



SPECIFICATIONS

CUSTOMER	:	CHC245
SAMPLE CODE	:	SH240320T062-LAA11
MASS PRODUCTION CODE	:	PH240320T062-LAA11 (59-606000-000-001)
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	JLMD- PH240320T062-LAA11_001
PACKAGING NO. (Ver.)	:	JPKG- PH240320T062-LAA11_001

Customer Approved

Date:

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

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Note: For detailed information please refer to IC data sheet: ILI9340X

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	240 (RGB) * 320 Dots
LCD Type	α -Si TFT, Normally white, Transmissive type
Screen size(inch)	2.4 inch
Viewing Direction	12 O'clock
Color configuration	RGB-Strip
Display Colors	Full Color: 262K (RGB= 666, Idle Mode Off)
Interface	8-bit 80-system MCU
Other(controller / driver IC)	ILI9340X
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : http://www.powertip.com.tw/news.php?area_id_view=1085560481/

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	42.0 (W) * 58.0 (L) * 2.5 (H)	mm

LCD Panel

Item	Standard Value	Unit
Viewing Area	37.72 (W) * 49.96 (L)	mm
Active Area	36.72 (W) * 48.96 (L)	mm
Pixel size	0.153(W) * 0.153(H)	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	-	-0.3	+4.0	V
	VGH ~ VGL	-	-0.3	+30.0	V
Logic Input Voltage Range	VIN	-	-0.3	VDD+0.5	V
Operating Temperature	T _{OP}	-	-20	+70	°C
Storage Temperature	T _{ST}	-	-30	+80	°C
Storage Humidity	H _D	T _a ≤ 60 °C	20	90	%RH

1.4 DC Electrical Characteristics

Module

GND = 0V, T_a = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for System	VDD	-	2.5	2.8	3.3	V
Input Signal Voltage	V _{IH}	-	0.7*VDD	-	VDD	V
	V _{IL}	-	GND	-	0.3*VDD	V
Output Signal Voltage	V _{OH}	I _{OH} =-0.1mA	0.8*VDD	-	VDD	V
	V _{OL}	I _{OL} =0.1mA	GND	-	0.2*VDD	V
Supply Current	I _{DD}	VDD=2.8V	-	12	18	mA

1.5 Optical Characteristics

TFT LCD Panel

VDD= 2.8 V, Ta=25°C

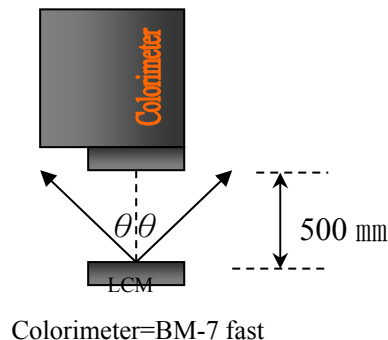
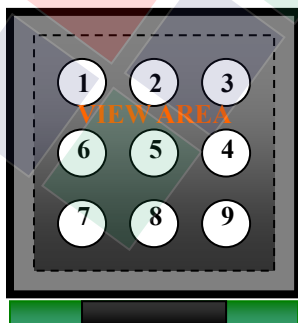
Item	Symbol	Condition	Min.	Typ.	Max.	unit		
Response time	$T_r + T_f$	-	-	25	38	ms	Note 2	
Viewing angle	Top	$\Theta+$	CR \geq 10	-	60	-	Deg.	Note 1
	Bottom	$\Theta-$		-	60	-		
	Left	ΘL		-	60	-		
	Right	ΘR		-	60	-		
Contrast ratio	CR		500	600	-	-	Note 3	
Color of CIE Coordinate (B/L & LCD)	White	x	IF=45mA	0.23	0.28	0.33	-	Note4
		y		0.25	0.30	0.35		
	Red	x		0.54	0.59	0.64		
		y		0.29	0.34	0.39		
	Green	x		0.29	0.34	0.39		
		y		0.56	0.61	0.66		
	Blue	x		0.10	0.15	0.20		
		y		0.01	0.06	0.11		
Average Brightness Pattern=white display (BL & LCD)*1	IV	IF= 45mA	220	270	-	cd/m ²		
Uniformity (BL & LCD)*2	ΔB	IF=45mA	80	-	-	%		

Note 4 :

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

2 : Measurement Condition for Optical Characteristics:

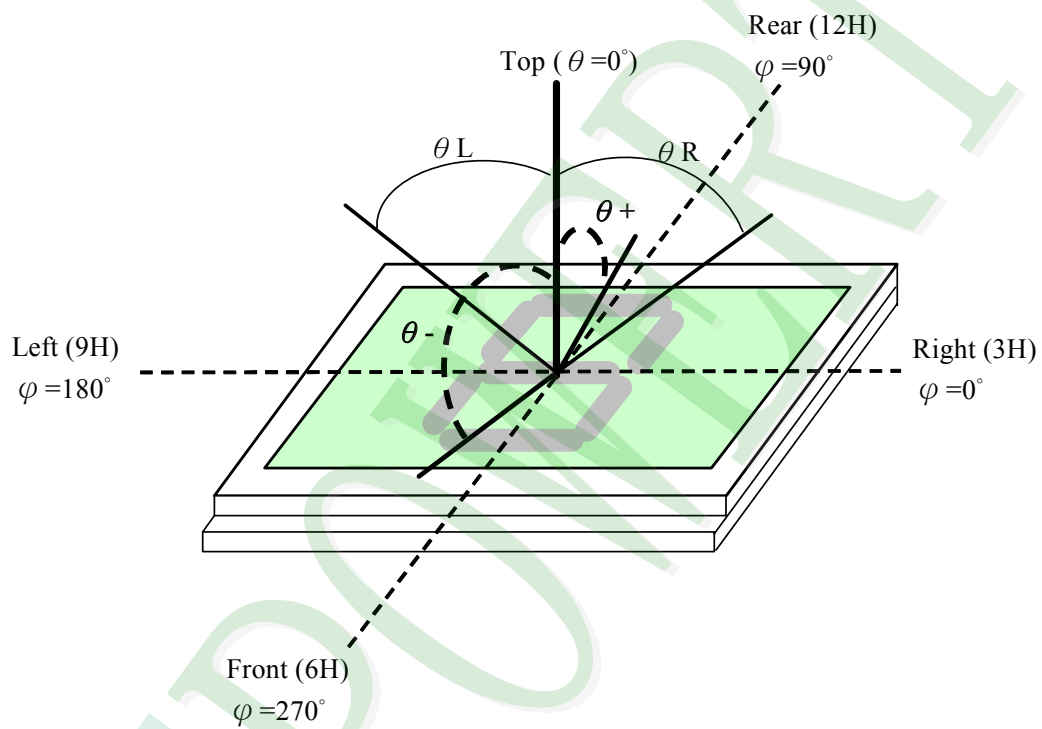
- a : Environment: 25°C±5°C / 60±20%R.H , no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.
- b : Measurement Distance: 500 ± 50 mm , ($\theta = 0^\circ$)
- c : Equipment: TOPCON BM-7 fast , (field 1°) , after 10 minutes operation.
- d : The uncertainty of the C.I.E coordinate measurement ±0.01 , Average Brightness ± 4%



Note 1.

