



XINSUN Display Integration Ltd.

Product Specification For TFT Module with CTP

MODEL NO. : XF1011280800FC-IRNL

CUSTOMER :

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☐ CUSTOMER'S APPROVAL

BY:

DATE:

PRESENTED

BY:



4. General Specifications

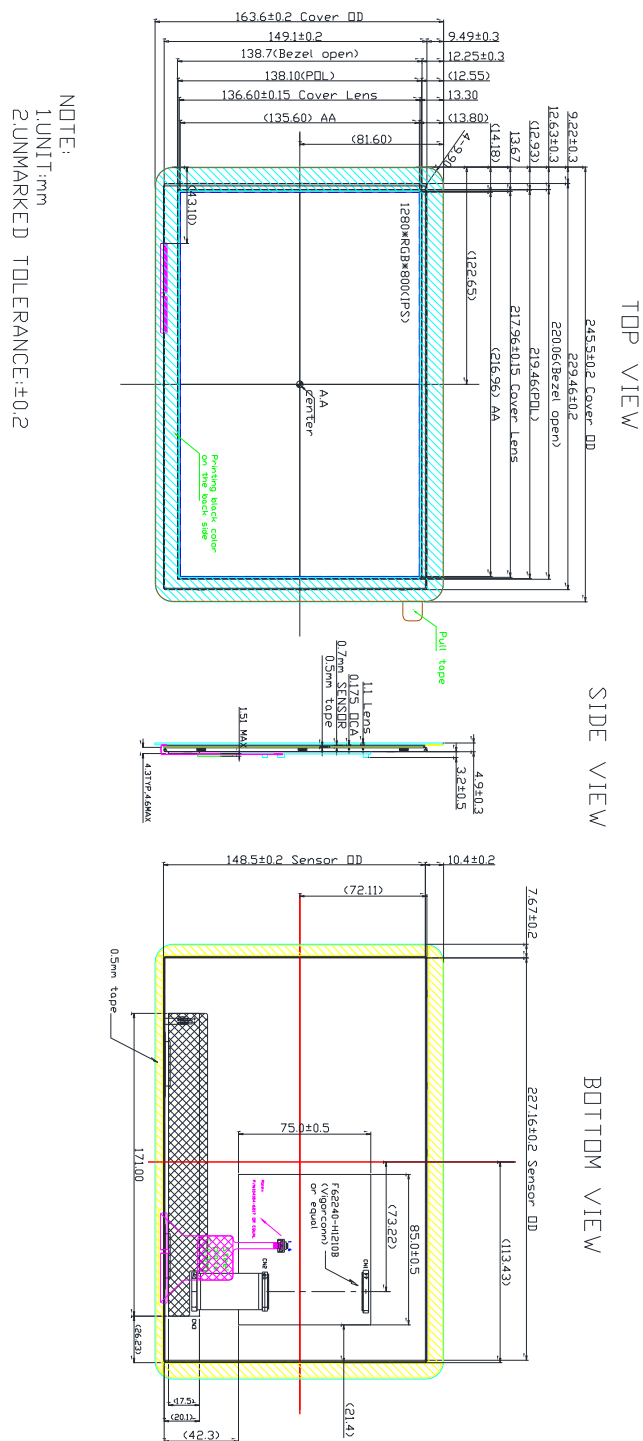
XF1011280800FC-IRNL is a TFT-LCD module. It is composed of a TFT-LCD panel, driver IC, FPC, CTP, a back light unit. The 10.1" display area contains 1280X800 pixels and can display up to 16.7M colors. This product accords with RoHS

4.1 Features

- High image quality a-Si TFT LCD module.
- High contrast, high brightness
- Low power consumption.

4.2 General Specifications

Item	Standard Value	Unit
Screen Size	10.1"(WXGA)	Inch
Dot Matrix	1280(RGB)*800	-
Color Number	16.7M	-
Module Dimension	245.5(W)*163.6(H)*4.9(T) Without PCB and component	mm
Active Area	216.96(W)*135.6(H)	mm
Color Arrangement	RGB-stripe	-
LCD Type	IPS TFT, TRANSMISSIVE, Normally Black	-
Viewing Direction	Free	-
Backlight type	LED, WHITE	-
Assembly Type	COG	-
Weight	TBD	-
Driver IC for TFT	LT7686	-
Driver IC for CTP	GT928	-
Interface for CTP	I2C	-





5.1 Interface Pin Description

NO	SYMBOL	FUNCTION	
1	VDD	Power supply	
2	NC/(XCLK1)	No connection	
3	VDD	Power supply	
4	GND	Ground	
5	TEST0	Ground	
6	PSM2	PSM[2:0]	MCU Mode
		00X	8080 mode,8bits or 16 bits
7	PSM1	01X	6800 mode,8bits or 16 bits
		100	SPI mode,3-wires
8	PSM0	101	SPI mode,4-wires
		11X	IIC mode
9	XnRST	L:Reset	
10	XnCS	Chip select input	
11	XnRD/XEN	Enable/Read enable	
12	XnWR/XRnw	Write/Read-write	
13	XA0	Command/Data select input	
14	XnWAIT	L:LT7686 Busy	
15	XDB0/I2CA0	Data bus,IIC address	
16	XDB1/I2CA1	Data bus,IIC address	
17	XDB2/I2CA2	Data bus,IIC address	
18	XDB3/I2CA3	Data bus,IIC address	
19	XDB4/SnSCS/I2CA4	Data bus,SPI Chip select input, ,IIC address	
20	XDB5/SD(3-SPI)/SDO(4-SPI)/I2CA5	Data bus,SPI data bus(3wires),SPI data output (4lines), IIC address	
21	XDB6/SDI(4-SPI)/I2CSDA	Data bus, SPI data bus(4wires),IIC data bus	
22	XDB7/SCLK	Data bus,SPI/IIC clock input	
23~30	XDB8~XDB15	Data bus	
31	XnINTR	Interrupt pin output	
32	CTP_SCL	CTP clock input	
33	CTP_SDA	CTP data bus	
34	CTP_INT	CTP interrupt pin	
35	CTP_RST	CTP reset pin	



36	VLEDK	Power supply for backlight cathode
37	VLEDK	Power supply for backlight cathode
38	MCU PWM	PWM input to control Backlight
39	VLEDA	Power supply for backlight anode
40	VLEDA	Power supply for backlight anode
41	XPWM0	LT7686 PWM output
42	GND	Ground
43	GND	Ground
44	VDD	Power supply

6. Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	VDD	-	-0.3	4.0	V
Input voltage	V _{in}		-0.3	VDD+0.3	V
Operating Temperature	T _{OP}	-	-20	+70	°C
Storage Temperature.	T _{ST}	-	-30	+80	°C
Storage Humidity	H _D	T _a < 40 °C	-	90	%RH

7. Electrical Characteristics

7.1 DC Characteristics for Digital Circuit

T_a = 25 °C

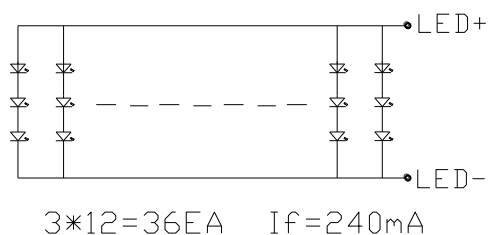
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
System voltage	VDD		3.0	3.3	3.6	V
“H” Input Voltage	V _{IH}	-	2	-	3.6	V
“L” Input Voltage	V _{IL}	-	-0.3	-	0.8	V
“H” Output Voltage	V _{OH}	-	2.4	-	-	V
“L” Output Voltage	V _{OL}	-	-	-	0.4	V

