



深圳市拓普微科技开发有限公司

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LMT080DIEFWU-AAN-2

LCD Module User Manual

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Rev.	Descriptions	Release Date
0.1	Preliminary release	2014-06-23
0.2	Update 6. AC Characteristics	2017-07-25

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1. General Specification

Signal Interface :	LVDS(VESA 24 bit)
Display Technology :	a-Si TFT active matrix
Display Mode :	Transmissive / Normal White
Screen Size(Diagonal) :	8.0"
Outline Dimension :	196.0 x 143.9 x12.2 (mm) (see attached drawing for details)
Active Area :	162.0 x 121.5 (mm)
Number of dots :	800 x 600
Pixel Pitch :	0.2025 x 0.2025 (mm)
Pixel Configuration :	RGB Stripe
Backlight :	LEDs
Surface Treatment :	Anti-Glare Surface
Viewing Direction :	6 o'clock(Gray scale Inversion) (*1) 12 o'clock (*2)
Operating Temperature :	-20 ~ +70°C
Storage Temperature :	-30 ~ +80°C

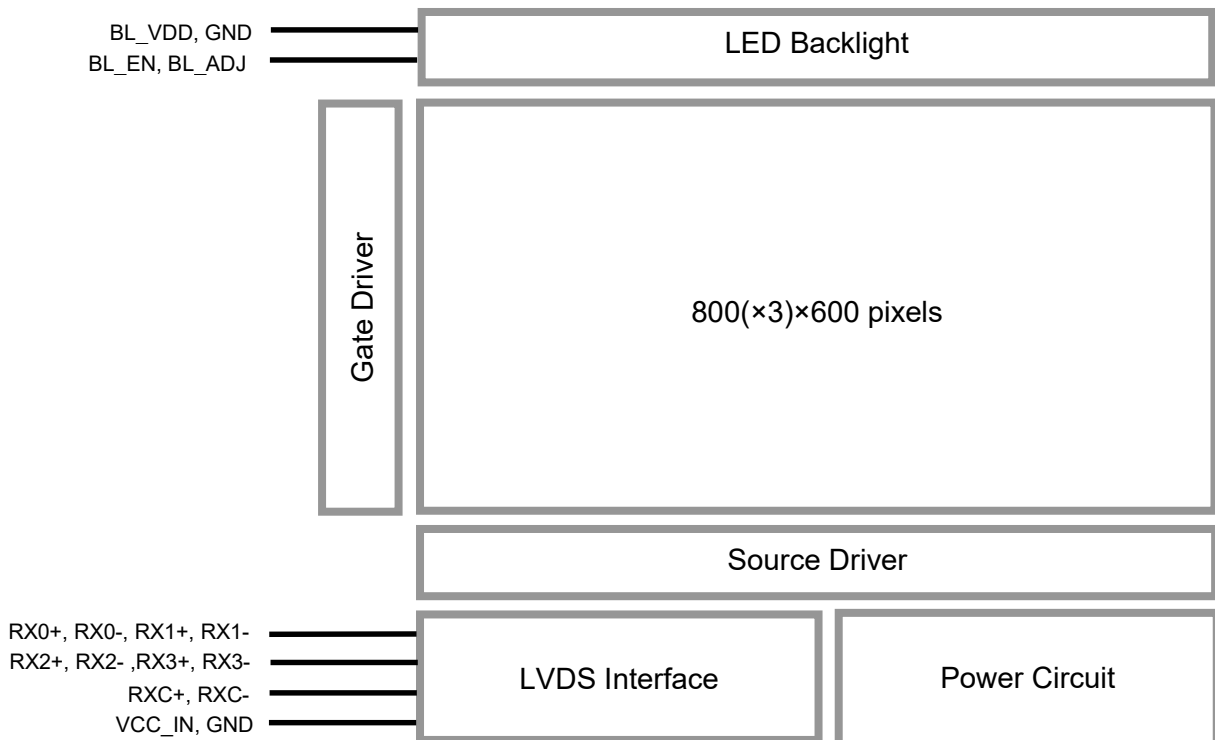
Note:

*1. For saturated color display content (eg. pure-red, pure-green, pure-blue or pure-colors-combinations).