Optical characteristics-2

Viewing angle

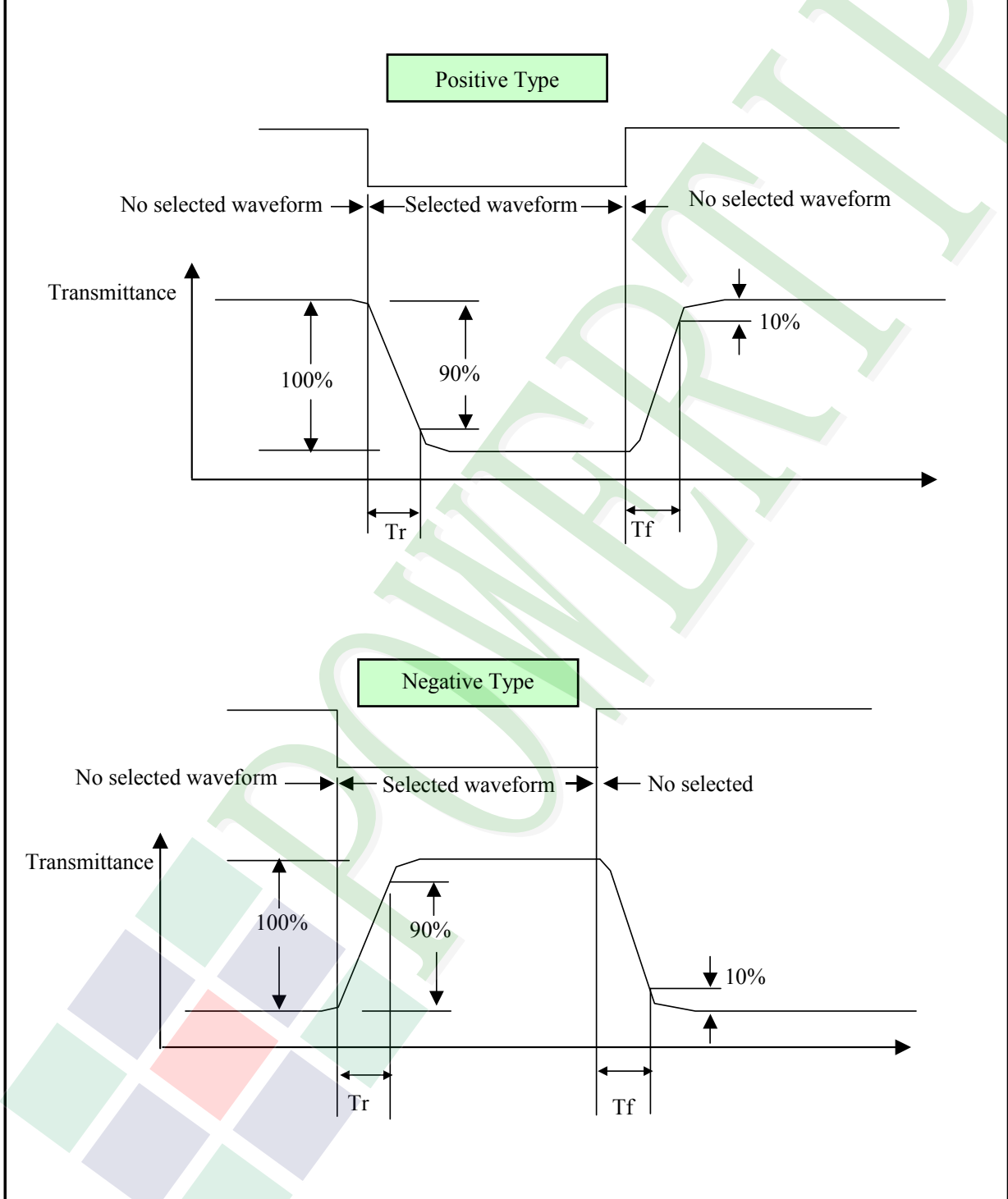


Viewing angle

Note 2.

Optical characteristics-3

Fig.2 Definition of response time



Electrical characteristics-2

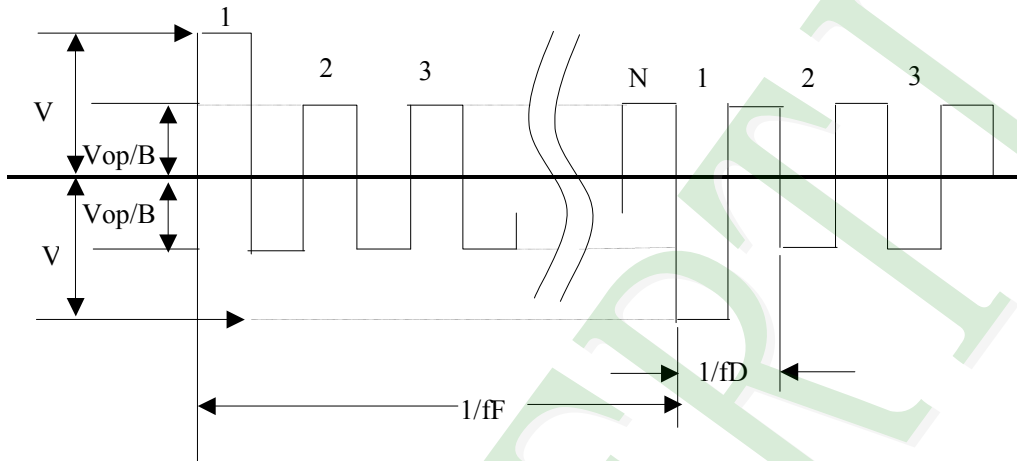
※2 Drive waveform

Vop: Drive voltage fF: Frame frequency

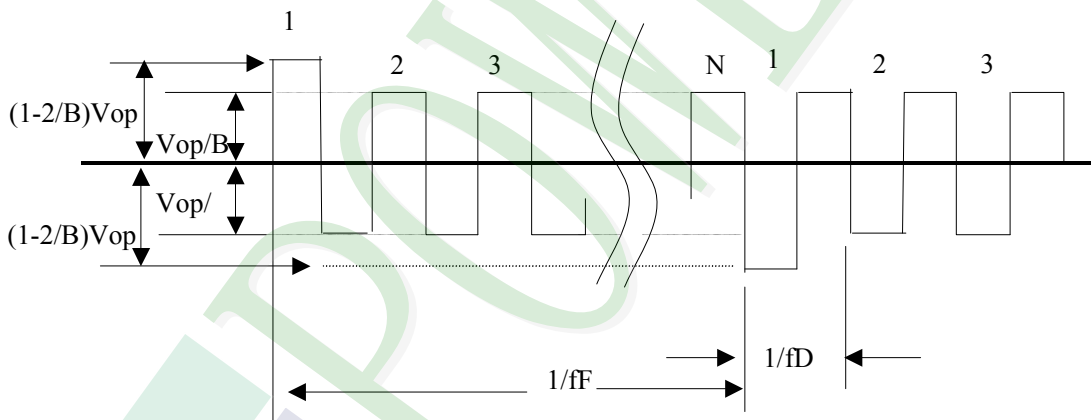
1/B: Bias fD: Drive frequency

N: Duty

(1) Selected waveform



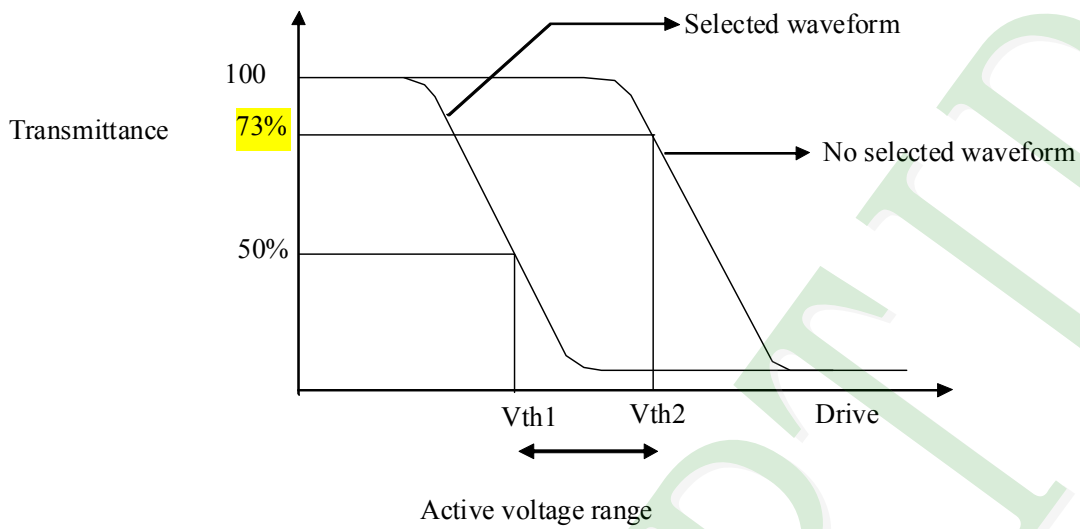
(2) Non- Selected wave form



Note:

Frame frequency is defined as follows: Common side supply voltage peak - to - peak / 2 = 1 period

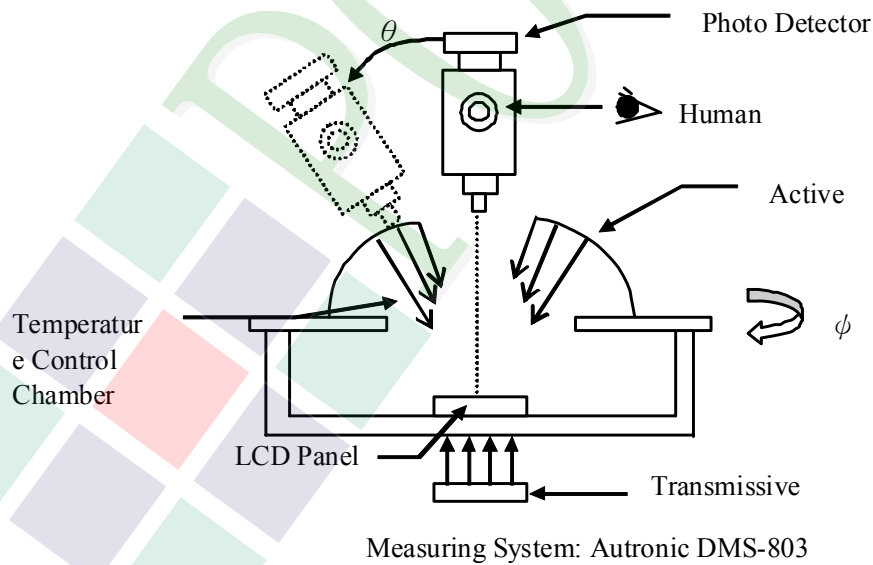
Note 3. : Definition of Vth



	Vth1	Vth2
View direction	10°	40°
Drive waveform	(Selected waveform)	(No selected waveform)
Transmittance	50%	73%

※1 Contrast ratio
 = (Brightness in OFF state) / (Brightness in ON state)

Outline of Electro-Optical Characteristics Measuring System



1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit	Remark
LED Forward Current	IF	Ta =25°C	-	30	mA	Each LED
LED Reverse Voltage	VR	Ta =25°C	-	5	V	Each LED
Power Dissipation	PD	Ta =25°C	-	139.5	mW	-

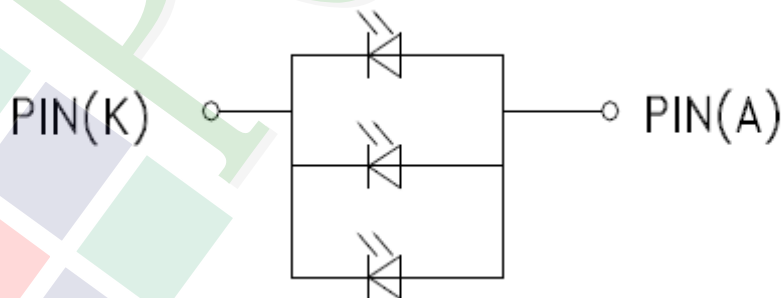
Backlight Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=45mA	2.8	3.0	3.1	V
Average Brightness	IV		5000	5500	-	cd/m ²
CIE Color Coordinate	X		0.26	0.28	0.31	-
	Y		0.26	0.28	0.31	
Color	White					

LED Specification:

1. LED Model: CBS206W
2. Bin Range of Forward Voltage: 5-2,6-1(2.8V~3.1V)
3. Bin Range of Luminous Intensity: Bin 43/44(5000~8000mcd)
4. Bin Range of Chromaticity Coordinates Block: C/E

Internal Circuit Diagram :



