DATA IMAGE CORPORATION
PRODUCT SPECIFICATION
MODEL NO.: FG0800X1DSSWBG01

■ Preliminary Specification

☐ Approval Specification

Customer :

APPROVED BY

_____ _____

SIGNATURE **DATE**

R&D Approved By	Prepared By
Roger	WenChun
Issued Date	Revision
30/MAY/23’	1

2. RECORD OF REVISION

Rev	Date	Item	Page	Comment	Source
1	30/MAY/23’	AII	AII	Initial Preliminary	ESR-230428007

Contents

1. GENERAL DESCRIPTION

1.1 OVERVIEW

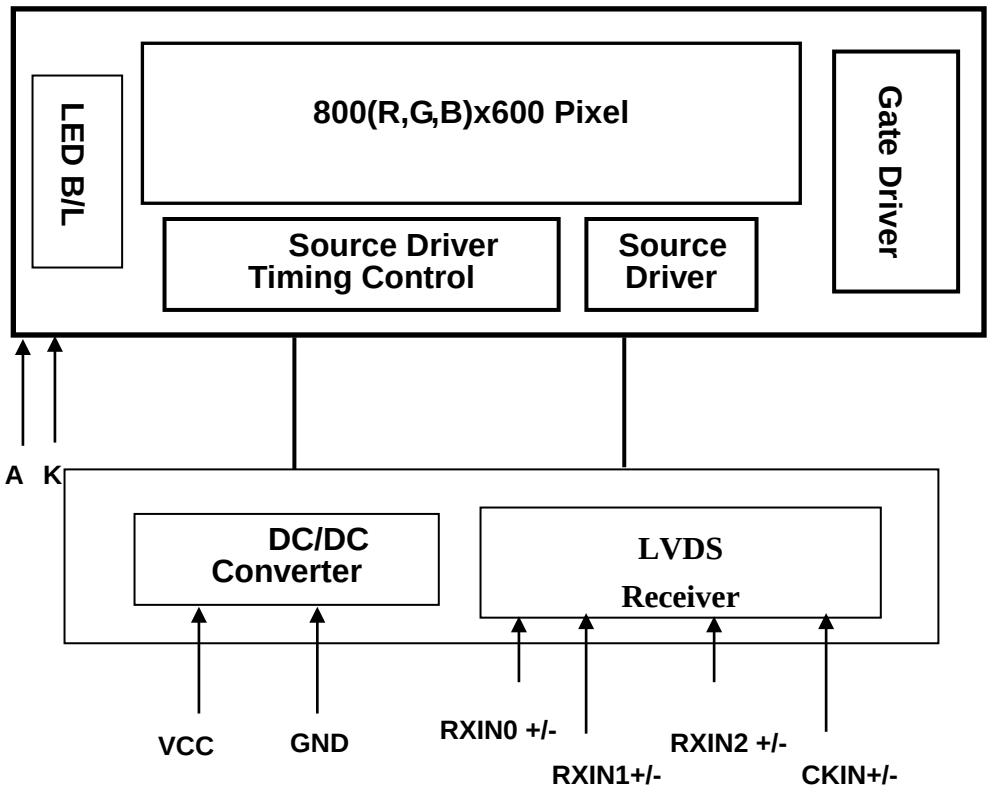
FG0800X1DSSWBG01 is an 8” (diagonal) a-Si & transmissive type thin film transistor liquid crystal display (TFT-LCD) module with LVDS interface. The module is composed of a TFT-LCD panel, driver circuit, and backlight unit.

1.2 TFT LCD MODULE SPECIFICATIONS

The following items are characteristics summary on the table under 25℃ condition :

Parameter	Specifications	Unit
Screen Size	8(diagonal)	inch
LCD Outline Dimension	183(H) x 141(V) x 8.8(D)	mm
LCD Active Area	162(H) x 121.5 (V)	mm
Resolution	800(H) x RGB x 600(V)	dot
Pixel Pitch	0.2025 (H) x 0.2025 (V)	mm
Pixel Arrangement	RGB-Stripe	
Display Mode	Normally White, Transmissive	
Display Colors	262K	
View direction (Gray Inversion)	6 o’clock	
Luminance, White	300	cd/m^2
LCD Interface	LVDS	
Surface treatment	Anti-Glare	
RoHS Compliance	Yes	

2. FUNCITONAL BLOCK DIAGRAM



3.ABSOLUTE MAXIMUM RATINGS

3.1 ABSOLUTE RATINGS OF ENVIRONMENT

Parameter	Symbol	MIN.	MAX.	Unit	Remark
Operating temperature	Top	-20	+70	°C	
Storage temperature	Tst	-30	+80	°C	

3.2 ELECTRICAL ABSOLUTE RATINGS

Ta= 25°C

Parameter	Symbol	MIN.	MAX.	Unit	Remark
Power supply voltage	VCC	-0.3	4.0	V	

4. ELECTRICAL SPECIFCATIONS

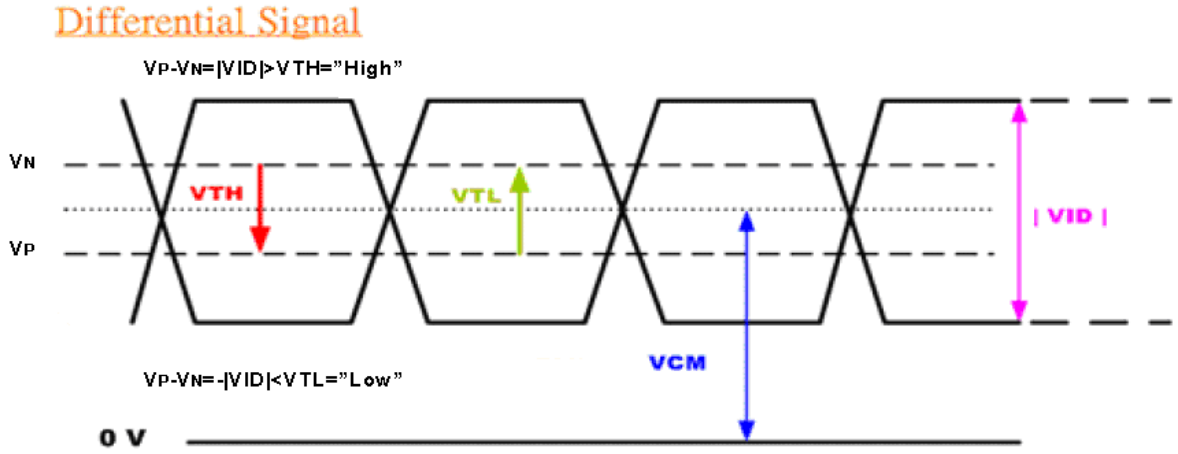
4.1 ELECTRICAL CHARACTERISTICS

4.1.1 TFT LCD MODULE ELETRONICS SPECIFICATION

Module

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage	VCC	3.0	3.3	3.6	V	
Power Supply Current	I_{CC}	--	200	300	mA	VCC =3.3V
Differential Input High Threshold	VTH	-	-	100	[mV]	VCM=1.2V Note 1
	VTL	-100	-	-	[mV]	
Ripple voltage	V_{RF}	-	-	100	mV_{P-P}	

Note 1: LVDS Signal Waveform.



4.1.2 BACKLIGHT DRIVING CONSUMPTION

Ta= 25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Unit
Voltage for LED backlight	V_F	8.4	9.3	10.5	V	Note 1
Current for LED backlight	I_F	162	180	198	mA	
LED lifetime	-	20,000	--	--	hr	Note 2

Note 1: The LED Supply Voltage is defined by the number of LED at Ta=25°C and IF =180mA.

Note 2: The "LED lifetime" is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IF =180mA. The LED lifetime could be decreased if operating IF is higher than 180mA.