*2. For “color scales” display content.

*3. Color tone may slightly change by temperature and driving condition.

2. Block Diagram



3. Terminal Function

3.1 LVDS Terminal (K2)

Pin No.	Pin Name	I/O	Descriptions
1	VCC_IN	Power	Positive Power Supply (3.3V)
2	VCC_IN	Power	Positive Power Supply (3.3V)
3	NC	-	NO connection
4	NC	-	NO connection
5	RX0-	Input	LVDS receiver negative signal channel 0
6	RX0+	Input	LVDS receiver positive signal channel 0
7	GND	Power	Power Supply GND (0V)
8	RX1-	Input	LVDS receiver negative signal channel 1
9	RX1+	Input	LVDS receiver positive signal channel 1
10	GND	Power	Power Supply GND (0V)
11	RX2-	Input	LVDS receiver negative signal channel 2
12	RX2+	Input	LVDS receiver positive signal channel 2
13	GND	Power	Power Supply GND (0V)
14	RXC-	Input	LVDS receiver negative signal clock
15	RXC+	Input	LVDS receiver positive signal clock
16	GND	Power	Power Supply GND (0V)
17	RX3-	Input	LVDS receiver negative signal channel 3
18	RX3+	Input	LVDS receiver positive signal channel 3
19	NC	-	NO connection
20	NC	-	NO connection

3.2 Backlight Input Terminal (K3)

Pin No.	Pin Name	I/O	Descriptions
1	GND	Power	Power Supply GND (0V)
2	GND		
3	BL_ADJ	Input	Backlight dimming control (*1, *2) PWM may be used to adjust the output brightness
4	BL_VDD	Power	Positive Power Supply(5V)
5	BL_VDD		
6	BL_EN	Input	Backlight driver enable (*1) BLON=Hi, Backlight Driving Booster enable BLON=Lo, Backlight Driving Booster disable

Note:

*1. With built in pull up resistor, it could leave open

*2. Recommended PWM Freq. = 3kHz (active high)

4. Absolute Maximum Ratings

Items	Symbol	Min.	TYP.	Max.	Unit	Condition
Power Supply Voltage	VCC_IN	-0.3	3.3	3.6	V	GND = 0V
Backlight Supply Voltage	BL_VDD	-0.3	5.0	6.0	V	GND = 0V
Operating Temperature	T _{OP}	-20	-	70	°C	No Condensation
Storage Temperature	T _{ST}	-30	-	80	°C	No Condensation

Cautions:

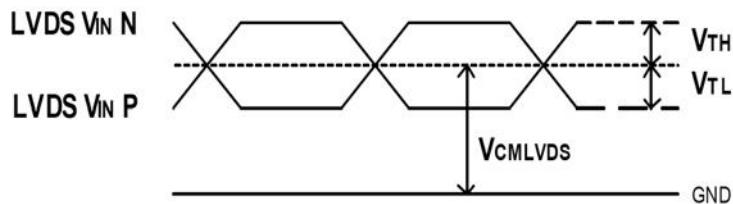
Any Stresses exceeding the Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

5. Electrical Characteristics

5.1 Driving TFT LCD Panel

GND=0V, VCC_IN=3.3V, T_{OP} =25°C

Items	Symbol	MIN.	TYP.	MAX.	Unit	Note
Supply Voltage	VCC_IN	3.0	3.3	3.5	V	
Common Electrode Driving Signal	V _{CMLVDS}	-	1.2	-	V	Note1
Differential Input High Threshold	V _{TH}	-	-	100	mV	
Differential Input Low Threshold	V _{TL}	-100	-	-	mV	
Sync Frequency	FVD	-	60	70	Hz	
VCC Power Consumption	I _{VCC_IN}	-	150	-	mA	



LVDS DC timing diagram

Note1: The value may be different for different LCM.

