



SPECIFICATION FOR LCD MODULE

MODULE NO: YB-YG320240S16A-C-A0

Doc.Version:00

Customer Approval:

<input type="checkbox"/> Accept	<input type="checkbox"/> Reject
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YEEBO	NAME	SIGNATURE	DATE
Prepare	Electronic Engineer	傅國長	2014.4.25
Check	Mechanical Engineer	連翹琪	2014.4.25
Verify		何志強	2014.4.25
Approval		陳志偉	2014.4.25

APPROVAL FOR SPECIFICATIONS ONLY

APPROVAL FOR SPECIFICATIONS AND SAMPLE

WIMRD005-02-C



2. Table of Contents:

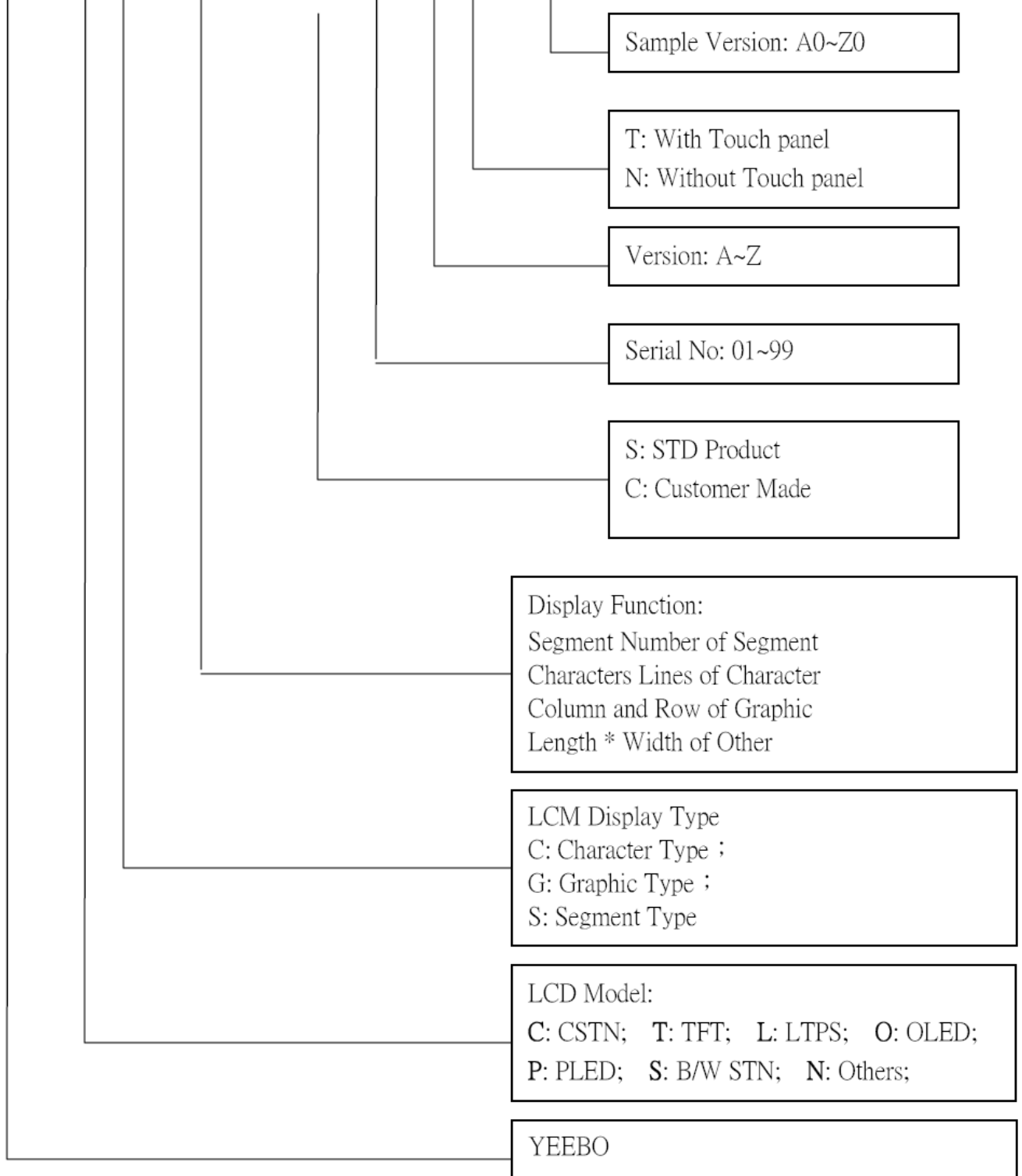
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3. Module Numbering System:

(Example)

YB- T G 240320 S 01 D -T - A0





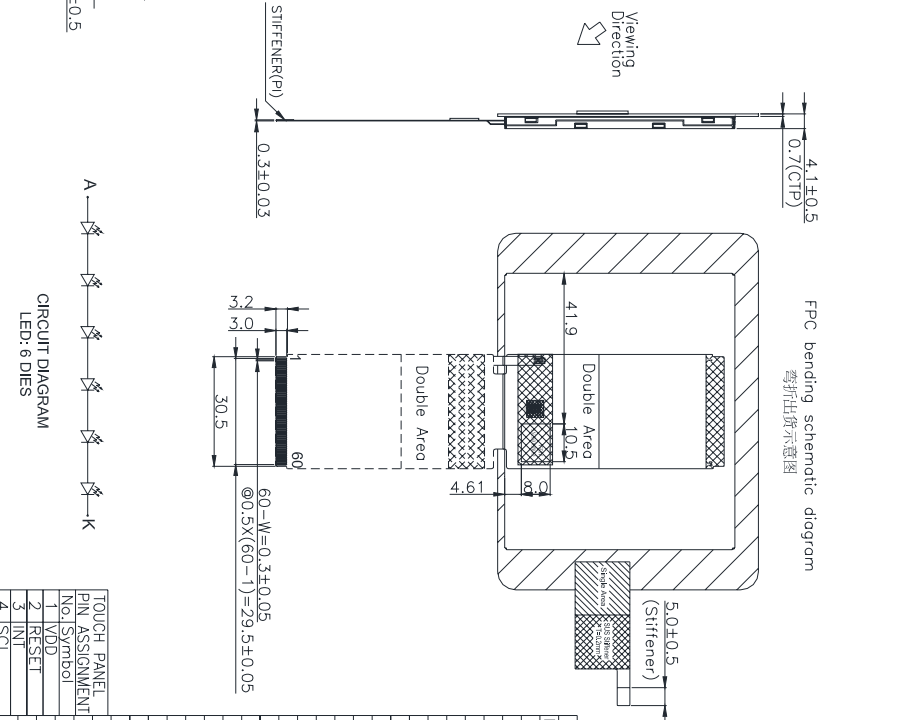
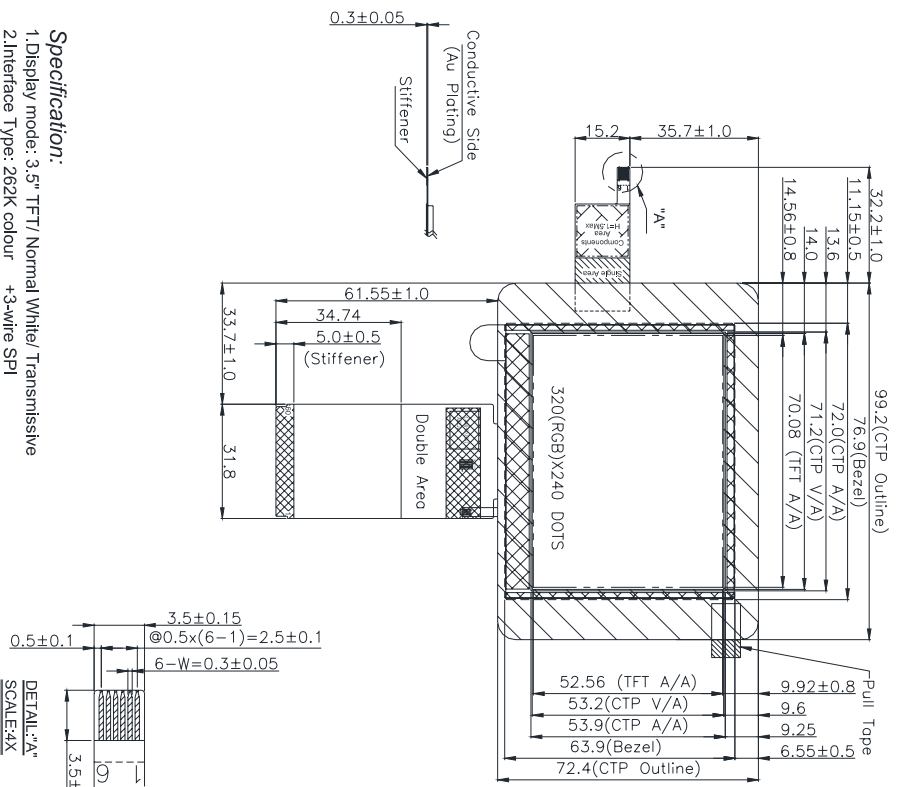
4. General Specification:

ITEM	CONTENTS
Module Size	99.2(W) * 72.4 (H) * 4.1(T) mm
Module Size(With FPC)	99.2(W) *133.95 (H) * 4.1 (T) mm
Display Size(Diagonal)	3.5 inch
Display Format	320(RGB)* 240 Pixels
Active Area	70.08(W) *52.56(H) mm
Pixel Pitch	0.219mm*0.219 mm
LCD Type	TFT (262K)/ Transmissive / NW
Touch panel Type	OLS/ Cover glass
View Angle	12 O'clock
CTP IC	ILI2830
Controller IC	HX8238-D
Weight	TBD



5. LCM drawing:

Rec.	Count drawing & Specification record during discussion with customer	
Revision	Revision content description	
#1	FIRST ISSUE	Date 2014-04-18

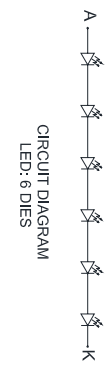


Pin Assignment	Pin	Assignment	Pin	Assignment
1	LED -	31	DATA9	
2	LED -	32	DATA10	
3	LED +	33	DATA11	
4	LED +	34	NC	
5	GND	35	NC	
6	NC(XR)	36	DATA12	
7	NC(YD)	37	DATA13	
8	NC(XL)	38	DATA14	
9	NC(TU)	39	DATA15	
10	GND	40	DATA16	
11	NC	41	DATA17	
12	NC	42	HSYNC	
13	NC	43	VSYNC	
14	RESET	44	DOTCLK	
15	CS	45	NC	
16	SCL	46	NC	
17	SOL	47	SOL	
18	NC	48	VCI	
19	NC	49	NC	
20	DATA0	50	NC	
21	DATA1	51	NC	
22	DATA2	52	NC	
23	DATA3	53	NC	
24	DATA4	54	NC	
25	DATA5	55	NC	
26	NC	56	NC	
27	NC	57	NC	
28	DATA6	58	ENABLE	
29	DATA7	59	GND	
30	DATA8	60	GND	

- Specification:**
1. Display mode: 3.5" TFT/ Normal White/ Transmissive
 2. Interface Type: 262K colour +3-wire SPI
 3. Viewing direction: 12 O'clock(Gray Inversion)
 4. Operating temperature: -10°C to +70°C
Storage temperature: -30°C to +80°C
 5. Drive IC: HX8238-D
 6. Backlight: 6 CHIP WHITE LED/
LCM Luminance(with T/Pl): 200 cd/m² (TYP)
Vf=19.2V(TYP) If=15mA
 7. Unspecified tolerance: ±0.30mm.
 8. ROHS compliant

9. Glass Type: OLG5 PCTP
10. Channel NO.: 15(X) x 11(Y)
11. Drive IC Is: IL12830

YEEBO		UNIT	SIZE	SCALE	MOD. Name	DESIGNED	CHECKED	VERIFIED	APPROVED	FILE NAME
		mm	A4	N-T-S	YB-YG320240S16A-C-A	連翊班				Count Dwg.
YEEBO		DESIGNED	CHECKED	VERIFIED	APPROVED					
		DESIGNED	CHECKED	VERIFIED	APPROVED					



CIRCUIT DIAGRAM
LED: 6 DIES
SCALE: 4X

TOUCH PANEL No. Symbol	Pin Assignment	Pin	Assignment
1	VDD	25	DATA5
2	RESET	26	NC
3	INI	27	NC
4	SCL	28	DATA6
5	SDA	29	DATA7
6	GND	30	DATA8



6. Electrical Characteristics

6-1 Absolute Maximum Ratings TFT IC HX8238-D Parameter

Item	Symbol	Min.	Type	Max.	Unit	Remark
Input Voltage	$V_{CI}-V_{SS}$	-0.3	-	+5.0	Volt	Note1
Supply Voltage	$V_{DDIO}-V_{SS}$	-0.3	-	+4.0	Volt	Note1
Operating Temperature	T_{opr}	-10	-	+70	°C	-
Storage Temperature	T_{stg}	-30	-	+80	°C	-

Note1: Absolute maximum rating is the limit value beyond which the IC maybe broken.
They do not assure operations.

Touch panel controller ILI2839 Parameter

Item	Symbol	Min.	Type	Max.	Unit	Humidity
Supply Voltage	VDD	-0.3	-	+3.6	V	Note1
Digital power supply voltage	VDDD	-0.3	-	+1.98		Note1
I/O power supply Voltage	VDDIO	-0.3	-	+3.6	V	Note1

Note1: Absolute maximum rating is the limit value beyond which the IC maybe broken.
They do not assure operations.



6-2 Operating Conditions

(Ta=25°C)

TFT IC HX8238-D Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply voltage	V_{CI-VSS}	-	2.6	2.8	3.0	Volt
Input Voltage	V_{IH}	-	$0.8 * V_{DDIO}$	-	V_{DDIO}	V
	V_{IL}	-	V_{SS}	-	$0.2 * V_{DDIO}$	V
Power Supply Current for LCM	I_{DD}	$V_{CI}=2.8V$	-	8	-	mA

Touch panel controller ILI2839 Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply	V_{DD}	-	2.6	3.3	3.6	Vt
Input Voltage	V_{IH}	-	$0.7 * V_{DDIO}$	-	V_{DDIO}	V
	V_{IL}	-	-0.3	-	$0.3 * V_{DDIO}$	V
Output Voltage	V_{OH}			V_{DDIO}		V
	V_{OL}			0.3		

