



PRODUCT SPECIFICATION

Part Number

PT804850B-TLMWD-ER07

CUSTOMER	
CUSTOMER PART NUMBER	
DESCRIPTION	5.0" TFT LCD, RTP
APPROVED BY	
DATE	

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2. Record of Revisions

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3. Module Numbering System

PT _____ - _____ - _____

1. 2. 3. 4. 5. 6. 7. 8. 9 10. 11. 12. 13. 14.

1. P-TEC TFT

8. VIEWING DIRECTION

D: 6 o'clock
U: 12 o'clock
F: Full Viewing Angle

2. LENGTH x WIDTH PIXELS

If third character is a zero, it is removed to shorten part number. Example: 240 x 320 = PT3224

9. A ~ Z CODE

Assigned by P-tec

3. DIAGONAL DIMENSIONS

Example: 3.5" display = 35 in part number

11. TEMPERATURE RANGE

Normal: Left Blank
Wide: X

4. PRODUCT VERSION

Series assigned by P-tec

12. LUMINANCE

Blank: Normal (<300 nit)
M: Middle (>= 300 nit)
H: High (> 600 nit)

5. LCD MODE

T: TN
I: IPS
V: VA

13. TOUCH PANEL OPTION

No TP: Left Blank
C: Capacitive TP
R: Resistive TP

6. POLARIZER

LM: Transmissive
LF: Transflective

14. SPECIAL CHARACTERS

Customer special requirements

7. BACKLIGHT COLOR

No Backlight: Left Blank
W: White
B: Blue/Green
S: Yellow/Green



4. Application

This specification is applied to the 5 inch WVGA supported TFT-LCD module, and can display true 16.7M colors(8 bit/ color). The module is designed for OA, Car TV application and other electronic products which require flat panel display of digital signal interface. This module is composed of a 5" TFT-LCD panel, a driver circuit and backlight unit and used as the input devices for general electric appliances via both finger and pen-entry.

5. Features

- WVGA (800×480 pixels) resolution.
- Digital 24 bit parallel RGB.
- Dot inversion mode with stripe type.
- Transparent Touch panel
 - 4-Wire
 - Analog Resistive

6. General Specifications

Item	Specifications	Unit
Screen Size	5 (Diagonal)	inch
Display Format	800RGB(H)×480(V)	dot
Active Area	108(H)×64.8(V)	mm
Pixel Size	0.135(H)×0.135(V)	mm
Pixel Configuration	RGB Vertical Stripe	-
Display Mode	TN Type Transmissive Mode Normally White	-
Surface Treatment	Anti-Glare and Hard Coating(3H)	-
Viewing Direction	6 O'clock (The Gray Inversion will appear at this direction)	-
Outline Dimension	118.5(W)×77.55(H)×4.5(D)	mm
Weight	79.4	g
RoHS Compliance	P-tec certifies this product to be in compliance with European Union Directive 2011/65/EU on the restriction of certain hazardous substances in electrical and electronic equipment	-



7. Absolute Maximum Ratings

7.1 Absolute Ratings of Environment

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-30	+80	°C	(1)(3)
Operating Temperature	T _{OP}	-20	+70	°C	(1)(2)

Note1: Background color changes slightly depending on ambient temperature.

This phenomenon is reversible.

Note2: Ta ≤ 70°C : 75%RH max.

Note3: Please refer to item of RELIABILITY.

7.2 Electrical Absolute Ratings

7.2.1 TFT-LCD Module

(Ta=25±2°C, GND=V_{SS}=0V)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Digital Power Supply Voltage	V _{CC}	-0.3	7.0	V	-

7.2.2 Backlight Unit

(Ta=25±2°C)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Current of Backlight Unit	I _B	-	50	mA	(1)
Voltage of Backlight Unit	V _B	-	35	V	(1)

Note (1) Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded.

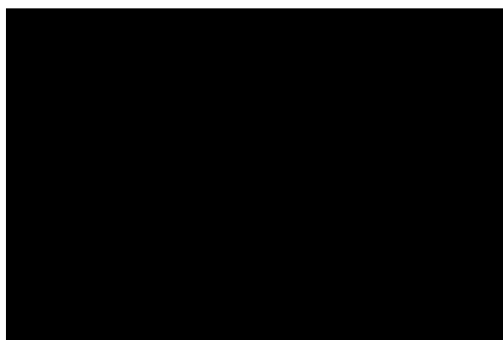
**8. Electrical Characteristics****8.1 TFT-LCD Module**

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V _{CC}	2.7	3.3	3.6	V	-
Power Supply Current	I _{CC}	-	110	154	mA	(1)
Input High Threshold Voltage	V _{IH}	0.7V _{CC}	-	V _{CC}	V	-
Input Low Threshold Voltage	V _{IL}	0	-	0.3V _{CC}	V	-
Power Consumption	P _L	-	363	508	mW	(1)
VSYNC Frequency	F _V	-	60	-	Hz	-
DCLK Frequency	DCLK	-	33.26	-	MHz	-

Note (1) The specified power consumption is under the conditions at V_{CC}=3.3V,
F_V=60Hz, whereas a power dissipation check pattern below is displayed.

Black Pattern / 0 Gray



Active Area

8.2 Backlight Unit

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Current of Backlight Unit	I _B	-	40	-	mA	-
Voltage of Backlight Unit	V _B	-	23.1	-	V	I _B =40mA
Power Consumption	P _{BL}	-	(0.924)	-	W	I _B =40mA
LED Life Time(25°C)	-	10000	-	-	hr	(1)

Note (1) : LED life time is defined as under 25±2°C , when the average brightness decrease to 50% of original brightness



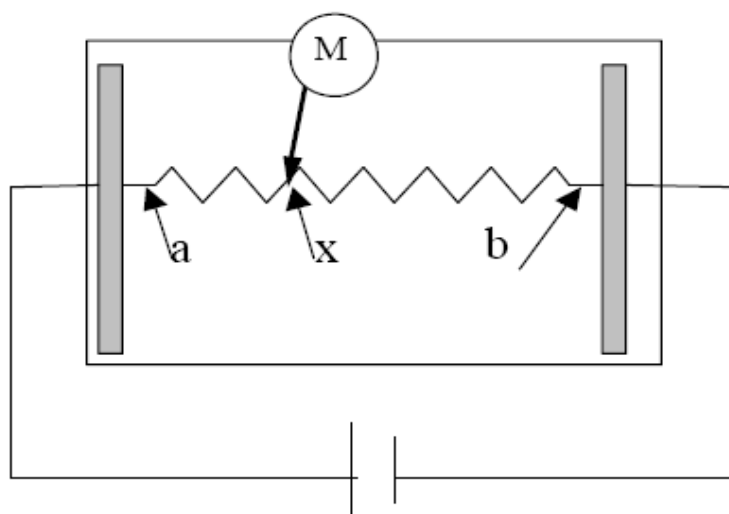
8.3 Transparent Touch panel

Electrical characteristics

Item		Value			Unit	Note
		Min.	Typ.	Max.		
Operating Voltage		3	-	5	V	-
Terminal Resistance	X-direction	550	-	1100	Ω	At connector
	Y-direction	100	-	300	Ω	At connector
Insulation Resistance		> 20M Ω				At DC25V
Chatting		≤ 10 ms Max				At connector
Linearity		$\leq 1.5\%$				(1)

