

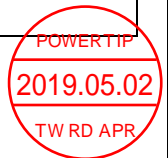
## SPECIFICATIONS

CUSTOMER	:	_____
SAMPLE CODE	:	SH320240T023-IBC01
MASS PRODUCTION CODE	:	PH320240T023-IBC01
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	003
DRAWING NO. (Ver.)	:	LMD-PH320240T023-IBC01 (Ver.003)
PACKAGING NO. (Ver.)	:	PKG-PH320240T023-IBC01 (Ver.002)

<b>Customer Approved</b>
<b>Date:</b>

Approved	Checked	Designer
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- Preliminary specification for design input
- Specification for sample approval



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Primacy(TFT LCD): Himax: HX8238-D

## 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
Touch panel	Projective capacitive touch panel True Multi-touch with up to 5 Points of Absolution
Screen size(inch)	3.5(Diagonal)
Viewing Direction	6 O'clock
Color configuration	R.G.B. vertical stripe
Backlight	White LED
Interface	Digital 24-bits Parallel RGB HSYNC,VSYNC,3Wires SPI
Other (controller / driver IC)	Himax:HX8238-D
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : <a href="http://www.powertip.com.tw/news_detail.php?Key=1&amp;cID=1">http://www.powertip.com.tw/news_detail.php?Key=1&amp;cID=1</a>

### 1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension(T/P)	76.9(W) x 63.9 (L) x 4.5 (H)	mm

#### LCD panel

Item	Standard Value	Unit
Active Area	70.08 (W) x 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	VDD	GND=0	-0.3	4.0	V
Booster Reference Supply Voltage	VCI	GND=0	GND-0.3	3.96	V
Operating Temperature	T <sub>OP</sub>	Excluded T/P	-20	70	°C
Storage Temperature	T <sub>ST</sub>	Excluded T/P	-30	80	°C

### 1.4 DC Electrical Characteristics

#### Module

GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage	VDD	-	3.0	3.3	3.6	V
Booster Reference Supply Voltage	VCI	-	3.0	3.3	3.6	V
V <sub>COM</sub> High Voltage	V <sub>COMH</sub>	-	-	-	5.54	V
V <sub>COM</sub> Low Voltage	V <sub>COML</sub>	-	-2.8	-	-	V
Input H/L Level Voltage	V <sub>IH</sub>	-	0.8VDD	-	VDD	V
	V <sub>IL</sub>	-	0	-	0.2VDD	V
Output H/L Level Voltage	V <sub>OH</sub>	-	0.9VDD	-	VDD	V
	V <sub>OL</sub>	-	-	-	0.1VDD	V
Supply Current	IDD	VDD=VCI=3.3V Pattern= black*1	-	9	14	mA

Note1: Maximum current display.

## 1.5 Optical Characteristics

### TFT LCD Panel

VDD=VCI=3.3V, Ta=25°C

Item	Symbol	Condition	Min.	Typ.	Max.	unit	-	
Response time	Tr + Tf	Ta = 25°C θX, θY = 0°	-	40	60	ms	Note2	
Viewing angle	Top	θY+	CR ≥ 10	-	60	-	Deg.	Note4
	Bottom	θY-		-	60	-		
	Left	θX-		-	60	-		
	Right	θX+		-	60	-		
Contrast ratio	CR		500	600	-	-	Note3	
Color of CIE Coordinate (With B/L & T/P )	White	X	IF= 20 mA	0.26	0.31	0.36	-	Note1
		Y		0.28	0.33	0.38		
	Red	X		0.57	0.62	0.57		
		Y		0.31	0.36	0.41		
	Green	X		0.29	0.34	0.39		
		Y		0.56	0.61	0.66		
	Blue	X		0.09	0.14	0.19		
		Y		0.03	0.08	0.13		
Average Brightness Pattern=white display	IV		390	450	-	cd/m <sup>2</sup>	Note1	
Uniformity	△B		80	-	-	%	Note1	

Note1:

1 :  $\Delta B = B(\min) / B(\max) \times 100\%$

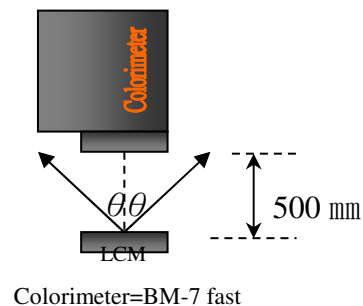
2 : Measurement Condition for Optical Characteristics:

a : Environment: 25°C±5°C / 60±20%R.H , no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.

b : Measurement Distance: 500 ± 50 mm , (θ= 0°)

c : Equipment: TOPCON BM-7 fast , (field 1°) , after 10 minutes operation.

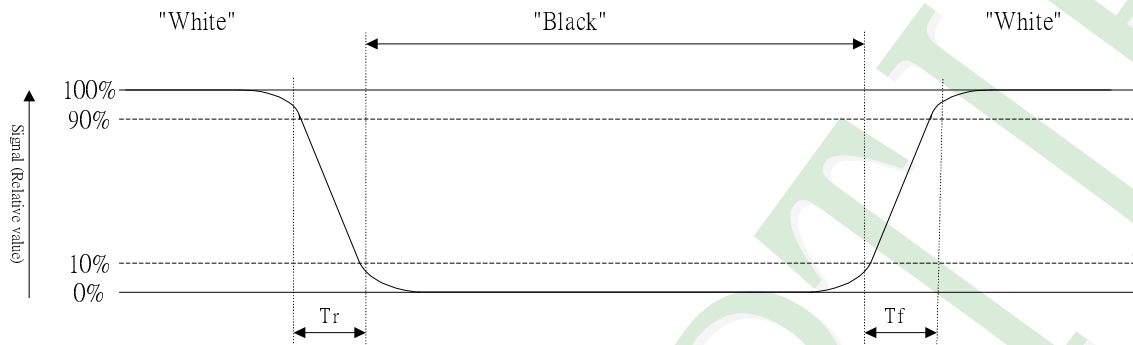
d : The uncertainty of the C.I.E coordinate measurement ±0.01 , Average Brightness ± 4%