4.2 SIGNAL CHARACTERISTICS

4.2.1 AC ELECTRICAL CHARACTERISTICS

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Data setup time	T_{dsu}	8	-	-	ns
Data hold time	T_{dhd}	8	-	-	ns
DEN setup time	T_{esu}	8	-	-	ns

4.2.2 RESOLUTION：800x600

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
DCLK frequency	F_{CPH}	-	40	50	MHz
DCLK period	T_{CPH}	20	25	-	ns
DCLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH}+T_{DEL}$	862	1056	1200	T_{CPH}
DE pulse width	T_{DH}	-	800	-	T_{CPH}
DE frame blanking	T_{DEB}	24	35	100	$T_{DEH}+T_{DEL}$
DE frame width	T_{DE}	-	600	-	$T_{DEH}+T_{DEL}$

4.2.3 TIMING CONTROLLER TIMING CHART

Clock and Data input waveforms

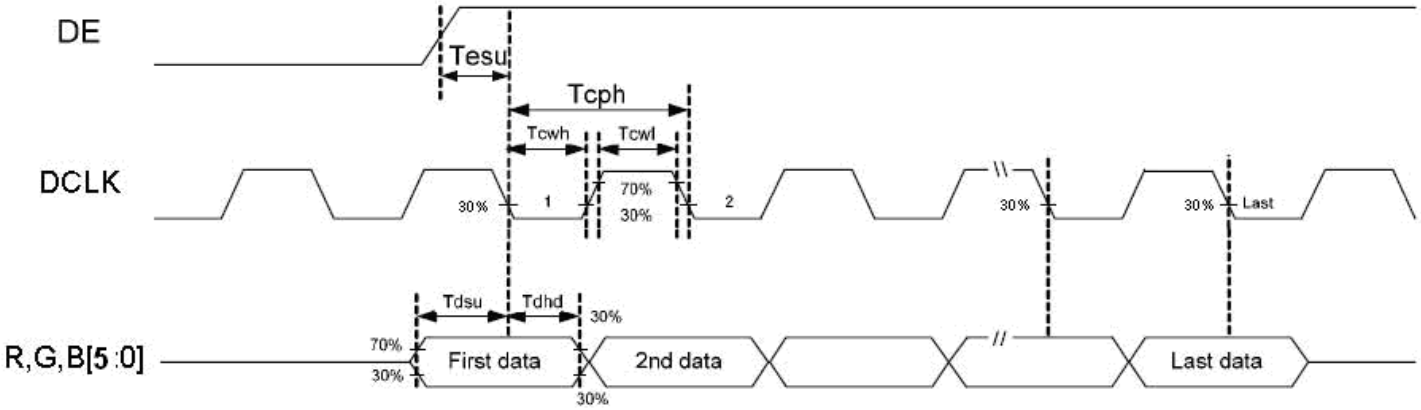
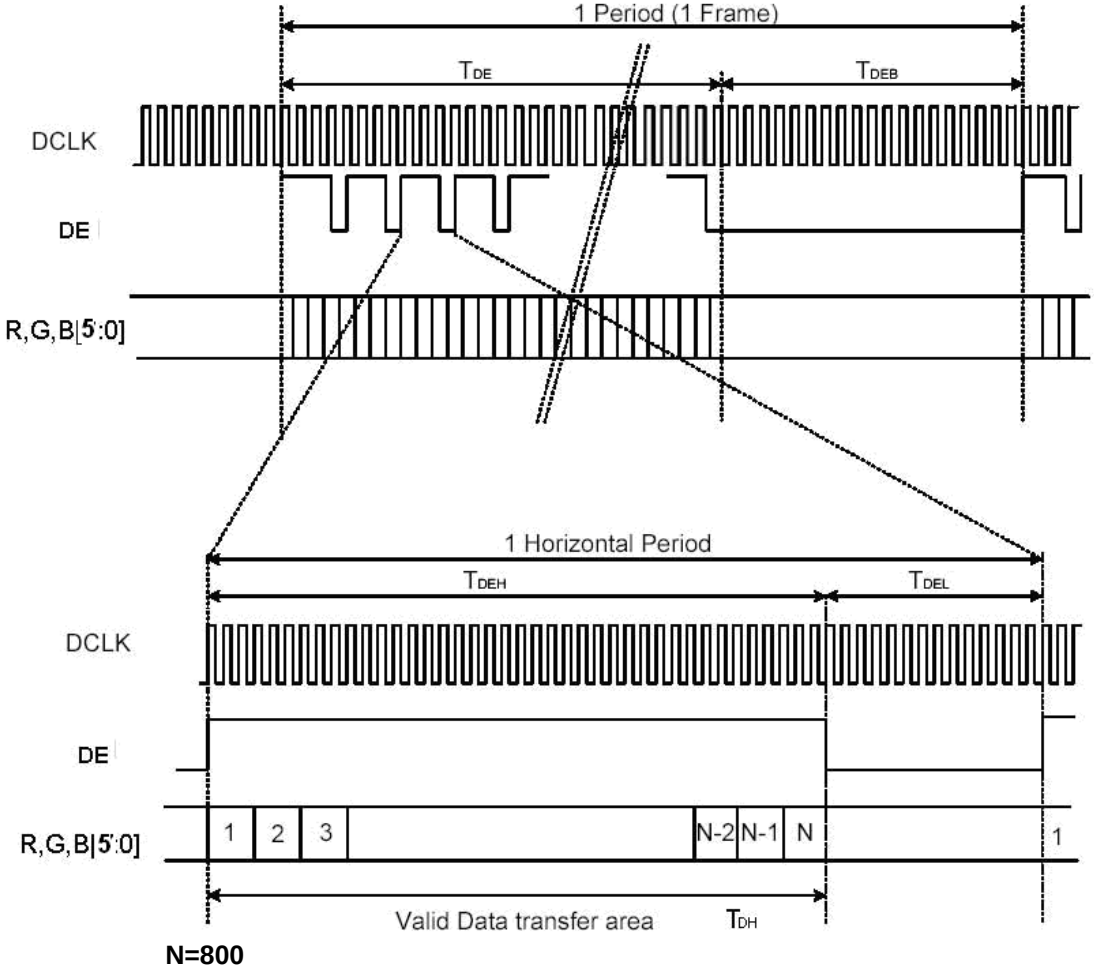


