



() Preliminary Specification
(V) Final Specification

Module	17.0" SXGA Color TFT-LCD with Pcap Touch Panel Module
Model Name	ST-170K01

Customer	Date
_____	_____
Checked & Approved by	Date
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Checked & Approved by	Date
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Prepared by	Date
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Record of Revision

Version and Date	Page	Old description	New Description
1.0 2019/08/09	All	First Edition for Customer	



1. Handling Precautions

- 1) Since front polarizer is easily damaged, pay attention not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
- 6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 7) Do not open or modify the Module Assembly.
- 8) Do not press the reflector sheet at the back of the module to any directions.
- 9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of the LED light bar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged
- 10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
- 12) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 -1 or UL60950-1), or be applied exemption.
- 13) Continuous operating TFT-LCD display under high temperature environment may accelerate LED exhaustion and reduce luminance dramatically.
- 14) Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.



2. General Description

This specification applies to the 17 inch Color TFT-LCD with Pcap Touch Panel Module ST-170K01. The display supports the SXGA (1280(H) x 1024(V)) screen format and 16.7M colors. All input signals are Dual Channel LVDS interface compatible.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25°C condition:

Items	Unit	Specifications
Screen Diagonal	[mm]	432 (17.0")
Active Area	[mm]	337.920(H) x 270.336(V)
Pixels H x V		1280 x 3(RGB) x 1024
Pixel Pitch	[mm]	0.264(per one triad) x 0.264
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		Normally White
White Luminance	[cd/m2]	1200 (Typ)
Contrast Ratio		700 : 1 (Typ)
Optical Response Time	[msec]	20
Nominal Input Voltage VDD	[Volt]	+5.0 (Typ)
Power Consumption	[Watt]	Logic 4.5W (max) @ All Black pattern (max.) BL TBD W (max.) (w/o LED driver board)
Weight	[Grams]	TBD (Max.)
Physical Size (H x V x D)	[mm]	358.5(H) x 296.5(V) Typ. x 12.45(D) typ
Electrical Interface		Dual Channel LVDS
Panel Surface Treatment		Anti-glare type, Hardness 3H
Support Color		16.7M colors (8-bits)
Temperature Range		
Operating	[°C]	-30 to +85
Storage (Non-Operating)	[°C]	-30 to +85
RoHS Compliance		RoHS Compliance
Type of Touch Sensor	Projected capacitive touch module	
Cover Lens Size	355.72 x 291.6 x 2.0(mm), surface hardness ≥ 7H	
Touch Controller	EETI 84H5680	
Interface	USB /RS232 / I2C	
Transmittance	≥ 86%	



2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

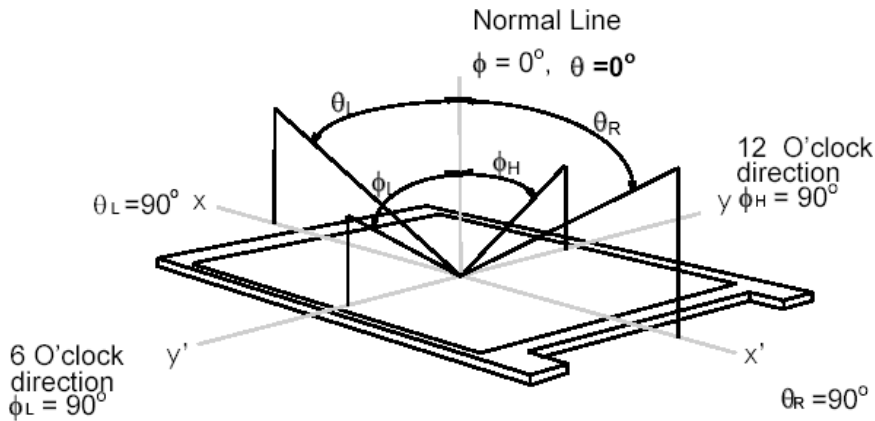
Item	Unit	Conditions	Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	70 70	80 80	-	1
		Vertical (Up) CR = 10 (Down)	50 60	70 70	-	
Luminance Uniformity	[%]	9 Points	75	80	-	2, 3
Contrast Ratio			500	700	-	4
White Luminance	[cd/m ²]		1000	1200	-	4
Optical Response Time	[msec]	Rising	-	15	-	5
		Falling	-	5	-	
		Rising + Falling	-	20	-	
Color / Chromaticity Coordinates (CIE 1931)		Red x	0.590	0.640	0.690	
		Red y	0.293	0.343	0.393	
		Green x	0.274	0.324	0.374	
		Green y	0.577	0.627	0.677	
		Blue x	0.106	0.156	0.206	
		Blue y	0.016	0.066	0.116	
		White x	0.263	0.313	0.363	
White y	0.279	0.329	0.379			
NTSC	[%]			72		

Optical Equipment: BM-5A, BM-7, PR880, or equivalent

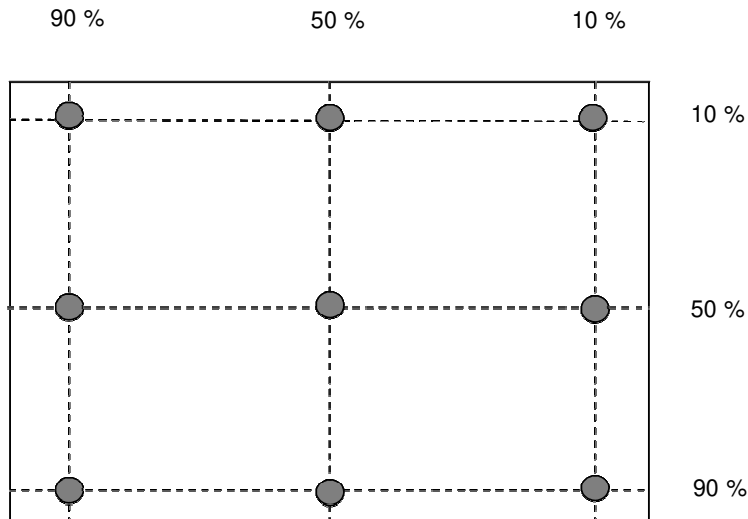


Note 1: Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (Φ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



