

TFT-DISPLAY DATASHEET

DATA IMAGE

Model: FG0700GYDSSWBGL1

BRIEF SPEC.:

Main Feature

Landscape Type

Wide Viewing Angle

Normali Withe

Active Screen Area

152.4 x 91.44(mm)

Diagonal | Format

7" | 15:9

Resolution

800 X 480

Colors

8Bit

Backlight

Normally White

Brightness

1000 cd/m²

LED Life Time

T.B.D

Interface

RGB

Viewing Angle

70/70 L/R 50/60

Touchscreen

No

Power Supply

3.3 V (Typ.)

Module Outline

169.8 x 106 x 10.33 (mm)

Operation Temperature

-20 ... +70 °C

Storage Temperature

-30... +80 °C

Surface Treatment

Anti-Glare Hard Coating (3H)

DATA IMAGE CORPORATION

TFT Module Specification

Preliminary

ITEM NO.: FG0700GYDSSWBGL1

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Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	ALEX	PRETTY	DAVID	KEN
Approved by	Version:	Issued Date:	Sheet Code:	Total Pages:
	1	09/SEP/15'		25

2. RECORD OF REVISION

Rev	Date	Item	Page	Comment	Source
1	10/SEP/15'			Initial Preliminary	ESR0407009

3. GENERAL SPECIFICATIONS

Parameter	Specifications	Unit
Screen Size	7 (diagonal)	inch
Display Format	800(H) x (R,G,B) x 480(V)	dot
Active Area	152.4(H) x 91.44(V)	mm
Dot Pitch	0.0635 (H) x 0.1905 (V)	mm
Pixel Configuration	Stripe	
Outline Dimension	169.8(W) x 106(H) x 10.33 (D)	mm
Surface treatment	Anti-glare and hard coating (3H)	
Back-light	LED	
Display mode	Normally white	
Weight	205	g
View Angle direction	6 o'clock	
Our components and processes are compliant to RoHS standard		

4. ABSOLUTE MAXIMUM RATINGS

GND=0V

Parameter	Symbol	MIN.	MAX.	Unit	Remark
Digital Power Voltage 1	VCC	-0.3	7	V	Ta=25°C
Digital Power Voltage 2	VDDG	-0.3	7	V	
Analog Power Voltage	AVDD	-0.3	13.5	V	
Gamma Voltage	V1, V5	0.4AVDD	AVDD	V	
Gamma Voltage	V6, V10	-0.3	0.6AVDD	V	
Gate On Voltage	VGH	-0.3	42	V	
Gate Off Voltage	VGL	VGH-42	0.3	V	
Operating temperature	Top	-20	70	°C	Module surface*
Storage temperature	Tst	-30	80	°C	-
Humidity	Operation	20%~90% relative humidity			Ta<=60°C
	Non Operation	5%~90% relative humidity			Ta<=60°C

5. ELECTRICAL CHARACTERISTICS

5.1 Operating Conditions

GND=0V, fH=31.5KHz, fV=60Hz, fCLK=33.26MHz, Ta=25°C

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Digital Power Voltage 1	VCC	3.0	3.3	3.6	V	
Digital Power Voltage 2	VDDG	3.0	3.3	3.6	V	
Analog Power Voltage	AVDD	11.5	12	12.5	V	
Gate On Power Voltage	VGH	15	16	17	V	
Gate Off Power Voltage	VGL	-8	-7	-6	V	
Common Power Voltage	VCOM	4.2	4.7	5.2	V	
Input H/L level voltage	V _{IH}	0.7V _{CC}	--	V _{CC}	V	
	V _{IL}	0	--	0.3V _{CC}	V	

5.2 Current consumption

GND=0V, fH=31.5KHz, fV=60Hz, fCLK=33.26MHz, Ta=25°C

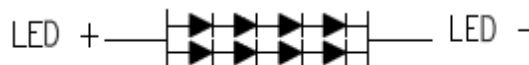
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Current for driver	IGH	VGH=16V	-	0.2	0.4	mA	
	IGL	VGL=-7V	-	0.2	0.4	mA	
	IVCC	VCC=3.3V	-	25	35	mA	
	IVDDG	VDDG=3.3V	-	50	100	μA	
	IAVDD	AVDD=12V	-	25	35	mA	

5.3 Backlight Driving Consumption

Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED voltage	V _L	-	26.8	-	V	
LED current	I _L	-	150	-	mA	total
LED dice life time		T.B.D.	-	-	hr	Note2

Note1 : LED circuit



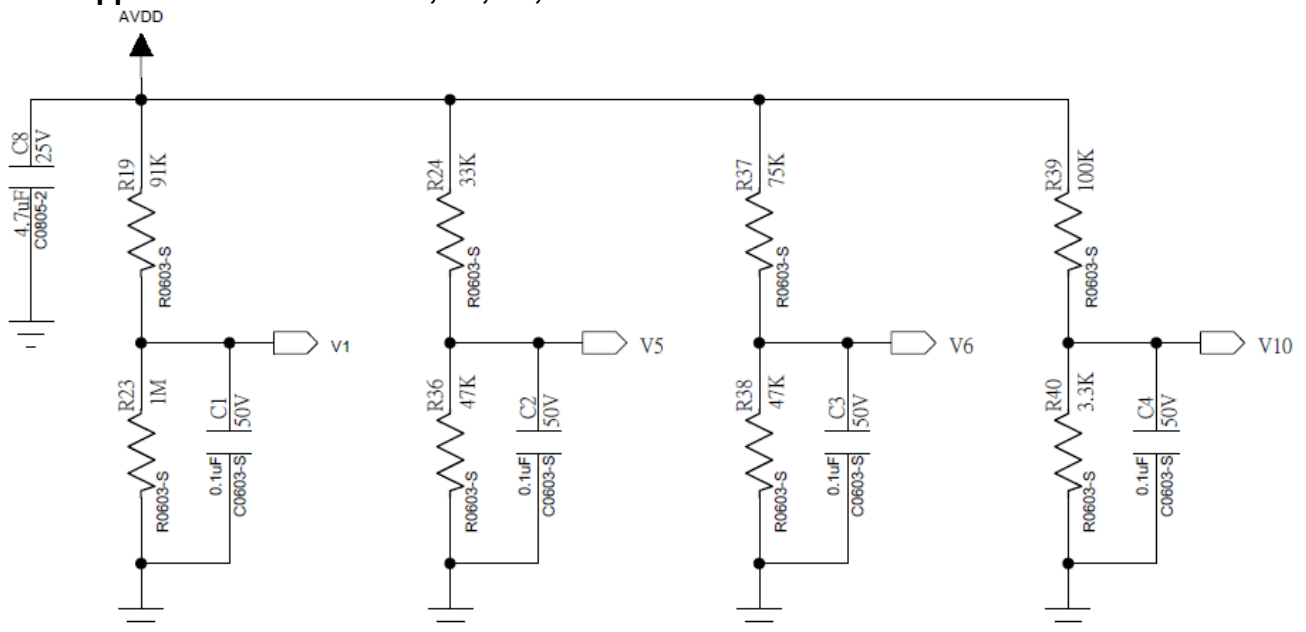
Number of LED 8 PCS

I : 150mA V : 26.8 V Max.

LED circuit

Note2 : The “LED dice life time” is defined as the brightness decrease to 50% original brightness that the ambient temperature is 18°C ~28°C and LED dice current=75mA.

