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## SPECIFICATION

**CUSTOMER :** \_\_\_\_\_

**MODULE NO.:** **EA TFT057-32CTP**

<b>APPROVED BY:</b> ( FOR CUSTOMER USE ONLY )	<b>PCB VERSION:</b>	<b>DATA:</b>
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
<b>ISSUED DATE: 2023 / 02 / 17</b>			

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# 1. Summary

This technical specification applies to 5.7' color TFT-LCD panel. The 5.7' color TFT-LCD panel is designed for camcorder, digital camera application and other electronic products which require high quality flat panel displays. It's equipped with a resistive touch panel. This module follows RoHS.

## **1.1. Accessories**

ZIF connector for display, bottom contact

ZIF connector for display, top contact

**EA WF050-40S**

**EA WF050-40ST**

## 2. General Specifications

Item	Dimension	Unit
Size	5.7	inch
Dot Matrix	320 x RGBx240(TFT)	dots
Module dimension	141.12(W) x 101.55(H) x 7.55(D)	mm
Active area	115.2 x 86.40	mm
Dot pitch	0.12 x 0.36	mm
LCD type	TFT, Normally White, Transmissive	
TFT Driver IC	HX8218 +HX8615 or Equivalent	
Interface	24-bit RGB	
View Direction	12 o'clock	
Gray Scale Inversion Direction	6 o'clock	
Backlight Type	LED	
Brightness	600 cd/m <sup>2</sup> (typ.)	
With /Without TP	With RTP	
Surface	Anti-Glare	

Color tone slight changed by temperature and driving voltage.

### 3. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T <sub>OP</sub>	-20	—	+70	°C
Storage Temperature	T <sub>ST</sub>	-30	—	+80	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above  
 1. Temp. ≤60°C, 90% RH MAX. Temp. >60°C, Absolute humidity shall be less than 90% RH at 60°C.

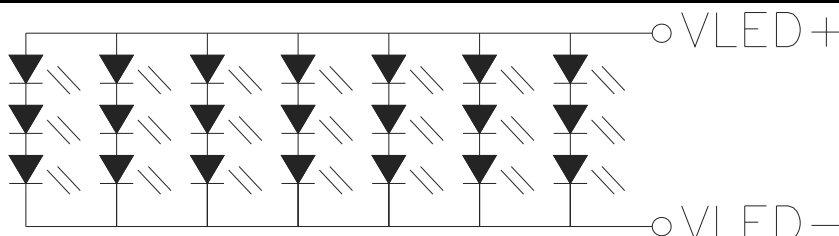
### 4. Electrical Characteristics

#### 4.1. Operating conditions:

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage for Logic	VCC	—	3.0	3.3	3.6	V
Supply Current	ICC	VCC=3.3V	—	230	345	mA

#### 4.2. LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I <sub>LED</sub>	—	140	—	mA	—
Power Consumption	—	1204	—	1470	mW	—
LED voltage	V <sub>BL+</sub>	8.6	—	10.5	V	Note 1
LED Life Time	—	—	50,000	—	Hr	Note 2,3,4



### Backlight LED Circuit

Note 2 : T<sub>a</sub> = 25 °C

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case.

## 5. DC CHARACTERISTICS

Parameter	Symbol	Rating			Unit	Condition
		Min	Typ	Max		
Low level input voltage	$V_{IL}$	0	-	0.3VCC	V	
High level input voltage	$V_{IH}$	0.7VCC	-	VCC	V	