6-3 Timing Characteristics

TFT IC HX8238-D

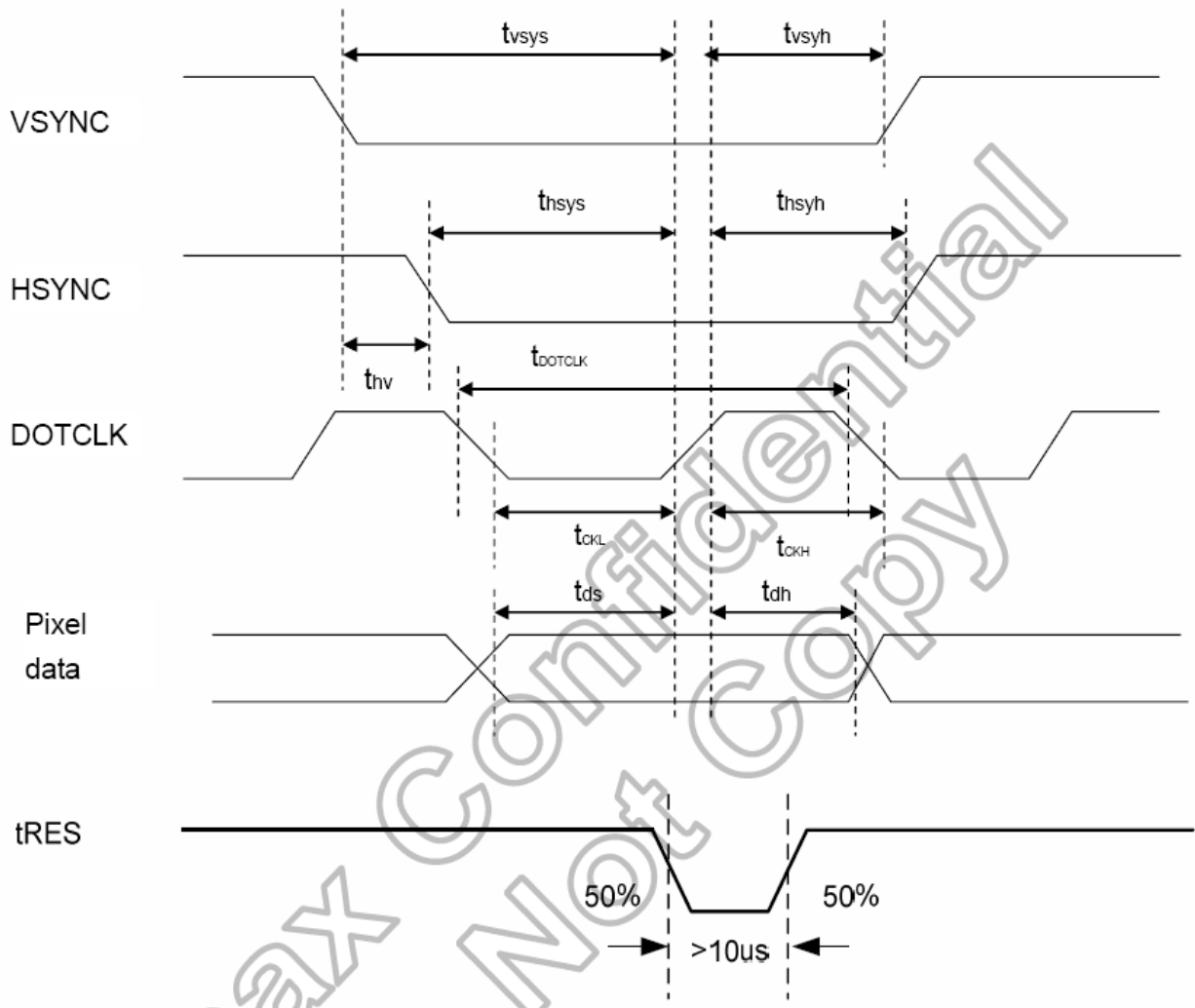
Pixel Timing

Characteristics	Symbol	Min.		Typ.		Max.		Unit
		24 bit	8 bit	24 bit	8 bit	24 bit	8 bit	
DOTCLK Frequency	fDOTCLK	-	-	6.5	19.5	10	30	MHz
DOTCLK Period	tDOTCLK	100	33.3	154	51.3	-	-	ns
Vertical Sync Setup Time	tvsys	20	10	-	-	-	-	ns
Vertical Sync Hold Time	tvsyh	20	10	-	-	-	-	ns
Horizontal Sync Setup Time	thsys	20	10	-	-	-	-	ns
Horizontal Sync Hold Time	thsyh	20	10	-	-	-	-	ns
Phase difference of Sync Signal Falling Edge	thv	1		-		240		tDOTCLK
DOTCLK Low Period	tCKL	50	15	-	-	-	-	ns
DOTCLK High Period	tCKH	50	15	-	-	-	-	ns
Data Setup Time	tds	12	10	-	-	-	-	ns
Data hold Time	tdh	12	10	-	-	-	-	ns
Reset pulse width	tRES	10		-		-		μs

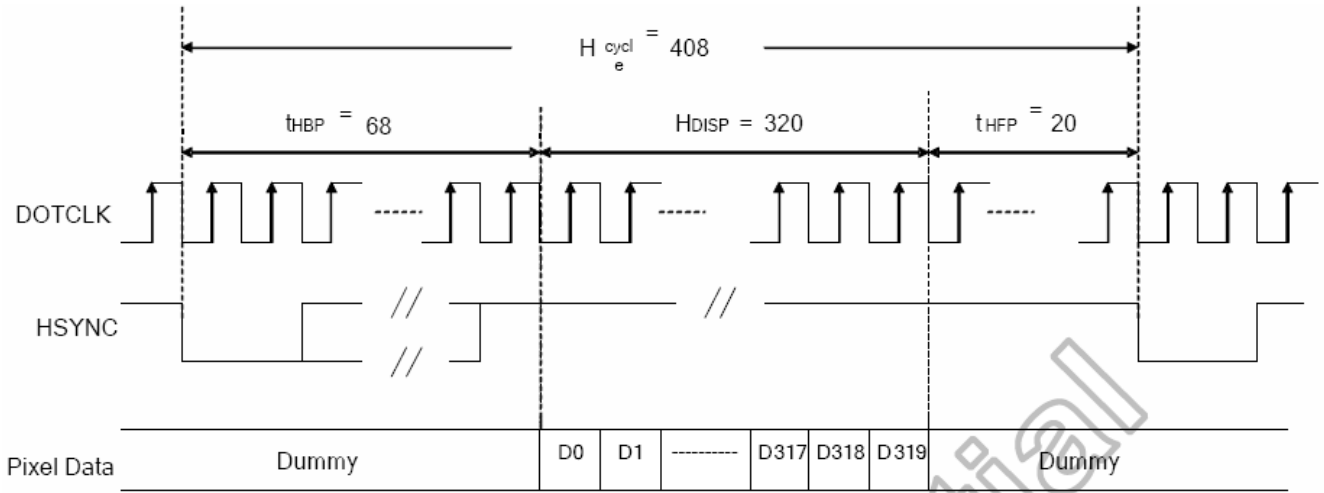
Note: External clock source must be provided to DOTCLK pin of HX8238-D. The driver will not operate if absent of the clocking signal.

AC Characteristics

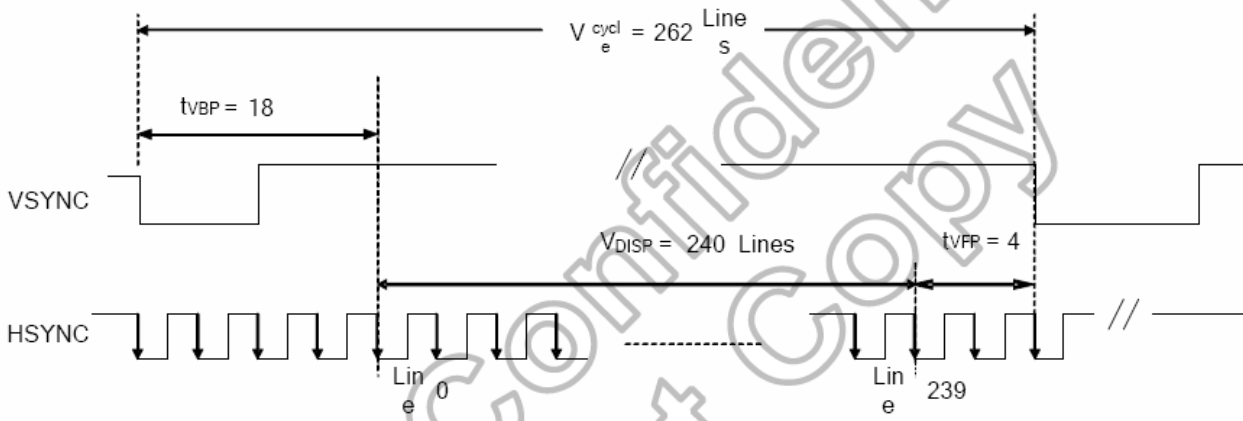
(Unless otherwise specified, Voltage Referenced to V_{SS}, V_{DDIO} = 2.2V, T_A = 25°C)