5.4 Application Circuit for V1, V5, V6, V10



6. INPUT SIGNAL CHARACTERISTICS

6.1 AC Characteristics

6.1.1 AC Electrical Characteristics

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
HS setup time	T_{hst}	6	-	-	ns
HS hold time	T_{hhd}	6	-	-	ns
VS setup time	T_{vst}	6	-	-	ns
VS hold time	T_{vhd}	6	-	-	ns
Data setup time	T_{dsu}	6	-	-	ns
Data hold time	T_{dhd}	6	-	-	ns
DE setup time	T_{esu}	6	-	-	ns

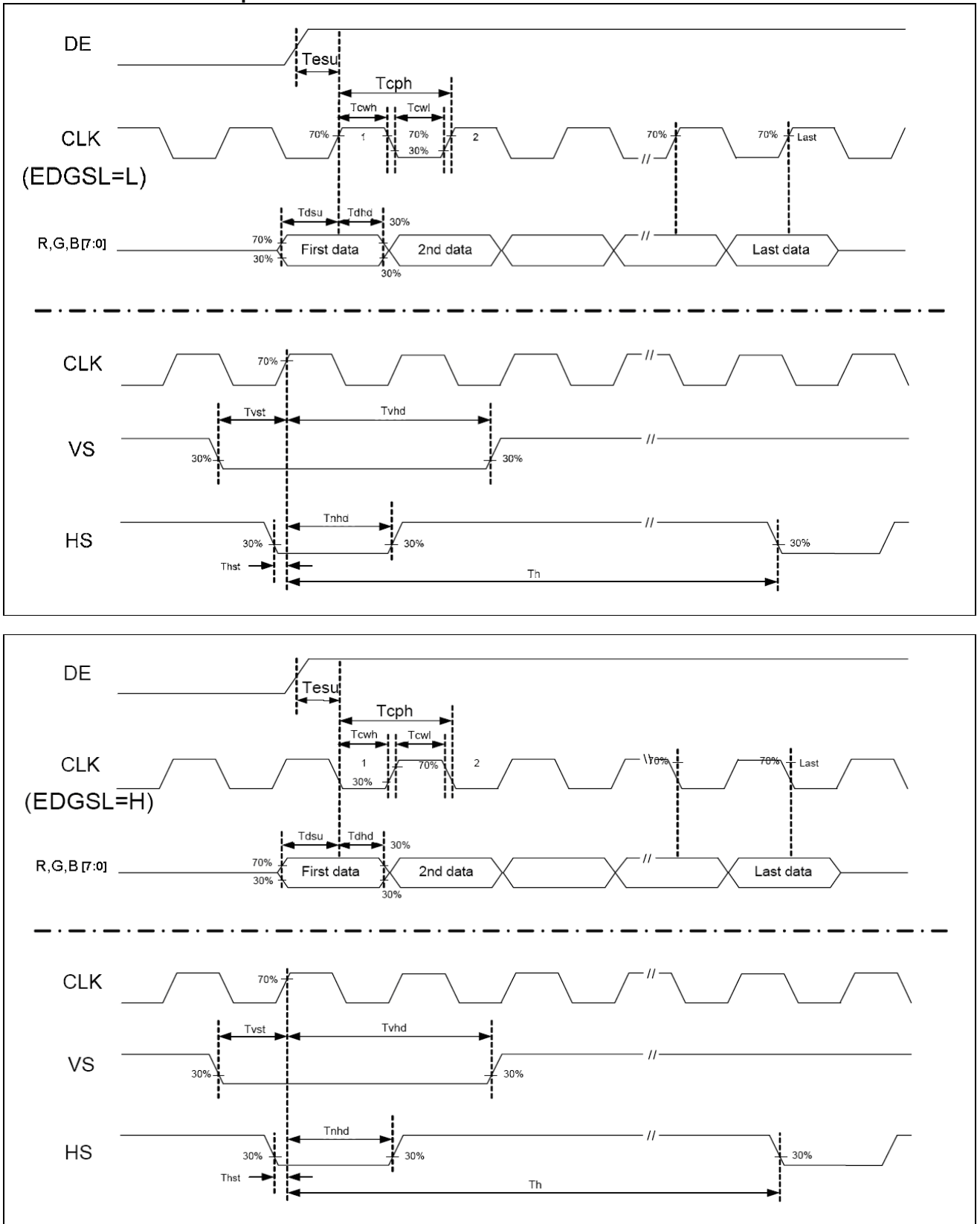
6.1.2 Resolution :

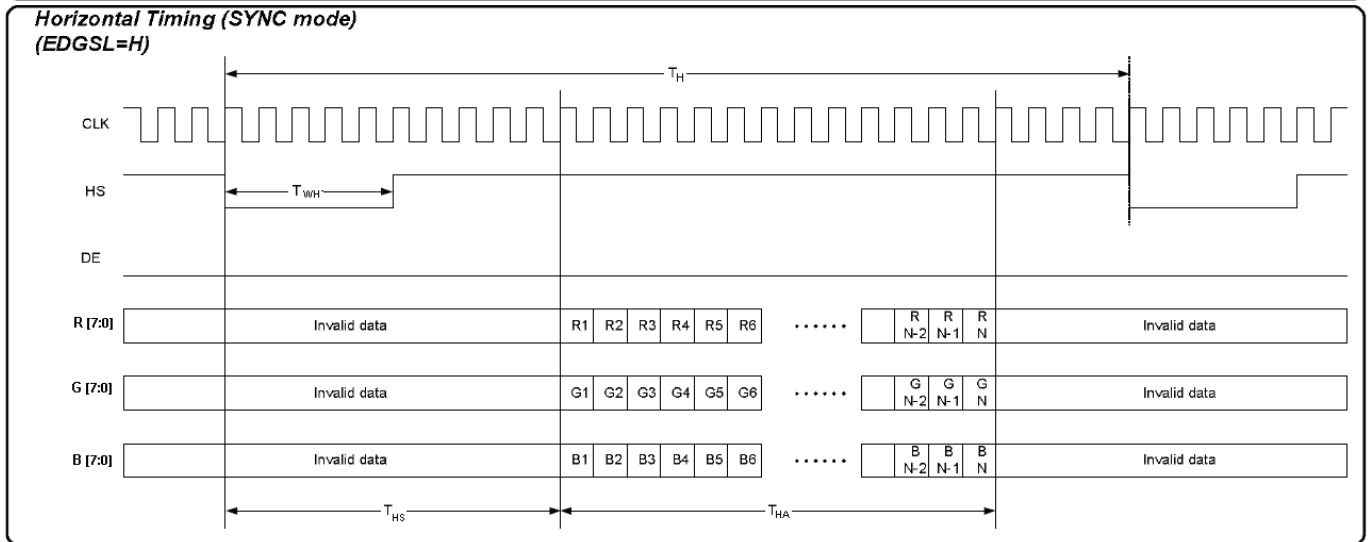
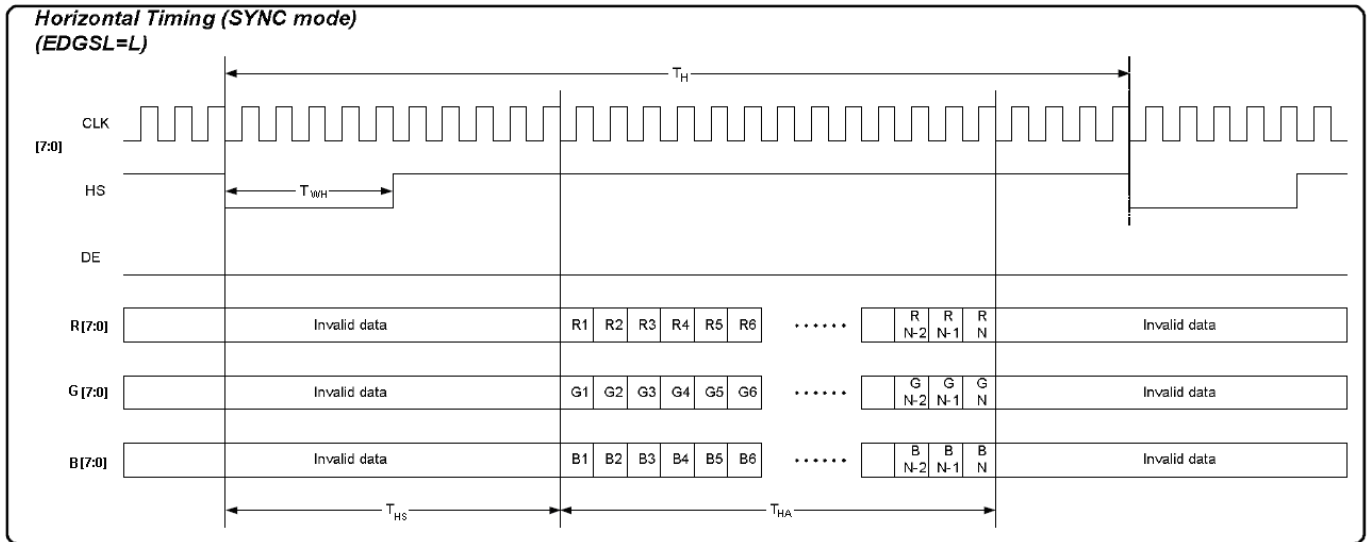
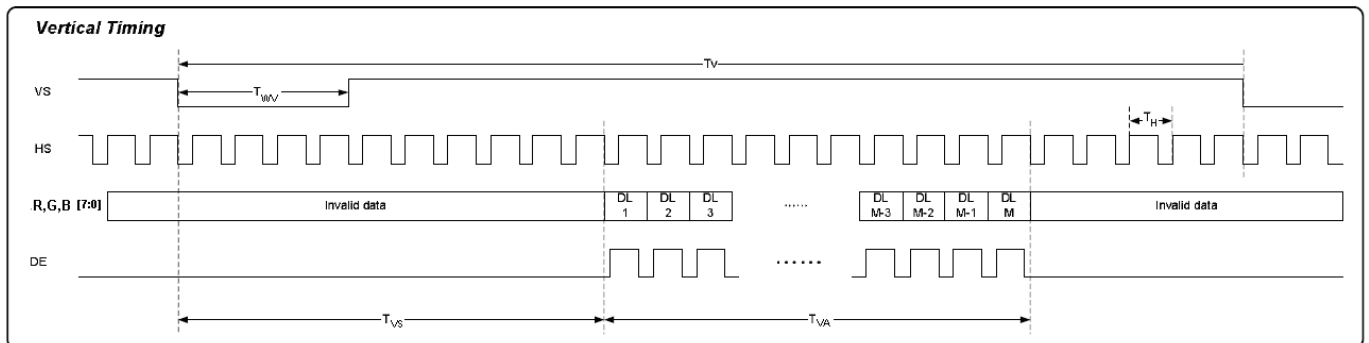
- sync mode

