



深圳市一众显示科技有限公司

SHEN ZHEN TEAM SOURCE DISPLAY TECH. CO, LTD.

TFT-LCD Module Specification

Module NO.: TST430MCNH-11X

Version: V1.0

☐ APPROVAL FOR SPECIFICATION

☐ APPROVAL FOR SAMPLE

For Customer' s Acceptance:	
Approved by	Comment

Team Source Display:		
Presented by	Reviewed by	Organized by

Version No.	Date	Content	Remark
V1.0	2017-7-10	Initial Release	

ITEM	Specification	Unit
LCD Type	a-Si TFT,Transmissive,Normally white,TN	-
LCD Size	4.3	inch
Resolution (W x H)	480 x (RGB) ×272	pixel
LCM (W × H × D)	105.5(W) x 67.2(H) x 3(D)	mm
Active Area (W × H)	95.04 (W) x 53.856 (H)	mm
Dot Pitch (W × H)	0.198 x 0.198	mm
Viewing Direction	12 o'clock	-
Gray Scale Inversion Direction	6 o'clock	-
Viewing Angle	Top:75,Bottom:70; Left/ Right:75	deg.
Color Depth	16.7M	-
Pixel Arrangement	RGB-stripe	-
Backlight Type	10 LEDs	-
Surface Luminance	500	cd/m2
Surface Treatment	Anti-Glare	-
Driver IC	HX8257A	-
Interface Type	24 BIT RGB	-
Input Voltage	2.8	V
With/Without TP	Optional	-
Weight	33	g

Note 1: RoHS compliant

Note 2: LCM weight tolerance: ± 5%.



Contents

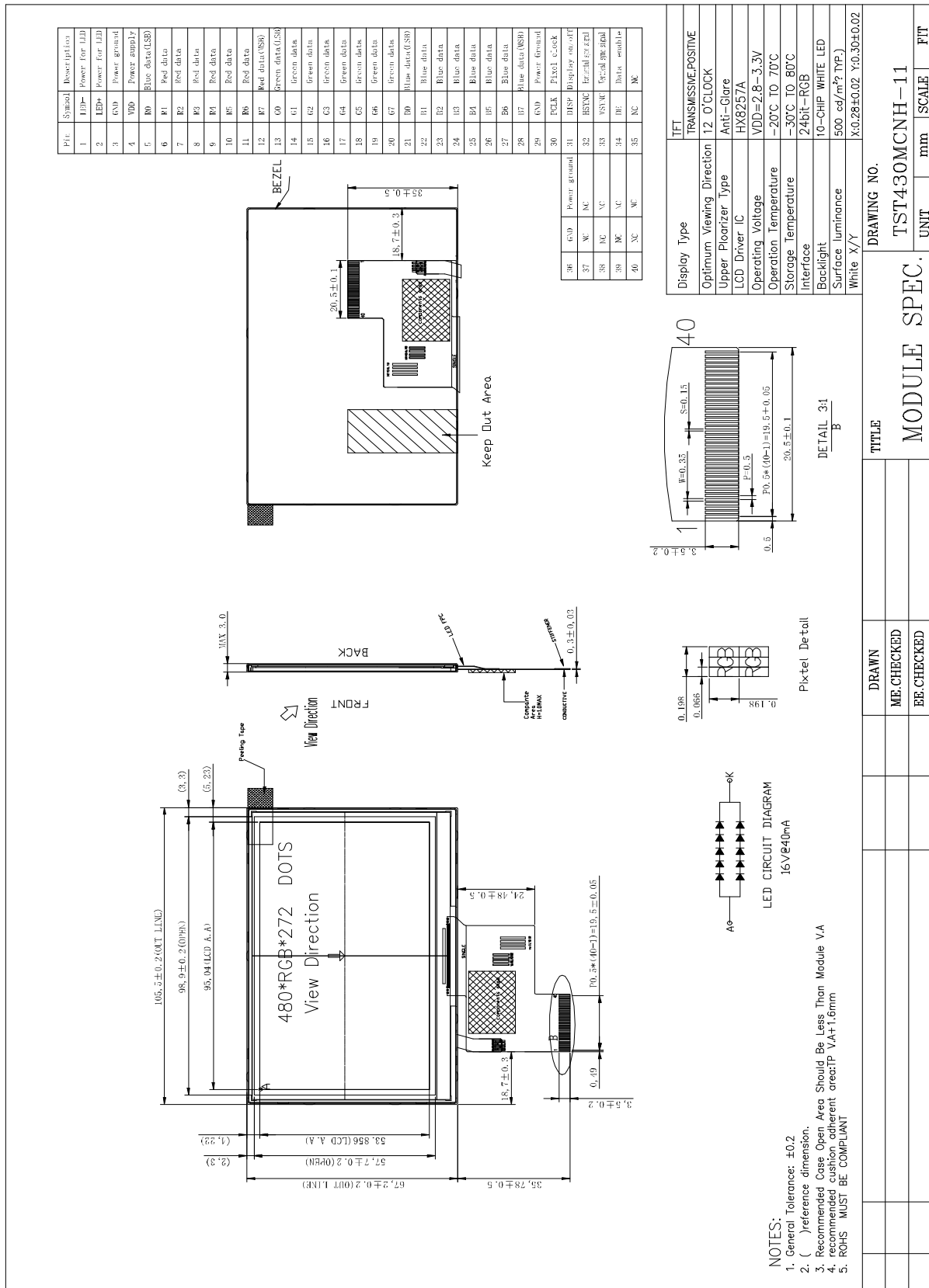
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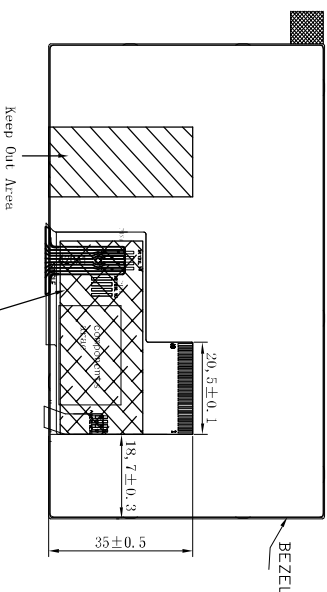
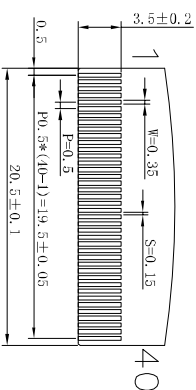
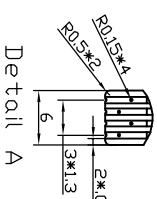
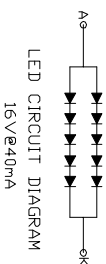
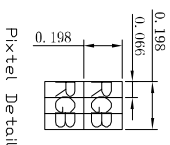
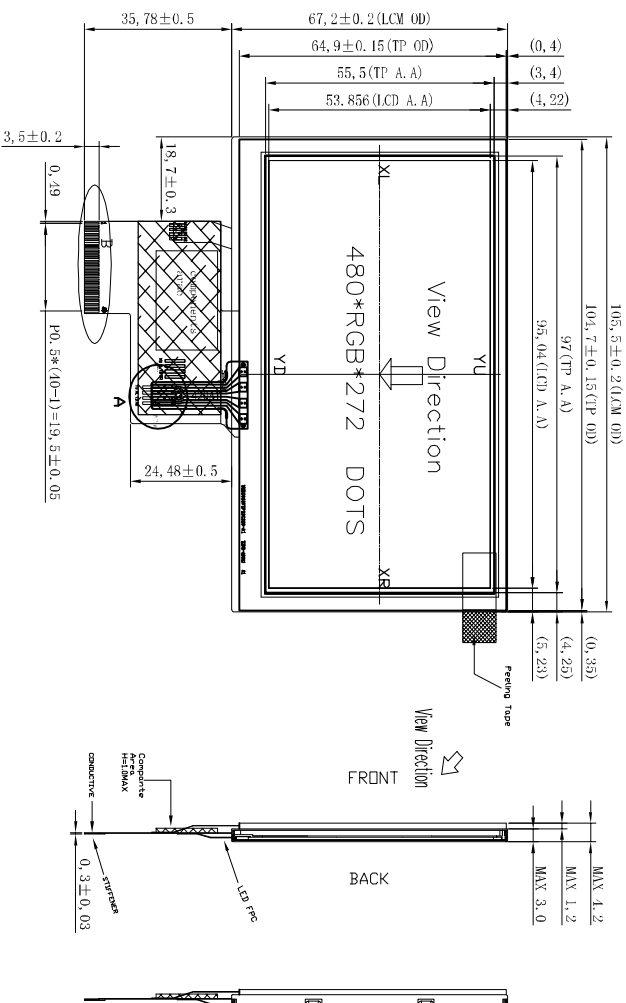