5.2 LED Backlight Circuit Characteristics

GND=0V, T_{OP}=25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Note
Operating Voltage	BL_VDD	4.5	5.0	5.5	V	
Input High Voltage	V _{IH}	3.0	-	BL_VDD	V	BL_ADJ,BL_EN
Input Low Voltage	V _{IL}	GND	-	0.3	V	BL_ADJ,BL_EN
Operating Current(*1)	I _{BL_VDD}	-	412	-	mA	BL_VDD

Cautions:

Exceeding the recommended driving current could cause substantial damage to the backlight and shorten its lifetime.

Note:

*1: BL_ADJ=Hi, BL_EN =Hi.

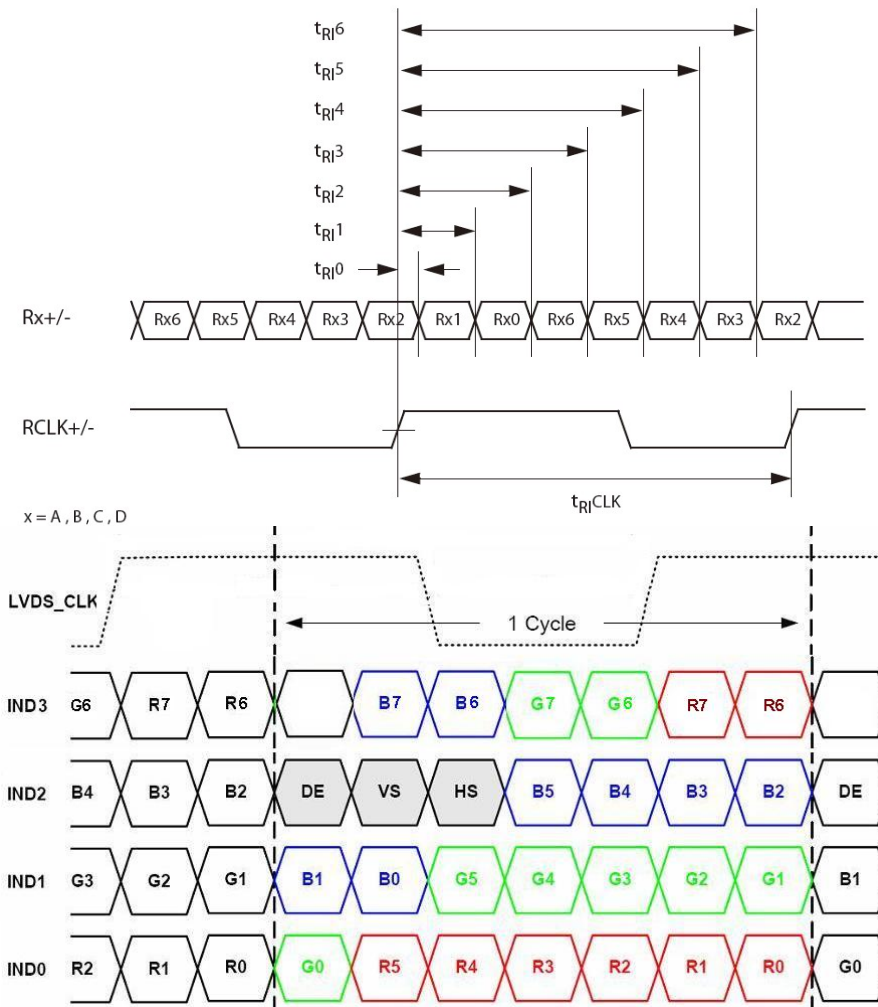
*2. Recommended BL_ADJ PWM Freq. is 3kHz (active high).