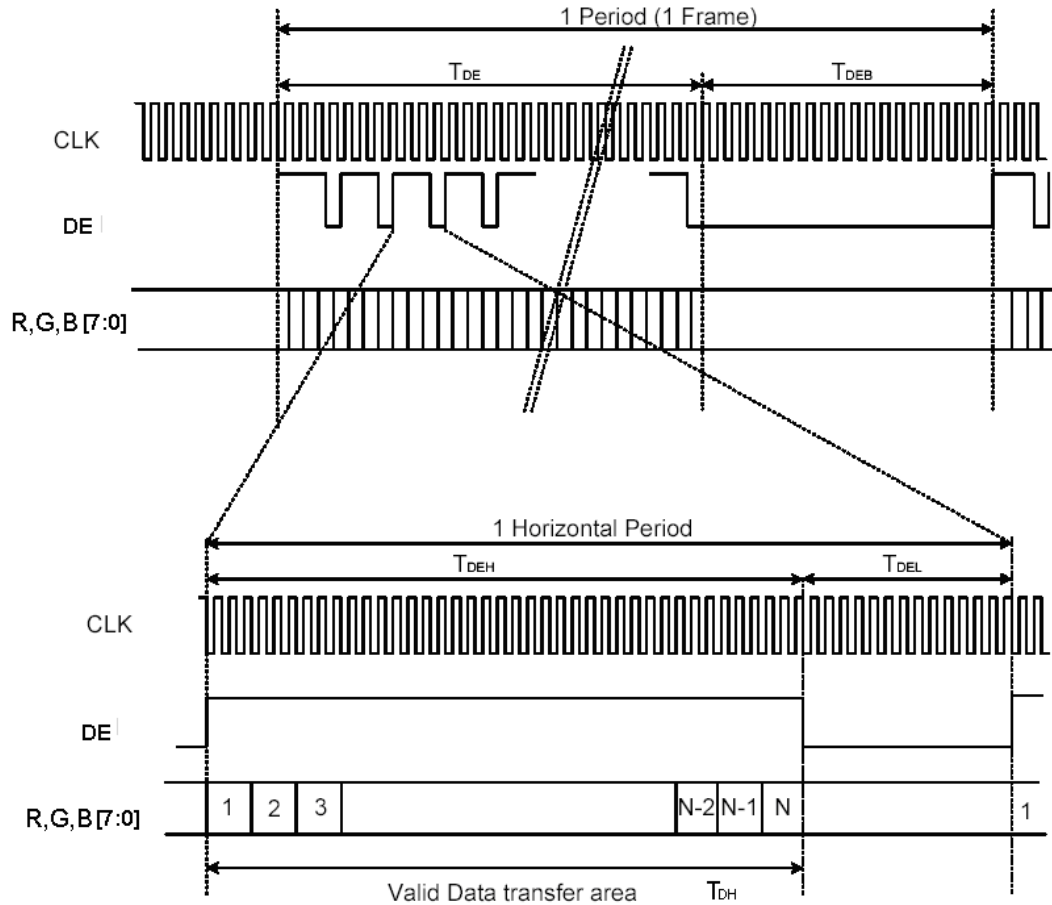
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLK frequency	F_{CPH}	-	33.26	-	MHz
CLK period	T_{CPH}	-	30.06	-	ns
CLK pulse duty	T_{CWH}	40	50	60	%
HS period	T_H	-	1056	-	T_{CPH}
HS pulse width	T_{WH}	1	128	-	T_{CPH}
HS-first horizontal data time	T_{HS}	216			T_{CPH}
HS Active Time	T_{HA}	-	800	-	T_{CPH}
VS period	T_V	-	525	-	T_H
VS pulse width	T_{WV}	1	2	-	T_H
VS-DE time	T_{VS}	35			T_H
VS Active Time	T_{VA}	-	480	-	T_H

- DE mode

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLK frequency	F_{CPH}	-	33.26	-	MHz
CLK period	T_{CPH}	-	30.06	-	ns
CLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH}+T_{DEL}$	1000	1056	1200	T_{CPH}
DE pulse width	T_{DH}	-	800	-	T_{CPH}
DE frame blanking	T_{HS}	10	45	110	$T_{DEH}+T_{DEL}$
DE frame width	T_{EP}	-	480	-	$T_{DEH}+T_{DEL}$

6.2 Timing Controller Timing Chart
6.2.1 Clock and Data input waveforms

Figure 1 Clock and Data input waveforms.

