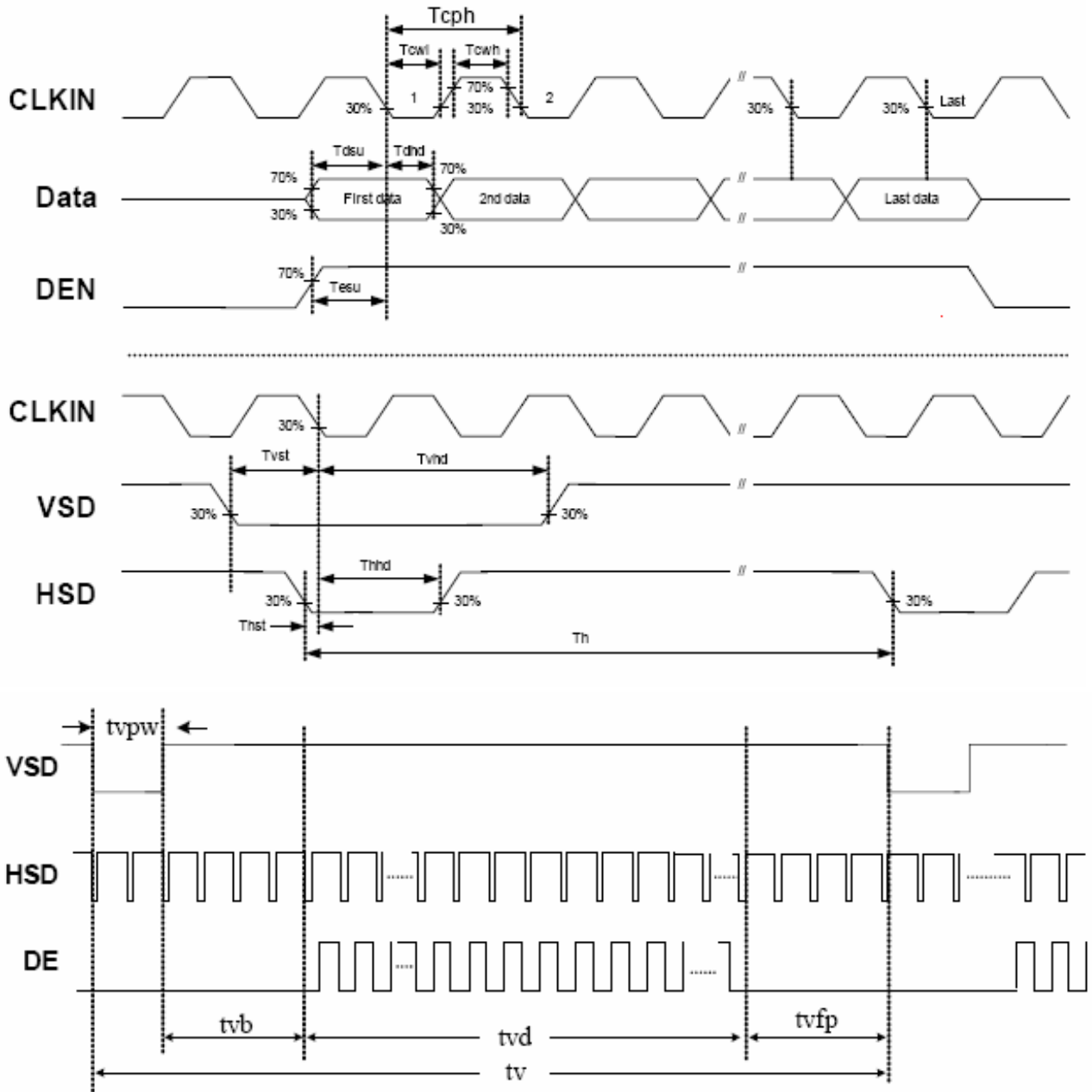
$$0 \leq t4 \leq 10\text{ms}$$



10.2 AC TIMING CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
DCLK cycle time	Tcph	20	-	-	ns	-
DCLK frequency	fclk	-	40	50	MHz	-
DCLK pulse duty	Tcwh	40	50	60	%	-
VSD setup time	Tvst	8	-	-	ns	-
VSD hold time	Tvhd	8	-	-	ns	-
HSD setup time	Thst	8	-	-	ns	-
HSD hold time	Thhd	8	-	-	ns	-
Data setup time	Tdsu	8	-	-	ns	-
Data hold time	Tdhd	8	-	-	ns	-
DE setup time	Tesu	8	-	-	ns	-
DE hold time	Tehd	8	-	-	ns	-
Horizontal display area	thd	-	800	-	Tcph	-
HSD period time	th	-	1000	-	Tcph	-
Horizontal display area	thpw	1	48	-	Tcph	-
HSD period time	thb	-	40	-	Tcph	-
HSD pulse width	thfp	-	112	-	Tcph	-
HSD back porch	tvd	-	600	-	th	-
HSD front porch	tv	-	660	-	th	-
VSD period time	tvpw	-	3	-	th	-
VSD pulse width	tvb	-	36	-	th	-
VSD back porch	tvfp	-	21	-	th	-

10.3 AC TIMING DIAGRAMS



11. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	80°C	240HRS	
2	Low Temperature Storage	-30±3°C	240HRS	
3	High Temperature Humidity Operation	60°C 90%RH	240HRS	
4	High Temperature Operation	70°C	240HRS	
