






# SPECIFICATIONS

**CUSTOMER** : \_\_\_\_\_  
**MODEL NO.** : GFTO057FA640480L  
**VERSION** : A  
**DATE** : 2018.01.04  
**CERTIFICATION** : ROHS  
**CUSTOMER SIGN** : \_\_\_\_\_

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## 1. OVERVIEW

GFTO057FA800480L is 5.7" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs and backlight.

General specifications are summarized in the following table:

Item	Specification
Display Area (mm)	116.16(H) × 87.12(V)
Resolution	640(H) × 3(RGB) × 480(V)
Pixel Pitch(mm)	0.1815(H) × 0.1815(V)
Pixel Arrangement	R,G,B vertical stripe
Display Mode	Normally White
Number of color	262K
Viewing Direction	6' o'clock
Response Time (Tr+Tf)	30ms(typ)
Contrast Ratio	300:1
Luminance (cd/m <sup>2</sup> )	220nit(typ)
NTSC	50%(typ)
Viewing Angle	CR > 10
Electrical Interface	TTL
Power Consumption(W)	1.4W(typ)
Outline Dimension (mm)	127(W) × 100(H) × 6.6(D)
Module Weight (g)	110g(typ)
Backlight	LED
Surface Treatment	Anti-Glare , Surface hardness: 3H



## 2. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage for LCD	V <sub>CC</sub>	-0.3	5	V	
Power Supply Voltage for LED	V <sub>LED</sub>	GND	30	V	
ICC Rush Current	IRUSH	-	1	A	*2)
Gate Off Voltage	VEEG	-20	0.3	V	
Operation Temperature	Topa	-30	85	°C	*1)
Storage Temperature	Tstg	-40	90	°C	*1)

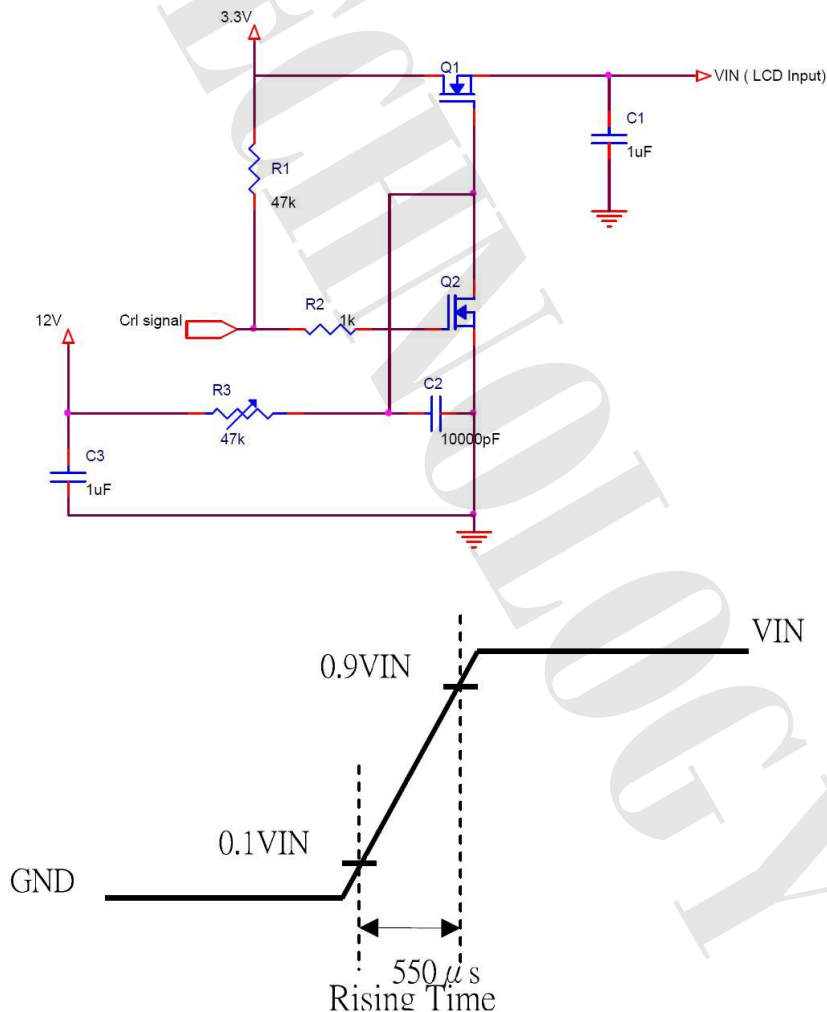
Remarks :

\*1) If the product were used out of the operation and storage range, it will have quality issue.

\*2) The input pulse-current measurement system is as below :

Control signal: High (+3.3V)→Low (GND)

Supply Voltage of rising time should be from R3 and C2 tune to 550μs.





### 3. ELECTRICAL CHARACTERISTICS

#### 3.1 TFT-LCD Power Supply Voltage

Ta=25°C

Item	Symbol	Min.	Min.	Max.	Unit	Remarks
Power Supply Voltage For LCD	V <sub>CC</sub>	3.0	3.3	3.6	V	
Power Supply Voltage For LED	V <sub>LED</sub>	3.0	5	5.5	V	
Logic Input Voltage	V <sub>IL</sub>	V <sub>CC</sub> *0.7	-	V <sub>CC</sub>	V	
	V <sub>IH</sub>	GND	-	V <sub>CC</sub> *0.3	V	
ADJ Input Voltage	V <sub>IL</sub>	3.0	-	3.3	V	
	V <sub>IH</sub>	GND	-	0.3	V	

#### 3.2 TFT-LCD Power Supply Current

Ta=25°C

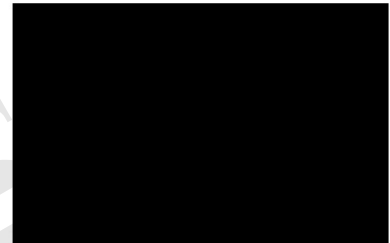
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Remarks
LCD Power Current	I <sub>CC</sub>	-	-	95	115	mA	*1)
LED Power Current	I <sub>LED</sub>	-	-	210	380	mA	*2)

Remarks :