Note 1: Measurement condition of Linearity

Linearity Definition



V_a : maximum voltage in the active area of touch panel

V_b: minimum voltage in the active area of touch panel

X : random measuring point

V_{xm}: Actual voltage of L_x point

V_{xi} : Theoretical voltage of L_x point



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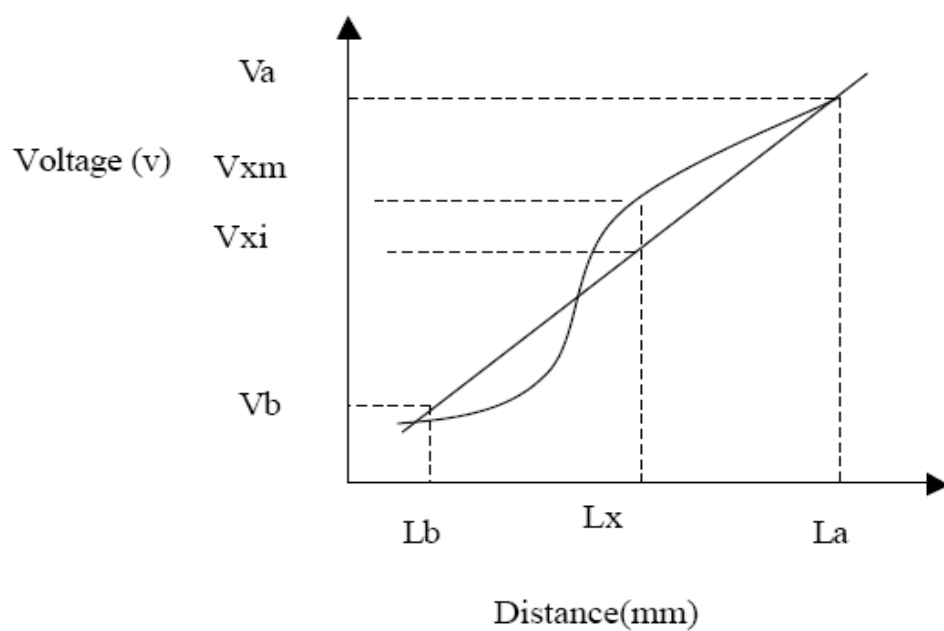
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$$\text{Linearity} : [| V_{xi} - V_{xm} | / (V_a - V_b)] * 100\%$$

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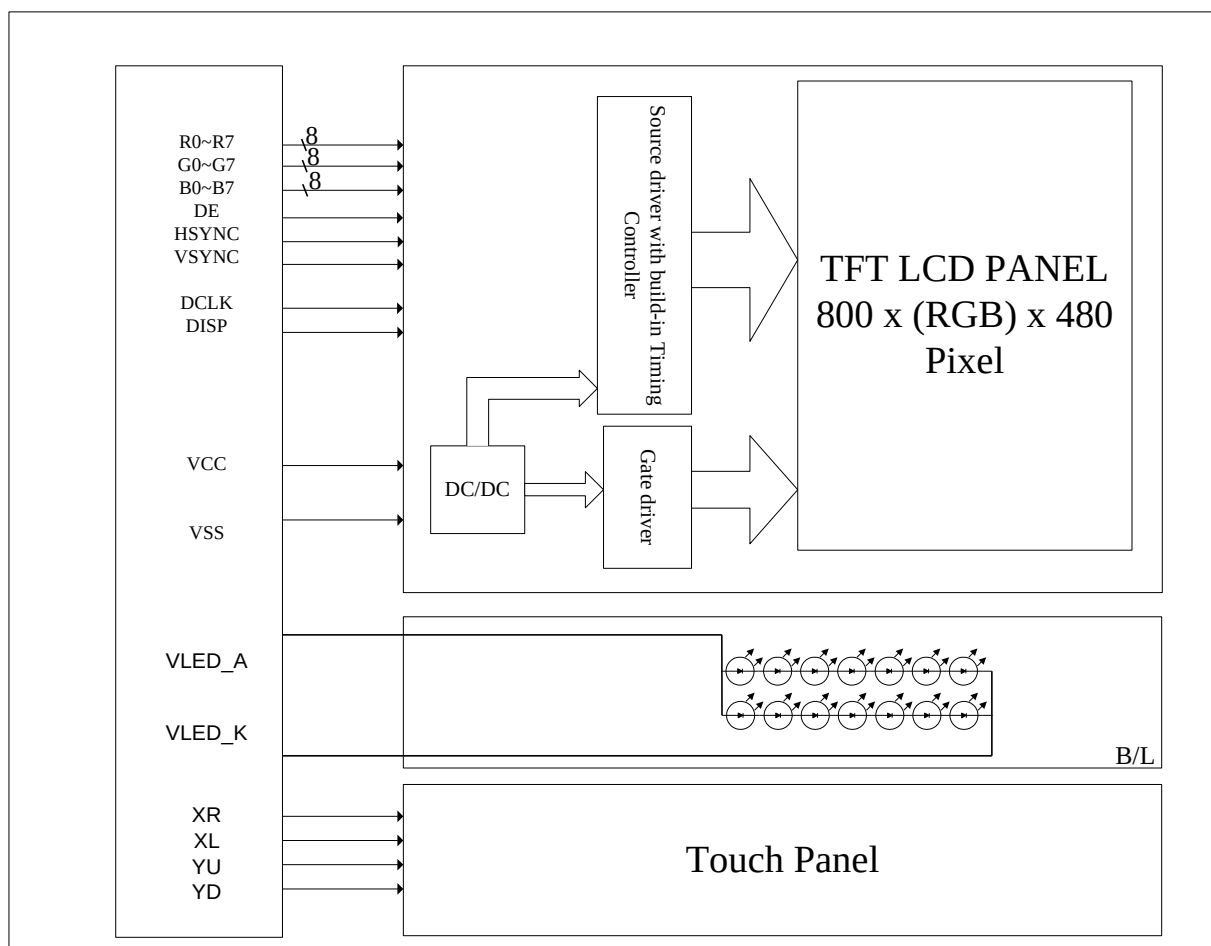
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9. Block Diagram

9.1 TFT-LCD Module with Backlight Unit





10. Input / Output Terminals Pin Assignment

10.1 TFT-LCD Module

Pin No.	Symbol	I/O	Description
1	VLED_K	I	LED Cathode
2	VLED_A	I	LED Anode
3	GND	I	Ground
4	V _{cc}	I	+3.3V power supply
5	R0	I	RED data (LSB)
6	R1	I	RED data
7	R2	I	RED data
8	R3	I	RED data
9	R4	I	RED data
10	R5	I	RED data
11	R6	I	RED data
12	R7	I	RED data(MSB)
13	G0	I	GREEN data(LSB)
14	G1	I	GREEN data
15	G2	I	GREEN data
16	G3	I	GREEN data
17	G4	I	GREEN data
18	G5	I	GREEN data
19	G6	I	GREEN data
20	G7	I	GREEN data(MSB)
21	B0	I	Blue data(LSB)
22	B1	I	Blue data
23	B2	I	Blue data
24	B3	I	Blue data
25	B4	I	Blue data
26	B5	I	Blue data
27	B6	I	Blue data
28	B7	I	Blue data(MSB)
29	GND	I	Ground
30	DCLK	I	Dot Clock
31	DSIP	I	Display On/Off (Note1)

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Pin No.	Symbol	I/O	Description
32	HSYNC	I	Horizontal synchronous signal
33	VSYNC	I	Vertical synchronous signal
34	DE	I	Input data enable control
35	NC	I	No Connect
36	GND	I	Ground
37	XR	I	Right(T/P)
38	YD	I	Bottom(T/P)
39	XL	I	Left(T/P)
40	YU	I	Up(T/P)

Note1: Usually pull high. High: Display On / Low: Display Off

10.2 Color Data Input Assignment

The brightness of each primary color (red, green and blue) is based on the 8 bit gray scale data input for the color. The higher the binary input, the brighter the color. The table provides the assignment of color versus data input.

