






# SPECIFICATIONS

**CUSTOMER** : \_\_\_\_\_  
**MODEL NO.** : GFT035EA320240Y  
**VERSION** : G  
**DATE** : 2023.03.06  
**CERTIFICATION** : ROHS

Customer Sign	Approved By	Prepared By	Prepared By
			

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## 1. SPECIFICATIONS

### 1.1 Features

#### Main LCD panel

Item	Standard Value
Display Type	320( R , G , B ) * 240 Dots
LCD Type	Normally white, Transmissive type
Screen size(inch)	3.5 inch
Viewing Direction	6 O'clock
Color configuration	R.G.B-Strip
Backlight	LED
Interface	Digital 24-bits RGB
Other(controller/driver IC)	Himax : HX8238-D
ROHS	This product conforms the ROHS of ptc

### 1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	76.9 (W) * 63.9 (L) * 4.0(H)(MAX)	mm

#### LCD panel

Item	Standard Value	Unit
Viewing Area	72.88 (W) * 55.36 (L)	mm
Active Area	70.08 (W) * 52.56 (L)	mm

Note : For detailed information please refer to LCM drawing



### 1.3 Absolute Maximum Ratings

Module					
Item	Symbol	Condition	Min.	Max.	Unit
System Power Supply Voltage	VDDIO	VSS=0	-0.3	4.0	V
Operating Temperature	T <sub>OP</sub>	-	-20	70	°C
Storage Temperature	T <sub>ST</sub>	-	-30	80	°C

### 1.4 DC Electrical Characteristics

Module		VSS = 0V, Ta = 25°C				
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage1	VDDIO	-	3.0	3.3	3.6	V
V <sub>COM</sub> High Voltage	V <sub>COMH</sub>	-	2.5	(3.6)	-4.5	V
V <sub>COM</sub> Low Voltage	V <sub>COML</sub>	-	-3	(-2.4)	0	V
Supply Current	IDD	VDD=3.3V Pattern=black*1	-	5.5	8.5	mA

Note1: Maximum current display



### 1.5 Optical Characteristics

#### TFT LCD panel

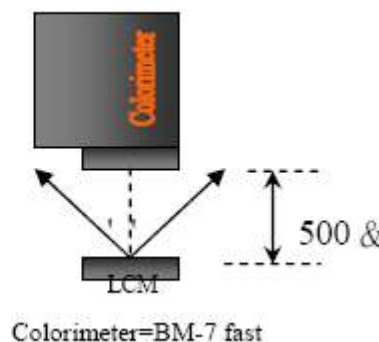
VDDIO=3.3V, Ta=25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	-
Response time	Tr+Tf	Ta=25°C ΘX, ΘY=0°	-	50	70	ms	Note2
Viewing angle	Top	ΘY+	-	45	-	Deg.	Note4
	Bottom	ΘY-	-	50	-		
	Left	ΘX-	-	50	-		
	Right	ΘX+	-	50	-		
Contrast ratio	CR	Ta=25°C ΘX, ΘY=0°	200	250	-	-	Note3
Color of CIE Coordinate (With B/L&T/P)	White	X	0.244	0.294	0.344	-	Note1
		Y	0.259	0.309	0.359		
	Red	X	0.577	0.627	0.677		
		Y	0.310	0.360	0.410		
	Green	X	0.282	0.332	0.382		
		Y	0.506	0.556	0.606		
	Blue	X	0.091	0.141	0.191		
		Y	0.040	0.090	0.140		
Average Brightness Pattern=white display (With B/L&T/P)*1	IV	IF=20mA	180	200	-	cd/m <sup>2</sup>	
Uniformity (With B/L&T/P)*2	ΔB	IF=20mA	70	-	-	%	



Note1:

- \*1 :  $\Delta B = B(\min) / B(\max) * 100\%$
- \*2 : Measurement Condition for Optical Characteristics :
  - a : Environment:  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$  /  $60 \pm 20\% \text{R.H.}$ , no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.
  - b : Measurement Distance :  $500 \pm 50 \text{ mm}$  , ( $\Theta = 0^{\circ}$ )
  - c : Equipment : TOPCON BM-7 fast , (field  $1^{\circ}$ ) , after 10 minutes operation .
  - d : The uncertainty of the C.I.E coordinate measurement  $\pm 0.01$  , Average Brightness  $\pm 4\%$



To be measured at the center area of panel with a viewing cone of  $1^{\circ}$  by Topcon luminance meter BM-7, after 10 minutes operation(module)

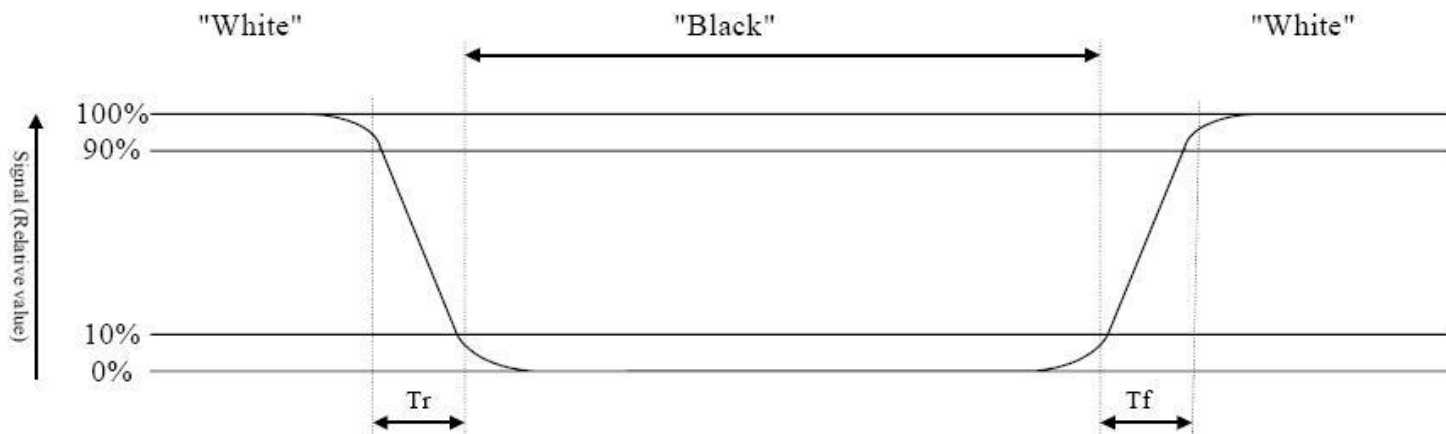
Note2: Definition of response time :

The output signals of photo detector are measured when the input signals are changed from "black"to "white"(falling time) and from"white"to"black"(rising time), respectively.