Note 2: 9 points position



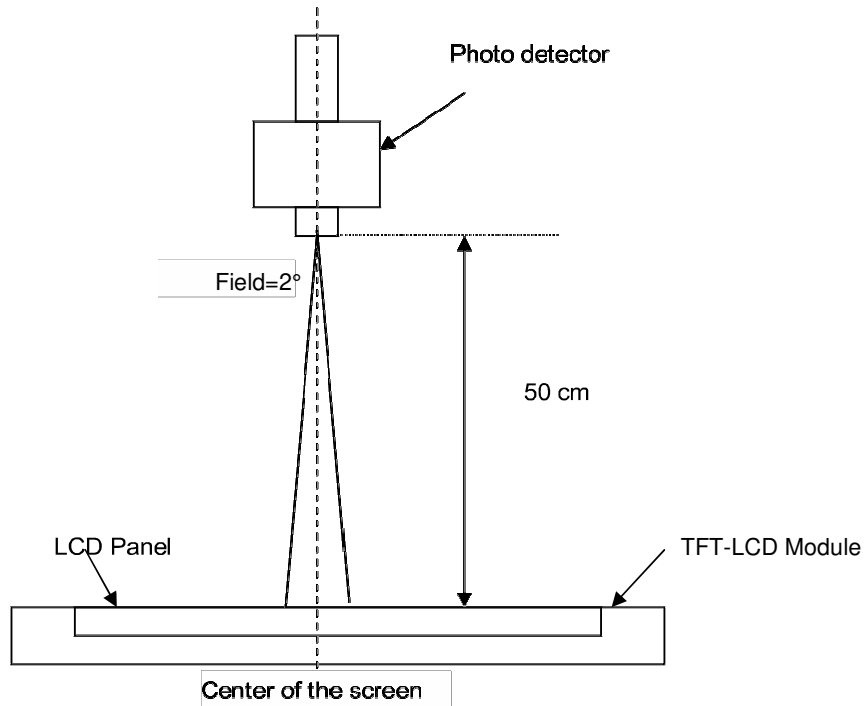
Note 3: The luminance uniformity of 9 points is defined by dividing the maximum luminance values by the minimum test point luminance

$$\delta_{W9} = \frac{\text{Minimum Luminance of 9 points}}{\text{Maximum Luminance of 9 points}}$$



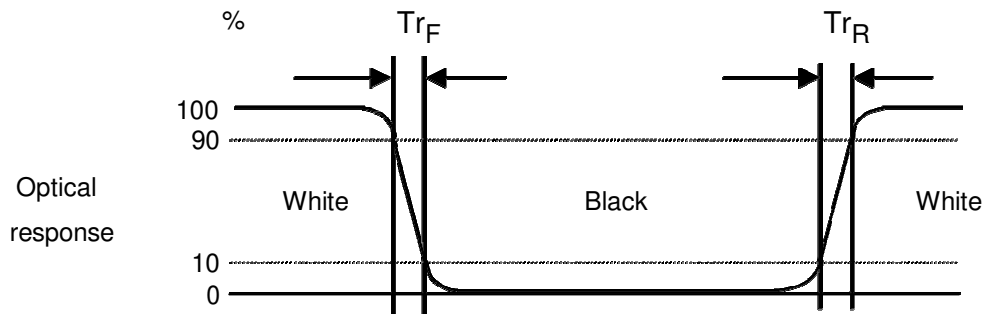
Note 4: Measurement method

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



Note 5: Definition of response time:

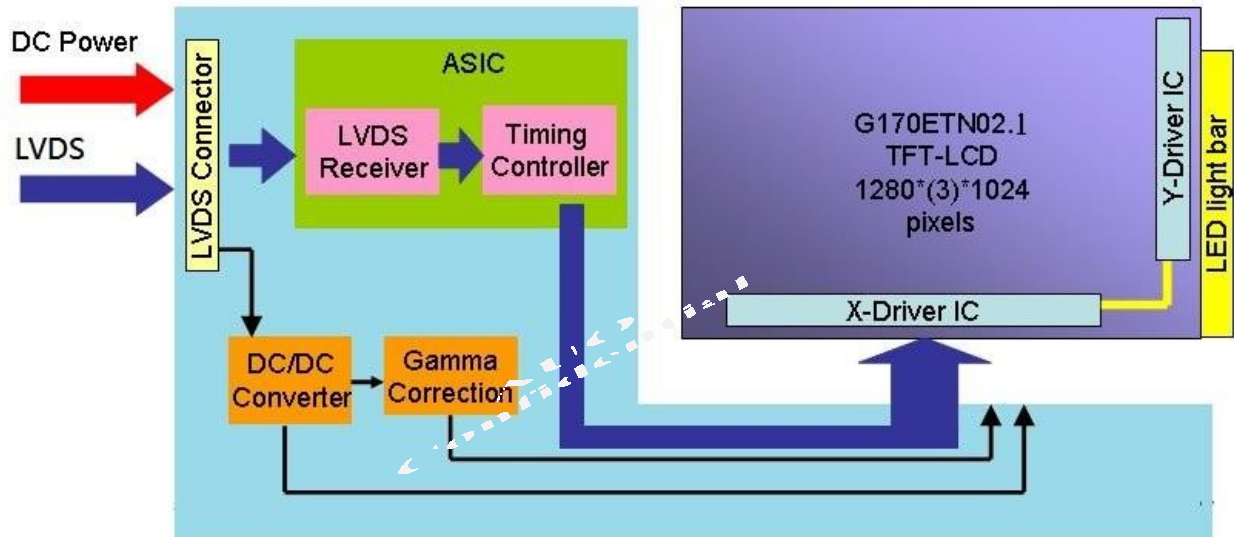
The output signals of photo detector are measured when the input signals are changed from “Full Black” to “Full White” (rising time), and from “Full White” to “Full Black” (falling time), respectively. The response time is interval between the 10% and 90% of amplitudes. Please refer to the figure as below.