5	Low Temperature Operation	-20°C	240HRS	
6	Temperature Cycle	-30°C ← -25°C → 80°C (30min) (5min) (30min)	100CYCLE	

Note (1): a. The module should work properly.

b. Before and after function test, the difference of consumptive current should be within 10%

Note (2) : a. The module should work properly.

b. The module won't be deformative, color changeable or broken.

c. The modules can't be apart.

12. LCM INSPECTION

12.1 QUALITY LEVEL

INSPECTION PLAN:

SAMPLING LEVEL : II, normal inspection, single sampling inspection

Sampling Plan		MIL-STD-105E
		Normal Inspection, Single Sampling
		Level II
AQL	Major Defect	1.0%
	Minor Defect	2.5%

12.2 ENVIRONMENT CONDITIONS:

Ambient Temperature		20 ~ 25°C.
Ambient Humidity		65±5%RH
Ambient Illumination	Inspection	250~350 Lux

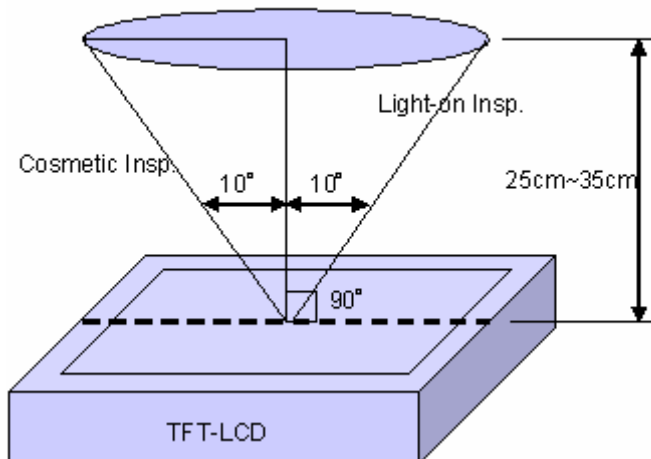
12.3 INSPECTION CONDITION

(1) Inspection Distance: 30 cm±5cm

(2) View Angle:

Light-on Inspection Angle : ±10°

Cosmetic Inspection Angle : ±10°



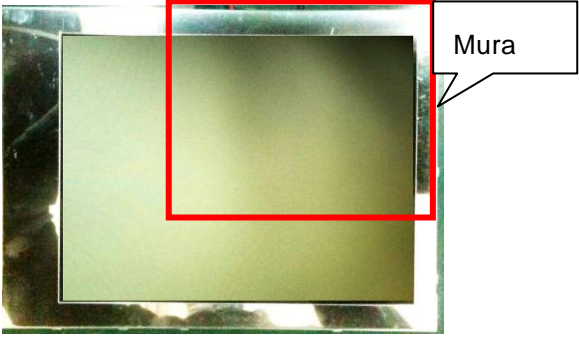
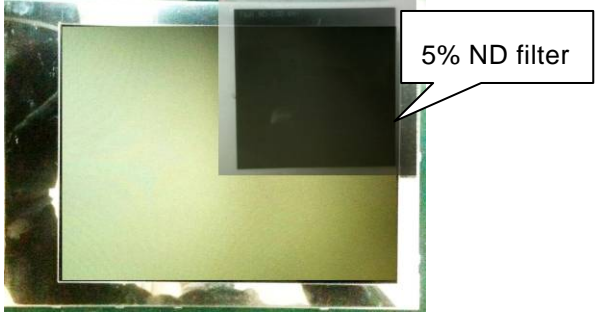
12.4 DEFINITION OF EACH ZONE