The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:

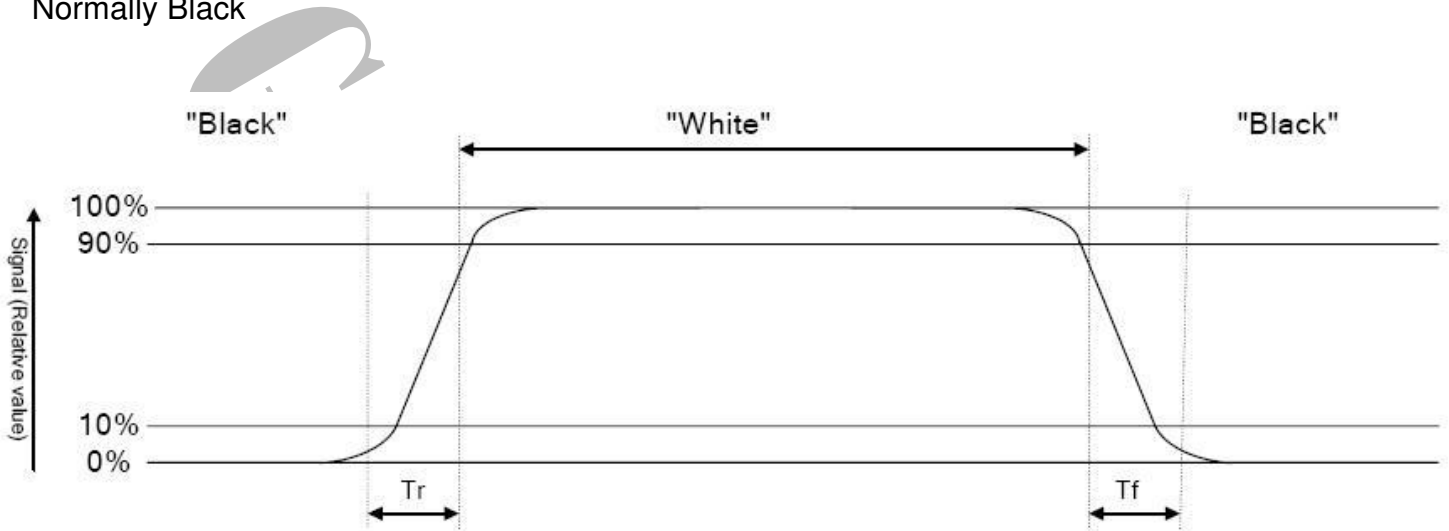
Normally White





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Normally Black



Note3 : Definition of contrast ratio :

Contrast ratio is calculated with the following formula

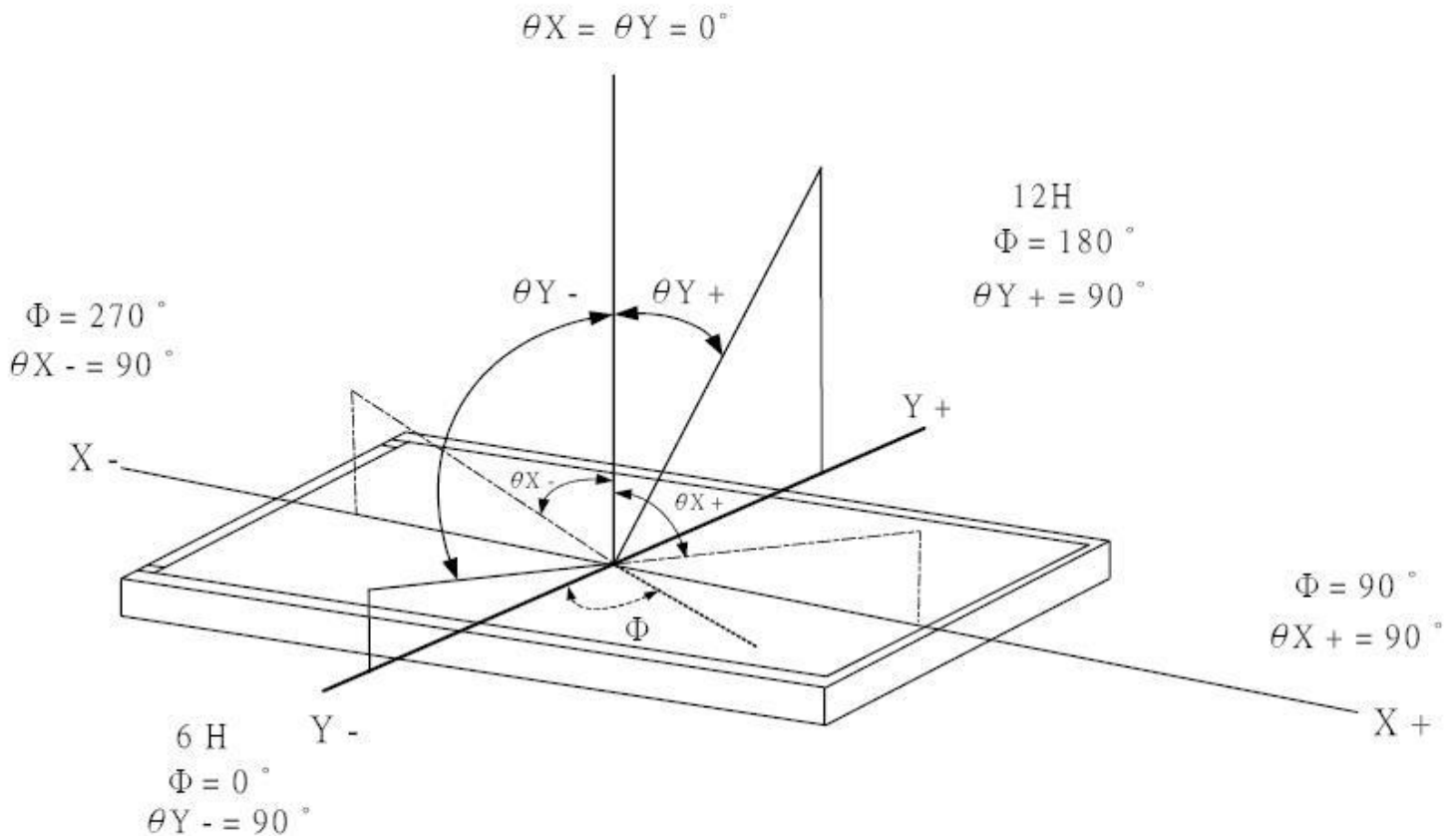
Photo detector output when LCD is at "White" state

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

Photo detector output when LCD is at "Black" state

Note4 : Definition of viewing angle :

Refer to figure as below :







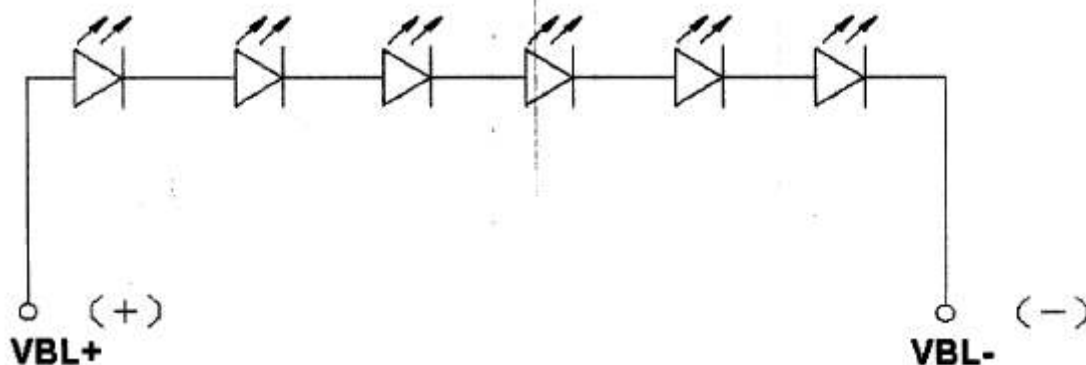
## 1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta=25°C	-	30	mA
Reverse Voltage	VR	Ta=25°C	-	5	V
Power Dissipation	PD	Ta=25°C	-	0.720	W