1. General Specification

Item	Contents	Unit
LCD TYPE	TFT/TRANSMISSIVE	
MODULE SIZE (W*H*T)	105.5*67.2*3.0	MM
ACTIVE SIZE (W*H)	95.04*53.856	MM
PIXEL PITCH (W*H)	0.198*0.198	MM
NUMBER OF DOTS	480*272	
DIVER IC	HX8257A	
INTERFACE TYPE	24BIT RGB	
TOP POLARIZER TYPE	ANTI-GLARE	
RECOMMEND VIEWING DIRECTION	12	O'CLOCK
GRAY SCALE INVERSION DIRECTION	6	O'CLOCK
COLORS	16.7M	
BACKLIGHT TYPE	10-DIES WHITE LED	
TOUCH PANEL TYPE	Optional	

2. Mechanical Drawing





Pin	Symbol	Description
1	L1D+	Power for L1H
2	L1D+	Power for L1H
3	GND	Power Ground
4	VDD	Power supply
5	R0	Blue data(LSB)
6	R1	Red data
7	R2	Red data
8	R3	Red data
9	R4	Red data
10	R5	Red data
11	R6	Red data
12	R7	Red data(GND)
13	G0	Green data(LSB)
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data
19	G6	Green data
20	G7	Green data
21	B0	Blue data(LSB)
22	B1	Blue data
23	B2	Blue data
24	B3	Blue data
25	B4	Blue data
26	B5	Blue data
27	B6	Blue data
28	R7	Blue data(MSB)
29	GND	Power Ground
30	PC1A	Pixel clock
31	HSYNC	HSync
32	TP PIN	TP PIN
33	VSSNC	VSSNC
34	DE	Vertical sync signal
35	NC	Data enable
40	YL	TP PIN

Display Type	TFT
Optimum Viewing Direction	TRANSMISSIVE, POSITIVE
Upper Polorizer Type	12 °CLOCK
LCD Driver IC	Anti-Glare HX8257A
Operating Voltage	VDD=2.8-3.3V
Operation Temperature	-20°C TO 70°C
Storage Temperature	-50°C TO 80°C
Interface	24bit~RGB
Backlight	10-Chip WHITE LED
Surface luminance	460 cd/m ² (TYP.)
White X,Y	---

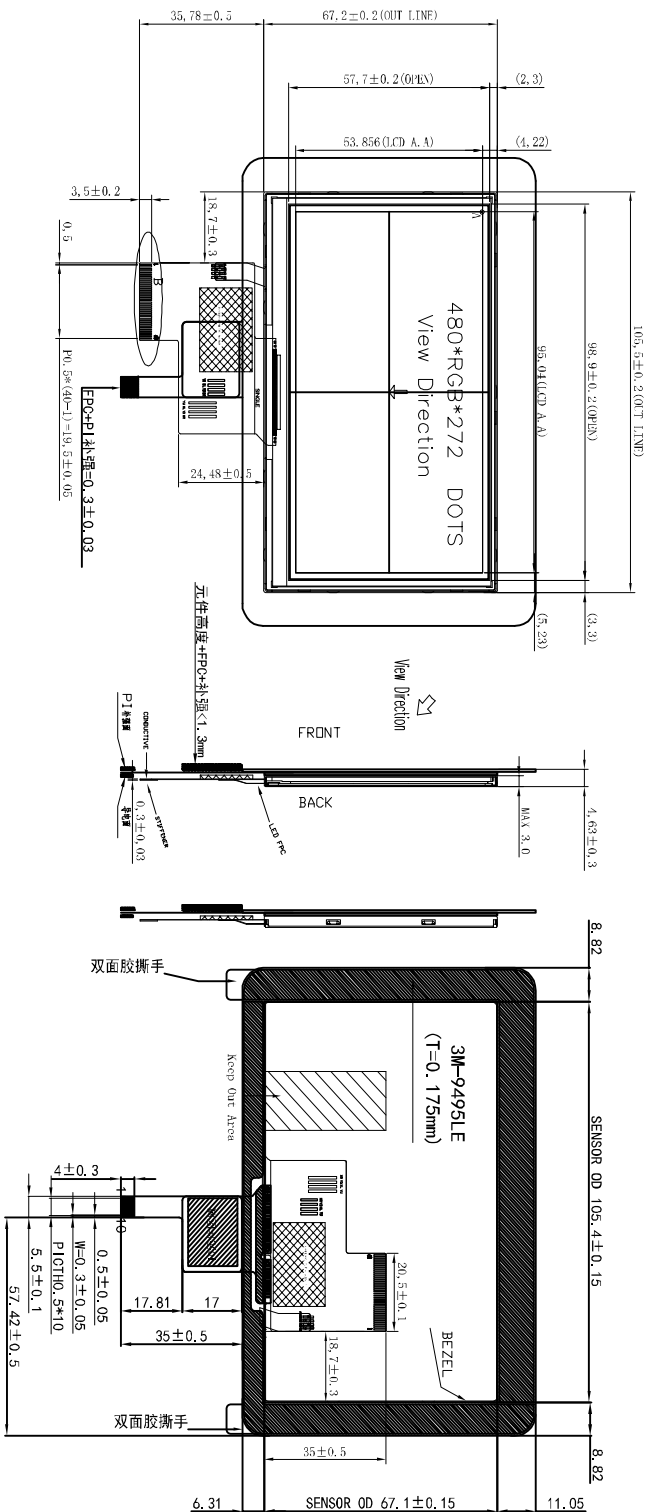
NOTES:

1. General Tolerance: ± 0.2
2. ()reference dimension.
3. Recommended Case Open Area Should Be Less Than Module VA
4. recommended cushion adherent area:TP VA+1.6mm
5. ROHS MUST BE COMPLIANT

V00	First issue		2015.10.21
VER. SYMBOL.	AMENDMENT	SIGN	DATE

DRAWN	TITLE		DRAWING NO.			
ME. CHECKED	MODULE SPEC.		TST430MCNH-11P			
EE. CHECKED			UNIT	mm	SCALE	FTT
APPROVED			3rd Angle 		SHEET 1 OF 1	
CUSTOMER'S APPROVAL	Team Source Display Technology Co., Limited					

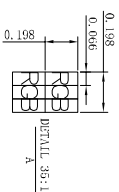
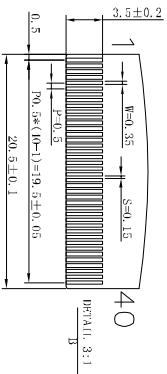
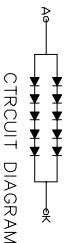
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Pin	Shops	Barcode
1	LD	Power Gen (1)
2	LD	Power Gen (2)
3	OD	Power Gen (3)
4	OD	Power Gen (4)
5	RD	Power Gen (5)
6	RD	Power Gen (6)
7	RD	Power Gen (7)
8	RD	Power Gen (8)
9	RD	Power Gen (9)
10	RD	Power Gen (10)
11	RD	Power Gen (11)
12	RD	Power Gen (12)
13	RD	Power Gen (13)
14	RD	Power Gen (14)
15	RD	Power Gen (15)
16	RD	Power Gen (16)
17	RD	Power Gen (17)
18	RD	Power Gen (18)
19	RD	Power Gen (19)
20	RD	Power Gen (20)
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30	RD	Power Gen (30)
31	RD	Power Gen (31)
32	RD	Power Gen (32)
33	RD	Power Gen (33)
34	RD	Power Gen (34)
35	RD	Power Gen (35)
36	RD	Power Gen (36)
37	RD	Power Gen (37)
38	RD	Power Gen (38)
39	RD	Power Gen (39)
40	RD	Power Gen (40)

CTP PIN脚定义

PIN NO	DIPINATION
1	NC
2	NC
3	RST
4	GND
5	INT
6	SDA
7	SCL
8	GND
9	GND
10	VDD



Display Type	CMO 4.3 TFT
Viewing Angle	NORMALLY WHITE, TRANSMISSIVE
LCD Driver IC	12:00 CLOCK HX8257A
Logic Voltage	VDD=3.3V
Operation Temperature	-20°C TO 70°C
Storage Temperature	-30°C TO 80°C
Interface	24bit-RGB
Backlight	10-LED WHITE 40MA/16V
Surface luminance	450cd/m ²
White X/Y	X:0.30E-0.02 Y:0.33E-0.02
VDD	
VER. SYMBOL	Flts
	AMP

CTRCUIT DIAGRAM		20.5 ± 0.1
Issue		20150825
ENDMENT	SIGN	DATE

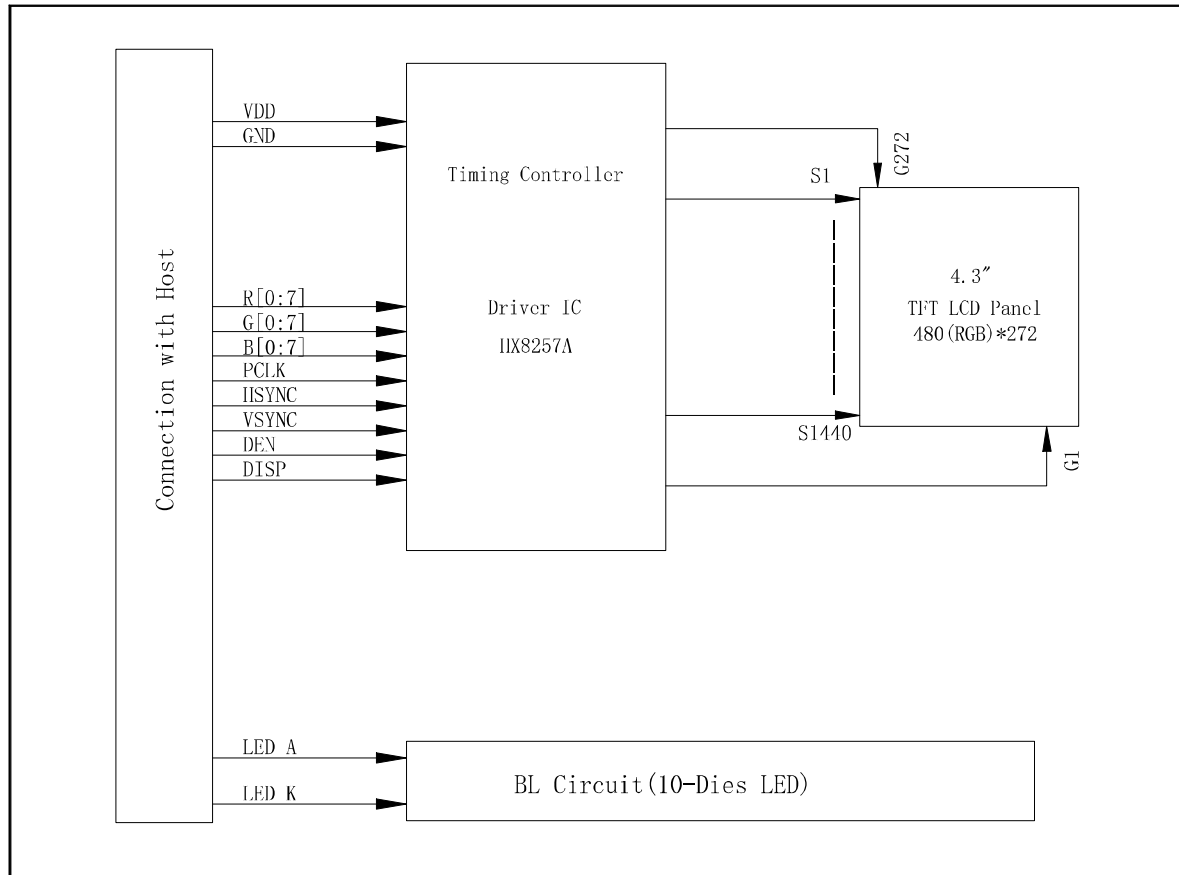
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CUSTOMER'S APPROVAL	