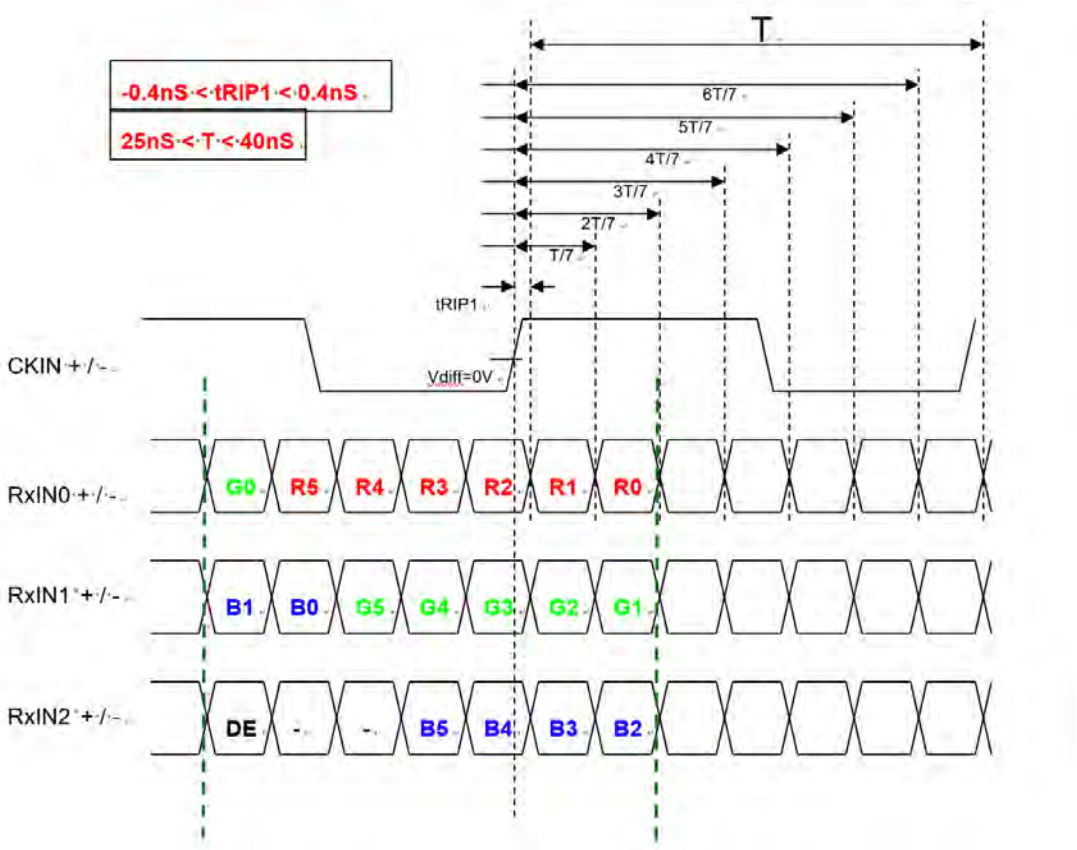
Figure 4.2.3-1 Clock and Data input waveforms



N=800

Figure 4.2.3-2 DE Mode Data Format

LVDS Timing Chart

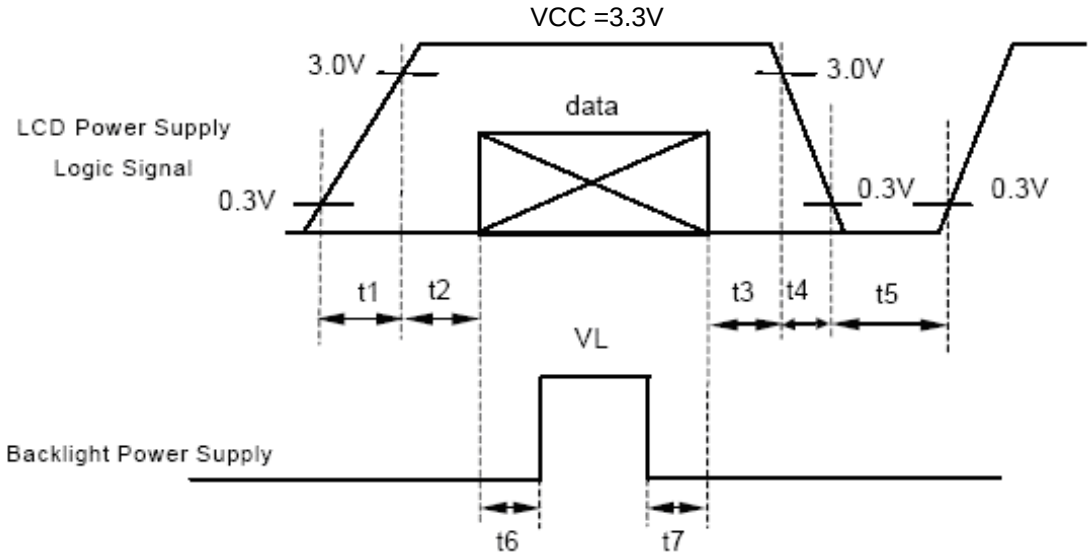


4.2.4 COLOR DATA INPUT ASSIGNMENT

Color		Data Signal																	
		Red						Green						Blue					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Red(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Green(0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Gray Scale of Blue	Blue(0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue (61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue (62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

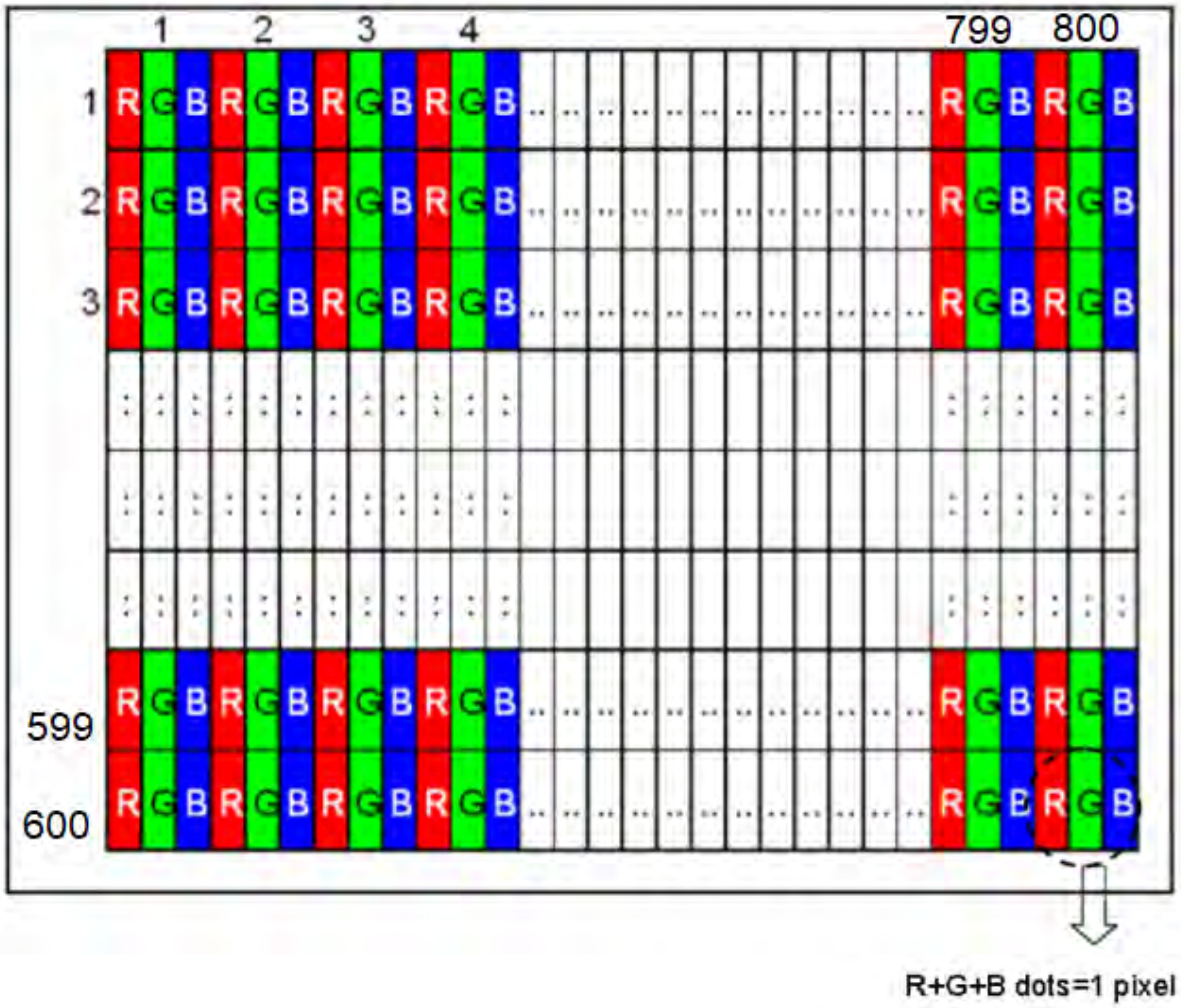
4.2.5 POWER ON OFF SEQUENCE

t1 ≤10ms : 1 sec≤ t5
50ms≤ t2 : 200ms ≤t6
0<t3 ≤50ms: 200ms≤ t7
0<t4 ≤10ms



Data: RXIN0(+/-), RXIN1(+/-), RXIN2(+/-), CKIN(+/-)