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=20mA	18.0	19.8	21.0	V
Average Brightness (Without LCD)	IV		3000	3300	-	cd/m <sup>2</sup>
CIE Color Coordinate (Without LCD)	X		-	0.30	-	-
	Y		-	0.30	-	
Color		White				





## 1.7 Touch Panel

### 1) Product type

- Resistance Type , Analogy Type
- Film/Glass Type

### 2) Criteria of Materials

#### 2.1 Uper Electrode

- ITO FILM Base material: ITO FILM
- Type: anti-glare and anti-newton ring
- Thickness:  $188\pm 10\mu\text{m}$
- Resistance:  $400\pm 100\Omega/\text{sq}$

#### 2.2 Lower Electrode

- Base material: ITO GLASS
- Thickness:  $0.7\pm 0.10\text{mm}$
- Resistance :  $400\pm 100\Omega/\text{sq}$

#### 2.3 Connector Tail

- type : FPC ( double side )

### 3) Characteristics

#### 3.1 Mechanical characteristics

- Outside dimension :  $76.44\pm 0.2\text{ mm}\times 61.46\pm 0.2\text{ mm}$
- View area :  $72.00\text{ mm}\times 55.00\text{mm}$
- Thickness :  $1.15\pm 0.10\text{mm}$
- Input method : Pen
- Operating force : 10-100g

Shape of pen end:  $\varnothing 0.3\text{mm}\sim \varnothing 0.5\text{mm}$

- Hardness of surface :

Hard surface :  $> 3\text{H}$  [ JIS K 5400 ]

- Heat seal intensity: X $>2.0\text{kgf}$  Y $>500\text{gf}$  Z $>200\text{gf}$

#### 3.2 Electrical characteristics

- Operating Voltage : DC5V
- Loop resistance: X :  $350\text{-}800\Omega$  Y :  $150\text{-}500\Omega$
- linearity :  $\leq \pm 15\%$
- Insulation resistance:  $> 10\text{M}\Omega$  At DC 25V.
- Insulation ability:  $\geq 60\text{sec.}$  At DC 25V.
- Chatting times:  $< 10\text{ms}$

#### 3.3 Optical characteristics

- Total Transmittance:  $> 80\%$  [JISK7105]



#### 4) Processing Environment :

- Operating Temperature:  $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Operating Humidity:  $\leq 90\% \text{RH}$
- Storage Temperature:  $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$
- Storage Humidity:  $< 90\% \text{RH}$

#### 5) Environmental test

- High temperature :  $+70^{\circ}\text{C}$  , 120 hr.
- Low temperature :  $-20^{\circ}\text{C}$  , 120 hr.
- High temp./high humidity test:  $70^{\circ}\text{C} \& 90\%$ , 120hr.
- High Low temperature test:  $-30^{\circ}\text{C}$  30min/ $+80^{\circ}\text{C}$  30min
- Notes life  $\geq 1 \times 10^5$  words min
- Input life  $\geq 10^6$  times min



