10.1 inch TFT LCD
with capacitive touch panel
SPECIFICATION

MODEL NAME: LMCYA101XXN1- CCG1

Date: 2014 / 04 / 21

Customer Signature		
Customer		
Approved Date	**Approved By**	**Reviewed By**

1. Revision History

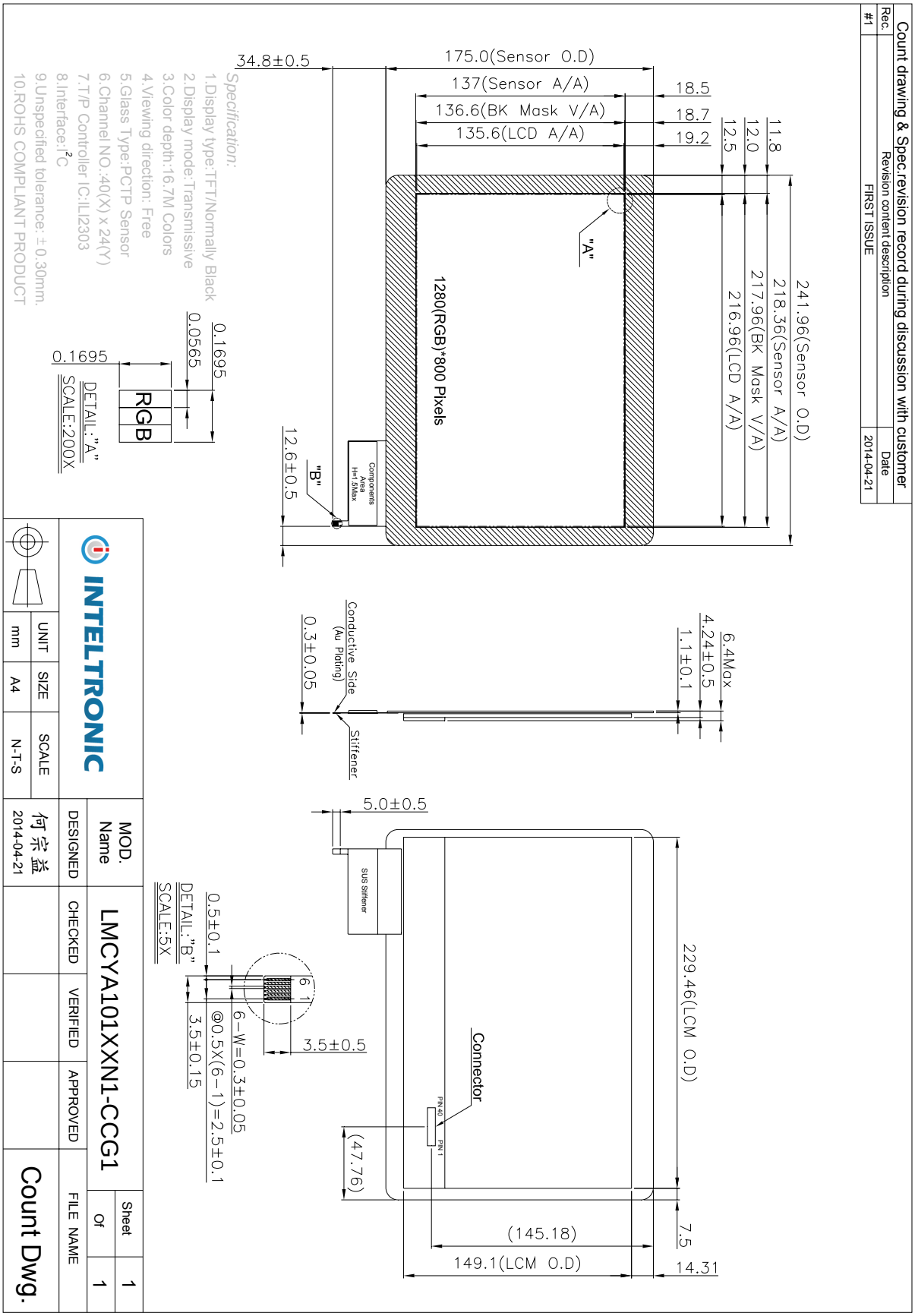
Sample Version	DOC. Version	DATE	DESCRIPTION		CHANGED BY
A0	00	2014-04-21	FULL SPEC	First issue	Fanny / Jimmy