3. Functional Block Diagram

The following diagram shows the functional block of the 17.0 inches Color TFT-LCD Module:





4. Absolute Maximum Ratings

An absolute maximum ratings of the module is as followi ng:

4.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	-0.3	+6	[Volt]	Note 1,2
Signal Voltage	RxOINi-/+, RxEINi-/+	-0.3	4	[Volt]	Note 1,2, i=0,1,2,3
Signal Voltage	RxOCLKON-/+ RxECLKIN-/+	-0.3	4	[Volt]	Note 1,2

4.2 Backlight Unit

Item	Symbol	Min	Typ	Unit	Conditions
L/B Forward Current	I _F	-	TBD	[mA]	Note 1,2

4.3 Absolute Ratings of Environment

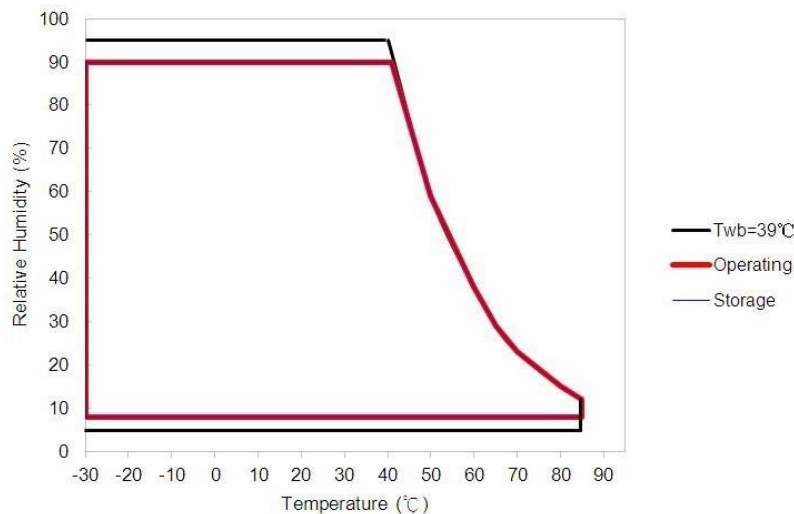
Item	Symbol	Min	Max	Unit	Conditions
Operating Temperature	TOP	-30	+85	[°C]	Note 3
Operation Humidity	HOP	8	90	[%RH]	
Storage Temperature	TST	-30	+85	[°C]	
Storage Humidity	HST	8	90	[%RH]	

Note 1: With in Ta (25°C)

Note 2: Permanent damage to the device may occur if exceeding maximum values

Note 3: Temperature and relative humidity range are shown as the below

1. 90% RH Max
2. Max wet-bulb temperature at 39°C or less. (Ta ≤ 39°C)
3. No condensation





5. Electrical Characteristics

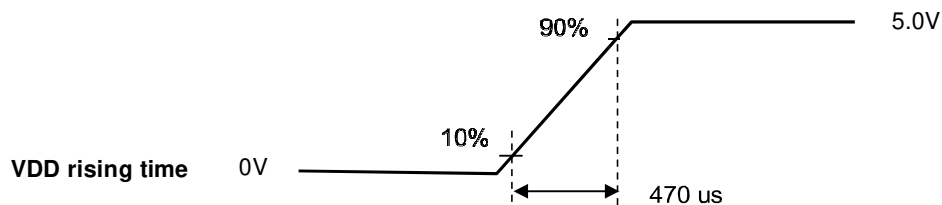
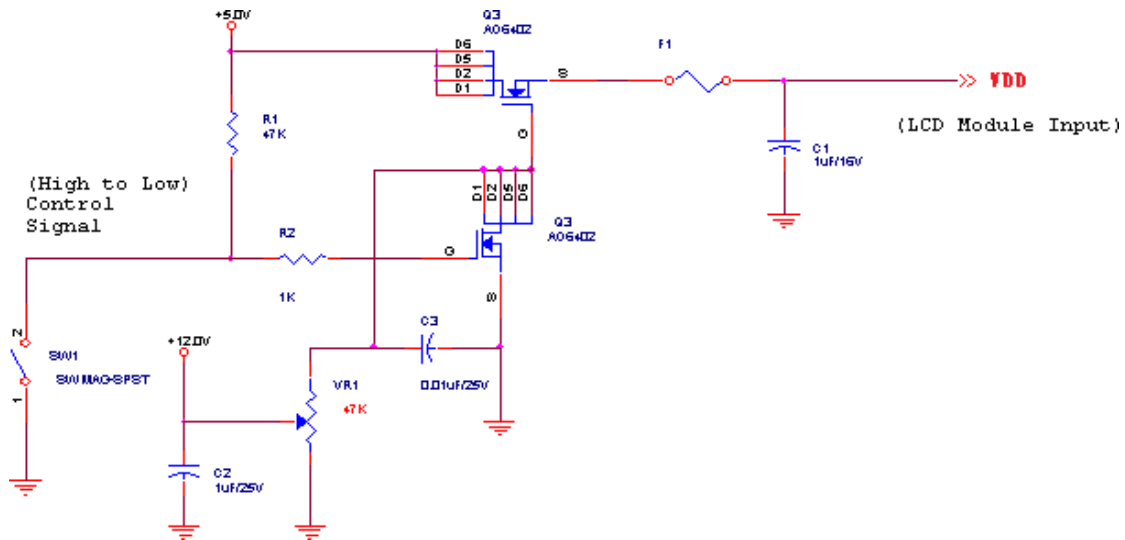
5.1 TFT LCD Module

5.1.1 Power Specification

Input power specifications are as follows:

Symble	Parameter	Min.	Typ.	Max.	Unit	Condition
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	±10%
IDD	Input Current	-	0.8	1.0	[A]	VDD=5V , All Black Pattern, at 60Hz
IRush	Inrush Current	-	-	2.5	[A]	Note
PDD	VDD Power	-	4	4.5	[Watt]	VDD=5V , All Black Pattern, at 60Hz
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	200	[mV] p-p	VDD=5V , All Black Pattern, at 60Hz

Note: Measurement conditions:





5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off.