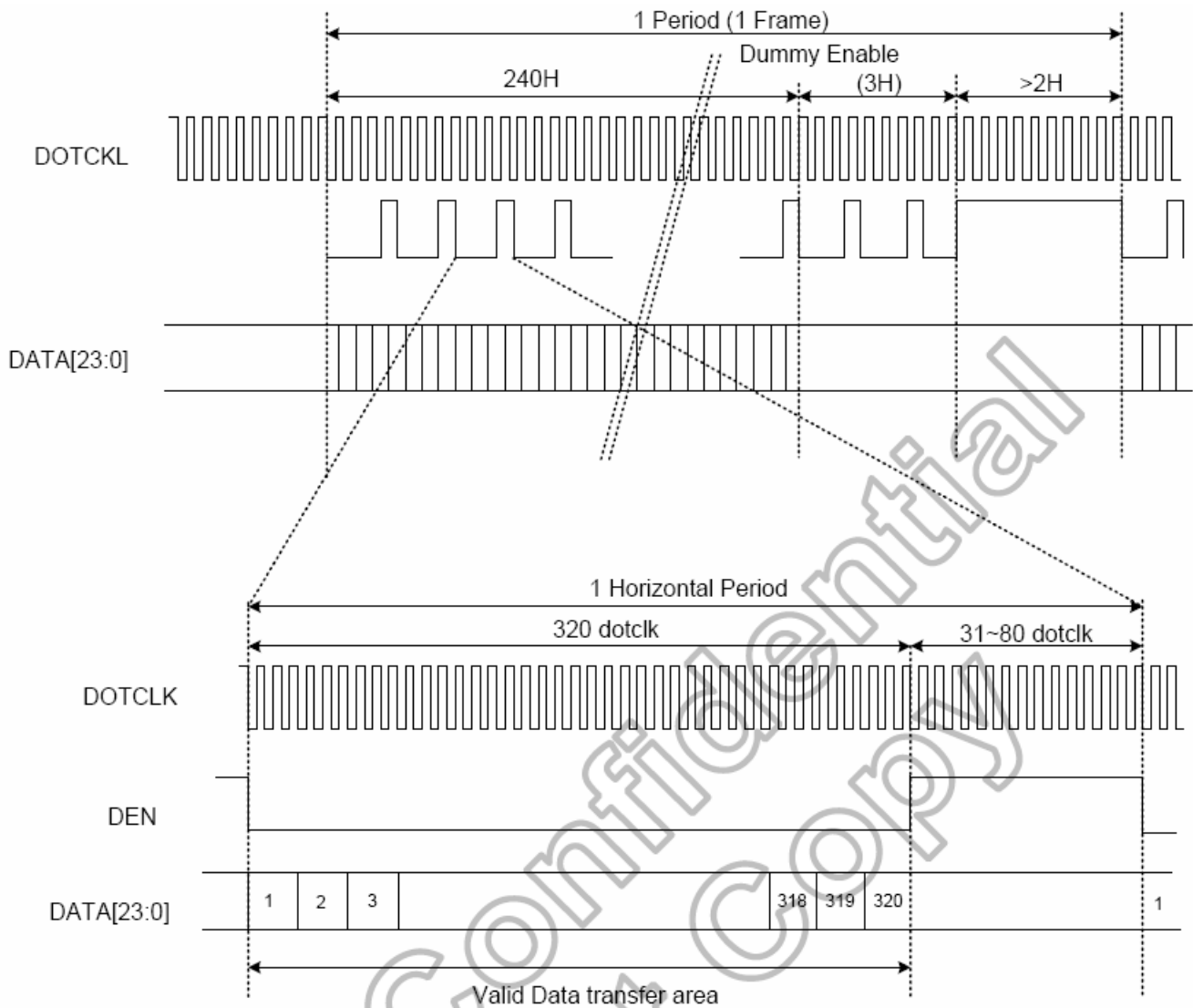
Data Transaction Timing in Parallel RGB Interface (SYNC Mode)



(a) Horizontal Data Transaction Timing

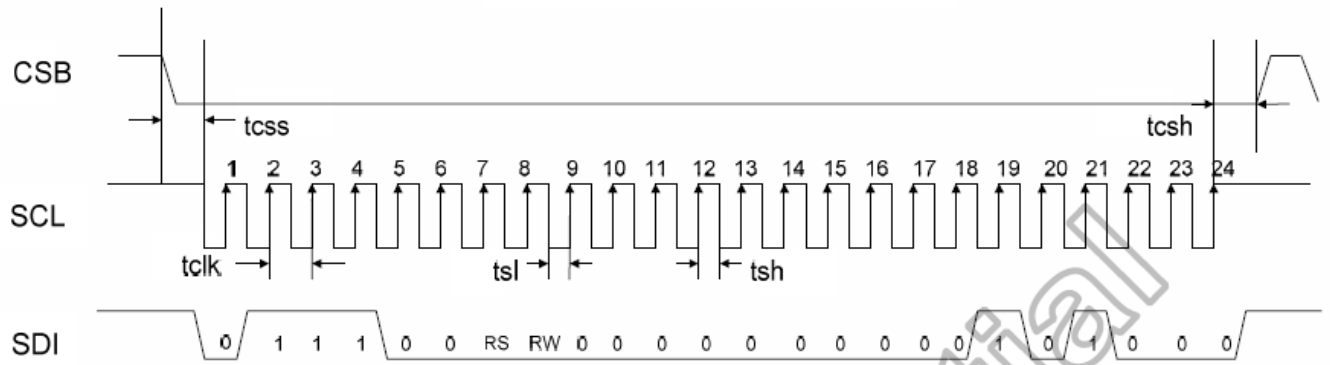


Data Transaction Timing in Parallel RGB Interface (DE Mode)

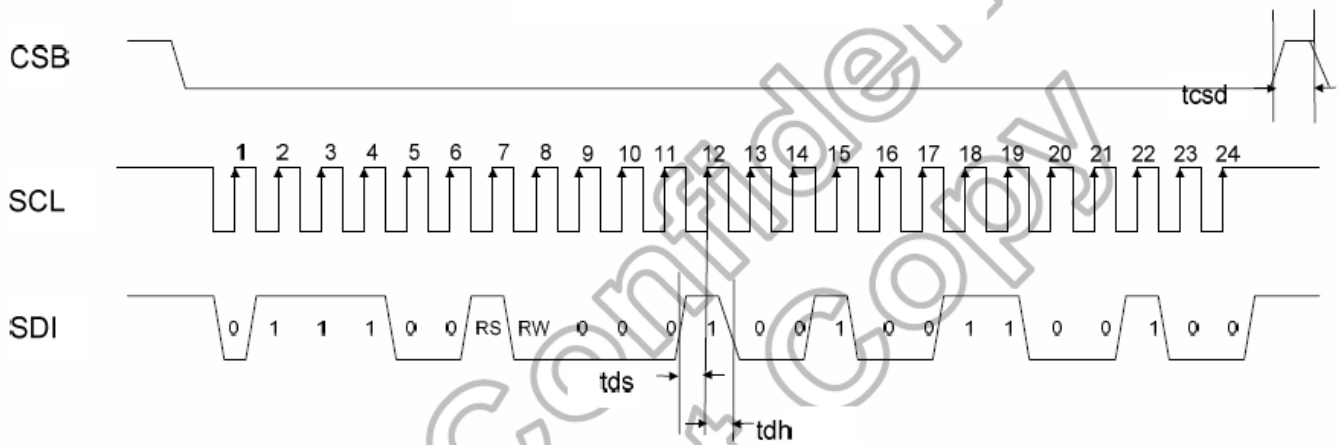


Characteristics	Symbol	Min.		Typ.		Max.		Unit
		24 bit	8 bit	24 bit	8 bit	24 bit	8 bit	
DOTCLK Frequency	fDOTCLK	-	-	6.5	19.5	10	30	MHz
DOTCLK Period	tDOTCLK	100	33.3	154	51.3	-	-	ns
Horizontal Frequency (Line)	fH	-	-	14.9	-	22.35	-	KHz
Vertical Frequency (Refresh)	fV	-	-	60	-	90	-	Hz
Horizontal Back Porch	tHBP	-	-	68	204	-	-	tDOTCLK
Horizontal Front Porch	tHFP	-	-	20	60	-	-	tDOTCLK
Horizontal Data Start Point	tHBP	-	-	68	204	-	-	tDOTCLK
Horizontal Blanking Period	tHBP + tHFP	-	-	88	264	-	-	tDOTCLK
Horizontal Display Area	HDISP	-	-	320	960	-	-	tDOTCLK
Horizontal Cycle	Hcycle	-	-	408	1224	450	1350	tDOTCLK
Vertical Back Porch	tVBP	-	-	18	-	-	-	Lines
Vertical Front Porch	tVFP	-	-	4	-	-	-	Lines
Vertical Data Start Point	tVBP	-	-	18	-	-	-	Lines
Vertical Blanking Period	tVBP + tVFP	-	-	22	-	-	-	Lines
Vertical Display Area	NTSC	VDISP	-	240	-	-	-	Lines
	PAL			280(PALM=0)				
	PAL			288(PALM=1)				
Vertical Cycle	NTSC	Vcycle	-	262	350	-	-	Lines
	PAL			313				