2. Table of Contents:

3. General Specification:

ITEM	CONTENTS
Module Size	241.96(W) * 175.0 (H) * 6.4(T) mm
Module Size(With FPC)	241.96(W) *209.8 (H) * 6.4 (T) mm
Display Size(Diagonal)	10.1 inch
Display Format	1280(RGB)* 800 Pixels
Active Area	216.96(W) * 135.6(H) mm
Pixel Pitch	0.1695 * 0.1695 mm
LCD Type	TFT(16.7M) / Transmissive / Normal Black/Glare
Touch panel Type	OLGS
View Angle	Free
CTP IC	ILI2303
Weight	303.5g

4. LCM drawing:



5. Electrical Characteristics

5-1 Absolute Maximum Ratings (Ta=25℃ VSS=0V)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	VDD	-0.3	-	4.0	Volt	
	AVDD	-0.3	-	14.0	Volt	
	VGH	-0.3	-	42.0	Volt	
	VGL	-19	-	0.3	Volt	
	LED+	7.8	-	9.9	Volt	
Operating Temperature	Topr	0	-	+50	℃	
Operating Humidity	Hopr	-		+90	%RH	
Storage Temperature	Tstg	-20	-	+60	℃	
Storage Humidity	Hstg	-		+90	%RH	

Touch panel controller ILI2303

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply	V_{DD}	-	3.0	3.3	3.3	*V*

5-2 Operating Conditions

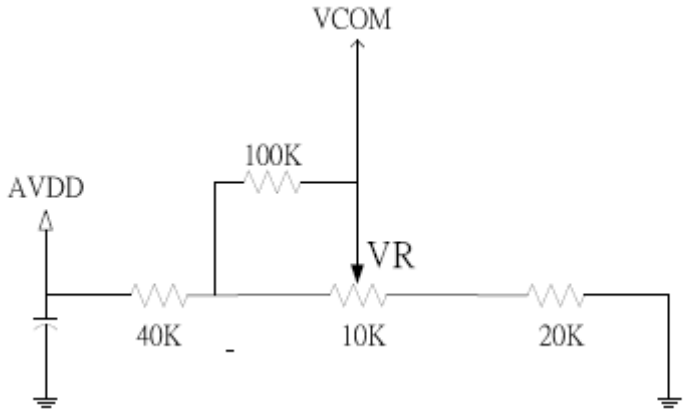
5-2-1 Input Voltage (Ta=25℃)

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply voltage	VDD	3.0	3.3	3.6	Volt	
Analog Power Supply	AVDD	7.9	8.2	8.5	Volt	Ripple=± 150mV
TFT Gate On Voltage	VGH	21.5	22.0	22.5	Volt	
TFT Gate off Voltage	VGL	-7.5	-7.0	-6.5	Volt	
Input Common voltage	VCOM	3.0	3.3	3.6	Volt	Note 1
Voltage for LED BL	VL	8.1	9.0	9.6	Volt	

5-2-2 Supply Current

Power Supply Current	IVDD	-	270	-	mA	VDD=3.3V
Analog Power Supply	IAVDD	-	250	-	mA	AVDD=8.2V
TFT Gate On Power	IGH	20	-	-	mA	VGH=22V
TFT Gate off Power	IGL	20	-	-	mA	VGL=-7V
Common Voltage Current	IVCOM	3	-	-	mA	
Current for LED BL	IL	-	220	-	mA	VL=9V

Note1: Specification is reference only ,the optimized VCOM value should be got by adjusting VR at flicker pattern. Below show suggested VR circuit