**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:



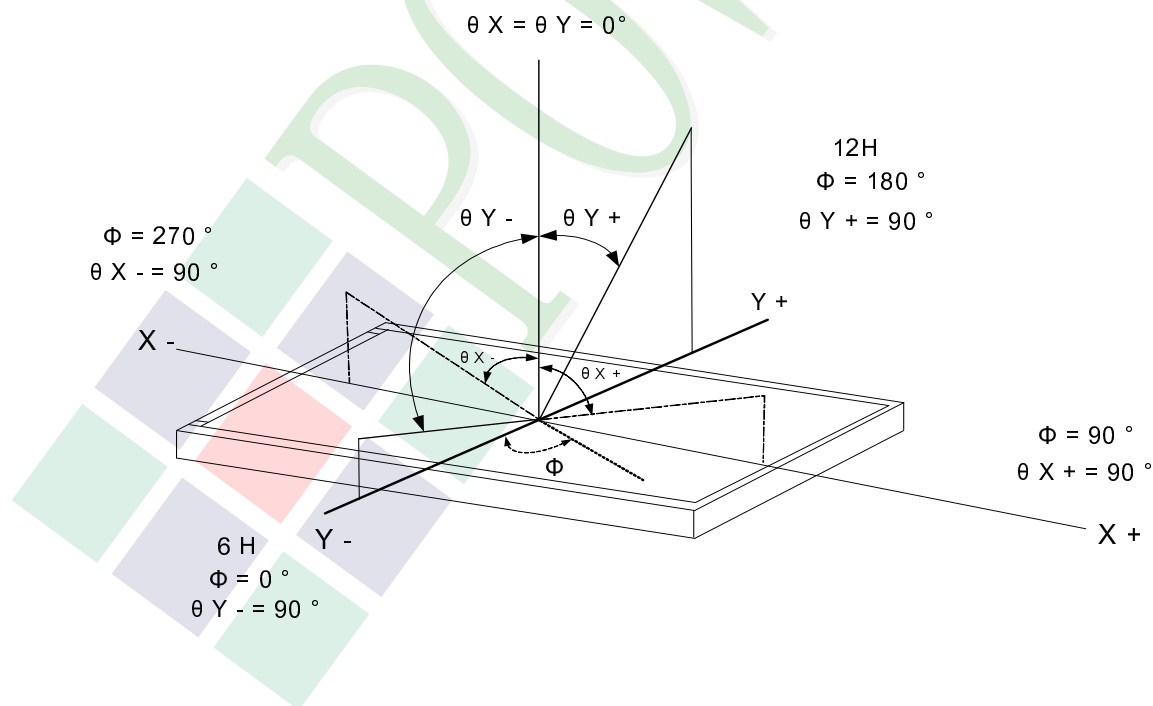
**Note3: Definition of contrast ratio:**

Contrast ratio is calculated with the following formula

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

**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	-	48	mA
Power Dissipation	PD	Ta =25°C	-	540	mW

### Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 20 mA	-	19.2	21.0	V
Color	White					

### Internal Circuit Diagram



Item	Conditions	Description
Life Time	Ta =25°C IF= 20 mA	20000 Hzrs



## 1.7 Touch Panel Characteristics

### Features

Item	Standard Value
Touch Panel Size	3.5"
Touch type	Projective capacitive touch panel
Input Method	Finger / 5 Points touch
Output Interface	I <sup>2</sup> C
IC	ST1633

### Mechanical Specifications

Item	Standard Value	Unit
Viewing Area	71.68 mm (W) x 54.16 mm (H)	mm
Number of sensing channel	12 (W) x 10 (H)	mm

### Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	TPVDD	-	-0.3	+6.0	V
Operating Temperature	T <sub>OP</sub>	-	-20	+70	°C
Storage Temperature	T <sub>ST</sub>	-	-30	+80	°C

### DC Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage	TPVDD	-	2.8	3.3	3.6	V
Input High Voltage	V <sub>IH</sub>	-	0.85 TPVDD	-	-	V
Input Low Voltage	V <sub>IL</sub>	-	-	-	0.15 TPVDD	V

### Touch Panel IC Read/Write description & Register Mapping

Reference :Sitronix Touch Driver Porting Reference Guide.

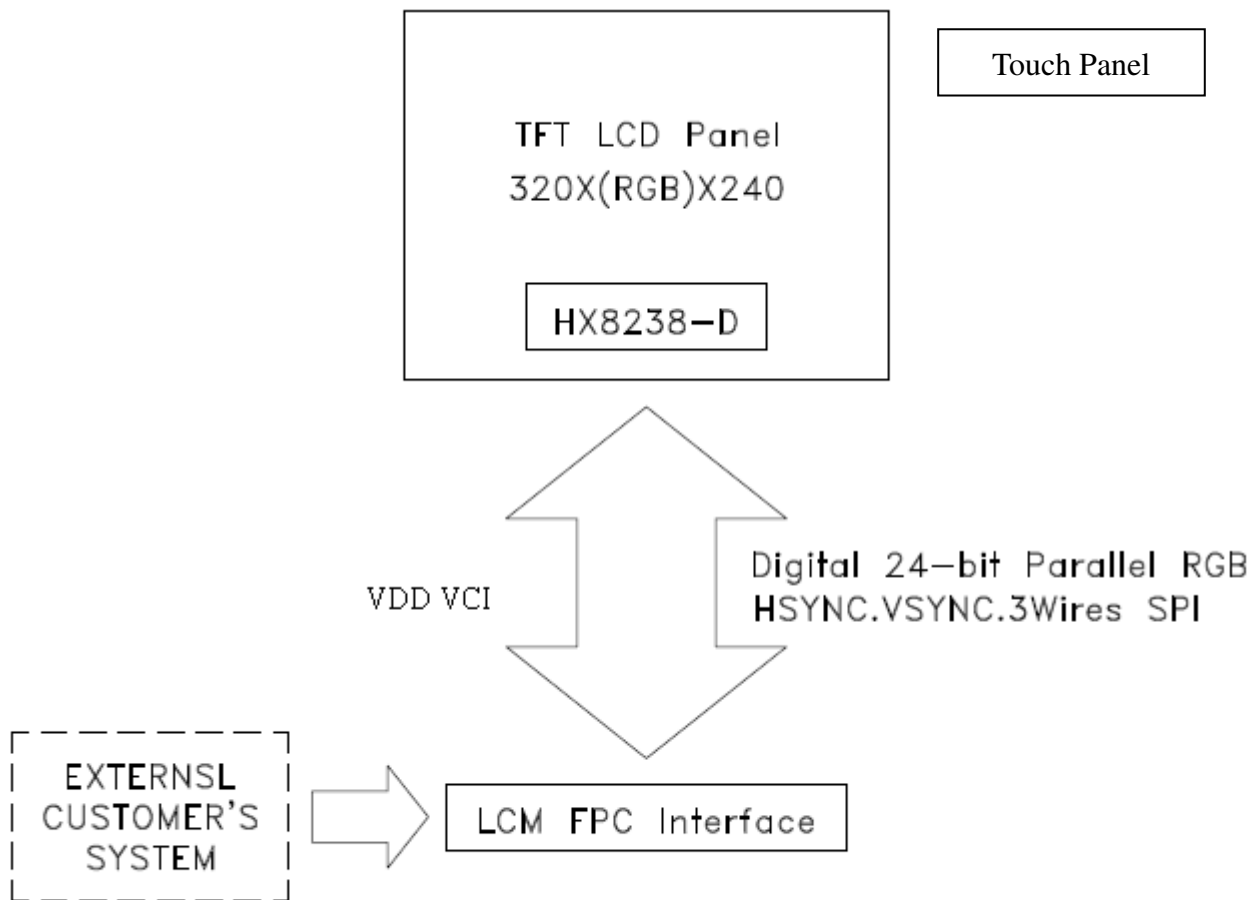
## 2. MODULE STRUCTURE

### 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	A	LED Anode.
2	K	LED Cathode.
3	GND	Ground.
4	VCI	Booster Reference Supply Voltage.
5	ID	Note1.
6	VDD	Power Supply Voltage.
7	GND	Ground.
8	RESB	Reset.
9	CSB	Chip select Input: CSB = L - selected and accessible. CSB = H - is not selected and not accessible.
10	SCK	SPI Clock Input.
11	SDO	SPI Data Output. The data is valid on the falling edge of the SCK signal.
12	SDI	SPI Data Input. The data is latched on the rising edge of the SCK signal.
13	GND	Ground.
14	B0	Graphic display Blue data.
15	B1	
16	B2	
17	B3	
18	B4	
19	B5	
20	B6	

Pin No.	Symbol	Function
21	B7	Graphic display Blue data.
22	G0	Graphic display Green data.
23	G1	
24	G2	
25	G3	
26	G4	
27	G5	
28	G6	
29	G7	
30	R0	Graphic display Red data.
31	R1	
32	R2	
33	R3	
34	R4	
35	R5	
36	R6	
37	R7	
38	GND	Ground.
39	DCLK	Video Clock Input. The data is latched on the rising edge of DCLK.
40	HSYNC	Horizontal Sync Input.
41	VSYNC	Vertical Sync Input.