[illegible]

**11. Interface Timing****11.1 Input Signal Characteristics**● **sync mode**

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
CLK frequency	F_{CPH}	29.93	33.26	36.59	MHz
CLK period	T_{CPH}	27.32	30.06	33.41	ns
CLK pulse duty	T_{CWH}	40	50	60	%
HS period	T_H	950	1056	1600	T_{CPH}
HS pulse width	T_{WH}	1	128	$T_{HS} - 2$	T_{CPH}
HS-first horizontal data time	T_{HS}	STHD[7:0]+88 ⁽¹⁾			T_{CPH}
HS Active Time	T_{HA}	-	800	-	T_{CPH}
VS period	T_V	490	525	625	T_H
VS pulse width	T_{WV}	1	2	T_{VS}	T_H
VS-DEN time	T_{VS}	STVD[6:0]+8			T_H
VS Active Time	T_{VA}	-	480	-	T_H

Note: (1) $T_{HS} + T_{HA} < T_H$ ● **DE mode**

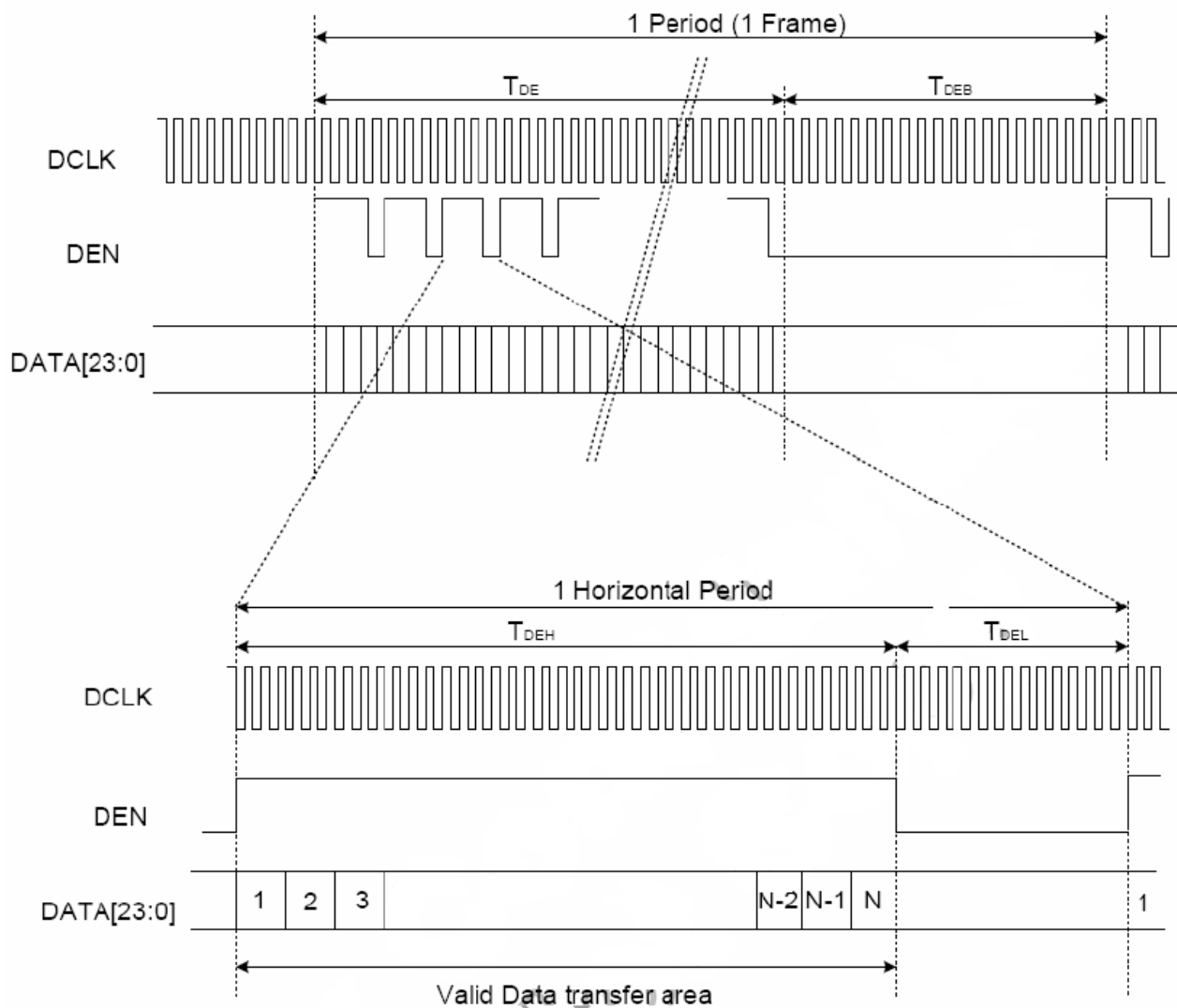
Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
CLK frequency	F_{CPH}	29.93	33.26	36.59	MHz
CLK period	T_{CPH}	-	30.06	-	ns
CLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH} + T_{DEL}$	1000	1056	1200	T_{CPH}
DE pulse width	T_{DEH}	-	800	-	T_{CPH}
DE frame blanking ⁽²⁾	T_{DEB}	10	45	110	$T_{DEH} + T_{DEL}$
DE frame width	T_{DE}	-	480	-	$T_{DEH} + T_{DEL}$

Note: (2) DE frame blanking (T_{DEB}) must be the integer of DE period ($T_{DEH} + T_{DEL}$).

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
OEV pulse width	T_{OEV}	-	150	-	T_{CPH}
CKV pulse width	T_{CKV}	-	133	-	T_{CPH}
DE(internal)-STV time	T_1	-	4	-	T_{CPH}
DE(internal)-CKV time	T_2	-	40	-	T_{CPH}
DE(internal)-OEV time	T_3	-	23	-	T_{CPH}
DE(internal)-POL time	T_4	-	157	-	T_{CPH}
STV pulse width	-	-	1	-	T_H



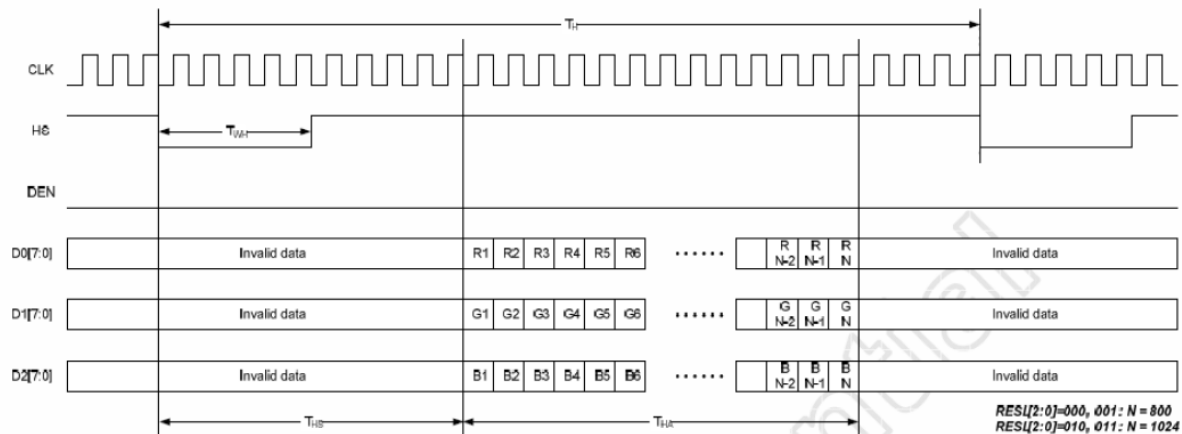
11.2 Waveform DEN mode





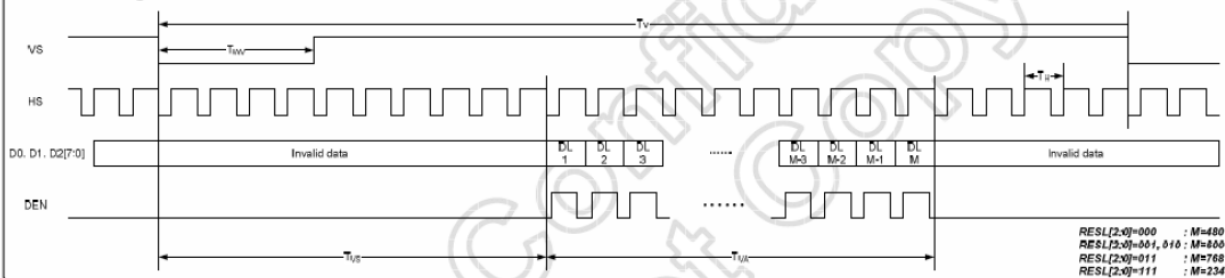
Sync mode

Horizontal Timing (SYNC mode)