4.3 PIXEL FORMAT IMAGE



4.4 INTERFACE CONNECTIONS

Pin	Name	Description	Remark
1	VCC	Power Supply	
2	VCC	Power Supply	
3	GND	Ground	
4	GND	Ground	
5	RXIN0-	Differential Data Input, CH0 (Negative)	R0 ~ R5, G0
6	RXIN0+	Differential Data Input, CH0 (Positive)	
7	GND	Ground	
8	RXIN 1-	Differential Data Input, CH1 (Negative)	G1 ~ G5, B0, B1
9	RXIN 1+	Differential Data Input, CH1 (Positive)	
10	GND	Ground	
11	RXIN 2-	Differential Data Input, CH2 (Negative)	B2 ~ B5, NC, NC, DE
12	RXIN 2+	Differential Data Input, CH2 (Positive)	
13	GND	Ground	
14	CKIN-	Differential Clock Input (Negative)	DCLK
15	CKIN+	Differential Clock Input (Positive)	
16	GND	Ground	
17	A	Backlight anode	
18	K	Backlight cathode	
19	GND	Ground	
20	GND	Ground	

5. OPTICAL SPECIFICATIONS

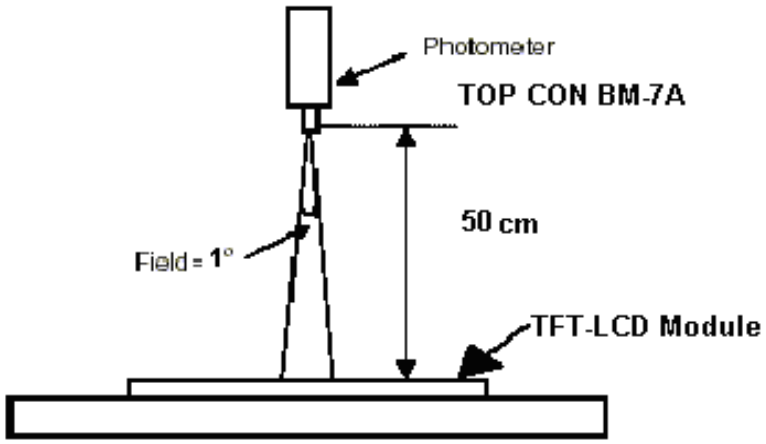
5.1 OPTICAL CHARACTERISTICS

Ta = 25°C

Parameter		Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remarks
Viewing Angle	Horizontal	θ_x+	Center CR≥10	60	70	--	deg	Note 1,4
		θ_x-		60	70	--		
	Vertical	θ_Y+		40	50	--		
		θ_Y-		60	70	--		
Contrast Ratio		CR max.	Center	800	1000	--		Note 1,3
Response time	Rise+ Fall	Tr+ Tf	Center θx=θy =0°	-	25	50	ms	Note 1,6
Brightness Uniformity		B-uni	θx=θy =0°	70	75	--	%	Note1,5
Central Luminance		L	IF=mA	250	300	--	cd/m²	Note 1,2
White Chromaticity		Wx	Center θx=θy =0°	0.26	0.31	0.36		Note 1,2
		Wy		0.28	0.33	0.38		
Image sticking		tis	2 hours			2	Sec	Note 7

The following optical specifications shall be measured in a darkroom or equivalent state (ambient luminance ≤1 lux, and at room temperature). The operation temperature is 25°C±2°C. The measurement method is shown in Note1.

Note1: The method of optical measurement:

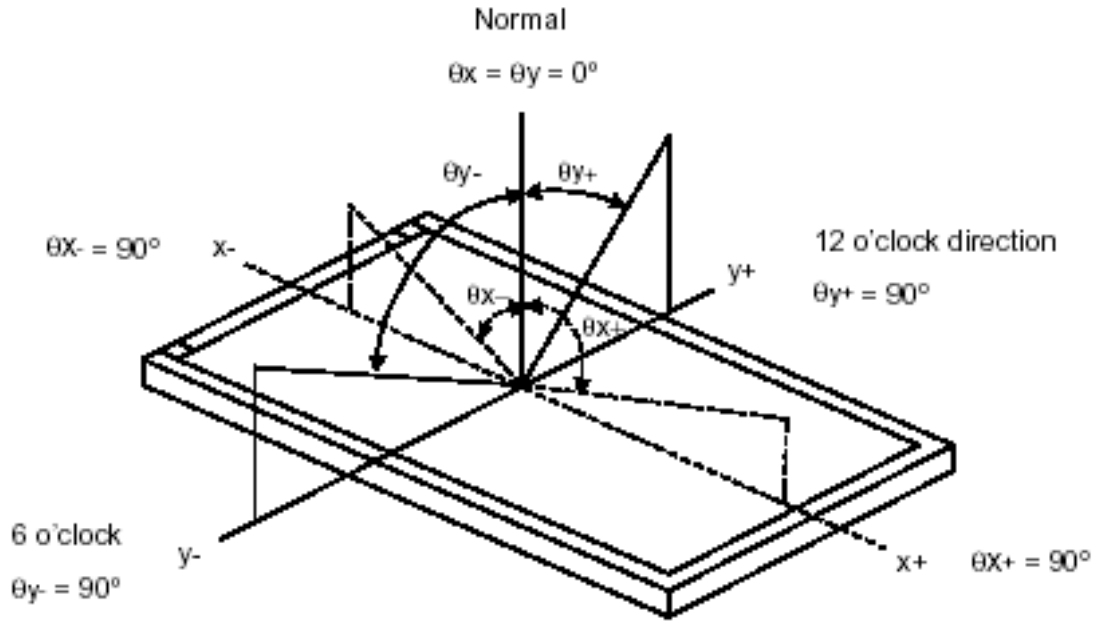


Note2: Measured at the central point of the LCD module and at the viewing angle of the θx=θy=0°

Note3: Definition of Contrast Ratio (CR):

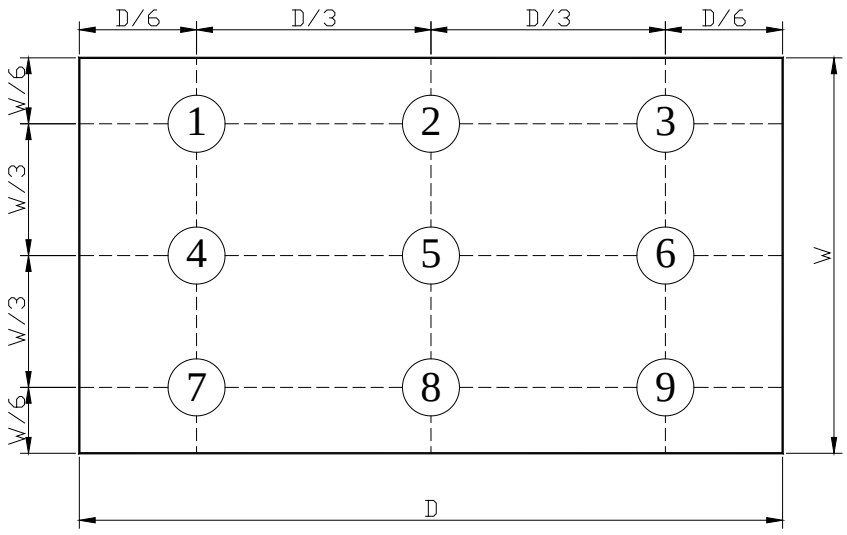
$$CR = \frac{\text{Luminance with all pixels in white state}}{\text{Luminance with all pixels in Black state}}$$

