SPECIFICATIONS

CUSTOMER	:	
MODEL NO.	:	GFTO043IF480272YL
VERSION	:	B
DATE	:	2024.11.19
CERTIFICATION	:	ROHS

Customer Sign	Approved By	Prepared By	Prepared By
	GIFAR 2024.11.19 Carlos		GIFAR 2024.11.19 Hazel

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GI FAR TECHNOLOGY CO., LTD.
No. 81, Dongfeng St, Shulin District, 238034, New Taipei City, Taiwan, R.O.C.

Revision Record

Data(y/m/d)	Ver.	Description	page
2024.08.02	A	Specification released	
2024.11.19	B	Add Package Information	

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CONTENTS

P-18-09B

1 General Description and Features

This is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT-LCD module, a driver circuit, a Touch Panel and a back-light unit. The resolution of a 4.3" contains 480(RGB)x272

dots.

1.1 Features

- Back-light with 10 LEDs are available.
- IPS.
- 24bit RGB Interface
- ROHS Compliance

1.2 LCD Module

Item	Specification	Unit
Screen Size	4.3 inches	Diagonal
Display Resolution	480(H) x RGB x 272(V)	Dot
Pixlel size	0.198 (H) x 0.198 (V)	mm
Active Area	95.040 (H) x 53.856 (V)	mm
Outline Dimension	105.5 (W) x 67.2 (H) x 4.1 (D)	mm
Display Mode	Normally Black	--
Pixel Arrangement	RGB Vertical-Stripe	--
Surface Treatment	Anti-glare (AG)	--
Display Color	16.7M	--
Viewing Direction	ALL	--
Driver IC	ILI6485D	
Input Interface	Digital 24-bits parallel RGB	--
Color Gamut(NTSC%)	NTSC 50%	--

TFT LCD PANEL
480(RGB)x272 dots

Pixel Arrangement
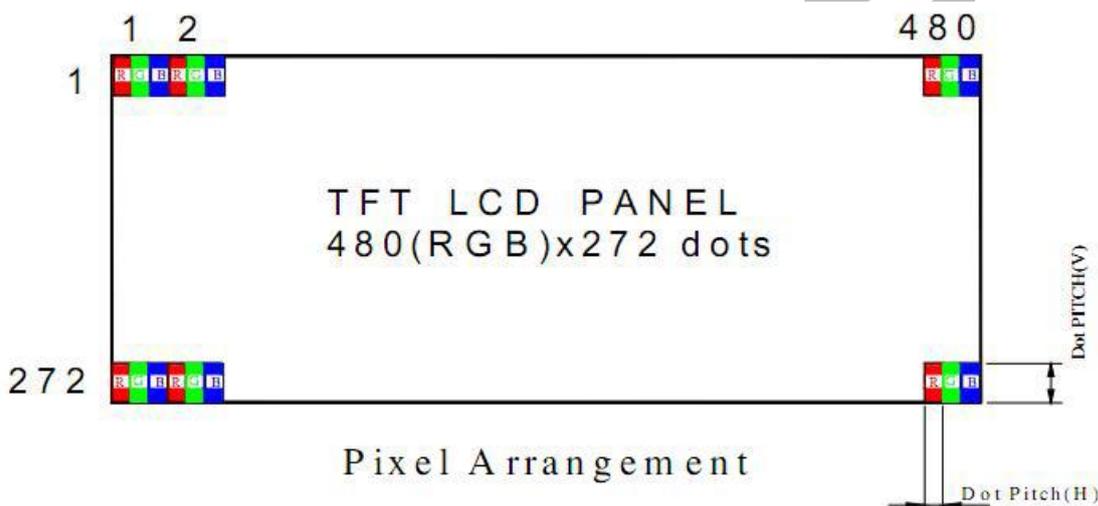
2 Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	105.3	105.5	105.7	mm	--
	Vertical (V)	67.0	67.20	67.4	mm	(1)
	Thickness (T)	3.9	4.1	4.3	mm	(1)
Weight		--	TBD	--	g	--

Note (1) Not include FPC.

Refer to the Dimensional Outlines for further information.

3 Electrical Specifications

3.1 Absolute Max. Ratings

3.1.1 Absolute Ratings of Environment

If the operating condition exceeds the following absolute maximum ratings, the TFT LCD module may be damaged permanently.

(Ta=25±2°C, VSS=GND=0)

Item	Symbol	Min.	Max.	Unit	Note
Storage temperature	TSTG	-30	80	°C	(1)
Operating temperature	TOPR	-20	70	°C	(1,2,3)

Note (1) 95 % RH Max. (40 °C≥ Ta). Maximum wet-bulb temperature at 39 °C or less. (Ta >40 °C) No condensation.

Note (2) In case of below 0°, the response time of liquid crystal (LC) becomes slower and the color of panel becomes darker than normal one. Level of retardation depends on temperature, because of LC's character

Note (3) Only operation is guarantied at operating temperature. Contrast, response time, another display quality are evaluated at +25°C.

3.2 Electrical Absolute Rating

3.2.1 TFT-LCD Module

(Ta=25±2°C, VSS=GND=0)

Item	Symbol	Value		Unit	Condition
		Min.	Max.		
Power supply voltage	VCI	-0.3	4.6	V	
IO Supply Voltage	VDDI	-0.3	4.6	V	
Charge Pump Supply Voltage	VCIP	-0.3	4.6	V	
Logic Input Voltage Range	VIN	-0.3	VDDI+0.3	V	
Logic Output Voltage Range	VO	-0.3	VDDI+0.3	V	

3.2.2 Back-Light Unit

(Ta=25±2°C)

Item	Symbol	Min.	Max.	Unit	Note
Current of One LED	IB	--	(25)	mA	(1)

Note (1) Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded. Functional operation should be restricted to the conditions described under normal operating conditions.

4 Electrical Characteristics

4.1 TFT-LCD Module

(Ta=25±2°C, VDD =3.3V)

Item	Symbol	Value			Unit	Condition
		Min.	Typ.	Max.		
Power supply voltage	VCI	3.0	3.3	3.6	V	
IO Supply Voltage	VDDI	3.0	3.3	3.6	V	VDDI<=VCI
Digital Current	IDD	-	(13)	(15)	mA	

Note (1) The specified power consumption is under the conditions at VCC=3.3V , FV=60Hz, whereas a Power dissipation check pattern below is displayed.