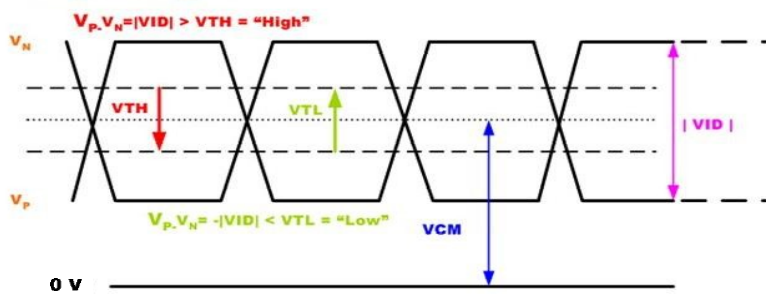
It is recommended to refer the specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Each signal characteristics are as follows;

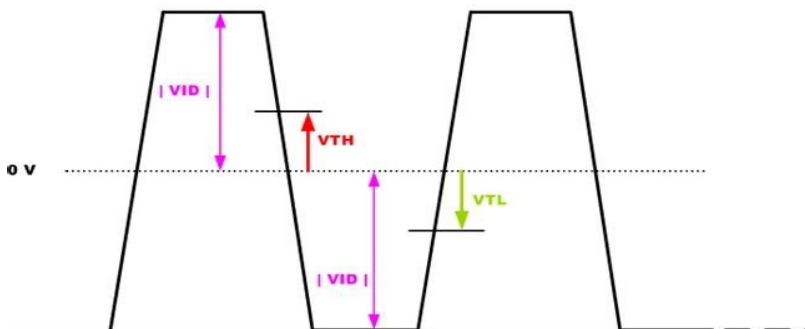
Symbol	Parameter	Min	Typ	Max	Units	Condition
V_{TH}	Differential Input High Threshold	-	-	+100	[mV]	$V_{CM} = 1.2V$ Note
V_{TL}	Differential Input Low Threshold	-100	-	-	[mV]	$V_{CM} = 1.2V$ Note
$ V_{ID} $	Input Differential Voltage	100	400	600	[mV]	Note
V_{CM}	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	$V_{TH} - V_{TL} = 200mV$ (max) Note

Note: LVDS Signal Waveform

Single-end Signal



Differential Signal





5.1.3 Backlight Unit

Parameter guideline for LED driving is under stable conditions at 25°C (Room Temperature)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
$I_{R_{LB}}$	L/B Operation Current	-	TBD	-	[mA] Note 1	Operating with fixed driving current
V_{LB}	Light Bar Operation Voltage (for reference)	-	-	TBD	[Volt] Note 2	
P_{BLU}	BLU Power consumption (for reference)	-	-	TBD	[Watt]	
LT_{LED}	LED life Time (Typical)	50,000	-	-	[Hour] Note 3	

Note 1 :The specified current is input LED chip 100% duty current.

Note 2 : The value showed in the table is one light bar's operation voltage.

Note 3 : Definition of life time : brightness becomes 50% of its original value.

5.1.4 P-CAP Controller Board

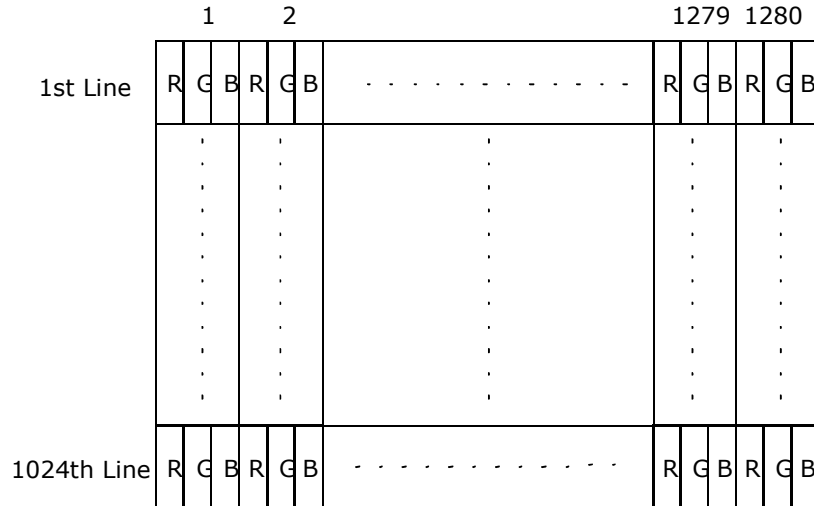
Circuit Board Dimension	33mm x 100mm x 8.1mm
Channels of Panel	Max.Tx:46 Rx:80 channels (include shielding pin)
Input Voltage	3.5V~5.5V. Typical 5V.
Linearity	Line drawing accuracy : 1pt +/- 1mm offset /10mm Touch (point) accuracy : 1pt +/- 1mm
Resolution	16384 x 16384 resolution
Power consumption(mA)	Active Mode: < 90mA Idle Mode : depends on firmware
Report rate(points/sec)*	> 100 Hz
Response time	Average < 25 ms



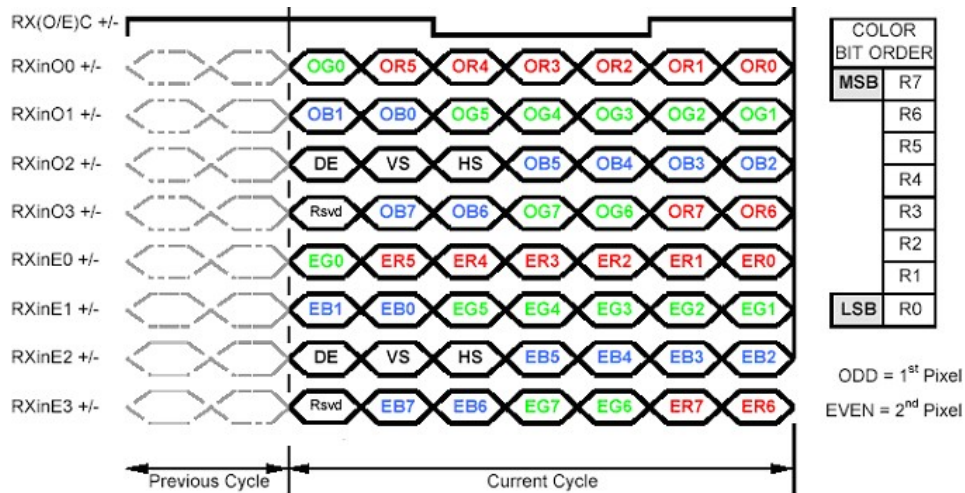
6. Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



6.2 The Input Data Format



Note1: Normally, DE, VS, HS on EVEN channel are not used.

Note2: Please follow PSWG.