7.2 DC Characteristics for Backlight(B/L)

$T_a=25^{\circ}\text{C}$

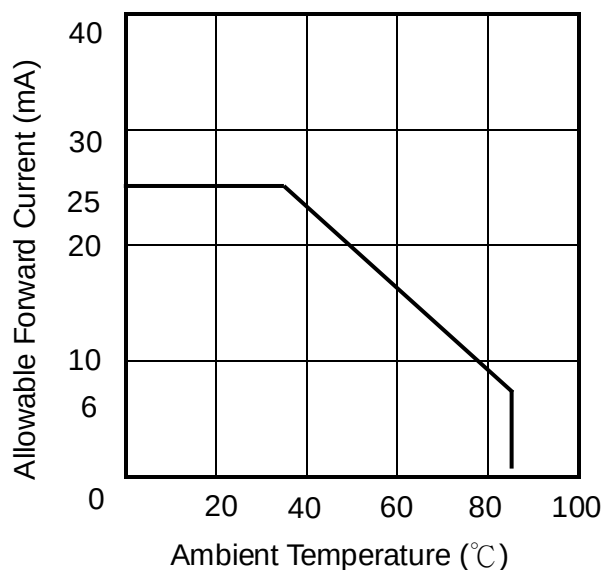
Item	Symbol	MIN	TYP	MAX	UNIT	Test Condition
Supply Voltage	VLED	8.1	19.2	10.5	V	ILED=240mA
Supply Current	ILED	-	240	-	mA	-
Luminous Intensity for LCM	-	-	300	-	cd/m ²	ILED=240mA
Uniformity for LCM	-	75	-	-	%	ILED=240mA
Life Time	-	-	30000	-	Hr	ILED=240mA
Backlight Color	White					

LED CIRCUIT :



NOTE1

Current reduction rate of LED backlight is according to the graph indicated below:





8.Optical Characteristics and Definitions

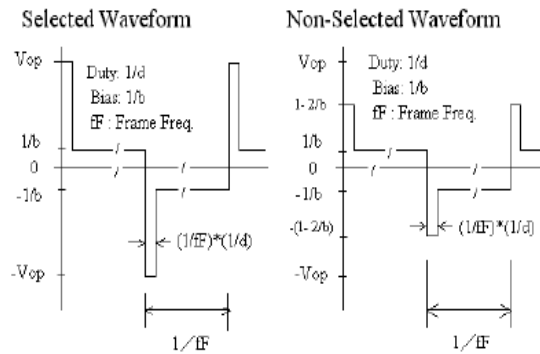
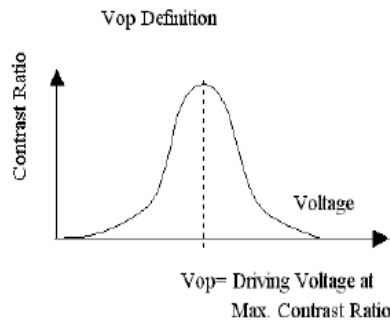
8.1 Optical Characteristics

Ta = 25°C, ILED=240mA

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Brightness		B		-	300	--	cd/m ²	(1)
Contrast Ratio		C/R		600	800	--	--	(2)
Response Time		Tr		-	15	-	ms	(3)
		Tf		--	20	-	ms	
Color chromaticity	White	Wx	$\theta=0^\circ$ Normal viewing angle At the center of panel	0.264	0.284	0.304	--	--
		Wy		0.330	0.350	0.37		
	Red	Rx		0.587	0.607	0.627		
		Ry		0.310	0.33	0.35		
	Green	Gx		0.258	0.278	0.298		
		Gy		0.526	0.546	0.566		
	Blue	Bx		0.121	0.141	0.161		
		By		0.138	0.158	0.178		
Viewing Angle	Top	θ_U	CR $\geq$ 10 Backlight On	-	85	--	degrees	(4)
	Bottom	θ_D		-	85	--		
	Left	θ_L		-	85	--		
	Right	θ_R		-	85	--		
Uniformity		Un	$\theta=0^\circ$ Normal viewing angle	75	--	--	%	(5)

8.2 Definition of Optical Characteristics

Note: Definition of LCD driving voltage and waveform



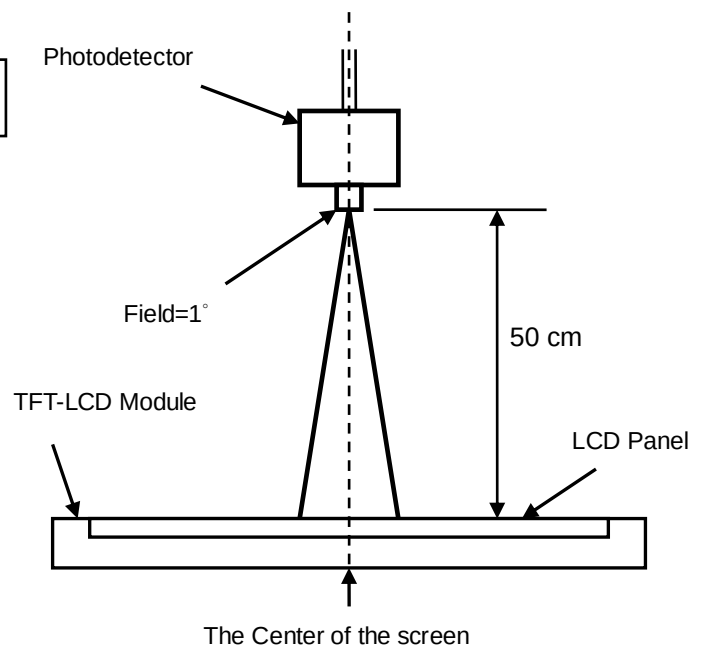
Note 1: The brightness test equipment setup

I_{LED}=240mA, Field=1°

(As measuring “black” image, field=1°

Is the best testing condition.)