4.2 Backlight Unit

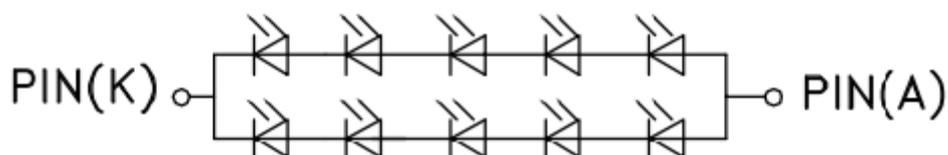The back-light system is an edge-lighting type with white LED (Light Emitting Diode)s.

(Ta=25±2°C)

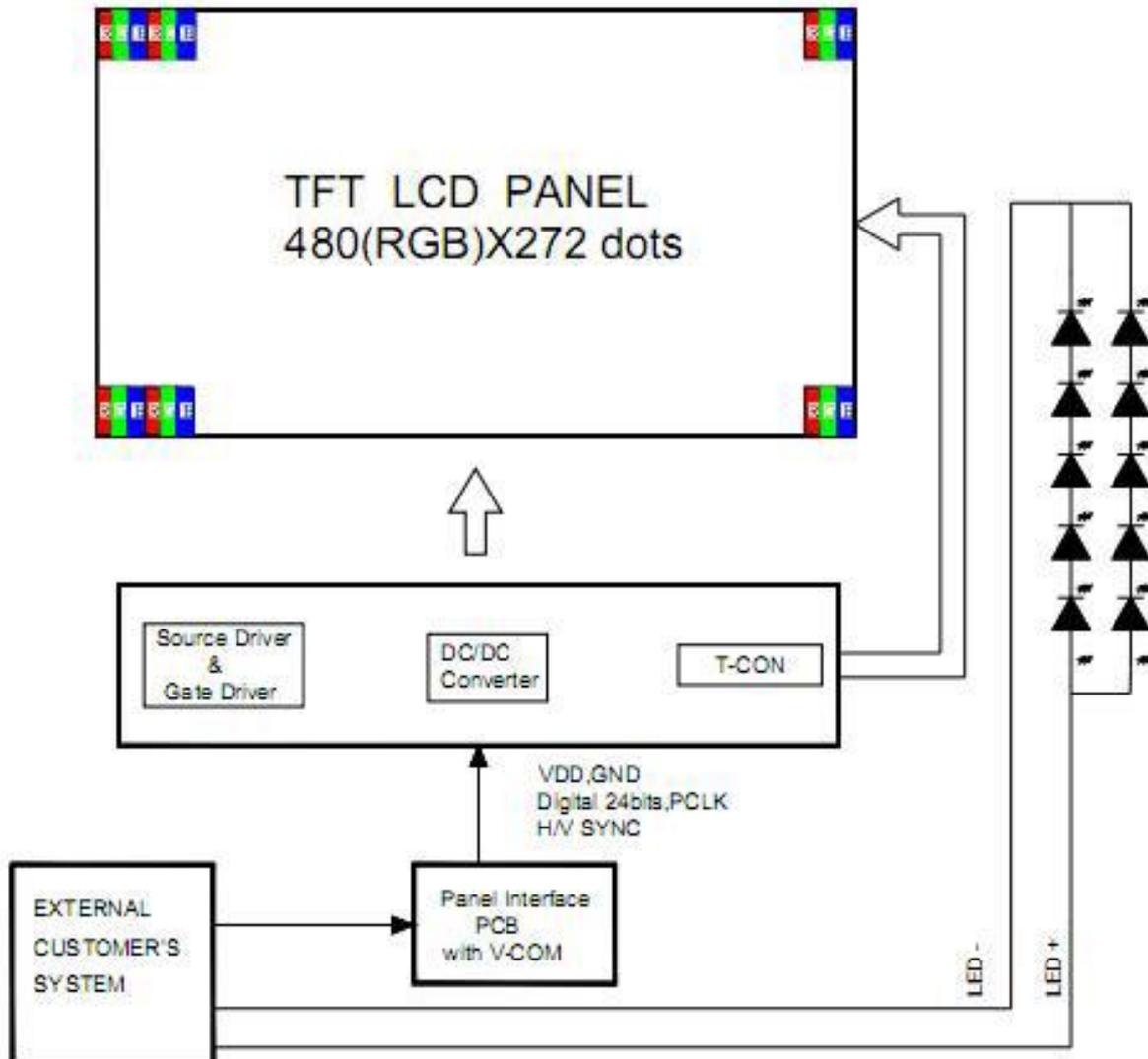| Item	Symbol	Value			Unit	Condition
		Min.	Typ.	Max.		
LED Voltage	VL	13.5	15.0	17	V	
LED Current	If	-	40	50	mA	
Power Consumption	PLED	-	600	850	mW	
LED Life Time (25℃)	-	35000	50000	-	hr	

Note (1) 10LEDs

(2) Where If = 40mA, VL = 15.0V, PLED = VL × If

(3)The environmental conducted under ambient air flow ,at Ta=25±2°C,60%RH±5%

5 Block Diagram

TFT LCD PANEL
480(RGB)X272 dots

Source Driver & Gate Driver

DC/DC Converter

T-CON

VDD,GND
Digital 24bits,PCLK
H/V SYNC

EXTERNAL CUSTOMER'S SYSTEM

Panel Interface PCB with V-COM

LED -

LED +

6 Input Terminal Pin Assignment

6.1 CN1 Pin Assignment(Reference Connector: Hirose : FH12A-40S-0.5SH(55)

Pin No	Symbol	Description	Input/Output	Note
1	VLED-	Power for LED Backlight Cathode	P	
2	VLED+	Power for LED Backlight Anode	P	
3	GND	Power Ground	P	
4	VDD	Power Supply For digital circuit	P	
5	R0	Red Data (LSB)	I	
6	R1	Red Data	I	
7	R2	Red Data	I	
8	R3	Red Data	I	
9	R4	Red Data	I	
10	R5	Red Data	I	
11	R6	Red Data	I	
12	R7	Red Data (MSB)	I	
13	G0	Green Data(LSB)	I	
14	G1	Green Data	I	
15	G2	Green Data	I	
16	G3	Green Data	I	
17	G4	Green Data	I	
18	G5	Green Data	I	
19	G6	Green Data	I	
20	G7	Green Data(MSB)	I	
21	B0	Blue Data (LSB)	I	
22	B1	Blue Data	I	
23	B2	Blue Data	I	
24	B3	Blue Data	I	
25	B4	Blue Data	I	
26	B5	Blue Data	I	
27	B6	Blue Data	I	
28	B7	Blue Data(MSB)	I	
29	GND	Power Ground	P	
30	DCLK	Dot Clock Signal	I	
31	DISP	Display On/off Mode Control H: Display On L: Display OFF	I	
32	HSYNC	Horizontal Synchronization Signal	I	(1)
33	VSYNC	Vertical Synchronization Signal	I	(1)
34	DE	Input Data Enable Control	I	