Note3: 8-bit in

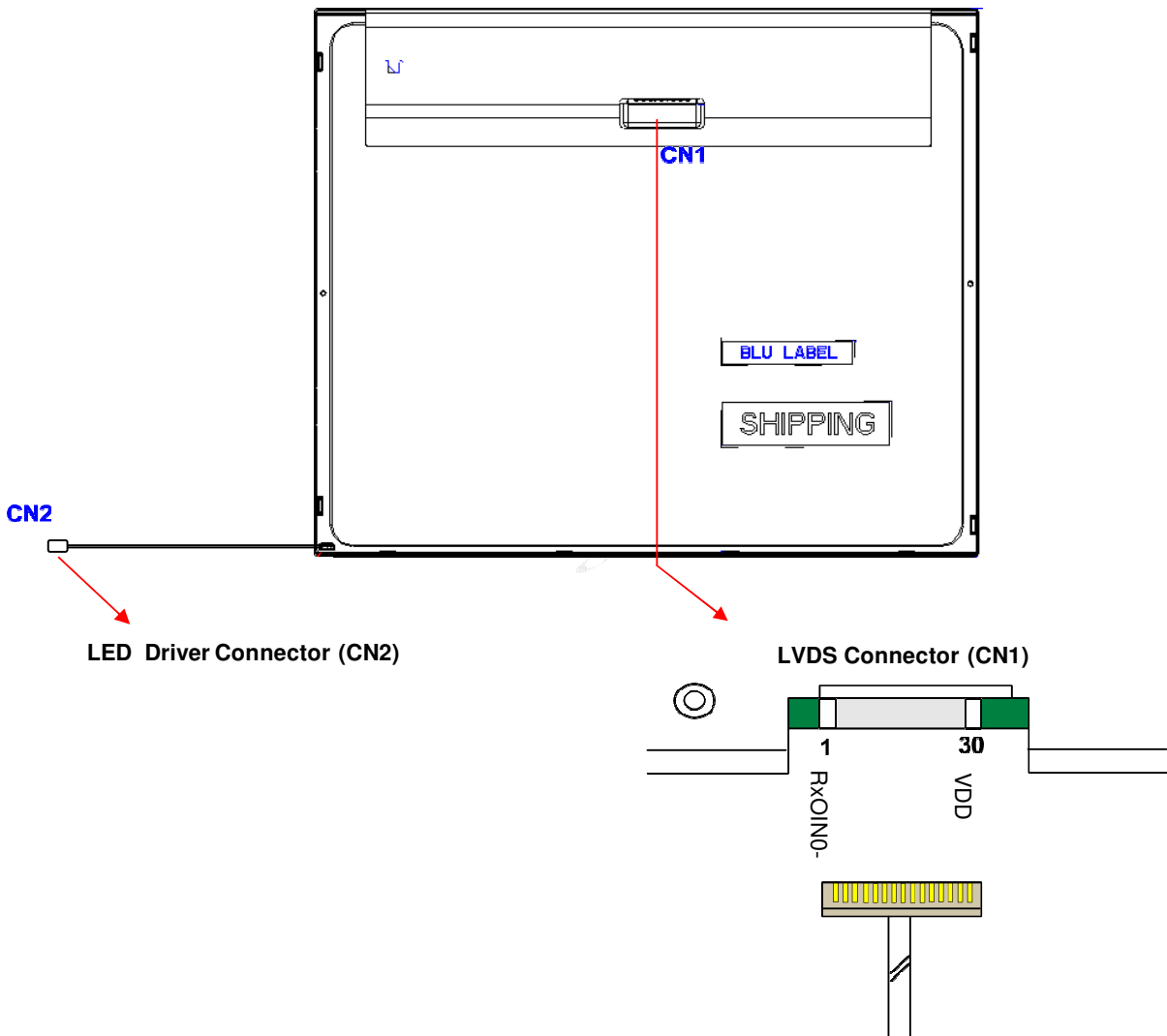


6.3 Signal Description

The module is using a pair of LVDS receiver SN75LVDS82DGG (Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. LVDS transmitter shall be SN75LVDS82DGG (negative edge sampling) or compatible. The first LVDS port (RxOxxx) transmits odd pixels while the second LVDS port (RxExxx) transmits even pixels.

LVDS Connector Pin Assignment (CN1)

PIN #	SIGNAL NAME	DESCRIPTION
1	RxOIN0-	Negative LVDS differential data input (Odd data)
2	RxOIN0+	Positive LVDS differential data input (Odd data)
3	RxOIN1-	Negative LVDS differential data input (Odd data)
4	RxOIN1+	Positive LVDS differential data input (Odd data)
5	RxOIN2-	Negative LVDS differential data input (Odd data, H-Sync,V-Sync,DSPTMG)
6	RxOIN2+	Positive LVDS differential data input (Odd data, H-Sync,V-Sync,DSPTMG)
7	GND	Power Ground
8	RxOCLKIN-	Negative LVDS differential clock input (Odd clock)
9	RxOCLKIN+	Positive LVDS differential clock input (Odd clock)
10	RxOIN3-	Negative LVDS differential data input (Odd data)
11	RxOIN3+	Positive LVDS differential data input (Odd data)
12	RxEIN0-	Negative LVDS differential data input (Even data)
13	RxEIN0+	Positive LVDS differential data input (Even data)
14	GND	Power Ground
15	RxEIN1-	Negative LVDS differential data input (Even data)
16	RxEIN1+	Positive LVDS differential data input (Even data)
17	GND	Power Ground
18	RxEIN2-	Negative LVDS differential data input (Even data)
19	RxEIN2+	Positive LVDS differential data input (Even data)
20	RxECLKIN-	Negative LVDS differential clock input (Even clock)
21	RxECLKIN+	Positive LVDS differential clock input (Even clock)
22	RxEIN3-	Negative LVDS differential data input (Even data)
23	RxEIN3+	Positive LVDS differential data input (Even data)
24	GND	Power Ground
25	GND (AGMODE)	Power Ground (For AUO test Aging mode)
26	GND	Power Ground
27	GND	Power Ground
28	VDD	+5.0V Power Supply
29	VDD	+5.0V Power Supply
30	VDD	+5.0V Power Supply