Note 4: Definition of Viewing Angle (CR≥10):



Note 5: Definition of Brightness Uniformity (B-uni):

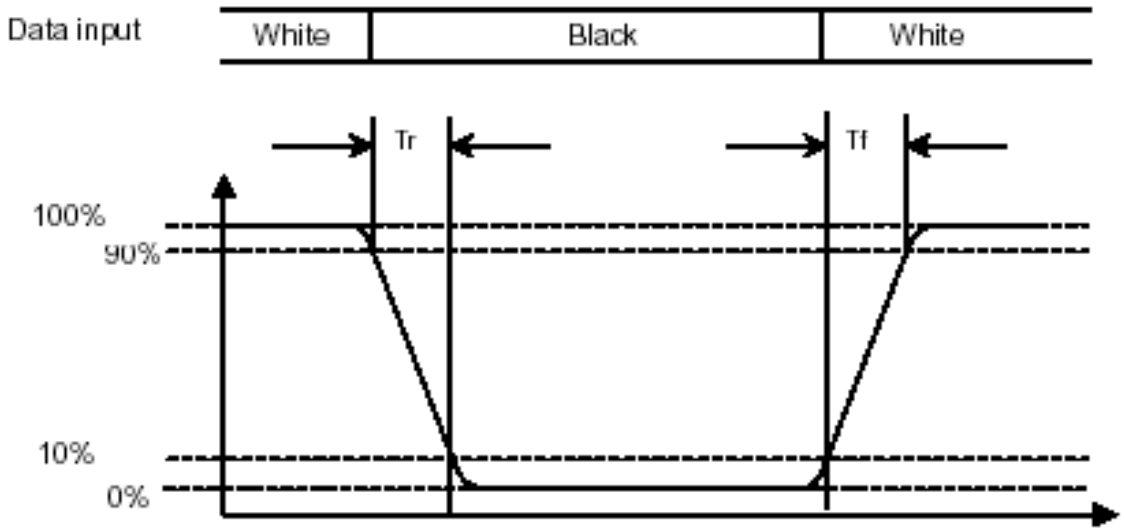
Luminance Measuring Points



$$\text{B-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9points}}$$

Note6: Definition of Response Time:

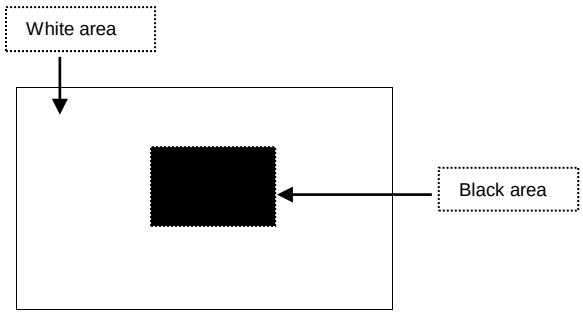
The Response Time is set initially by defining the “Rising Time (Tr)” and the “Falling Time (Tf)” respectively. Tr and Tf are defined as following figure.



Note 7: Definition of Image sticking (tis):

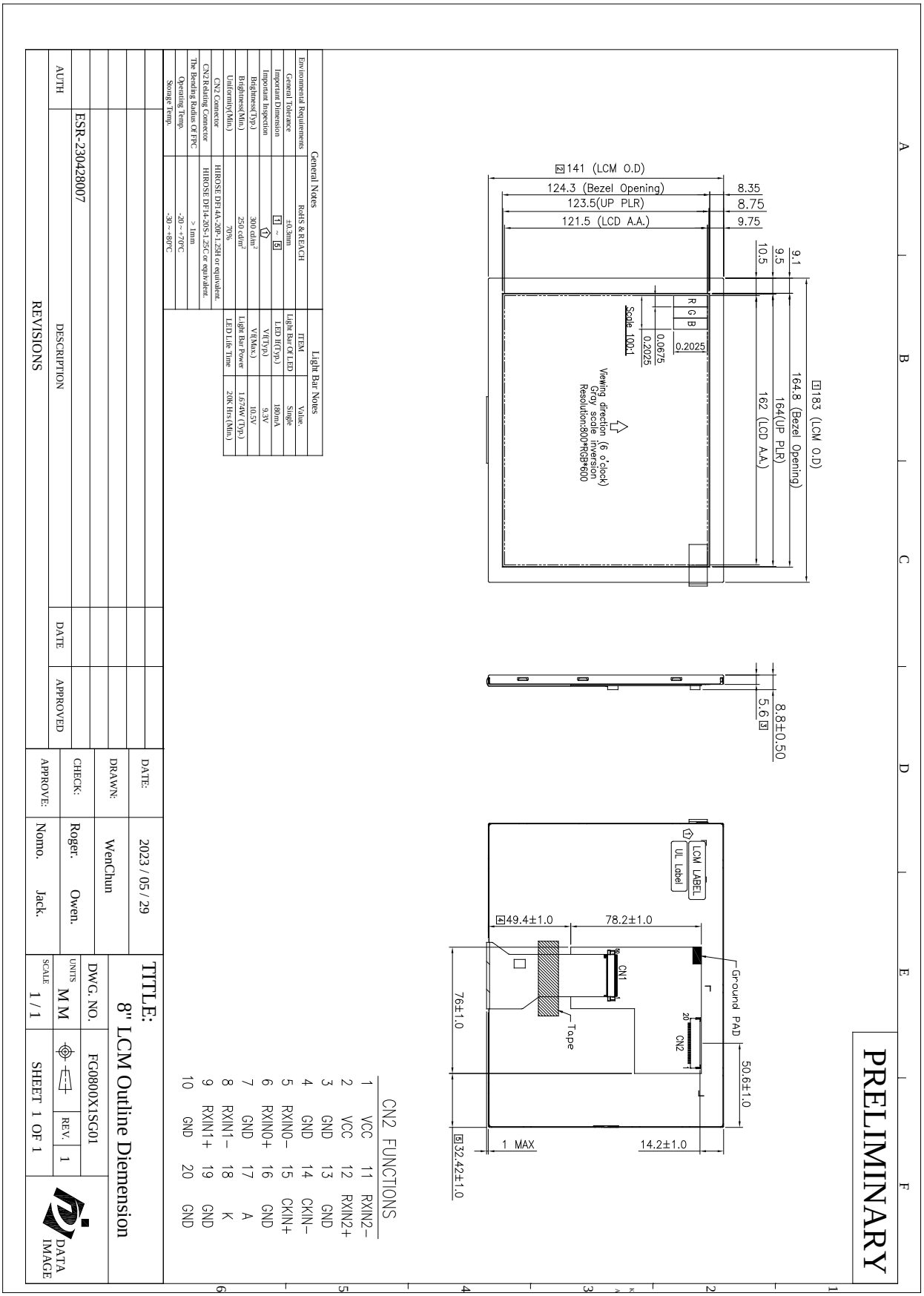
Continuously display the test pattern shown in the figure below for 2 hours. Then display a completely white screen. The previous image shall not persist more than 2 sec at 25 °C

Image sticking pattern



6. MECHANICAL SPECIFICATIONS

6.1 OUTLINE DRAWING



General Notes		
Environmental Requirements	RoHS & REACH	
General Tolerance	±0.3mm	
Important Dimension	1 ~ 5	
Important Inspection	①	
Brightness(Typ.)	300 cd/m²	
Brightness(Min.)	250 cd/m²	
Uniformity(Min.)	70%	
CN2 Connector	HIROSE DF14A-20P-1.25H or equivalent.	
CN2 Relating Connector	HIROSE DF14-20S-1.25C or equivalent.	
The Bending Radius Of FPC	> 1mm	
Operating Temp.	-20 ~ +70°C	
Storage Temp.	-30 ~ +80°C	

Light Bar Notes		
ITEM	Value	
Light Bar Of LED	Single	
LED If(Typ.)	180mA	
Vf(Typ)	9.3V	
Vf(Max.)	10.5V	
Light Bar Power	1.674W (Typ)	
LED Life Time	20K Hrs (Min.)	