35	NC	No Connection	--	
36	GND	Power Ground	P	
37	XR	Touch Panel Right Side	I/O	
38	YD	Touch Panel Bottom Side	I/O	
39	XL	Touch Panel Left Side	I/O	
40	YU	Touch Panel Top Side	I/O	

Note:

(1). Default Use SYNC MODE.

7 Optical Characteristics

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room
Measuring equipment: BM-7A

(Ta=25±2°C, VDD =3.3V, If=40mA)

Item		Symbol	Condition	Min	Type	Max	Unit	Note
Brightness		--	--	320	400	--	cd/m^2	--
Response time		Ton+ Toff	q=0°	--		40	ms	--
Contrast ratio		CR	At optimized viewing angle	800	1000	--	--	--
Color Chromaticity	Red	Rx	θ=0°Normal Viewing Angle	(0.55)	(0.60)	(0.65)		
		Ry		(0.28)	(0.33)	(0.38)		
	Green	Gx		(0.30)	(0.35)	(0.40)		
		Gy		(0.53)	(0.58)	(0.63)		
	Blue	Bx		(0.09)	(0.14)	(0.19)		
		By		(0.06)	(0.11)	(0.16)		
	White	Wx		(0.26)	(0.31)	(0.36)		
		Wy		(0.29)	(0.34)	(0.39)		
Viewing Angle (6H)	Hor.	θR	CR≥10	-	(85)	-	Degree	
		θL		-	(85)	-		
	Ver.	θU		-	(85)	-		
		θD		-	(85)	-		

a. Test equipment setup

After stabilizing and leaving the panel alone shall be warmed up for the stable operation of LCM, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-5A/BM-7(fast) with a viewing angle of 2° at a distance of 50cm and normal direction.

b. Definition of response time: Tr and Tf

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".
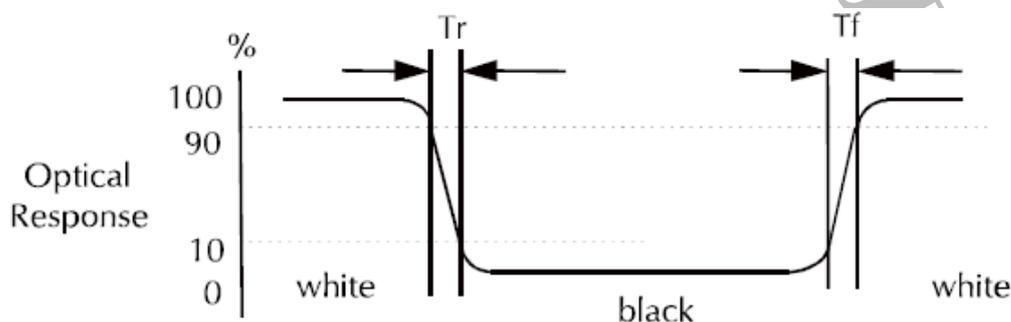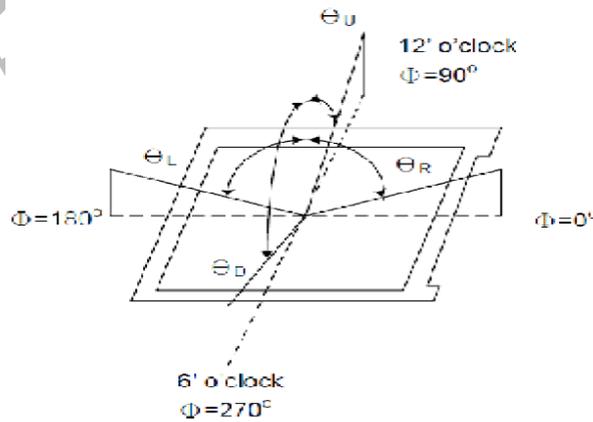
c. Definition of contrast ratio:

$$\text{Contrast Ratio (CR)} = \frac{\text{Brightness measured when LCD is at "white state"}}{\text{Brightness measured when LCD is at "black state"}}$$

d. Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

e. View Angle

f. Definition of Luminance of White: Luminance of white at the center points

Light Source of Back-Light Unit	LED Type

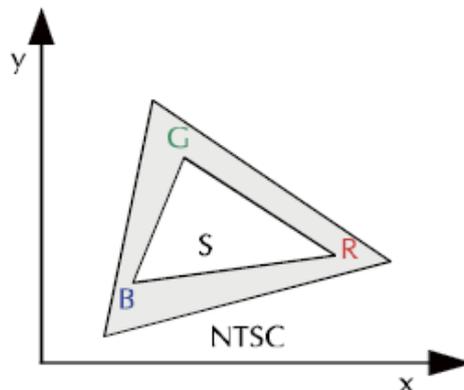g. Definition of White Uniformity

$$\text{White Uniformity} = \frac{\text{Min. luminance of white among 9-points}}{\text{Max. luminance of white among 9-points}} \times 100\%$$

h. The definition of Color Gamut -Color Chromaticity CIE 1931
  Color coordinate of white & red, green, blue at center point.
  Color Gamut : NTSC(%) = (RGB Triangle Area / NTSC Triangle Area) x 100

8 Touch Screen Panel Specifications

8.1 Electrical Characteristics

Item	Min.	Typ.	Max.	Unit	Note
Linearity	-1.5	-	1.5	%	Analog X and Y directions
Terminal resistance	500	-	1300	W	X(Glass side)
	100	-	540	W	Y(Film side)
Insulation resistance	20	-	-	MW	DC 25V
Voltage	3	-	15	V	DC
Chattering	-	-	10	ms	100kW pull-up