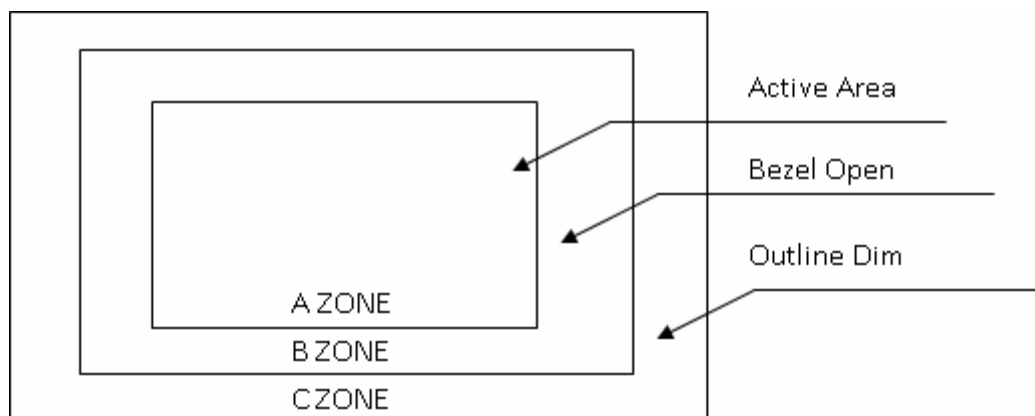
A zone : Active Area

B zone : Bezel Open

C zone : Outline Dim

NO.	ITEM	CRITERIA		ZONE
1	Point Defect	Bright Dots	$N \leq 2$	A
		Dark Dots	$N \leq 4$	
		Bright Dot- 2 Adjacent	$N \leq 0$	
		Dark Dots- 2 Adjacent	$N \leq 1$	
		Dark or Bright Dots- 3 and More Adjacent	$N \leq 0$	
		Total Bright and Dark Dots	$N \leq 5$	
		Minimum Distance Between Bright Dots	5mm	
		Minimum Distance Between Dark Dots	5mm	
		Minimum Distance Between Dark And Bright Dots	5mm	
2	Bubbles in polarizer	Average diameter D(mm)	Maximum number acceptable	A、B
		$D \leq 0.3$	Ignore	
		$0.3 < D \leq 1.0$	$N \leq 3$	
		$1.0 < D \leq 1.5$	$N \leq 1$	
		$1.5 < D$	None	
3	Bubbles in AR FILM	$D \leq 0.8$	$N \leq 3$	A、B
4	Circular Foreign Material : Dark/ Bright Spot (Visible under : ND5% filter)	Average diameter D(mm)	Maximum number acceptable	A、B
		$D \leq 0.15\text{mm}$	No count	
		$0.15\text{mm} < D \leq 0.5\text{mm}$	$N \leq 4$	
		$D > 0.5\text{mm}$	Not allowable	
5	Linear Foreign Material : Bright or Dark Line	Invisible under ND5% filter	Visible under ND5% filter	A、B
		$0.1\text{mm} < W \leq 0.5\text{mm}$, $0.3\text{mm} < L \leq 1.5\text{mm}$	$N \leq 4$	
6	Linear Scratch	$0.05\text{mm} \leq W \leq 0.2\text{mm}$ $0\text{mm} \leq L \leq 5.0\text{mm}$	$N \leq 4$	A、B