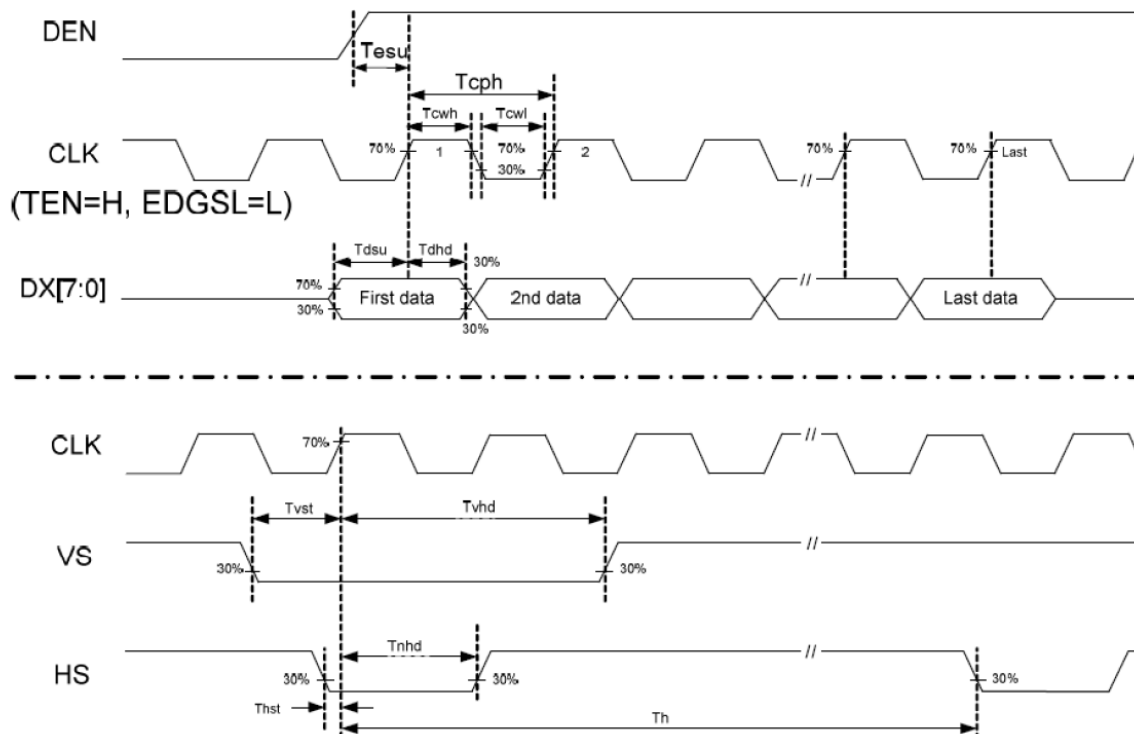


SYNC Mode Horizontal Data Format

Vertical Timing



SYNC Mode Vertical Data Format



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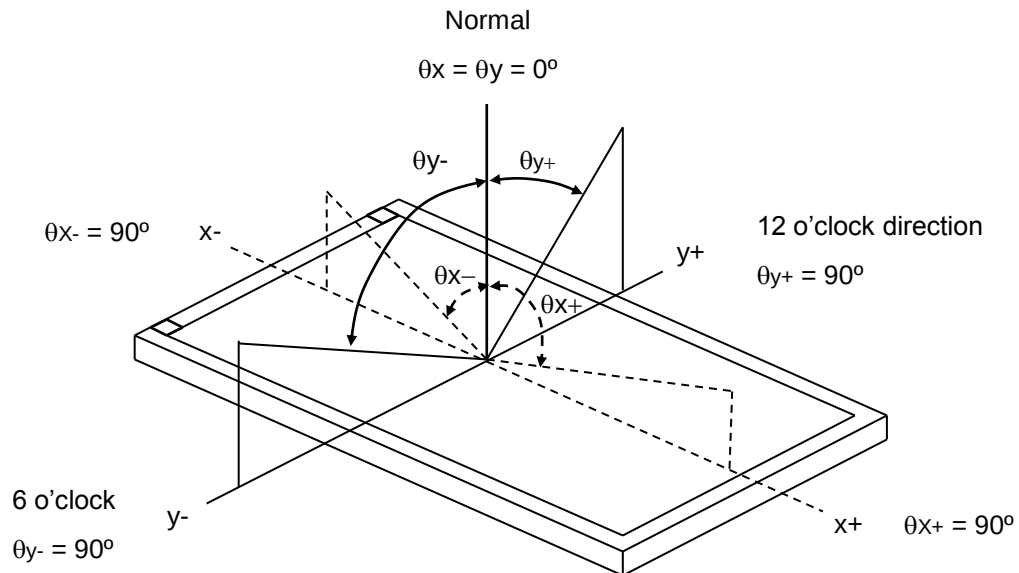
12. Optical Characteristics

The optical characteristics should be measured in a dark environment (≤ 1 lux) or equivalent state with the methods shown in Note (4).

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Normal Angle	360	(400)	-	-	(2)
Response Time		T_R		-	15	30	ms	(3)
		T_F		-	35	50	ms	
Luminance(Center)		Y		210	(250)	-	cd/m ²	(4)
Brightness uniformity		BUNI		75	(80)	-	%	(5)
Color Chromaticity	Red	R _x		0.590	0.640	0.690	-	(1),(4)
		R _y		0.270	0.320	0.370	-	
	Green	G _x		0.320	0.370	0.420	-	
		G _y		0.500	0.550	0.600	-	
	Blue	B _x		0.100	0.150	0.200	-	
		B _y		0.050	0.100	0.150	-	
	White	W _x		0.260	0.310	0.360	-	
		W _y		0.280	0.330	0.380	-	
Viewing Angle	Horizontal	θ_{x+}	CR $\geq$ 10	60	(70)	-	deg.	
		θ_{x-}		60	(70)	-		
	Vertical	θ_{y+}		50	(60)	-		
		θ_{y-}		60	(70)	-		