Other Description

Item	Conditions	Description
Life Time*1	Ta =25°C IF= 45mA	20,000 hrs

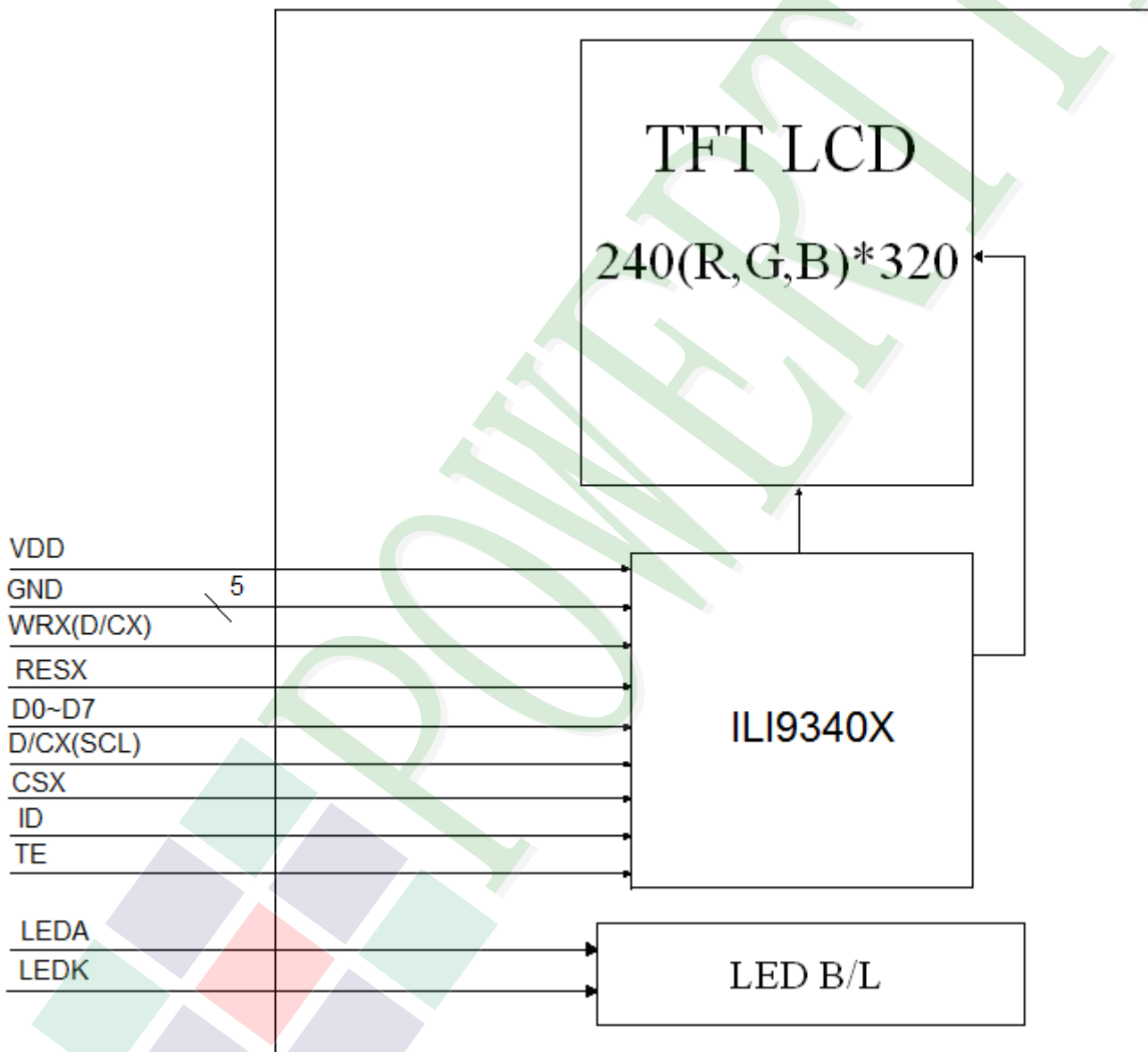
2. MODULE STRUCTURE

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	GND	System Ground
2	LEDA	LED Anode
3	LEDK	LED Cathode
4	VDD	Power Supply for System
5	D/CX	This pin is used to select "Data or Command" in the parallel interface. When DCX = "1", data is selected. When DCX = "0", command is selected. If it's not used, this pin should be connected to IOVCC or Ground.
6	CSX	Chip select input pin ("Low" enable). This pin can be permanently fixed "Low" state in MPU interface mode only.
7	WRX	Serves as a write signal and writes data at the rising edge. Fix to IOVCC or GND level when not in use.
8	GND	System Ground
9	D7	Data bus.
10	D6	Data bus.
11	D5	Data bus.
12	D4	Data bus.
13	GND	System Ground
14	D3	Data bus.
15	D2	Data bus.
16	D1	Data bus.
17	D0	Data bus.
18	GND	System Ground
19	RESX	This signal will reset the device and must be applied properly to initialize the chip. Signal is active low.
20	ID	Directly connect to GND, without component.
21	TE	Tearing effect output pin to synchronize MPU to frame writing, activated by S/W command. When this pin is not activated, this pin is low. If not used, open this pin.
22	GND	System Ground

2.2.1 Refer Initial Code

```
void LCD_Init(void)
{

    LCD_WR_REG(0x01);

    delay_ms(120);

    LCD_WR_REG(0xB1); // 0xB1 Frame Rate Control
    LCD_WR_DATA(0x00);
    LCD_WR_DATA(0x1F);

    LCD_WR_REG(0xB4); // Display Inversion Control
    LCD_WR_DATA(0x80);
    LCD_WR_DATA(0x00);

    LCD_WR_REG(0xB6);
    LCD_WR_DATA(0x0a);
    LCD_WR_DATA(0x42);
    LCD_WR_DATA(0x27);
    LCD_WR_DATA(0x04);

    LCD_WR_REG(0x36);
    LCD_WR_DATA(0x40);

    LCD_WR_REG(0xB7); // VGH & VGL Control
    LCD_WR_DATA(0xFF);
    LCD_WR_DATA(0x44);
    LCD_WR_DATA(0x04);
    LCD_WR_DATA(0x44);
    LCD_WR_DATA(0x04);
    LCD_WR_DATA(0x02); // VGH
    LCD_WR_DATA(0x04); // VGL

    LCD_WR_REG(0xBA); // Power Control
    LCD_WR_DATA(0x52); // VCOM
    LCD_WR_DATA(0x1B); // VRH
    LCD_WR_DATA(0x21); // VDV

    LCD_WR_REG(0xBB); // Power Control 2
    LCD_WR_DATA(0x74); // VGH & VGL
    LCD_WR_DATA(0x66); // DDVDH & DDVDL
    LCD_WR_DATA(0x33); // DDVDH2 & DDVDL2

    LCD_WR_REG(0xCD); // Pump Frequency Selection
    LCD_WR_DATA(0x44); // DDVDH Frequency
    LCD_WR_DATA(0x44); // DDVDL Frequency
    LCD_WR_DATA(0x44); // VGH & VGL Frequency
```

```
LCD_WR_REG(0xE8); // Source Timing 1
LCD_WR_DATA(0x11);
LCD_WR_DATA(0x11);
LCD_WR_DATA(0x33); // EQTI & EQTE
LCD_WR_DATA(0x33); // PC1TI & PC1TE
LCD_WR_DATA(0x55); // CRTI & CRTE
```

```
LCD_WR_REG(0xE9); // Source Timing 2
LCD_WR_DATA(0x40);
LCD_WR_DATA(0x84);
LCD_WR_DATA(0x65);
LCD_WR_DATA(0x30);
LCD_WR_DATA(0xC0);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0xFF);
LCD_WR_DATA(0x33); // SAP1 & SAP2
LCD_WR_DATA(0x88); // PC2TH & PC2TL
```

```
LCD_WR_REG(0xEA); // Gate Control
LCD_WR_DATA(0x02);
LCD_WR_DATA(0x22);
LCD_WR_DATA(0x3F);
LCD_WR_DATA(0x82);
LCD_WR_DATA(0x04);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
```

```
LCD_WR_REG(0xF2); // Low Power Frequency Control
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
```

```
LCD_WR_REG(0xF5); // Advance Gamma Correction
LCD_WR_DATA(0x00);
```

```
LCD_WR_REG(0xE4); // P Gamma
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x10);
LCD_WR_DATA(0x15);
LCD_WR_DATA(0x0a);
LCD_WR_DATA(0x1b);
LCD_WR_DATA(0x09);
LCD_WR_DATA(0x3c);
LCD_WR_DATA(0x5a);
LCD_WR_DATA(0x49);
LCD_WR_DATA(0x07);
LCD_WR_DATA(0x0E);
LCD_WR_DATA(0x0d);
LCD_WR_DATA(0x1a);
LCD_WR_DATA(0x1e);
LCD_WR_DATA(0x0F);
```

```
LCD_WR_REG(0xE5); // N Gamma
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x10);
LCD_WR_DATA(0x15);
LCD_WR_DATA(0x0a);
LCD_WR_DATA(0x1b);
LCD_WR_DATA(0x09);
LCD_WR_DATA(0x3c);
LCD_WR_DATA(0x5a);
LCD_WR_DATA(0x49);
LCD_WR_DATA(0x07);
LCD_WR_DATA(0x0E);
LCD_WR_DATA(0x0d);
LCD_WR_DATA(0x1a);
LCD_WR_DATA(0x1e);
LCD_WR_DATA(0x0F);

LCD_WR_REG(0xBC); // Power Control 3
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x10);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x10);
LCD_WR_DATA(0x0B);

LCD_WR_REG(0x3A);
LCD_WR_DATA(0x05); // 05=RGB565, 06=RGB666

LCD_WR_REG(0x2a);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0xef);

LCD_WR_REG(0x2b);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x01);
LCD_WR_DATA(0x3f);

LCD_WR_REG(0x35); // For Output TE Signal
LCD_WR_DATA(0x00);

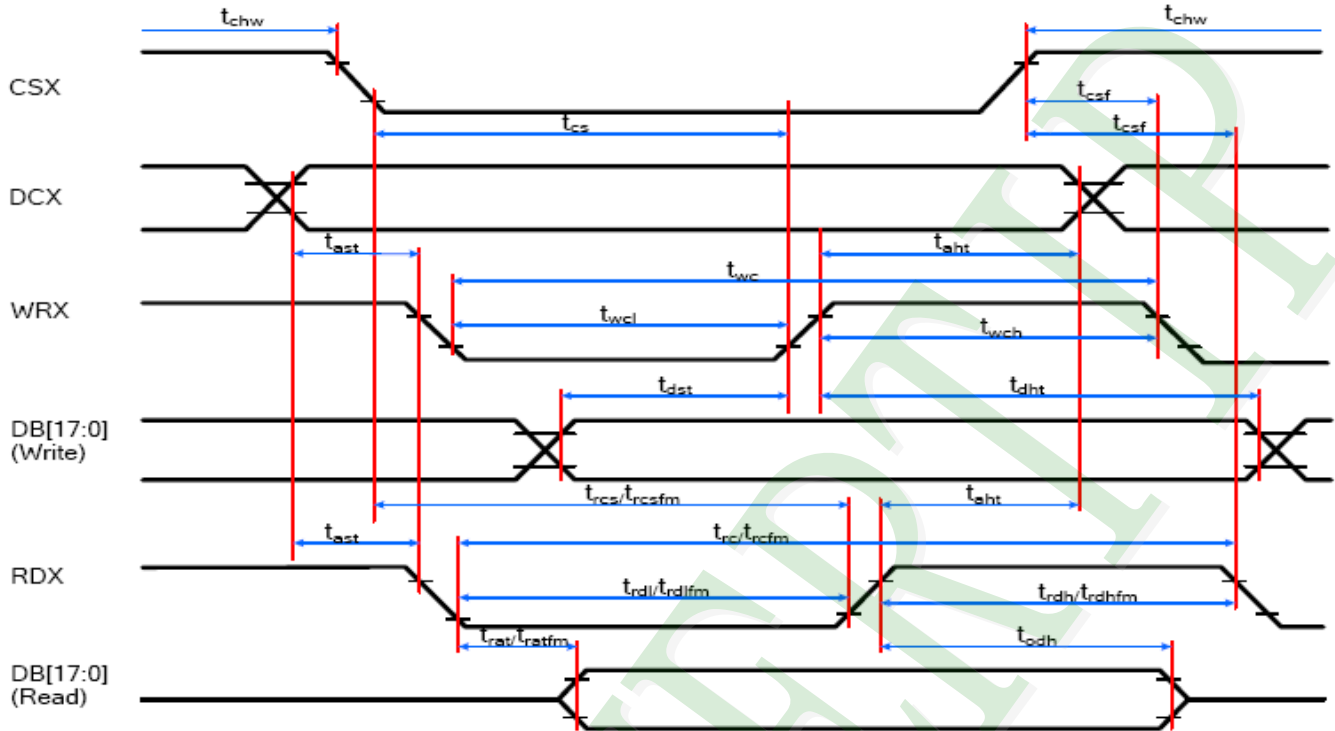
LCD_WR_REG(0x11); // Sleep Out
delay_ms(120);

LCD_WR_REG(0x29); // Display On

LCD_WR_REG(0x2C);
delay_ms(20);
}
```