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7	SA	SA
8	SA	SA
9	SA	SA
10	SA	SA

TITLE		DRAWING NO.	
MODULE SPEC.		TST430MCNH-11C	
UNIT	mm	SCALE	FT
3rd Angle		SHEET 1 OF 1	

Team Source Display Technology Limited

3. Block Diagram



4. Interface Pin Function

Pin No.	Symbol	Description
1	LEDK	Cathode of LED backlight
2	LEDA	Anode of LED backlight
3	GND	Power ground
4	VDD	Power supply
5~12	R0~R7	8-bit digital Red data input,
13~20	G0~G7	8-bit digital Green data input,
21~28	B0~B7	8-bit digital Blue data input,
29	GND	Power ground
30	PCLK	Clock signal; latching data at the falling edge
31	DISP	Display control / standby mode selection. DISP = "Low" : Standby; (Default) DISP = "High" : Normal display
32	HSYNC	Horizontal sync signal; negative polarity
33	VSYNC	Vertical sync signal; negative polarity
34	DEN	Data input enable. Active High to enable the data input.
35	NC	No connection.
36	GND	Power ground
37	NC	No connect
38	NC	No connect
39	NC	No connect
40	NC	No connect

5. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage for analog	VDD	-0.3	4.5	V
Supply voltage for logic	VDD	-0.3	4.5	V
Supply current (One LED)	I _{LED}		30	mA
Operating temperature	T _{OP}	-20	+70	°C
Storage temperature	T _{ST}	-30	+80	°C

Note : 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.

6. Electrical Characteristics

6.1 Input Power

Item	Symbol	Min	Typ.	Max	Unit	Applicable terminal
Supply Voltage for Analog	VDD	3.0	3.3	3.6	V	
Supply Voltage for Logic	VDD	3.0	3.3	3.6	V	
Input Voltage	V _{IL}	GND	-	0.3VCC	V	
	V _{IH}	0.7 VCC	-	VCC		
Input leakage Current	I _{LKG}	-1		1	μA	

6.2 Backlight Driving Conditions

Item	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V _F	-	16.0	-	V	I _L =40mA
Current for LED Backlight	I _L		40	60	mA	
Power Consumption	P		0.64		W	
LED Life Time		30,000	40000	--	Hr	Note

Note: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25℃

7. Optical Characteristics

ITEM		SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
				MIN	TYP.	MAX		
Luminance		L	$I_L = 40\text{mA}$	450	500	--	Cd/m^2	
Contrast Ratio		CR	$\theta = 0^\circ$	400	500			
Response Time		T_{ON}	25°C		5		ms	
		T_{OFF}			15			
CIE Color Coordinate	Red	X_R	Viewing normal angle	0.600	0.620	0.640		
		Y_R		0.324	0.344	0.364		
	Green	X_G		0.286	0.306	0.326		
		Y_G		0.543	0.563	0.583		
	Blue	X_B		0.113	0.133	0.153		
		Y_B		0.129	0.149	0.169		
	White	X_W		0.260	0.280	0.300		
		Y_W		0.280	0.300	0.320		
Viewing Angle	Hor.	θ_{X+}	$CR \geq 10$		75		Degree	
		θ_{X-}			75			
	Ver.	θ_{Y+}			75			
		θ_{Y-}			70			
Uniformity	Un			80			%	

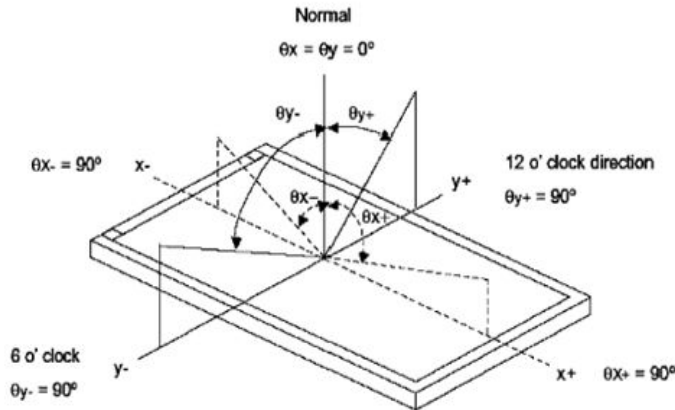
With Resistive touch panel

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle	Top	$CR \geq 10$	-	70	-	Deg.	Note 2,6,7
	Bottom	$CR \geq 10$	-	65	-		
	Left	$CR \geq 10$	-	70	-		
	Right	$CR \geq 10$	-	70	-		
Luminous	L	Viewing normal angle	---	460	--	Cd/m^2	

With Capacitive touch panel

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle	Top	$CR \geq 10$	-	65	-	Deg.	Note 2,6,7
	Bottom	$CR \geq 10$	-	60	-		
	Left	$CR \geq 10$	-	65	-		
	Right	$CR \geq 10$	-	65	-		
Luminous	L	Viewing normal angle	---	450	--	Cd/m^2	