Write SPI

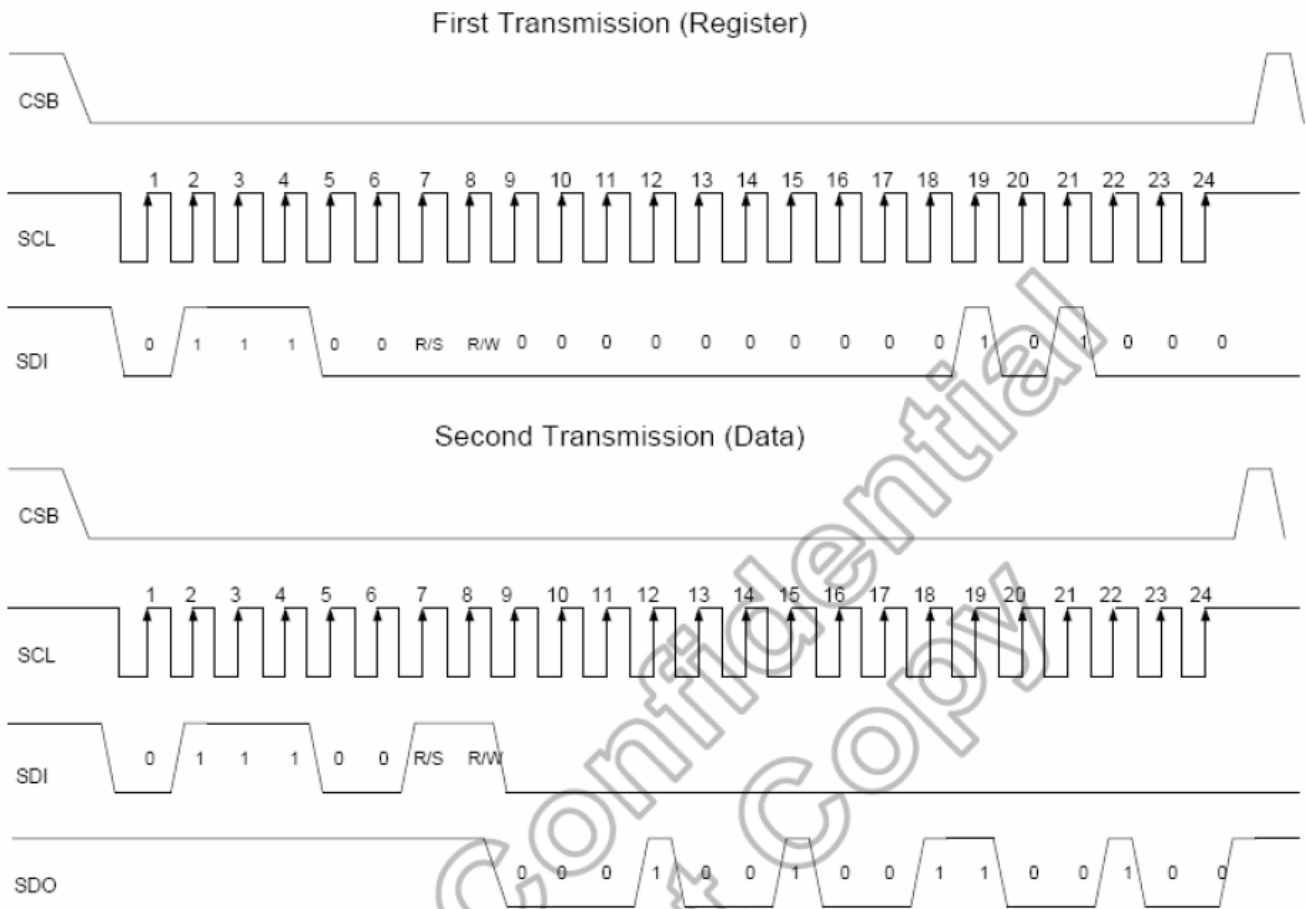


Second Transmission (Data)



Note: The example writes "0x1264h" to register R28h.
SPID connected to VSS.

Read SPI



Note: The example Read "0x1264h" from register R28h.

SPI Time

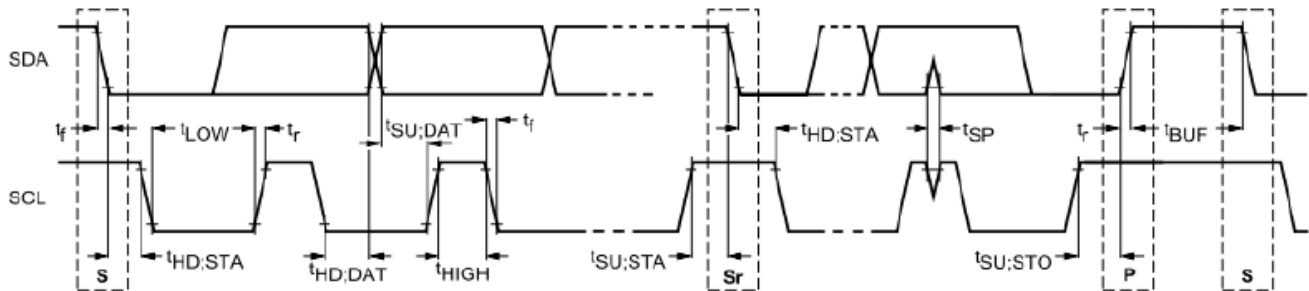
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Serial Clock Frequency	fclk	-	-	20	MHz
Serial Clock Cycle Time	tclk	50	-	-	ns
Clock Low Width	tsl	25	-	-	ns
Clock High Width	tsh	25	-	-	ns
Clock Rising Time	trs	-	-	30	ns
Clock Falling Time	tfl	-	-	30	ns
Chip Select Setup Time	tcss	0	-	-	ns
Chip Select Hold Time	tcsh	10	-	-	ns
Chip Select High Delay Time	tcsd	20	-	-	ns
Data Setup Time	tds	5	-	-	ns
Data Hold Time	tdh	10	-	-	ns

Touch panel controller ILI2830

Item	Specification					Remarks
7-1 Supply voltage for logic	Symbol	Min	Typ	Max	Unit	-
	V _{DD}	2.6	3.3	3.6	V	
7-2 Supply current for logic	Symbol	Min	Typ	Max	Unit	-
	I _{DD}	-	-	-	mA	
7-3 Insulation resistance	≧ 20M Ω(DC 25V)					-
7-4 Linearity	≧ 3.0%					Use Linear Teste
7-5 Chattering	≧ 15ms					-

7-6 Timing Characteristics

I²C interface



Symbol	Parameter	100KHz			400KHz		
		Min	Max	Unit	Min	Max	Unit
f _{SCL}	SCL clock frequency	0	100	kHz	0	400	kHz
t _{HD:STA}	Hold time (repeated) START condition. After this period, the first clock pulse is generated	4.0	-	μs	0.6	-	μs
t _{LOW}	LOW period of the SCL clock	4.7	-	μs	1.3	-	μs
t _{HIGH}	HIGH period of the SCL clock	4.0	-	μs	0.6	-	μs
t _{SU:STA}	Set-up time for a repeated START condition	4.7	-	μs	0.6	-	μs
t _{HD:DAT}	Data hold time	5.0	-	μs	0	0.9	μs
t _{SU:DAT}	Data set-up time	250	-	ns	100	-	ns
t _r	Rise time of both SDA and SCL signals	-	1000	ns	-	300	ns
t _f	Fall time of both SDA and SCL signals	-	300	ns	-	300	ns
t _{SU:STO}	Set-up time for STOP condition	4.0	-	μs	0.6	-	μs
t _{BUF}	Bus free time between a STOP and START condition	4.7	-	μs	1.3	-	μs



