SPECIFICATIONS

CUSTOMER	:	
SAMPLE CODE	:	SH102600T013-ZFA
MASS PRODUCTION CODE	:	PH102600T013-ZFA
SAMPLE VERSION	:	02
SPECIFICATIONS EDITION	:	004
DRAWING NO. (Ver.)	:	LMD-PH102600T013-ZFA (Ver.003)
PACKAGING NO. (Ver.)	:	PKG-PH102600T013-ZFA (Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
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POWERTIP
2020.07.30
TWRD APR
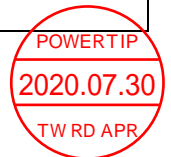
☐ Preliminary specification for design input
■ Specification for sample approval

POWERTIP TECH. CORP.

NO.PT-A-005-8

History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
08/02/2018	01	001	New Drawing	-	Yuan
12/31/2019	01	002	First Sample Modify FPC and Tape	- Appendix	Yuan
05/13/2020	02	003	Second Sample Modify LCD PLZ dimension and FPC design	- Appendix	Yuan
07/29/2020	02	004	Modify Life Time form 20000Hr to 50000Hr	9	Yuan

Contents

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	1024 * 3 (RGB) * 600 Dots
LCD Type	Full Viewing Angle , Normally Black , Transmissive type
Screen size(inch)	7.0 inch
Color configuration	RGB-Strip
Backlight Type	LED B/L
Interface	LVDS Interface
Other(controller/driver IC)	ST5021-G3-1 + ST5651CB-G3-1 (Or Compatible IC)
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : http://www.powertip.com.tw/news_detail.php?Key=1&cID=1

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	165.75(W) * 105.4(L) * 2.75(H)	mm

LCD panel

Item	Standard Value	Unit
Viewing Area	155.21(W) x 86.92 (L)	mm
Active Area	154.21 (W) * 85.92 (L)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit
Power Voltage	V_{DD}	-	-0.5	5	V
	AV_{DD}	-	-0.5	15	V
	VGH	-	-0.3	42	V
	VGL	-	-20	0.3	V
Operating Temperature	T_{OP} (Ts)	Note 1	-20	70	°C
Storage Temperature	T_{ST} (Ta)	Note 2	-30	70	°C

The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

Note 1：Ts is the temperature of panel's surface.

Note 2：Ta is the ambient temperature of samples.

1.4 DC Electrical Characteristics

Module   GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
	V_{DD}	-	2.5	3.3	3.6	V	
	AV_{DD}	-	11.9	12.1	12.3	V	
	VGH	-	16.8	17.0	17.2	V	
	VGL	-	-7.2	-7.0	-6.8	V	
Input signal Voltage	VCOM	-	4.0	4.2	4.4	V	Note2
Input Signal Voltage	VIH	-	$0.7V_{DD}$	-	V_{DD}	V	
	VIL	-	0	-	$0.3 V_{DD}$	V	
Supply Current	I_{DD}	V_{DD} = 3.3 V Pattern= Red	-	15	25	mA	Note1
	I_{ADD}	A_{VDD}=12.1V Pattern= Red	-	30	40	mA	
	I_{GH}	V_{GH}=17.0V Pattern= Red	-	0.5	1	mA	
	I_{GL}	VGL=-7.0V Pattern= Red	-	0.5	1	mA	

Note1:Maximum current display

Note2: Vcom must be adjusted to optimize display quality: cross-talk, contrast ratio and etc

1.5 Optical Characteristics

TFT LCD Module   VDD = 3.3 V, Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	unit	
Response time		Tr + Tf	Ta = 25°C θX, θY = 0°	-	32	48	ms	Note 2
Viewing angle	Top	θY+	CR ≥ 10	-	80	-	Deg.	Note 4
	Bottom	θY-		-	80	-		
	Left	θX-		-	80	-		
	Right	θX+		-	80	-		
Contrast ratio		CR		650	800		-	Note 3
Color of CIE Coordinate (With B/L)	White	X	Ta = 25°C θX , θY = 0°	0.24	0.29	0.34	-	Note1
		Y		0.26	0.31	0.36		
	Red	X		0.54	0.59	0.64		
		Y		0.31	0.36	0.41		
	Green	X		0.27	0.32	0.37		
		Y		0.51	0.56	0.61		
	Blue	X		0.08	0.13	0.18		
		Y		0.03	0.08	0.13		
Average Brightness Pattern=white display (With LCD)*1		IV	IF=200 mA	420	500	-	cd/m^2	Note1
Uniformity (With LCD)*2		△B	IF=200 mA	70	-	-	%	Note1

Note 1:

*1：△B=B(min) / B(max) * 100%

*2：Measurement Condition for Optical Characteristics:

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

　　b：Measurement Distance: 500 ± 50 ㎜ ，(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%

Colorimeter=BM-7 fast
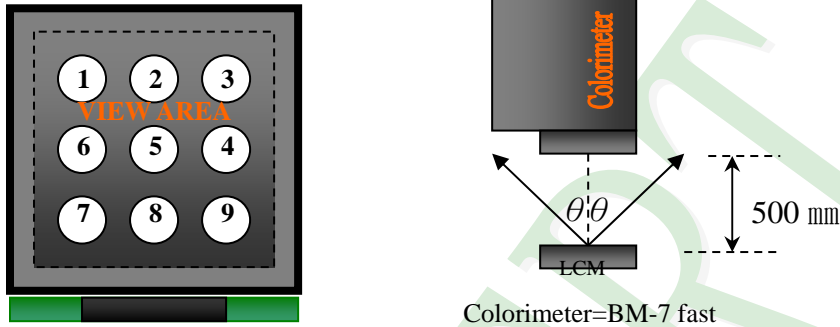
　　To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

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

Normally Black
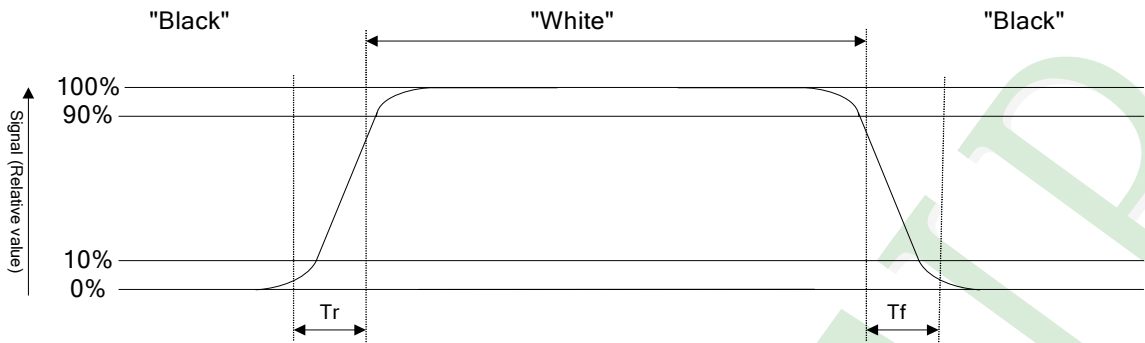
Note3: Definition of contrast ratio:

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:
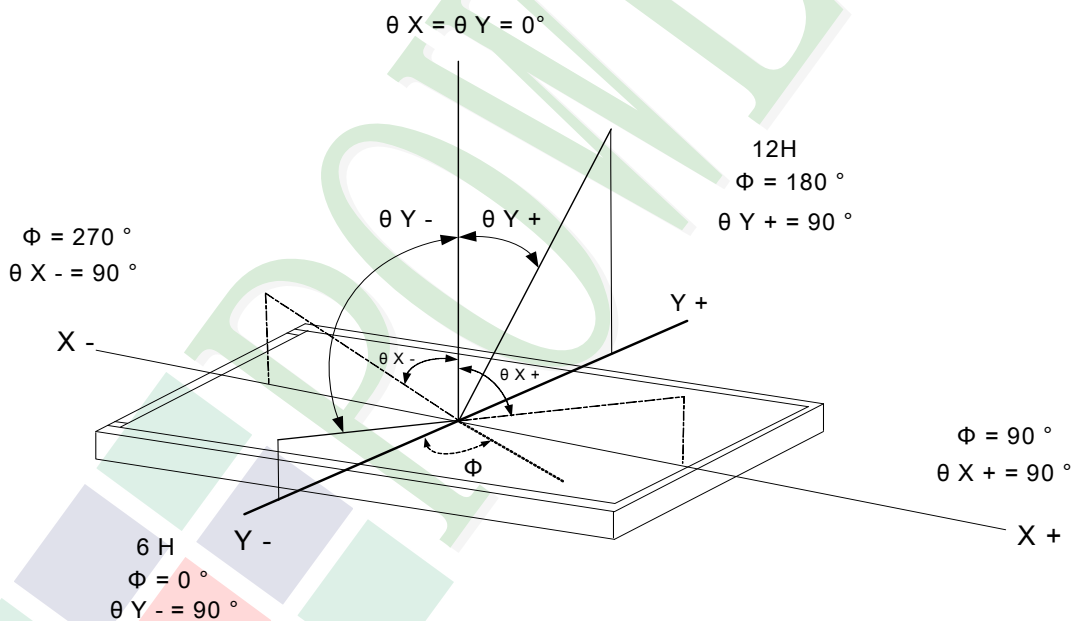
Note5: Applying with spectrophotometer in the condition of 400 to 700nm, 10nm/each; in accordance with JIS Z 8701 2 degree viewing XYZ system, measuring the reflective rate of 5 degree

1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
LED Forward Current	IF	Ta =25℃	-	300	mA
LED Reverse Voltage	VR	Ta =25℃	-	5	V
Power Dissipation	PD	Ta =25℃	-	3.06	W

Backlight Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF		8.4	9.0	10.2	V
Average Brightness (Without LCD)	IV		10000	12000	14000	cd/m^2
CIE Color Coordinate (Without LCD)	X	IF=200mA	0.24	0.27	0.30	-
	Y		0.22	0.25	0.28	
Uniformity *1	△B		80	-	-	*2
Color			White			

*1：This value will be changed while mass production.

*2：△B=B(min) / B(max)%

B/L Internal Circuit Diagram
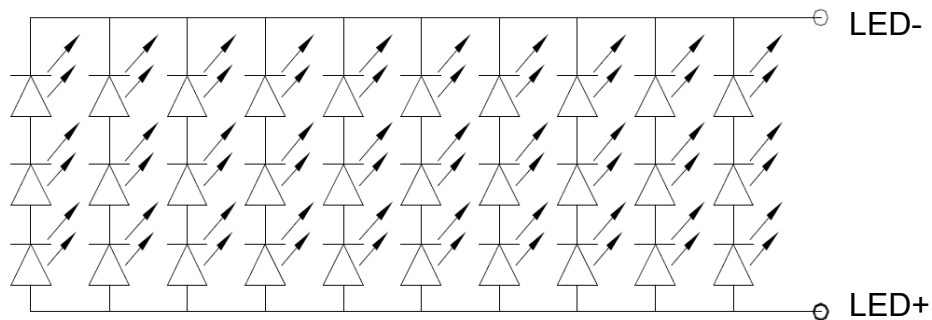
Other Description

Item	Conditions	Description
Life Time	Ta =25℃ IF=200mA	50000 hrs

2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram
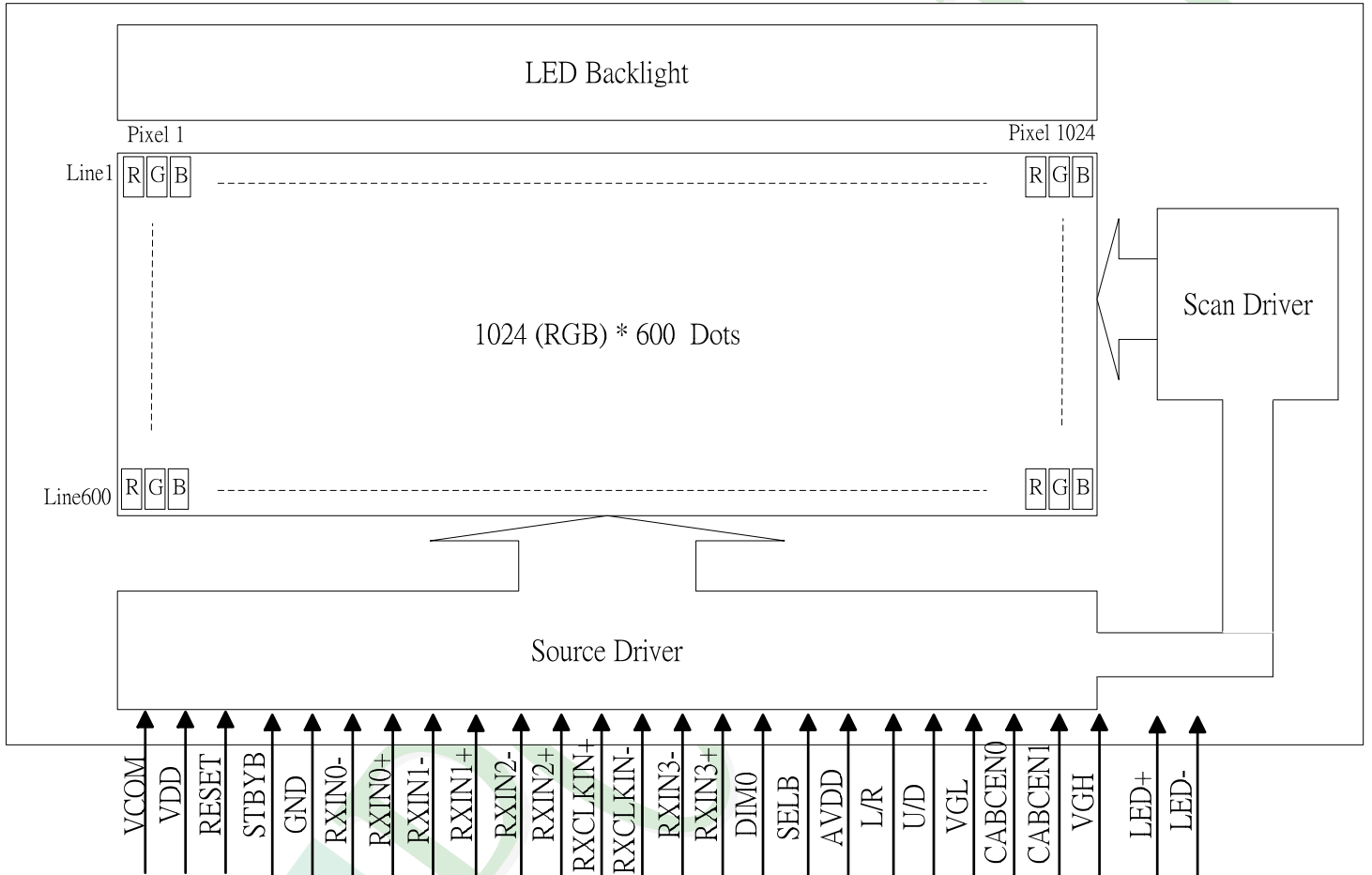
2.2 Interface Pin Description

