7.0 inch TFT LCD
with Capacitive Touch Panel
SPECIFICATION

MODEL NAME: LMCYA070YVN1- CCG1

Date: 2014 / 04 / 25

Customer Signature		
Customer		
Approved Date	Approved By	Reviewed By

1. Revision History

Sample Version	DOC. Version	DATE	DESCRIPTION		CHANGED BY
A0	00	2014-04-25	SPEC ONLY	First issue	Alex /Calamie

2. Table of Contents:

3. General Specification:

ITEM	CONTENTS
Module Size	190.0 (W) * 112.5 (H) * 4.6(T) mm
Module Size(With FPC)	235.85 (W) *171.32 (H) * 4.6(T) mm
Display Size (Diagonal)	7.0 inch
Display Format	800(RGB)* 480 Pixels
Active Area	153.6 (W) * 86.64 (H) mm
Dots Pitch	0.192 * 0.1805 mm
LCD Type	TFT (16.7M)/ Transmissive / Normal White
Touch panel Type	OLGS / PCTP
Viewing Direction	6 O'clock
Controller IC	NT39416Q & NT52001
CTP IC	ILI2303
Weight	157.0g

4. LCM drawing:

Specification:
1. Display mode: 7.0" TFT/ Normal White/ Transmissive
2. Color depth: 16.7M Colors
3. Viewing direction: 6 O'clock
4. Operating temperature: -20°C to +70°C
   Storage temperature: -30°C to +80°C
5. Drive IC: NT39416Q & NT52001
6. Backlight: 18 CHIP WHITE LED/
   LCM Luminance(with T/P): 220 cd/m² (TYP)/
   Vf=9.6V(TYP)/ If=120mA
7. Unspecified tolerance: ±0.30mm.
8. ROHS compliant

9. Glass Type: OLGS PCTP
10. Channel NO:28(X) x 16(Y)
11. Drive IC is: ILI2303

MOD. Name: LMCYA070YVN1-CCG1

	DESIGNED	CHECKED	VERIFIED	APPROVED
	連羽挺			
	2014-04-18			

UNIT: mm SIZE: A4 SCALE: N-T-S

Count Dwg.

FILE NAME

Sheet: 1 Of: 1

LCD MODULE FPC PIN OUT PIN ASSIGNMENT

No.	Symbol
1	NC
2	NC
3	NC
4	NC
5	GND
6	VCOM
7	DVDD
8	MODE
9	DE
10	VS
11	HS
12	B7
13	B6
14	B5
15	B4
16	B3
17	B2
18	B1
19	B0
20	G7
21	G6
22	G5
23	G4
24	G3
25	G2
26	G1
27	G0
28	R7
29	R6
30	R5
31	R4
32	R3
33	R2
34	R1
35	R0
36	GND
37	DCLK
38	GND
39	SHLR
40	UPDN
41	VDDC
42	VEEG
43	AVDD
44	RSTB
45	VCOM
46	VCOM
47	DITHB
48	GND
49	NC
50	NC
51	NC
52	NC
53	A
54	K

TOUCH PANEL PIN ASSIGNMENT

No.	Symbol
1	VDD
2	RESET
3	INT
4	SCL
5	SDA
6	GND

B/L CIRCUIT DIAGRAM
120mA(Reference VF≈9.6V)
IF=120mA (VF=9.6V)

LED K1 LED K2 LED K3 LED K4 LED K5 LED K6

800 (RGB) X 480 Pixels

VIEWING DIRECTION

DETAIL "A" SCALE:5X

FPC bending schematic diagram

Insulation Tape

Components area

5. Electrical Characteristics

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

TFT IC Parameter (NT39416Q & NT52001)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	DVDD	-0.3		5.0	Volt	
	AVDD	-0.3	-	15	Volt	
	VDDG	-0.3		42	Volt	
	VEEG	-20		-0.3	Volt	
	VDDG-VEEG	-0.3	-	40	Volt	DVDD =3.3V
Operating Temperature	Topr	-20	-	+70	℃	
Storage Temperature	Tstg	-30	-	+80	℃	

Touch panel controller IC (ILI2303)

Item	Symbol	Min.	Type	Max.	Unit	Remark
Power Supply voltage	VDD	-0.3		3.3	Volt	

Note: Absolute maximum rating is the limit value beyond which the IC maybe broken.