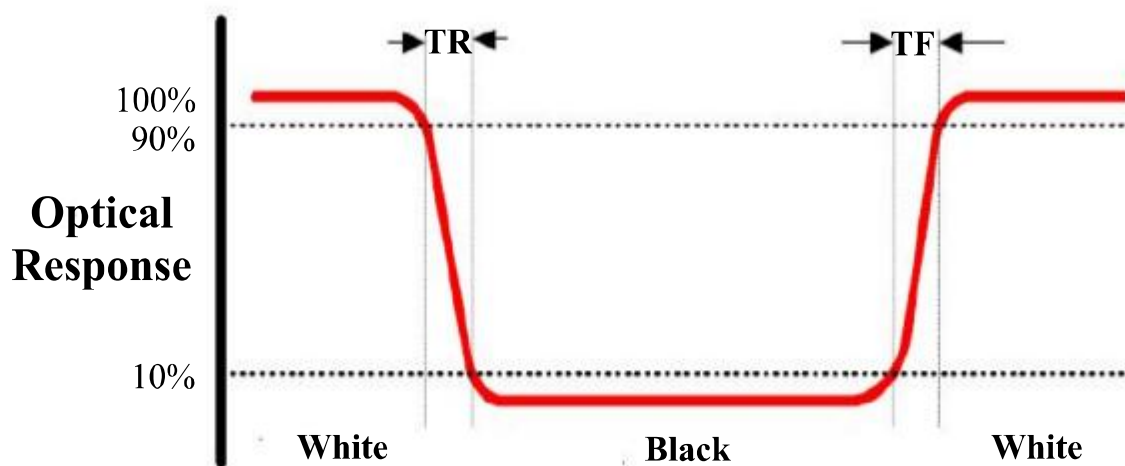
Note 1: Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Luminance of white state}}{\text{Luminance of black state}}$$

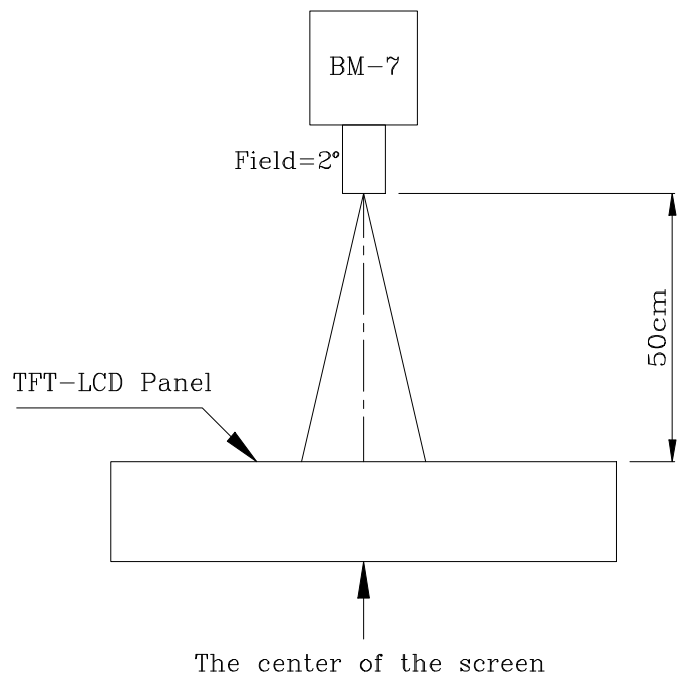
Note 3: Definition of Response Time(T_r , T_f)



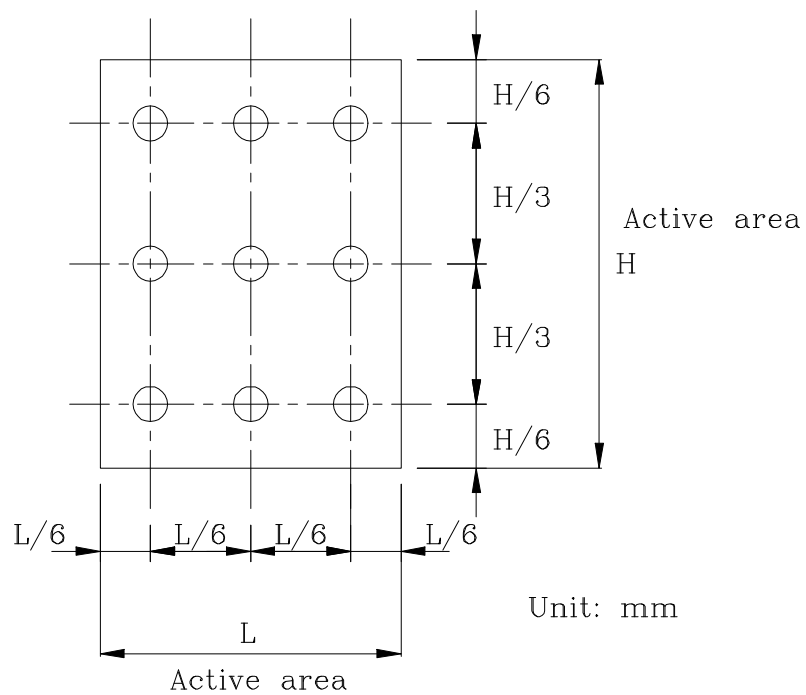
Note 4: Definition of Luminance

① The Brightness Test Equipment Setup

Field=2° (As measuring “black” image, field=2° is the best testing condition)



②The Brightness Test Point Setup





Resistive Touch Panel Specifications

ITEM	VALUE			UNIT	REMARK
	Min	Typ	Max		
Linearity	-	-	1.5	%	Analog X and Y directions
Terminal Resistance	200	-	900	Ω	x
	200	-	900		y
Insulation Resistance	20	-	-	M Ω	DC 25V
Voltage	-	3	10	V	DC
Chattering	-	-	10	ms	100k Ω pull-up
Transparency	-	92	-	%	-
Operation Force	30	-	120	g	-
Surface Hardness	3	-	-	H	-
Lifetime		1000K		touch	

Capacitive Touch Panel specifications

Mechanical characteristics

DESCRIPTION	INL SPECIFICATION	REMARK
Touch Panel Size	4.3	
Outline Dimension (OD)	123.04x84.46 mm	Cover Lens Outline
Product Thickness	1.6mm(max)	
Glass Thickness	0.7mm	
Ink View Area	97.7x56.44mm	
Sensor Active Area	97.7x56.44mm	
Input Method	5 Fingers	
Activation Force	Touch	
Surface Hardness	$\geq 6H$	

Electrical characteristics

DESCRIPTION		SPECIFICATION
Operating Voltage		DC 2.8~3.3V
Power Consumption (IDD)	Active Mode	12~4.5mA
	Sleep Mode	TBD
Interface		I ² C
Controller IC		FT5336
I ² C address		0x70
Resolution		480x272

Interface description

PIN NO.	SYMBOL	DESCRIPTION	REMARK
1	NC	Not Connected	
2	NC	Not Connected	
3	RST	Reset pin	
4	GND	Ground	
5	INT	Interrupt signal from CTP	
6	SDA	I2C data signal	
7	SCL	I2C clock input	
8	GND	Ground	
9	GND	Ground	
10	VCC	Power supply	