6.2.2 Data Input format

Figure 2 SYNC Mode Horizontal Data Format

Figure 3 SYNC Mode Vertical Data Format

6.2.3 DE Mode Data Format


N=800

Figure 4 DE Mode Data Format

6.3 Color Data Input Assignment

COLOR	DISPLAY	DATA SIGNAL																				GRAY SCALE LEVEL				
		RED							GREEN							BLUE										
		R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3		B4	B5	B6	B7
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
	BLUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	-
	GREEN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	-
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
	RED	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	-
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	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	1	1	1	1	1	1	-
GRAY SCALE OF RED	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R0	
	DARK ↑	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R1	
		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2	
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	R3~R252	
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
	LIGHT ↓	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R253	
		0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R254	
	RED	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R255	
GRAY SCALE OF GREEN	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G0	
	DARK ↑	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G1	
		0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	G2	
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	G3~G252	
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
	LIGHT ↓	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	G253	
		0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	G254	
	GREEN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	G255	
GRAY SCALE OF BLUE	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B0	
	DARK ↑	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	B1	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	B2	
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	B3~B252	
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
	LIGHT ↓	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	B253	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	B254	
	BLUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	B255	

Note) Definition of Gray :

R_n : Red Gray, G_n : Green Gray, B_n : Blue Gray (n = Gray level)

Input Signal : 0 = Low level voltage, 1 = High level voltage

7. OPTICAL CHARACTERISTIC

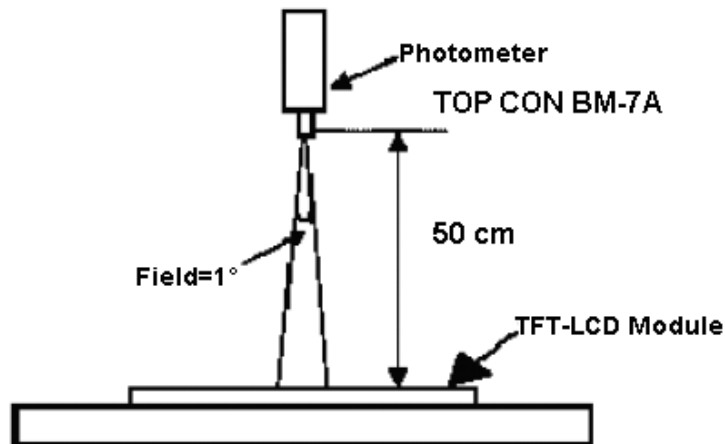
Parameter		Symbol	Condition	MIN.	TYP.	MAX.	Unit	Remarks
Viewing Angle	Horizontal	θ_{x+}	Center $CR \geq 10$	60	70	--	deg	Note 1,4
		θ_{x-}		60	70	--		
	Vertical	θ_{y+}		40	50	--		
		θ_{y-}		50	60	--		
Contrast Ratio		CR	at optimized viewing angle	300	400	--		Note 1,3
Response time	Rise	Tr	Center	-	5	10	ms	Note 1,6
	Fall	Tf	$\theta_x = \theta_y = 0^\circ$	-	15	20	ms	
Uniformity		B-uni	$\theta_x = \theta_y = 0^\circ$	70	80	--	%	Note 1,5
Brightness		L	$\theta_x = \theta_y = 0^\circ$	--	1000	--	cd/m ²	Note 1,2
Chromaticity	x_W	Center $\theta_x = \theta_y = 0^\circ$	Typ -0.05	Typ +0.05	0.302			Note 1,7
	y_W				0.339			
	x_R				0.575			
	y_R				0.360			
	x_G				0.331			
	y_G				0.571			
	x_B				0.149			
	y_B				0.138			
Image sticking		tis	2 hours			2	Sec	Note 8

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 $25^\circ\text{C} \pm 2^\circ\text{C}$ and LED Backlight Current $I_L = 150\text{mA}$.

The measurement method is shown in Note1.

Note1: The method of optical measurement:

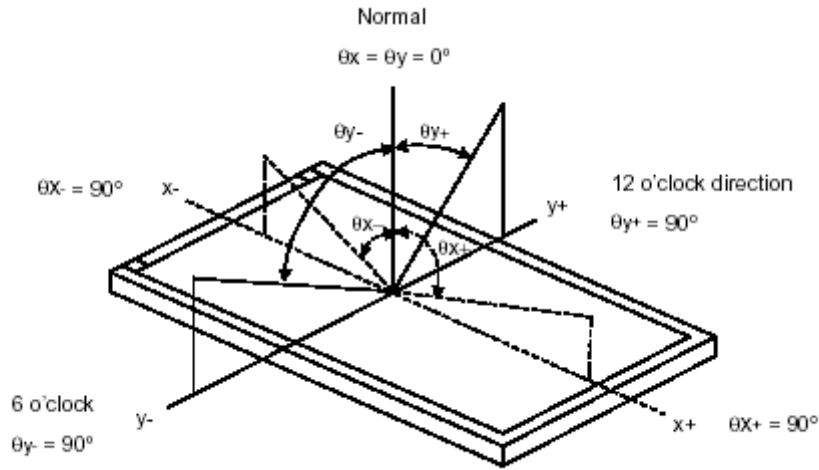


Note2: Measured at the center area of the panel and at the viewing angle of the $\theta_x = \theta_y = 0^\circ$

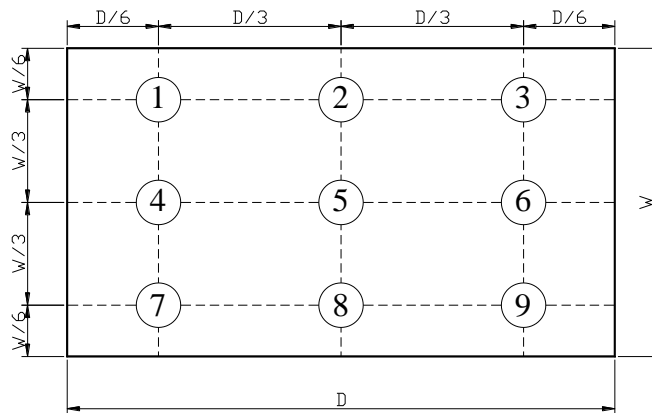
Note3: Definition of Contrast Ratio (CR):

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

Note4: Definition of Viewing Angle



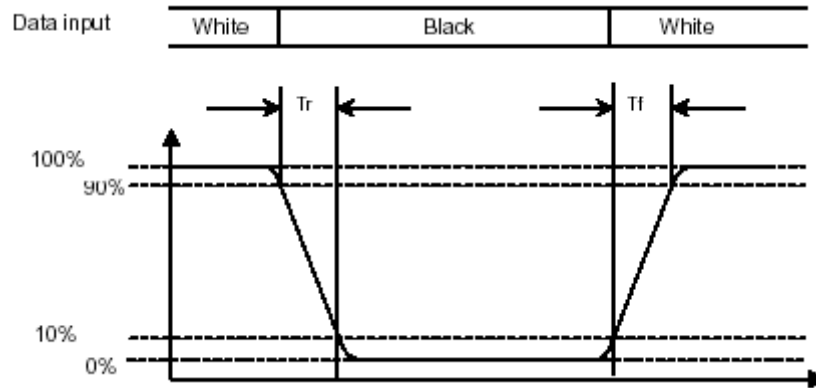
Note 5: Definition of Brightness Uniformity (B-uni):



$$B\text{-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9 points}} \quad (\text{Note 5}).$$

Note6: Definition of Response Time:

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



Note 7: Definition of Chromaticity:

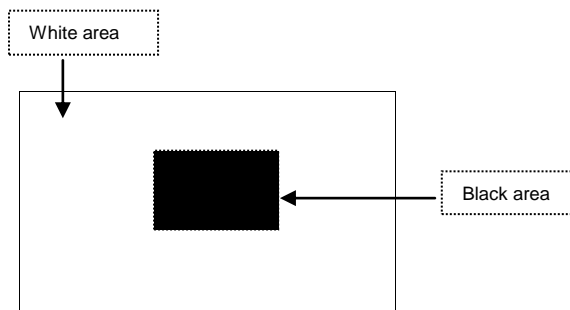
The color coordinates (x_W, y_W) , (x_R, y_R) , (x_G, y_G) , and (x_B, y_B) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.