CN2 FUNCTIONS									
1	VCC	11	RXIN2−	2	VCC	12	RXIN2+		
3	GND	13	GND	4	GND	14	CKIN−		
5	RXIN0−	15	CKIN+	6	RXIN0+	16	GND		
7	GND	17	A	8	RXIN1−	18	K		
9	RXIN1+	19	GND	10	GND	20	GND		

REVISIONS			
	DESCRIPTION	DATE	APPROVED
AUTH	ESR-230428007		

DATE:	2023 / 05 / 29	TITLE:	8" LCM Outline Diemension
DRAWN:	WenChun	DWG. NO.	FG0800X1SG01
CHECK:	Roger. Owen.	UNITS	M M
APPROVE:	Nomo. Jack.	SCALE	1 / 1
		SHEET	1 OF 1
		REV.	1

DATA IMAGE

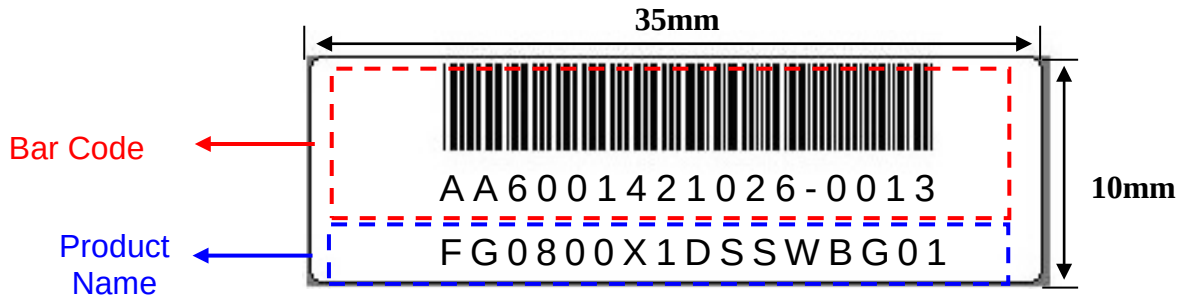
7. RELIABILITY TEST ITEM

Reliability Test Item & Level		Test Level	Remark
No.	Test Item		
1	High Temperature Storage Test	T=80℃,240hrs	IEC60068-2-2
2	Low Temperature Storage Test	T=-30℃,240hrs	IEC60068-2-1
3	High Temperature Operation Test	T=70℃,240hrs	IEC60068-2-2
4	Low Temperature Operation Test	T=-20℃,240hrs	IEC60068-2-1
5	High Temperature and High Humidity Operation Test	T=40℃,90%RH,240hrs	IEC60068-2-3
6	Thermal Cycling Test (No operation)	-30℃/30 min ~ +80℃/30 min for a total 100 cycles, Start with cold temperature and end with high temperature.	IEC60068-2-14
7	Vibration Test (No operation)	Frequency：10 ~ 55 Hz Amplitude：1.5 mm Sweep Time：11mins Test Period：6 Cycles for each Direction of X,Y,Z	IEC60068-2-6
8	Drop test (Package)	Height :60cm 1 conner,3edges,6surfaces	IEC60068-2-32
9	Electrostatic Discharge Test	State: operating Location: LCM/TP surface Condition:150pf 330Ω Contact +/- 8kV Air +/-15kV Criteria: Class C	IEC61000-4-2

8. LCM PRODUCT LABEL DEFINE

8.1 SHIPPING LABLE

Product Label style:

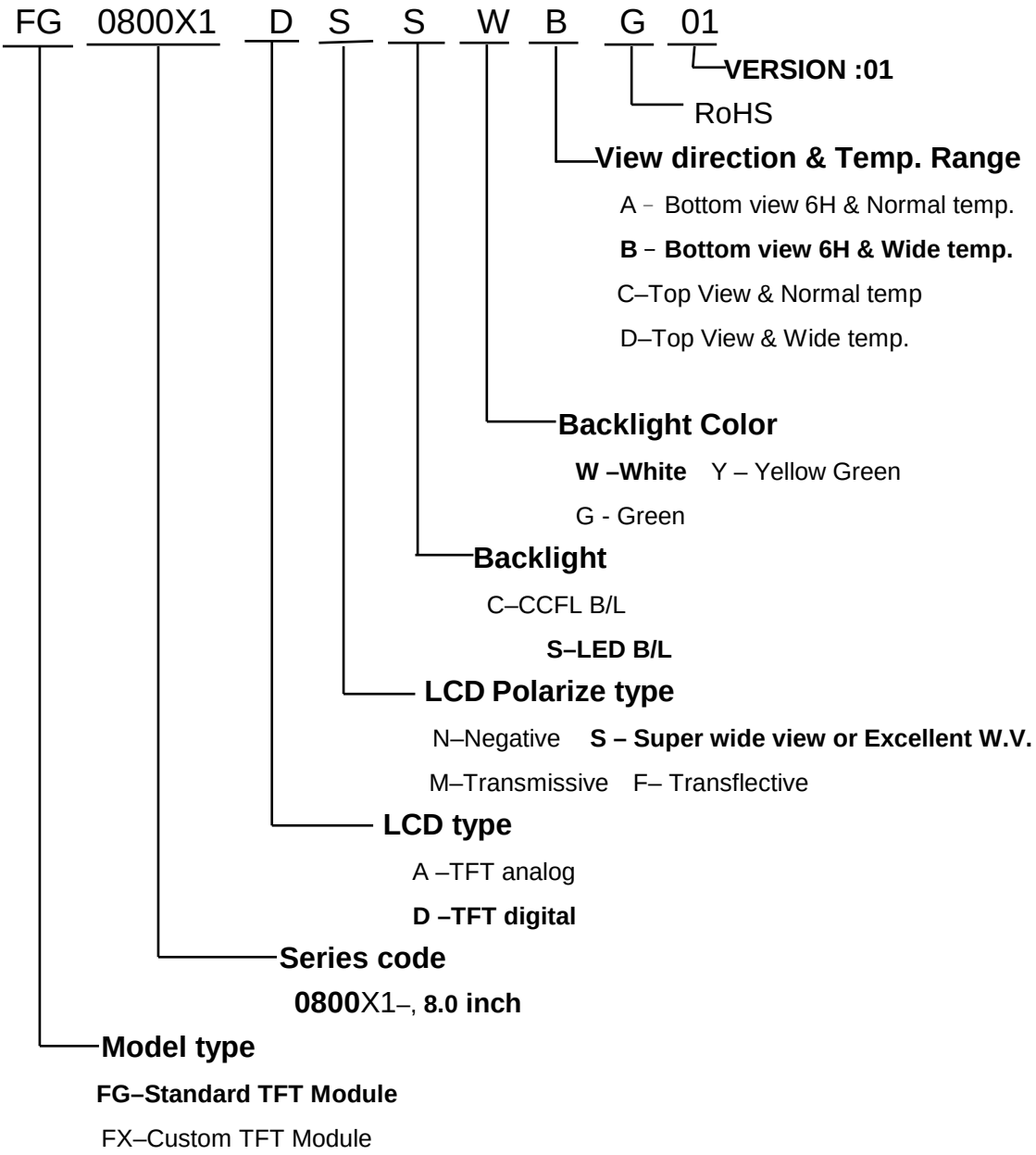


Bar Code Define:

A A 6 0014 2 10 26-0013

- Serial number of the products
  Serial number starts from 0000
  Every work order is 10K at most
- Week of production
- Year of production
- Storage area
- Serial number of work order
  Serial number starts from 0000 each month
- Month of work order
- Year of work order
- The first 3 numbers of work order

Product Name Define:



8.2 CARTON PACKAGE

TBD

9.Precaution

9.1 HANDLING PRECAUTIONS

(1). The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.