8.2 Mechanical & Reliability Characteristics

Item	Min.	Typ.	Max.	Unit	Note
Activation force	60		100	g	
Durability-surface scratching	Write 100,000	-	-	characters	
Durability-surface pitting	1,000,000	-	-	touches	
Surface hardness	3	-	-	H	JIS K5400,ASTM D3363

9 Basic Display Color and Gray Scale

	Color & Gray Scale	Data Signal																													
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
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	0
	Red(0)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(0)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	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	0	1	1	1	1	1	1	1	1
	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
	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
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	0
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(127)	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(127)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
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	0
	Blue(1)	0	0	0	0	0	0	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	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(127)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

0 : Low level voltage, 1 :High level voltage Each basic color can be displayed in 256 gray scales from 8 bit data signals. With the combination of total 24 bit data signals, the 16,7M-color display can be achieved on the screen.

10 RGB Interface

10.1 Parallel RGB Input Timing Table (SYNC MODE)

RGB Input Timing Table (VCIP=VCI=VDDI= 3.3V, VSSA= 0V,TA=25℃)

480RGB X 272 Resolution Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	125	111	83	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp	-	480	-	DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_Blanking setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	75	DCLK	
VSYNC	Period Time	Tv	276	292	321	H	
	Display Period	Tvdisp	-	272	-	H	
	Back Porch	Tvbp	2	12	12	H	By V_Blanking setting
	Front Porch	Tvfp	2	8	37	H	
	Pulse Width	Tvw	2	4	37	H	
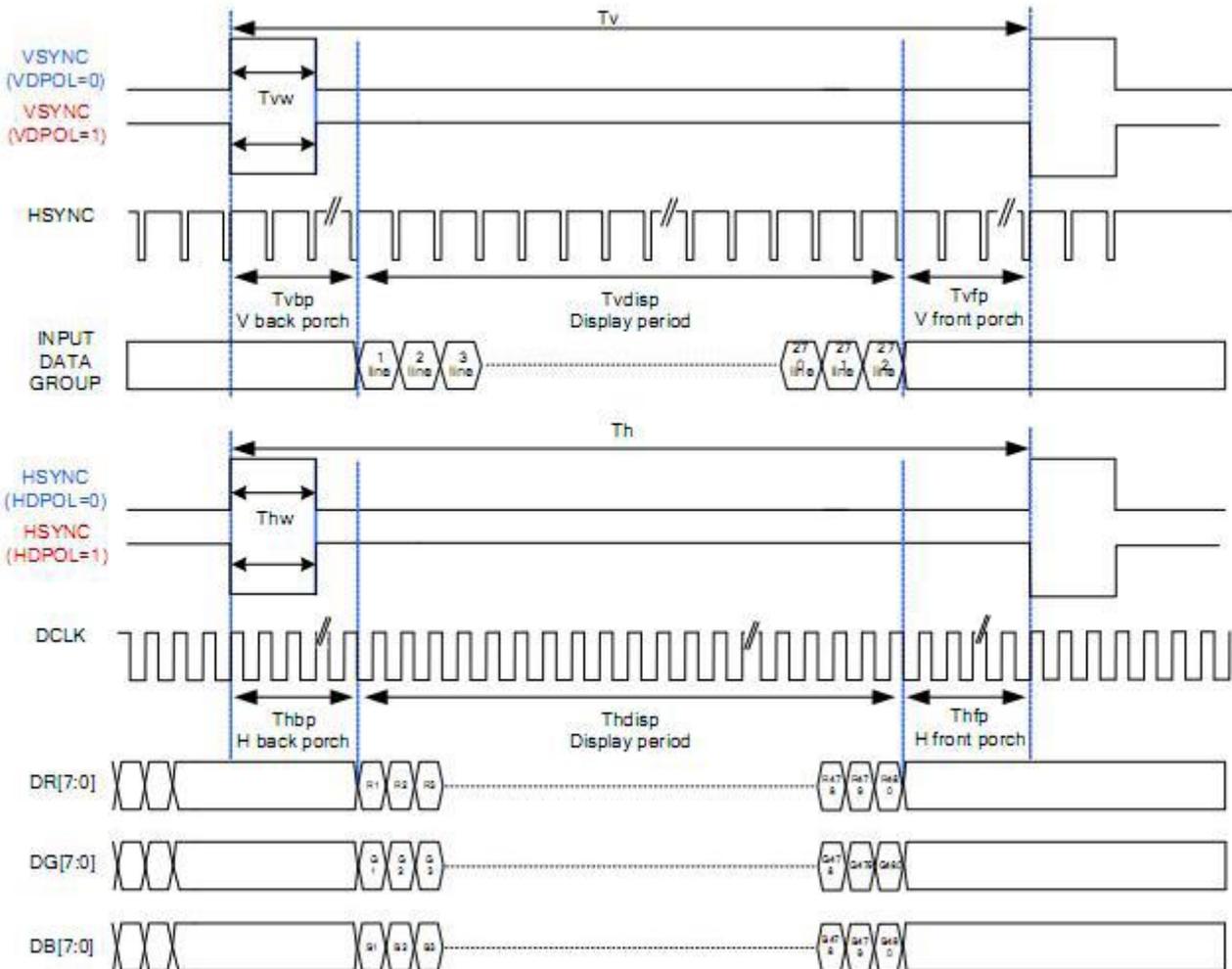
10.2 POWER ON/OFFSEQUENCE