\*1) Typical : 64 gray pattern , Maximum : Black pattern



64 Gray Pattern



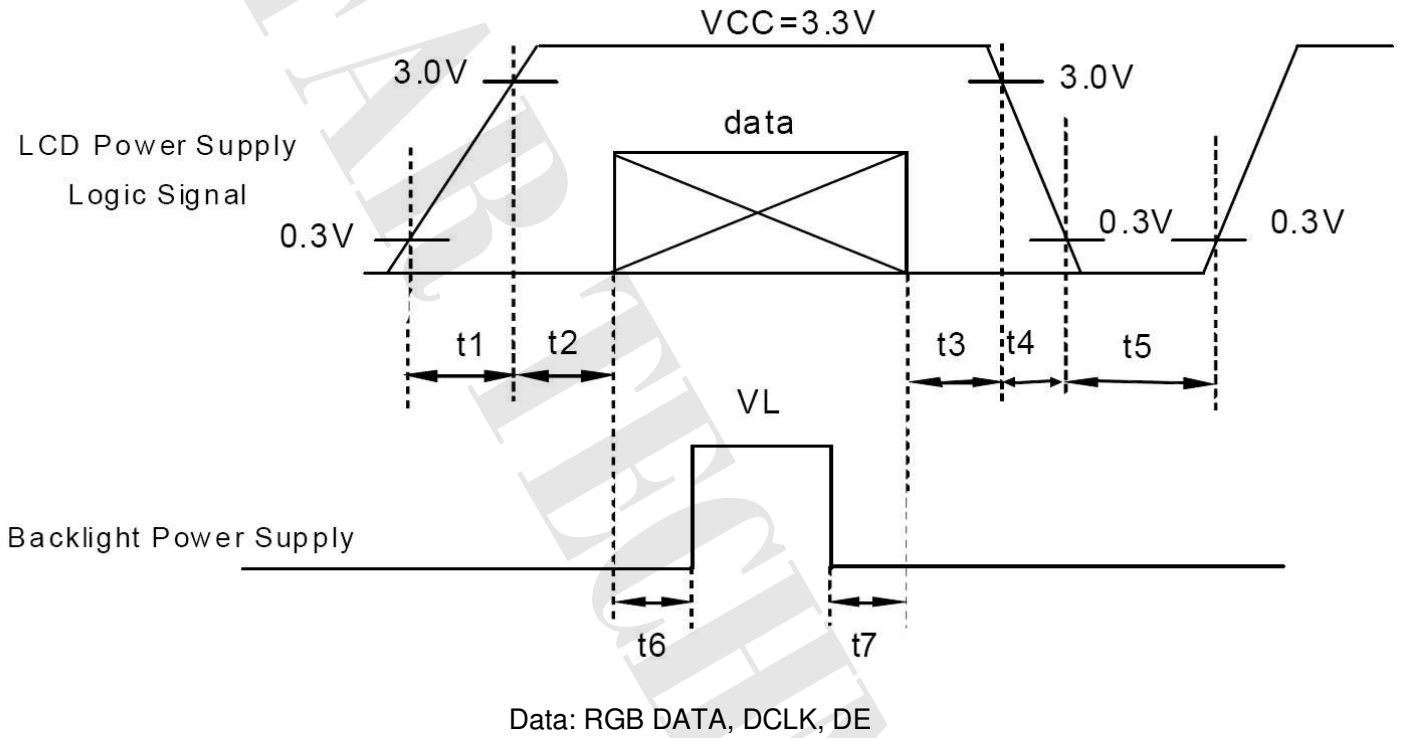
Black Pattern

\*2) Typical : V<sub>LED</sub> = 5V  
Maximum: V<sub>LED</sub> =3.0V

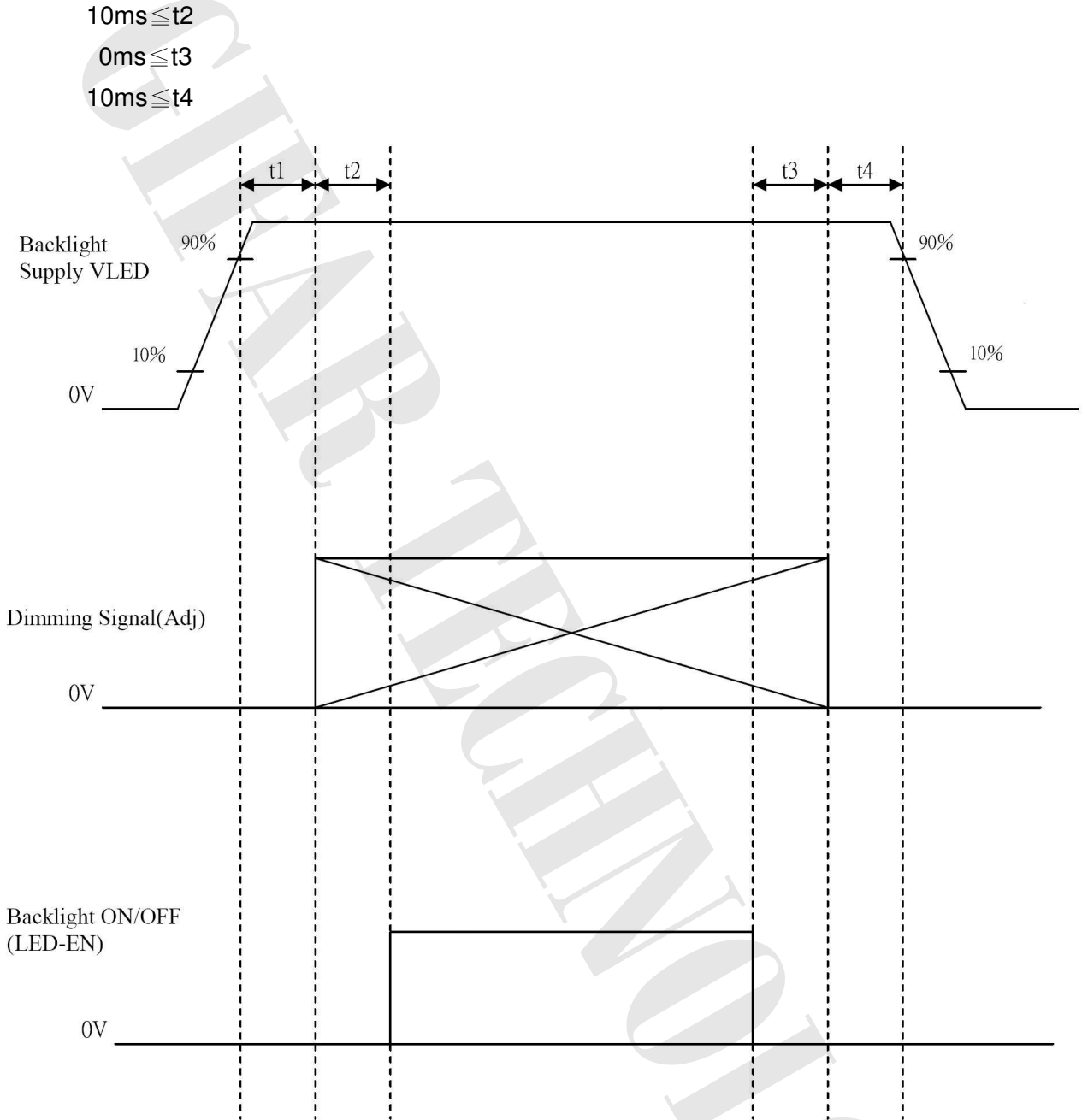


### 3.3 Power & Signal sequence

- $0.5 < t1 \leq 10ms$
- $0 < t2 \leq 50ms$
- $0 < t3 \leq 50ms$
- $0 < t4 \leq 10ms$
- $200ms \leq t5$
- $200ms \leq t6$
- $200ms \leq t7$



$10ms \leq t1$



### 3.4 Backlight

Item	Symbol	Conditions	Min.	Min.	Max.	Unit	Remarks
LED Lifetime	-	Ta=25°C Each serial=20mA	30000			Hr	
		Ta=60°C Each serial=20mA	15000			Hr	

Remarks :

\*1)Definition LED lifetime : Luminance will decay less than 50%





## 4. INTERFACE CONNECTION

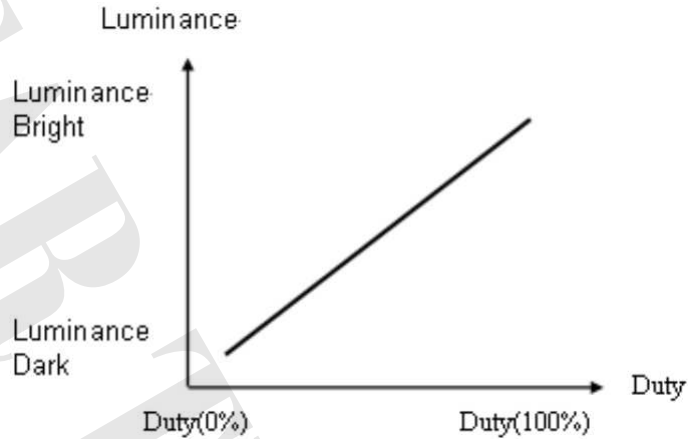
(a)CN1 : Starconn. 089N40-000R00-G2-R

Pin NO.	SYMBOL	DESCRIPTION
1	U/D	Up / Down Display Control
2	DMS	DE / SYNC Mode Selection
3	Hsync	Horizontal SYNC.
4	V <sub>LED</sub>	Power Supply for LED
5	V <sub>LED</sub>	Power Supply for LED
6	V <sub>LED</sub>	Power Supply for LED
7	V <sub>CC</sub>	Power Supply for LCD
8	Vsync	Vertical SYNC.
9	DE	Data Enable
10	V <sub>SS</sub>	Power Ground