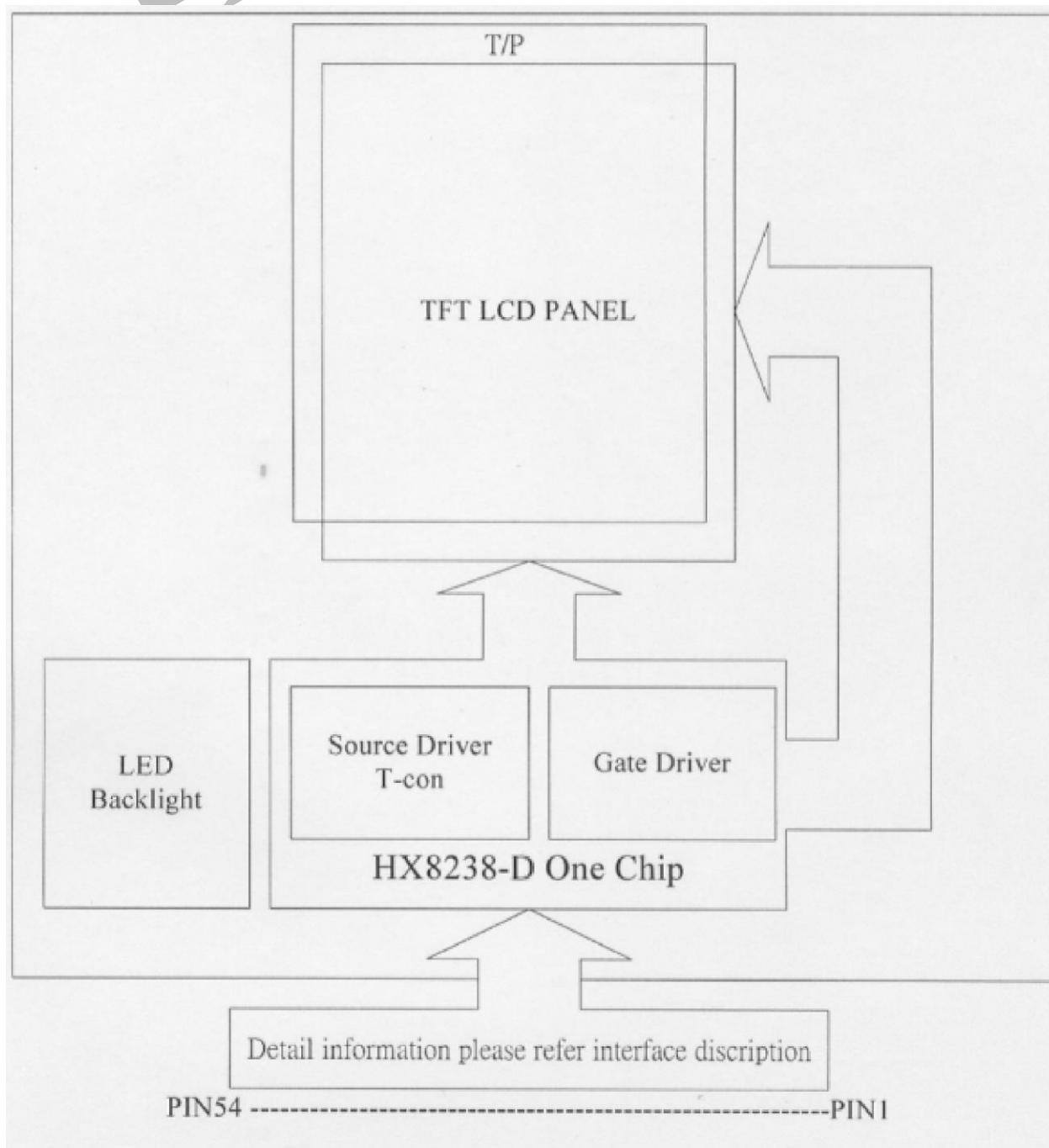
## 2. MODULE STRUCTURE

### 2.1 Counter Drawing

#### 2.1.1 LCM Mechanical Diagram

\*See Appendix

#### 2.1.2 Block Diagram





## 2.2 Interface Pin Description

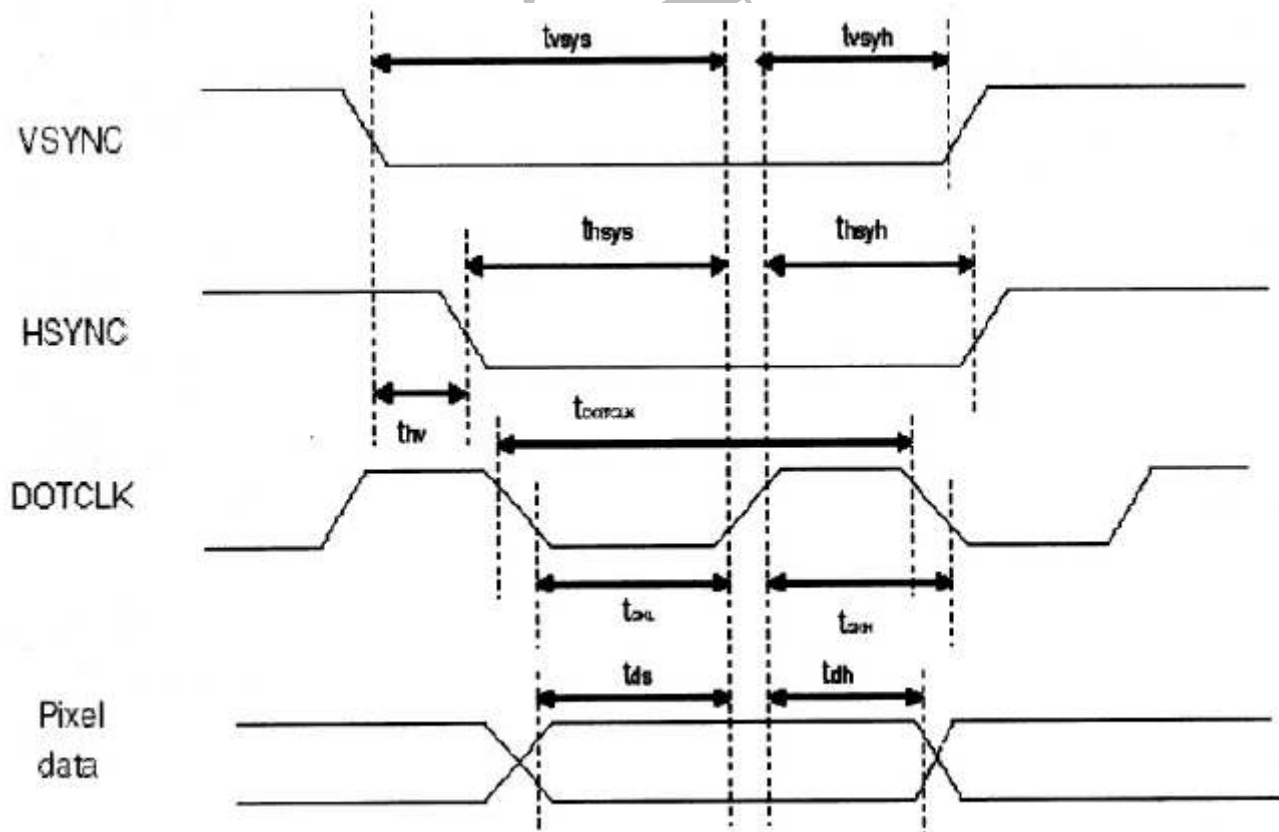
Pin NO.	Symbol	Function
1	VBL-	Power Supply for LED Backlight cathode input
2	VBL-	Power Supply for LED Backlight cathode input
3	VBL+	Power Supply for LED Backlight cathode input
4	VBL+	Power Supply for LED Backlight cathode input
5	NC	No used, Must be open
6	/RESET	Hardware reset
7	NC	Not used, Must be open.(Output Pin, POL output.)
8	Y1	Touch panel TOP
9	X1	Touch panel RIGHT
10	Y2	Touch panel BOTTOM
11	X2	Touch panel LEFT
12	B0	Blue data bit 0
13	B1	Blue data bit 1
14	B2	Blue data bit 2
15	B3	Blue data bit 3
16	B4	Blue data bit 4
17	B5	Blue data bit 5
18	B6	Blue data bit 6
19	B7	Blue data bit 7
20	G0	Green data bit 0
21	G1	Green data bit 1
22	G2	Green data bit 2
23	G3	Green data bit 3
24	G4	Green data bit 4
25	G5	Green data bit 5
26	G6	Green data bit 6
27	G7	Green data bit 7
28	R0	Red data bit 0
29	R1	Red data bit 1
30	R2	Red data bit 2
31	R3	Red data bit 3
32	R4	Red data bit 4
33	R5	Red data bit 5
34	R6	Red data bit 6
35	R7	Red data bit 7
36	HSYNC	Horizontal sync input
37	VSYNC	Vertical sync input
38	DOTCLK	Dot data clock
39	VDDIO	Digital power
40	VDDIO	Digital power
41	VDDIO	Digital power
42	VDDIO	Digital power



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43	SPENA	Serial port data enable signal
44	NC	Not used , Must be open
45	NC	Not used , Must be open(Output Pin, VGL, Gate off power.)
46	NC	Not used , Must be open
47	NC	Not used , Must be open(Output Pin, VGH, Gate off power.)
48	SHUT	Display shut down pin to put the drive into sleep mode. A sharp falling edge must be provided to such pin when IC power on. Internal pull low -Connect to VDDIO for sleep mode -Connect to VSS for normal operating mode (Refer to Power Up Sequence)
49	SPCLK	Serial data clock
50	SPDAT	Serial data
51	NC	Not used , Must be open (Output Pin , VCOM power.)
52	ENB	Data enable control
53	VSS	Ground
54	VSS	Ground

## 2.3 Timing Characteristics





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Characteristics	Symbol	Min		Typ		Max		Unit
		24 bit	8 bit	24 bit	8 bit	24 bit	8 bit	
DOTCLK Frequency	fDOTCLK	-		6.5	19.5	10	30	MHz
DOTCLK Period	tDOTCLK	100	33.3	154	51.3	-		ns
Vertical Sync Setup Time	tvsys	20	10	-		-		ns
Vertical Sync Hold Time	tvsyh	20	10	-		-		ns
Horizontal Sync Setup Time	thsys	20	10	-		-		ns
Horizontal Sync Hold Time	thsyh	20	10	-		-		ns
Please difference of Sync Signal Falling Edge	thv	1		-		240		tDOTCLK
DOTCLK Low Period	tCKL	50	15	-		-		ns
DOTCLK High Period	tCKH	50	15	-		-		ns
Data Setup Time	tds	12	10	-		-		ns
Data hold Time	tdh	12	10	-		-		ns
Reset pulse width	tRES	10		-		-		us

Note: External clock source must be provided to DOTCLK pin of HX8238-A. The driver will not operate if absent Of the clocking signal.