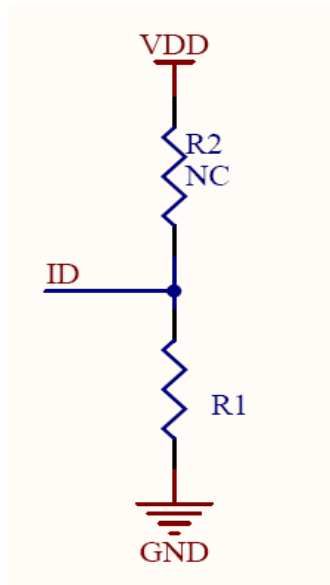
Pin No.	Symbol	Function
42	DEN	Video Data Enable Input. VSYNC+HSYNC mode - This pin is shorted to GND normally and the back/front porch is determined by the control register. VSYNC+HSYNC+DE mode - The valid data is determined by the VSYNC+HSYNC+DEN pin. DE mode - VSYNC and HSYNC are unused and shorted to GND. The valid input. data is determined by DEN pin.
43	GND	Ground.
44	SEL0	Note2.
45	SEL1	
46	SEL2	
47	NC	Not use.
48	NC	Not use.
49	NC	Not use.
50	NC	Not use.

## T/P PIN

Pin No.	Symbol	Function
1	GND	Ground.(T/P)
2	SDA	I <sup>2</sup> C Data.(T/P)
3	SCL	I <sup>2</sup> C Clock.(T/P)
4	VDD	Power.(T/P)
5	INT	The interrupt from the CTP to the Host. H:CTP interrupt not requested. L:CTP request interrupt.
6	XRES	XRES. (T/P)

### Note1: ID code Circuit

Vendor ID (On FPC, ID resistor as specified in vendor table shall be connected to this pin, and other side of the resistor shall be connected to GND)



**R1=44.2KΩ**

### Note2: Define the input interface mode

SEL2	SEL1	SEL0	Format	Operating frequency
0	0	0	Parallel-RGB data format (only support stripe type color filter)	6.5MHz
0	0	1	Serial-RGB data format	19.5MHz
0	1	0	CCIR 656 data format (640RGB)	24.54MHz
0	1	1	CCIR 656 data format (720RGB)	27MHz
1	0	0	YUV mode A data format (Cr-Y-Cb-Y)	24.54MHz
1	0	1	YUV mode A data format (Cr-Y-Cb-Y)	27MHz
1	1	0	YUV mode B data format (Cb-Y-Cr-Y)	27MHz
1	1	1	YUV mode B data format (Cb-Y-Cr-Y)	24.54MHz

Input format	DOTCLK Freq (MHz)	Display data	Active area (DOTCLK)
YUV mode	24.54	640	1280
	27	720	1440

### 2.2.1 Refer Initial code:

//Initial-----

\void Initial\_Main(void)

```
{  
MOV    DPH,#00H           ;Register 0001
```

```
MOV    DPL,#01H
```

```
CALL   COM_SER
```

```
MOV    DPH,#63H
```

```
MOV    DPL,#00H
```

```
CALL   DATA_SER
```

```
MOV    DPH,#00H           ;Register 0002
```

```
MOV    DPL,#02H
```

```
CALL   COM_SER
```

```
MOV    DPH,#02H
```

```
MOV    DPL,#00H
```

```
CALL   DATA_SER
```

```
MOV    DPH,#00H           ;Register 0003
```

```
MOV    DPL,#03H
```

```
CALL   COM_SER
```

```
MOV    DPH,#01100100B     ;DB3 ~ DB0
```

```
MOV    DPL,#01100100B
```

```
CALL   DATA_SER
```

```
MOV    DPH,#00H           ;Register 0004
MOV    DPL,#04H
CALL   COM_SER
MOV    DPH,#04H
MOV    DPL,#C7H           ;Parallel 24 bits
CALL   DATA_SER

MOV    DPH,#00H           ;Register 0005
MOV    DPL,#05H
CALL   COM_SER
MOV    DPH,#FCH
MOV    DPL,#80H
CALL   DATA_SER

MOV    DPH,#00H           ;Register 000A
MOV    DPL,#0AH
CALL   COM_SER
MOV    DPH,#40H
MOV    DPL,#08H
CALL   DATA_SER

MOV    DPH,#00H           ;Register 000D
MOV    DPL,#0DH
CALL   COM_SER
MOV    DPH,#00000010B
```



