ILLUMINANT 北極光企業有限公司

PRODUCT SPECIFICATION FOR LCM

CUSTOMER:	
MODEL NO:	I3202-7HMT2432A
ACCEPTED BY:	

APPROVED BY:	CHECKED BY:	ORGANIZED BY:
LCM產品部 2011.01.26 贺秋芳	LCM產品部 2011.01.26 贺秋芳	LCM產品部 2011.01.26 隆茂生

□Approval for Specifications Only

■Approval for Specifications and Sample

Note: 1. Version of Specifications : 1.1

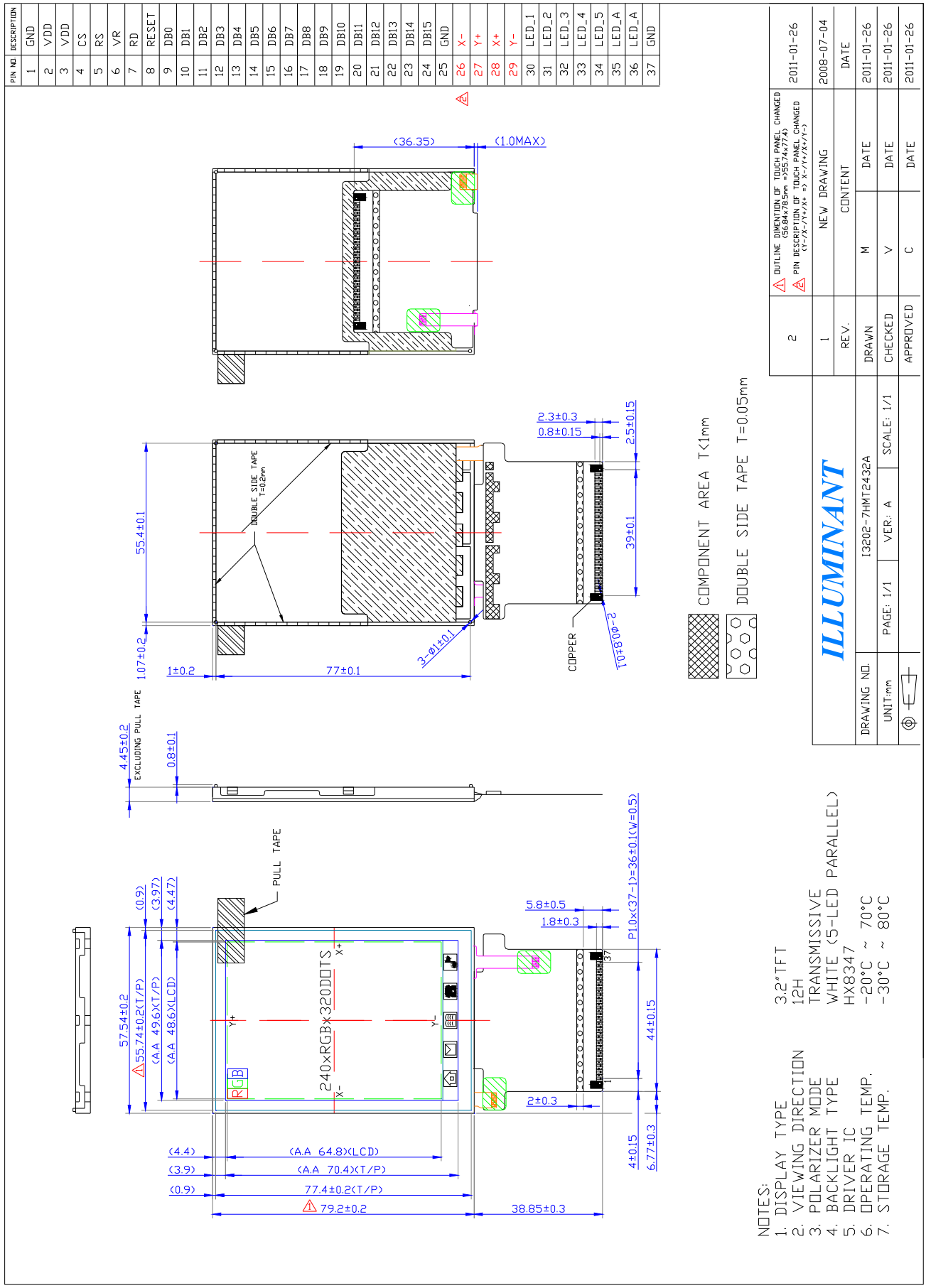
2. Others: Rohs Compliment

Version	Date	Contents
1.0	2008/07/04	Initial Release
1.1	2011/01/26	Outline Dimension of Touch Panel Changed Pin Description of Touch Panel Changed