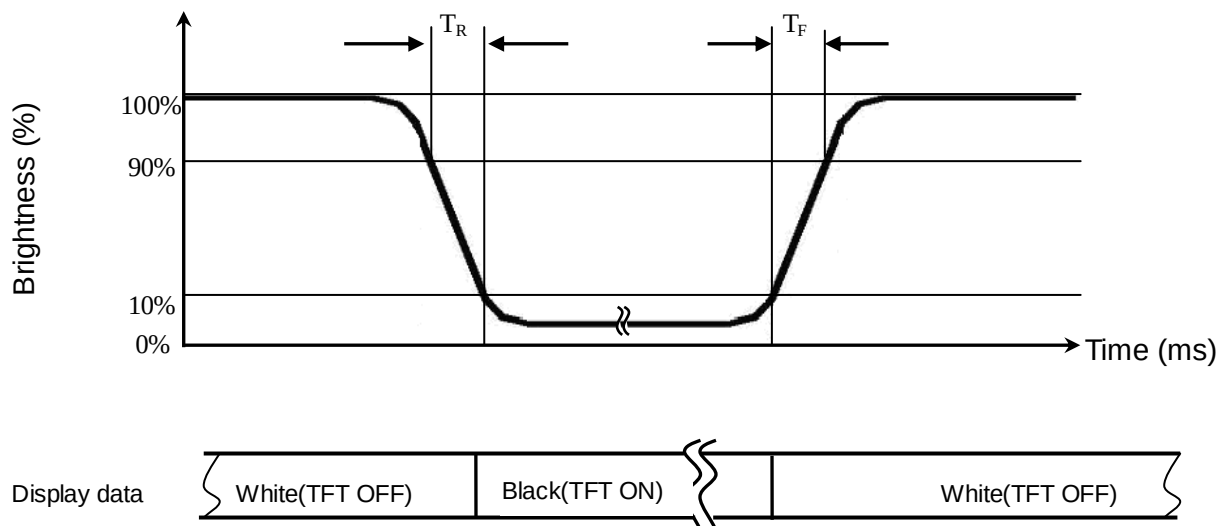
BM7



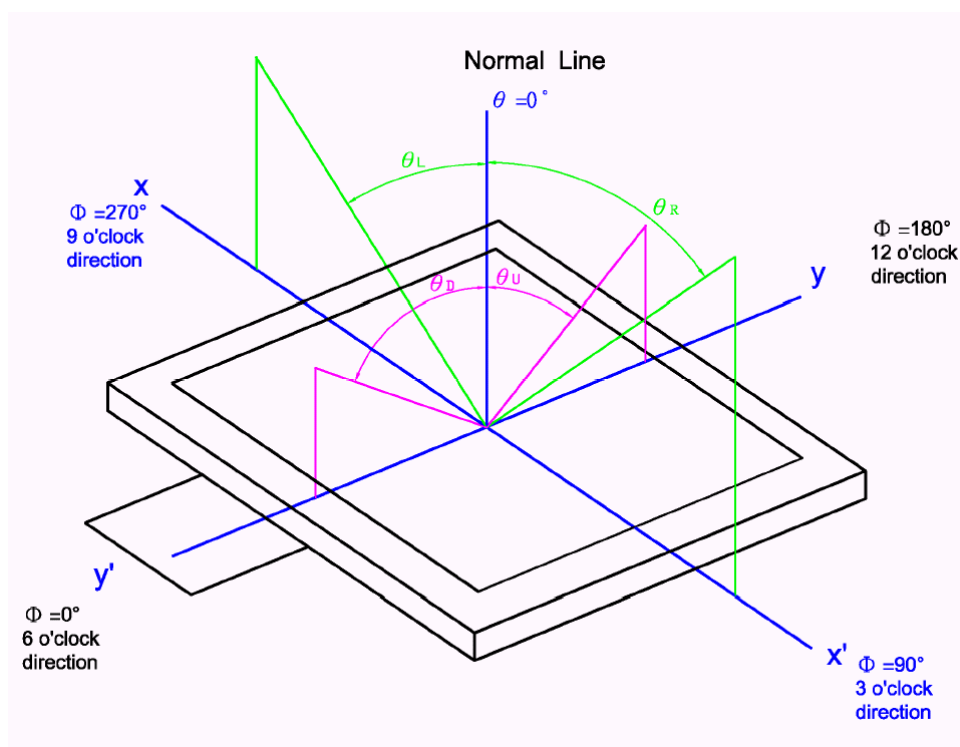
Note 2: Definition of contrast Ratio (C.R)

$$C.R = \frac{\text{Brightness When LCD is at "White" State}}{\text{Brightness When LCD is at "Black" State}}$$

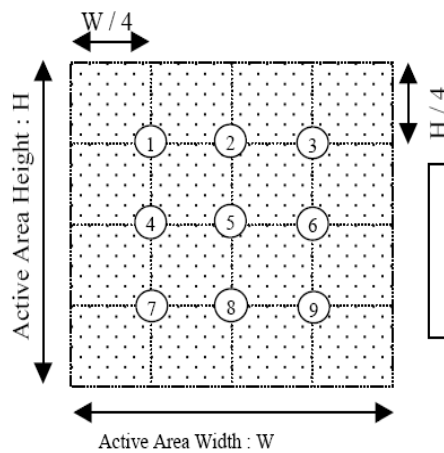
Note 3: Definition of response time



Note 4: Definition of viewing angle



Note 5: Definition of uniformity (Un)



$$\text{Brightness Uniformity} = \frac{\text{Minimum Brightness of Point 1~9}}{\text{Maximum Brightness of Point 1~9}}$$

Note 6: In a Dark Room.

9. Timing Chart and Display Command

1. Please refer to controller IC LT7686 for TFT
2. Please refer to controller IC GT928 for CTP



10. Reliability Test

No	Items	Condition	INSPECTION AFTER TEST
1	High temperature operating	70℃,96 hours	Inspection after 2~4hours storage at room temperature, the samples should be free from defects: 1, Air bubble in the LCD. 2, Seal leak. 3, Non-display. 4, Missing segments. 5, Glass crack. 6, Current IDD is twice higher than initial value. 7, The surface shall be free from damage. 8, The electric characteristic requirements shall be satisfied.
2	Low temperature operating	-20℃,96 hours	
3	High temperature storage	80℃,96 hours	
4	Low temperature storage	-30℃,96 hours	
5	High temperature and humidity storage	50℃,90%RH,96 hours	
6	Thermal Shock storage	-20℃ ————— →70℃ 30min 5min 30min after 5 cycle, Restore 2H at 25℃Power off	
7	Vibration test	10Hz~150Hz, 100m/s ² , 120min	
8	Drop test	Packed,100cm free fall, 6side,1corner,3edges	
9	Room temperature and humidity storage	25℃,60%,no dew	

NOTE:

- 1, The Test samples should be applied to only one test item.
- 2, Sample side for each test item is 5~10pcs.
- 3, For Damp Proof Test, Pure water(Resistance > 10MΩ) should be used.
- 4, In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.
- 5, Failure Judgment Criterion: Basic Specification Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.



11. Precautions in Use of TFT LCM

11.1 Safety

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

11.2 Handling

1. Avoid any strong mechanical shock which can break the glass.
2. Do not remove the panel or frame from the module.
3. The polarizing plate of the display is very fragile. So, please handle it very carefully and do not touch, push or rub the exposed polarizing.
4. Do not touch the display area with bare hands, this will stain the display area.
5. Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
6. Do not use ketonics solvent and Aromatic solvent, use with a soft cloth soaked with a cleaning Naphtha solvent.
7. To avoid organic solvent (include liquid) stained on LCM.

11.3 Storage

1. Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and in a relative Humidity of 40~60%RH.
2. Store in a clean environment, do not place the module near organics solvent or corrosive gases.
3. Do not crush, shake, or jolt the module.
4. Store in anti-static electricity container.

11.4 Soldering

1. Use a no leakage soldering iron and the high quality solder.
2. To control temperature and time of soldering conditions is $280 \pm 10^{\circ}\text{C}$ and 3~5sec.
3. Soldering: only to the I/O terminals.
4. Rewiring: no more than 3 times.