5-3 LVDS Receiver

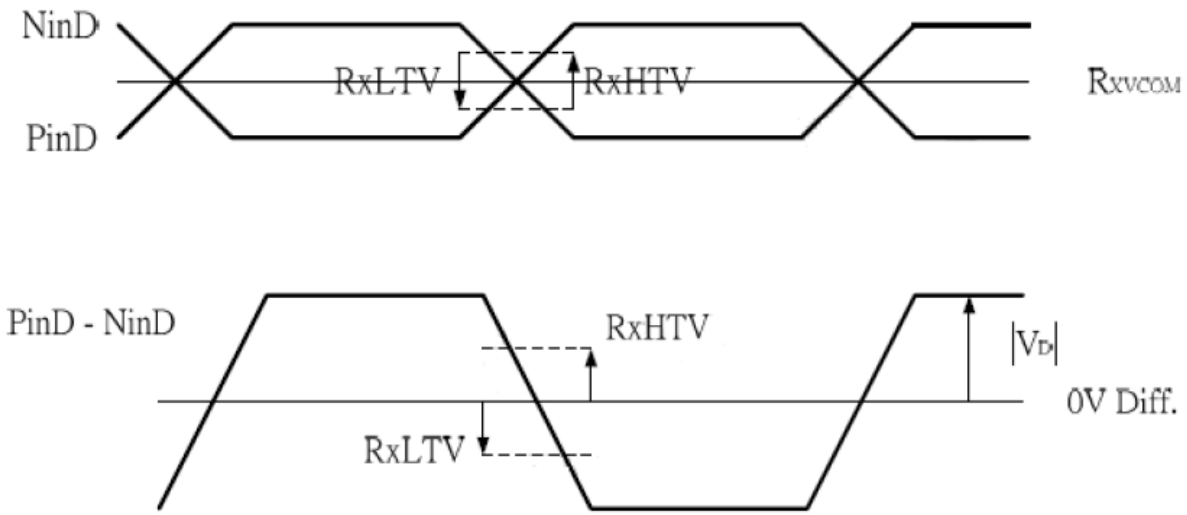
5-3-1 Signal Electrical Characteristics For LVDS Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
LVDS Differential signal high Threshold voltage	RXHTV	-	-	+100	mV	RXVCOM=1.2V
LVDS Differential signal Low Threshold voltage	RXLTV	-100	-	-	mV	
LVDS Differential signal Common voltage	RXVCOM	0.7	-	1.6	V	-
LVDS Differential signal voltage	| VD |	0.1	-	0.6	V	-

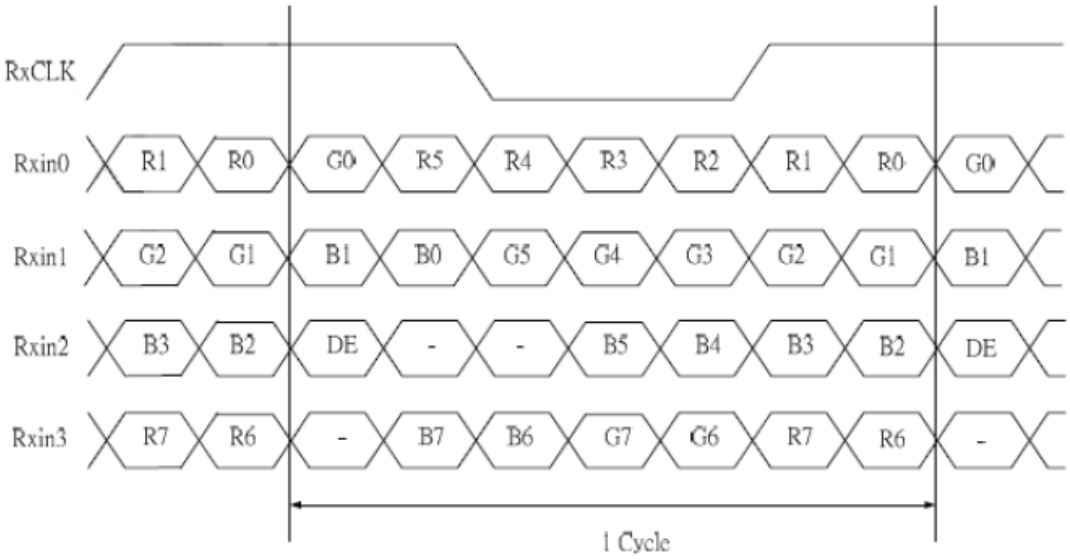
Note (1) Input signals shall be low or Hi-Z state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