7. Optical Characteristics:

Item	Symbol	Conditions	Specifications			Unit	Note	
			Min	Typ	Max			
Transmittance (Without PL)	T(%)	-	-	7.4	-	-	-	
Contrast Ratio	CR	$\Theta = 0$ Normal Viewing angle	200	300	-		(1) (2)	
Response time	TR+TF	-	-	50	80	ms	(1) (3)	
Viewing angle	Hor.	Θ_{x+}	CR ≥ 10	-	45	-	deg.	-
		Θ_{x-}		-	45	-		
	Ver.	Θ_{y+}		-	45	-		
		Θ_{y-}		-	45	-		

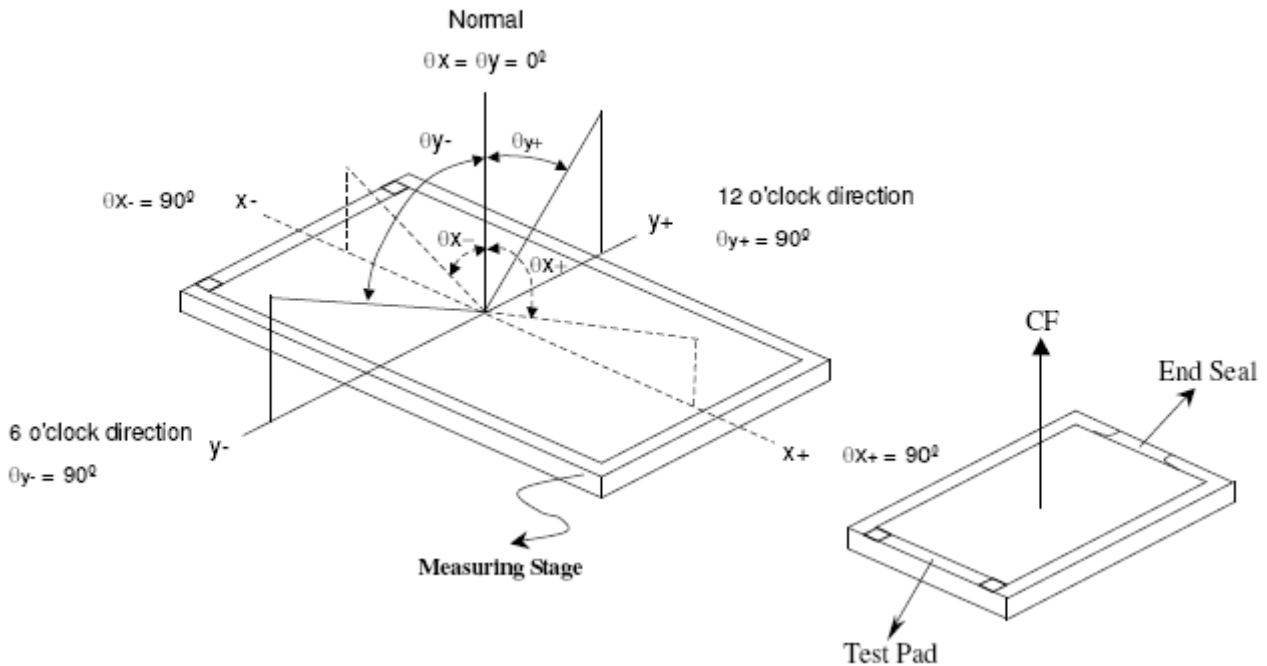
Measuring Condition

1. Measuring surrounding: dark room
2. Ambient temperature: $25 \pm 2^\circ\text{C}$
3. 30 min. Warm-up time.

Color of CIE Coordinate:

Item	Symbol	Condition	Min.	Typ.	Max.	Brightness	
Chromaticity Coordinates (Transmissive)	Red	x	-	0.6155	-	TBD Cd/m ²	
		y	-	0.3673	-		
	Green	x	$\theta = 0^\circ$ LED Backlight Color Degree X=0.26 Y=0.26 Brightness =TBD Cd/m ²	-	0.3386	-	TBD Cd/m ²
		y		-	0.5901	-	
	Blue	x		-	0.2966	-	TBD Cd/m ²
		y		-	0.3099	-	
	White	x		-	0.2966	-	TBD Cd/m ²
		y		-	0.3099	-	

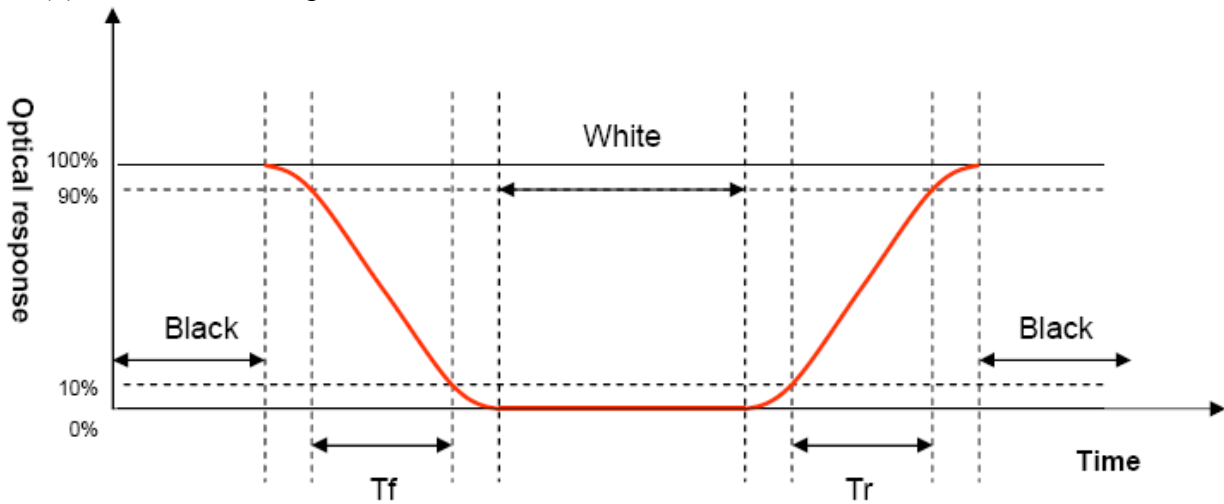
Note (1) Definition of Viewing Angle :



Note (2) Definition of Contrast Ratio(CR) :
measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

Note (3) Definition of Response Time : Sum of TR and TF





8. Interface Pin Assignment:

TFT Interface Pin

No.	Symbol	Function
1	LED-	Power Supply for Backlight.
2	LED-	Power Supply for Backlight.
3	LED+	Power Supply for Backlight.
4	LED+	Power Supply for Backlight.
5	GND	Power Ground.
6	NC(XR)	Open.
7	NC(YD)	Open.
8	NC(XL)	Open.
9	NC(YU)	Open.
10	GND	Power Ground.
11	NC	Open.
12	NC	Open.
13	NC	Open.
14	RESET	System reset pin. Internal pull high.- Connect to VDDIO when not used
15	CS	Chip select pin of serial interface.-Leave it OPEN when mot use.
16	SCL	Clock pin of serial interface.- Leave it OPEN when mot use.
17	SDI	Data input pin in serial mode.-Leave it OPEN when mot use.
18	NC	Open.
19	NC	Open.
20	DATA0	Blue Data Input Pins. -- If not use pins,plese connect to GND.
21	DATA1	
22	DATA2	
23	DATA3	
24	DATA4	
25	DATA5	
26	NC	Open
27	NC	Open
28	DATA6	Green Data Input Pins. --If not use pins,plese connect to GND.
29	DATA7	
30	DATA8	
31	DATA9	