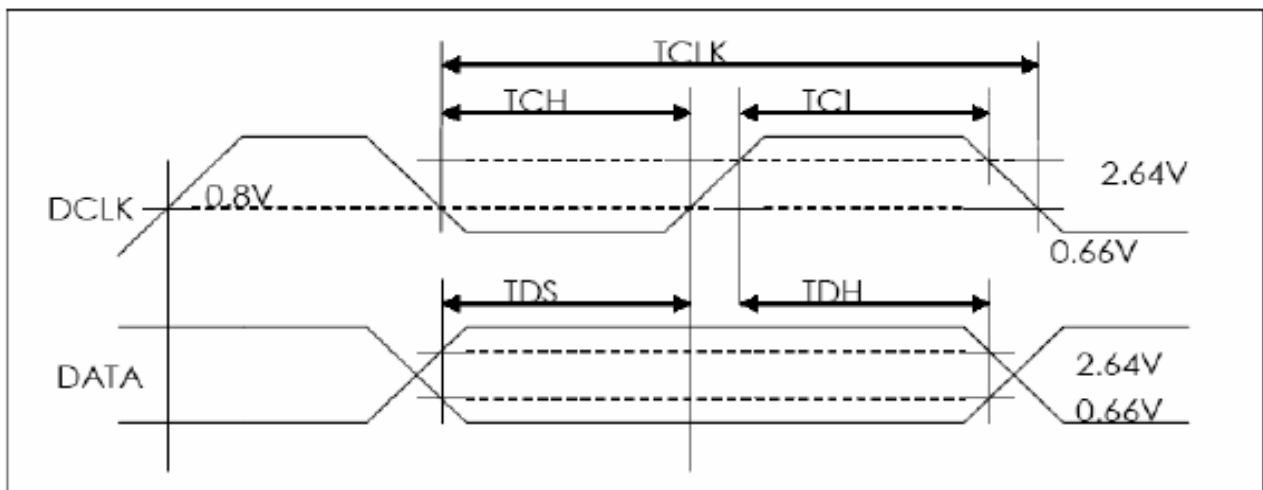
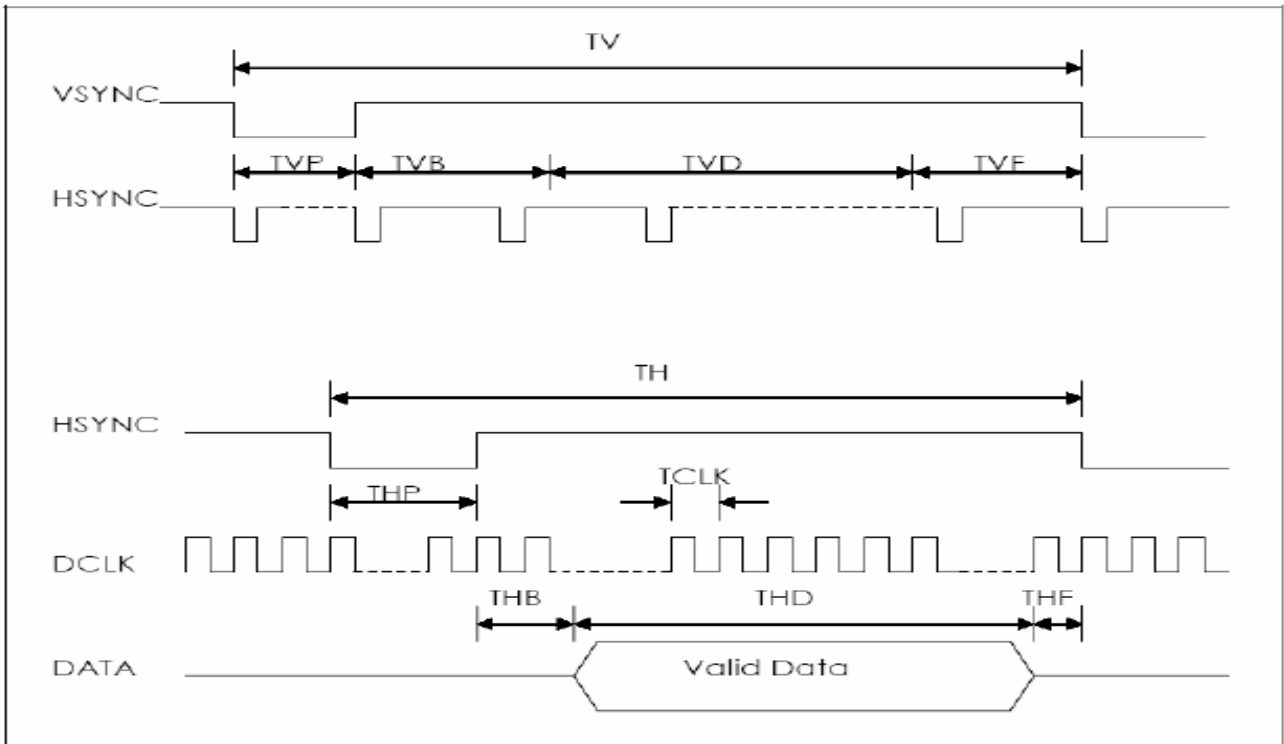
## 6. AC Characteristics