CONTENTS

1. Mechanical Specification

Item	Standard Value	Unit
Display Size	3.2	inch
Module Dimension	79.2(W)*57.54(H)*4.45(D)	mm
Active Area	64.80(W)*48.60(H)	mm
Number of Dots	240RGB*320Dots	Dot
Pixel Pitch	0.2025(W)mm*0.2025(H)mm	mm
LCD Type	Normal White	-
Viewing Direction	12H	-
Driver	HX8347	-
Approx. Weight	32.2	g
Various Color Display	65	K
Brightness	160(Typ.)	cd/m^2
Backlight Type	5-LED pa rallel	
Backlight Color	White	
Touch Panel	4-Wire Analog Resistive	



2. Absolute Maximum Ratings

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage for Logic	V_{DD}	-0.3		+4.0	V	
Input Voltage	Vin	-0.5		V_{DD}+0.5	V	
Operating Temperature	T_{OP}	-20	-	+70	℃	-
Storage Temperature	T_{ST}	-30	-	+80	℃	-

*NOTE: Based on Vss=0V.

3. Electrical Characteristics

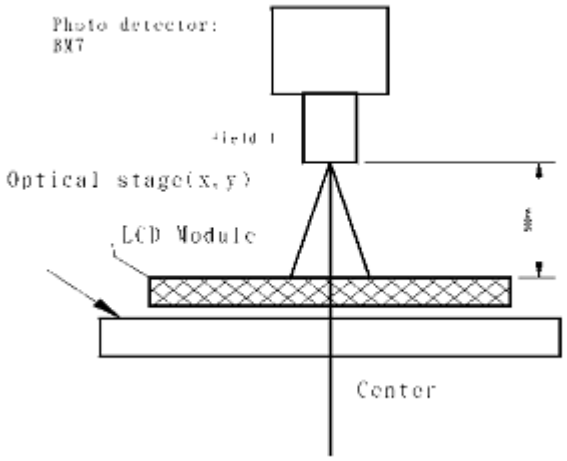
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage for Logic	V_{DD}	Ta=25℃	2.2	2.8	3.3	V
High-Level Input Voltage	VIHC	V_{DD}=3.0V	0.8V_{DD}		V_{DD}	
Low-Level Input Voltage	VILC	V_{DD}=3.0V	-0.3		0.2V_{DD}	
TFT Gate ON Voltage	VGH	V_{DD}=3.0V	--	15	--	-
TFT Gate OFF Voltage	VGL	V_{DD}=3.0V	--	-10	--	V
Power Supply Current for V_{DD}	I_{DD}	V_{DD}=3.0V	-	8.5		mA

4. Optical Characteristics

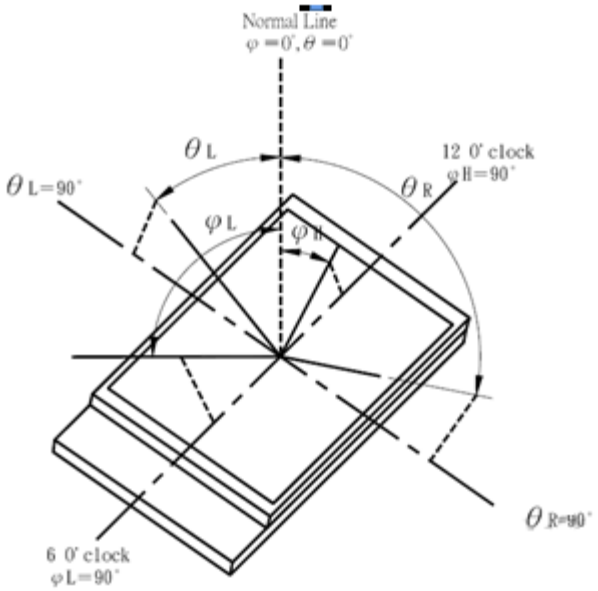
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle	Top	FH	CR≧10	-	(50)	-	degree	Note.2
	Bottom	FLL		-	(30)	-		
	Left	TL		-	(60)	-		
	Right	TR		-	(60)	-		
Response Time (Tr+Tf)			T=0	-	50	80	ms	Note.3
Uniformity		△B	IF=90mA	80	85		%	Note.0
Brightness			Center	150	160		Cd/m^2	
Contrast Ratio		CR	At optimized viewing angle	250	300		-	Note.4
Color Chromaticity	White	XW	Viewing Normal Angle F,T=0	0.243	0.293	0.343	-	Note.5
		YW		0.288	0.338	0.388		
	Red	XR		0.571	0.621	0.671	-	-
		YR		0.288	0.338	0.388		
	Green	XG		0.294	0.344	0.394	-	-
		YG		0.553	0.603	0.653		
	Blue	XB		0.070	0.120	0.170	-	-
		YB		0.044	0.094	0.144		