Voltage Definition



LVDS Data Mapping



5-4 Interface Timing

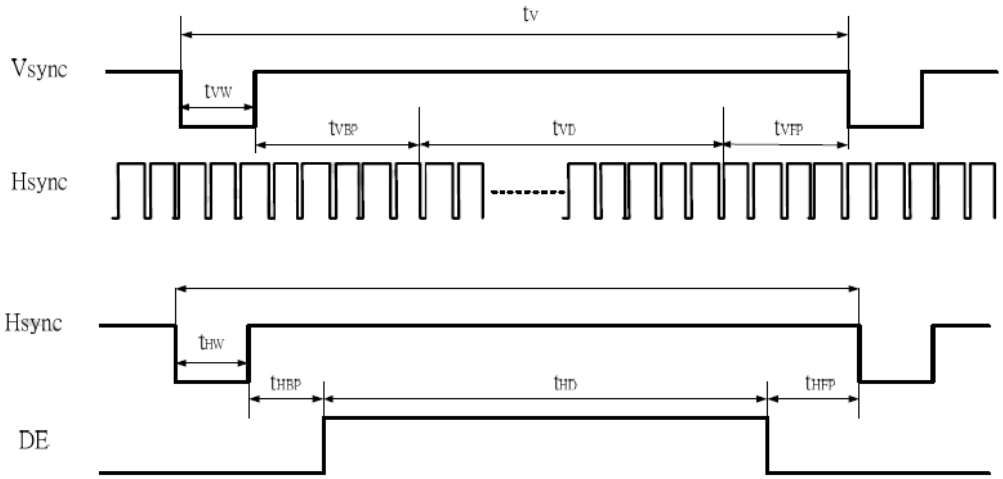
5-4-1 LVDS Interface Characteristics

Interface Timings

Parameter	Symbol	Unit	Min.	Typ.	Max.
Frame Rate	--	Hz	-	60	-
Vertical Total Time	t_V	line	(815)	(823)	(1023)
Vertical Display Time	t_{VD}	line		800	
Vertical Blanking Time	$t_{VW}+t_{VBP}+t_{VFP}$	line	(15)	(23)	(33)
Horizontal Total Time	t_H	clock	(1340)	(1440)	(1470)
Horizontal Display Time	t_{HD}	clock		1280	
Horizontal Blanking Time	$t_{HW}+t_{HBP}+t_{HFP}$	clock	(60)	(160)	(190)
Clock Rate	1/Tc	MHz	(68.9)	(71.1)	(73.4)

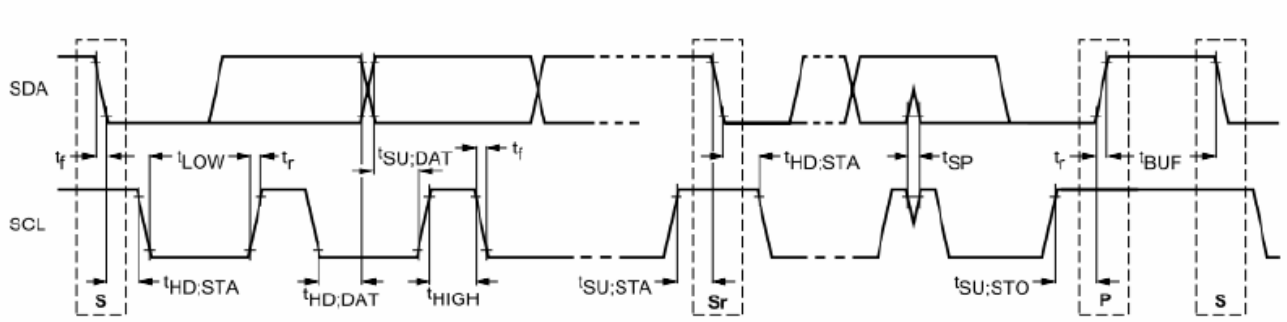
5-4-2 Timing Diagram of Interface Signal(DE mode)