### 6.1. 24-bits parallel RGB Interface

#### 6.1.1 AC Timing Characteristics

Signal	Item		Symbol	Min.	Typ.	Max.	Unit
Dclk	Frequency		Dclk	-	6.4	-	MHZ
	High time		Tch	-	78	-	ns
	Low time		Tcl	-	78	-	ns
Data	Setup time		Tds	12	-	-	ns
	Hold time		Tdh	12	-	-	ns
Hsync	Period		TH	-	408	-	DCLK
	Pulse Width		Thp	-	30	-	DCLK
	Back-Porch		Thb	-	38	-	DCLK
	Display Period		Thd	-	320	-	DCLK
	Front-Porch		Thf	-	20	-	DCLK
Vsync	Period	NTSC	TV	-	262.5	-	DCLK
		PAL			312.5		
	Pulse Width		Tvp	1	3	5	TH
	Back-Porch	NTSC	Tvb	-	15	-	TH
		PAL			23		
	Display Period		Tvd	-	240	-	TH
	Front-Porch	NTSC	Tvf	-	4.5	-	TH
PAL		46.5					

### 6.1.2 AC Timing Diagrams





## 7. Optical Characteristics

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark	
Response time	Tr+ Tf	$\theta=0^\circ \cdot \Phi=0^\circ$	-	25	-	ms	Note 3,5	
Contrast ratio	CR	At optimized viewing angle	-	300	-	-	Note 4,5	
Color Chromaticity	White	Wx	$\theta=0^\circ \cdot \Phi=0$	0.267	0.317	0.367	Note 2,6,7	
		Wy		0.303	0.353	0.403		
Viewing angle (Gray Scale Inversion Direction)	Hor.	$\Theta_R$	$CR \geq 10$	-	60	-	Deg.	Note 1
		$\Theta_L$		-	60	-		
	Ver.	$\Phi_T$		-	70	-		
		$\Phi_B$		-	70	-		
Brightness	-	-	550	600	-	cd/m <sup>2</sup>	Center of display	
Uniformity	(U)	-	75	-	-	%	Note 5	

$T_a=25 \pm 2^\circ C, I_{LED}=140mA$

Note 1: Definition of viewing angle range

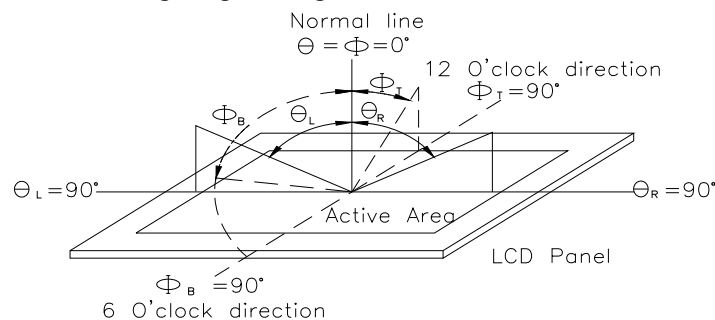


Fig. 7.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

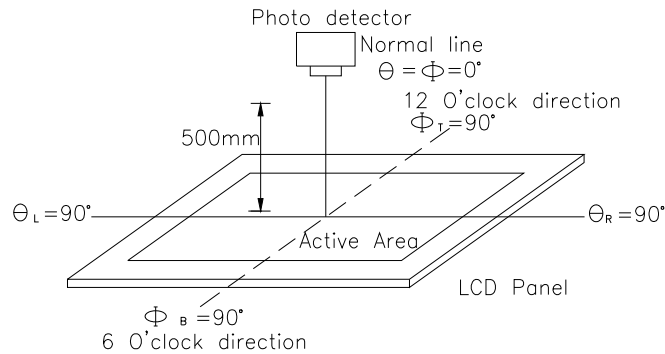
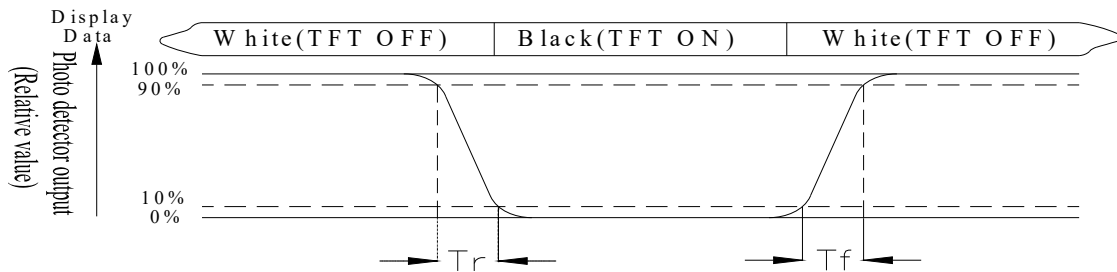


Fig. 7.2. Optical measurement system setup

**Note 3: Definition of Response time:**

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time,  $T_r$ , is the time between photo detector output intensity changed from 90% to 10%. And fall time,  $T_f$ , is the time between photo detector output intensity changed from 10% to 90%