Note 8: 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



8. PIN CONNECTIONS

Pin NO.	SYMBOL	DESCRIPTION
1	GND	Power Ground
2	VGL	Gate OFF Power Supply Voltage
3	VDDG	Gate Driver Power Supply Input (+3.3V)
4	NC	No Connection
5	VGH	Gate ON Power Supply Voltage
6	VCOM	Common voltage input
7	UD	Gate Driver Up/Down scan setting When UD=H, reverse scan When UD=L, normal scan(Default pull low)
8	HS	Horizontal sync. Signal.
9	VS	Vertical sync. Signal.
10	DE	Input data enable control When DE mode, active High to enable data input.
11	B7	Blue data(MSB)
12	B6	Blue data
13	B5	Blue data
14	B4	Blue data
15	B3	Blue data
16	B2	Blue data
17	B1	Blue data
18	B0	Blue data(LSB)
19	GND	Power Ground
20	CLK	Clock signal User can input different polarity CLK by EDGSL setting.(Default pull low)
21	GND	Power Ground
22	G7	Green data(MSB)
23	G6	Green data
24	G5	Green data
25	G4	Green data
26	G3	Green data
27	G2	Green data
28	G1	Green data
29	G0	Green data(LSB)
30	GND	Power Ground
31	R7	Red data(MSB)
32	R6	Red data
33	R5	Red data
34	R4	Red data
35	R3	Red data
36	R2	Red data
37	R1	Red data
38	R0	Red data(LSB)
39	RESETB	Hard ware global rest. Low active
40	LR	Shift direction of Source Driver IC internal shift register is controlled by this pin as show below. LR=H SO1-->SO1200(Default pull high) LR=L SO1-->SO1

41	VCC	Digital power Supply Input(+3.3V)
42	GND	Power Ground
43	V10	Gamma voltage level 10
44	V6	Gamma voltage level 6
45	V5	Gamma voltage level 5
46	V1	Gamma voltage level 1
47	AVDD	Analog power Supply Input (+12V)
48	GND	Power Ground
49	EDGSL	Define input clock polarity When EDGSL=L, Latch data by rising edge of CLK(Default pull high) When EDGSL=H, CLK polarity is inverted, Latch data by falling edge of CLK
50	VCOM	Common voltage input

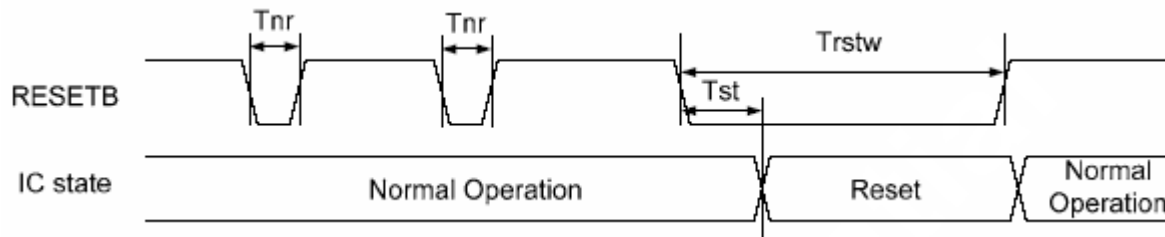
Remarks:

- 1) If DE signal is fixed low, SYNC mode is used. Otherwise, DE mode is used.
- 2) LR&UD setting

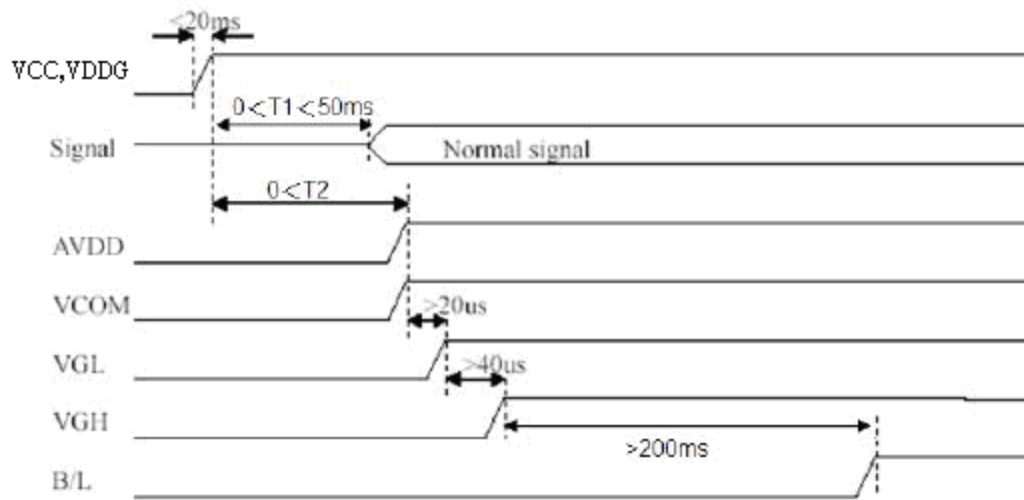
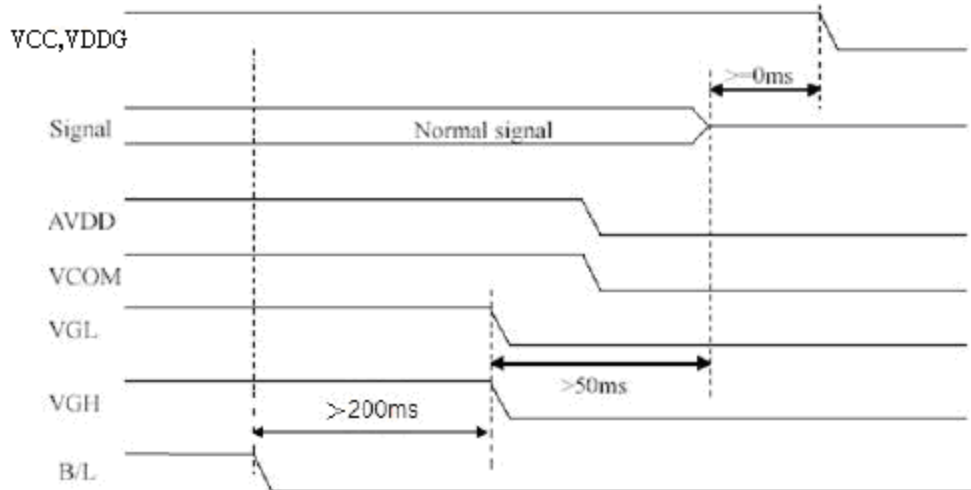
LR	UD	Function
1	0	Normally display
0	0	Left and Right opposite
1	1	Up and Down opposite
0	1	Left and Right opposite, Up and Down opposite

3) Hardware Reset Timing

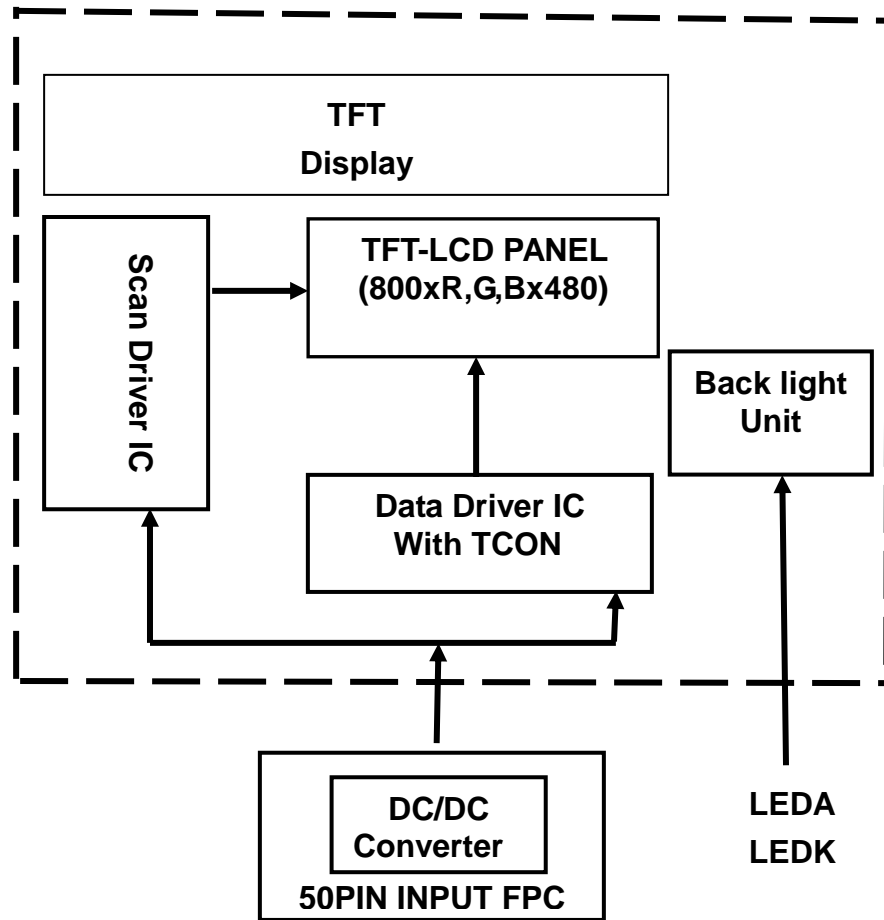
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
RESETB low pulse width	T_{rstw}	10	-	-	μs
Negative noise pulse width	T_{nr}		-	4	μs
Reset start time	T_{st}	4	-		μs