MOV DPL,#00110001B ;DB5 ~ DB0 VLCD63

CALL DATA\_SER

MOV DPH,#00H ;Register 000E

MOV DPL,#0EH

CALL COM\_SER

MOV DPH,#00101110B ;DB4 ~ DB0 VCOM

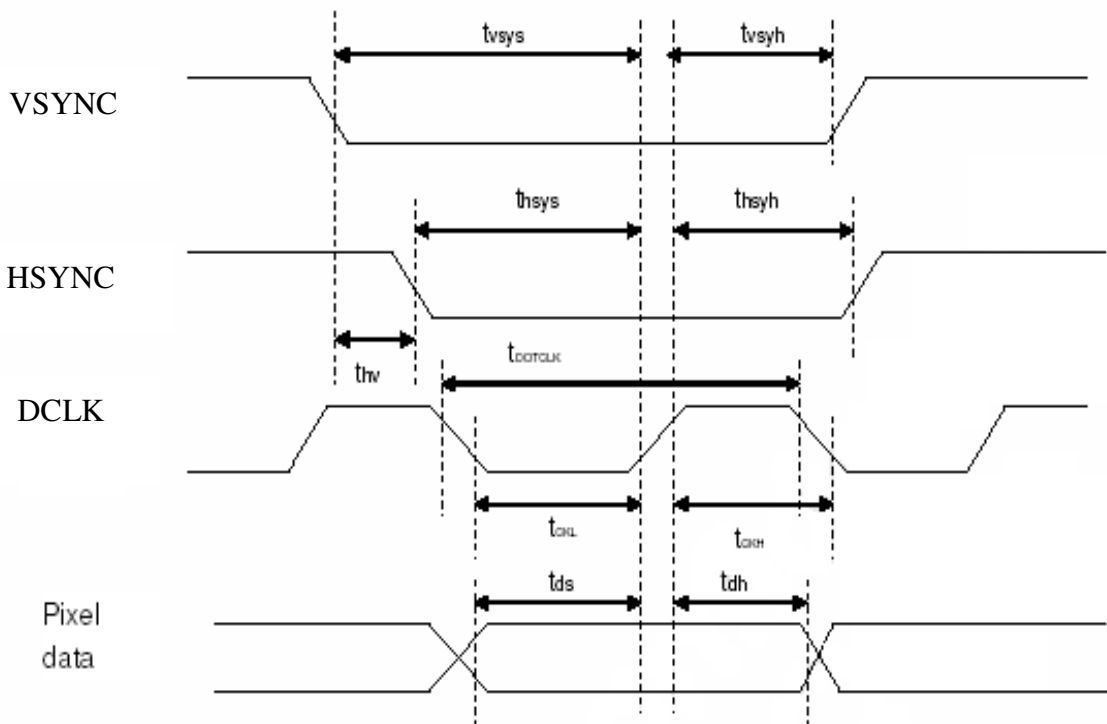
MOV DPL,#10000000B ;DB7 ~ DB6

CALL DATA\_SER

CALL DELAY2

}

## 2.3 Timing Characteristics



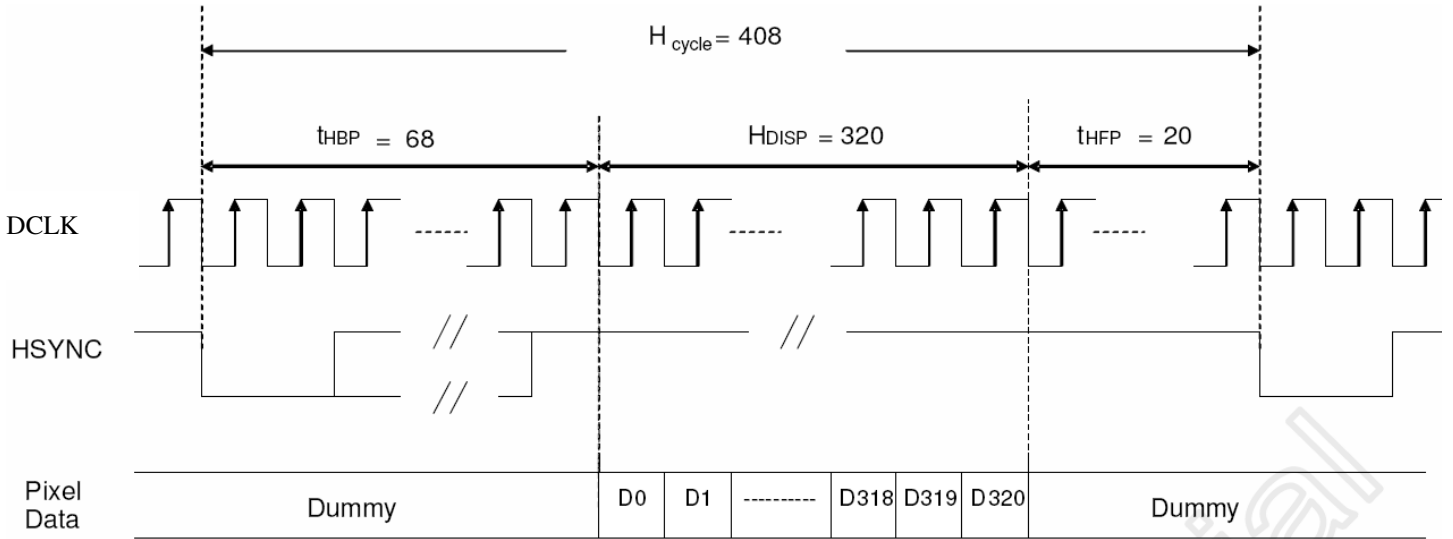
Pixel timing

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
Phase 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

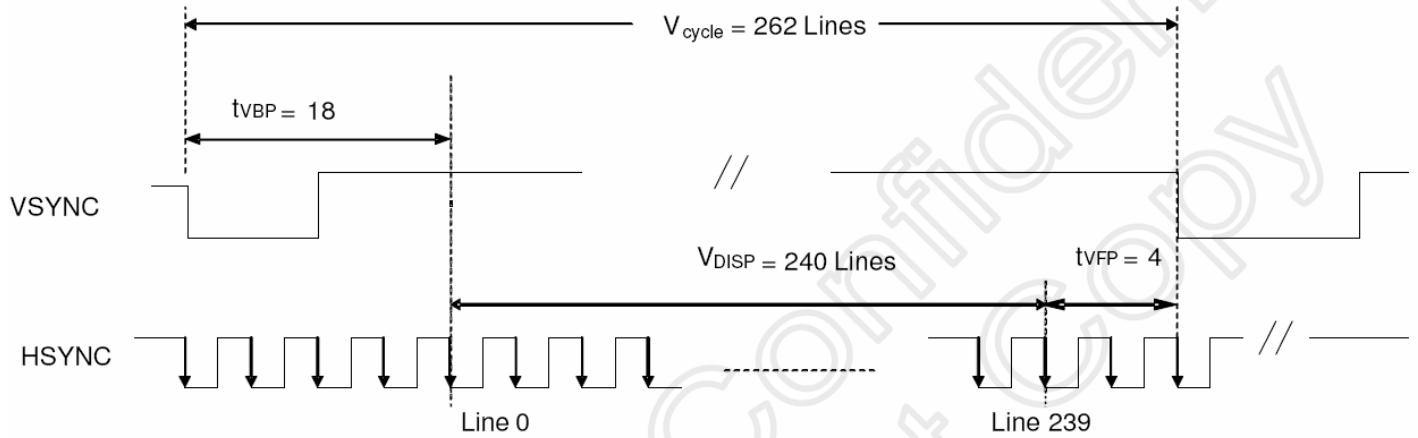
Note: External clock source must be provided to DOTCLK pin of HX8238-A. The driver will not operate if absent of the clocking signal.