6.4 Timing Characteristics

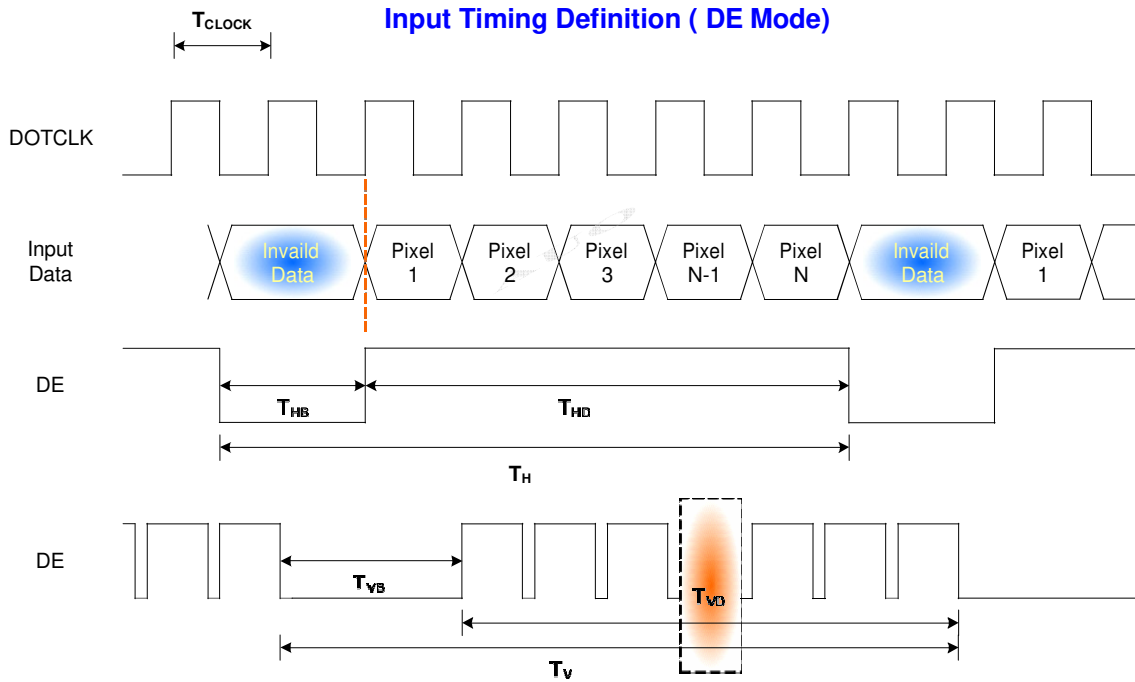
6.4.1 Timing Characteristics

Basically, interface timings described here is not actual input timing of LCD module but output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

Signal	Item	Symbol	Min	Typ	Max	Unit
Vertical Section	Period	T_v	1034	1066	1150	Th
	Active	$T_{disp(v)}$	1024	1024	1024	Th
	Blanking	$T_{bp(v)}+T_{fp(v)}+PW_{vs}$	10	42	126	Th
Horizontal Section	Period	T_h	750	844	2048	Tclk
	Active	$T_{disp(h)}$	640	640	640	Tclk
	Blanking	$T_{bp(h)}+T_{fp(h)}+PW_{hs}$	110	204	400	Tclk
Clock	Period	T_{clk}	25	18.52	11	ns
	Frequency	Freq	40	54	91	MHz
Frame rate	Frame rate	F	51	60	76	Hz

Note : DE mode only

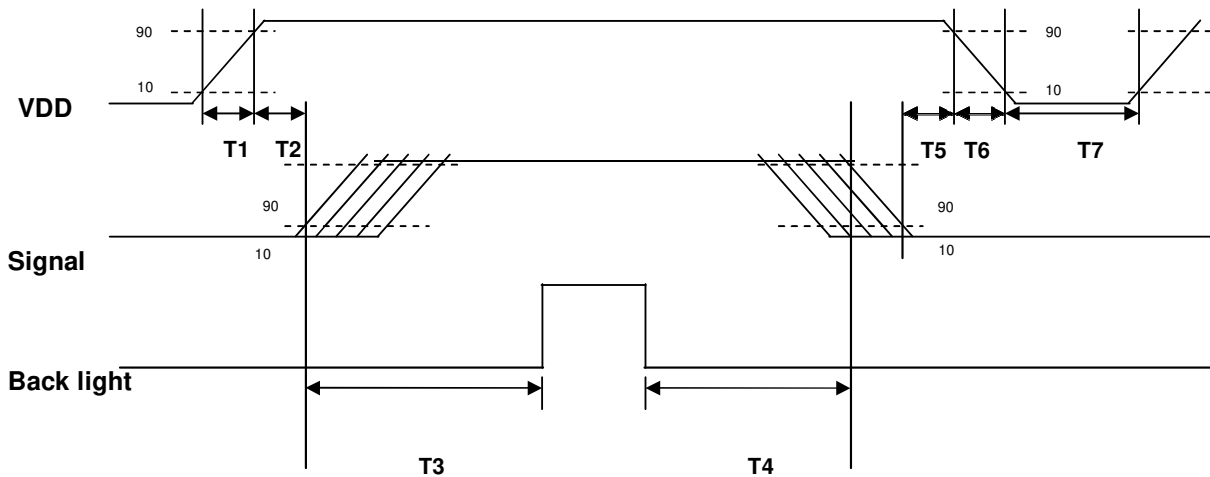
6.4.2 Timing Diagram





6.5 Power ON/OFF Sequence

VDD power and LED on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Power Sequence Timing

Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	0.5	-	10	[ms]
T2	30	40	50	[ms]
T3	200	-	-	[ms]
T4	110	-	-	[ms]
T5	0	16	50	[ms]
T6	-	-	10	[ms]
T7	1000	-	-	[ms]



7. Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT LCD Module

7.1.1 Connector

Connector Name / Designation	Interface Connector
Manufacturer	HRS
Type Part Number	MDF76URW-30S-1H(55)
Mating Housing Part Number	MDF76-30P-1C

7.1.2 LVDS Pin Assignment (CN1)

Pin#	Signal Name	Pin#	Signal Name
1	RxOIN0-	2	RxOIN0+
3	RxOIN1-	4	RxOIN1+
5	RxOIN2-	6	RxOIN2+
7	GND	8	RxOCLKIN-
9	RxOCLKIN+	10	RxOIN3-
11	RxOIN3+	12	RxEIN0-
13	RxEIN0+	14	GND
15	RxEIN1-	16	RxEIN1+
17	GND	18	RxEIN2-
19	RxEIN2+	20	RxECLKIN-
21	RxECLKIN+	22	RxEIN3-
23	RxEIN3+	24	GND
25	GND (AGMODE)	26	GND
27	GND	28	VDD
29	VDD	30	VDD