4) Power Signal sequence:

Power on:

Power off:


9. BLOCK DIAGRAM



10. QUALITY ASSURANCE

10.1 Test Condition

10.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : $25 \pm 5^{\circ}\text{C}$

Humidity : $65 \pm 5\%$

10.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

10.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

10.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

10.1.5 Test Method

No.	Reliability Test Item	Test Level	Remark
1	High Temperature Storage Test	T=80°C,240hrs	IEC68-2-2
2	Low Temperature Storage Test	T=-30°C,240hrs	IEC68-2-1
3	High Temperature Operation Test	T=70°C,240hrs	IEC68-2-2
4	Low Temperature Operation Test	T=-20°C,240hrs	IEC68-2-1
5	High Temperature and High Humidity Operation Test	T=60°C,90%RH,240hrs	IEC68-2-3
6	Thermal Cycling Test (No operation)	-30°C → +25°C → +80°C ,100 Cycles 30 min 5 min 30 min	IEC68-2-14
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	IEC68-2-6
8	Shock Test (No operation)	100G, 6ms Direction : ± X,± Y,± Z Cycle : 3 times	IEC68-2-27
9	ESD Test	State: operating Location: LCM/TP surface Condition:150pf 330Ω Contact +/- 8kV Air +/-15kV Criteria: Class C	IEC 6100-4-2

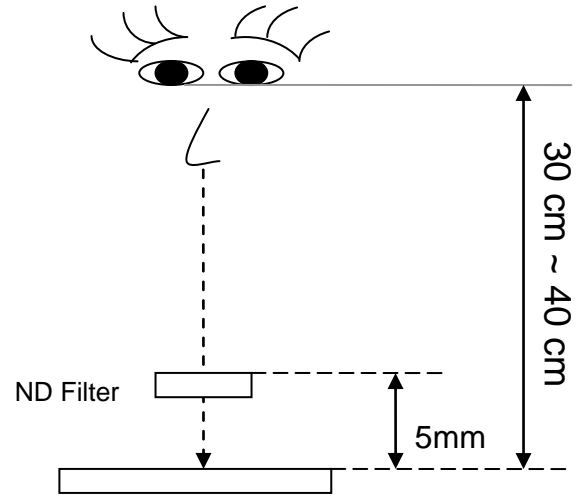
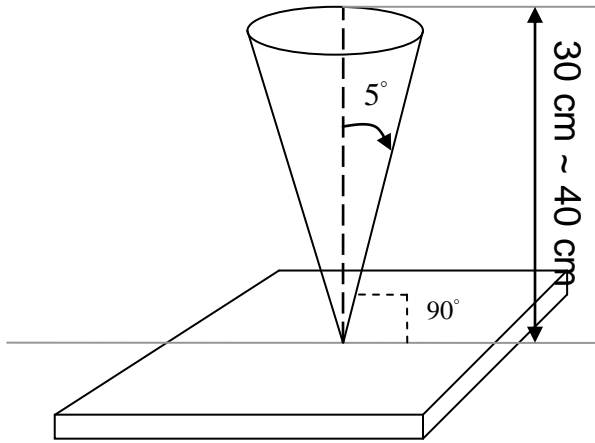
10.3 Inspection condition

10.3.1 Inspection conditions

10.3.1.1 Inspection Distance : 35 ± 5 cm

10.3.1.2 View Angle :

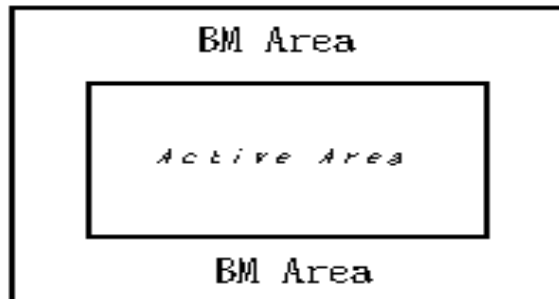
- (1) Inspection under operating condition : $\pm 5^\circ$
- (2) Inspection under non-operating condition : $\pm 45^\circ$



10.3.2 Environment conditions :

Ambient Temperature :		$25 \pm 5^\circ\text{C}$
Ambient Humidity :		$65 \pm 5\%$
Ambient Illumination	Cosmetic Inspection	600 ~ 800lux
	Functional Inspection	300 ~ 500lux

10.3.3 Definition of applicable Zones



10.3.4 Inspection Parameters

No.	Parameter	Criteria																		
1	Operating	Display function: No Display malfunction (Major)																		
		Line Defect: No obvious Vertical and Horizontal line defect in bright, dark and colored. (Major) (Note:1)																		
		Point Defect (Red, green, blue, dark): Active area ≤ 8 dots (Minor)(Note:1)																		
		<table border="1"> <thead> <tr> <th>Item</th> <th>Acceptable number</th> <th>Total</th> <th>Class Of Defects</th> <th>AQL Level</th> </tr> </thead> <tbody> <tr> <td>Bright</td> <td>4</td> <td rowspan="2">8</td> <td rowspan="4">Minor</td> <td rowspan="4">1.5</td> </tr> <tr> <td>Dark</td> <td>4</td> </tr> <tr> <td>Adjacent Bright</td> <td>1</td> <td>1</td> </tr> <tr> <td>Adjacent Dark</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Item	Acceptable number	Total	Class Of Defects	AQL Level	Bright	4	8	Minor	1.5	Dark	4	Adjacent Bright	1	1	Adjacent Dark	1	1
		Item	Acceptable number	Total	Class Of Defects	AQL Level														
		Bright	4	8	Minor	1.5														
		Dark	4																	
		Adjacent Bright	1	1																
		Adjacent Dark	1	1																
		Non-uniformity: Visible through 2%ND filter white, R, G, B and gray 50%pattern. (Minor)																		
Foreign material in Black or White spots shape ($W > 1/4L$) (Note: 5)																				
<table border="1"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Class Of Defects</th> <th>AQL Level</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.3$</td> <td>*</td> <td rowspan="3">Minor</td> <td rowspan="3">1.5</td> </tr> <tr> <td>$0.3 < D \leq 0.5$</td> <td>4</td> </tr> <tr> <td>$D > 0.5$</td> <td>0</td> </tr> </tbody> </table>	Dimension	Acceptable number	Class Of Defects	AQL Level	$D \leq 0.3$	*	Minor	1.5	$0.3 < D \leq 0.5$	4	$D > 0.5$	0								
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$D = (\text{Long} + \text{Short}) / 2$ * : Disregard																				
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L : Length W : Width * : Disregard																				
2	External Inspection (non-operating)	Dimension: Outline (Major)																		
		Bezel appearance: uneven (Minor)																		
		Scratch on the Polarize: (Note:2)																		
		<table border="1"> <thead> <tr> <th>Dimension</th> <th>Acceptable number</th> <th>Class Of Defects</th> <th>AQL Level</th> </tr> </thead> <tbody> <tr> <td>$W > 0.1\text{mm}, L > 5\text{mm}$</td> <td>0</td> <td rowspan="3">Minor</td> <td rowspan="3">1.5</td> </tr> <tr> <td>$L \leq 5\text{mm}, 0.07\text{mm} < W \leq 0.1\text{mm}$</td> <td>4</td> </tr> <tr> <td>$L \leq 5\text{mm}, W < 0.07\text{mm}$</td> <td>*</td> </tr> </tbody> </table>	Dimension	Acceptable number	Class Of Defects	AQL Level	$W > 0.1\text{mm}, L > 5\text{mm}$	0	Minor	1.5	$L \leq 5\text{mm}, 0.07\text{mm} < W \leq 0.1\text{mm}$	4	$L \leq 5\text{mm}, W < 0.07\text{mm}$	*						
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		Dent and spots shape on the polarize (Note:2): (Note: 5)																		
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$D = (\text{Long} + \text{Short}) / 2$ * : Disregard																				
Polarizer flaw or leak out resin : Defect is defined as the active area.																				