10.2.1 Power ON Sequence
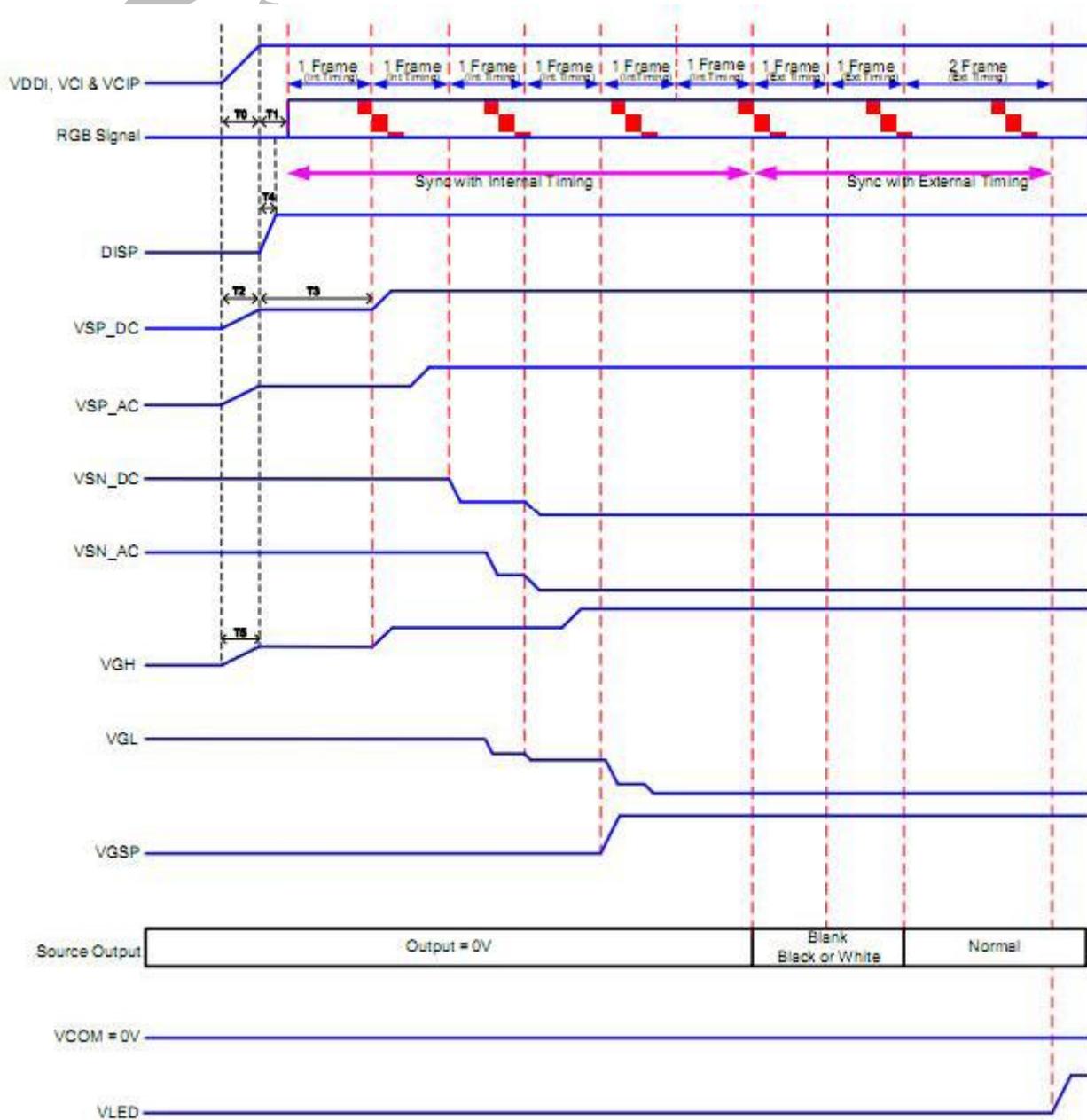
Item	Description	Min. Time
T0	Determined by the external power.	
T1	Time from stable VDDI, VCI, VCIP set-up to the first frame.	T1=0
T2	Time from VSP_DC=0V to VSP_DC=3.3V.	T2=T0
T3	Time from VSP_DC =3.3V to VSP_DC =6.0V.	T3=T1+ (1*Frame)
T4	Time from stable VDDI, VCI, VCIP set-up to DISP asserted.	T4=0
T5	Time from VGH=0V to VGH=3.3V.	T5=T0

10.2.2 Power OFF Sequence
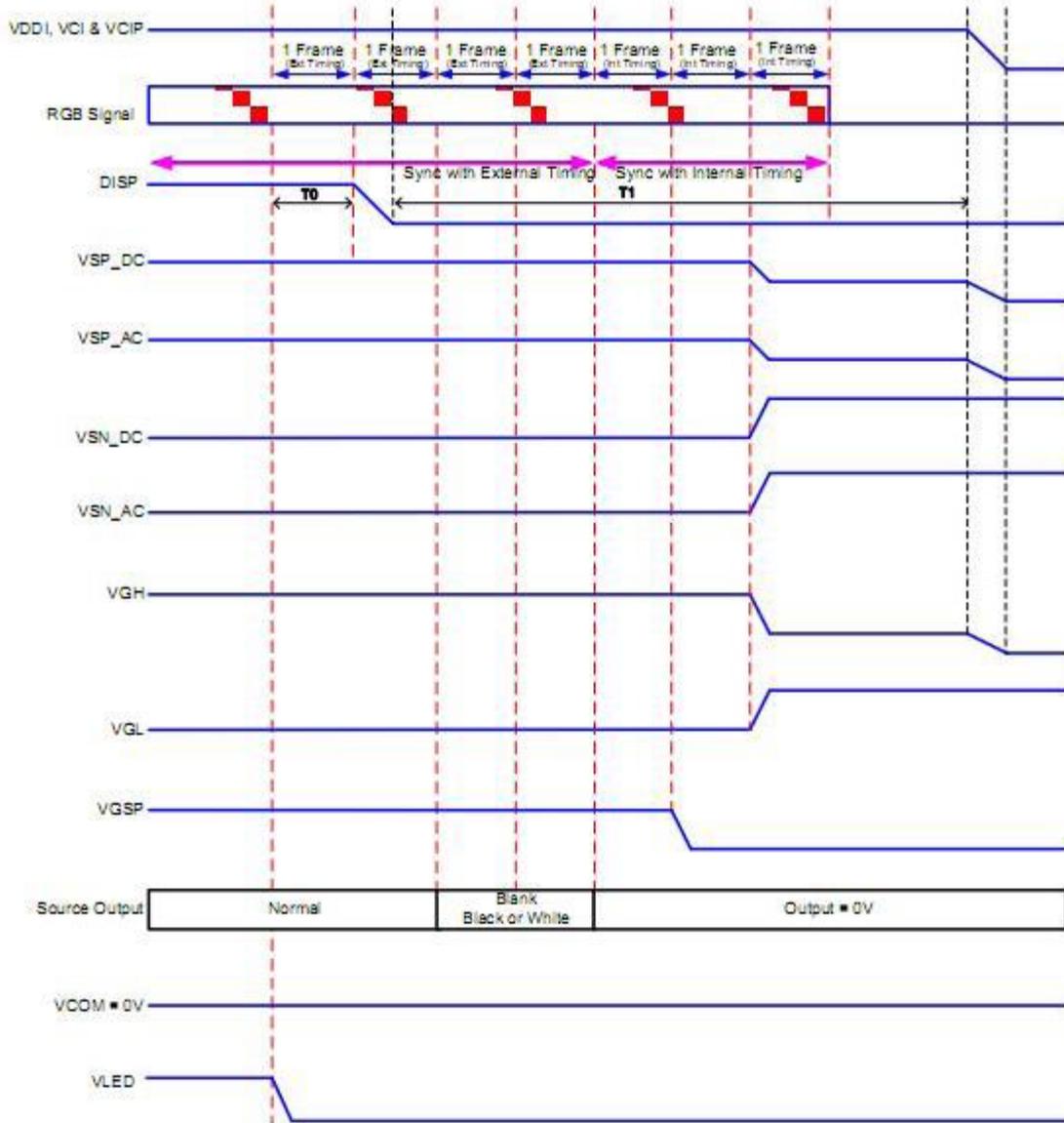
Item	Description	Min. Time
T0	Time from backlight power off to DISP="L".	1*Frame
T1	Time from DISP="L" to LCM Power off.	5*Frame