Timing Characteristics



5-4-3 Touch panel controller ILI2303

I2C Interface

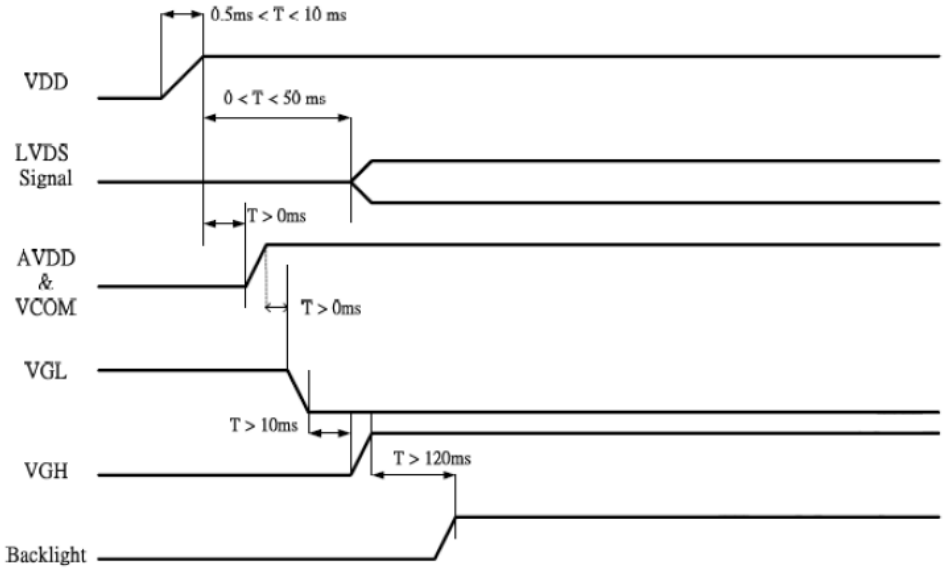


Symbol	Parameter	100KHz			400KHz		
		Min	Max	Unit	Min	Max	Unit
f_{SCL}	SCL clock frequency	0	100	kHz	0	400	kHz
$t_{HD;STA}$	Hold time (repeated) START condition. After this period, the first clock pulse is generated	4.0	–	µs	0.6	–	µs
t_{LOW}	LOW period of the SCL clock	4.7	–	µs	1.3	–	µs
t_{HIGH}	HIGH 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

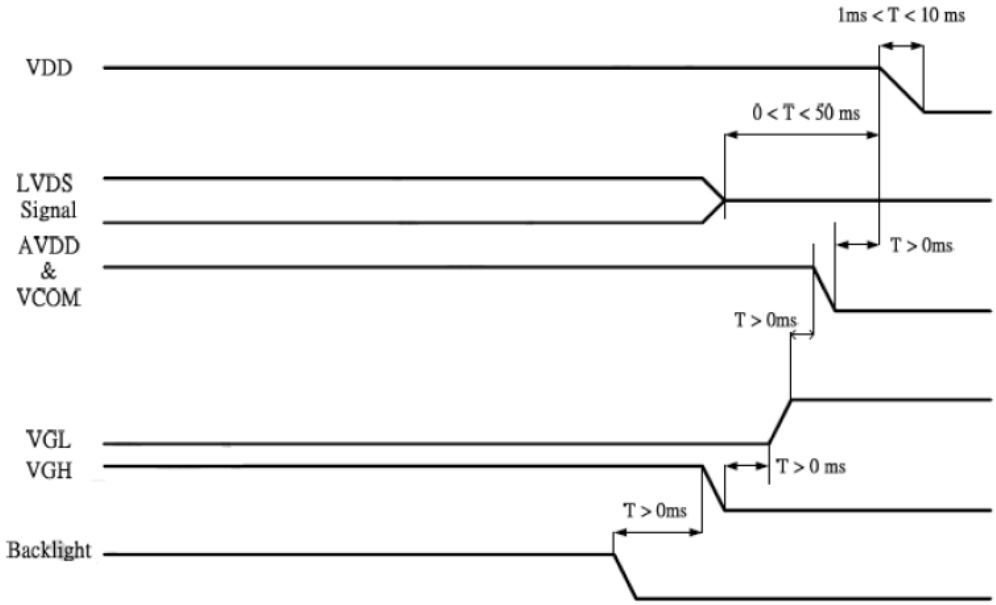
5-5 Power ON/OFF Sequence

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

Power ON:



Power OFF:



6. Optical Characteristics:

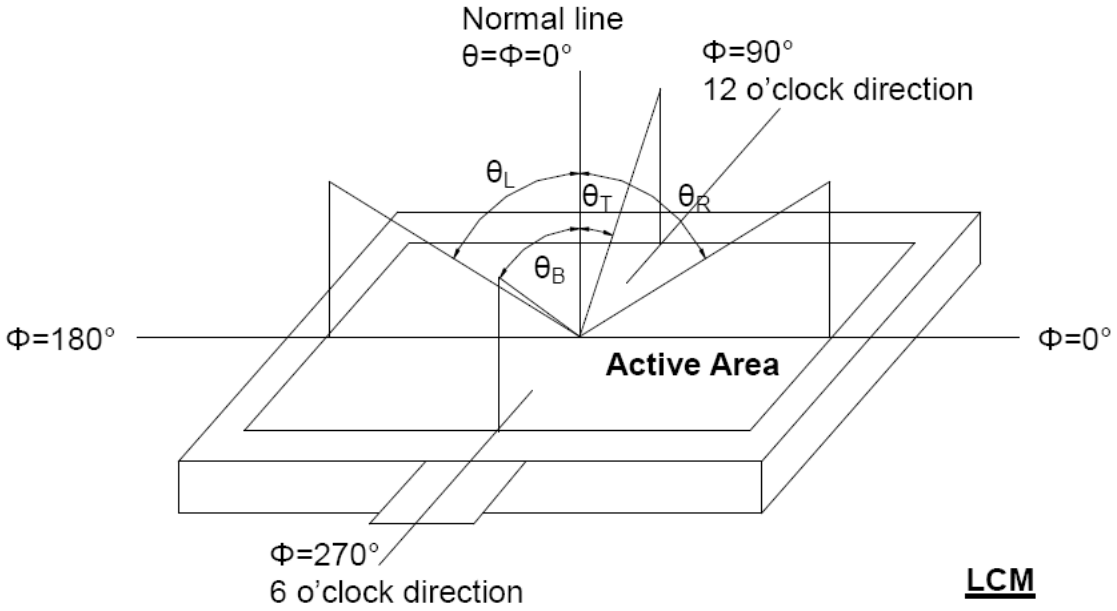
Item		Symbol	Conditions	Specifications			Unit	Remark
				Min	Typ	Max		
Contrast Ratio		CR	Normal θ=Φ=0°	600	800	-		Note 3
Response time		Rising +Falling			(25)	(50)	ms	Note 2
Viewing angle (CR≧10) B/L ON	Hor.	θL	Φ=180°(9 o'clock)	75	85	-	deg.	Note 1
		θR	Φ=0°(3 o'clock)	75	85	-		
	Ver.	θT	Φ=90°(12 o'clock)	75	85	-		
		θB	Φ=270°(6 o'clock)	75	85	-		

Measuring Condition
1. Measuring surrounding: dark room
2. Ambient temperature: 25±2℃
3. 30 min. Warm-up time.

Color of CIE Coordinate:

Item		Symbol	Min.	Typ.	Max.
Chromaticity Coordinates (Transmissive)	Red	x	-	TBD	-
		y	-	TBD	-
	Green	x	-	TBD	-
		y	-	TBD	-
	Blue	x	-	TBD	-
		y	-	TBD	-
	White	x	0.263	0.313	0.363
		y	0.279	0.329	0.379