5-2 Operating Conditions　　　　　　　　　　(Ta=25℃)

TFT IC Parameter (NT39416Q & NT52001)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply voltage	DVDD	-	3.1	3.3	3.5	Volt
	AVDD	-	10.3	10.5	10.7	Volt
	VCOM	-	3.7	3.9	4.2	Volt
	VDDG		14.3	15.0	15.7	Volt
	VEEG	-	-7.7	-7.0	-6.3	Volt
Level Input Voltage (Digital signal)	VIH	-	0.7*DVDD	-	DVDD	Volt
	VIL	-	GND	-	0.3*DVDD	Volt
	VOH	-	DVDD-0.4	-	DVDD	Volt
	VOL	-	GND	-	GND+0.4	Volt
Power Supply Current for LCM	DVDD_IDD	DVDD=3.3V	-	70	105	mA
	AVDD_IDD	AVDD=10.5V	-	13.5	20.3	mA

Touch panel controller IC (ILI2303)

| Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply voltage	VDD	-	3.0	3.3	3.3	Volt

Note:GND=VSS=0V

5-3 Data Input Timing
5-3-1 TFT Data Input Timing (Reference to NT39416Q)

Vertical Input Timing
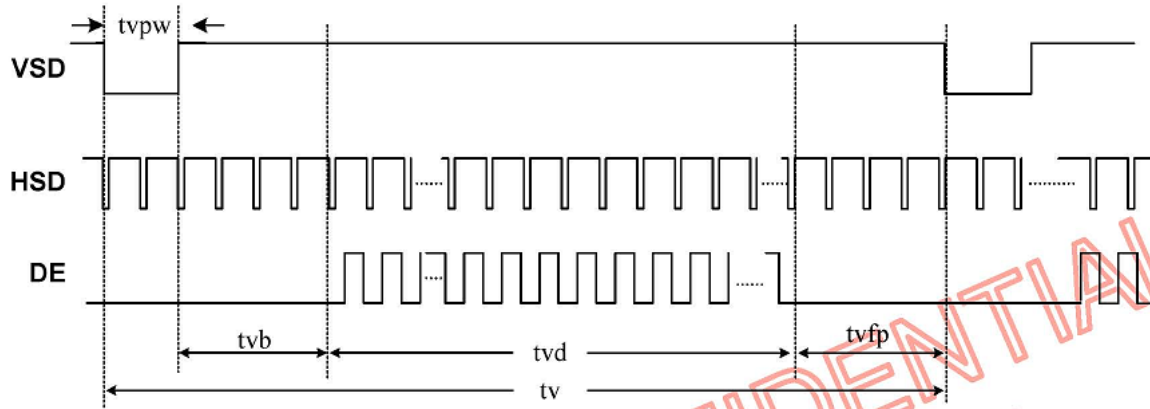
Horizontal Input Timing
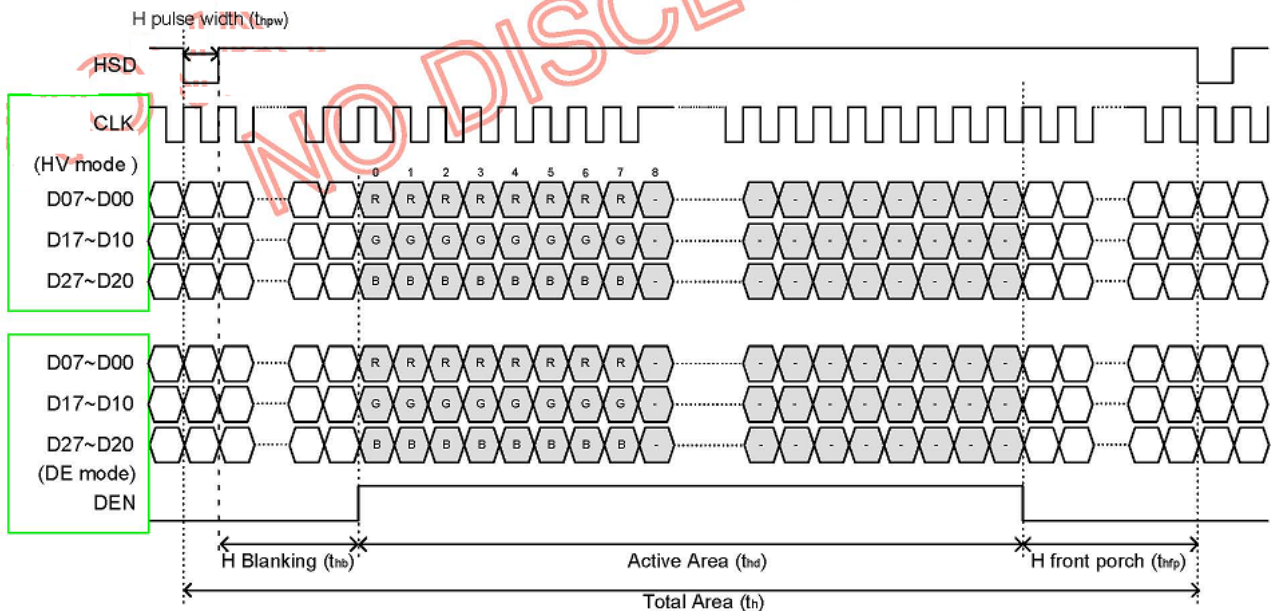
Horizontal Input Timing Table