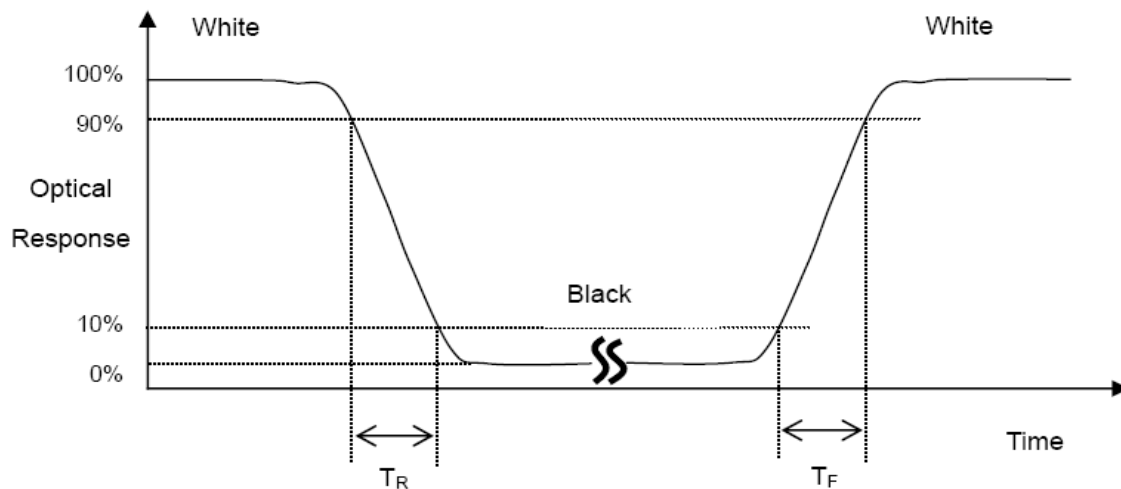
Note (1) Definition of Viewing Angle (θ_x , θ_y):



Note (2) Definition of Contrast Ratio (CR):

$$CR = \frac{\text{Luminance (brightness) all pixels "White"}}{\text{Luminance (brightness) all pixels "dark"}}$$

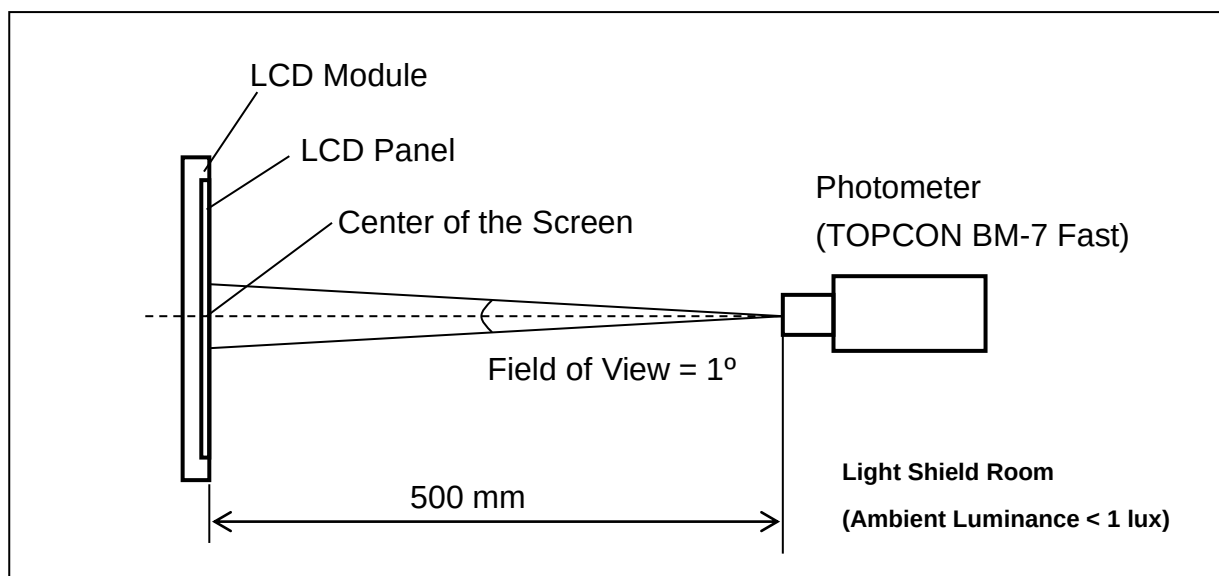
Note (3) Definition of Response Time (T_R , T_F):





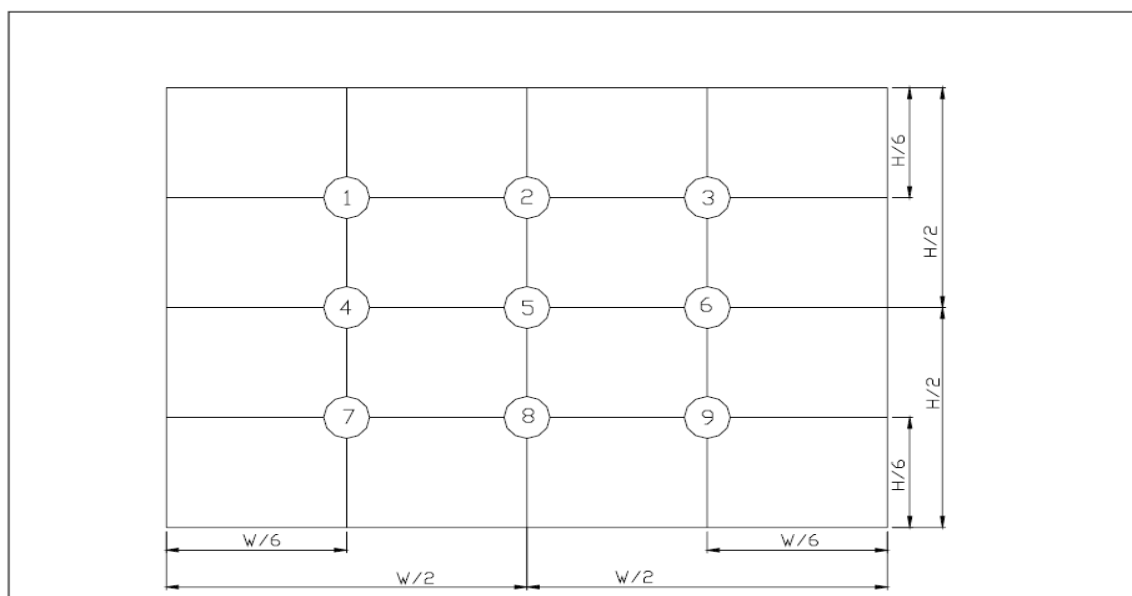
Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room.



Note (5) Definition of brightness uniformity

Brightness uniformity=(Min Luminance of 9 points)/(Max Luminance of 9 points)×100%



(單位 : mm)

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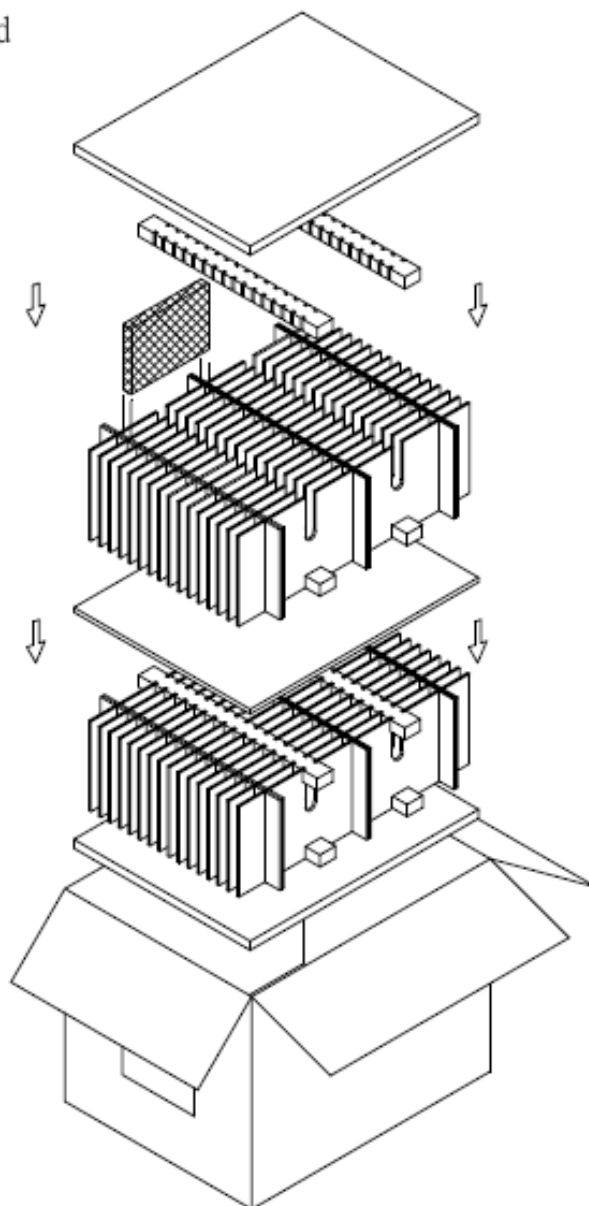
13. Reliability Test