11.5 Static electricity warning

1.The TFT Module uses CMOS LSI technology. Therefore strict measures to avoid static electricity discharge are followed through all processes from manufacturing through shipping. So attention to the following:

- (1) Always use a ground strap when handling a TFT Module
Always use a ground strap while working with the module, from the time it is taken out of the anti-static bag until it is assembled. When it is necessary to transfer the LCM, once it has been taken out of the bag, always place it in an electric conductive container. Avoid wearing clothes made of chemical fibers, the use of cotton or conductive treated fiber clothing is recommended.
- (2) Do not take the TFT Module from its anti-static bag until it's to be assembled. LCM's are individually packaged in bags specially treated to resist static electricity. When storing, keep the TFT Module packed in the original bags, or store them in a container processed to be resistant to static electricity, or in an electric conductive container.
- (2) Always ground electrical apparatuses required for assembly.
Electrical apparatuses required to assemble the TFT Module into a product, i.e. electrical screw drivers are to be first grounded to avoid transmitting spike noises from the motor.
- (4) Use a no-leak iron for soldering the TFT Module
The soldering iron to be used for soldering the I/O terminals to the TFT Module are to be insulated or grounded at the iron tip.
- (5) Pay attention to the humidity in the work area, 50~60% RH is recommended.
- (6) Peel off the TFT Module protective film slowly. The module is attached with a film to protect the display surface from contamination, damage, adhesion of flux, etc. Peeling off this film abruptly could cause static electricity to be generated, so peel the tape slowly.
- (7) Assure that the work bench is properly grounded.

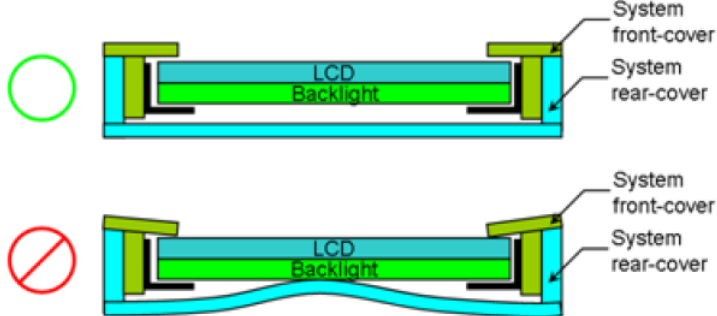
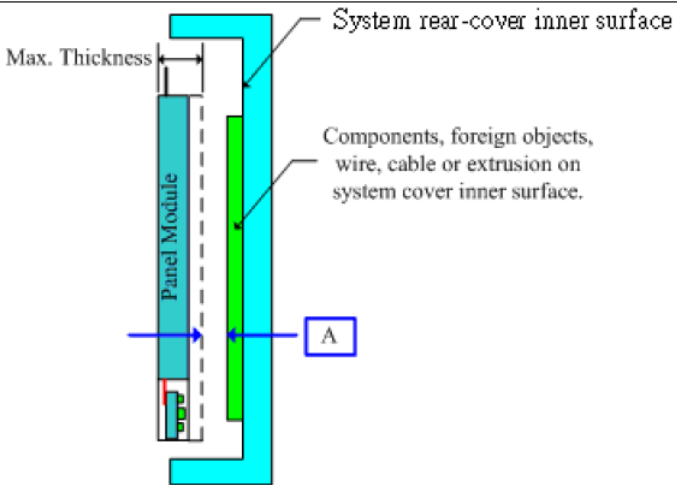


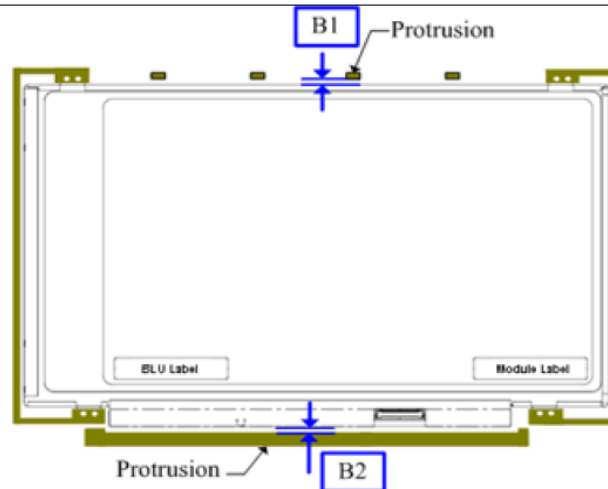
11.6 Precaution:

Please pay attention to the following items when you use the LCD Module with back-light unit.

- (1) Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
- (2) Adopt measures in adequately ventilated environment. Be sure to use the module in the specified temperature range.
- (3) Avoid dust or oil mist during assembly.
- (4) Follow the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
- (5) Try to avoid the electrical magnetic interference, and it will be more safety and less noise.
- (6) Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
- (7) Avoid displaying the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image sticking.
- (8) Be sure to turn off the power when connecting or disconnecting the circuit.
- (9) Display surface Polarizer scratches easily, please avoid dirt and stains carefully.
- (10) A dewdrop may lead to destruction. Please wipe off any moisture before using module.
- (11) Sudden temperature changes cause condensation, and it will cause polarizer damaged.
- (12) High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
- (13) Avoid any acid or chlorine compounds, which are harmful to the LCD module.
- (14) Static electricity will damage the modules; please do not touch the module without any grounded device connected.
- (15) Do not disassemble and reassemble the module by self.
- (16) Do not touch the rear side directly to avoid the electrical shock by the backlight high voltage.
- (17) Avoid strong vibration or shock. or it will cause the module broken.
- (18) Store the modules in suitable environment with regular packing.
- (19) Be careful of injury from a broken display module. Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the non-uniformity or other function issue to display.

11.7 System Cover Design Guidance:

0.	Permanent deformation of system cover after reliability test
	
Definition	System cover including front and rear cover may deform during reliability test. Permanent deformation of system front and rear cover after reliability test should not interfere with panel. Because it may cause issues such as pooling, abnormal display, white spot, and also cell crack. Note: If the interference can not be avoided, please feel free to contact FAE Engineer for collaboration design. We can help to verify and pass risk assessment for customer reference.
1.	Design gap A between panel & any components on system rear-cover
	
Definition	Gap between panel's maximum thickness boundary & system's inner surface components such as wire, cable, extrusion is needed for preventing from backpack or pogo test fail. Because zero gap or interference may cause stress concentration. Issues such as pooling, abnormal display, white spot, and cell crack may occur. Maximum flatness of panel and system rear-cover should be taken into account for gap design. Note: If the interference can not be avoided, please feel free to contact FAE Engineer for collaboration design. We can help to verify and pass risk assessment for customer reference.
2	Design gap B1 & B2 between panel & protrusions



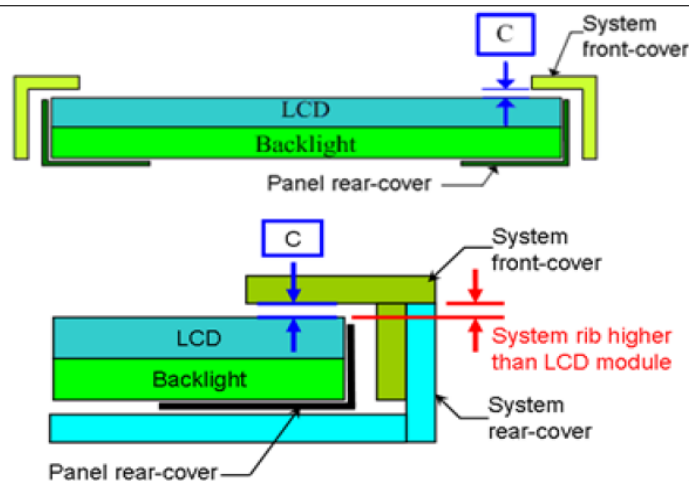
Definition

Gap between panel & protrusions is needed to prevent shock test failure. Because protrusions with small gap may hit panel during the test. Issue such as cell crack, abnormal display may occur.