Interface timing characteristics

PARAMETER	MIN	MAX	UNIT
SCL Frequency	-	400K	Hz
Bus Free Time Between a STOP and START Condition	4.7	-	uS
Hold Time (repeated) START Condition	4.0	-	uS
Data Setup Time	250	-	nS
Setup Time for Repeated START Condition	4.7	-	uS
Setup Time for STOP Condition	2.0	-	uS

8. Timing Characteristics

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Clock cycle	$f_{CLK}^{(1)}$	-	9	15	MHz
Hsync cycle	1/th	-	17.14	-	KHz
Vsync cycle	1/tv	-	59.94	-	Hz
Horizontal Signal					
Horizontal cycle	th	525	525	605	CLK
Horizontal display period	thd	480	480	480	CLK
Horizontal front porch	thf	2	2	82	CLK
Horizontal pulse width	thp ⁽²⁾	2	41	41	CLK
Horizontal back porch	thb ⁽²⁾	2	2	41	CLK
Vertical Signal					
Vertical cycle	tv	285	286	399	H ⁽¹⁾
Vertical display period	tvd	272	272	272	H ⁽¹⁾
Vertical front porch	tvf	1	2	227	H ⁽¹⁾
Vertical pulse width	tvp ⁽²⁾	1	10	11	H ⁽¹⁾
Vertical back porch	tvb ⁽²⁾	1	2	11	H ⁽¹⁾

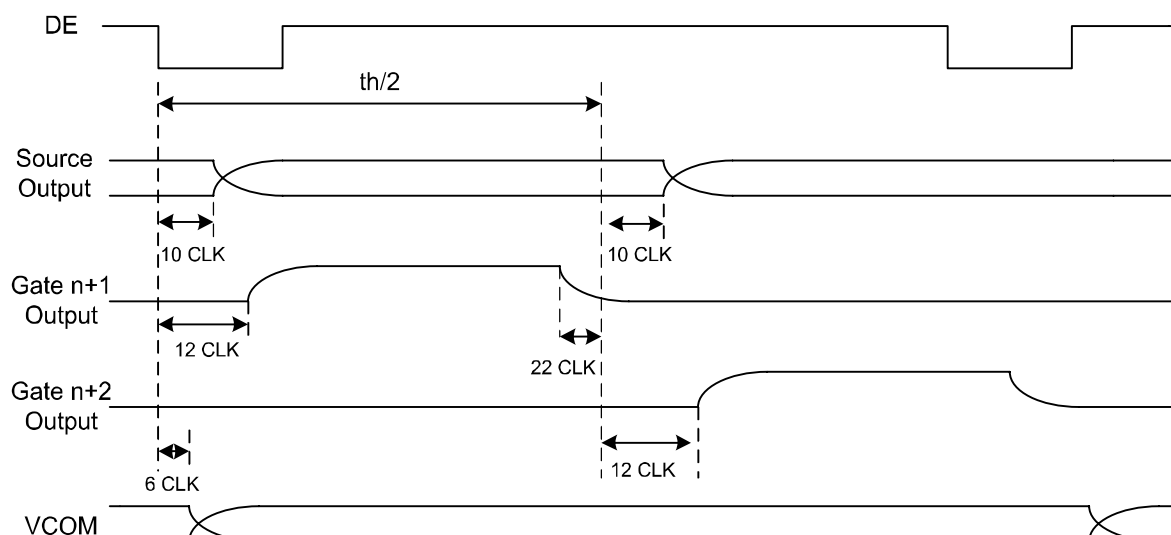
Note: (1) Unit: CLK=1/ f_{CLK} , H= th,

(2) It is necessary to keep tvp+tvb=12 and thp+thb=43 in sync mode. DE mode is unnecessary to keep it.

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Clock cycle	$f_{CLK}^{(1)}$	-	9.6	15	MHz
Hsync cycle	1/th	-	15.72	-	KHz
Vsync cycle	1/tv	-	60	-	Hz
Horizontal Signal					
Horizontal cycle	th	525	612	-	CLK
Horizontal display period	thd	480	480	480	CLK
Horizontal front porch	thf	2	30	-	CLK
Horizontal pulse width	thp	2	46	-	CLK
Horizontal back porch	thb	2	56	-	CLK
Vertical Signal					
Vertical cycle	tv	-	262	275	H ⁽¹⁾
Vertical display period	tvd	-	240	-	H ⁽¹⁾
Vertical front porch	tvf	1	4	-	H ⁽¹⁾
Vertical pulse width	tvp	1	3	-	H ⁽¹⁾
Vertical back porch	tvb	1	15	-	H ⁽¹⁾

Note: (1) Unit: CLK=1/ f_{CLK} , H=th,

11.1 Timing relationship among DE、Source Output、Gate Output、VCOM



9. Standard Specification for Reliability

9.1 Standard Specification for Reliability of LCD Module

No.	Item	Description
01	High temperature operation	The sample should be allowed to stand at 70℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
02	Low temperature operation	The sample should be allowed to stand at -20℃ for 120 hours under driving condition and then returning it to normal temperature condition, and allowing it stand for 2 hours.
03	High temperature storage	The sample should be allowed to stand at 80℃ for 240 hours under no-load condition, and then returning it to normal temperature condition, and allowing it stand for 2 hours.
04	Low temperature storage	The sample should be allowed to stand at -30℃ for 240 hours under no-load condition, then returning it to normal temperature condition, and allowing it stand for 2 hours.
05	Moisture storage	The sample should be allowed to stand at 60℃,90%RH MAX for 240 hours under no-load condition, then taking it out and drying it at normal temperature for 2 hours.
06	Thermal shock storage	The sample should be allowed to stand the following 10 cycles : -30℃ for 30 minutes → normal temperature for 5 minutes → +80℃ for 30 minutes → normal temperature for 5 minutes, as one cycle.
07	Packing vibration	Frequency range : 10Hz ~ 55Hz Amplitude of vibration : 1.5mm Sweep time: 12 min X,Y,Z 2 hours for each direction.
08	Packing drop test	According to ASTM-D-5327.
09	Electrical Static Discharge	Air: ±4KV 150pF/330Ω 5 times
		Contact: ±2KV 150pF/330Ω 5 time

*Sample size for each test item is 3~5pcs

9.2 Testing Conditions and Inspection Criteria

For the final test, the testing sample must be stored at room temperature for 24 hours. After the tests listed in Table 9.2, standard specifications for reliability will be executed in order to ensure stability.