Pixel timing

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



a) Horizontal Data Transaction Timing

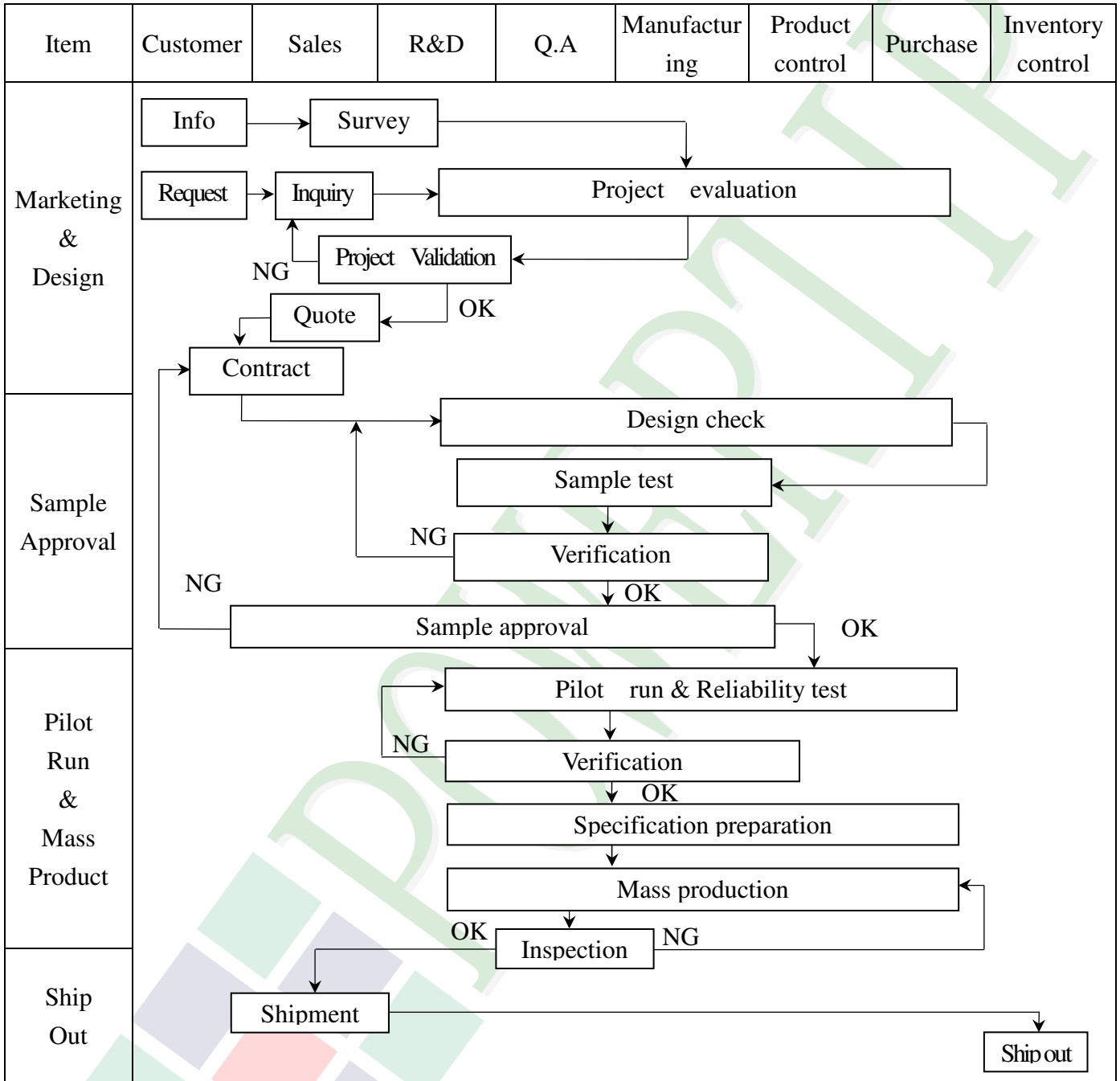


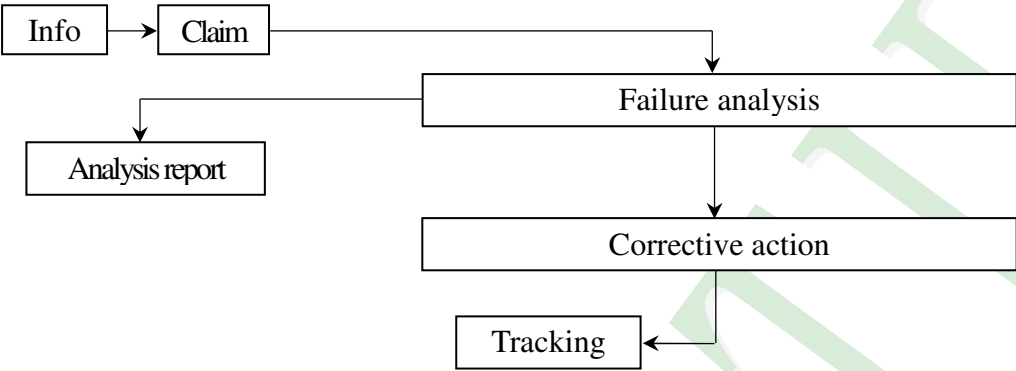
b) Vertical Data Transaction Timing

Data transaction timing in parallel RGB(24 bit)interface (SYNC mode)

### 3. QUALITY ASSURANCE SYSTEM

#### 3.1 Quality Assurance Flow Chart



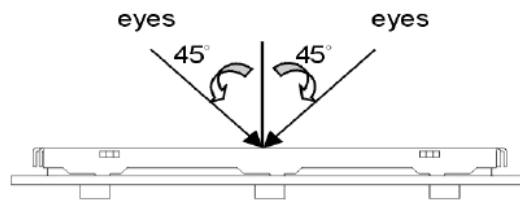
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD     Info[Info] --&gt; Claim[Claim]     Claim --&gt; Failure[Failure analysis]     Failure --&gt; Report[Analysis report]     Failure --&gt; Action[Corrective action]     Action --&gt; Tracking[Tracking]           </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

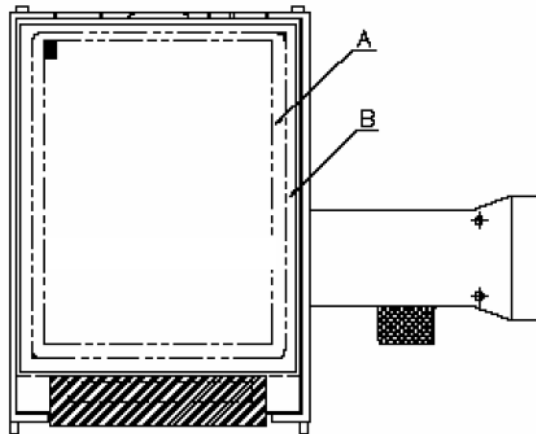
- ◆Scope : The document shall be applied to TFT-LCD Module for 3.5" ~10" (Ver.B01).
- ◆Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II.
- ◆Equipment : Gauge 、 MIL-STD 、 Powertip Tester 、 Sample
- ◆Defect Level : Major Defect AQL : 0.4 ; Minor Defect AQL : 1.5
- ◆OUT 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)



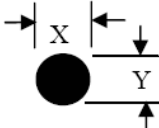
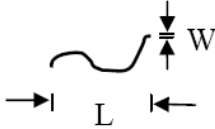
◆Specification For TFT-LCD Module 3.5" ~10" :

(Ver.B01)

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	<p>Dot defect (Bright dot、Dark dot)  On -display</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Item</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">Dot Defect</td> <td style="text-align: center;">Bright Dot</td> <td style="text-align: center;"><math>\leq 4</math></td> </tr> <tr> <td style="text-align: center;">Dark Dot</td> <td style="text-align: center;"><math>\leq 5</math></td> </tr> <tr> <td style="text-align: center;">Joint Dot</td> <td style="text-align: center;"><math>\leq 3</math></td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;"><math>\leq 7</math></td> </tr> </tbody> </table> <p>5. 1 Inspection pattern : full white , full black , Red , Green and blue screens. 5. 2 It is defined as dot defect if defect area <math>&gt; 1/2</math> dot. 5. 3 The distance between two dot defect <math>\geq 5</math> mm.</p>	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	$\leq 7$													

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

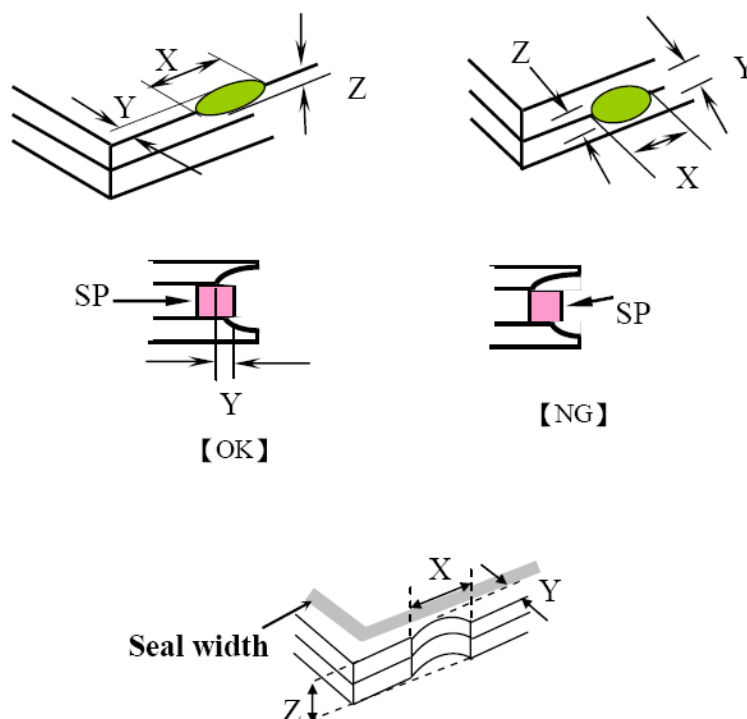
(Ver.B01)