2.3 Timing Characteristics

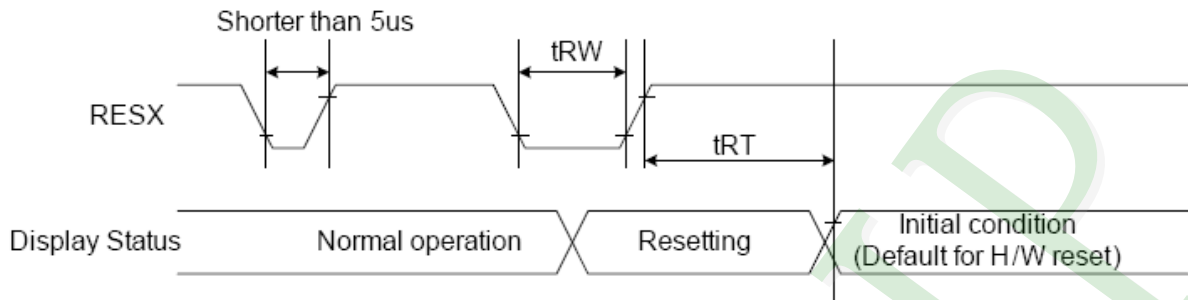
8080 Series MCU Parallel Interface Characteristics: 8-bit Bus



Signal	Symbol	Parameter	min	max	Unit	Description
DCX	tast	Address setup time	0	-	ns	
	taht	Address hold time (Write/Read)	10	-	ns	
CSX	tchw	CSX "H" pulse width	0	-	ns	
	tcs	Chip Select setup time (Write)	15	-	ns	
	trcs	Chip Select setup time (Read ID)	45	-	ns	
	trcsfm	Chip Select setup time (Read FM)	355	-	ns	
	tcsf	Chip Select Wait time (Write/Read)	10	-	ns	
WRX	twc	Write cycle	66	-	ns	
	twrh	Write Control pulse H duration	15	-	ns	
	twrl	Write Control pulse L duration	15	-	ns	
RDX (FM)	trcfm	Read Cycle (FM)	450	-	ns	
	trdhfm	Read Control H duration (FM)	90	-	ns	
	trdlfm	Read Control L duration (FM)	355	-	ns	
RDX (ID)	trc	Read cycle (ID)	160	-	ns	
	trdh	Read Control pulse H duration	90	-	ns	
	trdl	Read Control pulse L duration	45	-	ns	
DB[17:0], DB[16:0], DB[8:0], DB[7:0] DB[17:10], DB[8:1] DB[17:0]	tdst	Write data setup time	10	-	ns	For maximum CL=30pF For minimum CL=8pF
	tdht	Write data hold time	10	-	ns	
	trat	Read access time	-	40	ns	
	trafm	Read access time	-	340	ns	
	todh	Read output disable time	20	80	ns	

Note: $T_a = -30$ to 80 °C, $I_{OVCC} = 1.65V$ to $3.3V$, $V_{CI} = 2.5V$ to $3.3V$, $GND = 0V$

Reset Tinting



Signal	Symbol	Parameter	Min	Max	Unit
RESX	tRW	Reset pulse duration	10		uS
	tRT	Reset cancel		5 (note 1,5)	mS
				120 (note 1,6,7)	mS

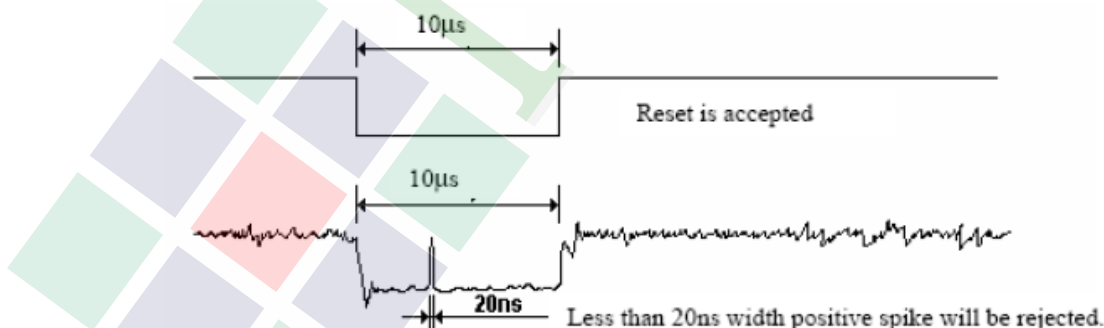
Note 1: The reset cancel includes also required time for loading ID bytes, VCOM setting and other settings from NV memory to registers. This loading is done every time when there is HW reset cancel time (tRT) within 5 ms after a rising edge of RESX.