Note. 0 : △B=B(min)/B(max)

Note. 1 : After stabilizing and leaving the panel alone at a given temperature for 30 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7(fast) with a viewing angle of 1°at a distance of 50cm and normal direction.

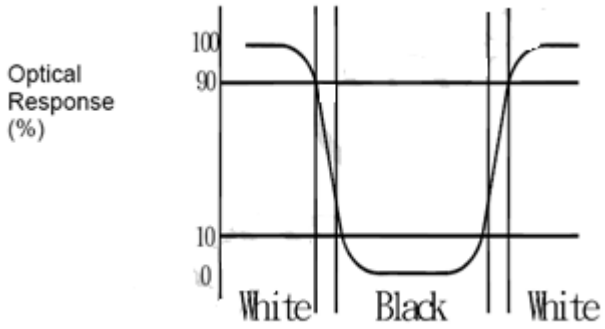


Note.2 : Definition of Viewing Angle : Refer to figure as below :



Note. 3 : Definition of Response Time : TR and TF

The figure below is the output signal of the photo detector.



Note.4 : Definition of Contrast Ratio (CR)

Ration of gray max (G max) & gray min (G min)

Contrast Ratio (CR) = (G max) / (G min)

(G max) = Luminance with all pixel white

(G min) = Luminance with all pixel black

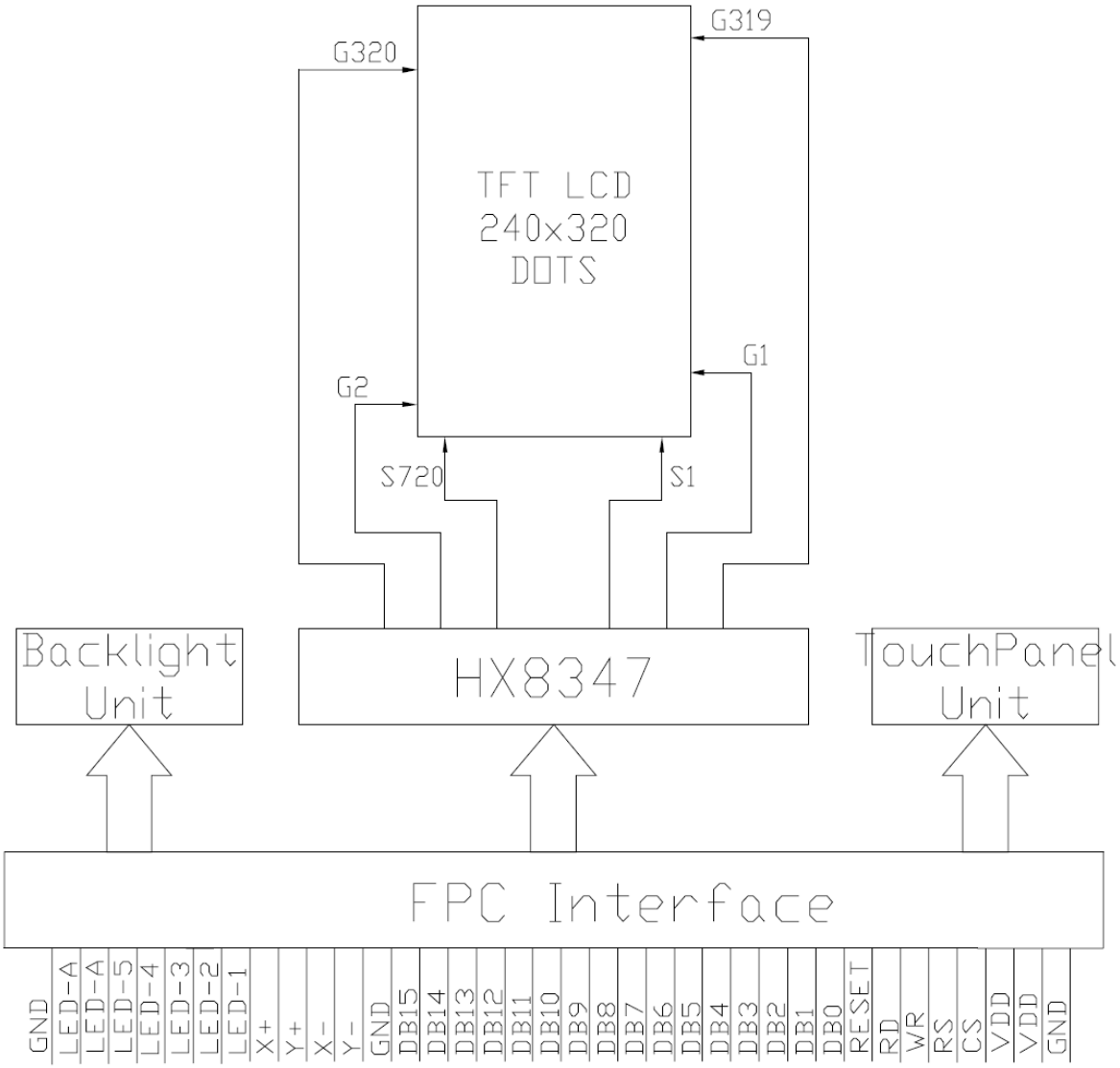
Note.5 : Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