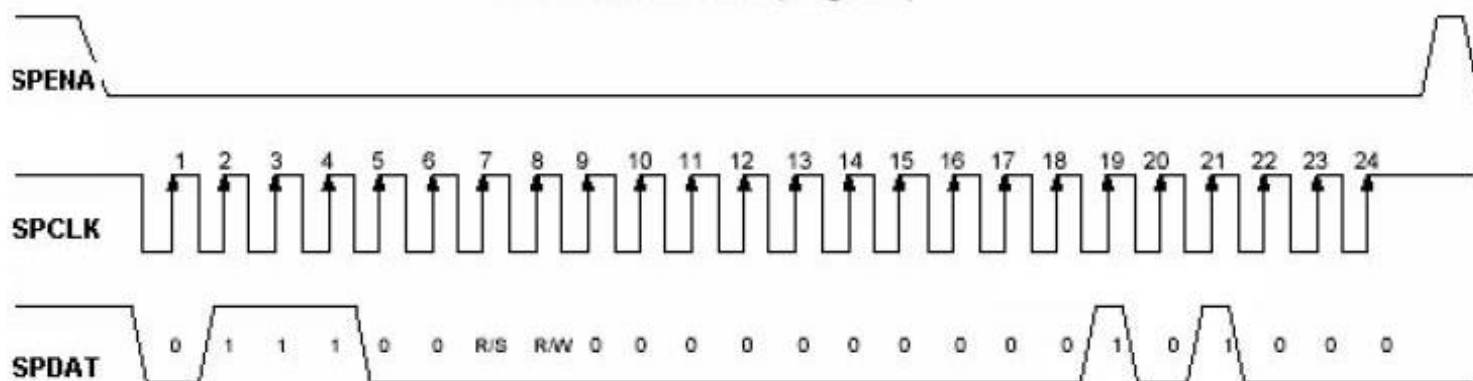
Pixel timing

Note : The interface of this module can drive by digital 24-bit data.

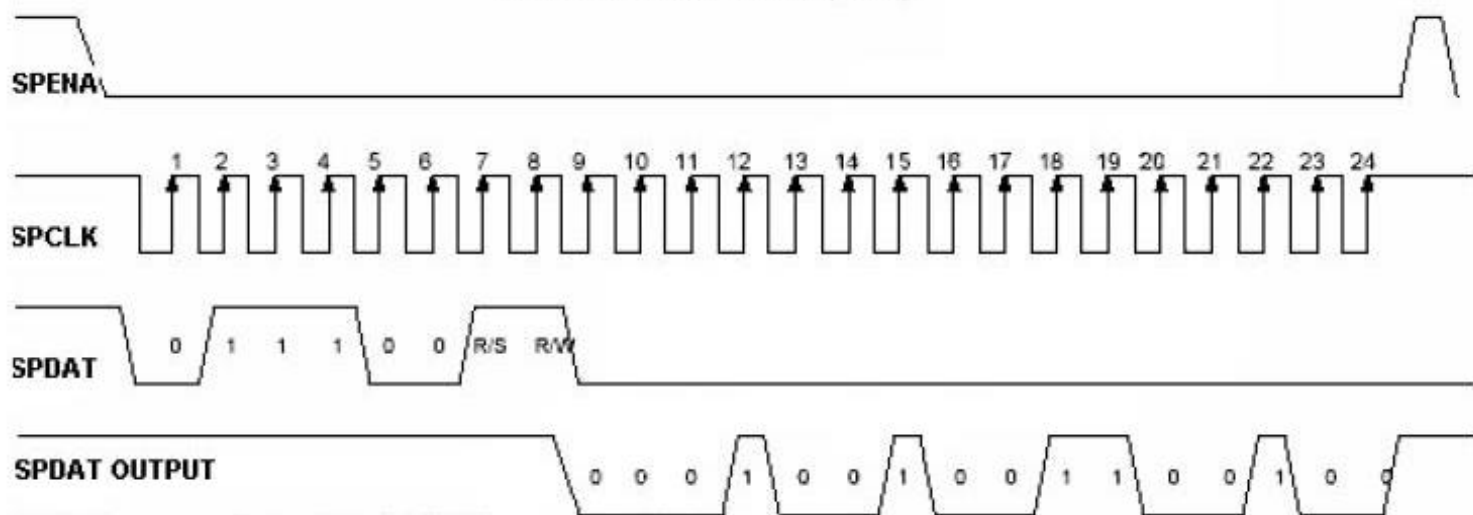
First Transmission (Register)



### 2.3.1 SPI Read



Second Transmission (Data)



Note: The example Read "0x1264h" from register R28h.