11	V <sub>SS</sub>	Power Ground
12	ADJ	Adjust for LED brightness
13	B5	Blue Data 5 (MSB)
14	B4	Blue Data 4
15	B3	Blue Data 3
16	V <sub>SS</sub>	Power Ground
17	B2	Blue Data 2
18	B1	Blue Data 1
19	B0	Blue Data 0 (LSB)
20	V <sub>SS</sub>	Power Ground
21	G5	Green Data 5 (MSB)
22	G4	Green Data 4
23	G3	Green Data 3
24	V <sub>SS</sub>	Power Ground
25	G2	Green Data 2
26	G1	Green Data 1
27	G0	Green Data 0 (LSB)
28	V <sub>SS</sub>	Power Ground
29	R5	Red Data 5 (MSB)
30	R4	Red Data 4
31	R3	Red Data 3
32	V <sub>SS</sub>	Power Ground
33	R2	Red Data 2
34	R1	Red Data 1
35	R0	Red Data 0 (LSB)
36	V <sub>SS</sub>	Power Ground
37	V <sub>SS</sub>	Power Ground
38	DCLK	Clock Signals
39	V <sub>SS</sub>	Power Ground
40	L/R	Left / Right Display Control



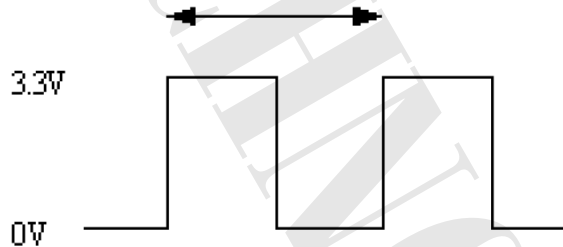
Remarks :

- \*1) VSS pin must be connected with GND. Don't let it be an empty pin.
- \*2) Adjust control pin (ADJ) controls brightness. The bigger pulse duty, the brighter luminance.



- \*3) ADJ signal=0~3.3V, operation frequency: 25KHZ±5KHz..

$$F=25\text{KHz} \pm 5\text{KHz} \cdot T=0.04\text{ms}$$



The ADJ should pull-high if not adjust brightness, this pin can't floating.