(2). While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.

(3). Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.

(4). Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.

(5). If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.

(6). Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.

(7). If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.

(8). Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.

(9). Do not disassemble the module.

(10). Do not pull or fold the LED wire.

(11). Pins of I/F connector should not be touched directly with bare hands.

9.2 STORAGE PRECAUTIONS

(1). High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.

(2). It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.

(3). It may reduce the display quality if the ambient temperature is lower than 10 ºC. For example, the response time will become slowly, and the starting voltage of LED will be higher than the room temperature.

9.3 OPERATION PRECAUTIONS

(1). Do not pull the I/F connector in or out while the module is operating.

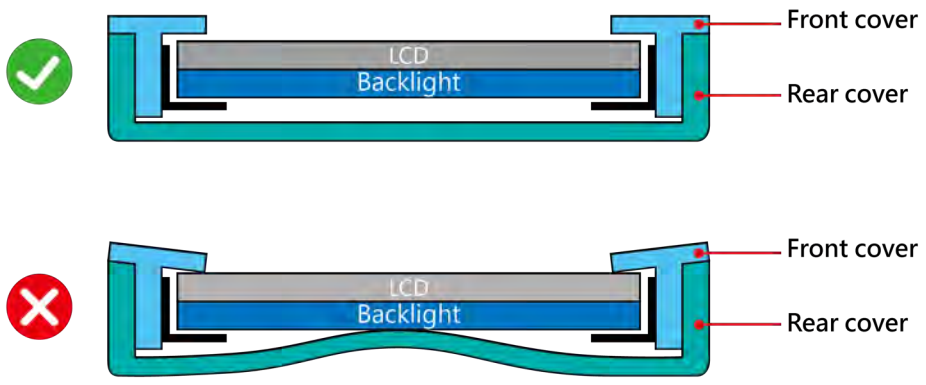
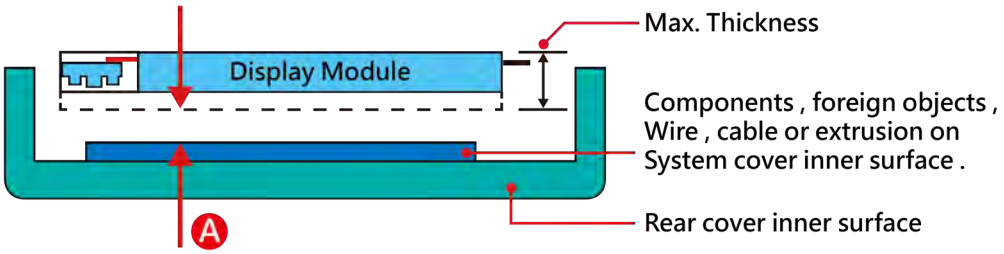
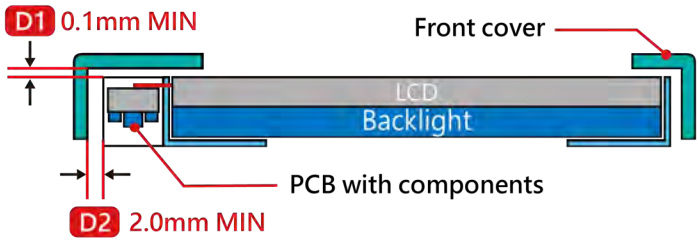
(2). Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.

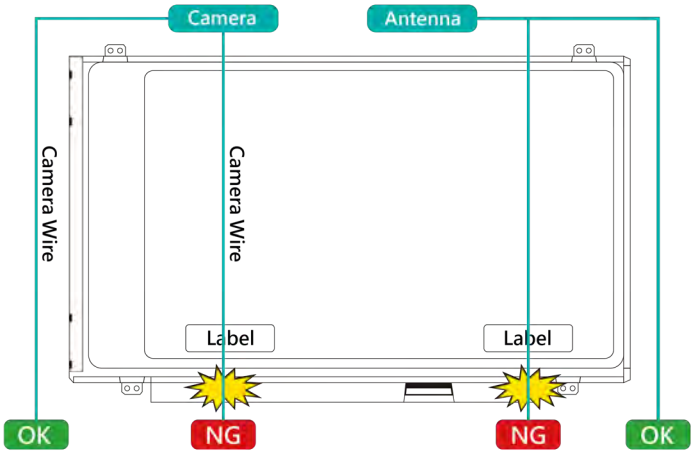
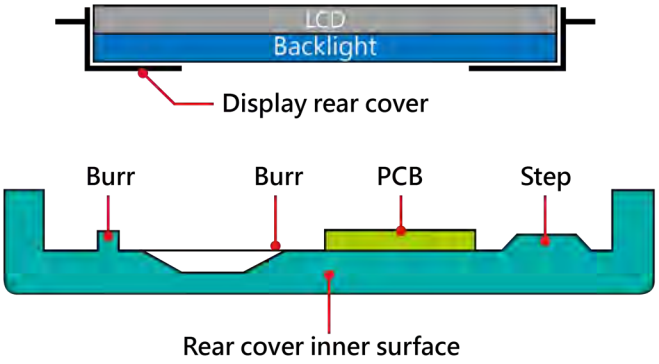
(3). The startup voltage of Backlight is approximately 1000 Volts. It may cause electrical shock while assembling with converter. Do not disassemble the module or insert anything into the Backlight unit.

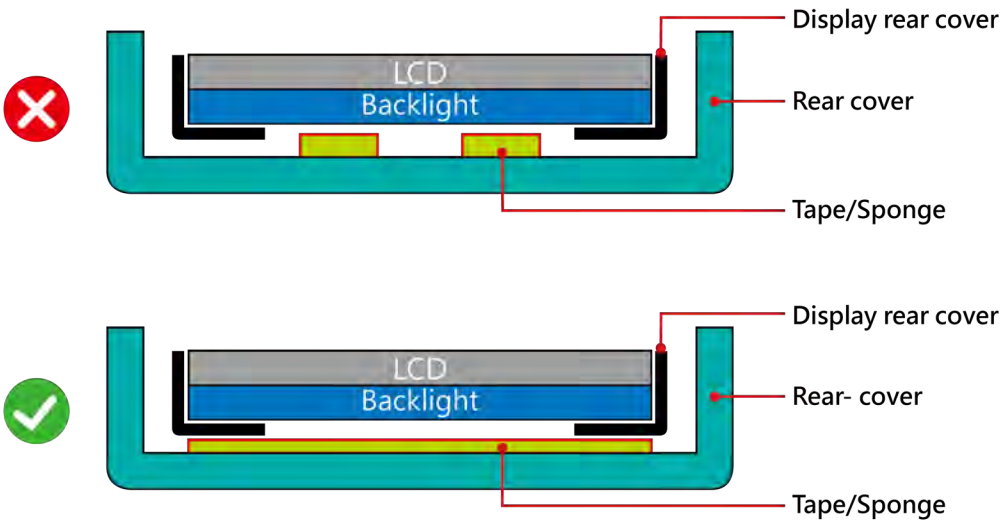
(4). LIMITED WARRANTY

Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not responsible for any subsequent or consequential events