Note 2: Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below: -

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 10us	Reset
Between 5us and 10us	Reset starts

Note 3: During the Resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode.) And then return to Default condition for Hardware Reset.

Note 4: Spike Rejection also applies during a valid reset pulse as shown below:



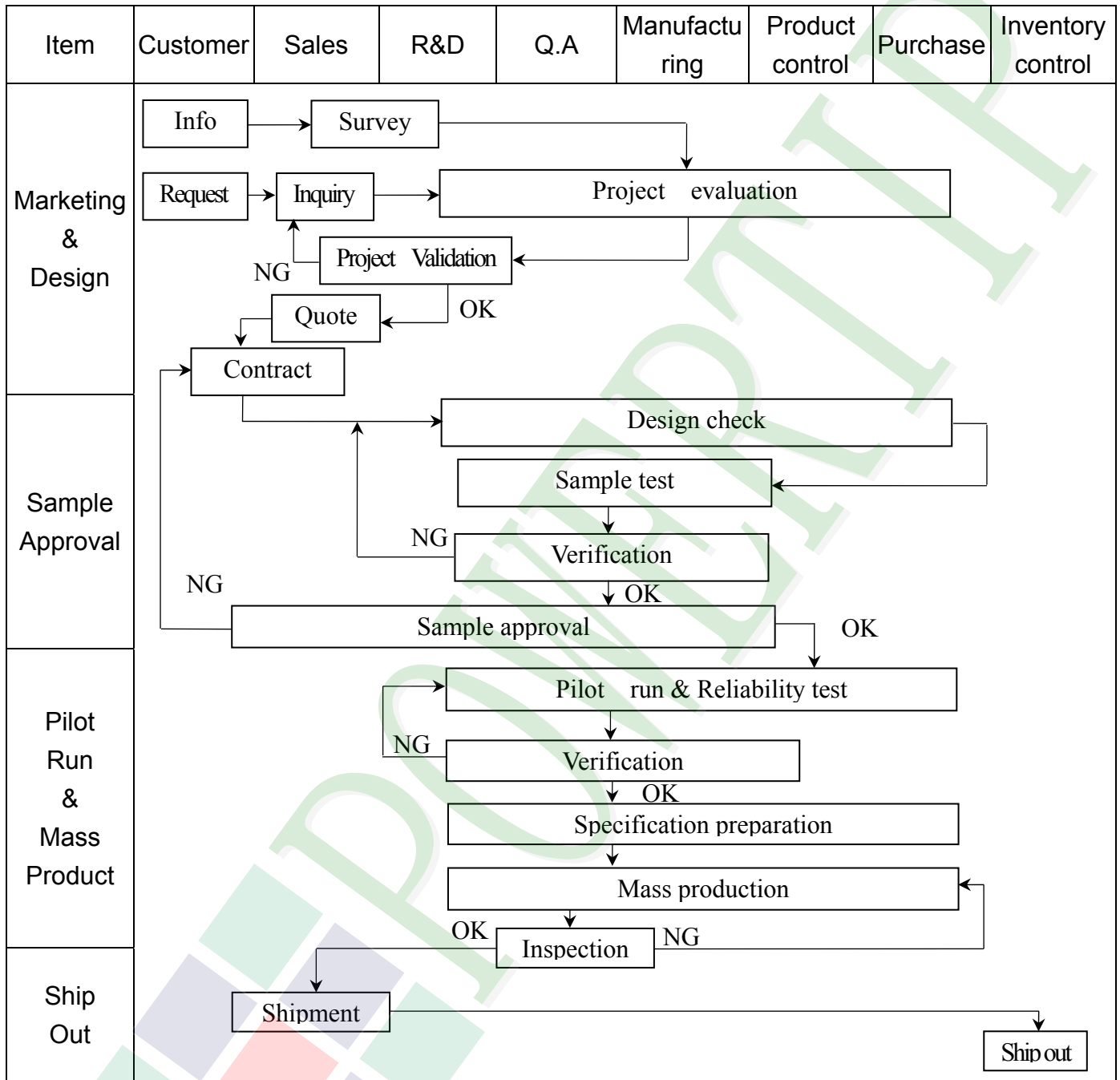
Note 5: When Reset applied during Sleep In Mode.

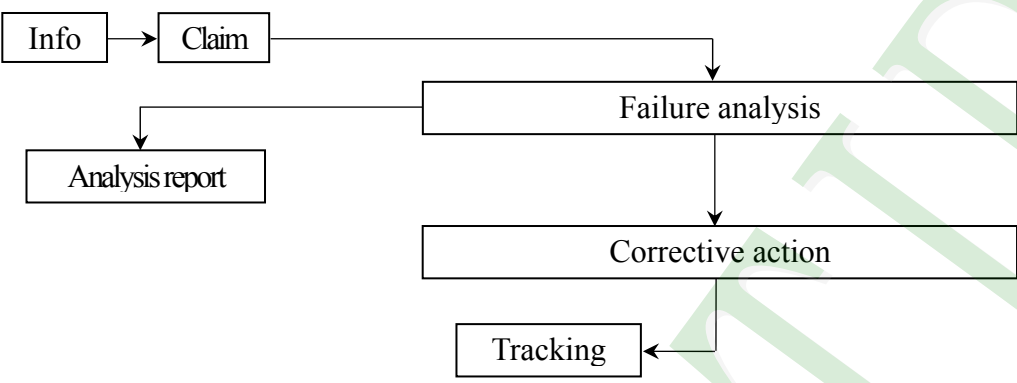
Note 6: When Reset applied during Sleep Out Mode.

Note 7: It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



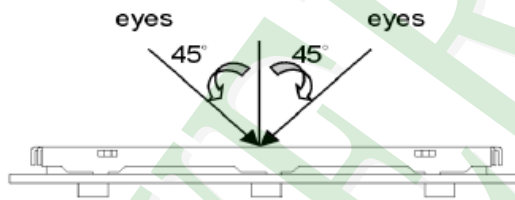
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD Info[Info] --> Claim[Claim] Claim --> Failure[Failure analysis] Failure --> Report[Analysis report] Failure --> Action[Corrective action] Action --> Tracking[Tracking] </pre>							
Q.A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

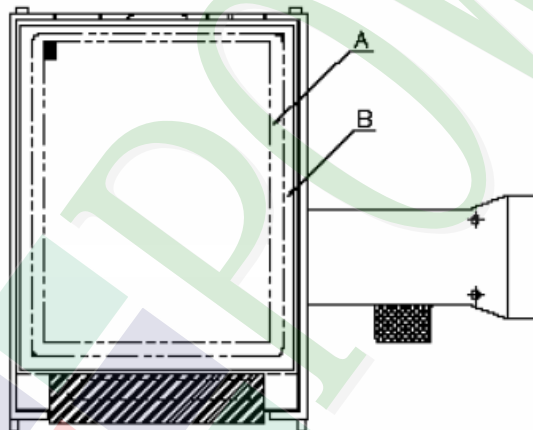
- ◆ Scope : The document shall be applied to TFT-LCD Module for less than 3.5" (Ver.B01).
- ◆ Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II .
- ◆ Equipment : Gauge 、 MIL-STD 、 Powertip Tester 、 Sample
- ◆ Defect Level : Major Defect AQL : 0.4 ; Minor Defect AQL :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

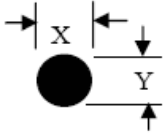
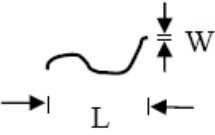
◆ Specification For TFT-LCD Module Less Than 3.5" :

(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	Dot defect (Bright dot 、 Dark dot) On -display	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>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>Bright Dot</td> <td style="text-align: center;">≤ 2</td> </tr> <tr> <td>Dark Dot</td> <td style="text-align: center;">≤ 3</td> </tr> <tr> <td>Joint Dot</td> <td style="text-align: center;">≤ 2</td> </tr> <tr> <td>Total</td> <td style="text-align: center;">≤ 3</td> </tr> </tbody> </table>		Item	Acceptance (Q'ty)	Dot Defect	Bright Dot	≤ 2	Dark Dot	≤ 3	Joint Dot	≤ 2	Total	≤ 3	Minor
			Item	Acceptance (Q'ty)											
		Dot Defect	Bright Dot	≤ 2											
			Dark Dot	≤ 3											
			Joint Dot	≤ 2											
Total	≤ 3														
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 ≥ 5 mm.															