- \*4) U/D & L/R Control Function

L/R	U/D	Function
1	0	Normal Display
0	0	Left / Right Contrary
1	1	Up / Down Reverse
0	1	Left / Right Contrary · Up / Down Reverse

- \*5) DMS ( Selection DE / SYNC mode )

DMS	Function
1	DE Mode
0	SYNC Mode



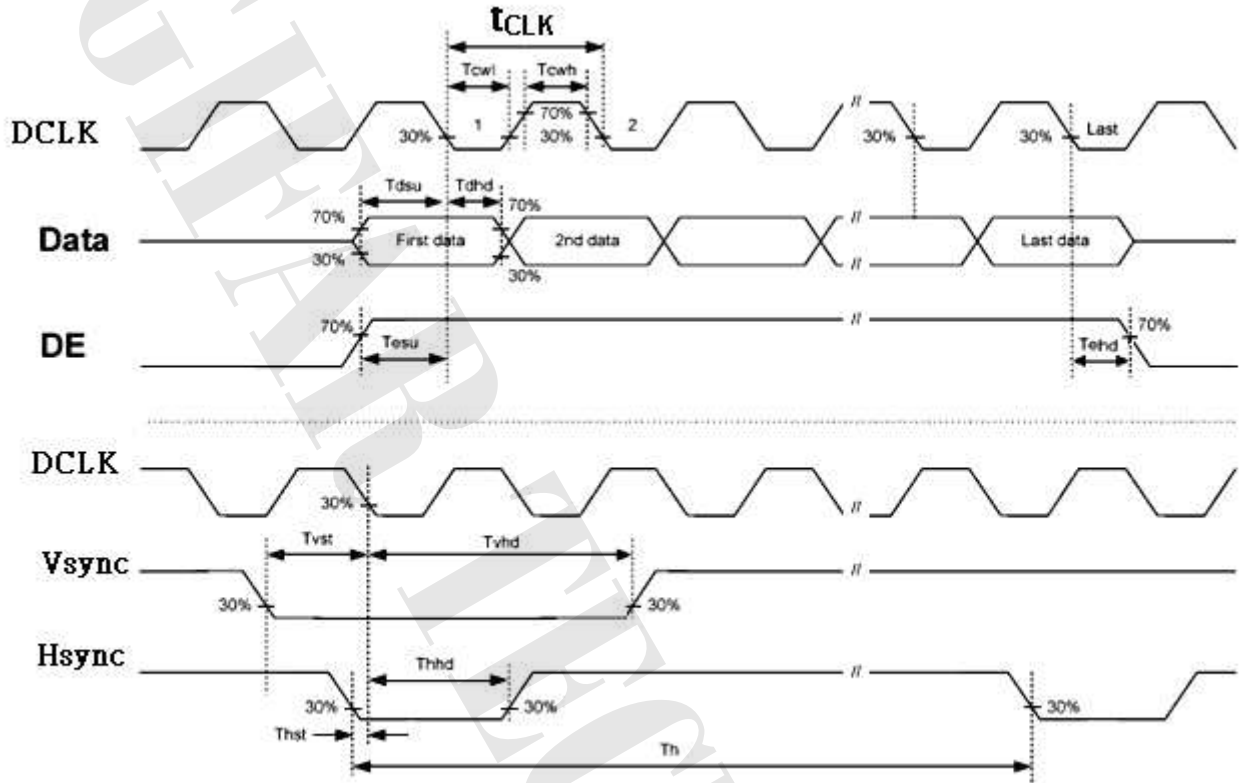
## 5. INPUT SIGNAL (DE ONLY MODE)

### 5.1 Timing specification

	ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	Note
DCLK	Dot Clock	1/Tclk	23	25	30	MHz	
	DCLK pulse duty	Tcwh	40	50	60	%	
DE	Setup Time	Tesu	8	-	-	ns	
	Hold time	Tehd	8	-	-	ns	
	Horizontal Period	t <sub>H</sub>	750	800	900	t <sub>CLK</sub>	
	Horizontal Valid	t <sub>HA</sub>	640			t <sub>CLK</sub>	
	Horizontal Blank	t <sub>HB</sub>	110	160	260	t <sub>CLK</sub>	
	Vertical Period	t <sub>V</sub>	515	525	560	t <sub>H</sub>	
	Vertical Valid	t <sub>VA</sub>	480			t <sub>H</sub>	
	Vertical Blank	t <sub>VB</sub>	35	45	80	t <sub>H</sub>	
	SYNC	HSYNC Setup Time	Thst	8	-	-	ns
HSYNC Hold Time		Thhd	8	-	-	ns	
VSYNC Setup Time		Tvst	8	-	-	ns	
VSYNC Hold Time		Tvhhd	8	-	-	ns	
Horizontal Period		t <sub>H</sub>	750	800	900	t <sub>CLK</sub>	
Horizontal Pulse Width		t <sub>HPW</sub>	1	48	-	t <sub>CLK</sub>	t <sub>HB</sub> + t <sub>HPW</sub> = 88DCLK is fixed
Horizontal Back Porch		t <sub>HB</sub>	-	40	-	t <sub>CLK</sub>	
Horizontal Front Porch		t <sub>HFP</sub>	22	72	172	t <sub>CLK</sub>	
Horizontal Valid		t <sub>HD</sub>	640			t <sub>CLK</sub>	
Vertical Period		t <sub>V</sub>	515	525	560	t <sub>H</sub>	
Vertical Pulse Width		t <sub>VPW</sub>	1	3	-	t <sub>H</sub>	t <sub>VPW</sub> + t <sub>VB</sub> = 32t <sub>H</sub> is fixed
Vertical Back Porch		t <sub>VB</sub>	-	29	-	t <sub>H</sub>	
Vertical Front Porch		t <sub>VFP</sub>	3	13	48	t <sub>H</sub>	
Vertical Valid		t <sub>VD</sub>	480			t <sub>H</sub>	
DATA	Setup Time	Tdsu	8	-	-	ns	
	Hold Time	Tdhd	8	-	-	ns	