The gap should be large enough to absorb the maximum displacement during the test.

Note: If the interference can not be avoided, please feel free to contact FAE Engineer for collaboration design. We can help to verify and pass risk assessment for customer reference.

3 Design gap C between system front-cover & panel surface.



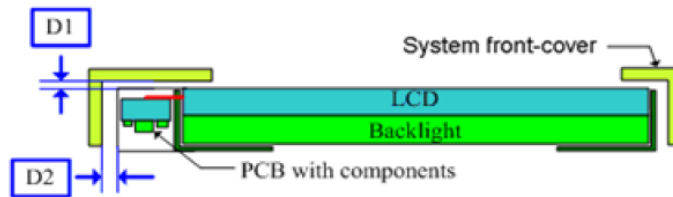
Definition

Gap between system front-cover & panel surface is needed to prevent pooling or glass broken. Zero gap or interference such as burr and warpage from mold frame may cause pooling issue near system front-cover opening edge. This phenomenon is obvious during swing test, hinge test, knock test, or during pooling inspection procedure.

To remain sufficient gap, design with system rib higher than maximum panel thickness is recommended.

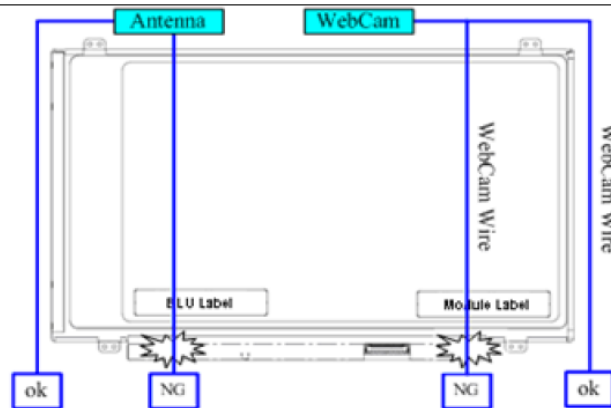
Note: If the interference can not be avoided, please feel free to contact FAE Engineer for collaboration design. We can help to verify and pass risk assessment for customer reference.

4 Design gap D1 & D2 between system front-cover & PCB Assembly.



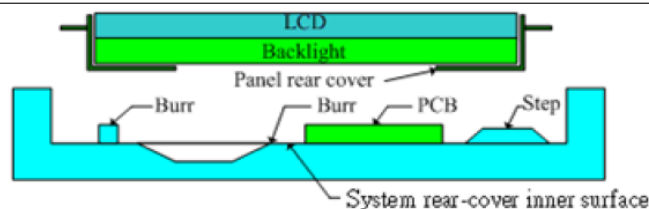
Definition Same as point 2 and 3, but focus on PCBA side.

5 Interference examination of antenna cable and WebCam wire



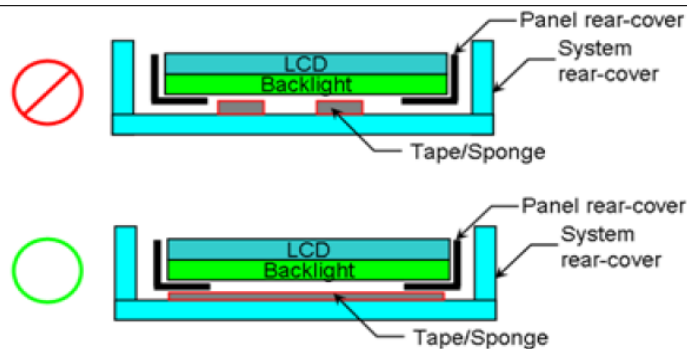
Definition Antenna cable or WebCam wire should not overlap with panel outline. Because issue such as abnormal display & white spot after backpack test, hinge test, twist test or pogo test may occur.
Note: If the interference can not be avoided, please feel free to contact FAE Engineer for collaboration design. We can help to verify and pass risk assessment for customer reference.

6 System rear-cover inner surface examination



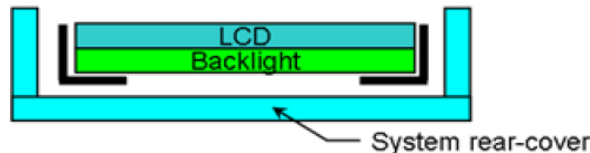
Definition Burr at logo edge, steps, protrusions or PCB board may cause stress concentration. White spot or glass broken issue may occur during reliability test.

7 Tape/sponge design on system inner surface



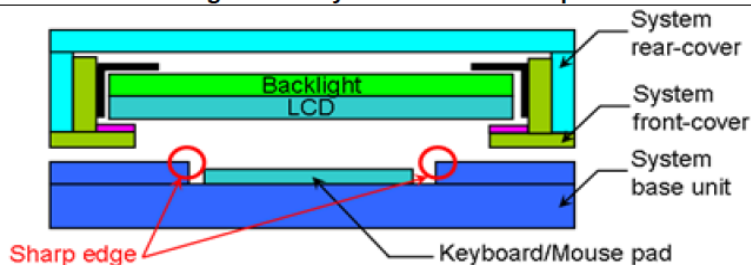
Definition To prevent abnormal display & white spot after scuffing test, hinge test, pogo test, backpack test, tape/sponge should be well covered under panel rear-cover. Because tape/sponge in separate location may act as pressure concentration location.

8 Material used for system rear-cover



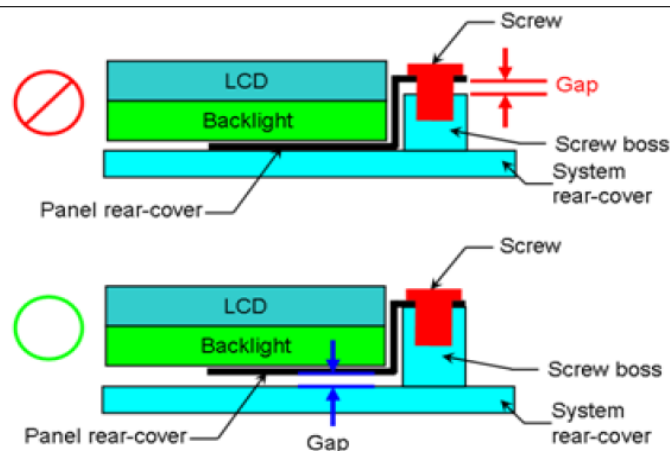
Definition System rear-cover material with high rigidity is needed to resist deformation during scuffing test, hinge test, pogo test, or backpack test. Abnormal display, white spot, pooling issue may occur if low rigidity material is used. Pooling issue may occur because screw's boss positioning for module's bracket are deformed during open-close test. Solid structure design of system rear-cover may also influence the rigidity of system rear-cover. The deformation of system rear-cover should not caused interference.