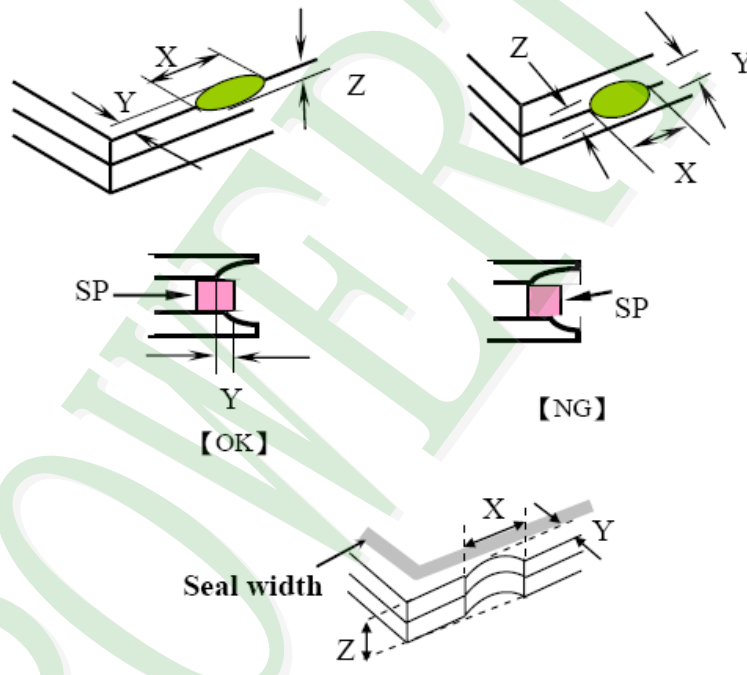
◆ Specification For TFT-LCD Module Less Than 3.5" :

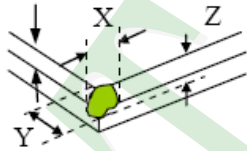
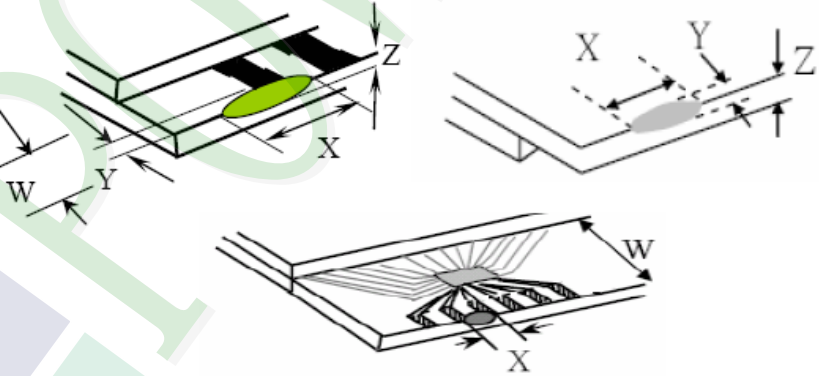
(Ver.B01)

NO	Item	Criterion	Level																																								
06	<p>Black or white dot、scratch、contamination</p> <p>Round type</p>  <p>$\Phi = (x + y) / 2$</p> <p>Line type</p> 	<p>6.1 Round type (Non-display or display) :</p> <table border="1" data-bbox="552 421 1321 875"> <thead> <tr> <th rowspan="2">Dimension (diameter : Φ)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.15$</td> <td colspan="2">Ignore</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.20$</td> <td>2</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.30$</td> <td>2</td> </tr> <tr> <td>$\Phi > 0.30$</td> <td>0</td> </tr> <tr> <td>Total</td> <td colspan="2">3</td> </tr> </tbody> </table> <p>6.2 Line type(Non-display or display) :</p> <table border="1" data-bbox="533 987 1342 1402"> <thead> <tr> <th colspan="2">Dimension</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>Length (L)</th> <th>Width (W)</th> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.03$</td> <td>Ignore</td> <td rowspan="4">Ignore</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.03 < W \leq 0.05$</td> <td>3</td> </tr> <tr> <td>---</td> <td>$W > 0.05$</td> <td>As round type</td> </tr> <tr> <td colspan="2">Total</td> <td colspan="2">3</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.15$	Ignore		$0.15 < \Phi \leq 0.20$	2	Ignore	$0.20 < \Phi \leq 0.30$	2	$\Phi > 0.30$	0	Total	3		Dimension		Acceptance (Q'ty)		Length (L)	Width (W)	A area	B area	---	$W \leq 0.03$	Ignore	Ignore	$L \leq 5.0$	$0.03 < W \leq 0.05$	3	---	$W > 0.05$	As round type	Total		3		Minor
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◆ Specification For TFT-LCD Module Less Than 3.5" :

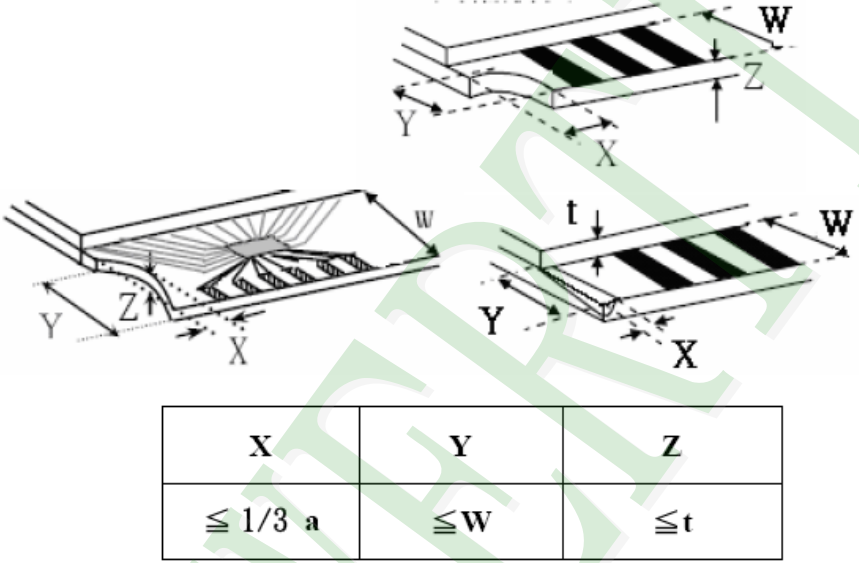
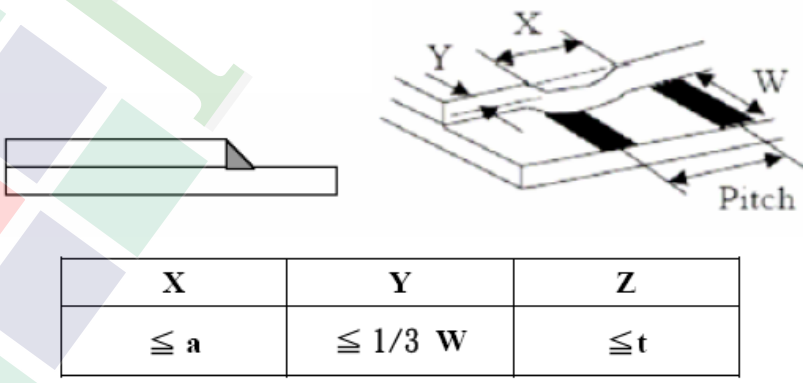
(Ver.B01)