NO	Item	Criterion	Level																																								
06	<p>Black or white dot、scratch、contamination</p> <p>Round type</p>  <p><math>\Phi = (x + y) / 2</math></p> <p>Line type</p> 	<p>6.1 Round type ( Non-display or display ) :</p> <table border="1" data-bbox="544 434 1302 840"> <thead> <tr> <th rowspan="2">Dimension (diameter : <math>\Phi</math>)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td><math>\Phi \leq 0.25</math></td> <td colspan="2">Ignore</td> </tr> <tr> <td><math>0.25 &lt; \Phi \leq 0.50</math></td> <td>5</td> <td rowspan="3">Ignore</td> </tr> <tr> <td><math>\Phi &gt; 0.50</math></td> <td>0</td> </tr> <tr> <td><b>Total</b></td> <td>5</td> </tr> </tbody> </table> <p>6.2 Line type( Non-display or display ) :</p> <table border="1" data-bbox="515 956 1331 1413"> <thead> <tr> <th rowspan="2">Length (L)</th> <th rowspan="2">Width (W)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>---</td> <td><math>W \leq 0.03</math></td> <td colspan="2">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> <td rowspan="3">Ignore</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 colspan="2">As round type</td> </tr> <tr> <td colspan="2"><b>Total</b></td> <td colspan="2">5</td> </tr> </tbody> </table>	Dimension (diameter : $\Phi$ )	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.25$	Ignore		$0.25 < \Phi \leq 0.50$	5	Ignore	$\Phi > 0.50$	0	<b>Total</b>	5	Length (L)	Width (W)	Acceptance (Q'ty)		A area	B area	---	$W \leq 0.03$	Ignore		$L \leq 10.0$	$0.03 < W \leq 0.05$	4	Ignore	$L \leq 5.0$	$0.05 < W \leq 0.10$	2	---	$W > 0.10$	As round type		<b>Total</b>		5		Minor
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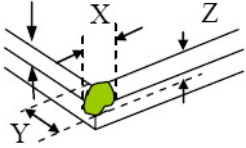
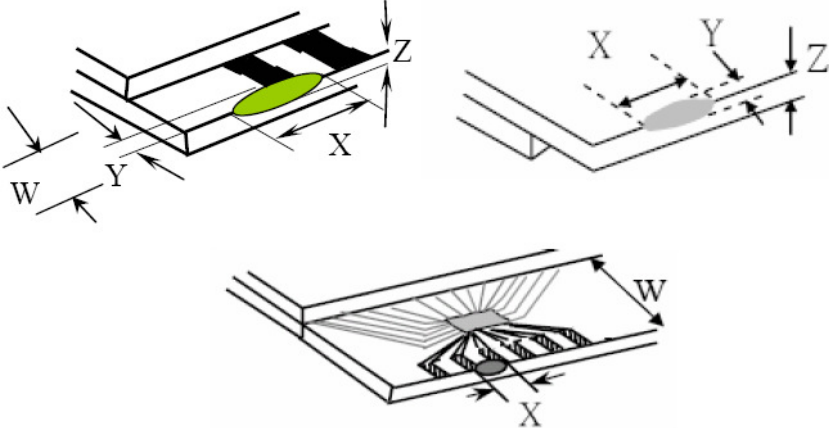
◆Specification For TFT-LCD Module 3.5" ~10" :

(Ver.B01)

NO	Item	Criterion	Level						
08	The crack of glass	<p>Symbols :</p> <p><b>X</b> : The length of crack                      <b>Y</b> : The width of crack.  <b>Z</b> : The thickness of crack                <b>W</b> : terminal length  <b>t</b> : The thickness of glass                 <b>a</b> : LCD side length</p>	Minor						
		<p>8.1 General glass chip :</p> <p>8.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="542 1568 1340 1859"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td><math>\leq a</math></td> <td>Crack can't enter viewing area</td> <td><math>\leq 1/2 t</math></td> </tr> <tr> <td><math>\leq a</math></td> <td>Crack can't exceed the half of SP width.</td> <td><math>1/2 t &lt; Z \leq 2 t</math></td> </tr> </tbody> </table>		X	Y	Z	$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$
X	Y	Z							
$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$							
$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$							

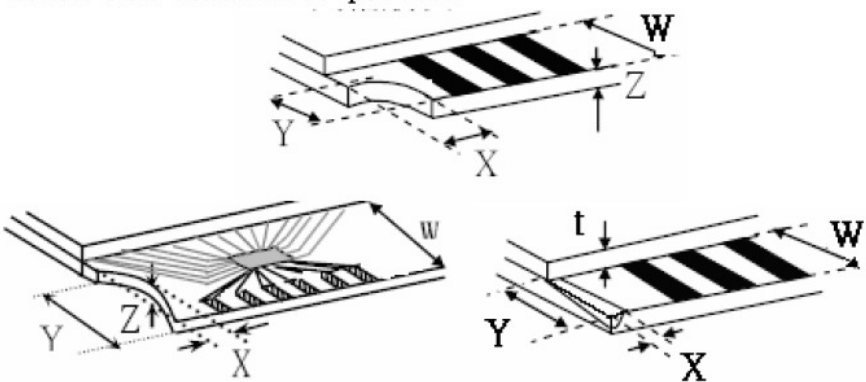
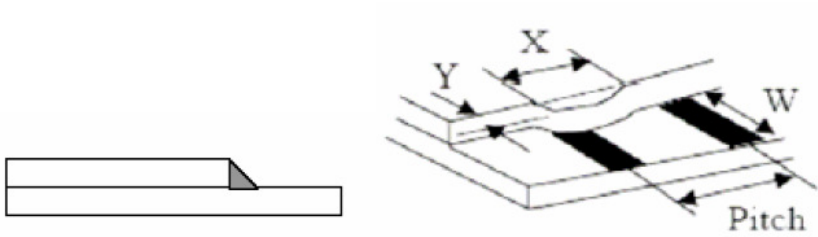
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(Ver.B01)

NO	Item	Criterion	Level												
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		<p>8.2 Protrusion over terminal :</p> <p>8.2.1 Chip on electrode pad :</p>  <table border="1" data-bbox="563 1688 1342 1861"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>Front</td> <td><math>\leq a</math></td> <td><math>\leq 1/2 W</math></td> <td><math>\leq t</math></td> </tr> <tr> <td>Back</td> <td><math>\leq a</math></td> <td><math>\leq W</math></td> <td><math>\leq 1/2 t</math></td> </tr> </tbody> </table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	$\leq a$	$\leq W$	$\leq 1/2 t$	Minor
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◆ Specification For TFT-LCD Module 3.5" ~10" :