7.2 Backlight Unit

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

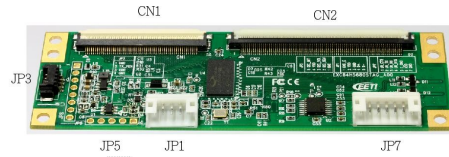
Connector Name / Designation	LED Connector
Manufacturer	JST
Connector Model Number	PHR-2P

7.2.1 Pin Assignment (CN2)

Pin#	Symbol	Signal Name
1	VCC	High Voltage
2	GND	Low Voltage



7.3 P-CAP Controller PIN ASSIGNMENT



FPC Pin Description

CN1					
PN		PN		PN	
1	NC	1	TX34	41	TX14
2	NC	22	TX33	42	TX13
3	NC	23	TX32	43	TX12
4	NC	24	TX31	44	TX11
5	NC	25	TX30	45	TX10
6	NC	26	TX29	46	TX9
7	NC	27	TX28	47	TX8
8	NC	28	TX27	48	TX7
9	TX_S1	29	TX26	49	TX6
10	TX45	30	TX25	50	TX5
11	TX44	31	TX24	51	TX4
12	TX43	32	TX23	52	TX3
13	TX42	33	TX22	53	TX2
14	TX41	34	TX21	54	TX1
15	TX40	35	TX20	55	TX0
16	TX39	36	TX19	56	TX_S0
17	TX38	37	TX18		
18	TX37	38	TX17		
19	TX36	39	TX16		
20	TX35	40	TX15		

CN2							
PN		PN		PN		PN	
1	RX_S1	21	RX58	41	RX38	61	RX18
2	RX77	22	RX57	42	RX37	62	RX17
3	RX76	23	RX56	43	RX36	63	RX16
4	RX75	24	RX55	44	RX35	64	RX15
5	RX74	25	RX54	45	RX34	65	RX14
6	RX73	26	RX53	46	RX33	66	RX13
7	RX72	27	RX52	47	RX32	67	RX12
8	RX71	28	RX51	48	RX31	68	RX11
9	RX70	29	RX50	49	RX30	69	RX10
10	RX69	30	RX49	50	RX29	70	RX9
11	RX68	31	RX48	51	RX28	71	RX8
12	RX67	32	RX47	52	RX27	72	RX7
13	RX66	33	RX46	53	RX26	73	RX6
14	RX65	34	RX45	54	RX25	74	RX5
15	RX64	35	RX44	55	RX24	75	RX4
16	RX63	36	RX43	56	RX23	76	RX3
17	RX62	37	RX42	57	RX22	77	RX2
18	RX61	38	RX41	58	RX21	78	RX1
19	RX60	39	RX40	59	RX20	79	RX0
20	RX59	40	RX39	60	RX19	80	RX_S0

Connector Pin Configuration

JP1 USB connector

JP1	
1	GND_E
2	VDD
3	GND
4	D +
5	D -

JP5 I2C connector

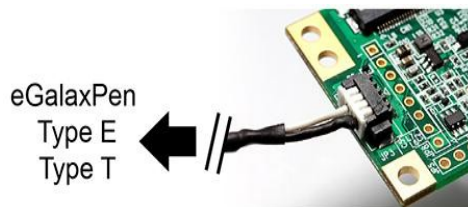
JP5	
1	GND
2	I2C_SDA
3	I2C_SCL
4	VDD
5	I2C_INT

JP7 RS232 connector

JP7	
1	UR_CTS
2	UR_TX
3	UR_RX
4	UR_RTS
5	GND_E
6	VDD
7	GND

JP3 Tethered active stylus connector

JP3	
1	GND_D
2	TX_PEN
3	VDD
4	GND_D



*JP3 connector is reserved for EETI tethered active tylius :

Type E : Entry-type active stylus

Type T : Tethered USB active stylus



8. Reliability Test

Environment test conditions are listed as following table.

Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50°C, 80%RH, 240hours	2
High Temperature Operation (HTO)	Ta= 85°C, 240hours	2
Low Temperature Operation (LTO)	Ta= -30°C, 240hours	2
High Temperature Storage (HTS)	Ta= 85°C, 240hours	2
Low Temperature Storage (LTS)	Ta= -30°C, 240hours	2
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 – 200 Hz Sweep: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)	
Thermal Shock Test (TST)	-20□/30min, 60□/30min, 50 cycles	
On/Off Test	On/10sec, Off/10sec, 30,000 cycles	
ESD	Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 8 points, 25 times/ point.	1
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 8 points, 25 times/ point.	

Note1: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost Self-recoverable. No hardware failures.

Note2:

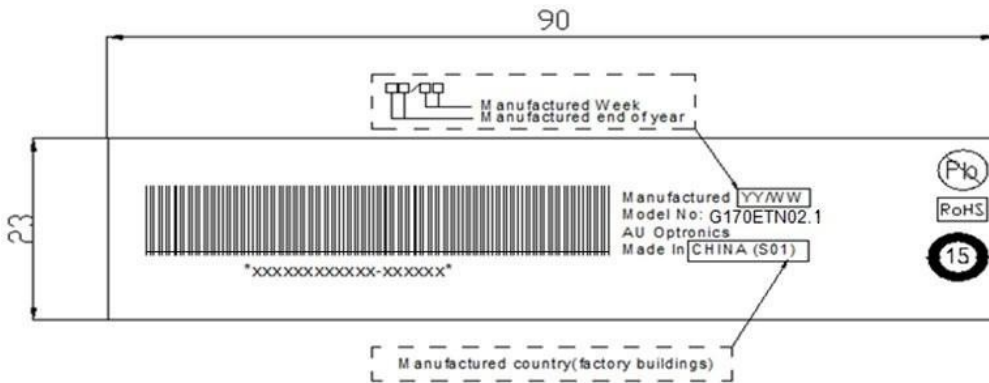
- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module. Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 24 hours at least in advance.
- No function failure occurs. Mura shall be ignored after high temperature reliability test.



9. Label and Packaging

9.1 Shipping Label

The shipping label format is shown as below.