Class of defects	Major	AQL 0.65%	Definition
			Minor

Note:1.(a)Bright point defect is defined as point defect of R,G,B with area >1/2 dot respectively

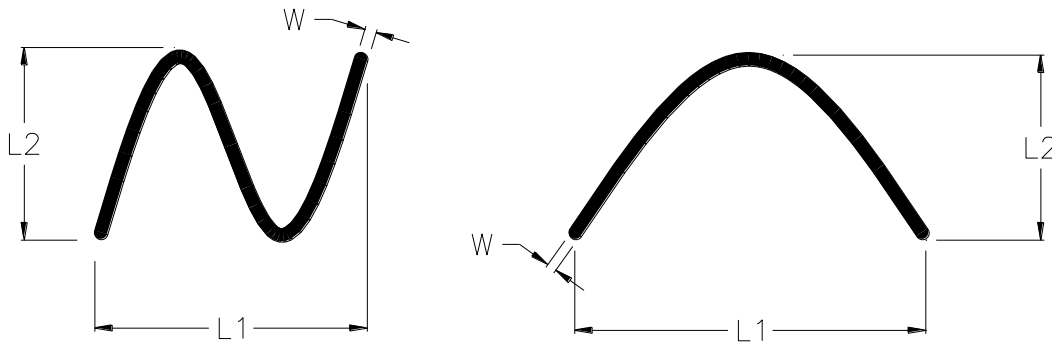
(b)Dark point defect is defined as visible in full white pattern.

(c)The point defect must under 2% ND Filter visible .

Note:2 The external inspection should be conducted at the distance 35 ± 5 cm between the eyes of inspctor and thepanel .

Note:3 Luminance measurement for contrast ratio is at the distance 50 ± 5 cm between the detective head and the panelwith ambient illuminance less than 1 lux. Contrast ratio is obtained at optimum view angle.

Note:4 W-Width in mm , L-length of Max.(L1,L2) in mm.



10.4 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

Sampling type: normal inspection, single sampling

Sampling table: MIL-STD-105E

Inspection level: Level II

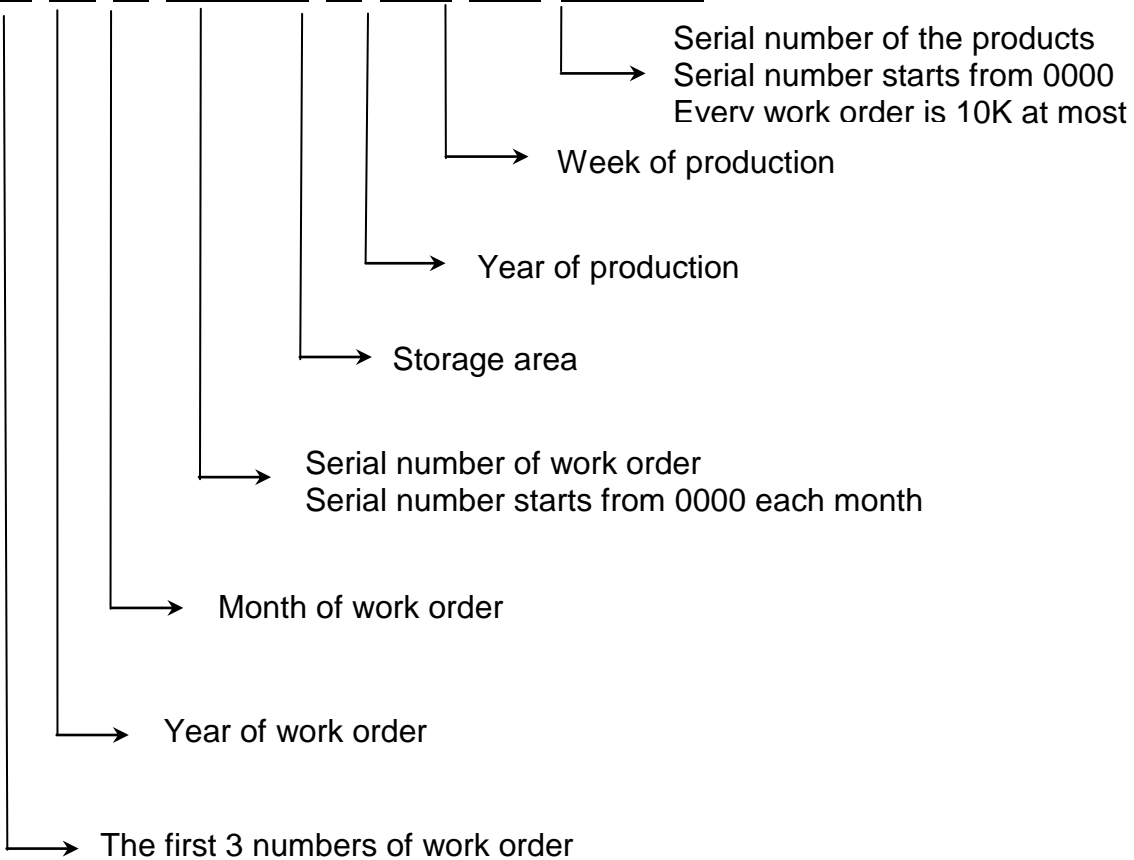
11. LCM Product Label Define

Product Label style:

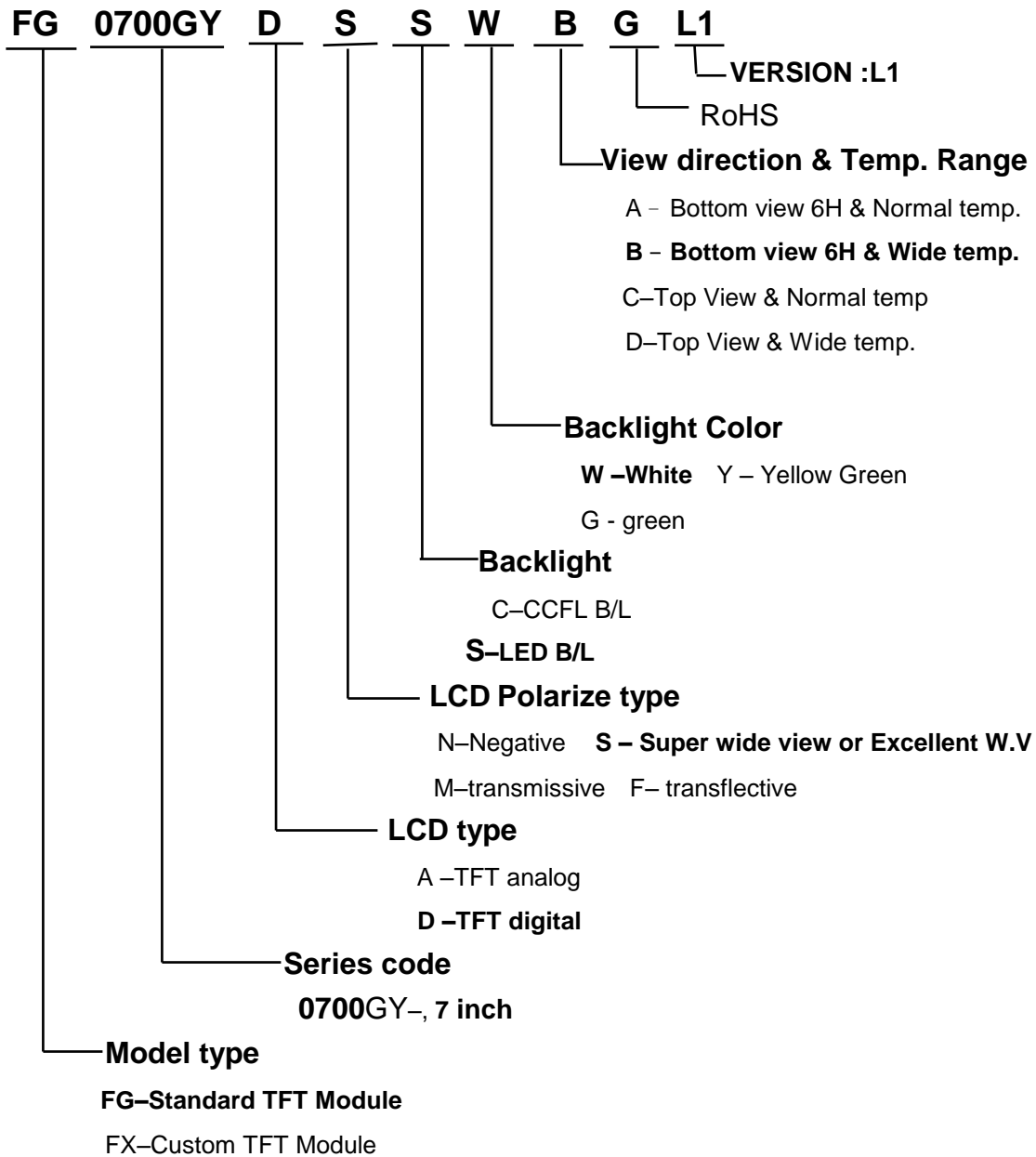


BarCode Define:

A A 6 0014 2 10 26-0013



Product Name Define:



12. PRECAUTIONS IN USE LCM

1. ASSEMBLY PRECAUTIONS

- (1) You must mount a module using holes arranged in four corners or four sides.
- (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- (3) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
- (4) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (5) Do not open the case because inside circuits do not have sufficient strength.
- (6) Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
- (7) Please do not touch metal frames with bare hands and soiled gloves. A color change of the metal frames can happen during a long preservation of soiled LCD modules.
- (8) Please pay attention to handling lead wire of backlight so that it is not tugged in connecting with inverter.

2. OPERATING PRECAUTIONS

- (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
- (2) Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification
- (3) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (4) When fixed patterns are displayed for a long time, remnant image is likely to occur.
- (5) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (6) Please consider that LCD backlight takes longer time to become stable of radiation characteristics in low temperature than in room temperature.

3. ELECTROSTATIC DISCHARGE CONTROL

- (1) The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such the copper leads on the PCB and the interface terminals with any parts of the human body.

The modules should be kept in antistatic bags or other containers resistant to static for storage.

- (2) Only properly grounded soldering irons should be used.
- (3) If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.
- (4) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended
- (5) Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.

4. STORAGE PRECAUTIONS

- (1) When you store LCDs for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
- (2) Please do not leave the LCDs in the environment of high humidity and high temperature such as 60°C 90%RH
- (3) Please do not leave the LCDs in the environment of low temperature; below -20°C.

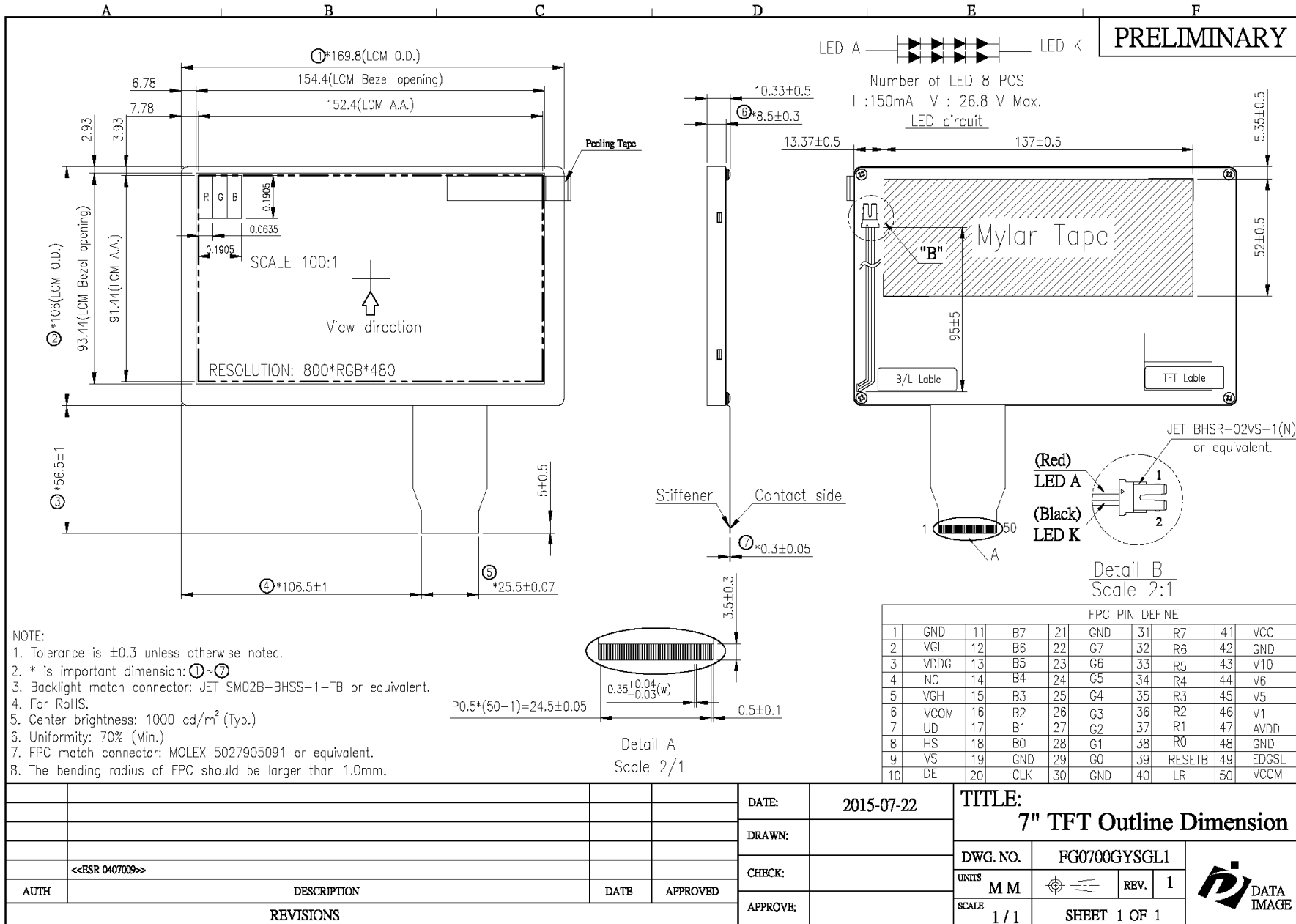
5. OTHERS

- (1) A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight and strong UV rays
- (2) Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
- (3) For the packaging box, please pay attention to the followings:
 - (4) Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
 - (5) Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
 - (6) Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

6. 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.

Confidential Document
13. OUTLINE DRAWING



14. PACKAGE INFORMATION

T.B.D.