SPI interface Timing Diagram & Read SPI Example

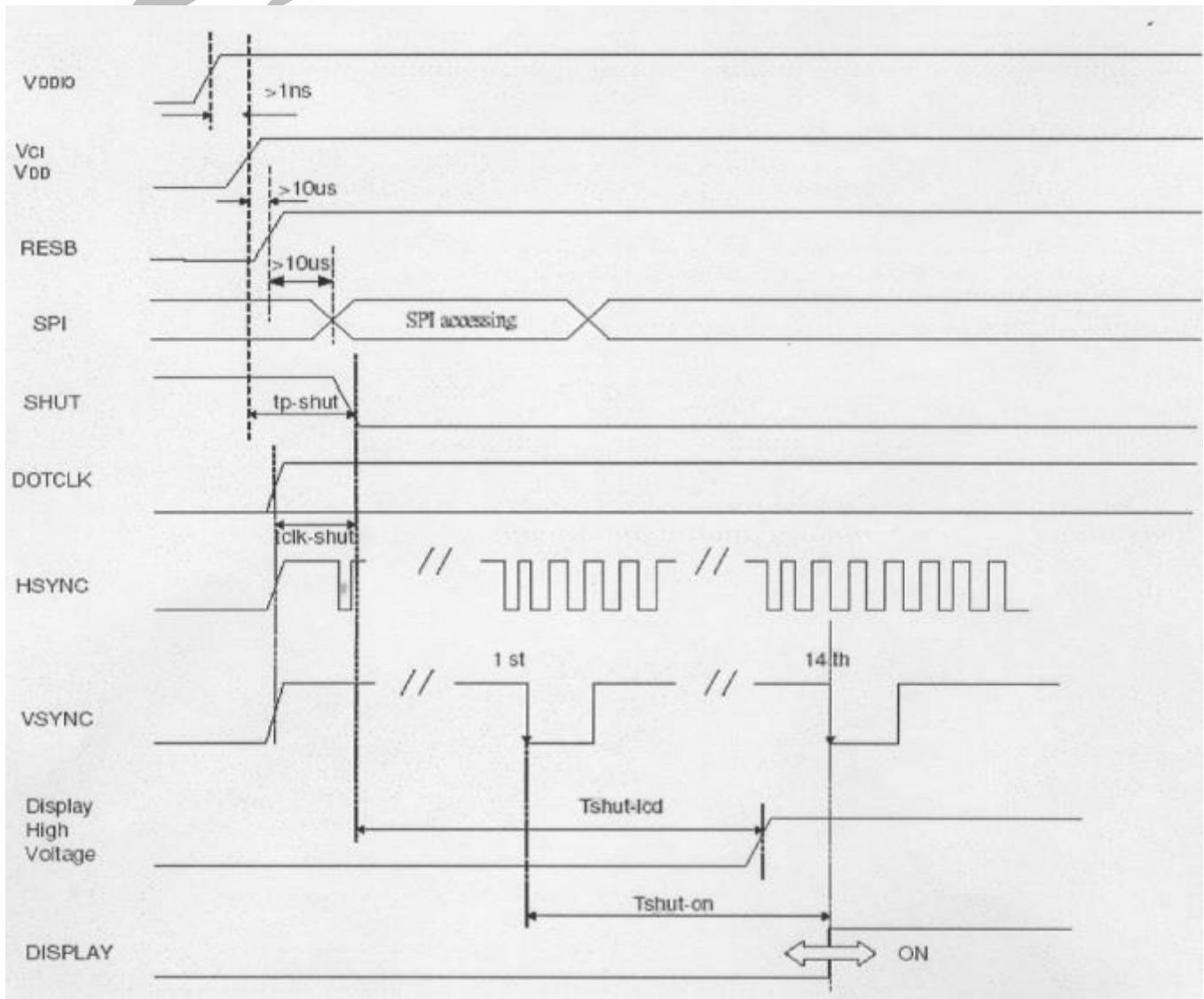






## 2.4 Power Sequence

### 2.4.1 Power up sequence



Characteristics	Symbol	Min	Typ	Max	Unit
VDDD/VDDIO on to falling edge of SHUT	tp-shut	1	-	-	us
DOTCLK	tclk-shut	1	-	-	clk
Falling edge of SHUT to LCD power on	tshut-lcd	-	-	128	ms
Falling edge of SHUT to display start	tshut-on	-	-	14	frame
- 1 line : 408 clk - 1 frame : 262 line - DOTCLK = 6.5 MHz		-	166	232.4	ms

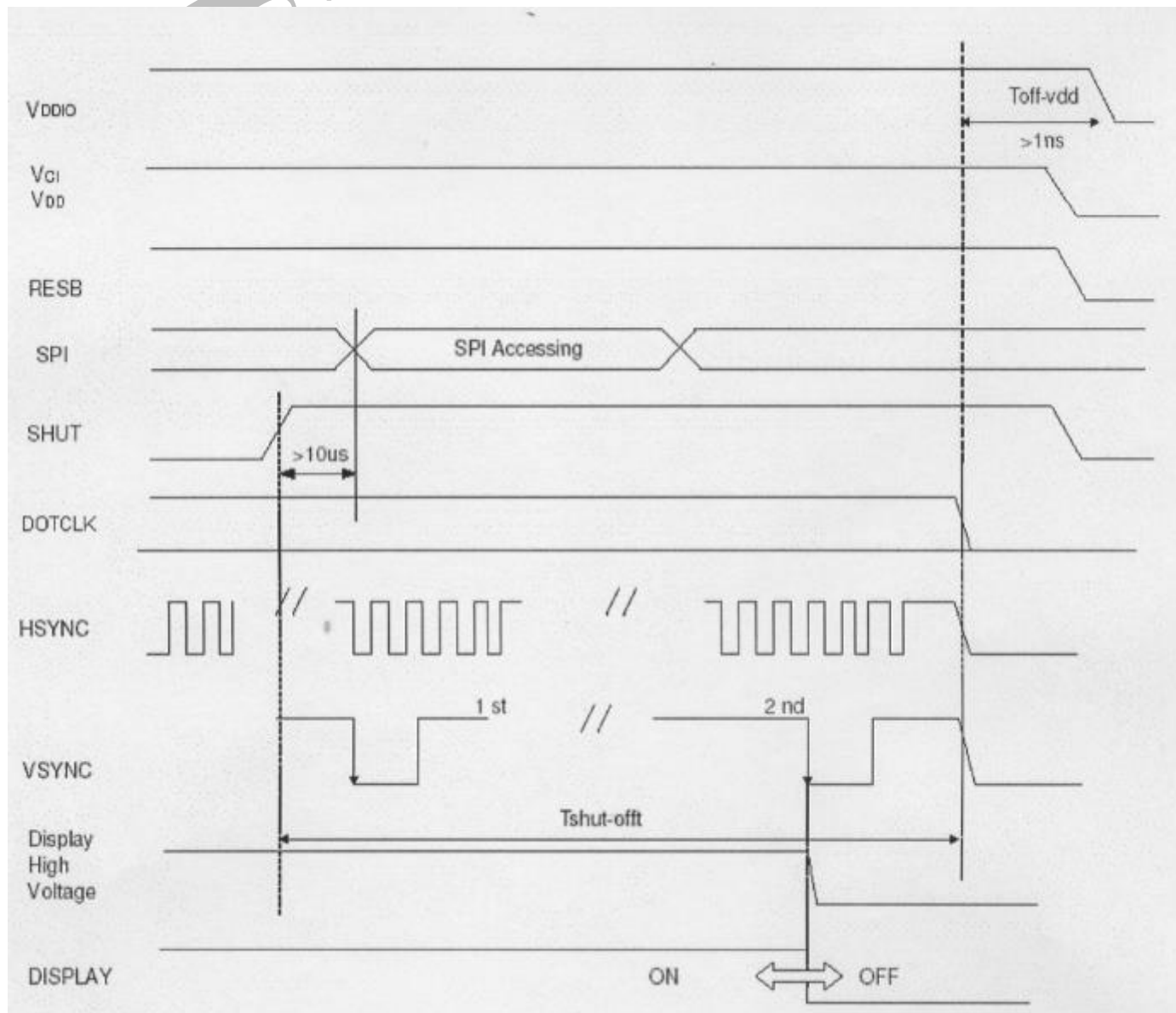
**Note** : It is necessary to input DOTCLK before the falling edge of SHUT.

Display starts at 10th falling edge of VSTNC after the falling edge of SHUT.

Note : 1、The voltage of VDD be boosted from VDDIO.



## 2.4.2 Power down sequence



Characteristics	Symbol	Min	Typ	Max	Unit
Rising edge of SHUT to display off	tshut-on	2	-	-	frame
- 1 line : 408 clk		33.4	-	-	ms
- 1 frame : 262 line - DOTCLK = 6.5 MHz			-	-	-
Input-signal-off to VDDD/VDDIO off	toff-vdd	1	-	-	us

**Note:** DOTCLK must be maintained at least 2 frames after the rising edge of SHUT.

Display become off at the 2nd falling edge of VSTNC after the falling edge of SHUT.

If RESET signal is necessary for power down, provide it after the 2-frames-cycle of the SHUT period.

Note : 1 、 The voltage of VDD be boosted from VDDIO.



## 2.5 Reference Initial code

Register(0 × 0001);  
Data (0 × 7300);

Register(0 × 0002);  
Data (0 × 0200);

Register(0 × 0003);  
Data (0 × 6164);

Register(0 × 0004);  
Data (0 × 04C7);

Register(0 × 0005);  
Data (0 × FC80);

Register(0 × 00,0 × 0A); //Contrast/Brightness control;  
Data (0 × 4008);

Register(0 × 00,0 × 0D); //Power control(2);  
Data (0 × 3229);

Register(0 × 00,0 × 0E); //Power control(3);VOML  
Data (0 × 3200);

\*\*\*\*\*

Flicker!!! Plz , download below.