5. Interface

No.	Symbol	I/O	Function	Remark
1	GND	I	Ground for logic circuit	
2	VDD	I	Power Supply	
3	VDD	I	Power Supply	
4	CS	I	Chip Select	
5	RS	I	Register Select	
6	WR	I	Write Signal	
7	RD	I	Read Signal	
8	RESET	I	Hardware Reset	
9	DB0	I/O	IC data Bit 0	
10	DB1	I/O	IC data Bit 1	
11	DB2	I/O	IC data Bit 2	
12	DB3	I/O	IC data Bit 3	
13	DB4	I/O	IC data Bit 4	
14	DB5	I/O	IC data Bit 5	
15	DB6	I/O	IC data Bit 6	
16	DB7	I/O	IC data Bit 7	
17	DB8	I/O	IC data Bit 8	
18	DB9	I/O	IC data Bit 9	
19	DB10	I/O	IC data Bit 10	
20	DB11	I/O	IC data Bit 11	
21	DB12	I	IC data Bit 12	
22	DB13	I/O	IC data Bit 13	
23	DB14	I/O	IC data Bit 14	
24	DB15	I/O	IC data Bit 15	
25	GND	I	Ground for logic circuit	
26	X-	I	Touch Panel Unit (X-)	
27	Y+	I	Touch Panel Unit (Y+)	
28	X+	I	Touch Panel Unit (X+)	
29	Y-	I	Touch Panel Unit (Y-)	
30	LED-1	I	Backlight Unit (-)	
31	LED-2	I	Backlight Unit (-)	

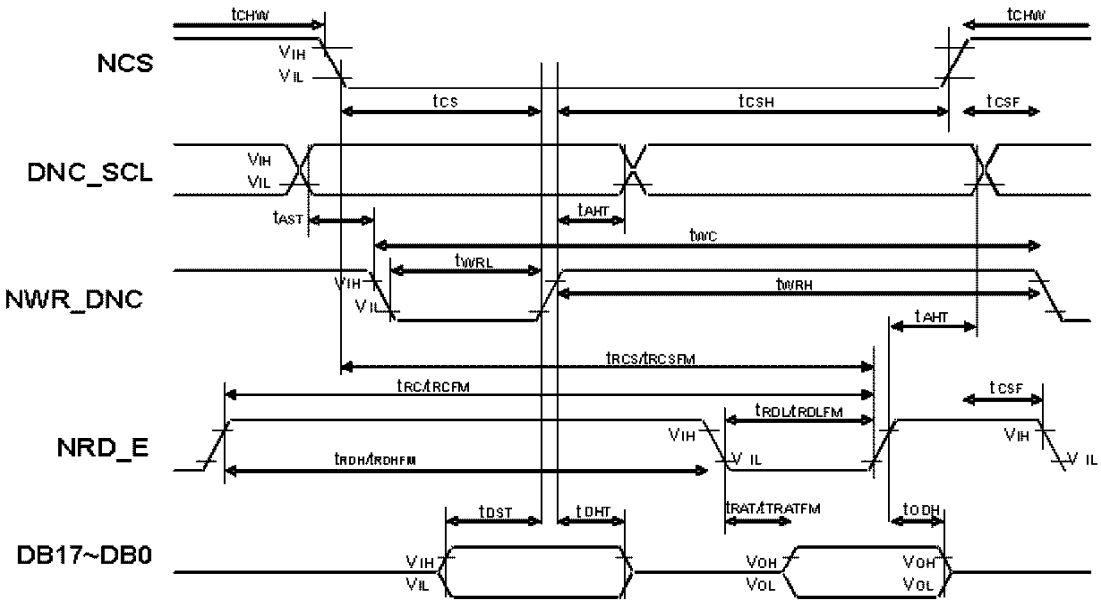
32	LED-3	I	Backlight Unit (-)	
33	LED-4	I	Backlight Unit (-)	
34	LED-5	I	Backlight Unit (-)	
35	LED-A	I	Backlight Unit (+)	
36	LED-A	I	Backlight Unit (+)	
37	GND	I	Ground for Logic Circuit	