6. AC Characteristics

6.1 AC Characteristics (LVDS)

VCC_IN = 3.3V, GND = 0V, Ta = 25°C

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Input CLK period	t _{RI} CLK	8.9	-	50	ns	
Input Data Position 0 (t _{RI} CLK = 8.9ns)	t _{RI} 0	-0.3	-	+0.3	ns	
Input Data Position 1 (t _{RI} CLK = 8.9ns)	t _{RI} 1	t _{RI} CLK/7-0.3	t _{RI} CLK/7	t _{RI} CLK/7+0.3	ns	
Input Data Position 2 (t _{RI} CLK = 8.9ns)	t _{RI} 2	2t _{RI} CLK/7-0.3	2t _{RI} CLK/7	2t _{RI} CLK/7+0.3	ns	
Input Data Position 3 (t _{RI} CLK = 8.9ns)	t _{RI} 3	3t _{RI} CLK/7-0.3	3t _{RI} CLK/7	3t _{RI} CLK/7+0.3	ns	
Input Data Position 4 (t _{RI} CLK = 8.9ns)	t _{RI} 4	4t _{RI} CLK/7-0.3	4t _{RI} CLK/7	4t _{RI} CLK/7+0.3	ns	
Input Data Position 5 (t _{RI} CLK = 8.9ns)	t _{RI} 5	5t _{RI} CLK/7-0.3	5t _{RI} CLK/7	5t _{RI} CLK/7+0.3	ns	
Input Data Position 6 (t _{RI} CLK = 8.9ns)	t _{RI} 6	6t _{RI} CLK/7-0.3	6t _{RI} CLK/7	6t _{RI} CLK/7+0.3	ns	

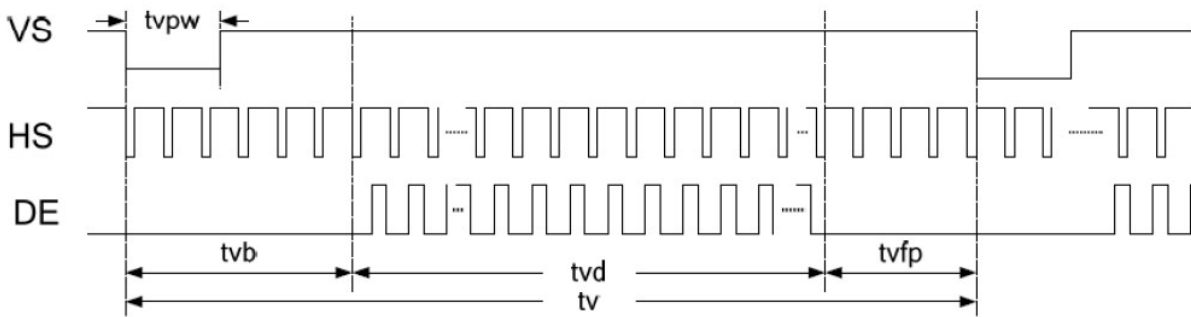


6.2 AC Characteristics (TFT)

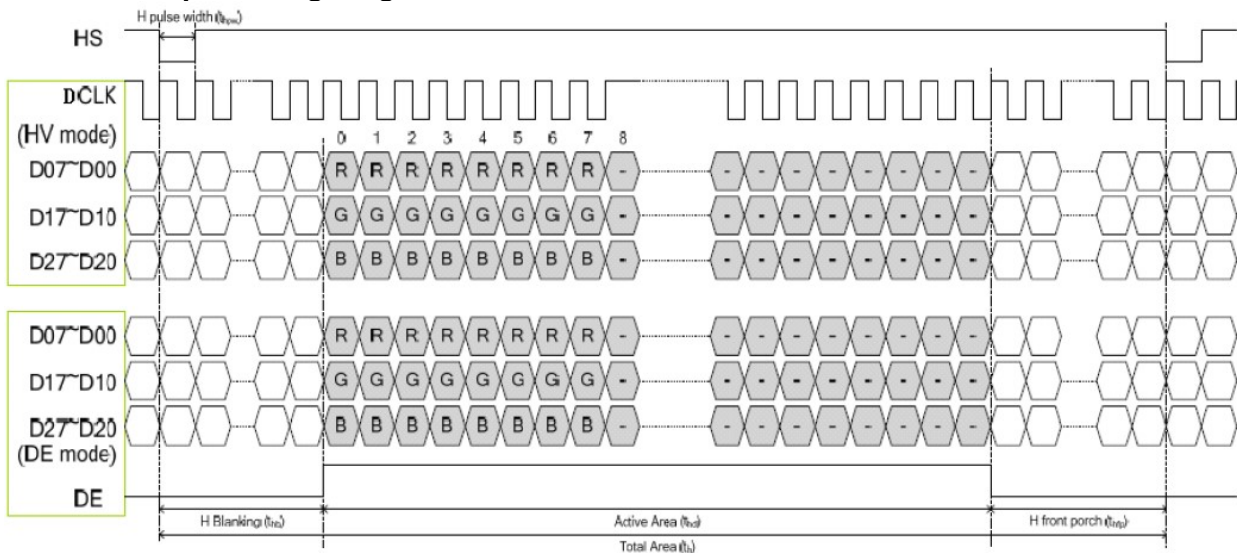
Parameter	Symbol	Min	Typ	Max	Unit	Remark
DCLK	F _{clk}	34.5	39.6	50.4	MHz	
	t _{clk}	-	25.3	-	ns	
HSD	t _h	900	1000	1200	DCLK	
	t _{hd}	-	800	-	DCLK	
	t _{hpw}	1	-	40	DCLK	
	t _{hb}	-	88	-	DCLK	
	t _{hfp}	12	112	312	DCLK	
VSD	t _v	640	660	700	th	
	t _{vd}	-	600	-	th	
	t _{vpw}	1	-	20	th	
	t _{vb}	-	39	-	th	
	t _{vfp}	1	21	61	th	