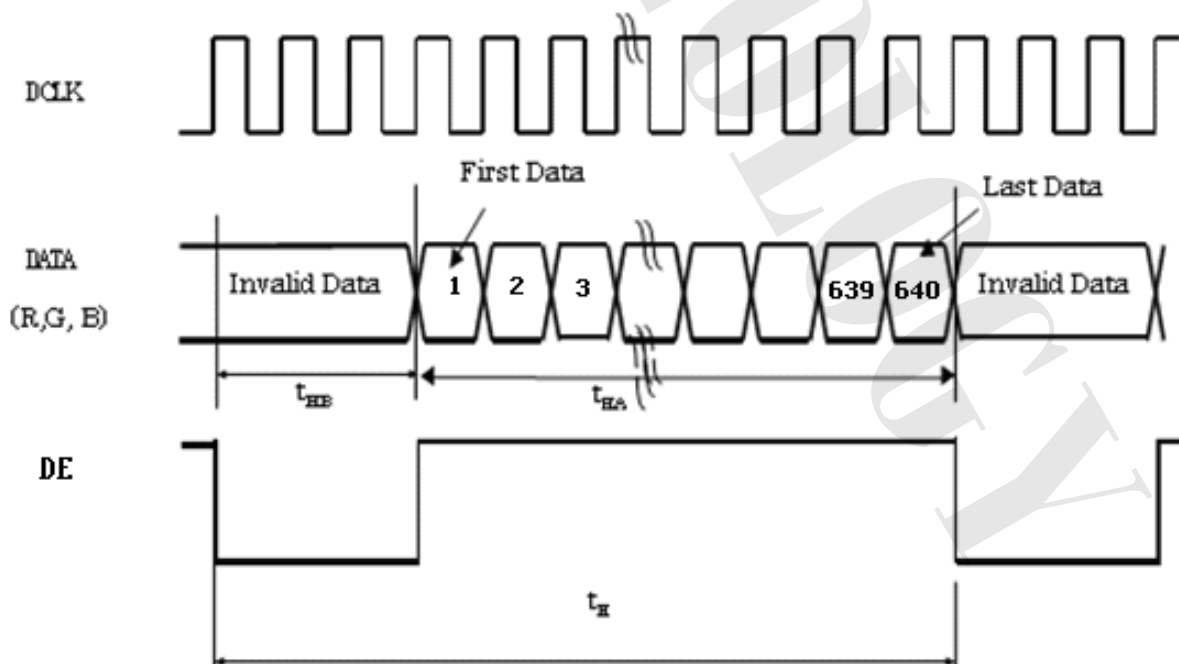


### 5.2 Timing Chart



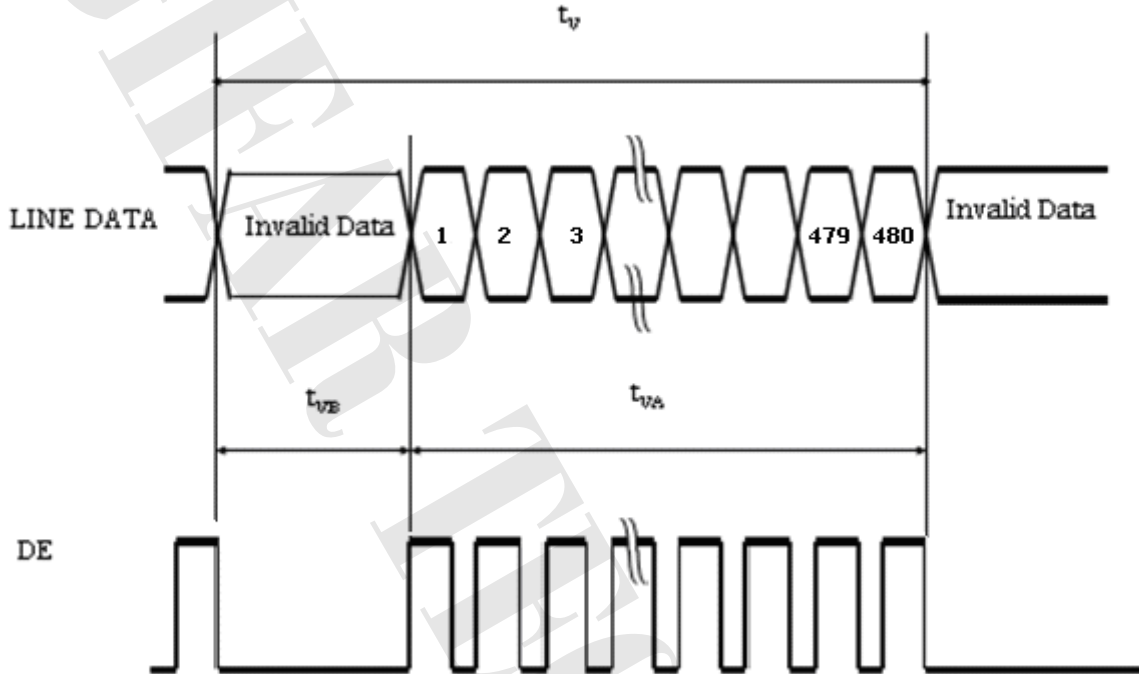
DE mode :

Horizontal Input timing :





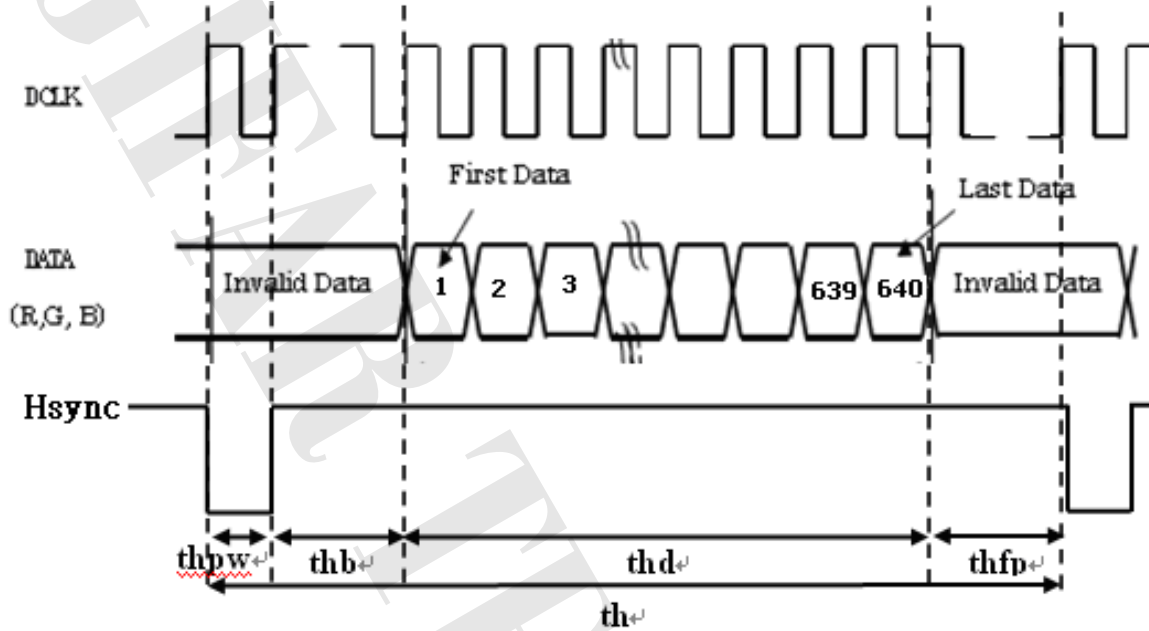
Vertical Input timing :