6. Block Diagram



7. Timing Control

Parallel interface characteristics



(VSSA=0V. IOVCC=1.65V to 1.95V, VCI=2.3V to 3.3V, Ta=-30 to 70℃)

Signal	Symbol	Parameter	Min.	Max.	Unit	Description
DNC_SCL	t_{AST}	Address setup time	10	-	ns	-
	t_{AHT}	Address hold time (Write/Read)	10	-		
NCS	t_{CHW}	Chip select "H" pulse width	0	-	ns	-
	t_{CS}	Chip select setup time (Write)	35	-		
	t_{RCS}	Chip select setup time (Read ID)	45	-		
	t_{RCSFM}	Chip select setup time (Read FM)	355	-		
	t_{CSF}	Chip select wait time (Write/Read)	10	--		
	t_{CSH}	Chip select hold time	10	-		
NWR_RNW	t_{WC}	Write Cycle	10	-	ns	-
	t_{WRH}	Control pulse "H" duration	35	-		
	t_{WRL}	Control pulse "L" duration	35	-		
NRD_E (ID)	t_{RC}	Read Cycle (ID)	160	-	ns	When read ID data
	t_{RDH}	Control pulse "H" duration (ID)	90	-		
	t_{RDL}	Control pulse "L" duration (ID)	45	-		
NRD_E (FM)	t_{RCFM}	Read Cycle (FM)	450	-	ns	When read from frame memory
	t_{RCHFM}	Control pulse "H" duration (FM)	90	-		
	t_{RCLFM}	Control pulse "L" duration (FM)	355	-		
D15 to D0	t_{DST}	Data setup time	15	-	ns	For maximum C_L=30pF For maximum C_L=30pF
	t_{DHT}	Data hold time	10	-		
	t_{RAT}	Read access time (ID)	-	40		
	t_{RATFM}	Read access time (FM)	-	340		
	t_{OCH}	Output disable time	20	80		

Note :The input signal rise time and fall time (tr, tf) is specified at 15ns or less.
Logic high and low levels are specified as 30% and 70% of VDD for input signals.

8.Backlight

8.1 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:

8.2 The Main Advantages of the LED Backlight are as Following:

The brightness of the backlight can simply be adjusted. By a resistor or a potentiometer.

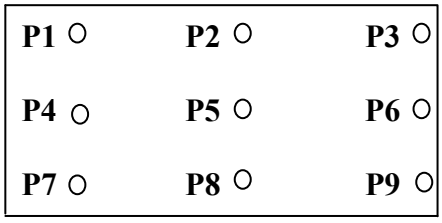
8.3 Data About LED Backlight:

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward voltage	Vf	If =75	-	3.3	3.5	V
Forward current	If		-	75		mA
Uniformity	-	If=75	80%	-	-	-
Luminous color	-	White				
Chip connection	-	5-LED parallel connection				

NOTE:

1.Backlight Only
2.Average Luminous Intensity of P1-P9
3.Uniformity = Min(P1~P9)/Max(P1~P9) * 100%>80%

8.4 Measured Method:



(Effective spatial Distribution)
Hole Diameter±1ø ; 1 to 9per Position Measured Luminous