9 System base unit design near keyboard and mouse pad



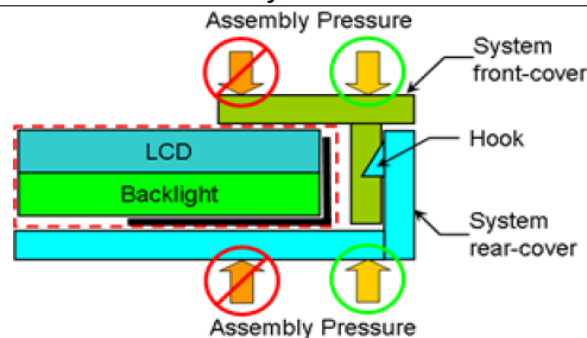
Definition To prevent abnormal display & white spot after scuffing test, hinge test, pogo test, backpack test, sharp edge design in keyboard surface may damage panel during the test. We suggest to use slope edge design, or to reduce the thickness difference of keyboard/mouse pad from the nearby surface.

10 Screw boss height design



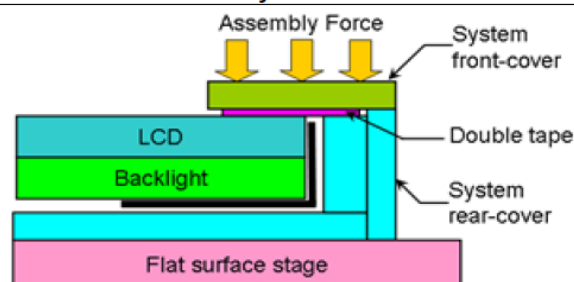
Definition Screw boss height should be designed with respect to the height of bracket bottom surface to panel bottom surface + flatness change of panel itself. Because gap will exist between screw boss and bracket, if the screw boss height is smaller. As result while fastening screw, bracket will deformed and pooling issue may occur.

11 Assembly SOP examination for system front-cover with Hook design



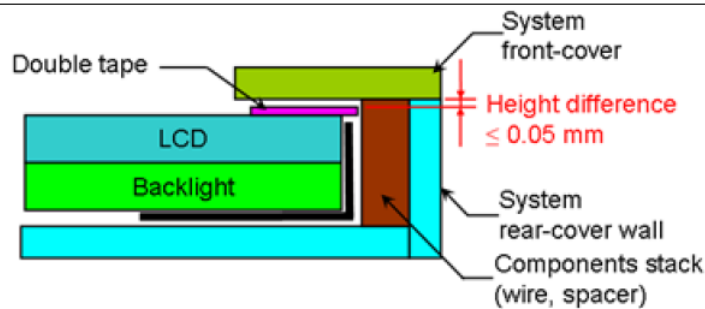
Definition To prevent panel crack during system front-cover assembly process with hook design, it is not recommended to press panel or any location that related directly to the panel.

12 Assembly SOP examination for system front-cover with Double tape design



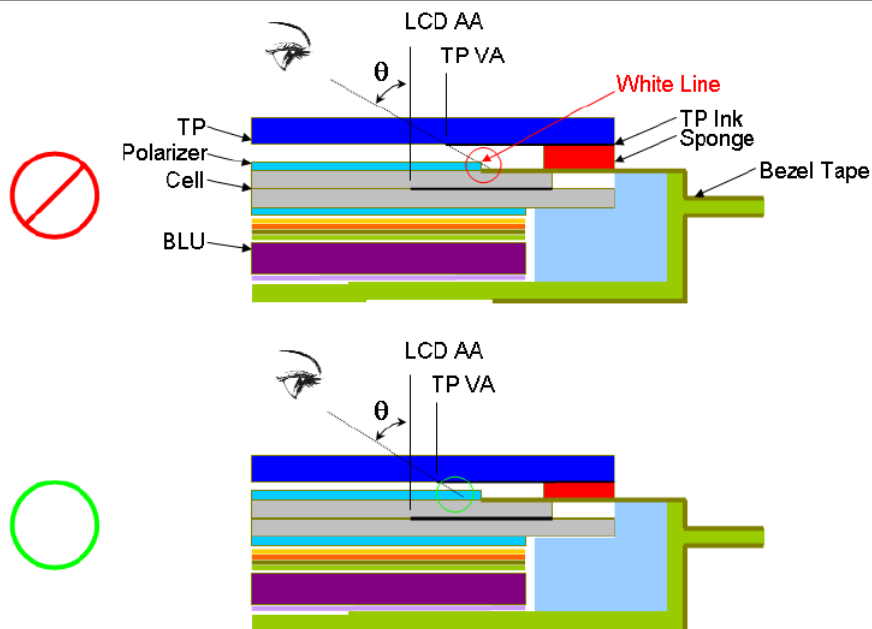
Definition To prevent panel crack during system front-cover assembly process with double tape design, it is only allowed to give slight pressure (MAX 3 Kgf/50mm²) with large contact area. This can help to distribute the stress and prevent stress concentration. We also suggest putting the system on a flat surface stage to prevent unequal stress distribution during the assembly.

13 System front-cover assembly reference with Double tape design



Definition To prevent system front-cover peeling at double tape contact area, Height difference between system front-cover assembly reference such as wall or components stack (wire, spacer) and double tape top surface must be less than 0.05mm.

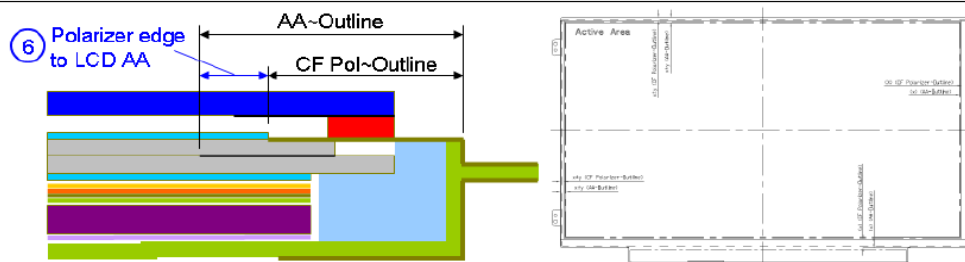
14 Touch Application : TP and LCD Module Combination for White Line Prevention



Parameter consideration for White Line Issue :

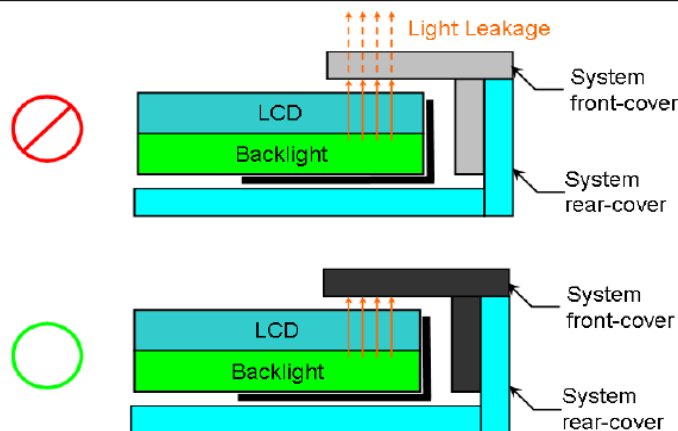
1	TP VA to LCD AA distance
2	TP Assembly tolerance
3	TP Ink Printing tolerance
4	Sponge thickness and tolerance
5	Inspection/Viewing Angle specification
6	Polarizer edge to LCD AA distance and tolerance

Polarizer edge to LCD AA distance can be derived by "AA~Outline" – "CF Pol~Outline" with respect to 2D Outline Drawing on each side.