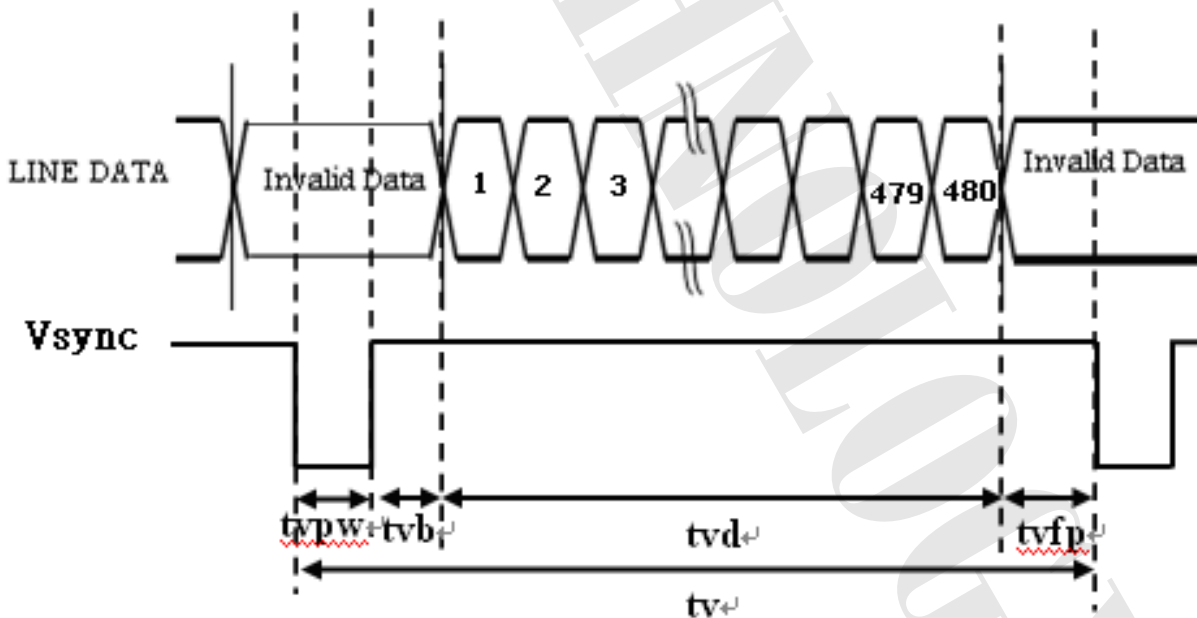


**SYNC mode :**

Horizontal Input timing :



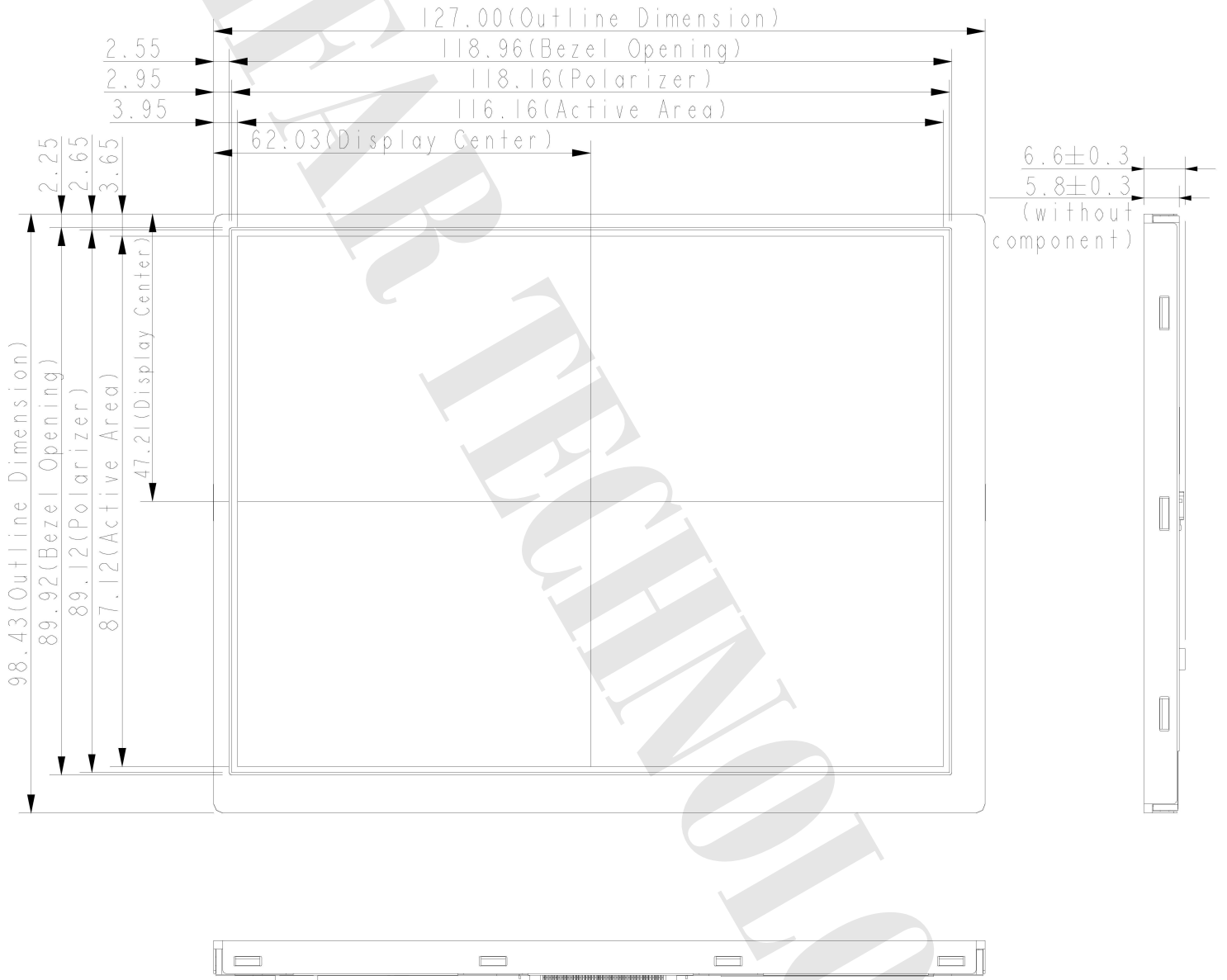
Vertical Input timing :