No.	Test Items	Test Condition	Remark
1	High Temperature Storage Test	T _a = 80℃ 240 hours	-
2	Low Temperature Storage Test	T _a = -30℃ 240 hours	-
3	High Temperature Operation Test	T _a = 70℃ 240 hours	-
4	Low Temperature Operation Test	T _a = -20℃ 240 hours	-
5	High Temperature and High Humidity Operation Test	T _a =60℃ 90%RH 240 hours	-
6	Electro Static Discharge Test (non-operating)	-Panel Surface/Top Case : 150pF, 330Ω Air: ±15kV, Contact: ±8kV	-
7	Mechanical Shock Test (non-operating)	Half sine wave, 100G, 6ms 3 times shock of each six surfaces	-
8	Vibration Test (non-operating)	Sine wave, 10 ~ 55 ~ 10Hz, 3 axis, 2 hours/axis	-
9	Thermal Shock Test (non-operating)	-20℃(30min) ~ 70℃(30min), 100 cycles	-
10	Drop Test(with Carton)	Height: 80cm 1 corner, 3 edges, 6 surfaces	-



14. Packaging

Packing Method



	PARTS LIST				
	ITEM	SIZE(LxWxH) unit:mm	MATERIAL	Q.T.Y	NOTE
1	STATIC SHIELDING BAGS	200.0×145.0×0.09		60	
2	EPE PLATE	440.0×340.0×15.0	EPE	2	
3	EPE PAD	345.0×30.0×20.0	EPE	8	
4	CARD BOARD	345.0×150.0×3.5	CARTON	12	
5	CARD BOARD	450.0×150.0×3.5	CARTON	32	
6	CARD BOARD	440.0×340.0×8.0	CARTON	1	
7	EXTERNAL BOX	460.0×360.0×355.0	CARTON	1	
8	PRODUCT	118.5×77.55×4.5		60	



15. Precautions

15.1 Assembly and Handling Precautions

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) It's recommended to assemble or to install a module into the user's system in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) Don't apply pressure or impulse to the module to prevent the damage of LCD panel and Backlight.
- (4) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.
- (5) Do not plug in or pull out the I/F connector while the module is in operation.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (9) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD module in the specified storage conditions.
- (10) When ambient temperature is lower than 10°C, the display quality might be reduced. For example, the response time will become slow.

15.2 Safety Precautions

- (1) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (2) After the module's end of life, it is not harmful in case of normal operation and storage.

15.3 Terms of Warrant

- (1) Acceptance inspection period
The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- (2) Applicable warrant period
The period is within twelve months since the date of shipping out under normal using and storage conditions.

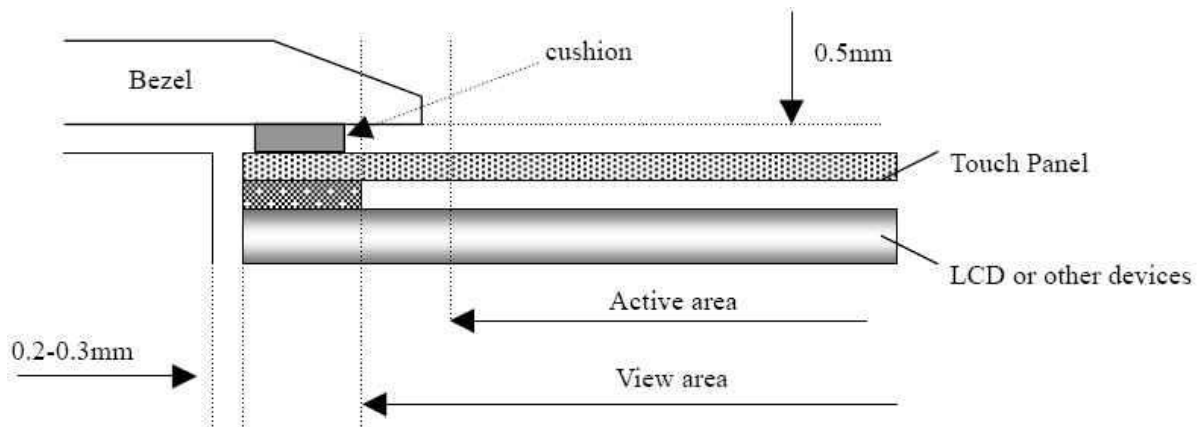


15.4 Cautions for installing and assembling

Bezel edge must be positioned in the area between the Active area and View area.

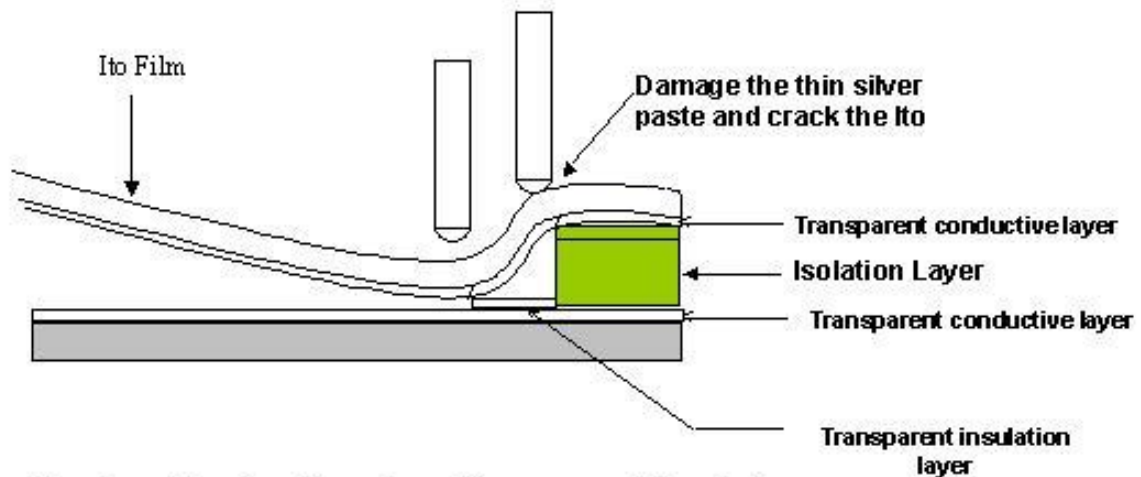
The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode.

It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.