No.	Item	Test Model	In section Criteria
01	Current Consumption	Refer To Specification	The current consumption should conform to the product specification.
02	Contrast	Refer To Specification	After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests.
03	Appearance	Visual inspection	Defect free.

9.3 MTBF

MTBF	Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature ($25\pm 5^{\circ}\text{C}$), normal humidity ($50\pm 10\%$ RH), and in area not exposed to direct sun light.
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10. Specification of Quality Assurance

This standard of Quality Assurance confirms to the quality of LCD module products supplied by Shenzhen Team Source Display Technology Co, Ltd..

10.1 Quality Test

Before delivering, the supplier should conduct the following tests to confirm the quality of products.

- Electrical-Optical Characteristics: According to the individual specification to test the product.
- Appearance Characteristics: According to the individual specification to test the product.
- Reliability Characteristics: According to the definition of reliability on the specification for testing products.

10.2 Delivery Test

Before delivering, the supplier should conduct the delivery test.

- Test method: According to MIL-STD105E.General Inspection Level II take a single Time.
- The defects classify of AQL as following:
Major defect: AQL = 0.65
Minor defect: AQL = 2.5
Total defects: AQL = 2.5

10.3 Non-conforming Analysis & Deal With Manners

10.3.1 Non-conforming Analysis

- Purchaser should provide the data detail of non-conforming sample and the non-conforming.
- After receiving the data detail from purchaser, the analysis of non-conforming should be finished within two weeks.
- If the analysis can't be finished on time, supplier must notice purchaser 3 days in advance.

10.3.2 Disposition of non-conforming

- If any product defect be found during assembling, supplier must change the good for every defect after confirmation.
- Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.

10.4 Agreement items

Both parties should negotiate together when the following problems happen.

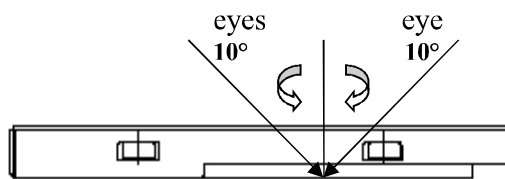
- There is any problem of standard of quality assurance, and both sides should agree that it must be modified.

- There is any argument item which does not record in the standard of quality assurance.
- Any other special problem.

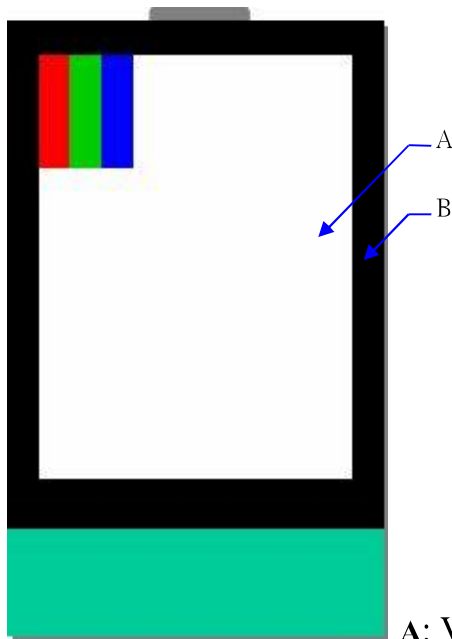
10.5 Standard of The Product Appearance Test

10.5.1 Manner of appearance test

- The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30±5cm.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: 25±5°C Humidity: 60±10%RH



- Definition of area:

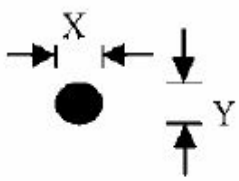
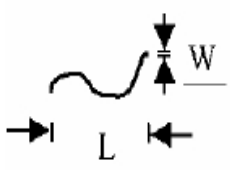


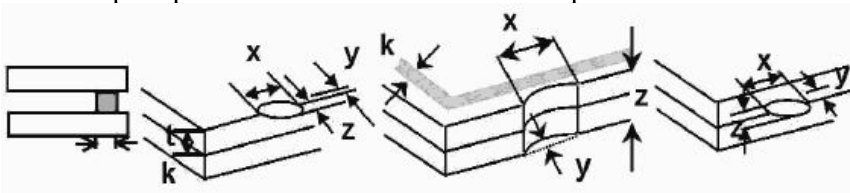
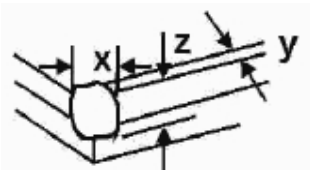
A: Viewing area B: Outside viewing area

10.5.2 Basic principle

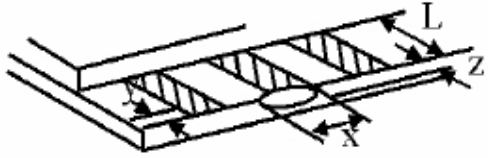
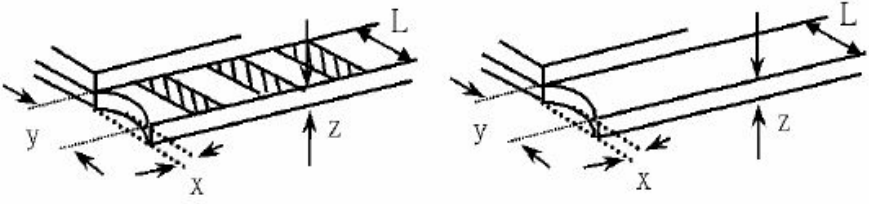
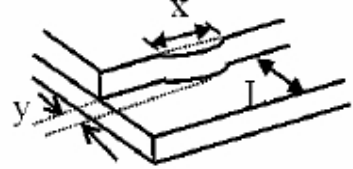
- When the standard can not be described, AQL will be applied.
- The sample of the lowest acceptable quality level must be negotiated by both supplier and customer when any dispute happened.
- New item must be added on time when it is necessary.