11 Test

No change on display and in operation under the following test condition.

Condition: Unless otherwise specified, tests will be conducted under the following condition.
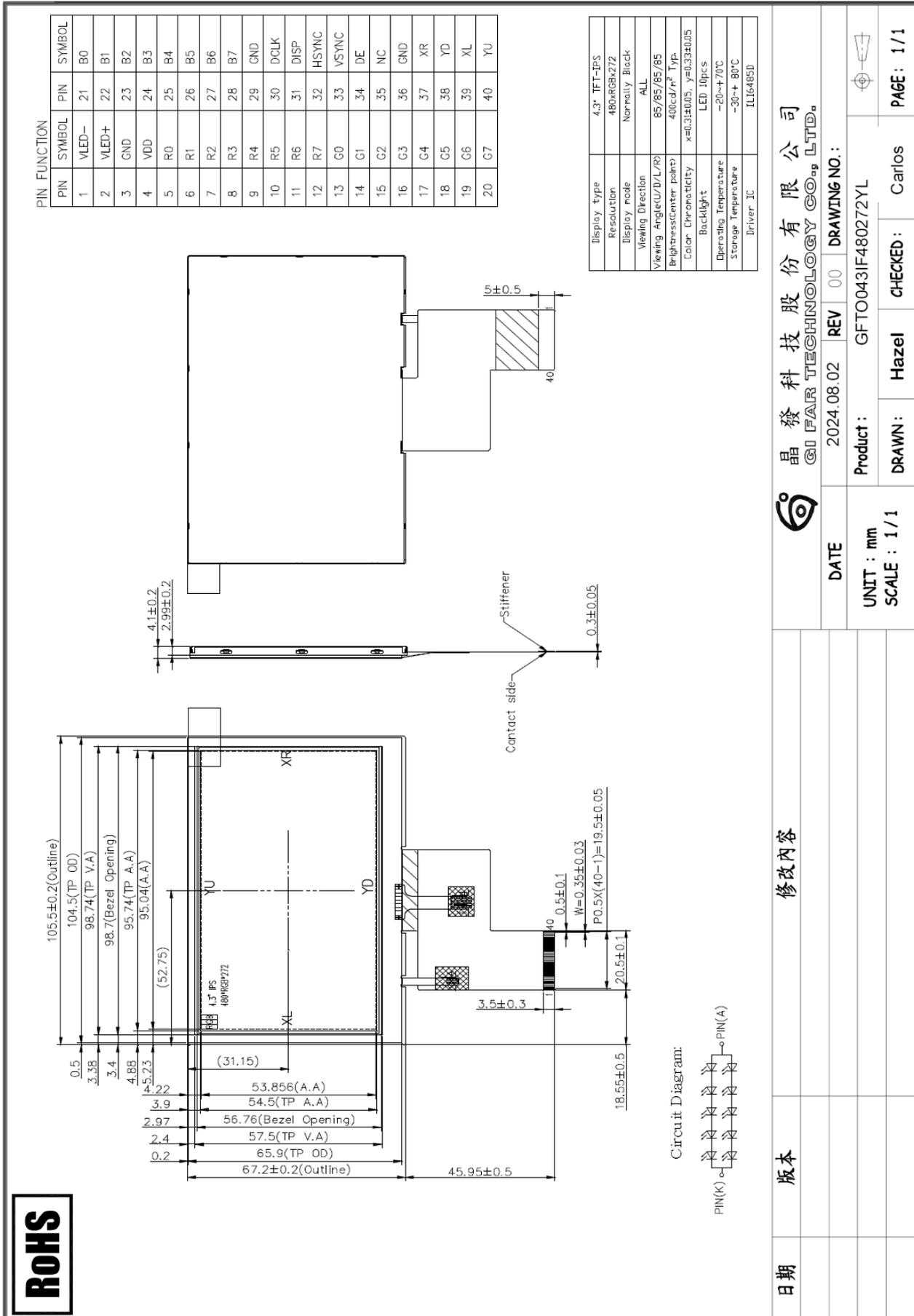
    Temperature: 20±5°C.

    Humidity: 65±5%RH.