15.5 Operation Prohibit

Not Suggested Pen Input Position On Touch Panel



Pen input load on the edge of transparent insulation area might damage the ITO of ITO Pet-Film and reduce the durability of touch panel



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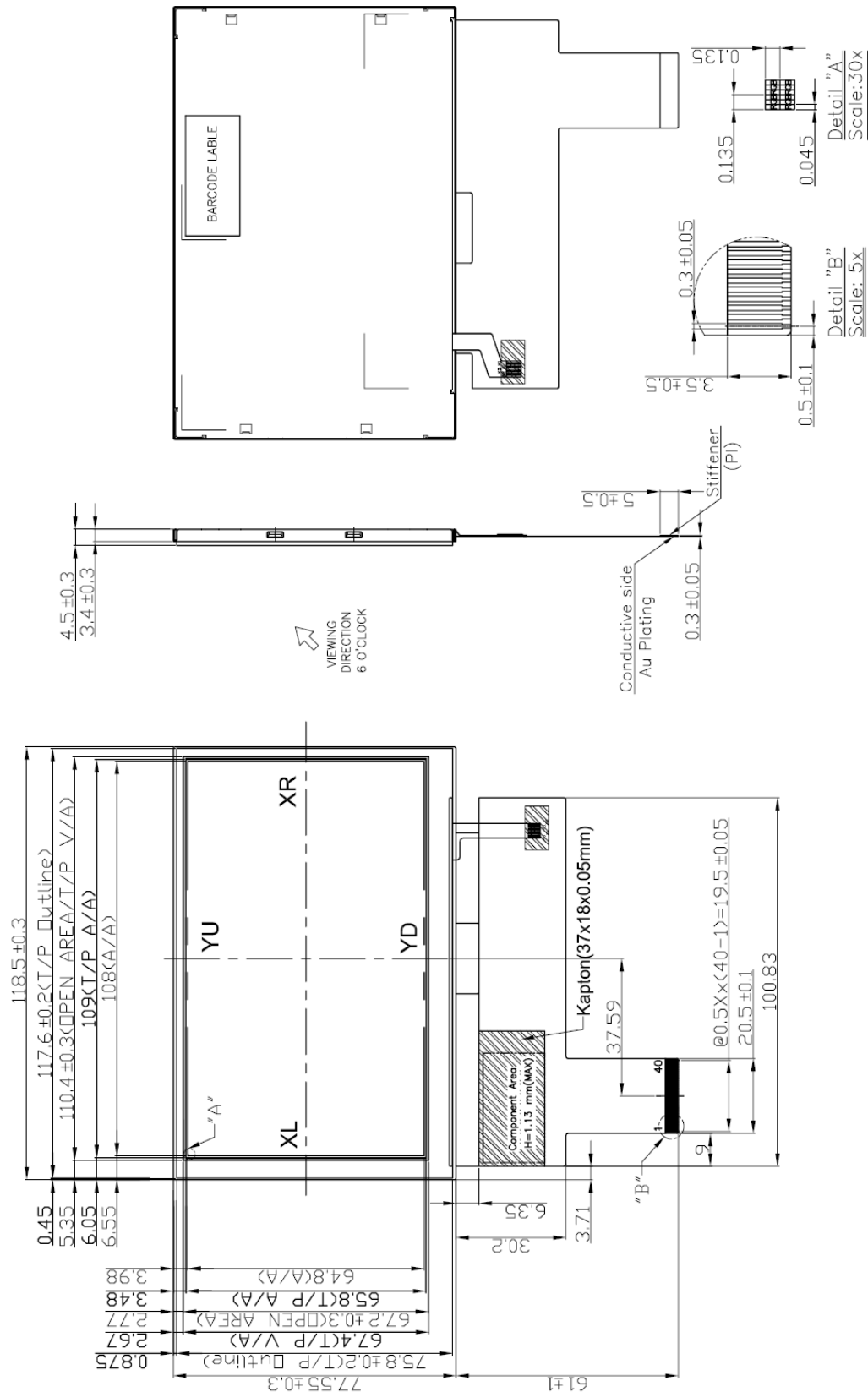
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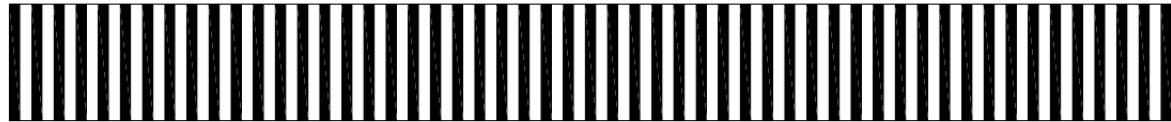
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16.Outline Drawing

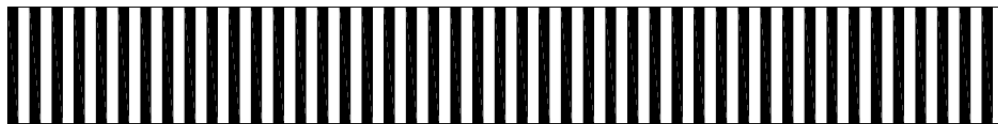


**17. Definition of Labels**

The bar code nameplate is pasted on each module as illustration, and its definitions are as following explanation.



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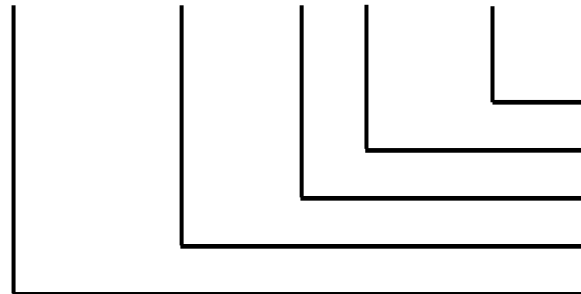


ABCDEFGHIJKLM

(a) Module Name: PT804850B-TLMWD-ER07

(b) Serial ID:

A B C D E F G H I J K L M



Serial No.
Revision Code
Factory Code
Manufactured Date
Screen Size

Serial ID includes the information as below:

(a) Screen size (Diagonal): Inch Code (ABCD)

3.5" → 0350

10.4" → 1040

(b) Manufactured Date: Year, Month, Day (EFG)

Year (E)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mark	0	1	2	3	4	5	6	7	8	9
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mark	A	B	C	D	E	F	G	H	I	J

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Month (F)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	B	C

Day (G)

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mark	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Mark	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	

(c) Factory Code (H):

For P-TEC internal use.

(d) Revision Code (I):

Cover all the change, for example: 1: Rev.1, 2: Rev.2, 3: Rev.3...etc.

(e) Serial No. (JKLM):

Manufacturing sequence of product, for example: 0001~9999.



18. Incoming Inspection Standards

18.1 The environmental condition of inspection

The environmental condition and visual inspection shall be conducted as below.

- (1) Ambient temperature $25 \pm 5^{\circ}\text{C}$
- (2) Humidity: $60 \pm 5\%$ RH
- (3) Viewing distance is approximately 35 ~ 40 cm
- (4) Viewing angle is normal to the LCD panel as Fig _1(10°)
- (5) Ambient Illumination: 300 ~ 500 Lux for external appearance inspection

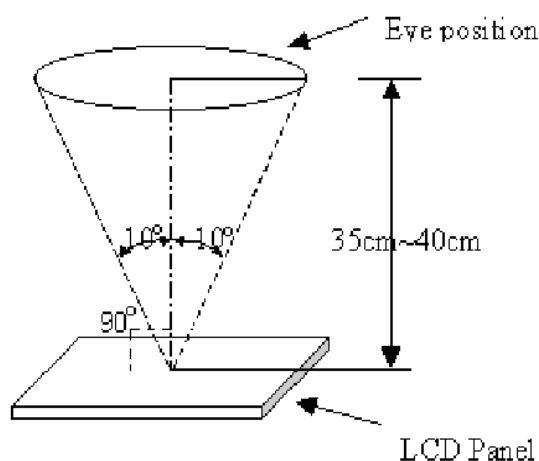


Fig _ 1

18.2 The defects classify of AQL as following:

Class of defects	AQL	Definition
Major	0.65%	It is defect that is likely to result in failure or to reduce materially the usability of the intended function.
Minor	1.5%	It is a defect that will not result in functioning problem with deviation classified.