Pin No.	Symbol	Function
1	VCOM	Common Voltage
2	VDD	Power Voltage for digital circuit
3	VDD	Power Voltage for digital circuit
4	NC	No connection
5	Reset	Global reset pin
6	STBYB	Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z
7	GND	Ground
8	RXIN0-	- LVDS differential data input
9	RXIN0+	+ LVDS differential data input
10	GND	Ground
11	RXIN1-	- LVDS differential data input
12	RXIN1+	+ LVDS differential data input
13	GND	Ground
14	RXIN2-	- LVDS differential data input
15	RXIN2+	+ LVDS differential data input
16	GND	Ground
17	RXCLKIN-	- LVDS differential clock input
18	RXCLKIN+	+ LVDS differential clock input
19	GND	Ground
20	RXIN3-	- LVDS differential data input
21	RXIN3+	+ LVDS differential data input
22	GND	Ground
23	NC	No Connection
24	NC	No Connection
25	GND	Ground

Pin No.	Symbol	Function
26	NC	No Connection
27	DIM0	Backlight CABC controller signal output DIMO=L Turn off external backlight controller DIMO=H Logical control signal to turn on external backlight controller
28	SELB	6bit/8bit mode select If LVDS input data is 6 bits ,SELB must be set to High; If LVDS input data is 8 bits ,SELB must be set to Low.
29	AVDD	Power for Analog Circuit
30	GND	Ground
31	LED-	LED Cathode
32	LED-	LED Cathode
33	L/R	Horizontal inversion When L/R="0", set right to left scan direction. When L/R="1", set left to right scan direction.
34	U/D	Vertical inversion When U/D="0", set top to bottom scan direction. When U/D="1", set bottom to top scan direction.
35	VGL	Gate OFF Voltage
36	CABCEN1	CABC H/W enable Note:1
37	CABCEN0	CABC H/W enable Note:1
38	VGH	Gate ON Voltage
39	LED+	LED Anode
40	LED+	LED Anode

Note1:

CABCEN1	CABCEN0	DESCRIPTION
L	L	CABC OFF
L	H	User interface Image
H	L	Still Picture
H	H	Moving Image

2.3 Timing Characteristics

DE mode

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
CLKIN frequency@ Frame rate = 60Hz	fclk	40.8	51.2	67.2	MHz
Horizontal display area	thd		1024		CLKIN
1 Horizontal Line	th	1114	1344	1400	
HSD Blanking	thb+thfp	90	320	376	
Vertical display area	tvd		600		H
1 vertical Line	tv	610	635	800	
VSD Blankking	tvb+tvfp	10	35	200	

SYNC mode

Horizontal input timing

Parameter	Symbol	Value			Uint
		Min.	Typ.	Max.	
CLKIN frequency@ Frame rate = 60Hz	fclk	44.9	51.2	63	MHz
Horizontal display area	thd		1024		CLKIN
1 Horizontal Line	th	1200	1344	1400	
HSD pulse width	thpw	1	-	140	
HSD Blanking	thb		160		
HSD Front Porch	thfp	16	160	216	

Vertical input timing

Parameter	Symbol	Value			Uint
		Min.	Typ.	Max.	
Vertical display area	tvd		600		H
VSD period time	tv	624	635	750	
VSD pulse width	tvpw	1	-	20	
VSD Blanking	tvb		23		
VSD Front Porch	tvfp	1	12	127	

Data Input Format For LVDS

6 bit LVDS input

PINC											
NINC											
IND0	R0	G0	R5	R4	R3	R2	R1	R0	G0	R5	R4
IND1	G1	B1	B0	G5	G4	G3	G2	G1	B1	B0	G5
IND2	B2	DE	VS	HS	B5	B4	B3	B2	DE	VS	HS

8 bit LVDS input

PINC											
NINC											
IND0	R0	G0	R5	R4	R3	R2	R1	R0	G0	R5	R4
IND1	G1	B1	B0	G5	G4	G3	G2	G1	B1	B0	G5
IND2	B2	DE	VS	HS	B5	B4	B3	B2	DE	VS	HS
IND3	R6	-	B7	B6	G7	G6	R7	R6	-	B7	B6
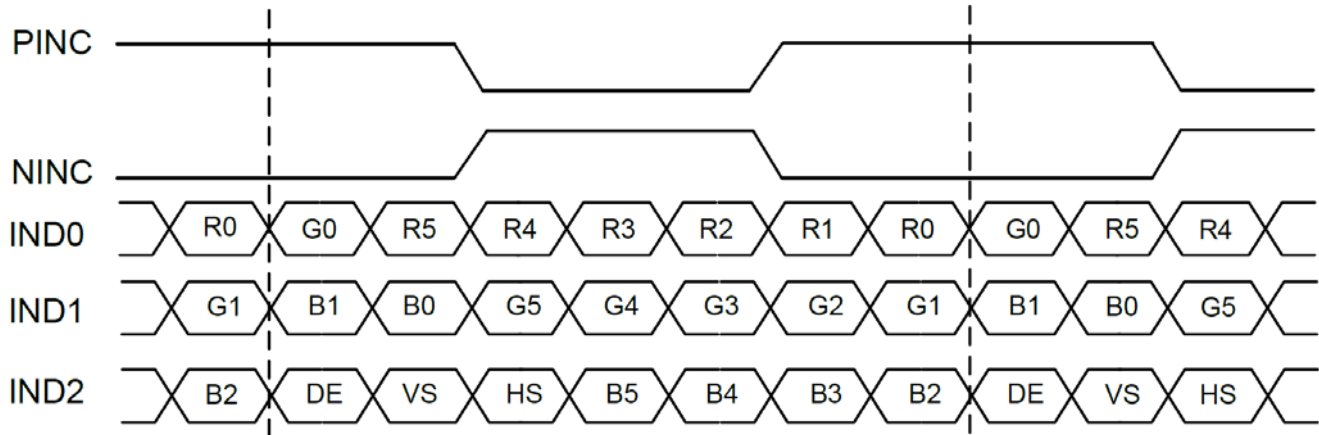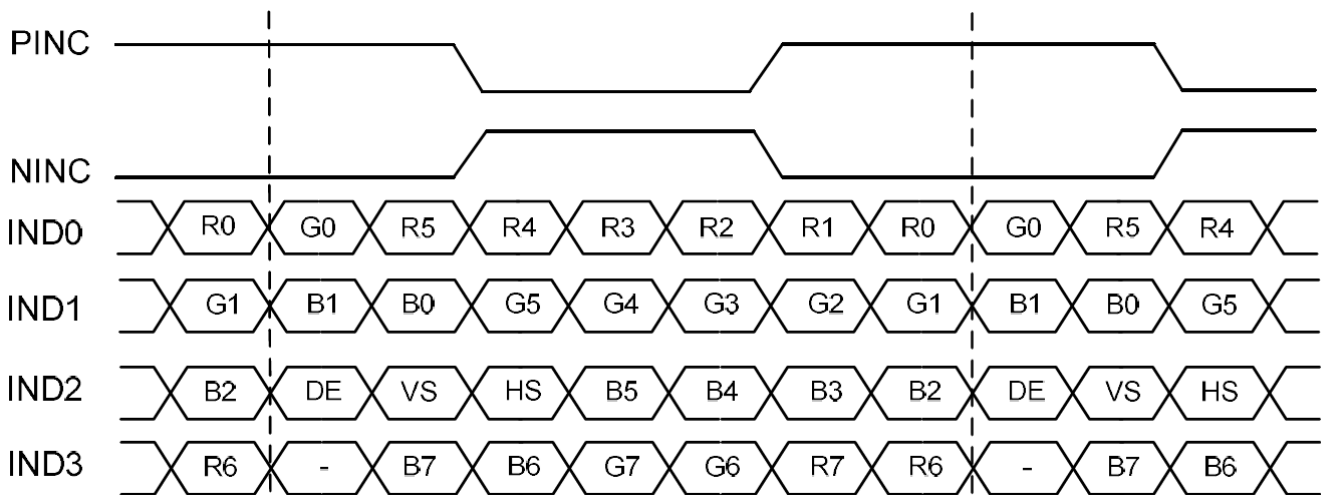
SDRRS (Seamless Display Refresh Rate Switching) Timing Diagram

When showing the still picture , it is accept to reduce the refresh rate from 60Hz to low refresh rate(For example 40Hz). The purpose is mainly for power saving. INTEL defined a timing chart switch between different refresh rates. Following this timing chart , the switch between different refresh rates is seamless for end user.