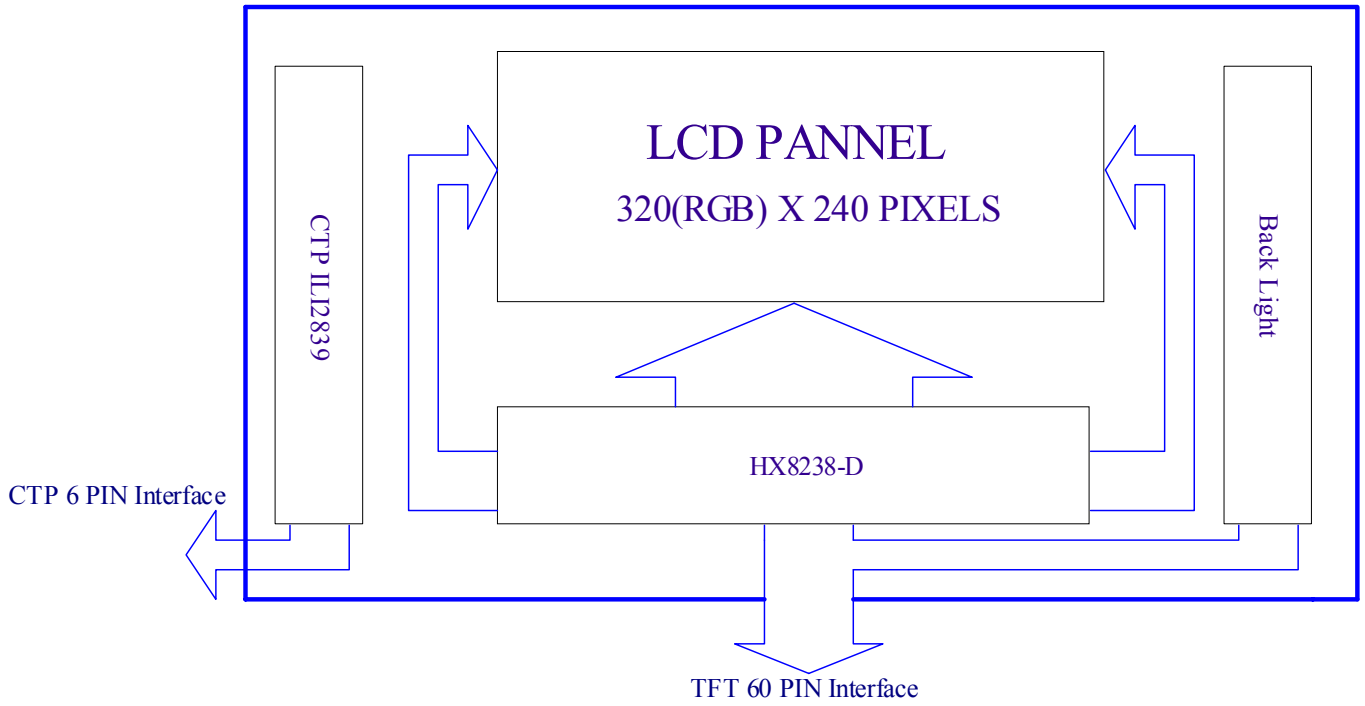


32	DATA10	
33	DATA11	
34	NC	Open.
35	NC	Open.
36	DATA12	Red Data Input Pins. --If not use pins, please connect to GND.
37	DATA13	
38	DATA14	
39	DATA15	
40	DATA16	
41	DATA17	
42	HSYNC	Horizontal Sync Input.
43	VSYNC	Vertical Sync Input.
44	DOTCLK	Dot Data Clock.
45	NC	Open.
46	NC	Open.
47	VCI	Power Supply.
48	VCI	Power Supply.
49-57	NC	Open.
58	ENABLE	Display enable pin from controller.
59	GND	Power Ground.
60	GND	Power Ground.

CTP Interface Pin

No.	Symbol	Function
1	VDD	Analog power supply.
2	RESET	RESET.
3	INT	External interrupt pin to host.
4	SCL	Serial clock pin for I2C interface.
5	SDA	Serial data pin for I2C interface.
6	GDN	Ground.

9. Block Diagram:



10. Backlight:

1. Standard Lamp Styles (Edge Lighting Type):
 The LED chips are distributed over the edge light area of the illumination unit, which gives the less power consumption:
2. The Main Advantages of the LED Backlight are as following:
 - 2.1 The brightness of the backlight can simply be adjusted.
 By a resistor or a potentiometer.

3. Data About LED Backlight:

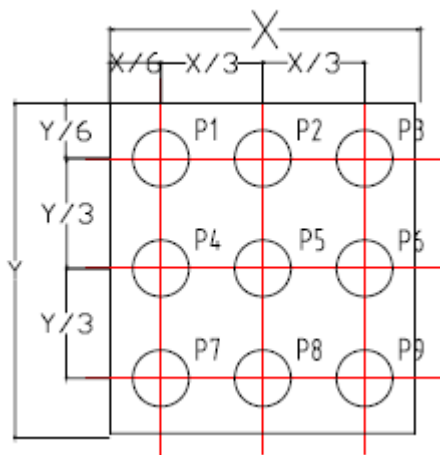
PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
Supply Current	I	-	15	-	mA	V=19.2V	
Supply Voltage	V	-	19.2	-	V	If=15mA	
Reverse Voltage	VR	-	-	5.0	V	-	
Luminous Intensity for LCM	IV	-	200	-	Cd/m ²	If=15mA	2
Uniformity for LCM	-	70		-	%		3
Life Time	-	20000		-	Hr.	If=15mA	4
Color	White						

NOTE:

1. Backlight Only
2. Average Luminous Intensity of P1-P9
3. Uniformity = Min/Max * 100%
4. LED life time defined as follows: The final brightness is at 70% of original brightness

Measured Method: (X*Y: Light Area)

Internal Circuit Diagram





11. Standard Specification for Reliability:

11 - 1 Standard Specifications for Reliability of LCD Module

No	Item	Description
01	High temperature operation	The sample should be allowed to stand at 70°C 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°C 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°C 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°C 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°C,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°C for 30 minutes → normal temperature for 5 minutes → +80°C 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 ISTA 1A 2001.



09	Electrical Static Discharge	Air: $\pm 4\text{KV}$ 150pF/330 Ω 5 times
		Contact: $\pm 2\text{KV}$ 150pF/330 Ω 5 time

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

11 - 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 11-1, Standard specifications for Reliability have been 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.

11- 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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12. Specification of Quality Assurance:

12-1. Purpose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by YEEBO CORPORATION (Supplier).

12-2. Standard for Quality Test

a. Inspection:

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

b. Electro-Optical Characteristics:

According to the individual specification to test the product.

c. Test of Appearance Characteristics:

According to the individual specification to test the product.

d. Test of Reliability Characteristics:

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

e. Delivery Test:

Before delivering, the supplier should take the delivery test.

(i) Test method: According to MIL-STD105E.General Inspection Level II take a single time.

(ii) The defects classify of AQL as following:

Major defect: AQL = 0.65

Minor defect: AQL = 2.5

Total defects: AQL = 2.5

12-3. Non- conforming Analysis & Deal With Manners

a. Non- conforming Analysis:

(i) Purchaser should supply the detail data of non- conforming sample and the non- conforming.

(ii) After accepting the detail data from purchaser, the analysis of non- conforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before 3 days.

b. Disposition of non- conforming:

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

(ii) Both supplier and customer should analyze the reason and discuss the disposition of non- conforming when the reason of nonconforming is not sure.

12-4. Agreement items

Both sides should discuss together when the following problems happen.

a. There is any problem of standard of quality assurance, and both sides should think that must be modified.

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

c. Any other special problem.

12-5. Standard of The Product Appearance Test

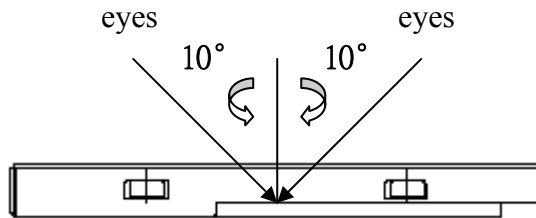
a. Manner of appearance test:

(i) The test must be under $20W \times 2$ or $40W$ fluorescent light, and the distance of view must be at $30 \pm 5cm$.