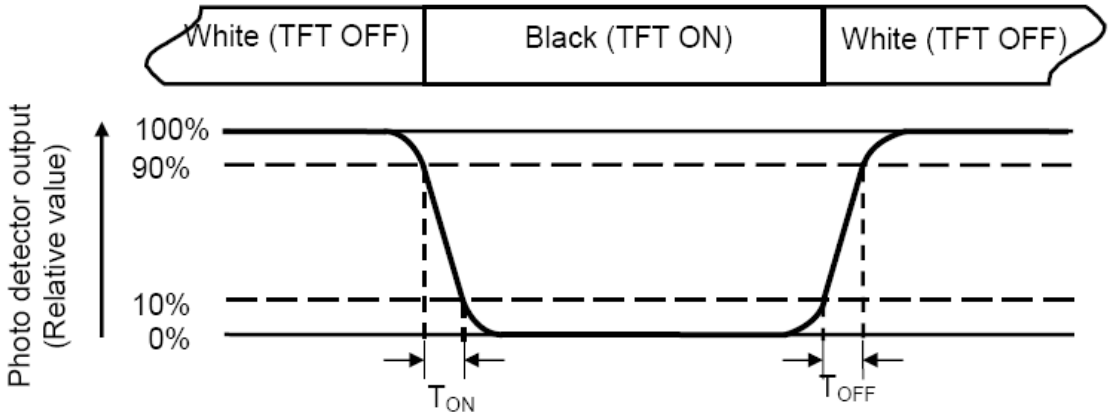
Note 1: Definition of viewing angle range



Note 2 :

Definition of Response Time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



Note 3 :

Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

7. Interface Pin Assignment:

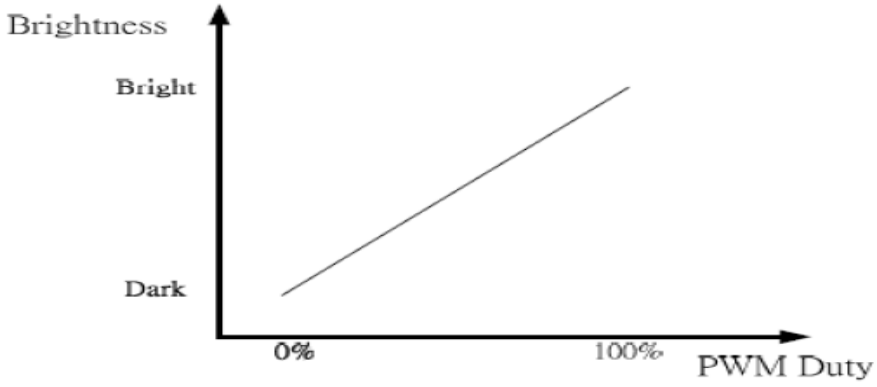
7-1 LCM Interface Pin

Interface connector apply F62240-H1210A or equivalent

No.	Symbol	I/O	Function	Remark
1	VCOM	P	Common Voltage	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	---	No Connection	
5	NC	---	No Connection	
6	NC	---	No Connection	Reserve for BIST
7	GND	P	Ground	
8	RXIN0-	I	-LVDS differential data input	R0~R5,G0
9	RXIN0+	I	+LVDS differential data input	
10	GND	P	Ground	
11	RXIN1-	I	-LVDS differential data input	G1~G5,B0,B1
12	RXIN1+	I	+LVDS differential data input	
13	GND	P	Ground	
14	RXIN2-	I	-LVDS differential data input	B2~B5,HS,VS,DE
15	RXIN2+	I	+LVDS differential data input	
16	GND	P	Ground	
17	RXCLKIN-	I	-LVDS differential clock input	LVDS clock
18	RXCLKIN+	I	+LVDS differential clock input	
19	GND	P	Ground	
20	RXIN3-	I	-LVDS differential data input	R6~R7,G6~G7,B6~B7
21	RXIN3+	I	+LVDS differential data input	
22	GND	P	Ground	
23	NC	---	No Connection	
24	NC	---	No Connection	
25	GND	P	Ground	
26	NC	---	No Connection	
27	LED-PWM	---	PWM Input Signal for LED Driver	Note 1
28	NC	---	No Connection	
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	

No.	Symbol	I/O	Function	Remark
31	LED-	---	LED Cathode	
32	LED-	---	LED Cathode	
33	NC	---	No Connection	
34	NC	---	No Connection	
35	VGL	P	TFT Gate OFF Voltage	
36	NC	---	No Connection	
37	CABC-EN	---	Content Adaptive Brightness Control Function Enable	*Enable: pull high *Disable: pull low or open
38	VGH	P	TFT Gate on Voltage	
39	LED+	---	LED Anode	
40	LED+	---	LED Anode	

I: input, O: output, P: Power
Note 1:



Note2: Interface connector apply 106A40-000000-G2-R(Starconn) or F62240-H1210A(Vigorconn) or equivalent,Pin 1 position see outline drawing)

7-2 CTP Interface Pin

No.	Symbol	I/O	Function
1	VDD	P	Power Voltage for digital circuit
2	RST	I	Reset
3	INT	I	Interrupt
4	SCL	I	I2C Serial Clock
5	SDA	I	I2C Serial Data
6	GND	P	Power Voltage for digital circuit

Note: I2C interface

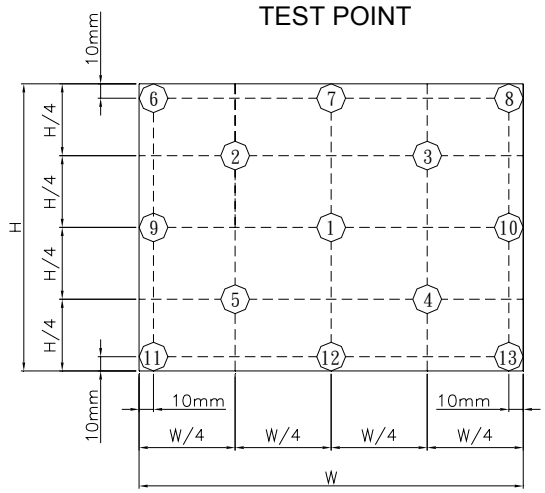
8. Backlight Characteristics:

Data About LED Backlight:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
Supply Current	I	-	220	-	mA	V=9.0V	
Supply Voltage	V	8..1	9.0	9.6	V	If=220mA	
Luminous Intensity for LCM	I_V	-	300	-	Cd/m^2	If=220mA	1
Uniformity for LCM	-	70	-	-	%		2

NOTE:
1. Average Luminous Intensity of P1-P13
2. Uniformity = Min/Max * 100%

Measured Method: (X*Y: Light Area)



9. Standard Specifica tion for Reliability .:

9–1. Standard Specifications for Reliability of LCD Module

No	Item	Description
01	High temperature operation	The sample should be allowed to stand at 50℃ 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 0℃ 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 60℃ 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 -20℃ 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 : -20℃ for 30 minutes → normal temperature for 5 minutes → +60℃ 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: ±6KV 150pF/330Ω 5 times
		Contact: ±4KV 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 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.

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±5℃), normal humidity (50±10% RH), and in area not exposed to direct sun light.

10. Handling Precaution:

10-1 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.

10-2 Storage

- Store in an ambient temperature of 25±10℃, and in a relative humidity of 50±10%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.

10-3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: No higher than 280±10℃ and less than 3 sec during Hand soldering.
- Rewiring: no more than 2 times.

11. Inspection Specifications

The buyer (customer) shall inspect the modules within twenty calendar days since the delivery date (the "inspection period") at its own cost. The results of the inspection (acceptance or rejection) shall be recorded in writing, and a copy of this writing will be promptly sent to the seller.

The buyer may, under commercially reasonable reject procedures, reject an entire lot in the delivery involved if, within the inspection period, such samples of modules within such lot show an unacceptable number of defects in accordance with this incoming inspection standards, provided however that the buyer must notify the seller in writing of any such rejection promptly, and not later than within three business days of the end of the inspection period.

Should the buyer fail to notify the seller within the inspection period, the buyer's right to reject the modules shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

12. Warranty

Inteltronic Inc. warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for one year from the date of purchase.

Inteltronic Inc. will be limited to replace or repair any of its module which is found and confirmed defective electrically or visually when inspected in accordance with Inteltronic Inc. general module inspection standard.

This warranty does not apply to any products which have been on customer’s production line, repaired or altered by persons other than repair personnel authorized by Inteltronic Inc., or which have been subject to misuse, abuse, accident or improper installation. Inteltronic Inc. assumes no liability under the terms of this warranty as a consequence of such events.

If an Inteltronic Inc. product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. In returning the modules, they must be properly packaged with original package; there should be detailed description of the failures or defect.

13. RMA

Products purchased through Inteltronic Inc. and under warranty may be returned for replacement. Contact support@inteltronicinc.com for RMA number and procedures

Office Locations

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