T1-Min delay from start of vert blank to start of timing change: 2 lines(HSD periods)
T2-Max delay for clock to transition to new frequency: 100us
T3-Max receiver lock delay from stable clock: Display specific(TBD)
T4-Max period during which panel maintains display (T2+T3): Display specific(TBD)
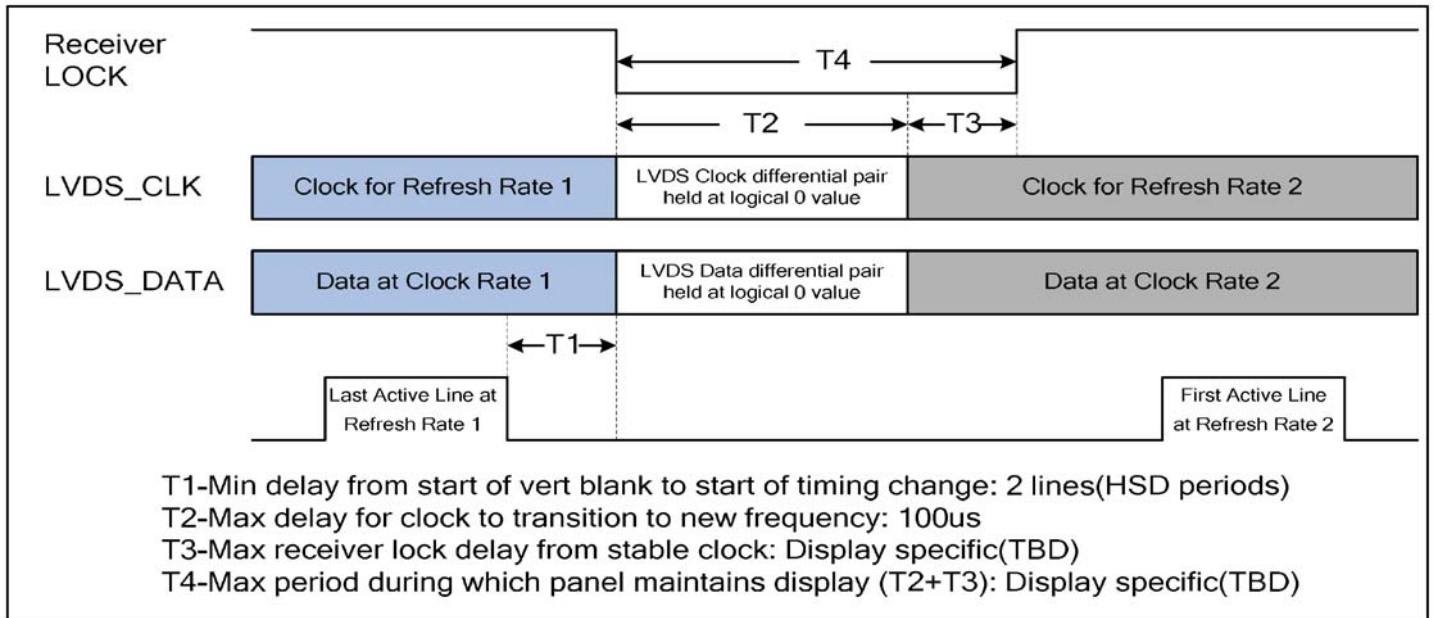
2.4 Power Sequence