NO	Item	Criterion	Level									
08	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p> <hr/> <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="550 1444 1348 1736"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>$\leq a$</td> <td>Crack can't enter viewing area</td> <td>$\leq 1/2 t$</td> </tr> <tr> <td>$\leq a$</td> <td>Crack can't exceed the half of SP width.</td> <td>$1/2 t < Z \leq 2 t$</td> </tr> </tbody> </table>	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.	$1/2 t < Z \leq 2 t$	Minor
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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="571 1659 1345 1832"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>Front</td> <td>$\leq a$</td> <td>$\leq 1/2 W$</td> <td>$\leq t$</td> </tr> <tr> <td>Back</td> <td>$\leq a$</td> <td>$\leq W$</td> <td>$\leq 1/2 t$</td> </tr> </tbody> </table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	$\leq a$	$\leq W$	$\leq 1/2 t$	
	X	Y	Z										
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Back	$\leq a$	$\leq W$	$\leq 1/2 t$										

◆ Specification For TFT-LCD Module Less Than 3.5" :

(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>  <p>8.2.3 Glass remain :</p> 	

◆ Specification For TFT-LCD Module Less Than 3.5" :

(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 ≤ 1.5 mm.	Minor

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 .
- 5.2.10 Caution!(LCM products with Capacitive Touch Panel)
Strong EMI-sources such as switch-mode power supplies (SMPS) can lead to touch malfunction (e.g. ghost-touches).
Therefore, the touch needs to be thoroughly tested inside the target application.

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.



Ver.002

LCM包裝規格書

Documents NO. JPKG-PH240320T062-LAA11

LCM Packaging Specifications
(For Tray)

Approve	Check	Contact
Ryan	Terry	Air

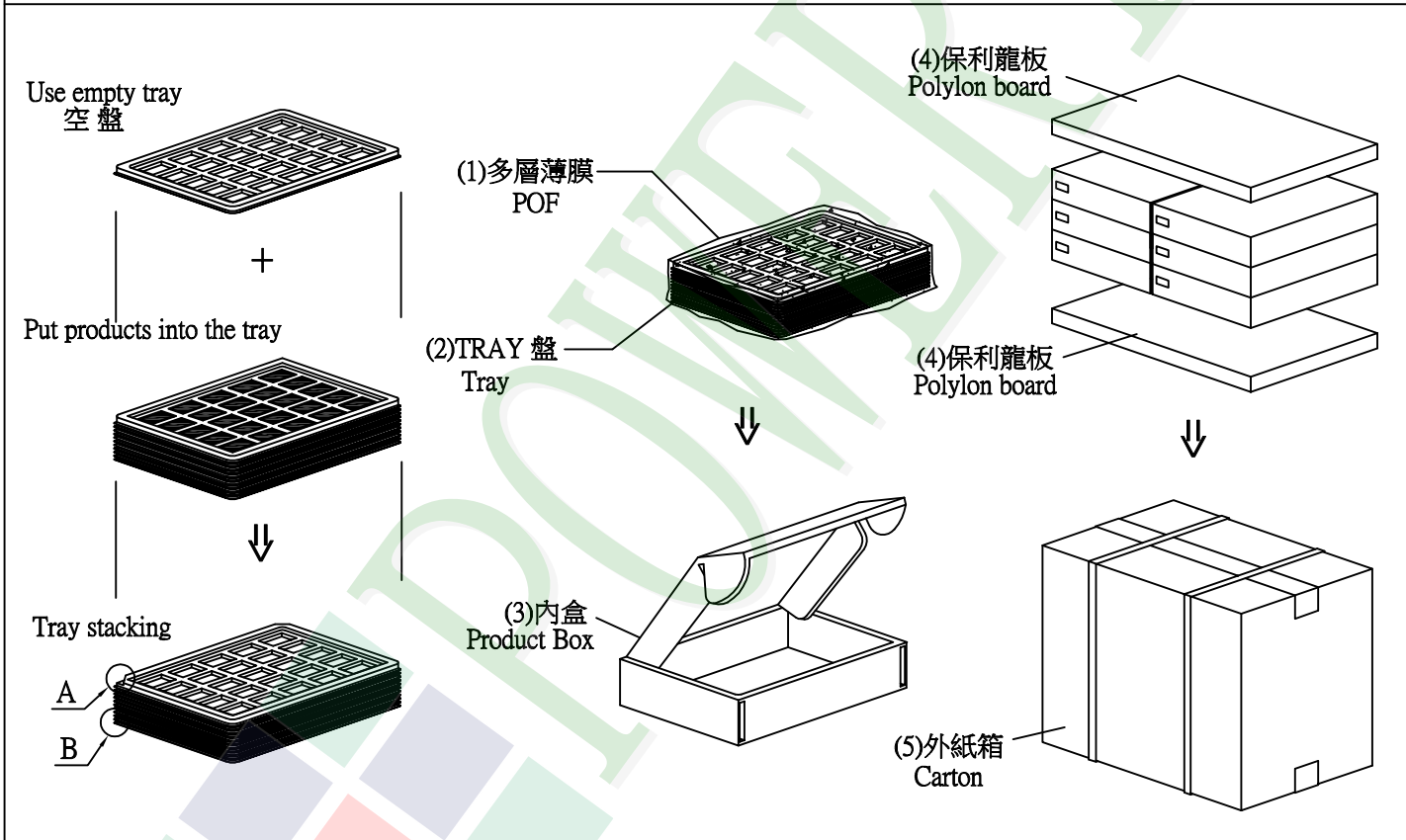
1. 包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH240320T062-LAA11	42.0 X 58.0 X 2.5	0.0092	672	6.1824
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	—	6	—
3	TRAY 盤 (2)Tray	TYSG000000396	352 X 260 X 11.8	0.1	48	4.8
4	內盒(3)Product Box	BX36627063ABBA	383 X 270 X 66	0.182	6	1.092
5	保利龍板(4)Pollyon board	OTPLB00PL08ABA	550 X 393 X 20	0.0284	2	0.0568
6	外紙箱(5)Carton	BX57041027CCBA	570 X 410 X 265	1.0	1	1.0
7						
8						
9						

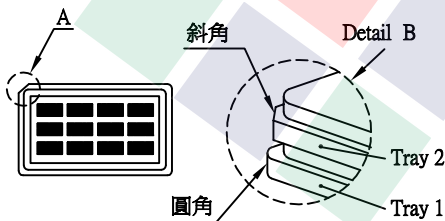
2. 一整箱總重量 (Total LCD Weight in carton) : 13.13 Kg±10%

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

(1) LCM quantity per box : no per tray	16	x no of tray	7	=	112
(2) Total LCM quantity in carton : quantity per box	112	x no of boxes	6	=	672



特 記 事 項 (REMARK)



4. TRAY 盤相疊時, 需旋轉180度, 請詳見B視圖
 Rotate tray 180 degrees and place on top of stack.
 Check the tray stack using Fig. B.