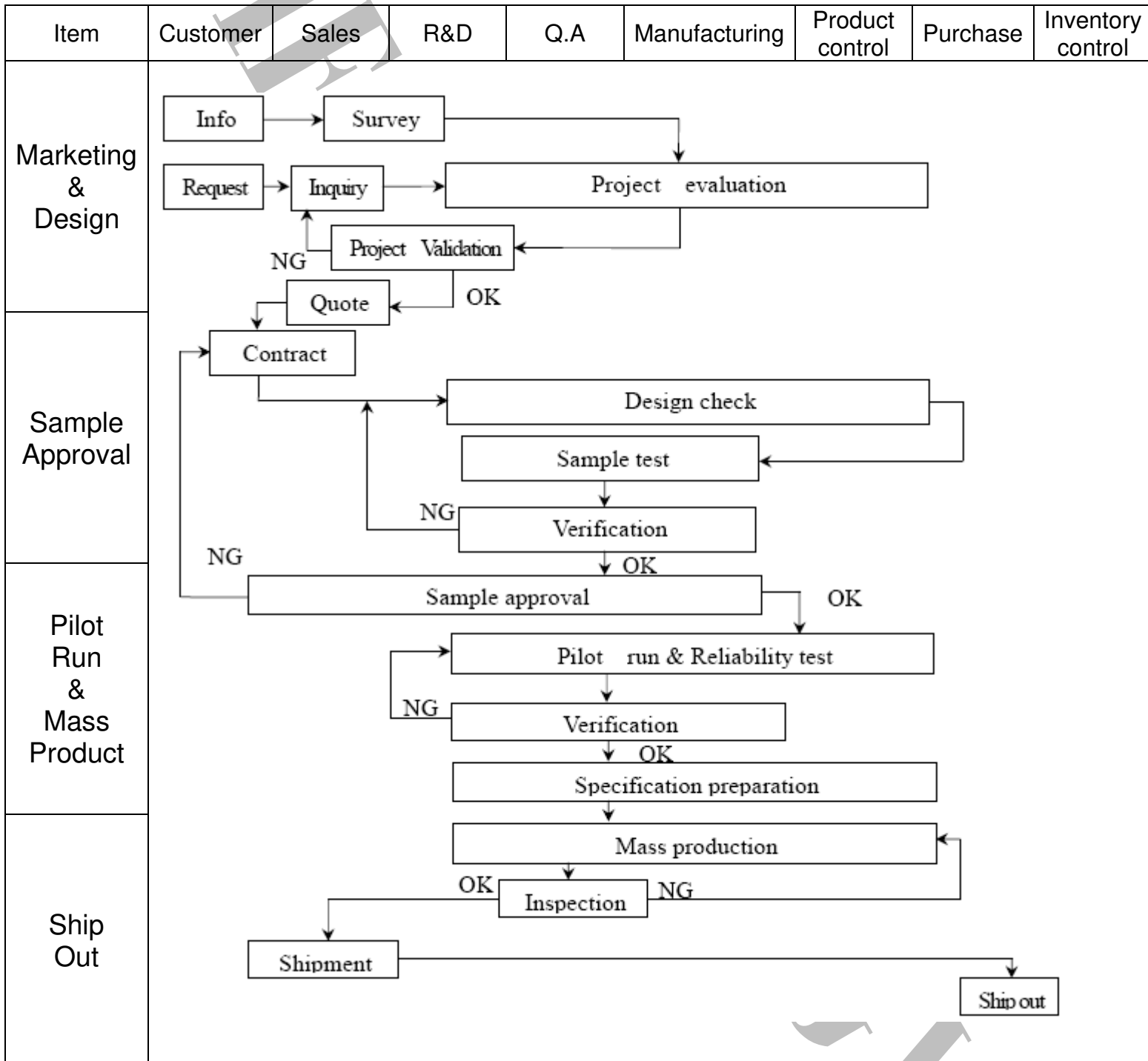
Register(0×00 , 1×1E); //Power control(4);COMH  
Data(0×00DF);

\*\*\*\*\*



### 3. QUALITY ASSURANCE SYSTEM

#### 3.1 Quality Assurance Flow Chart





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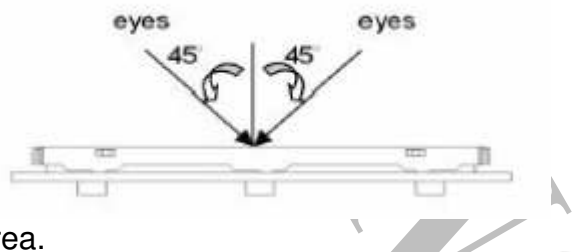
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	<pre> graph TD     Info[Info] --&gt; Claim[Claim]     Claim --&gt; FA[Failure analysis]     FA --&gt; CA[Corrective action]     CA --&gt; Tracking[Tracking]     FA --&gt; AR[Analysis report]           </pre>							
Q.A Activity	1.ISO 9001 Maintenance Activities 3.Equipment calibration 5.Standardization Management				2.Process improvement proposal 4.Education And Training Activities			



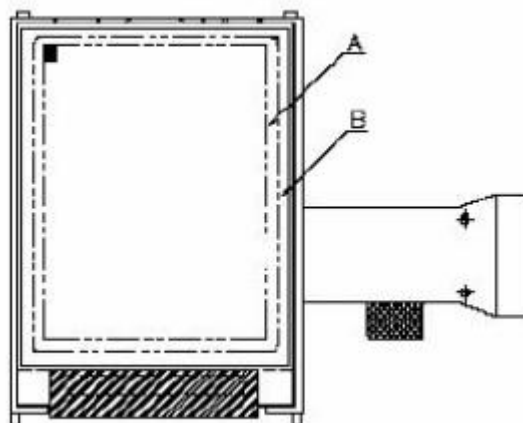
### 3.2 Inspection Specification

#### 1. Inspection Specification

- ◆ Scope : The document shall be applied to TFT-LCD module for 3.5"~ 10" (Ver.02)
- ◆ Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II .
- ◆ Equipment : Gauge 、 MIL-STD 、 Gi Far Taster 、 Sample
- ◆ Defect Level : Major Defect AQL : 0.4 : Minor Defect AQL : 1.5
- ◆ OUT Going Defect Level : Sampling.
- ◆ Standard of the product appearance test :
  - a. Manner of appearance test :
    - (1). The test best be under 20W×2 fluorescent light , and distance of view must be at 30 cm.
    - (2). The test direction is base on about around 45 of vertical line.



#### (3). Definition of area.



*A* area : viewing area

*B* area : Outside of viewing area

#### (4). Standard of inspection : (Unit : mm)





◆ Specification For TFT-LCD Module 3.5" ~ 10" :

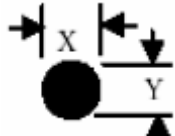
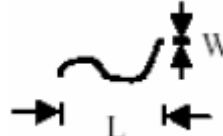
NO	Item	Criterion	Level													
01	Product condition	1.1 The part number is inconsistent with work order of production.	Major													
		1.2 Mixed product types.	Major													
		1.3 Assembled in inverse direction.	Major													
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major													
03	Outline dimension	3.1 Product dimension and structure must conform to structure diagram.	Major													
04	Electrical Testing	4.1 Missing line character and icon.	Major													
		4.2 No function or no display.	Major													
		4.3 Display malfunction.	Major													
		4.4 LCD viewing angle defect.	Major													
		4.5 Current consumption exceeds product specifications.	Major													
05	Dot defect (Bright dot , Dark dot)  On-display	<table border="1"> <thead> <tr> <th colspan="2">Item</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Dot Defect</td> <td>Bright Dot</td> <td><math>\leq 4</math></td> </tr> <tr> <td>Dark Dot</td> <td><math>\leq 5</math></td> </tr> <tr> <td>Joint Dot</td> <td><math>\leq 3</math></td> </tr> <tr> <td>Total</td> <td><math>\leq 7</math></td> </tr> </tbody> </table>		Item		Acceptance (Q'ty)	Dot Defect	Bright Dot	$\leq 4$	Dark Dot	$\leq 5$	Joint Dot	$\leq 3$	Total	$\leq 7$	Minor
		Item		Acceptance (Q'ty)												
		Dot Defect	Bright Dot	$\leq 4$												
			Dark Dot	$\leq 5$												
			Joint Dot	$\leq 3$												
Total	$\leq 7$															
5.1 Inspection pattern : full white, full black, Red , Green and blue screens.																
5.2 It is defined as dot defect if defect area > 1/2 dot.																
5.3 The distance between two dot defect $\geq 5$ mm.																