(Ver.B01)

NO	Item	Criterion	Level									
08	The crack of glass	<p>Symbols :</p> <p>X : The length of crack                      Y : The width of crack.            Z : The thickness of crack                W : terminal length            t : The thickness of glass                 a : LCD side length</p>	Minor									
		<p>8.2.2 Non-conductive portion :</p>  <table border="1" data-bbox="630 974 1260 1131"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td><math>\leq 1/3 a</math></td> <td><math>\leq W</math></td> <td><math>\leq t</math></td> </tr> </table> <p>⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.</p> <p>8.2.3 Glass remain :</p>  <table border="1" data-bbox="550 1747 1244 1892"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td><math>\leq a</math></td> <td><math>\leq 1/3 W</math></td> <td><math>\leq t</math></td> </tr> </table>		X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$	X	Y	Z
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◆ Specification For TFT-LCD Module 3.5" ~10" :

(Ver.B01)

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 $\leq 1.5$ mm.	Minor



## 4. RELIABILITY TEST

### 4.1 Reliability Test Condition

(Ver.B01)

NO.	TEST ITEM	TEST CONDITION										
1	High Temperature Storage Test	Keep in +80 ±2℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.										
2	Low Temperature Storage Test	Keep in -30 ±2℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.										
3	High Temperature / High Humidity Storage Test	Keep in +60℃ / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)										
4	Temperature Cycling Storage Test	<div style="text-align: center;"> <math display="block">-30^{\circ}\text{C} \xrightarrow{(30\text{mins})} +25^{\circ}\text{C} \xrightarrow{(5\text{mins})} +80^{\circ}\text{C} \xrightarrow{(30\text{mins})} +25^{\circ}\text{C} \xrightarrow{(5\text{mins})}</math> <p>← 10 Cycle →</p> </div> Surrounding temperature, then storage at normal condition 4hrs.										
5	ESD Test	<b>Air Discharge:</b> Apply 2 KV with 5 times Discharge for each polarity +/-										
		<b>Contact Discharge:</b> Apply 250 V with 5 times discharge for each polarity +/-										
		1. Temperature ambience : 15℃ ~ 35℃ 2. Humidity relative : 30% ~ 60% 3. Energy Storage Capacitance(Cs+Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330Ω±10% 5. Discharge, mode of operation : Single Discharge (time between successive discharges at least 1 sec) (Tolerance if the output voltage indication : ±5%)										
6	Vibration Test (Packaged)	1. Sine wave 10~55 Hz frequency (1 min/sweep) 2. The amplitude of vibration :1. 5 mm 3. Each direction (X、Y、Z) duration for 2 Hrs										
7	Drop Test (Packaged)	<table border="1" style="width: 100%;"> <thead> <tr> <th>Packing Weight (Kg)</th> <th>Drop Height (cm)</th> </tr> </thead> <tbody> <tr> <td>0 ~ 45.4</td> <td>122</td> </tr> <tr> <td>45.4 ~ 90.8</td> <td>76</td> </tr> <tr> <td>90.8 ~ 454</td> <td>61</td> </tr> <tr> <td>Over 454</td> <td>46</td> </tr> </tbody> </table>	Packing Weight (Kg)	Drop Height (cm)	0 ~ 45.4	122	45.4 ~ 90.8	76	90.8 ~ 454	61	Over 454	46
		Packing Weight (Kg)	Drop Height (cm)									
0 ~ 45.4	122											
45.4 ~ 90.8	76											
90.8 ~ 454	61											
Over 454	46											
	Drop Direction : ※1 corner / 3 edges / 6 sides each 1time											

## 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

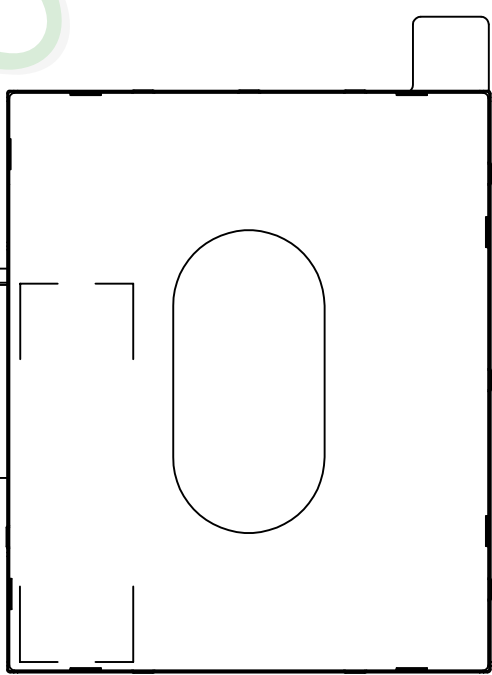
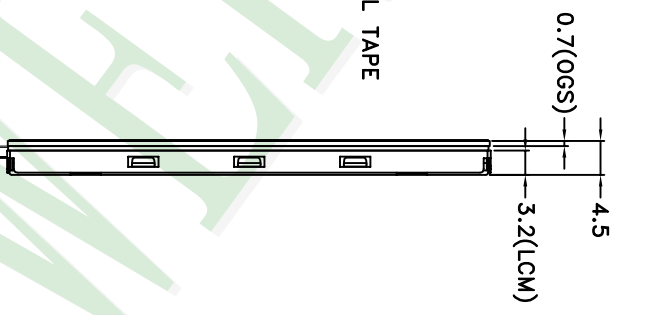
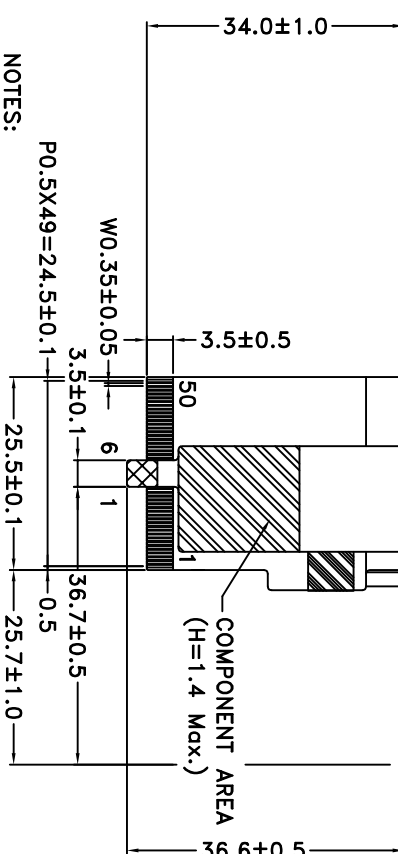
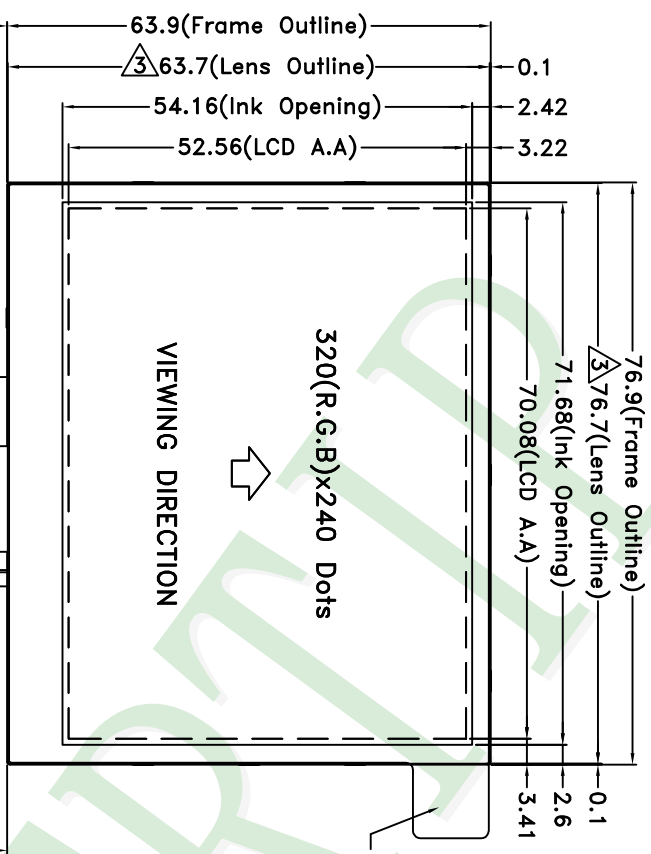
- 5.2.1 Avoid any strong mechanical shock which can break the glass.
- 5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.
- 5.2.3 Do not remove the panel or frame from the module.
- 5.2.4 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  $320 \pm 10^{\circ}\text{C}$  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.