    Tests will be not conducted under functioning state.

| No.	Parameter	Condition	Notes
1	High Temperature Operating	70°C±2°C, 240hrs (Operation state).	
2	Low Temperature Operating	-20°C±2°C, 240hrs (Operation state).	1
3	High Temperature Storage	80°C±2°C, 240hrs.	2
4	Low Temperature Storage	-30°C±2°C, 240hrs.	1,2
5	High Temperature and High Humidity Operation Test	60°C±2°C, 90%, 240hrs	1,2
6	Vibration Test	Total fixed amplitude: 1.5mm. Vibration Frequency: 10~55Hz. One cycle 60 seconds to 3 direction of X, Y, Z each 15 minutes.	3
7.	Drop Test	To be measured after dropping from 60cm high on the concrete surface in packing state. Dropping method corner dropping: A corner: Once edge dropping. B, C, D edge: Once face dropping. E, F, G face: Once.	
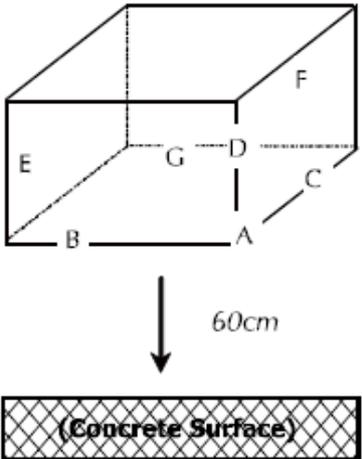
12 Dimensional outlines

PIN FUNCTION

PIN	SYMBOL	PIN	SYMBOL
1	VLED−	21	B0
2	VLED+	22	B1
3	GND	23	B2
4	VDD	24	B3
5	R0	25	B4
6	R1	26	B5
7	R2	27	B6
8	R3	28	B7
9	R4	29	GND
10	R5	30	DCLK
11	R6	31	DISP
12	R7	32	HSYNC
13	G0	33	VSYNC
14	G1	34	DE
15	G2	35	NC
16	G3	36	GND
17	G4	37	XR
18	G5	38	YD
19	G6	39	XL
20	G7	40	YU

Display type	4.3" TFT-IPS
Resolution	480xRGBx272
Display mode	Normally Black
Viewing Direction	ALL
Viewing Angle(U/D/L/R)	85/85/85/85
Brightness(Center point)	400cd/m² Typ.
Color Chromaticity	x=0.31±0.05, y=0.33±0.05
Backlight	LED 10pcs
Operating Temperature	−20~+70°C
Storage Temperature	−30~+ 80°C
Driver IC	ILI6485D

DATE	2024.08.02	REV	00	DRAWING NO.: GFTO043IF480272YL
Product:				
DRAWN: Hazel	CHECKED: Carlos			
UNIT : mm				
SCALE : 1/1				PAGE : 1/1

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GI FAR TECHNOLOGY CO., LTD.

修改内容

版本

日期

RoHS

Circuit Diagram:

13 Incoming Inspection Standards

13.1 Inspection and Environment Conditions

13.1.1 Inspection Conditions:

(1) Inspection Distance: 35 cm±5cm

(2) View Angle:Light-on Inspection Angle：±5°

Cosmetic Inspection Angle：±45°
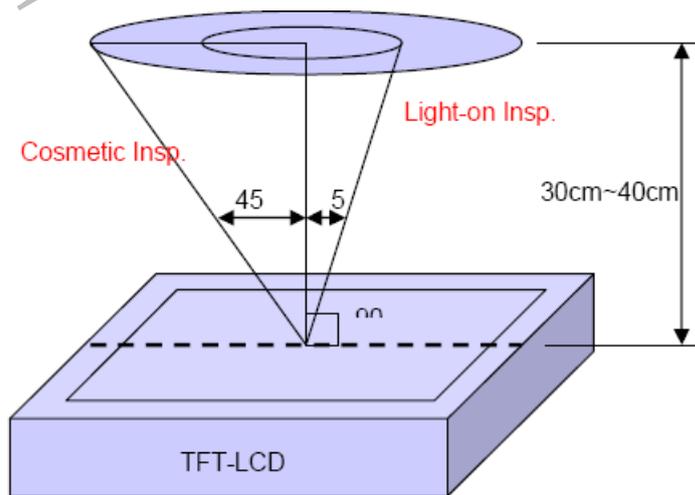
(perpendicular to LCD panel surface)

13.1.2 Environment Conditions:

Ambient Temperature		23℃±5℃
Ambient Humidity		55±10%RH
Ambient Illumination	Cosmetic Inspection	more than 600 Lux
	Functional Inspection	300~500 Lux

13.1.3 Sampling Conditions:

(1) Lot Size: Quantity of shipment lot per model

(2) Sampling Method:

Sampling Plan		MIL-STD-105E
		Normal Inspection, Single Sampling
		Level II
AQL	Major Defect	1.0%
	Minor Defect	1.5%

(3) The classification of Major(MA) and Minor(MI) defects is shown as 3. Inspection Criteria.

13.1.4 Inspection Criteria

13.1.4.1 Cosmetic Inspection(Panel):

| Item	Judgment Criteria	Classification
Chipping on Panel	 $a \leq 3.0mm$ 、 $b \leq 3.0mm$ 、 $c \leq t$ (Bottom glass thickness)	MA
Scratch on Panel *Note-2	$W \leq 0.05mm$ or $L < 5mm$: Ignored $0.05mm < W \leq 0.1mm$ and $L \leq 5mm$: $N \leq 5$ $W > 0.1mm$ or $L > 5mm$: Not allowed	MI
Bubble or Dent on Panel *Note-3	$D \leq 0.2mm$: Ignored $0.2mm < D \leq 0.3mm$: $N \leq 5$ $D > 0.3mm$: Not allowed	MI
Panel Crack	 Not Allowed crack	MA
Bezel Deformation	Obvious deformation is not allowed.	MI
Bezel Oxidation	Not allowed if it rusts continuously over 1 cm (It is out of warranty with rusted tin plate)	MI
Bezel Scratch	$L \leq 20mm$, $W \leq 0.2$, $N \leq 3$	MI
Metal Squash Dent /Flange(Front Side)	$D(W) \leq 1, L \leq 3, N \leq 3$;	MI
B/L High Voltage Wire Denudation	Not allowed	MA
Polarizer flaw or leak out resin	Defect is defined as the active area.	MI
Outline Dimension	Must in Spec, refer to related product spec.	MI