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
DCLK frequency	fclk	20	33.3	50	MHz	DCLK(max) = 50MHz
Horizontal display area	thd		800		DCLK	
1 Horizontal Line	th	908	928	1088	DCLK	
HSD pulse width	thpw	1	48	87	DCLK	thb+thpw=88 DCLK is fixed.
HSD Back Porch (Blanking)	thb	87	40	1	DCLK	
HSD Front Porch	thfp	20	40	200	DCLK	

Vertical Input Timing Table

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Vertical display area	tvd		480		H	
VSD period time	tv	517	525	712	H	
VSD pulse width	tvpw	1	1	3	H	Tvpw+tvb=32 H is fixed
VSD Back Porch (Blanking)	tvb	31	31	29	H	
VSD Front Porch	tvfp	5	13	200	H	

5-3-2 Touch panel controller IC Input Timing（Reference to ILI2303）

I²C interface
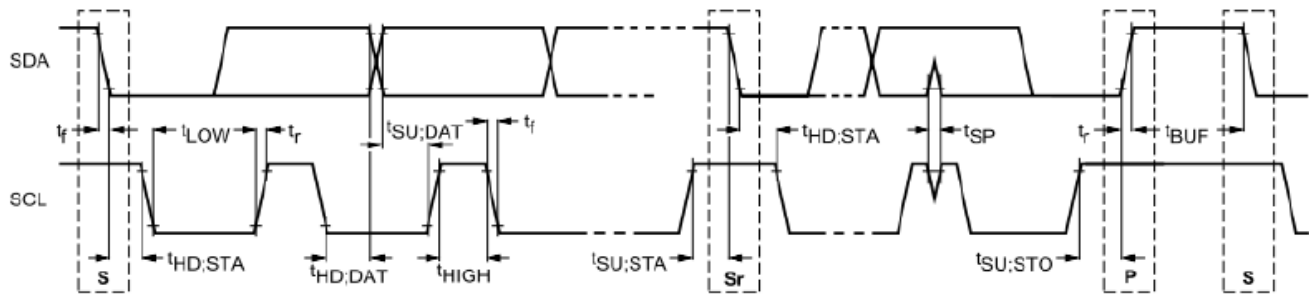
Symbol	Parameter	100KHz			400KHz		
		Min	Max	Unit	Min	Max	Unit
f_{SCL}	SCL clock frequency	0	100	kHz	0	400	kHz
$t_{HD;STA}$	Hold time (repeated) START condition. After this period, the first clock pulse is generated	4.0	–	µs	0.6	–	µs
t_{LOW}	LOW period of the SCL clock	4.7	–	µs	1.3	–	µs
t_{HIGH}	HIGH 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

6. Optical Characteristics:

Item		Symbol	Conditions	Specifications			Unit	Note
				Min	Typ	Max		
Transmittance		T(%)	-	-	TBD	-	-	-
Contrast Ratio		CR	θ=0 Normal Viewing angle	-	500	-		(1) (2)
Response time		TR+TF	-	-	25	-	ms	(1) (3)
Viewing angle	Hor.	Θx+	CR≧10	60	70	-	deg.	-
		Θx-		60	70	-		
	Ver.	Θy+		40	50	-		
		Θy-		50	60	-		

Measuring Condition

1. Measuring surrounding: dark room

2. Ambient temperature: 25±2℃

3. 30 min. Warm-up time.