**Note 4: Definition of contrast ratio:**

The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

**Note 5: Definition of Luminance Uniformity**

Active area is divided into 9 measuring areas (reference the picture in below). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = \text{Lmin/Lmax} \times 100\%$$

L = Active area length  
W = Active area width

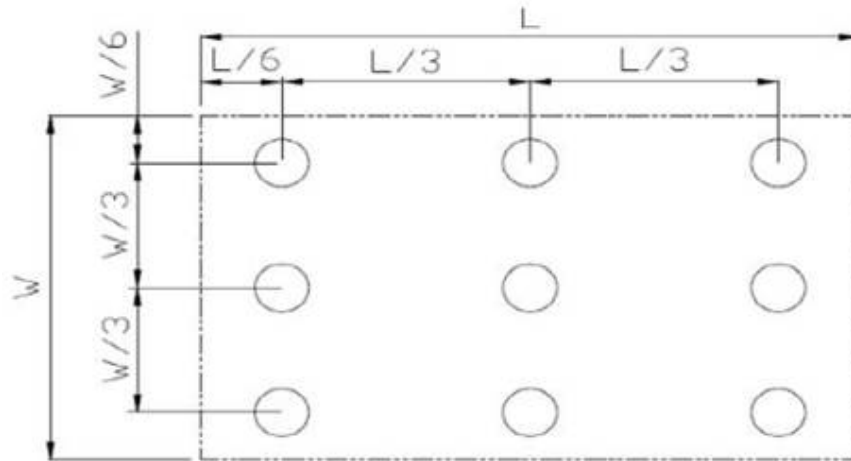


Fig 7.3. Definition of uniformity

Note 6: Definition of color chromaticity (CIE 1931)  
Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

# 8. Interface

## 8.1. LCM PIN Definition CON1

Pin	Symbol	Function	Remark
1	NC	No connection	
2	NC	No connection	
3	GND	System ground pin of the IC. Connect to system ground.	
4	VCC	Power Supply	
5	R0	Red Data bit (LSB)	
6	R1	Red Data bit	
7	R2	Red Data bit	
8	R3	Red Data bit	
9	R4	Red Data bit	
10	R5	Red Data bit	
11	R6	Red Data bit	
12	R7	Red Data bit (MSB)	
13	G0	Green Data bit (LSB)	
14	G1	Green Data bit	
15	G2	Green Data bit	
16	G3	Green Data bit	
17	G4	Green Data bit	
18	G5	Green Data bit	
19	G6	Green Data bit	
20	G7	Green Data bit (MSB)	
21	B0	Blue Data bit (LSB)	
22	B1	Blue Data bit	
23	B2	Blue Data bit	
24	B3	Blue Data bit	
25	B4	Blue Data bit	
26	B5	Blue Data bit	
27	B6	Blue Data bit	
28	B7	Blue Data bit (MSB)	
29	GND	System ground pin of the IC. Connect to system ground.	
30	CLK	Dot data clock	
31	L/R	Shift direction of device internal shift register control.	Note2
32	Hsync	Horizontal sync signal	Note1
33	Vsync	Vertical sync signal	Note1
34	DE	Data Enable signal	Note1
35	U/D	Up/down selection	Note2
36	RESET	Hardware reset	
37	XR	Touch: right electrode	
38	YD	Touch: bottom electrode	
39	XL	Touch: left electrode	
40	YU	Touch: top electrode	

LED connector CN2 is JST type PHR-2

For digital 24Bit RGB input data format, both SYNC mode and DE mode are supported. If DE signal is fixed low, SYNC mode is used. Otherwise, DE mode is used. It is suggested to use SYNC mode.

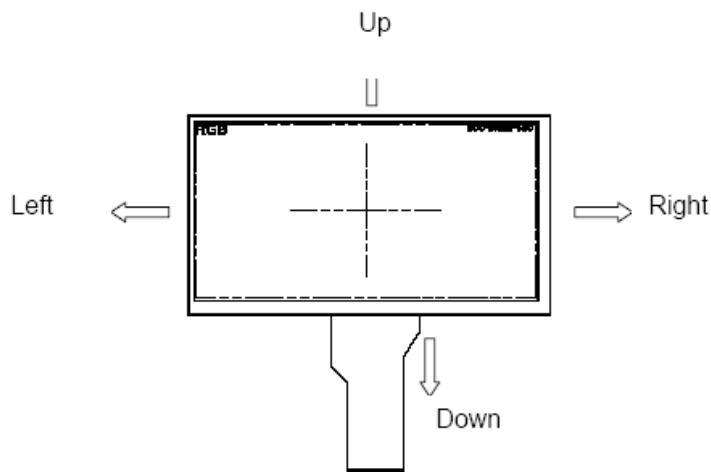
Mode	D[23:16]	D[15:8]	D[7:0]	IHS	IVS	DEN
24 bit RGB	R[7:0]	G[7:0]	B[7:0]	HSYNC	VSYNC	DE signal is fixed low for SYNC mode
				Floating if not used	Floating if not used	DE for DE Mode