NOTES:  
 1. LCD TYPE: a-Si TFT  
 2. LCD DISPLAY: POSITIVE / TRANSMISSIVE  
 3. The tolerance unless classified  $\pm 0.3\text{mm}$

4. LCD FPC Matching Connector: Kyocera 08 6282 050 340 829+ or EQUIVALENT  
 5. CTP FPC Matching Connector: Kyocera 08 6260 006 340 829+ or EQUIVALENT

007				
006				
005				
004				
003	MODIFY CTP DIMENSION	Stone	2016/02/26	
002	ADD DIMENSION	Stone	2015/11/26	
001	NEW DRAWING	Stone	2015/11/19	
REV	REV BY	REVISER	DATE	

PART NO:	PH320240T023-IBC01
DRAWING NAME:	LMD-PH320240T023-IBC01
TITLE:	LCD MODULE DRAWING

Design	Stone	久正光電股份有限公司 POWER TIP TECHNOLOGY CORPORATION	Surface	Unit	MM	Material	Thickness	Quantity	Precision Level
Check	Sarn								
Approve	Oliver								

Ver.002

Documents NO.

PKG-PH320240T023-IBC01

# LCM包裝規格書

## LCM Packaging Specifications

Approve

Check

Contact

Oliver

Oliver

Stone

### 1. 包裝材料規格表 (Packaging Material) : (per carton)

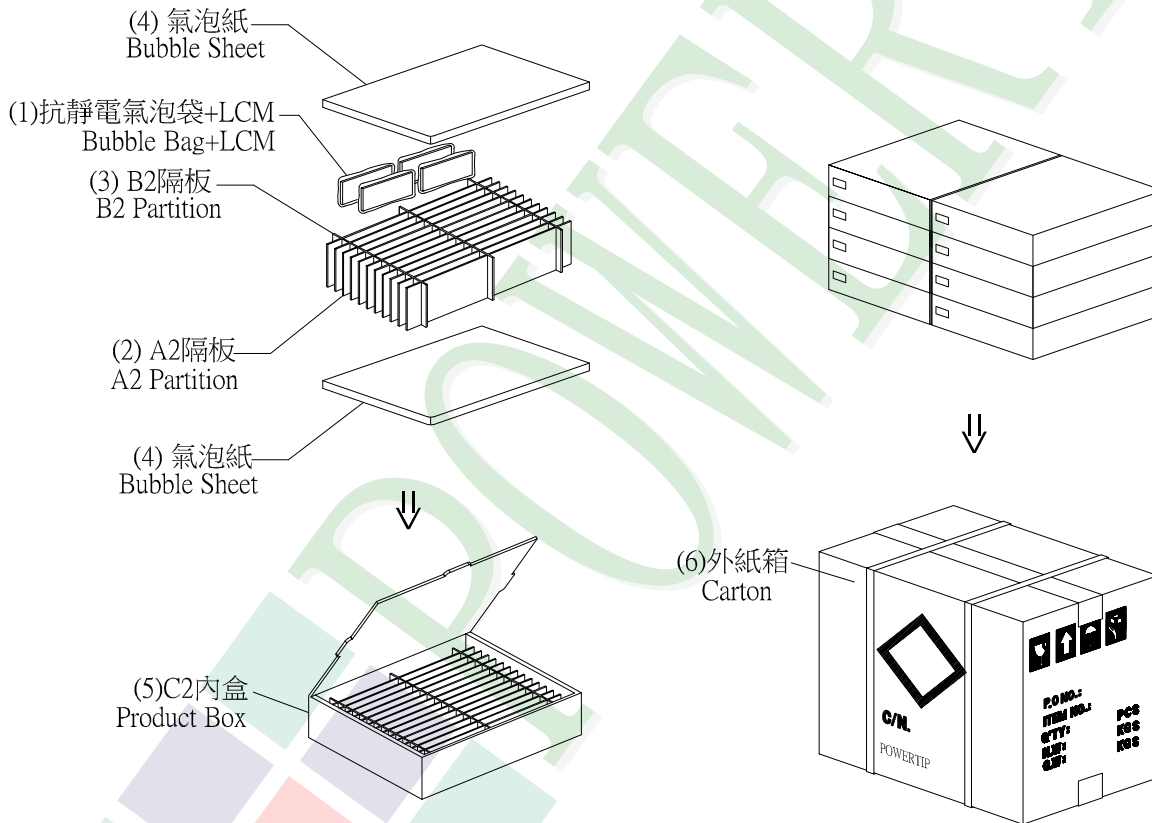
No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH320240T023-IBC01	76.9 X 63.9	0.038	160	6.08
2	抗靜電氣泡袋(1)Bubble Bag	BAG0000000005	150 X 120	0.002	160	0.32
3	A2隔板(2)A2 Partition	BX29300070BMBA	293 X 70 X 2.5	0.011	88	0.968
4	B2隔板(3)B2 Partition	BX24500070BLBA	245 X 70 X 2.5	0.01	24	0.24
5	氣泡紙(4)Bubble Sheet	BAG280240BWABA	280 X 240	0.006	16	0.096
6	C2內盒(5)Product Box	BX31025580AABA	310 X 255 X 80	0.221	8	1.768
7	外紙箱(6)Carton	BX52732536CCBA	527 X 325 X 360	1.092	1	1.092
8						
9						

2. 一整箱總重量 (Total LCD Weight in carton) : 10.57 Kg $\pm$ 10%

3. 單箱數量規格表 (Packaging Specifications and Quantity) :

(1)Quantity Of Spacer : A2隔板 X 11 , B2隔板 X 3

(2)Total LCM quantity in carton : quantity per box 20 x no of boxes 8 = 160

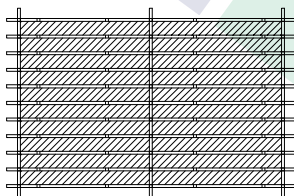


### 特記事項 (REMARK)

1. LCM排放示意圖(前後間隔不放置):

1. LCM placed as figure showing:

( First and last slot should be empty)



▨ 模組(LCM) X 1pcs.