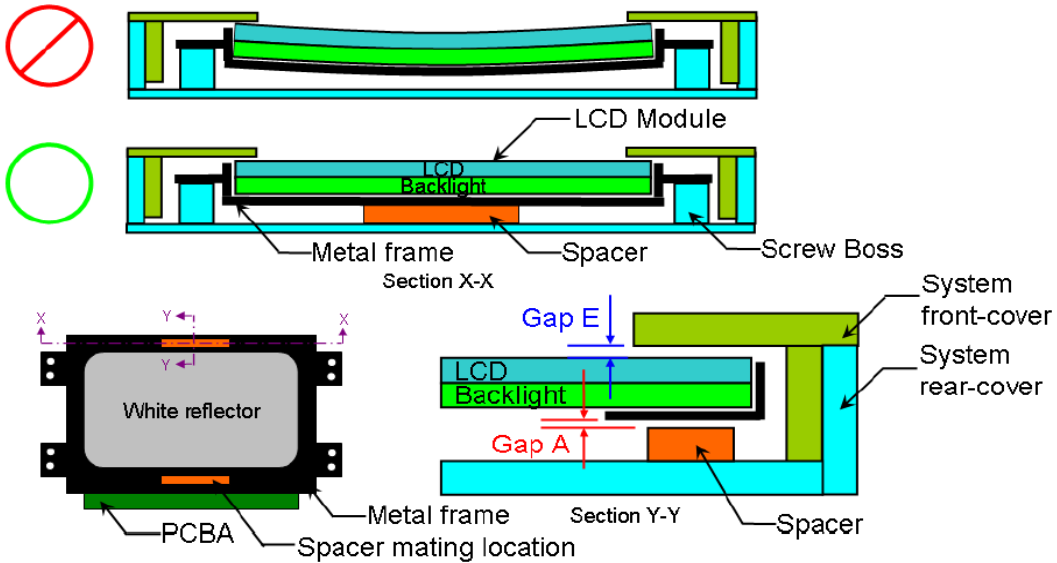


Definition	For using in Touch Application: to prevent White Line appears between TP and LCD module combination, the maximum inspection angle location must not fall onto LCD polarizer edge, otherwise light line near edge of polarizer will be appear. Parameters such as TP VA to LCD AA distance, TP assembly tolerance, TP Ink printing tolerance, Sponge thickness and tolerance, and Maximum Inspection/Viewing Angle, must be considered with respect to LCD module's Polarizer edge location and tolerance. This consideration must be taken at all four edges separately. The goal is to find parameters combination that allow maximum inspection angle falls inside polarizer black margin area. Note: Information for Polarizer edge location and its tolerance can be derived from 2D Outline Drawing ("AA ~Outline" - "CF Pol~Outline"). Note: Please feel free to contact FAE Engineer. By providing value of parameters above on each side, we can help to verify and pass the white line risk assessment for customer reference.
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15 Color of system front-cover material



Definition	To prevent light leakage is seen at system front-cover due to material transparency, we suggest using dark color material (black) for system front-cover design.
------------	---

16	Inspection spec of gap E between system front-cover to LCD module surface
	Section X-X Section Y-Y Gap E Gap A Labels: LCD Module, LCD Backlight, Metal frame, Spacer, Screw Boss, System front-cover, System rear-cover, White reflector, PCBA, Spacer mating location
Definition	To maintain gap E (gap of system front-cover to LCD module) in its inspection spec, especially at location with maximum LCD deformation (center of LCD length), we recommend adding spacer with design gap A smaller or equal to gap E. The allowable spacer mating location is on module metal frame outside LCD Active-Area. Note: If the interference can not be avoided, please feel free to contact FAE Engineer for collaboration design. We can help to verify and pass risk assessment for customer reference.



12.Specification of Quality Assurance

12.1 Purpose

This standard for Quality Assurance should affirm the quality of TFT Module (TFT LCM) products.

12.2 Standard Quality Test

1.Inspection:

Before delivering,the supplier should take the following tests,and affirm the quality of product.

2.Electro-Optical Characteristics:

According to the individual specification to test the product.

3.Test of Apperance Characteristics:

According to the individual specification to test the product.

4.Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

12.3 Nonconforming Analysis and Deal with manners

1.Purchaser should supply the detail data of non-conforming sample and the non-suitable state.

2.After accepting the detail data from purchaser,the analysis of nonconforming should be finished in two weeks.

3.If supplier can not finish analysis on time,must announce purchaser before one weeks.

4.If find any product defect of supplier during assembly time,supplier must change the good Product for every defect after recognition.

5.Both supplier and customer should analyze the reason and discuss the disposition of Nonconforming when the reason of nonconforming is not sure.

12.4 Agreement items

Both sides should discuss together when the following problems happen.

1.There is any problem of standsrd of quality assurance,and both sides think that it must be modified.

2.There is any argument item which does not record in standard of quality assurance.

3.Any other special problem.

12.5 Inspection Specification

1.Inspection Standard:MIL-STD-105E table normal inspection single sampling level II.

2.Test condition: Ambient temperature: $25 \pm 5^{\circ}\text{C}$ //Humidity: $55 \pm 10\%$ RH

3.The defects classify of AQL(%) as following:

Major defect:AQL=0.65

Minor defect:AQL=2.5

4.Manner of appearance test:

(1)The test must be under 40W fluorescent light,and the distance of view must be at 30cm.

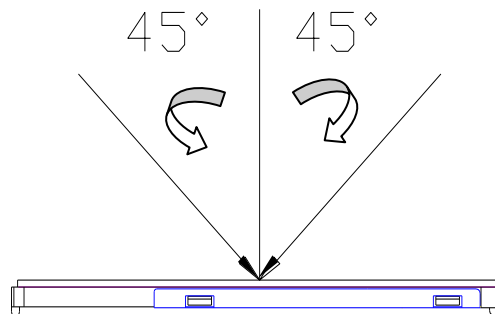
(2)The test direction is base on about around 45° of vertical line.

(3)Definition of area:

A area:Active area.

B area:Viewing area.

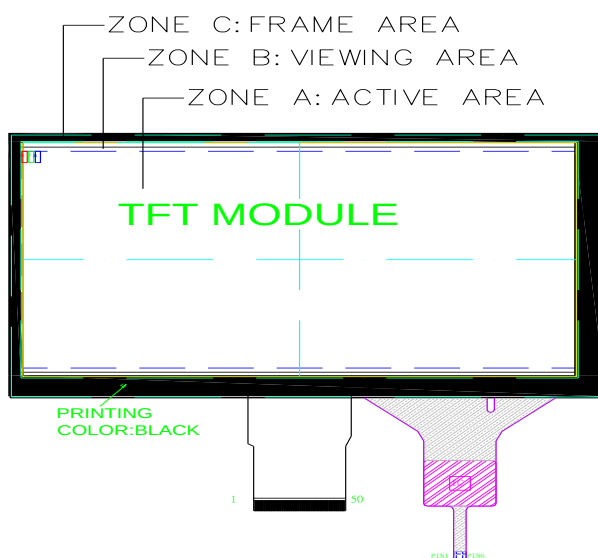
C area:Out of viewing area.(Outside viewing area)>>Do not count



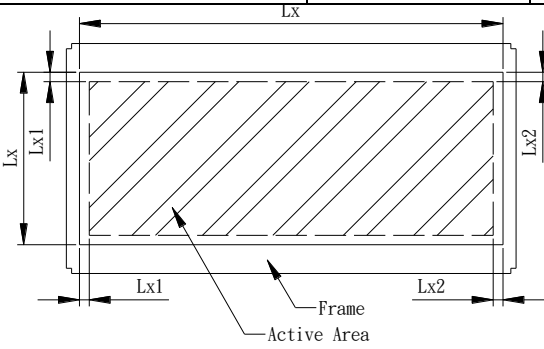
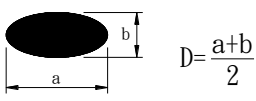
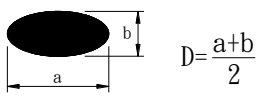
5.It will accord to AQL when the standard can not be described.