Note: DE timing refer to HSD, VSD input timing.

Vertical input timing Diagram



Horizontal input timing Diagram



7. Optical Characteristics

Test Conditions:

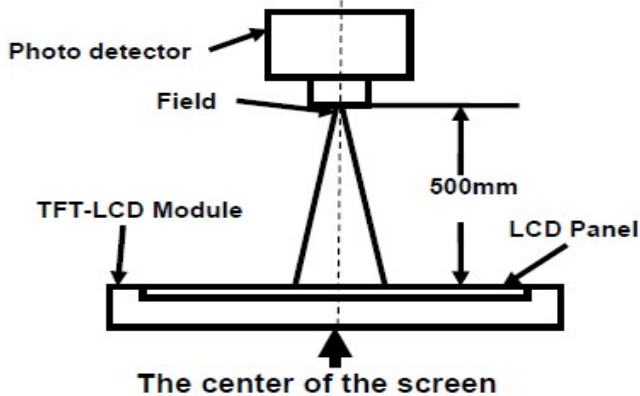
1. $I_F= 180mA$, $V_F=9.6V$, and the ambient temperature is $25^{\circ}C$.
2. The test systems refer to Note 1 and Note 2.

$VCC_IN = 3.3V, GND=0V, T_a=25^{\circ}C$

Item	Symbol	Condition	MIN.	TYP.	MAX.	UNIT	Note.
Viewing angle ($CR \geq 10$)	θ_L	9 o'clock	60	70	-	degree	Note 2
	θ_R	3 o'clock	60	70	-		
	θ_T	12 o'clock	50	60	-		
	θ_B	6 o'clock	60	70	-		
Response Time	T_f	$25^{\circ}C$	-	25	30	ms	Note 1 Note 4
	T_r					ms	
Contrast ratio	CR	$\theta=0^{\circ}$	600	800	-	-	Note 1,3
Color chromaticlty	White	X	Backlight is on	0.253	0.303	0.353	Note 1 Note 5
		Y		0.257	0.307	0.357	
	Red	X		0.525	0.575	0.625	
		Y		0.296	0.346	0.396	
	Green	X		0.298	0.348	0.398	
		Y		0.527	0.577	0.627	
	Blue	X		0.101	0.151	0.201	
		Y		0.031	0.081	0.131	
Luminance	L		-	250	-	cd/m ²	Note 1,6
Luminance uniformity	Y _U		70	75	-	%	Note 1,7

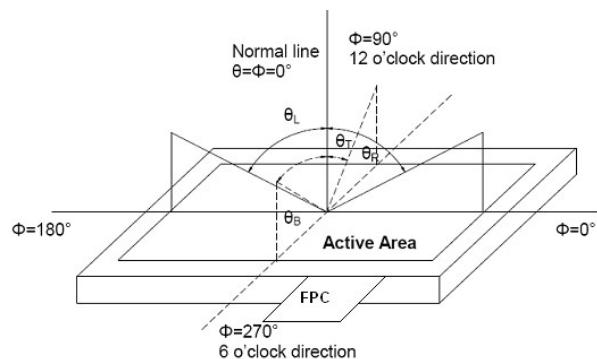
Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	BM-5A	1°
Luminance		
Lum Uniformity		
Chromaticity	SR-3A	
Response Time	TRD100	-