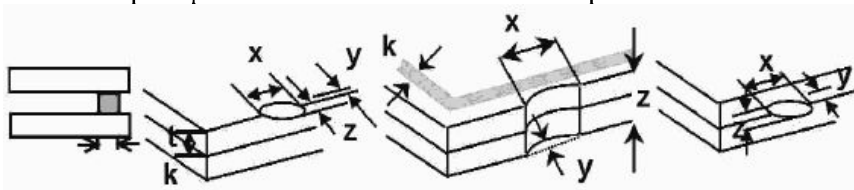
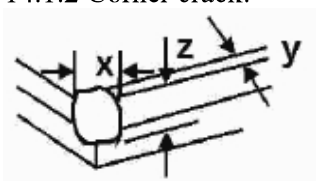
10.6 Inspection Specification

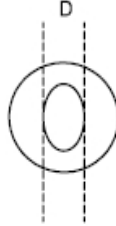
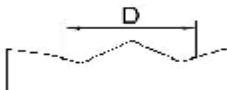
NO.	Item	Criterion	AQL																										
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65																										
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display $\leq 0.25\text{mm}$, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	2.5																										
03	LCD and Touch Panel black spots, white spots, contamination (non – display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> <tr> <td>$\Phi \leq 0.10$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.20$</td> <td>2</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.25$</td> <td>2</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.30$</td> <td>1</td> </tr> <tr> <td>$0.30 < \Phi$</td> <td>0</td> </tr> </table> * Densely spaced: No more than two spots within 3mm. 3.2 Line type: (As following drawing)  <table> <tr> <th>Length(mm)</th> <th>Width(mm)</th> <th>Acceptable Q'ty</th> </tr> <tr> <td>---</td> <td>$W \leq 0.02$</td> <td>Accept no dense</td> </tr> <tr> <td>$L \leq 3.0$</td> <td>$0.02 < W \leq 0.05$</td> <td rowspan="2">2</td> </tr> <tr> <td>$L \leq 2.5$</td> <td>$0.03 < W \leq 0.08$</td> </tr> <tr> <td>---</td> <td>$0.08 < W$</td> <td>Rejection</td> </tr> </table> * Densely spaced: No more than two lines within 3mm.	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.10$	Accept no dense	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	2	$0.25 < \Phi \leq 0.30$	1	$0.30 < \Phi$	0	Length(mm)	Width(mm)	Acceptable Q'ty	---	$W \leq 0.02$	Accept no dense	$L \leq 3.0$	$0.02 < W \leq 0.05$	2	$L \leq 2.5$	$0.03 < W \leq 0.08$	---	$0.08 < W$	Rejection	2.5
Size(mm)	Acceptable Q'ty																												
$\Phi \leq 0.10$	Accept no dense																												
$0.10 < \Phi \leq 0.20$	2																												
$0.20 < \Phi \leq 0.25$	2																												
$0.25 < \Phi \leq 0.30$	1																												
$0.30 < \Phi$	0																												
Length(mm)	Width(mm)	Acceptable Q'ty																											
---	$W \leq 0.02$	Accept no dense																											
$L \leq 3.0$	$0.02 < W \leq 0.05$	2																											
$L \leq 2.5$	$0.03 < W \leq 0.08$																												
---	$0.08 < W$	Rejection																											

NO.	Item	Criterion			AQL
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction	Size Φ(mm)	Acceptable Q'ty	2.5
			Φ ≤ 0.20	Accept no dense	
			0.20 < Φ ≤ 0.50	3	
			0.50 < Φ ≤ 1.00	2	
			1.00 < Φ	0	
			Total Q'ty	3	
05	Scratches	Follow NO.3 -2 Line Type.			
06	Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels:			2.5
					
		z: Chip thickness	y: Chip width	x: Chip length	
		$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	
		$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip			
		6.1.2 Corner crack:			
					
		z: Chip thickness	y: Chip width	x: Chip length	
		$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	
		$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip			

NO.	Item	Criterion	AQL
08	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	2.5 2.5 0.65
10	Bezel	Bezel must comply with product specifications.	2.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	2.5 2.5 2.5 2.5 0.65 0.65
12	FPC	12.1 FPC terminal damage $\leq$ 1/2 FPC terminal width and can not affect the function , we judge accept. 12.2 FPC alignment hole damage $\leq$ 1/2 alignment area and can not affect the function , we judge accept.	2.5 2.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC.	2.5 0.65

NO.	Item	Criterion	AQL																
07	Glass crack	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq 0.5\text{mm}$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> 7.2.2 Non-conductive portion:  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq L$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> ⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged. 7.2.3 Substrate protuberance and internal crack  <table><tr><td>y: width</td><td>x: length</td></tr><tr><td>$y \leq 1/3L$</td><td>$X \leq a$</td></tr></table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$X \leq a$	2.5
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$																	
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$																	
y: width	x: length																		
$y \leq 1/3L$	$X \leq a$																		

NO.	Item	Criterion	AQL												
14	Touch Panel Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Touch Panel Total thickness a: LCD side length L: Electrode pad length 14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$Z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> </table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 14.1.2 Corner crack:  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$z \leq t$</td> <td>$\leq 1/2 k$ and not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> </table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$	2.5
z: Chip thickness	y: Chip width	x: Chip length													
$Z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													
z: Chip thickness	y: Chip width	x: Chip length													
$z \leq t$	$\leq 1/2 k$ and not over viewing area	$x \leq 1/8a$													

NO.	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table><tr><th>SIZE(mm)</th><th>Acceptable Q'ty</th></tr><tr><td>$\Phi \leq 0.2$</td><td>Accept no dense</td></tr><tr><td>$0.2 < D \leq 0.4$</td><td>5</td></tr><tr><td>$0.4 < D \leq 0.5$</td><td>2</td></tr><tr><td>$0.5 < D$</td><td>0</td></tr></table> 	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dense	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	2.5
SIZE(mm)	Acceptable Q'ty												
$\Phi \leq 0.2$	Accept no dense												
$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	0												
16	Touch Panel Newton ring	Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$) , it is acceptable.	2.5										
17	Touch Panel Linearity	Less than 2.5% is acceptable.	2.5										
18	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	2.5										
19	General appearance	19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65										

11. Handling Precaution

11.1 Handling of LCM

- Avoid external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance, do not lick or swallow. When the liquid is attaching to your hand, skin, cloth, etc., wash it thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.
- The operators should wear protections whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- The modules should be kept in antistatic bags or other containers resistant to static for storage.
- The module is coated with a film to protect the display surface, be careful when peeling off this protective film since static electricity may be generated.

11.2 Storage

- Store it in an ambient temperature of $25\pm 10^{\circ}\text{C}$, and in a relative humidity of $50\pm 10\%\text{RH}$. Don't expose to sunlight or fluorescent light.
- Store it in a clean environment, free from dust, active gas, and solvent.
- Store it in anti-static electricity container.
- Store it without any physical load.

11.3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: no higher than $280\pm 10^{\circ}\text{C}$ and less than 3 sec during hand soldering.
- Rewiring: no more than 2 times.

12. Packing -NoTouch

PARAMETER	Specification	Unit
Outside box	390(L) x 350(W) x 480(H)	mm
Inside pearl wool box	375(L) x 340(W) x 100(H)	mm
Product quantity of Inside box	36	pcs
Total product quantity	$36*4=144$	pcs
Total weight	8.8 ± 0.5	Kg