6.The sample of the lowest acceptable quality level must be discussed by both supplier and Customer when any dispute happened.

7.Must add new item on time when it is necessary.



12.6 Inspection Quality Criterion

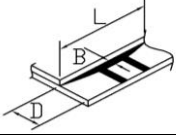
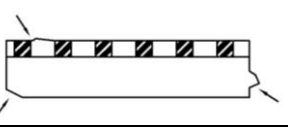
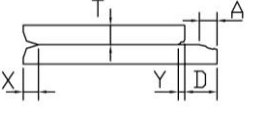
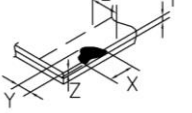
ITEM	DESCRIPTION OF DEFECTS	Class of defects	Acceptable level (%)
DIMENSION	Refer to individual acceptance specification	Major	2.5
SLANT	Viewing Area	Lx1-Lx2	Judgment
	$Lx \leq 100\text{mm}$	$\leq 0.2\text{mm}$	ACC
	$100\text{mm} < Lx \leq 150\text{mm}$	$\leq 0.3\text{mm}$	ACC
	$150\text{mm} < Lx \leq 200\text{mm}$	$\leq 0.4\text{mm}$	ACC
	$200\text{mm} < Lx$	$\leq 0.5\text{mm}$	ACC
			Minor 2.5
LINE DEFECT ON SURFACE (SCRATCHES, BLACK/ WHITE LINE)	(a) $L \leq 3\text{mm}$ & $W \leq 0.03\text{mm}$, disregard (b) $L \leq 3\text{mm}$ & $0.03\text{mm} < W \leq 0.05\text{mm}$, $N \leq$ (d) $L > 3\text{mm}$ or $W > 0.05\text{mm}$, REJ (e) Distance between 2 lines $\geq 10\text{mm}$		Minor 2.5
SPOT DEFECT ON SURFACE (BLACK/ WHITE SPOT)	Average diameter, D (a) $D \leq 0.25\text{mm}$, disregard (b) $0.25\text{mm} < D \leq 0.35\text{mm}$, $N \leq 3$.ACC (c) $D > 0.35\text{mm}$, REJ (d) Distance between 2 spots $\geq 10\text{mm}$		Minor 2.5
PROTRUDE DOT/ DENT ON SURFACE	Average diameter D (a) $D \leq 0.3\text{mm}$, disregard (b) $0.3\text{mm} < D \leq 0.35\text{mm}$, $N \leq 3$.ACC (c) $0.35\text{mm} < D \leq 0.5\text{mm}$, $N \leq 1$.ACC (d) $D > 0.5\text{mm}$, REJ (e) Distance between 2 protrude dot/ dent $\geq 10\text{mm}$		Minor 2.5
RIFT	Not allowed.	Major	0.65
LIFTED ON POLIZER EDGESIDE	Average diameter D (a) $D > 0.5\text{mm}$, REJ (b) $L > 5\text{mm}$, $W > 0.5\text{mm}$, REJ	Minor	2.5

NOTE : (1) ACC : Accept (2) REJ : Reject



ITEM	DESCRIPTION OF DEFECTS				Class of defects	Acceptable level (%)
BRIGHT/ DARK POINT	Item		Allow number in Area A		Minor	2.5
	(a) Bright point	Single point	2			
		Two adjacent point	1			
		Three adjacent point	0			
		Total point	2			
	(b) Dark point	Single point	3			
		Two adjacent point	0			
		Three adjacent point	0			
		Total point	3			
	※ Point : A sub pixel 1R or 1G or 1B					
※ The distance of bright or dark point > 5mm						
CHROMA MURA	Not allowed if it can be observed through ND Filter 6%. Refer to individual acceptance limited sample				Minor	2.5
COLOR NOT ACCORD	Not allowed if it can be observed through ND Filter 6%. Refer to individual acceptance limited sample				Minor	2.5
SCRATCH (LINEAR)	Width W, Length L		A	B	Minor	2.5
	W ≤ 0.05mm,L≤15mm		disregard			
	0.05mm < W ≤ 0.08mm, L ≤10.0mm		3	4		
	0.08mm < W , 10.0mm<L		0	1		
DISPLAY ABNORMAL	(a) Non display (b) Line defect (c) Response time, contrast ratio, brightness or viewing angle abnormal (d) Water ripple (e) Flicker				Major	0.65

NOTE : (1) ACC : Accept (2) REJ : Reject

ITEM	DESCRIPTION OF DEFECTS		Class of defects	Acceptable level (%)
POOR CUTTING	(a) 	According to Engineering drawing	Major	0.65
	(b) 	According to Engineering drawing		
	(c) 	1.X,Y damage touch 1/3 width 2.A>1/4D, REJ		
DAMAGE		1. $Z < T$ and $X < 15\text{mm}$ $Y \leq 1.0\text{mm}$, ACC 2. $Z = T$ and $X > 15\text{mm}$ $Y > 1.0\text{mm}$, REJ	Minor	2.5

NOTE : (1) ACC : Accept (2) REJ : Reject

13. Terms of Warranty

1.Applicable warranty period

The period is within thirteen months since the date of shipping out under normal using and Storage conditions.

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 aerospace,unclear power control 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.



14. Material List of Components for ROHS

XINSUN Display Integration Ltd. hereby declares that our company do not intentionally contain any of the substances listed in applicable EU directives and regulations

and all our products will conform to content requirement of 6 substances

(Pb, Cd, Hg, Cr⁶⁺, PBB, PBDE) of RoHS directive, and we will not use these 6 substances in the manufacturing process, and guarantee that the content of these substances in our products won't exceed the limit value of RoHS as followings:

Hazardous Substance	Limit value of RoHS (ppm, mg/kg)
Lead and its compounds (Pb)	< 1000
Cadmium and its compounds (Cd)	< 100
Mercury and its compounds (Hg)	< 1000
Chromium VI and its compounds (Cr ⁶⁺)	< 1000
Polybrominated Biphenyls (PBB)	< 1000
Polybromodiphenyl Ether (PBDE)	< 1000
Packaging: PB + Cd+Hg+Cr ⁶⁺	< 100

Remarks:

- (1) In addition to the basic restricted items in the above list, if any individual customers have any other special item requirement, please specify, so that we can specially try to conform.
- (2) If any individual customers really need to have RoHS compliant earlier than the above schedule, please specify on Purchase Order so that we can specially try to conform.