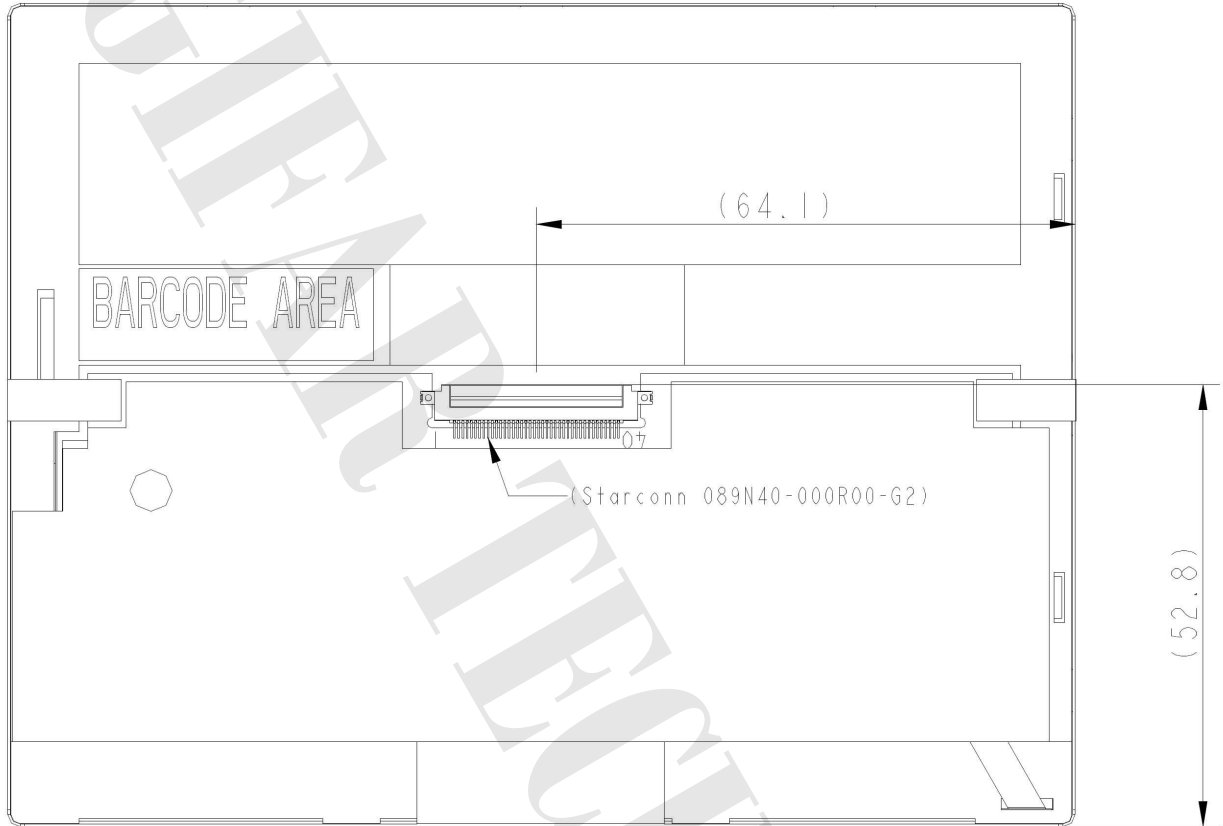
## 6. MECHANICAL SPECIFICATION

### 6.1 Front View





### 6.2 Rear View



Remarks : General tolerance  $\pm 0.3$  mm





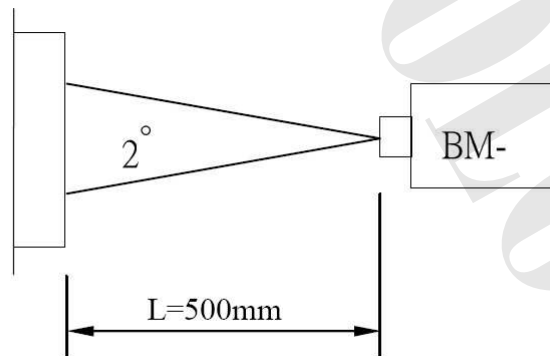
## 7. OPTICAL CHARACTERISITCS

Item	Symbol	Condition	Min	Typ	Max	Unit	Remarks	
Contrast	CR	Point-5	200	300	-	-	*1)*2)*3)	
Luminance	Center point	Lw	180	220	-	cd/m <sup>2</sup>	*2)*3)	
	Uniformity	ΔL	70	80	-	%	*2)*3)	
Response Time (White - Black)	Tr+Tf		-	30	-	ms	*1)*3)*5)	
NTSC	-	Point-5	40	50		%	*1)*3)	
Viewing Angle	Horizontal	Φ	CR≥10 Point-5	120	140	-	°	*1)*2)*4)
	Vertical	θ		80	100	-	°	*1)*2)*4)
Color Coordinate	White	Wx	Point-5	0.273	0.313	0.353	-	*1)*3)
		Wy		0.289	0.329	0.369		
	Red	Rx		0.557	0.597	0.637		
		Ry		0.289	0.329	0.369		
	Green	Gx		0.307	0.347	0.387		
		Gy		0.541	0.581	0.621		
	Blue	Bx		0.116	0.156	0.196		
		By		0.045	0.085	0.125		

Remarks :

\*1) Measuring conditions : 25°C ±2°C , 60±10%RH , under 10 Lunx in the darkroom ◦

BM-5A (TOPCON) , view cone=2° VCC=3.3V , Vadj=3.3V Duty 100% after 10 minutes operation.