Color of CIE Coordinate:

Item		Symbol	Condition	Min.	Typ.	Max.	Brightness
Chromaticity Coordinates (Transmissive)	Red	x	θ = φ = 0° LED Backlight Color Degree X=0.30 Y=0.30 Brightness =TBD cd/m²	-	0.6124	-	TBD cd/m²
		y		-	0.3423	-	
	Green	x		-	0.3367	-	TBD cd/m²
		y		-	0.5587	-	
	Blue	x		-	0.1463	-	TBD cd/m²
		y		-	0.0899	-	
	White	x		-	0.3214	-	TBD cd/m²
		y		-	0.3354	-	

Note (1) Definition of Viewing Angle :
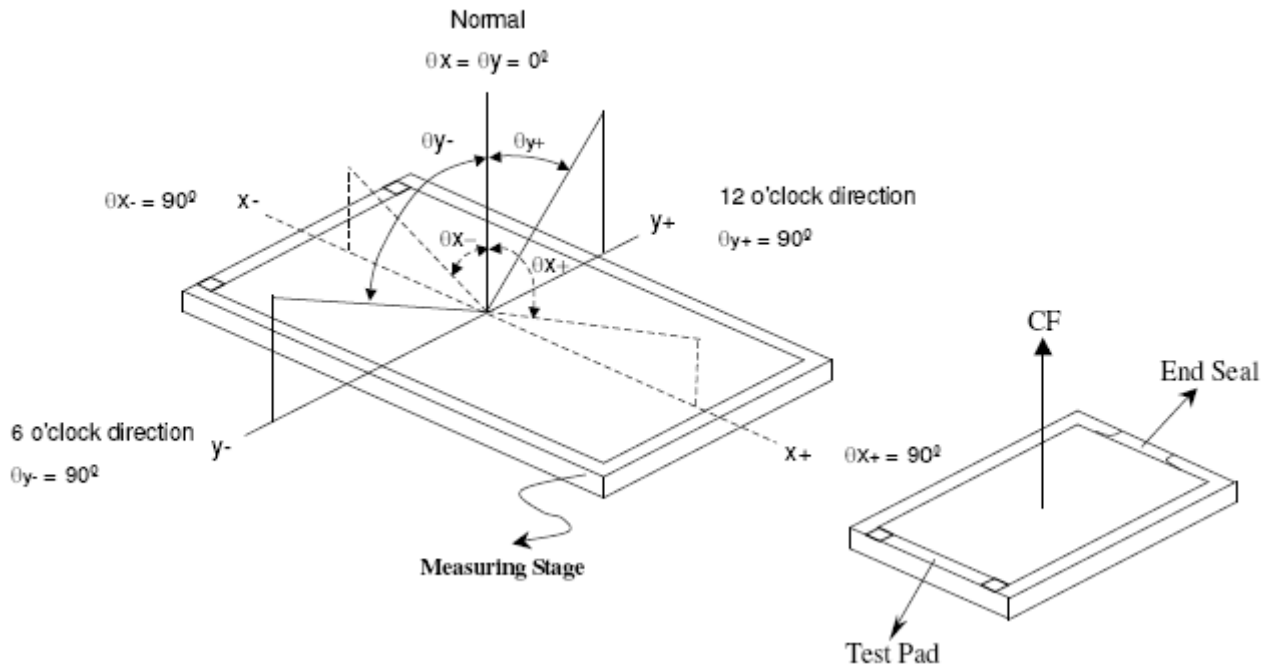
Note (2) Definition of Contrast Ratio(CR) :
        measured at the center point of panel