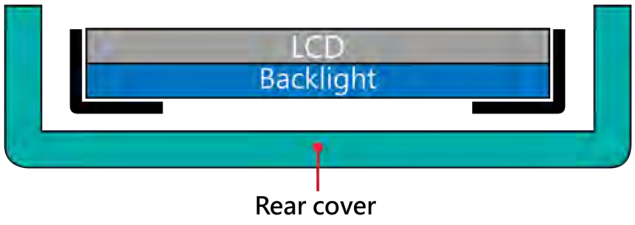
Appendix. Covers Design Guideline

A.	**Permanent deformation of front/rear covers after reliability test**
	
Definition	Front/rear covers may deform during reliability test. Permanent deformation of front/rear covers after reliability test should not interfere with display. Because it may cause issues such as pooling, abnormal display, white spot, and also cell crack.
B.	**Design gap A between display and any components on rear cover**
	
Definition	Gap A between display's maximum thickness boundary and rear cover inner surface components such as wire, cable, extrusion is needed for preventing from backpack or pogo test fail. Because zero gap or interference may cause stress concentration. Issues such as pooling, abnormal display, white spot, white spot and cell crack may occur. Flatness of display and rear cover should be taken into account for gap design.
C.	**Design gap D1 & D2 between front cover and PCB assembly**
	

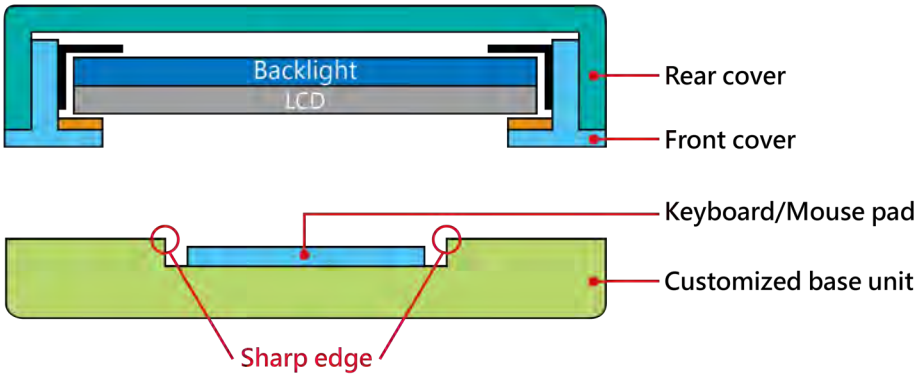
Definition	Gap D1 & D2 between front cover and LCD & front cover and PCBA are needed to prevent pooling or glass broken. Zero gap or interference such as burr and warpage from mold frame may cause pooling issue near front cover opening edge. This phenomenon is obvious during swing test, hinge test, knock test or during pooling inspection procedure. To remain sufficient gap, design with system rib higher than maximum display thickness is recommended.
D.	**Interference examination of camera's and antenna's cable**
	
Definition	Camera's and antenna's cable should not overlap with panel outline. Because issue such as abnormal display and white spot after backpack test, hinge test, twist test or pogo test may occur.
E.	**Rear cover inner surface examination**
	
Definition	Burr at logo edge, steps, protrusions or PCB may cause stress concentration. Whiter spot or glass broken issue may occur during reliability test.
F.	**Tape/sponge design on rear cover inner surface**



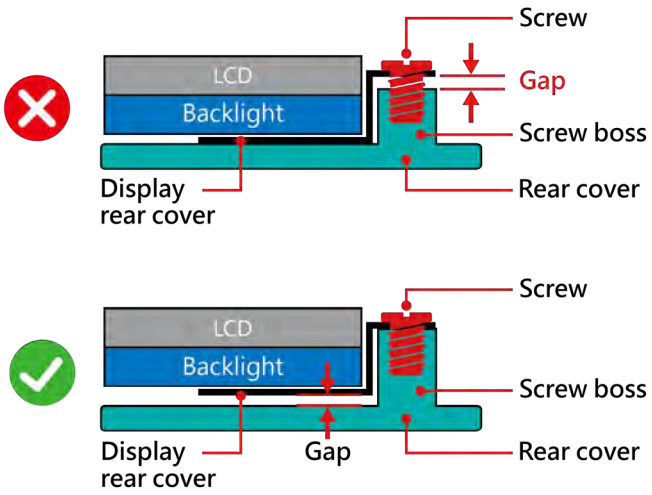
Definition	To prevent abnormal display and white spot after scuffing test, hinge test, pogo test, backpack test, tape/sponge should be well covered under rear cover. Because tape/sponge in separate location may act as pressure concentration location.
G.	**Material used for rear cover**



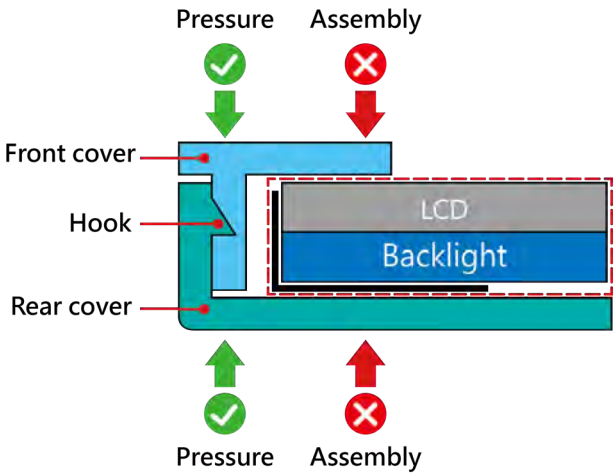
Definition	Rear cover material with high rigidity is needed to resist deformation during scuffing test, hinge test, pogo test or backpack test. Abnormal display, white spot, pooling issue may occur if low rigidity material is used. Pooling issue may occur because screw's boss positioning for module's bracket are deformed during open-close test. Solid structure design of system rear cover may also influence the rigidity of rear cover. The deformation of rear cover should not caused interference.
H.	**Customized base unit design near keyboard and mouse pad**



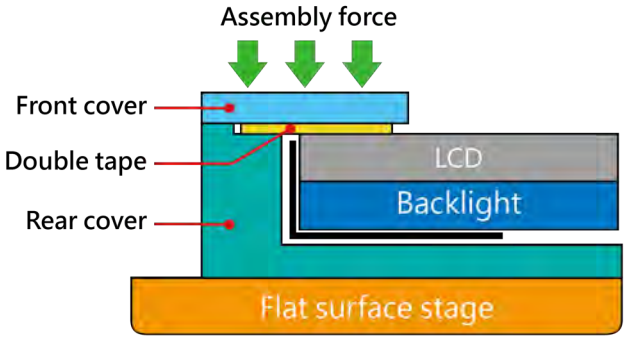
Definition	To prevent abnormal display and white spot after scuffing test, hinge test, pogo test, backpack test, sharp edge design in keyboard surface may damage display during the test. We suggest to use slope edge design or to reduce the thickness difference of keyboard/mouse pad from the nearby surface.
I.	**Screw boss height design**



Definition	Screw boss height should be designed with respect to the height of bracket bottom surface to display bottom surface with flatness change of display it set. Because gap will exist between screw boss and bracket, if the screw boss height is smaller. As result while fastening screw, bracket will deformed and pooling issue may occur.
J.	**Assembly SOP examination for front cover with Hook design**



Definition	To prevent display crack during front cover assembly process with hook design, it is not recommended to press display or any location that related directly to the display.
L.	**Assembly SOP examination for front cover with Double tape design**



Definition	To prevent display crack during system front cover assembly process with double tape design, it is only allowed to give slight pressure (MAX 3 Kgf/50mm2) with large contact area. This can help to distribute the stress and prevent stress concentration. We also suggest putting the system on a flat surface stage to prevent unequal stress distribution during the assembly.