Note 1: SYNC mode and DE mode

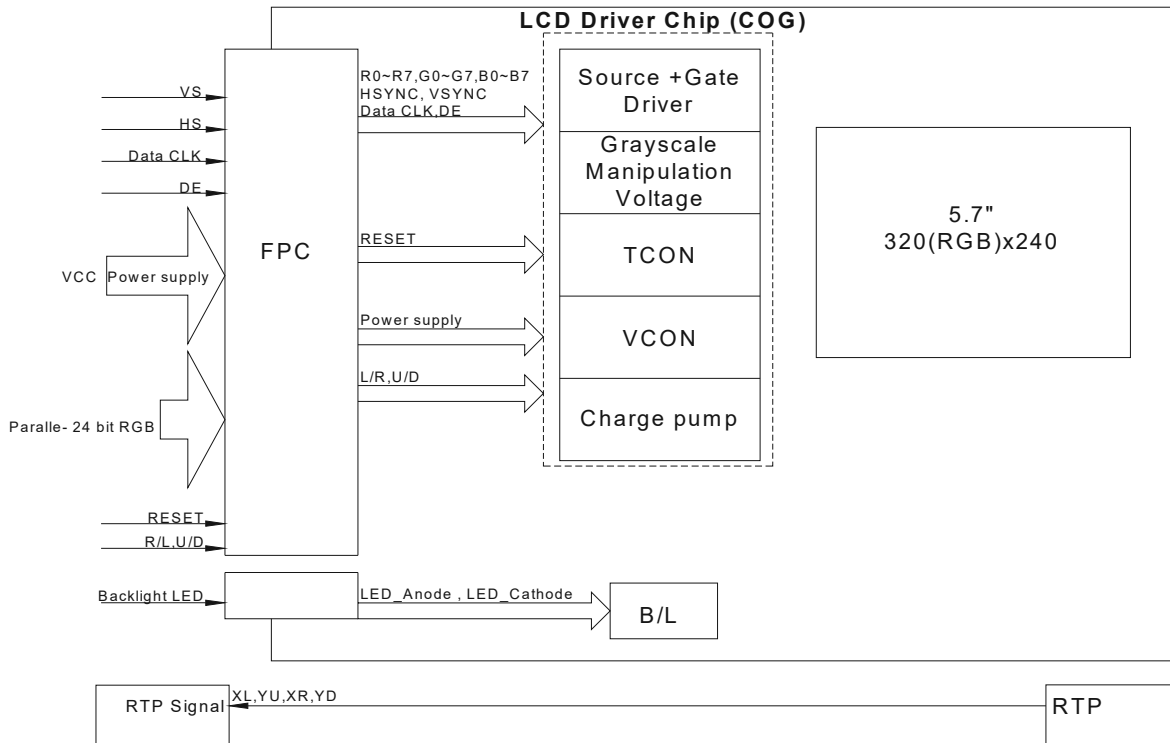
## 8.2 Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	R/L	
GND	VCC	Up to down, left to right
VCC	GND	Down to up, right to left
GND	GND	Up to down, right to left
VCC	VCC	Down to up, left to right

Note 2: Definition of scanning direction. Refer to the figure as below:




## 9. Block Diagram



# 10. Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60°C,90%RH max	60°C,90%RH 96hrs	1,2
Thermal shock resistance	<p>The sample should be allowed stand the following 10 cycles of operation</p> <p style="text-align: center;">           -20°C    25°C    70°C              30min    5min    30min            1 cycle         </p>	-20°C/70°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact), ±800v(air), RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

# 11. Touch Panel Information

## 11.1. General Specifications

The EA TFT057-32CTP is equipped with a resistive touch panel. It can be operated by finger, with and w./o. hand glove, pencil. It operates with water drops and even under water.

Item	Description
Driving condition	5V=
Operating force	60~150g
Linearity max	$\leq \pm 1.5\%$
Insulating resistance	$> 20M\Omega$ , 25V(DC)
Light transparence	70%
Structure type	ITO Film/ITO Glass(F/G)
Surface Hardness	3H typ
Pen Hitting Durability (with the silicon rubber)	$> 1000,000$ times
X Axis resistance	200~900 $\Omega$
Y Axis resistance	200~900 $\Omega$



# 12. Contour Drawing