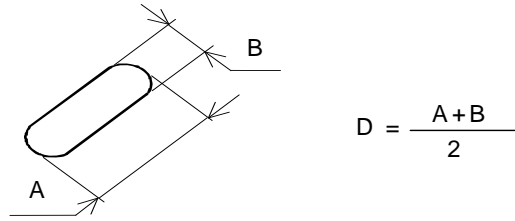
7	Mura & Leak	<p>1. Mura Definition: Under the Inspection Angle ϵ of view, visible brightness creates each kind of trace non-uniform the phenomenon.</p> 		
		<p>2. Covers the 5% ND filter not to be able to see namely regards as the nondefective</p> 		
8	Bezel Deformation	Obvious deformation is not allowed		C
9	Bezel Oxidation	Not allowed if it rusts continuously over 1 cm (It is out of warranty with rusted tin plate)		C
10	Bezel Scratch	Non-feeling abrasion	Ignore	C
		Has the feeling abrasion	$L \leq 20\text{mm}$, $W \leq 0.3 \text{ mm}$, $N \leq 7$	
11	Metal Squash Dent /Flange(Front Side)	$D(W) \leq 1 \text{ mm}, L \leq 3, N \leq 4$		C



12.5 APPEARANCE SPECIFICATION

If a problem occurs in respect to any of these items , both parties(Customer and Onation) will discuss in more detail.

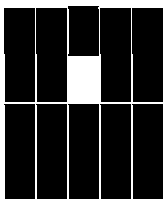
Note 1 : Definition of average diameter D



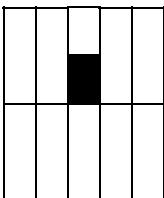
Note 2 : Definition of length L and width W



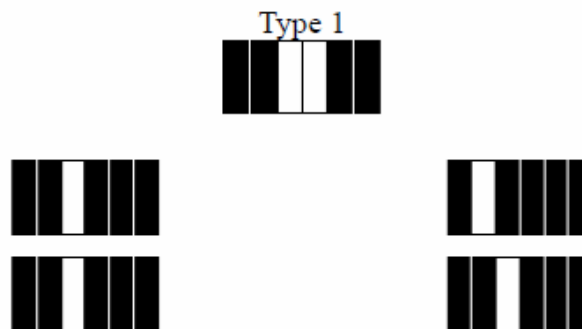
Note 3 :Bright dot defect definition-bright area is more than 50% of one dot .All bright dot defect must be visible through 5% ND filter.



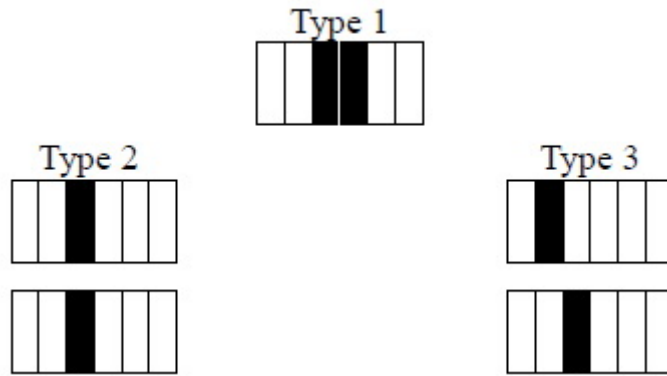
Note 4 : Dark dot defect definition-Dark area is more than 50% of one dot . All bright dot defect must be visible through 5% ND filter.