2.4.1 Power On/Off Sequence

In order to prevent IC from power on reset fail, the rising time (TPOR) of the digital power supply VDD should be maintained within the given specifications. Refer to "AC Characteristics" for more detail on timing.
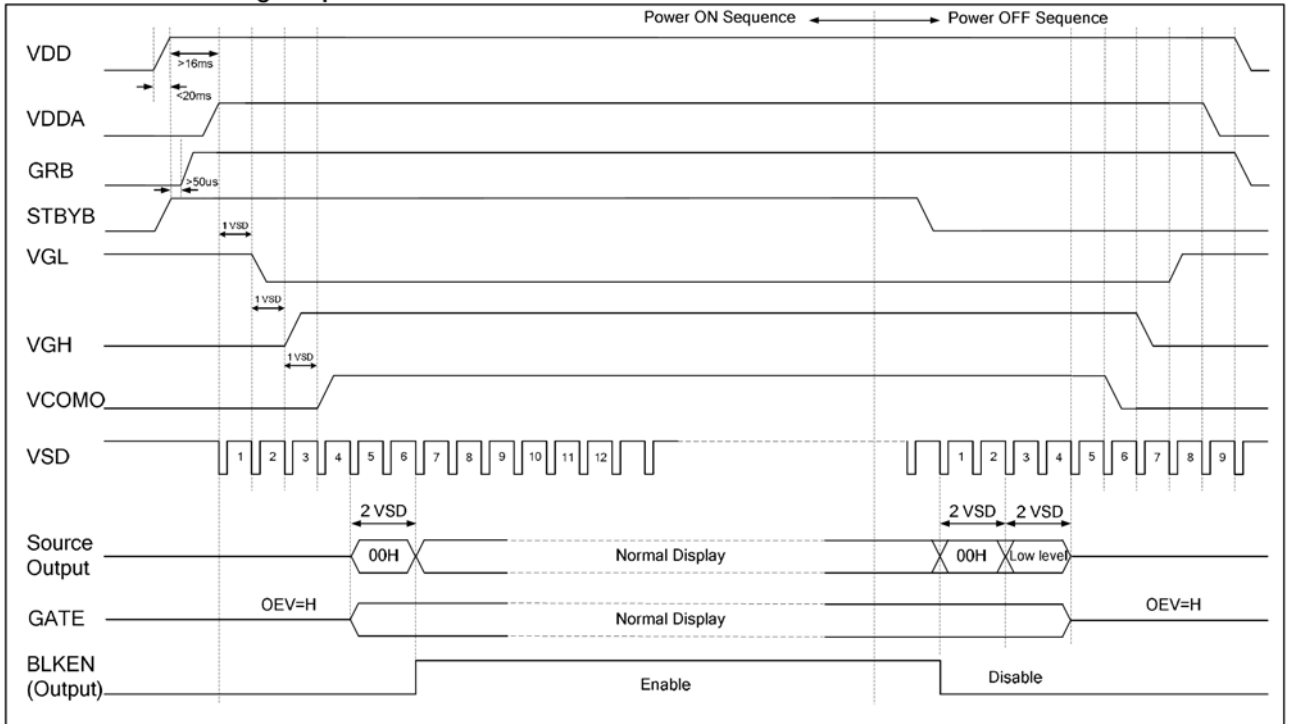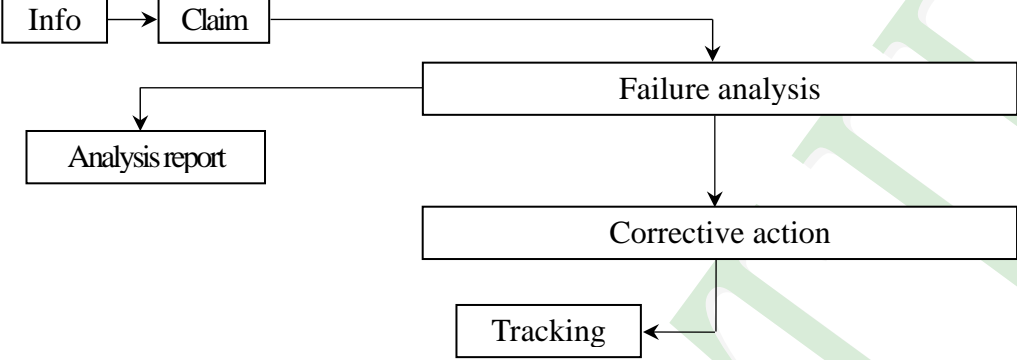
2.4.2 Standby mode Sequence
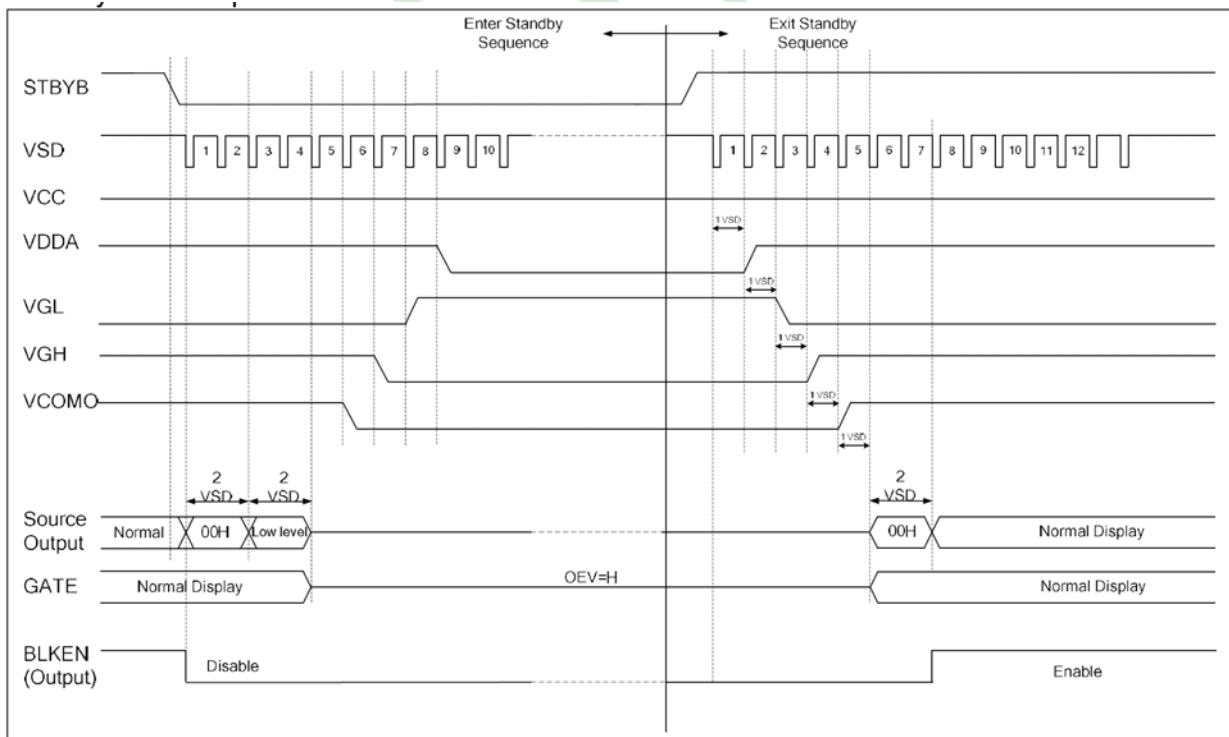
3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Marketing & Design								
Sample Approval								
Pilot Run & Mass Product								
Ship Out								

Info → Survey

Request → Inquiry → Project   evaluation

Project   Validation   NG   OK

Quote

Contract   NG

Design check

Sample test

Verification   NG

Sample approval   OK   OK

Pilot   run & Reliability test

Verification   NG   OK

Specification preparation

Mass production

Inspection   OK   NG

Shipment

Ship out

Item	Customer	Sales	R&D	Q.A	Manufact uring	Product control	Purchase	Inventory control
Sales Service								
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

Info → Claim

Failure analysis

Analysis report

Corrective action

Tracking

3.2. Inspection Specification

◆Scope: The document shall be applied to TFT-LCD Module for 3.5" –15″ (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(about 300lux ～500lux)

       , and distance of view must be at 30~40 cm.

   (2). The test direction is base on about around 45° of vertical line.

eyes   eyes
45°   45°

5% Brightness

ND fliter

30~40 cm

90°

100% Brightness

LCD panel   2.5~3cm
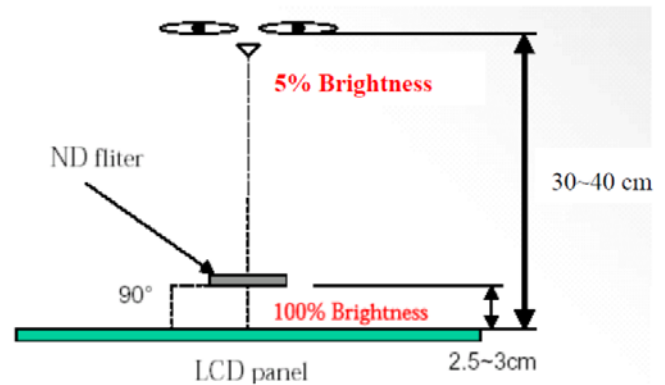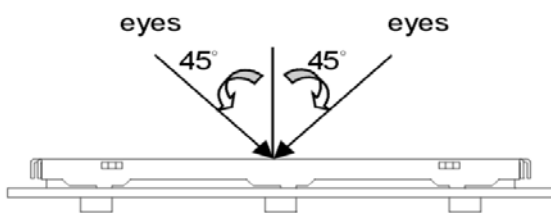
   (3). Definition of area.
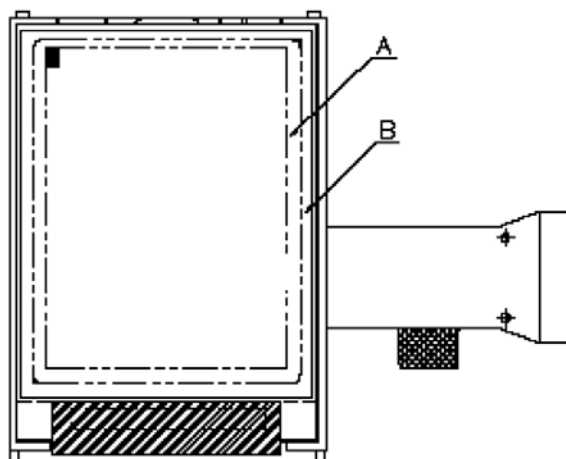
A area: viewing area