## 13.1.4.2 Functional Inspection:

Item	Judgment Criteria				Classification
	Area(Note1)		I	O	
Point Defect	Bright dot	Random	2		MI
		2 dots adjacent	0	0	
		3 dots adjacent or more	0	0	
	Dark dot	Random	3		
		2 dots adjacent	0		
		3 dots adjacent or more	0	0	
	Total Dot Defect		5		
	Distance	Distance between Bright and Bright dot	$L \geqq 5mm$		
		Distance between Bright and Dark dot	$L \geqq 5mm$		
		Distance between Dark dot	$L \geqq 5mm$		
	(1) It is defined as Point Defect if defect area $>$ 0.5dot (2) It is ignored if defect area $\leqq$ 0.5dot (3) Weak point defect will be defined as Bright Dot if it can be observed through ND filter 5%(Full Screen Black Inspection)				
Line Defect	Obvious vertical or horizontal line defect is not allowed.				MA
Mura	Not allowed if it can be observed through ND Filter 5 %				MI
Foreign Material in spot shape *Note-3	$D \leqq 0.2mm$: Ignored $0.2mm < D \leqq 0.5mm$: $N \leqq 8$ $D > 0.5mm$: Not allowed				MI
Foreign Material in line or spiral shape *Note-4	$W \leqq 0.05mm$ or $L \leqq 5mm$: Ignored $0.05mm < W \leqq 0.2mm$ and $L1.0mm \leqq 5mm$: $N \leqq 8$ $W > 0.2mm$ or $L > 5mm$: Not allowed				MI
Display Function Abnormal	No Malfunction can be allowed				MA

Note-1：I/OArea Definition
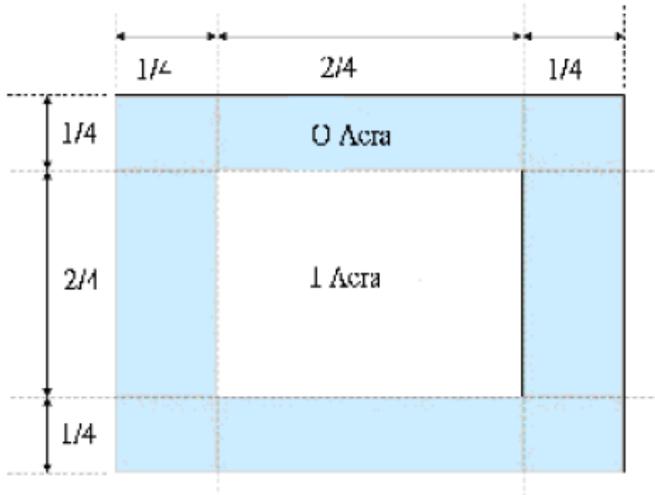
Note-2： Polarizer Scratch
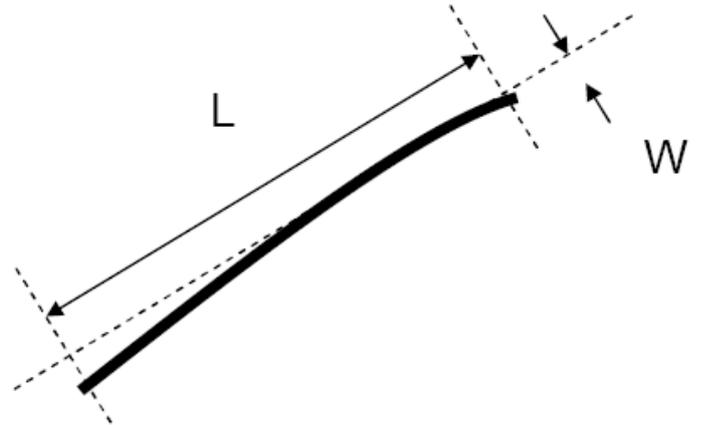
Note-3：Spot Foreign Material
(W ≧ L / 4)

$$D = \frac{(L+W)}{2}$$
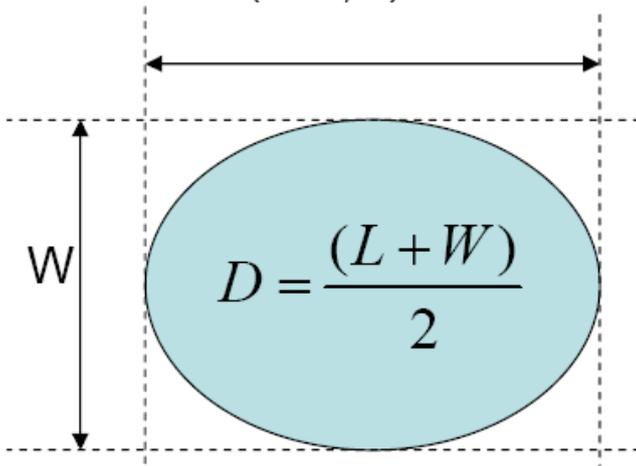
Note-4：Line or Spiral Foreign Material
(W < L / 4)
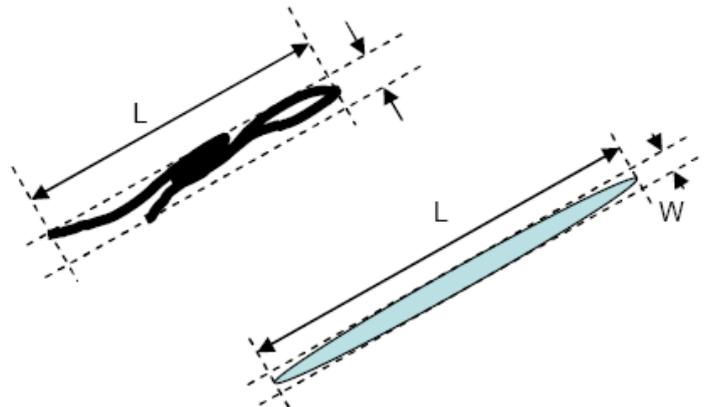
14. PACKAGE INFORMATION

1	1 Tray	:	6 pcs (modules)
2	1 stack	:	10 tray +1 Cover tray
3	1 Carton	:	(1 Cover tray + 10 tray) 3 stack
4	Total pcs	:	1 Carton (6pcs * 10tray * 3 stack) = 180 pcs
5	Carton size = NO. 17	:	495*315*435mm
6	Net weight	:	10.6 KG
7	Gross weight	:	15.1 KG

** Packaging information**

● **1 Tray = 6 pcs**

● **1 stack=10 tray+1 Cover tray**   ****Each layer of tray should be staggered stacked**

WW

● **1 Carton = 3 stack,   Total pcs = 180 pcs**