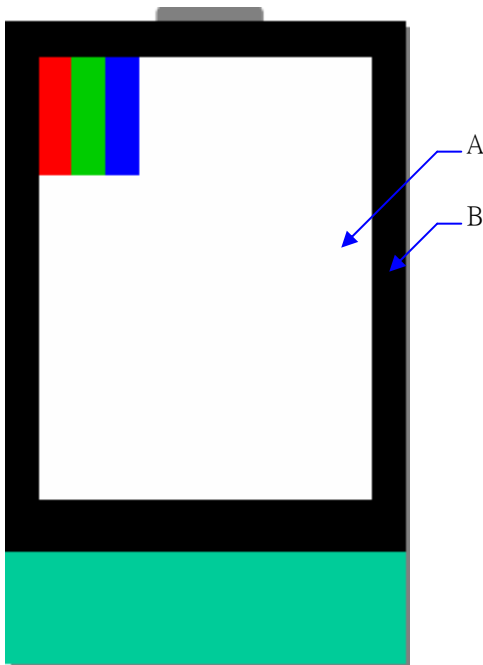
(ii) When test the model of transmissive product must add the reflective plate.

(iii) The test direction is base on around 10° of vertical line.

(iii) Temperature: $25 \pm 5^\circ C$ Humidity: $60 \pm 10\% RH$



(iv) Definition of area:



A. Area: Viewing area.

B. Area: Out of viewing area.

(Outside viewing area)

b. Basic principle:

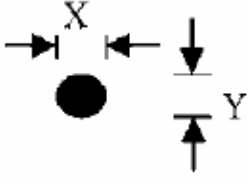
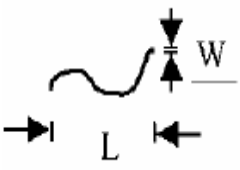
(i) It will accord to the AQL when the standard can not be described.

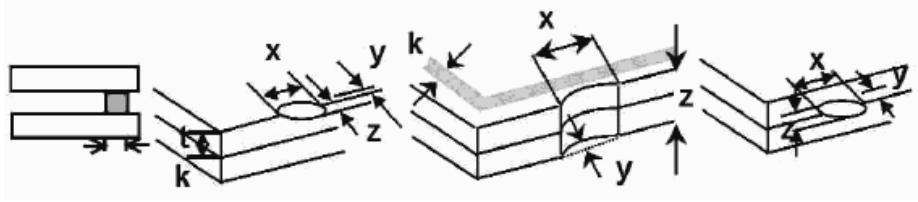
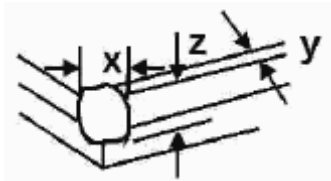
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

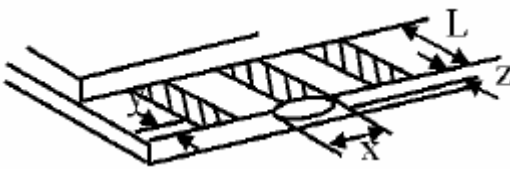
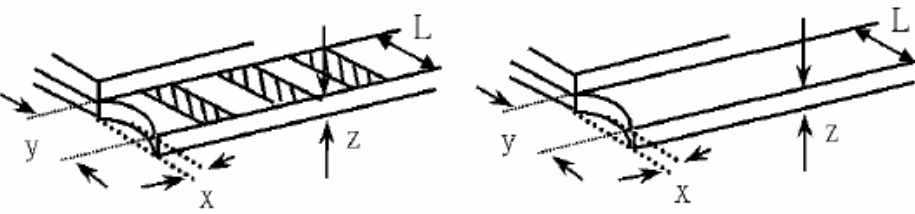
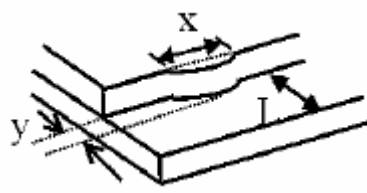
(iii) Must add new item on time when it is necessary.

c. Standard of inspection: (Unit: mm)

12-6. Inspection specification

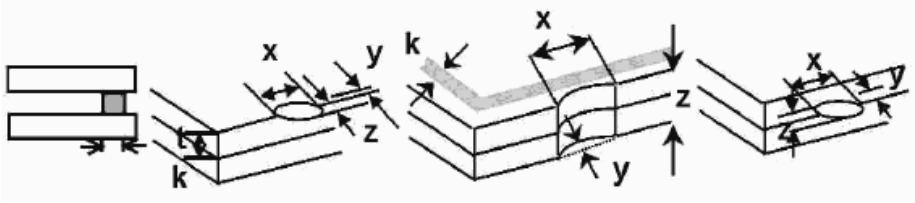
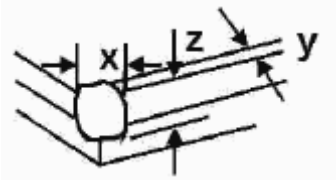
NO	Item	Criterion	AQL									
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 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 $\Phi = (X+Y) / 2$ <div style="display: flex; align-items: center; justify-content: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Size(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.40$</td> <td>5</td> </tr> <tr> <td>$0.40 < \Phi$</td> <td>0</td> </tr> </tbody> </table> </div> <p style="text-align: center;">* Densely spaced: No more than two spots within 3mm.</p>	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.20$	Accept no dense	$0.20 < \Phi \leq 0.40$	5	$0.40 < \Phi$	0	2.5	
		Size(mm)	Acceptable Q'ty									
$\Phi \leq 0.20$	Accept no dense											
$0.20 < \Phi \leq 0.40$	5											
$0.40 < \Phi$	0											
3.2 Line type: (As following drawing) <div style="display: flex; align-items: center; justify-content: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Length(mm)</th> <th>Width(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td rowspan="2">$L \leq 3.0$</td> <td>$W \leq 0.05$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.05 < W \leq 0.1$</td> <td>5</td> </tr> <tr> <td>$L > 3.0$</td> <td>$0.1 < W$</td> <td>Rejection</td> </tr> </tbody> </table> </div> <p style="text-align: center;">* Densely spaced: No more than two lines within 3mm.</p>	Length(mm)	Width(mm)	Acceptable Q'ty	$L \leq 3.0$	$W \leq 0.05$	Accept no dense	$0.05 < W \leq 0.1$	5	$L > 3.0$	$0.1 < W$	Rejection	2.5
Length(mm)	Width(mm)	Acceptable Q'ty										
$L \leq 3.0$	$W \leq 0.05$	Accept no dense										
	$0.05 < W \leq 0.1$	5										
$L > 3.0$	$0.1 < W$	Rejection										

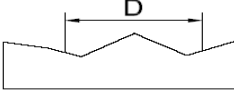
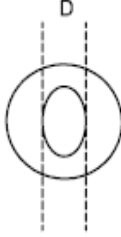
NO	Item	Criterion	AQL																		
04	Polarizer bubbles	<p>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction</p> <table border="1"> <thead> <tr> <th>Size Φ(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq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

NO	Item	Criterion	AQL																
07	Glass crack	<p>Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length</p> <p>7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:</p>  <table border="1" data-bbox="555 678 1232 826"> <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> <p>7.2.2 Non-conductive portion:</p>  <table border="1" data-bbox="555 1193 1232 1341"> <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> <p>⊙ 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.</p> <p>7.2.3 Substrate protuberance and internal crack</p>  <table border="1" data-bbox="880 1668 1316 1812"> <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
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												
14	Touch Panel Chipped glass	<p>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</p> <p>14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="416 797 1235 1014"> <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> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p> <p>14.1.2 Corner crack:</p>  <table border="1" data-bbox="416 1395 1235 1612"> <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> <p>⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip</p>	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 border="1" data-bbox="416 271 948 479"> <thead> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> </thead> <tbody> <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> </tbody> </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 Product packaging must the same as specified on packaging specification sheet. 19.2 Product dimension and structure must conform to product specification sheet.	0.65 0.65										



13. Handling Precaution:

13-1 Handling of LCM

- Don't give external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.
- The operators should be grounded 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 care when peeling off this protective film since static electricity may be generated.

13-2 Storage

- Store 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.
- Storage in a clean environment, free from dust, active gas, and solvent.
- Store in anti-static electricity container.
- Store without any physical load.

13-3 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.

14. Guarantee:

Our products could meet requirements of the environment.
YB's RoHS is introduce European Union Directive 2011/65/EU (ROHS)
Requirements and Update