B area: Outside of viewing area

   (4). Standard of inspection： (Unit：mm)
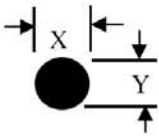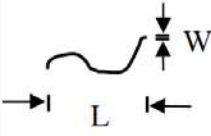
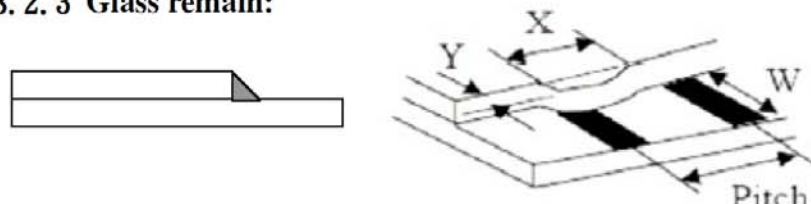◆Specification For TFT-LCD Module 3.5″ ~15″ :   (Ver.B01)
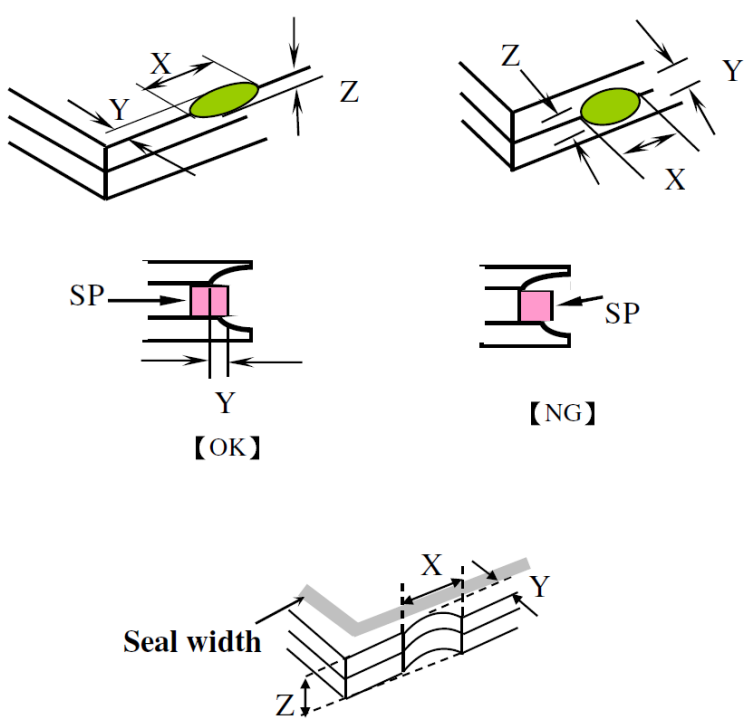
NO	Item	Criterion	Level
01	Product condition	1.1 The part number is inconsistent with work order of production.	Major
		1.2 Mixed product types.	Major
		1.3 Assembled in inverse direction.	Major
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	3.1 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
		4.6 Mura cannot be seen through 5% ND filter at 50% Gray , should be judged by the viewing angle of 90 degree.	Minor
05	Dot defect (Bright dot, Dark dot) On -display	(see table below) 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. 5.4 Bright dot that can not be seen through 5% ND filter.	Minor

Item		Acceptance (Q'ty)
Dot Defect	Bright Dot	≦ 4
	Dark Dot	≦ 5
	Joint Dot	≦ 3
	Total	≦ 7

◆Specification For TFT-LCD Module 3.5″ ~15″ :   (Ver.B01)
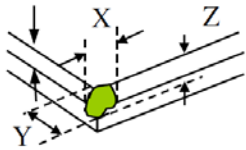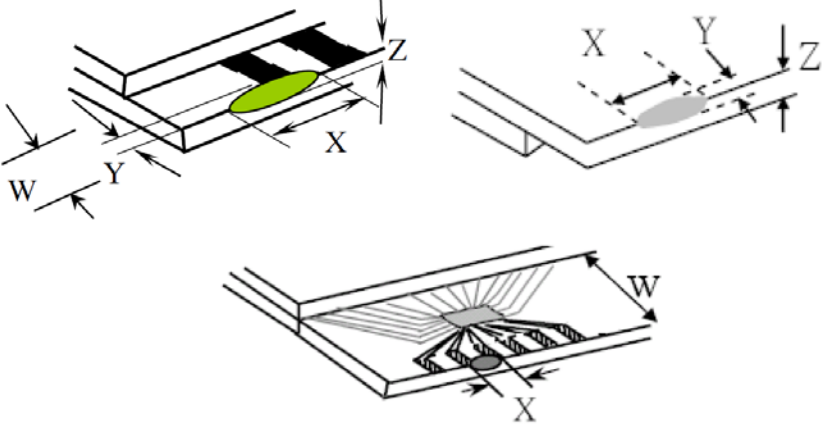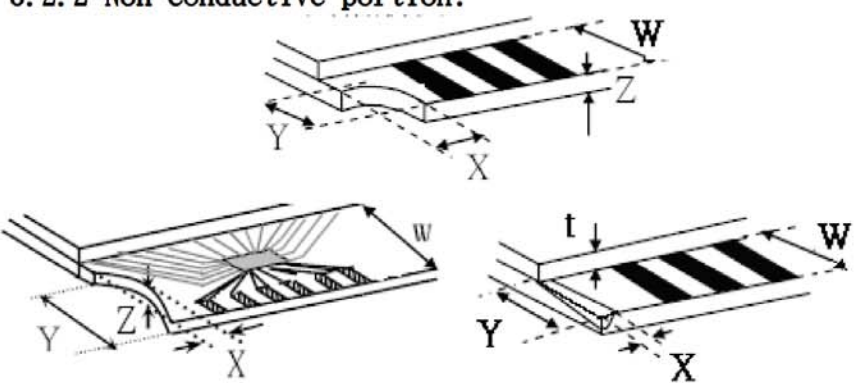
NO	Item	Criterion	Level
06	Black or white Dot, scratch, contamination Round type $\Phi = (x+y)/2$ Line type 	**6.1 Round type (Non-display or display):** 	Dimension (diameter : Φ)	Acceptance (Q'ty)	
	A area	B area
---	---	---
Φ ≦ 0.25	Ignore	Ignore
0.25 < Φ ≦ 0.50	5	
Φ > 0.50	0	
Total	**5**	| **6.2 Line type(Non-display or display):** | module size	Length (L)	Width (W)	Acceptance (Q'ty)	
			A area	B area
---	---	---	---	---
3.5" to less 9"	---	W ≦ 0.03	Ignore	Ignore
	L ≦10.0	0.03 <W ≦ 0.05	4	
	L ≦5.0	0.05 <W ≦ 0.10	2	
	---	W >0.10	As round type	
	Total		5	
9" to 15"	---	W ≦ 0.05	Ignore	Ignore
	L ≦10.0	0.05 <W ≦ 0.10	5	
	---	W >0.10	As round type	
	Total		5			Minor
07	Polarizer Bubble		Dimension (diameter: Φ)	Acceptance (Q'ty)	
	A area	B area
---	---	---
Φ ≦ 0.25	Ignore	Ignore
0.25 < Φ ≦ 0.50	4	
0.50 < Φ ≦ 0.80	1	
Φ >0.80	0	
Total	**5**			Minor

NO	Item	Criterion	Level
08	The crack of glass	Symbols： 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 8.1 General glass chip: 8.1.1 Chip on panel surface and crack between panels: 【OK】　　　　　【NG】 Seal width	Minor

X	Y	Z
≦ a	Crack can't enter viewing area	≦1/2 t
≦ a	Crack can't exceed the half of SP width.	1/2 t ＜ Z ≦2 t

◆Specification For TFT-LCD Module 3.5″ ~15″ :　　　　　　　　　　　　　　　　　　(Ver.B01)

NO	Item	Criterion	Level
08	The crack of glass	(see below)	Minor

Symbols：

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

- -

8.1.2 Corner crack:

X	Y	Z
≦1/5 a	Crack can't enter viewing area	Z ≦1/2 t
≦1/5 a	Crack can't exceed the half of SP width.	1/2 t < Z ≦ 2 t