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

Note (3) Definition of Response Time : Sum of TR and TF
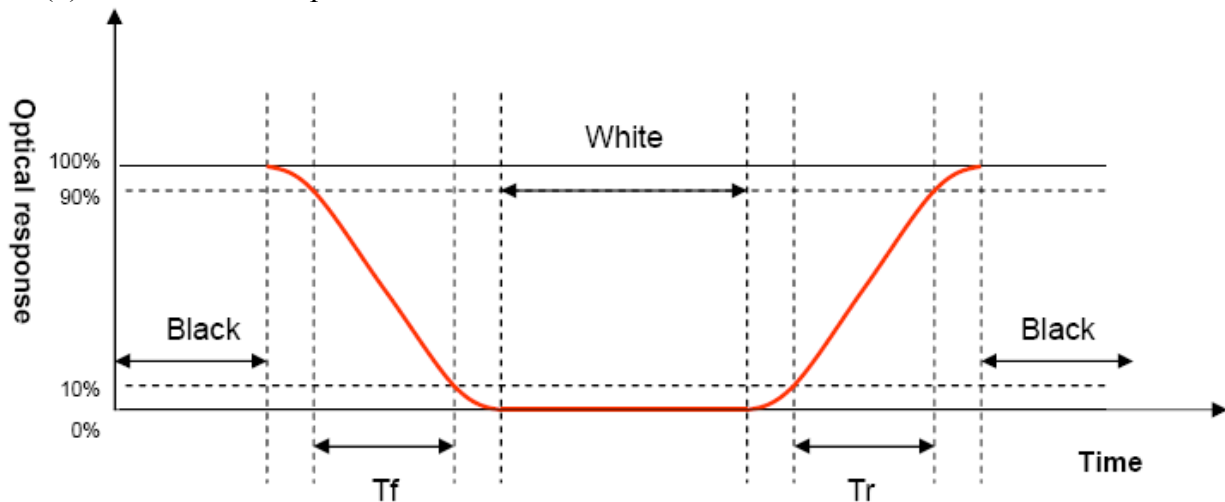
7. Interface Pin Assignment:

7-1 LCM FPC Interface

No.	Symbol	Function
1	NC	No Connection
2	NC	No Connection
3	NC	No Connection
4	NC	No Connection
5	GND	Power ground
6	VCOM	Common voltage input.
7	DVDD	Digital Power input.
8	MODE	DE/SYNC mode select. Normally pull high H:DE mode. L:HSD/VSD mode
9	DE	Data Enable signal
10	VS	Vertical sync input. Negative polarity
11	HS	Horizontal sync input. Negative polarity
12~19	B7~B0	Blue Data Input
20~27	G7~G0	Green Data Input
28~35	R7~R0	Red Data Input
36	GND	Power ground
37	DCLK	Data clock Input
38	GND	Power ground
39	SHLR	Left or Right Display Control
40	UPDN	Up / Down Display Control
41	VDDG	Positive Power for TFT. (VGH)
42	VEEG	Negative Power for TFT.(VGL)
43	AVDD	Analog Power input.
44	RSTB	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10K，C=1μF)
45	NC	Not connect
46	VCOM	Common Voltage input.
47	DITHB	Dithering setting, Normally pull high. DITH="H" 6bit resolution(last 2 bit of input data truncated)
48	GND	Power ground
49	NC	Not connect

50	NC	No Connection
51	NC	No Connection
52	NC	No Connection
53	A	Black Light+
54	K	Black Light -

7-2 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	GND	Ground.