18.3 Inspection Parameters

Item		Specification/Description				Note
Display	Function	No Display				-
		Malfunction				-
Operating	Contrast ratio	Out of Spec				-
	Line defect	No obvious Vertical and Horizontal line defect in bright , dark and colored.				-
	Point Defect (red,green,blue,dark , white) Mura (50% gray)	Item	Acceptable number			Note: 1、2、5、 6、7
			A	B	Total	
		BRIGHT DOT	N≤2	N≤2	N≤7	
		DARK DOT	N≤3	N≤4		
		TOTAL DOT	N≤4	N≤5		
		TWO ADJACENT BRIGHT DOT	NOT ALLOWED			
		TWO ADJACENT DARK DOT	N≤1			
	THREE OR MORE ADJACENT DOT	NOT ALLOWED				
External Inspection (non-operating)	Scratch on the polarizer	L(mm)	W(mm)	Acceptable number		Note:3
		L≤2.5	W≤0.1	4		
		L>2.5	W>0.1	0		
	Dent or bubble on the polarizer	Dimension(mm)		Acceptable number		Note:4
		D≤0.5		4		
		D≤0.15		Disregard		
	Foreign material on the polarizer	Dimension(mm)		Acceptable number		Note:4
		D≤0.5		4		
D≤0.15		Disregard				



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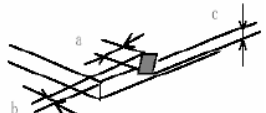
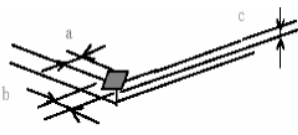
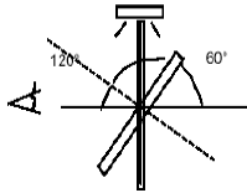
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Item		Specification/Description			Note
Touch Panel	Scratch	L(mm)	W(mm)	Acceptable number	Note:3
		$L \leq 10$	$W < 0.05$	Disregard	
			$0.05 \leq W < 0.1$	$N \leq 4$	
			$W \geq 0.1$	0	
	Foreign Materials (Linear shape)	$L \leq 10$	$W < 0.05$	Disregard	Note:3
			$0.05 \leq W < 0.1$	$N \leq 3$	
			$W \geq 0.1$	0	
	Foreign Materials (Circular shape)	Dimension(mm)		Acceptable number	Note:4
		$D \leq 0.25$		Disregard	
		$0.25 < D \leq 0.5$		$N \leq 6$	
		$D > 0.5$		0	
	Glass chipping			$a \leq 5\text{mm}$ $b \leq 3\text{mm}$ $c \leq t$ (t : Glass think)	Note:8
				$a \leq 3\text{mm}$ $b \leq 3\text{mm}$ $c \leq t$ (t : Glass think)	Note:8
	Newton-ring	(In case of doubtful situations) Observe on 60° from the product surface under a while Fluorescent lamp(3-wavelength lamp).		Average diameter $\leq 1/3$ Touch Panel area Disregard.	Note:8
					



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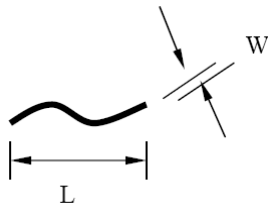
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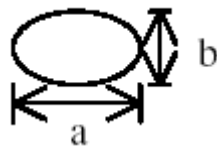
30

Note1. The definition of dot defect : The dot defect was judged after repair and the size of a defective dot over 1/2 of whole dot is regarded as one defective dot.

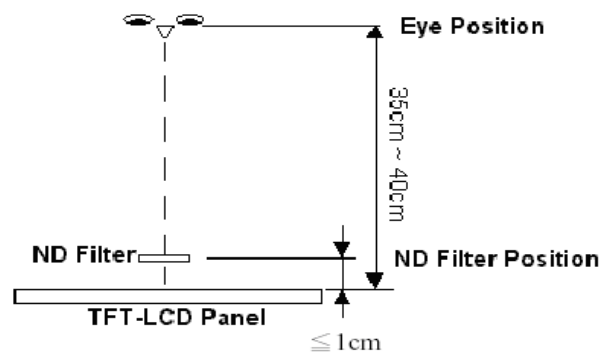
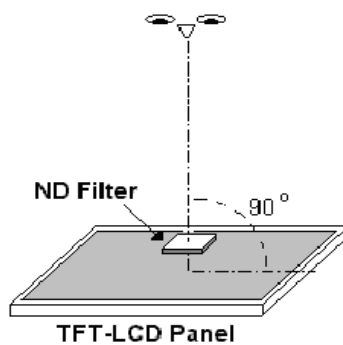
Note2.



Note3. D : Diameter $D=(a+b)/2$



Note4. Bright dot is defined through 6% transmission ND Filter as following.

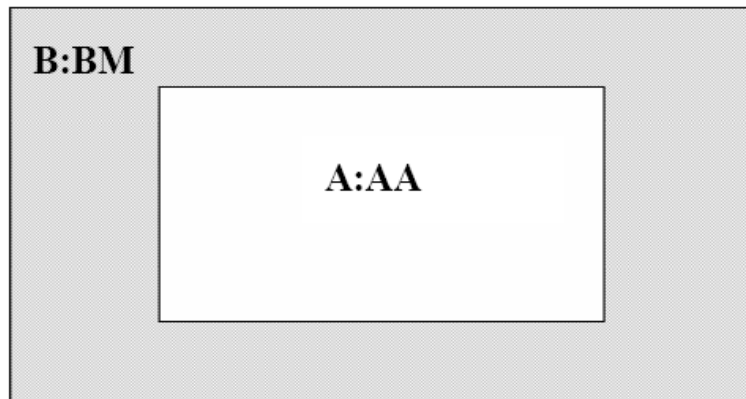


Note5. ADJACENT DOT

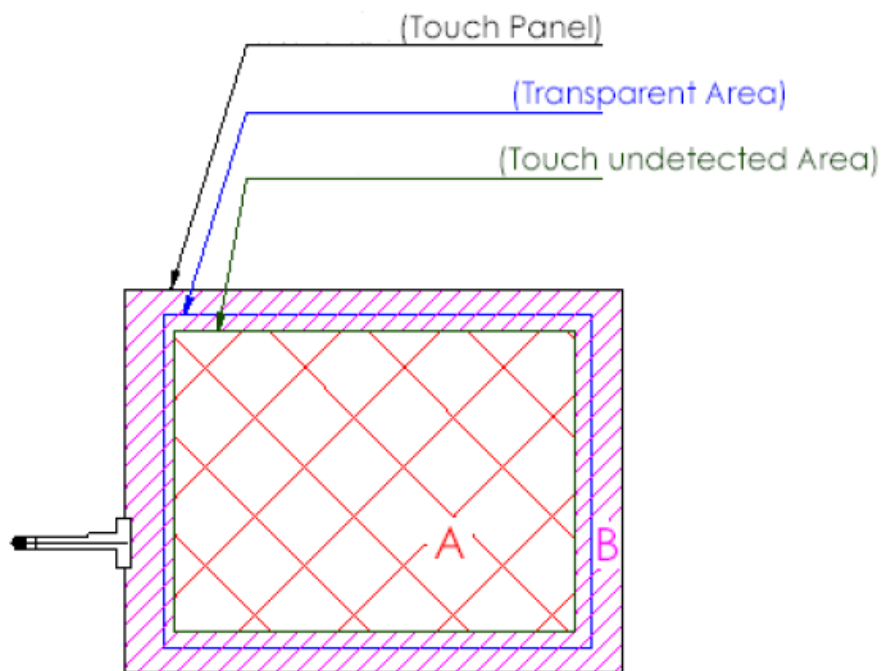




Note6.



Note7.



A area : Without any defect point effect on normal operation.

B area : None-specify

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18.4 Handling of LCM

- (1)Don't give external shock.
- (2)Don't apply excessive force on the surface.
- (3)Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- (4)Don't operate it above the absolute maximum rating.
- (5)Don't disassemble the LCM.