8.2 Protrusion over terminal:

8.2.1 Chip on electrode pad:

	X	Y	Z
Front	≦ a	≦ 1/2 W	≦ t
Back	≦ a	≦ W	≦ 1/2 t

◆Specification For TFT-LCD Module 3.5″ ~15″ :   (Ver.B01)

NO	Item	Criterion	Level
08	The crack of glass	Symbols: 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 8.2.2 Non-conductive portion: $\begin{array}{\|c\|c\|c\|} \hline X & Y & Z \\ \hline \leqq 1/3\ a & \leqq W & \leqq t \\ \hline \end{array}$ ⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. 8.2.3 Glass remain: $\begin{array}{\|c\|c\|c\|} \hline X & Y & Z \\ \hline \leqq a & \leqq 1/3\ W & \leqq t \\ \hline \end{array}$ 8.2.4 Cracking: Not Allowed	Minor

◆Specification For TFT-LCD Module 3.5″ ~15″ :　　　　　　　　　　　　　　　(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: 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

4. RELIABILITY TEST

(Ver.B01)

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Storage Test	Keep in 70 ±5℃ 240 hrs
2	Low Temperature Storage Test	Keep in −30 ±5℃ 240 hrs
3	High Temperature / High Humidity Storage Test	Keep in 60 ℃ / 90% R.H duration for 240 hrs (Excluding the polarizer)
4	Temperature Cycling Storage Test	−30℃ → +25℃ → 70℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 20 Cycle
5	ESD Test	**Air Discharge:** Apply 2 KV with 5 times Discharge for each polarity +/- **Contact Discharge:** Apply 250 V with 5 times discharge for each polarity +/- 1. Temperature ambiance : 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)	Packing Weight (Kg) Drop Height (cm) Drop Direction :※1 corner / 3 edges / 6 sides each 1time

Table within row 7:

Packing Weight (Kg)	Drop Height (cm)
0 ~ 45.4	122
45.4 ~ 90.8	76
90.8 ~ 454	61
Over 454	46

◎Result Evaluation Criteria :
 Under the display quality test conditions with normal operations with normal operation state.
 Do not change these conditions as such changes may affect practical display function.
 (Normal operation state)
    Temperature : +20~30℃
    Humidity : 50~70%
    Atmospheric pressure : 86~106Kpa

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

5.2.10　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.

5.2.11　Do not let the LCD screen display static images (text, logos or pictures) for a prolonged period of time to prevent possible image burn-in.

5.3 STORAGE

5.3.1　Store the panel or module in a dark place where the temperature is $25°C \pm 5°C$ 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.
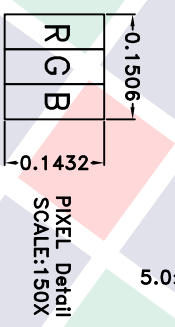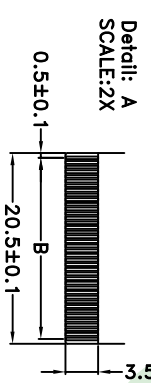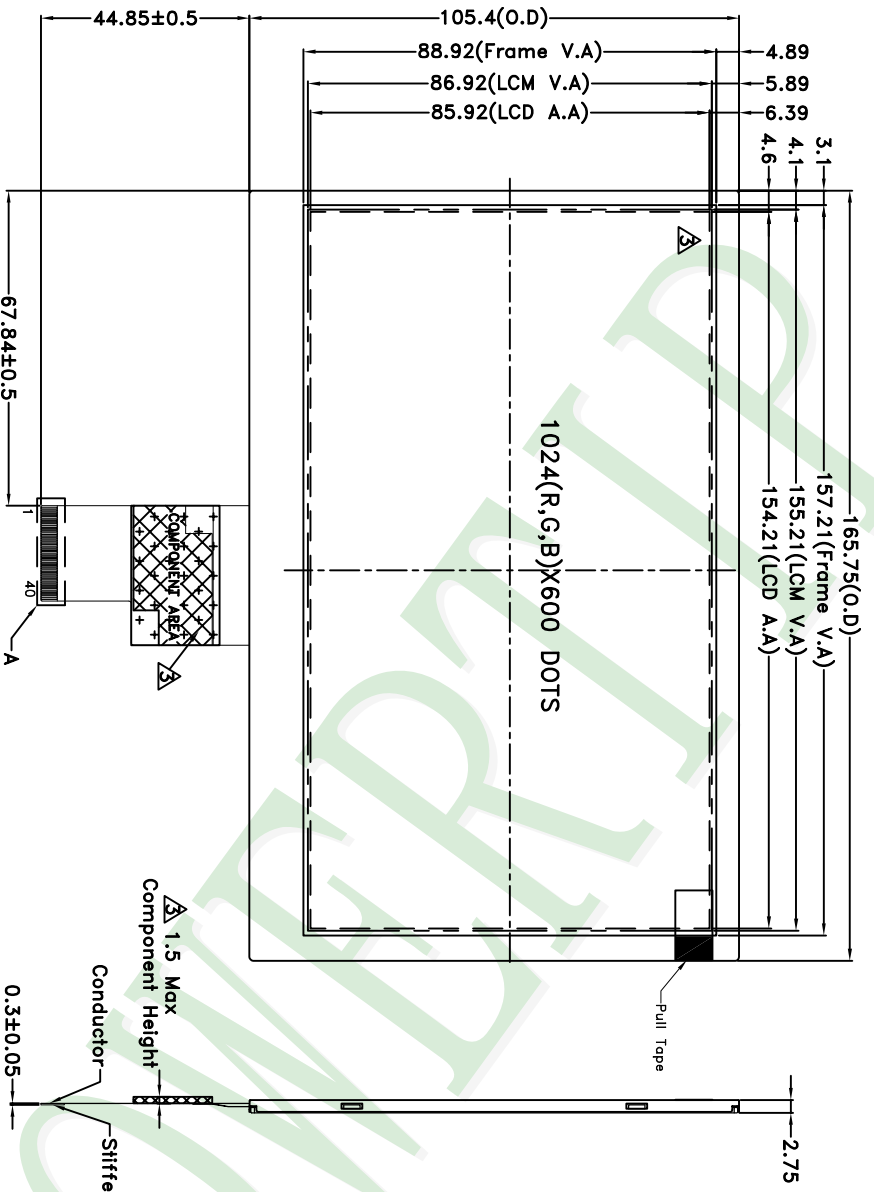
NOTES:
1.LCD TYPE: TFT LCD
2.LCD DISPLAY: Normally Black/TRANSMISSIVE
3.The tolerance unless classified ±0.3mm
4.B:P0.5X39=19.5±0.05; W=0.3±0.05
⚠5.▨▨:FPC Component Area & Unbending area;
▦:Stiffener (PI); ▨▨:GND; ▨▨:Kapton tape;
6.FPC suggested connector : HIROSE FH12A-40S-0.5SH or compatible

44.85±0.5
105.4(O.D)
88.92(Frame V.A)
86.92(LCM V.A)
85.92(LCD A.A)
4.89
5.89
6.39
3.1
4.1
4.6

67.84±0.5

165.75(O.D)
157.21(Frame V.A)
155.21(LCM V.A)
154.21(LCD A.A)