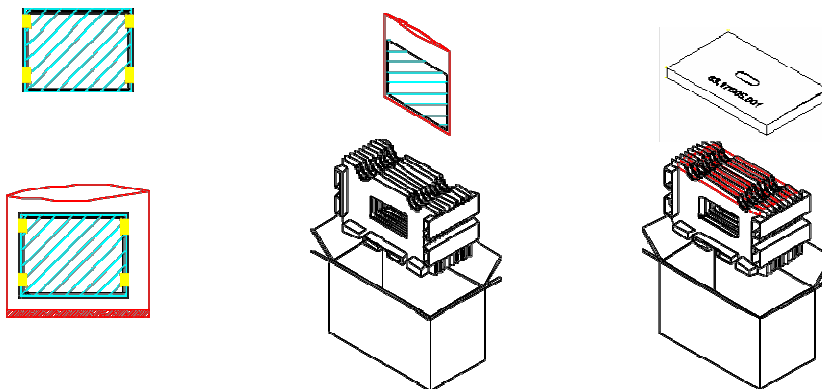
9.2 Carton Package

Max capacity : 8 TFT-LCD module per carton

Max weight: **TBD** kg per carton

Outside dimension of carton:448(L)mm*283(W)mm*397(H)mm

Pallet size : 1150 mm *910 mm * 138mm





10. Appearance Inspection

10.1 Inspection Environment specifications

- A. 觸控面板的目視檢查作業必須在至少無塵室等級為 10,000 的環境下執行。

The touch sensor has to be inspected at a clean room of at least class 10,000.

- B. 觸控面板的目視檢查環境設定值必須被控制溫度在 23°C 到 27°C 以及濕度在 40%到 60%之間。

The visual inspection environment should be set at 23 to 27 degree C and 40% to 60% humidity.

- C. 觸控面板外觀目視檢查之環境照度須設定在 1000±300 Lux 的日光燈光源下。

The illumination of the appearance inspection should be 1000±300 Lux with fluorescent reflection light source.

- D. 觸控面板的目視檢查須在人眼裸視基礎下，並且觸控面板到人眼的目檢距離須至少超過 30 公分。

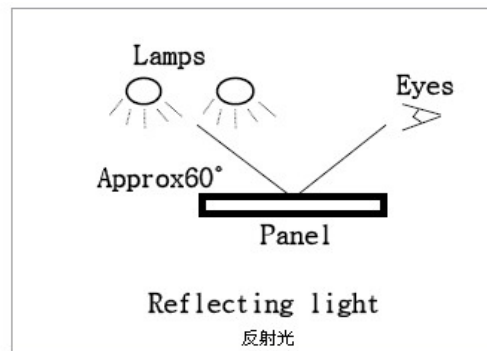
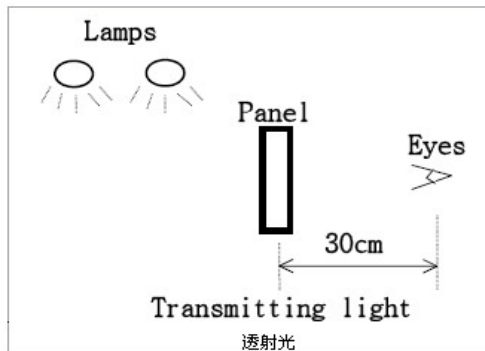
The visual inspection should be kept the distance 30cm or more between the touch sensor and the raw eyes of inspectors.

- E. 觸控面板的裸眼目視檢查角度須以 30 度正負 15 度的角度作業。

The viewing angle should be 30±15 degree with an inspector's raw eyes when visual inspection.

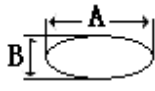

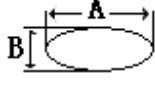
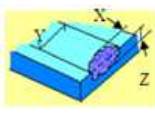
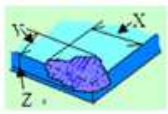

- F. 目視檢查示意圖如下附圖所示，且目視檢查時間為 15 秒正負 5 秒鐘。

The visual inspection illustration is showed as below and Visual inspection time is 15±5 second per one's.





10.2 Appearance Testing Conten

Item 品項	Calculate Method 計算方式	The standard of determination 判定標準	
		大小	允許數量
Spot defect (White/ Black) (黑/白/污點、粒子雜物點)	大小: $\Phi=(A+B)/2$ 	$0 \leq \Phi \leq 0.5\text{mm}$	不計
		$0.5\text{mm} < \Phi \leq 0.7\text{mm}$ $DS > 10\text{mm}$	$N \leq 6$
		$\Phi > 0.7$	$N = 0$
Linear defect 刮傷/毛屑/線狀異物		$W \leq 0.1\text{mm}$	不計
		$0.1\text{mm} < W \leq 0.15\text{mm}$ $L \leq 15\text{mm}, DS \geq 15\text{mm}$	$N \leq 5$
		$W > 0.15$	$N = 0$
Bump point (魚眼、凹凸點)	大小: $\Phi=(A+B)/2$ 	$0 \leq \Phi \leq 0.1\text{mm}$	不計
		$0.15\text{mm} < \Phi \leq 0.5\text{mm}$ $DS > 10\text{mm}$	$N \leq 5$
		$\Phi > 0.5$	$N = 0$
CG chipping/crack (CG崩邊,裂紋)		正面: $\Phi \leq 0.15\text{mm}, Z \leq T/2$ $DS \geq 25\text{mm}, N \leq 2$	背面: 1. 從正面看不影響外觀 2. $\Phi \leq 0.5\text{mm}, Z \leq T/2$, 不計
		正面: $X \leq 0.15\text{mm}, Y \leq 0.15\text{mm},$ $Z \leq T/2, N \leq 2$	背面: 1. 從正面看不影響外觀; 2. $X \leq 2\text{mm}, Y \leq 2\text{mm}$ $Z \leq T, N \leq 2$
		Crack is not allowed 裂紋不允許	
Dirty 髒汙		Wipe the dirt acceptance, cannot be wiped follow the bad liner calculation 可擦拭髒汙允收, 不可擦拭按點線狀不良計算	
Light leak 漏光		Flat test is not visible is OK 平光檢驗不可見為OK	
Other not be defined 其他未定義缺陷		See sample limitation 參見限度樣品	