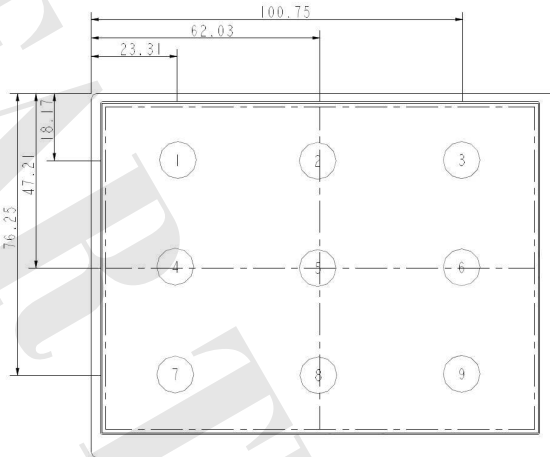


\*2) Contrast : CR = On (White Luminance) / Off (Black Luminance)

\*3) Luminance and Uniformity :

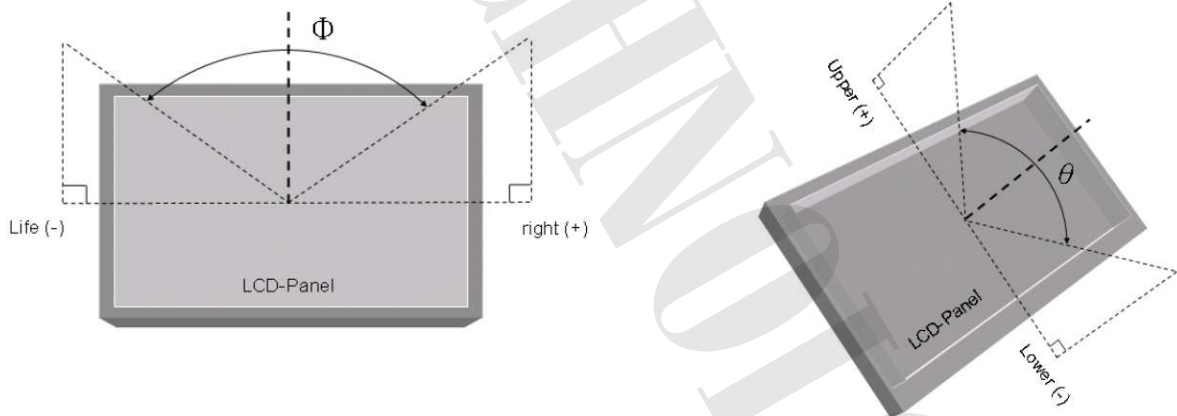
The center point of the Luminance : No 5 point.

$$\text{Uniformity} : \Delta L = [L(\text{MIN})/L(\text{MAX})] \times 100$$



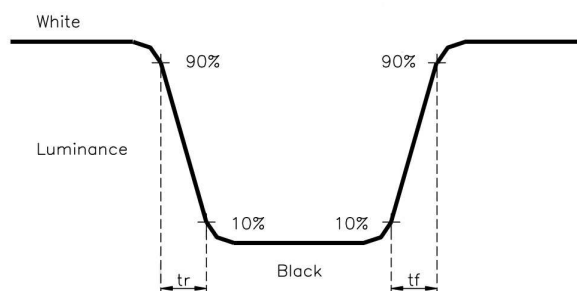
Measuring point

\*4) Viewing Angle ( $\theta$  ,  $\Phi$ ) : (Measuring Device : EZ-CONTRAST)



Definition of Viewing Angle

\*5). Response Time (White - Black)



Definition of Response Time



## 8. RELIABILITY TEST

### 8.1 Temperature and Humidity

Item	Conditions
High Temperature Operation	85°C, 240hrs
High Temperature Storage	95°C, 240hrs
High Temperature and High Humidity Operation	60°C, 90%RH, 240hrs(No condensation)
Low Temperature Operation	-30°C, 240hrs
Low Temperature Storage	-40°C, 240hrs
Thermal Shock	-30°C(0.5hr)~ 85°C(0.5hr) , 200 CYCLE

### 8.2 Shock and Vibration

Item	Conditions
Shock (Non Operation)	100G 6msec 1/2 Sine wave, ±X , ±Y , ±Z , each axis 3times.
Vibration (Non Operation)	Frequency range : 8~33.3Hz Stroke : 1.3 mm Sweep:2.9G , 33.3 Hz ~ 400 Hz Vibration : X , Z 2hrs each axis ◦ Y 4hrs each axis ◦ Sin wave ◦ Cycle:15 min

### 8.3. ESD

Item	Conditions	Remarks
ESD	150 pF 、 330Ω 、 ±8KV,±15KV air & contact test	*1)
	200 pF 、 0Ω 、 ±200V contact test	*2)

Remarks :

- \*1) LCD glass and metal bezel
- \*2) IF connector pins

### 8.4. Judgment standard

The judgment of the above test should be made as follow

Pass : Normal display image with no obvious non-uniformity and no line defect.

Partial transformation of the module parts should be ignored.

Fail : No display image or line defects.



## 9. WARRANTY

- 9.1. The period is within 12 months since the date of shipping out under normal using and storage conditions.
- 9.2. The warranty will be avoided in case of defect induced by customer.