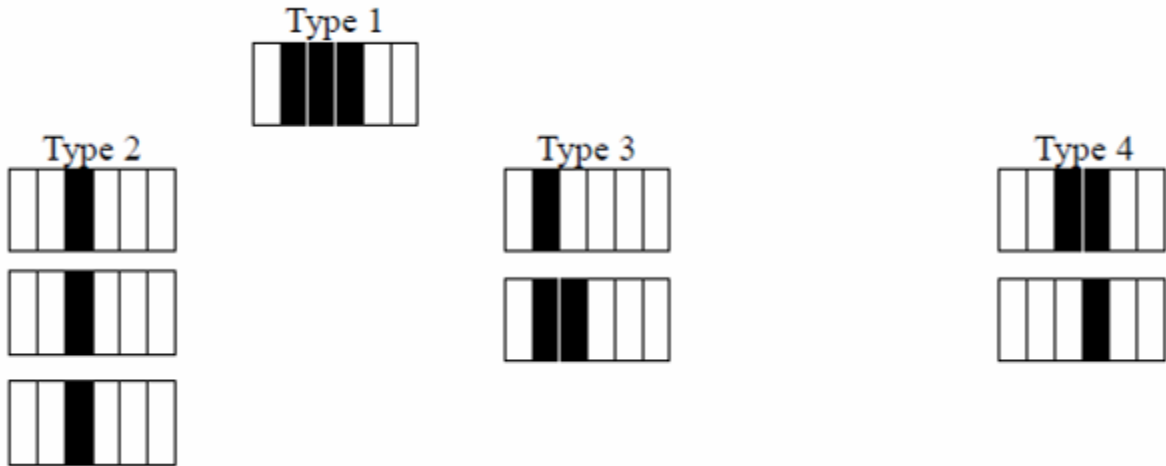
Note 5 : Bright dot defect description- Two adjacent.



Note 6 : Dark dot defect description- Two adjacent.

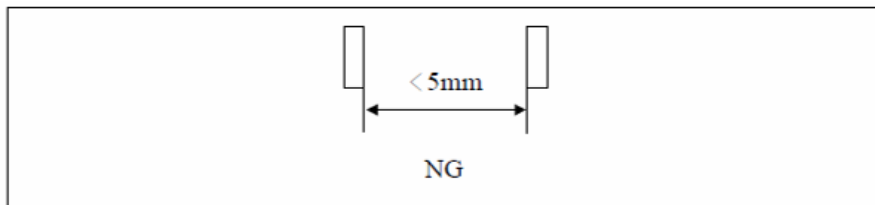


Note 7 : Dark dot defect description- Three adjacent.

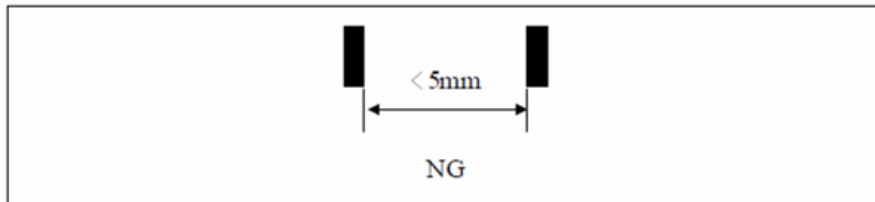


Note 8 :Minimum distance between dot defects.

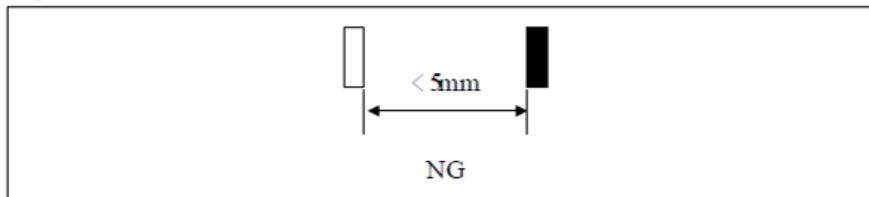
Bright dot to bright dot.



Dark dot to dark dot



Bright dot to dark dot



Note 9 : Every dot herein means sub-pixel(Each Red, Green, Blue Color).

Note 10 : Damaged less than half size of sub-pixel is not counted as defect.

Note 11 : Extraneous substances which can be wiped out, such as fingerprint and particles are not considered as a defect.

Note 12 : Defects on the Black Matrix (outside Active Area 0.3mm) are not considered as a defect

13. PRECAUTIONS FOR USE

13.1 SAFETY

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

13.2 STORAGE CONDITIONS

- (1) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\%\text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

13.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
- (10) Wipe off water droplets or oil immediately . If you leave the droplets for a long time, staining and discoloration may occur.
- (11) 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.

13.4 WARRANTY

(1) Acceptance inspection period

The period is within one month after the arrival of contracted commodity at the buyer's factory site.

(2) Applicable warrant period

The period is within 12 months since the date of shipping out under normal using and storage conditions.