Note: I2C   interface

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8. Block Diagram:
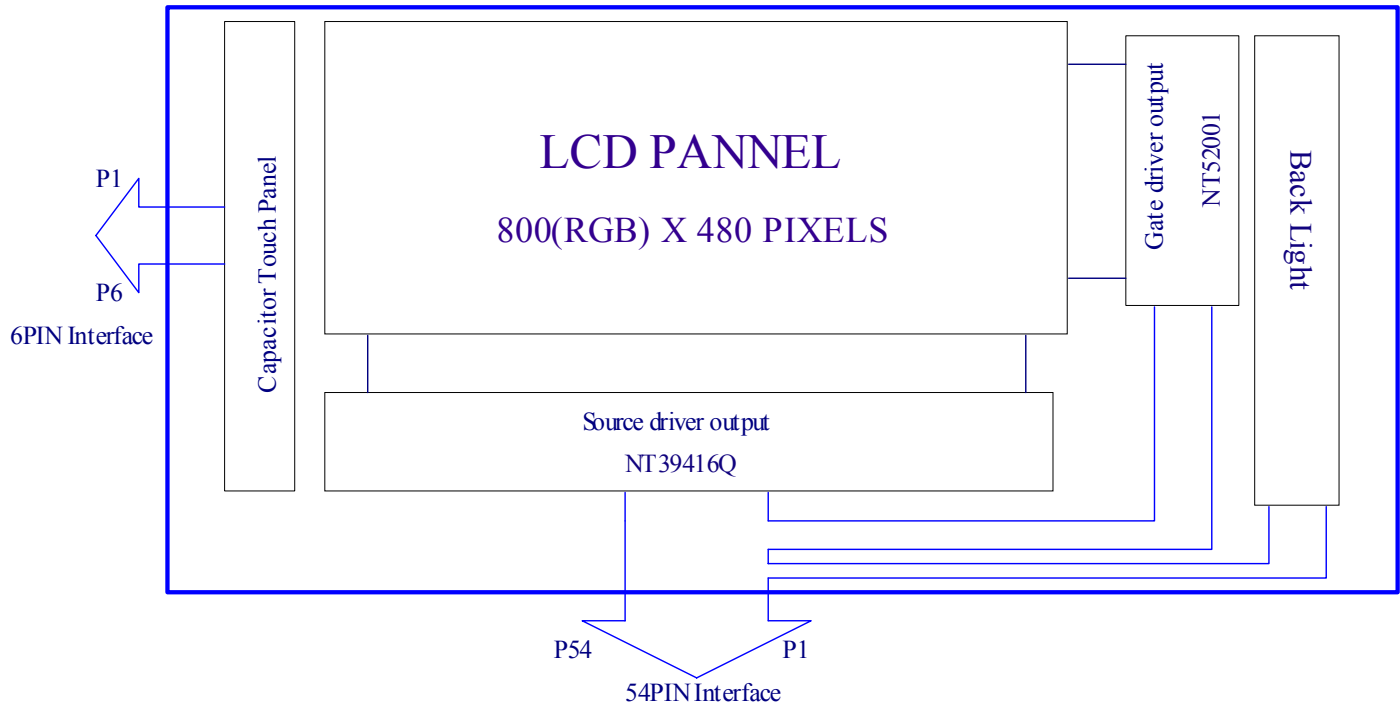
9. Backlight:

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		120		mA	V=9.6V	
Supply Voltage	V	-	9.6	-	V	If=120mA	
Reverse Voltage	VR	-	-	5.0	V	-	
Luminous Intensity for LCM	IV	-	220	-	Cd/m2		2
Uniformity for LCM	-	70	-	-	%	If=120mA	3
Life Time	-	20000	-	-	Hr.		4
Color	White						

NOTE:
1. Backlight Only
2. Average Luminous Intensity of P1-P13
3. Uniformity = Min/Max * 100%
4. LED life time defined as follow: the final brightness is at 70% of original brightness

Measured Method: (X*Y: Light Area)   **Internal Circuit Diagram**
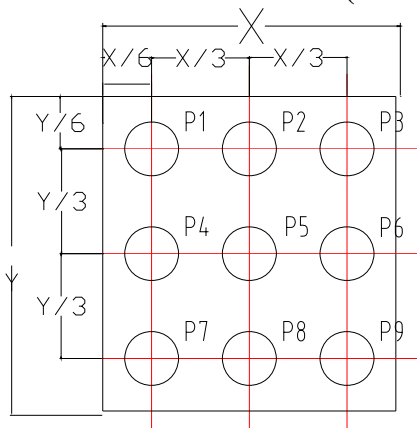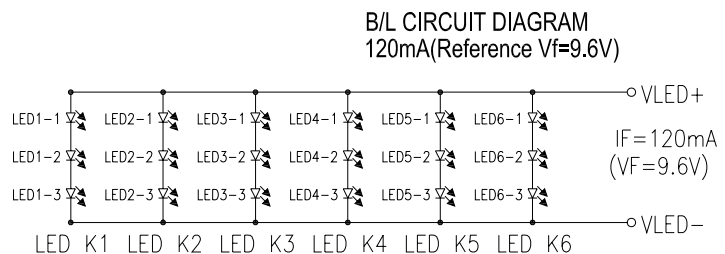
10. Standard Specification for Reliability:

10–1. Standard Specifications 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 ISTA 1A 2001.
09	Electrical Static Discharge	Air: ±6KV 150pF/330Ω 5 times
		Contact: ±4KV 150pF/330Ω 5 time

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10 - 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 10-1, 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.

10- 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.

11. Handling Precaution:

11-1 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.

11-2 Storage

- Store in an ambient temperature of $25\pm10℃$, and in a relative humidity of $50\pm10\%RH$. 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.

11-3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: No higher than $280\pm10℃$ and less than 3 sec during Hand soldering.
- Rewiring: no more than 2 times.

12. 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.

13. 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.

14. 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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