1024(R,G,B)X600 DOTS

Pull Tape

COMPONENT AREA

40
1

A

2.75

⚠ 1.5 Max
Component Height

Conductor

Stiffener

0.3±0.05

Detail: A
SCALE:2X

0.5±0.1

20.5±0.1

B

3.5

Black tape

Print white line

GND

40

1

AK

5.0±0.5

R
G
B

0.1506

0.1432

PIXEL Detail
SCALE:150X

007				
006				
005				
004	Modify LCD PLZ Dimension & FPC design	Clare	2020/03/27	
003	Modify FPC & Add TAPE	Tina	2019/12/25	
002	NEW DRAWING	Bob	2018/08/02	
001				
REV	REV BY	REVISER	DATE	

PART NO.: PH102600T013-ZFA

DRAWING NAME : LMD-PH102600T013-ZFA

TITLE: LCD MODULE DRAWING

Design	Bob Zhang
Check	Tina Chen
Approve	Jimmy Chen

POWERTIP TECHNOLOGY CORPORATION
大正光電股份有限公司

Unit	MM	Surface
Scale	1:1	Material
Page	1/1	Thickness
		Quantity

Length/Min (mm)	Tolerance(mm)	Precision Level
1 ~ 4	-	-
4 ~ 16	-	-
16 ~ 63	-	-
63 ~ 250	-	-
250 ~ 1000	-	-

PT-A-054-01

A B C D E F G H
6 5 4 3 2 1

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)	PH102600T013-ZFA	165.2 X 104.85	0.0988	60	5.928
2	靜電袋(1)Antistatic Bag	BAG240170ARABA	240 X 170	0.0048	60	0.288
3	氣泡袋(2)Bubble Bag	BAG170150BRABA	170 X 150	0.0045	60	0.27
4	A9隔板(3)A9 Partition	BX00000000058	245 X 125 X 4	0.0204	64	1.3056
5	B9隔板(4)B9 Partition	BX00000000057	295 X 125 X 4	0.0209	12	0.2508
6	海綿墊(5)Foam Rubber Cushion	OTFOAM00006ABA	290 X 240 X 10	0.02	8	0.16
7	C5內盒(6)Product Box	BX00000000059	310 X 255 X 155	0.248	4	0.992
8	外紙箱(7)Carton	BX52732536CCBA	527 X 325 X 360	0.83	1	0.83
9	保麗龍板(8)Polylon board	OTPLB00000017	510 X 310 X 15	0.025	3	0.075
10	舒美墊(9)EPE	OTFOAMEP0005BA	333 X 218 X 20	0.036	2	0.072

2.一 整箱總重量 (Total LCD Weight in carton) : 　10.17　Kg±10%
3.單箱數量規格表 (Packaging Specifications and Quantity) :
　(1)Quantity Of Spacer : 　A9隔板　X　16　, B9隔板　X　3
　(2)Total LCM quantity in carton : quantity per box　15　x no of boxes　4　=　60

(5) 海綿墊
Foam Rubber Cushion

(9)舒美墊X2(註 Remark 5)
EPE X2(See Remark 5)

(1)靜電袋+(2)氣泡袋+LCM
Antistatic Bag+Bubble Bag+LCM

(3)(4)隔板
Partition
(註 Remark 1)

(5) 海綿墊
Foam Rubber Cushion

(6) C5內盒
Product Box

(8)保麗龍板
Polylon board

(7)外紙箱
Carton
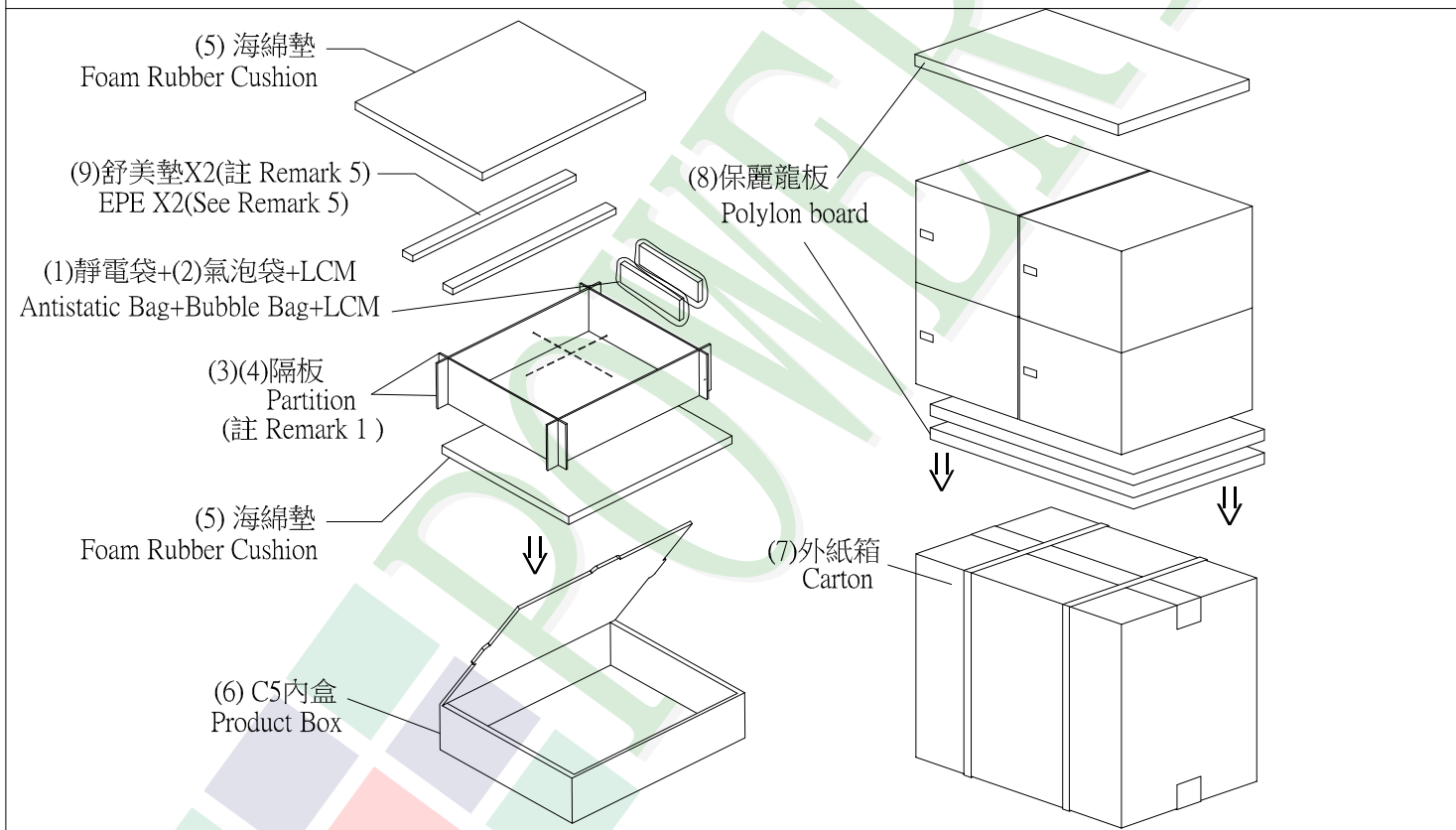
特 記 事 項 (REMARK)

4. LCM排放示意圖(前後間隔不放置):
4. LCM placed as figure showing:
　(First and last slot should be empty)
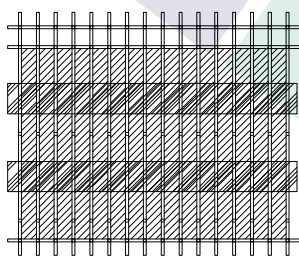
5. 將OTFOAMEP0005BA裁切成295*30mm,
可裁成7片
5. OTFOAMEP0005BA cut 7pcs
　(size:295X 30 mm)

▨ 模組(LCM)　▨ EPE