◆ Specification For TFT-LCD Mpdule 3.5" ~ 10" :

(Ver.02)

NO	Item	Criterion	Level															
06	Black or white dot 、 Scratch 、 contamination  Round type  $\Phi = (x+y) / 2$  Line type 	6.1 Round type (Non-display or display) :  <table border="1"> <thead> <tr> <th>Dimension (diameter : <math>\Phi</math>)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.25</math></td> <td>Ignore</td> </tr> <tr> <td><math>0.25 &lt; \Phi \leq 0.50</math></td> <td>5</td> </tr> <tr> <td><math>\Phi &gt; 0.50</math></td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> </tr> </tbody> </table>	Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)	$\Phi \leq 0.25$	Ignore	$0.25 < \Phi \leq 0.50$	5	$\Phi > 0.50$	0	Total	5	Minor					
		Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)															
$\Phi \leq 0.25$	Ignore																	
$0.25 < \Phi \leq 0.50$	5																	
$\Phi > 0.50$	0																	
Total	5																	
6.2 Line type(Non-display or display) :  <table border="1"> <thead> <tr> <th>Length(L)</th> <th>Width(W)</th> <th>Acceptance(Q'ty)</th> </tr> </thead> <tbody> <tr> <td>---</td> <td><math>W \leq 0.03</math></td> <td>Ignore</td> </tr> <tr> <td><math>L \leq 10.0</math></td> <td><math>0.03 &lt; W \leq 0.05</math></td> <td>4</td> </tr> <tr> <td><math>L \leq 5.0</math></td> <td><math>0.05 &lt; W \leq 0.10</math></td> <td>2</td> </tr> <tr> <td>---</td> <td><math>W &gt; 0.10</math></td> <td>As round type</td> </tr> <tr> <td colspan="2">Total</td> <td>5</td> </tr> </tbody> </table>	Length(L)	Width(W)	Acceptance(Q'ty)	---	$W \leq 0.03$	Ignore	$L \leq 10.0$	$0.03 < W \leq 0.05$	4	$L \leq 5.0$	$0.05 < W \leq 0.10$	2	---	$W > 0.10$	As round type	Total		5
Length(L)	Width(W)	Acceptance(Q'ty)																
---	$W \leq 0.03$	Ignore																
$L \leq 10.0$	$0.03 < W \leq 0.05$	4																
$L \leq 5.0$	$0.05 < W \leq 0.10$	2																
---	$W > 0.10$	As round type																
Total		5																
07	Polarizer  Bubble	<table border="1"> <thead> <tr> <th>Dimension (diameter : <math>\Phi</math>)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.25</math></td> <td>Ignore</td> </tr> <tr> <td><math>0.25 &lt; \Phi \leq 0.50</math></td> <td>4</td> </tr> <tr> <td><math>0.50 &lt; \Phi \leq 0.80</math></td> <td>1</td> </tr> <tr> <td><math>\Phi &gt; 0.80</math></td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> </tr> </tbody> </table>	Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)	$\Phi \leq 0.25$	Ignore	$0.25 < \Phi \leq 0.50$	4	$0.50 < \Phi \leq 0.80$	1	$\Phi > 0.80$	0	Total	5	Minor			
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$\Phi > 0.80$	0																	
Total	5																	









◆ Specification For TFT-LCD Module 3.5" ~ 10"

NO	Item	Criterion	Level
09	Backlight elements	9.1 Backlight can't work normally	Major
		9.2 Backlight doesn't light or color is wrong.	Major
		9.3 Illumination source flickers when lit.	Major
10	General appearance	10.1 Pin type 、 quantity 、 dimension must match type in structure diagram.	Major
		10.2 No short circuits in components on PCB or FPC.	Major
		10.3 Parts on PCB or FPC must be the same as on the production characteristic chart. There should be no wrong parts, missing parts or excess parts.	Major
		10.4 Product packaging must the same as specified on packaging specification sheet.	Minor
		10.5 The folding and peeled off in polarizer are not acceptable.	Minor
		10.6 The PCB or FPC between B/L assembled distance(PCB or FPC) is $\leq 1.5\text{mm}$ .	Minor



## 4. RELIABILITY TEST

### 4.1 Reliability Test Condition

NO.	ITEM	CONDITION		STANDARD	NOTE
1	High Temp. Storage	80°C	120 hrs	Appearance Without defect	
2	Low Temp. Storage	-30°C	120 hrs	Appearance Without defect	
3	High Temp. & High Humi. Storage	40°C 90% RH	120 hrs	Appearance Without defect	
4	High Temp. Operating Display	70°C	120 hrs	Appearance Without defect	
5	Low Temp. Operating Display	-20°C	120 hrs	Appearance Without defect	
6	Thermal Shock	-20°C, 30min. → 70°C, 30min. ↑ (1cycle)		Appearance Without defect	10 cycles

\*\* Dissipation current, contrast and display functions

\*\* Polarizing filter deterioration, other appearance defects

\*\* The function test shall be conducted after 4hours storage at the normal temperature and humidity after remove from the test chamber.



## 5. PRECAUTION RELATING PRODUCT HANDLING

### 5.1 SAFETY

- 5.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.
- 5.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

### 5.2 HANDLING

- 5.2.1 Avoid any strong mechanical shock which can break the glass.
- 5.2.2 Avoid static electricity which can damage the CMOS LSI-When working with the module, be sure to ground your body and any electrical equipment you may be using.
- 5.2.3 Do not remove the panel or frame from the module.
- 5.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully , do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)
- 5.2.5 Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.
- 5.2.6 Do not touch the display area with bare hands, this will stain the display area.
- 5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.
- 5.2.8 To control temperature and time of soldering is  $320 \pm 10$  °C and 3-5 sec.
- 5.2.9 To avoid liquid (include organic solvent) stained on LCM.

### 5.3 STORAGE

- 5.3.1 Store the panel or module in a dark place where the temperature is  $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$  and the humidity is below 65% RH.
- 5.3.2 Do not place the module near organics solvents or corrosive gases.
- 5.3.3 Do not crush, shake, or jolt the module.

### 5.4 TERMS OF WARRANTY

- 5.4.1 Applicable warrant period  
The period is within thirteen months since the date of shipping out under normal using and storage conditions.
- 5.4.2 Unaccepted responsibility  
This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in nuclear power control equipment, aerospace equipment, fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