Note 2: Definition of viewing angle range



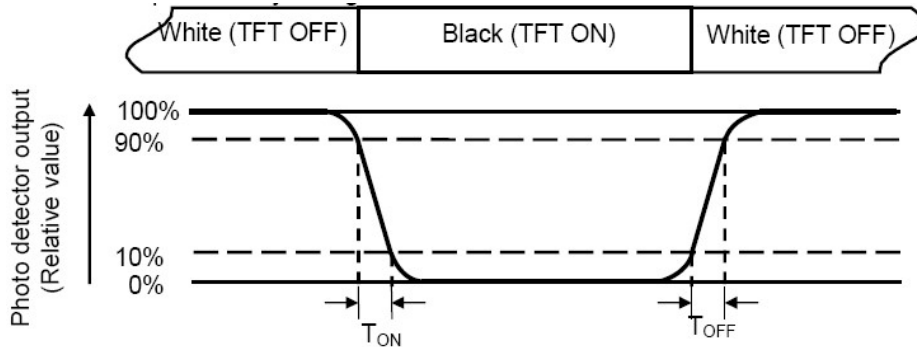
Note 3: Definition of contrast ratio

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

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and

“Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



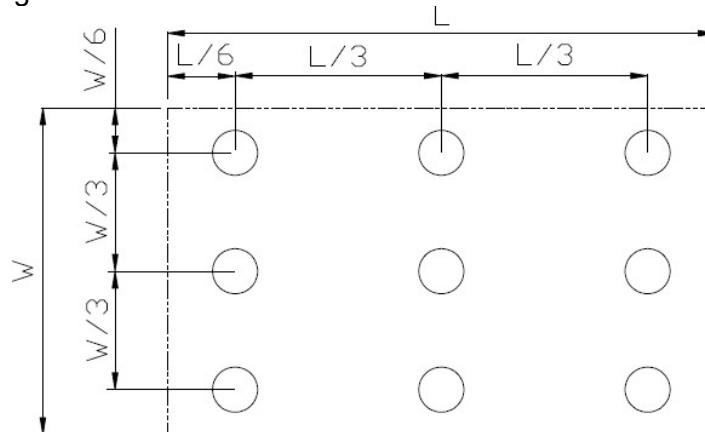
Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = L_{\min} / L_{\max}$$

L-----Active area length W----- Active area width



L_{\max} : The measured Maximum luminance of all measurement position.

L_{\min} : The measured Minimum luminance of all measurement position.

Note 7: Definition of Luminance:

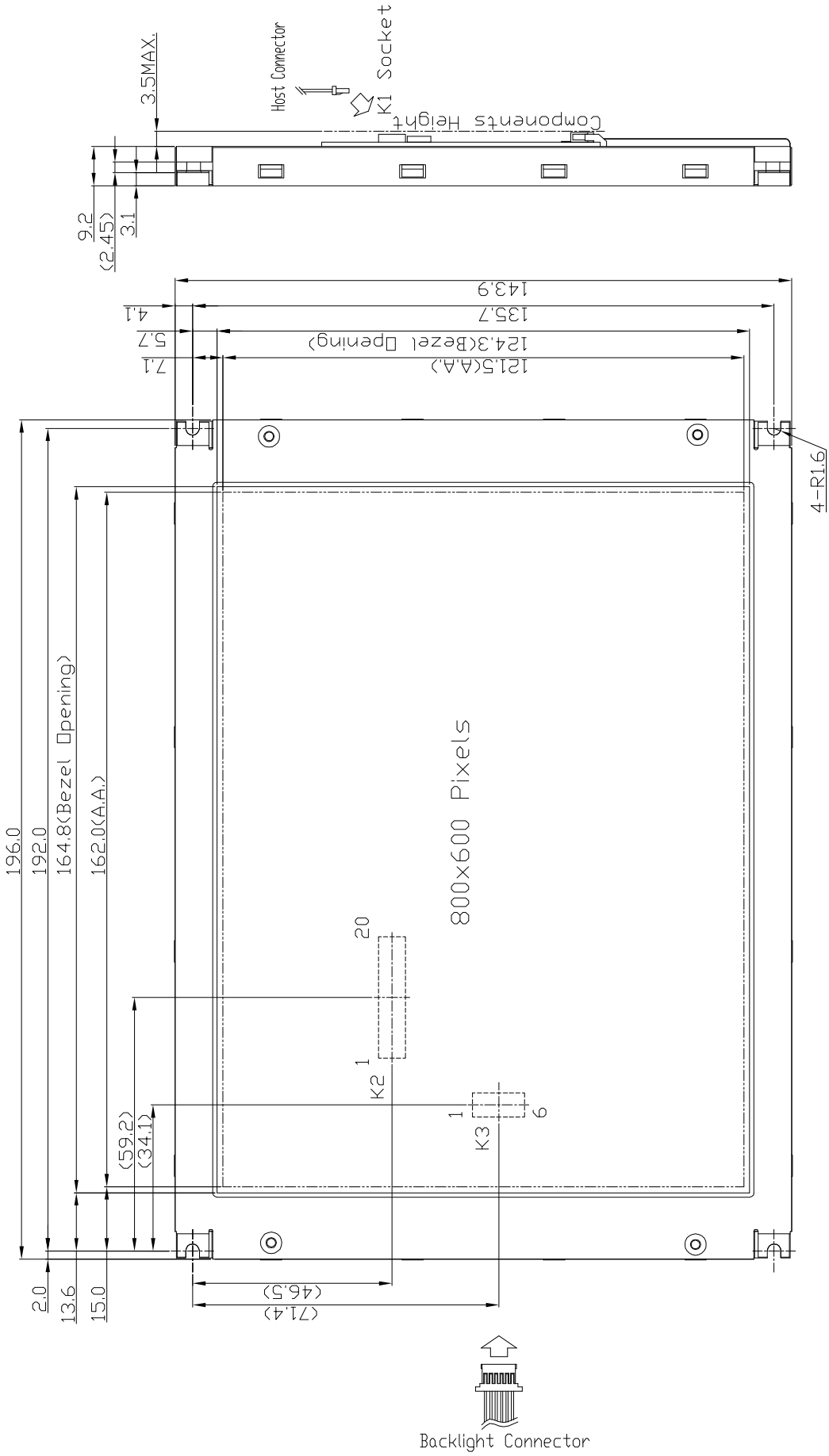
Measure the luminance of white state at center point.

8. Precautions of using LCD Modules

Please refer to "LCD-Module-Design-Handling-Precaution.pdf".

K2 Terminal No	Pin Name
1	VCC_IN
2	VCC_IN
3	NC
4	NC
5	RX0-
6	RX0+
7	GND
8	RX1-
9	RX1+
10	GND
11	RX2-
12	RX2+
13	GND
14	RXC-
15	RXC+
16	GND
17	RX3-
18	RX3+
19	NC
20	NC

K3 Terminal No.	Pin Name
1	GND
2	GND
3	BL_ADJ
4	BL_VDD
5	BL_VDD
6	BL_EN



- Note:
- *1. LCD Display Type: TFT, Transmissive
 - *2. Pixel Arrangement: RGB-STRIPE
 - *3. Operating Voltage : 3.3V
 - *4. Backlight Supply : 5.0V
 - *5. Backlight : LEDs
 - *6. Color Depth : 16M colors
 - *7. K2: Connector Type : JAE FI-SEB20P-HFE or equivalent
K3: Molex 53261-0619 or equivalent
 - *8. Operating Temperature : -20°C~70°C
 - *9. Storage Temperature : -30°C~80°C

C	
B	
A	
Rev/Note	Date
Dwg Title	LMT080DIEFWU-AAN-2 Outline Dwg
Dwg No.	MK-004805-1-1
Scale	1/1
Tol.	±0.5
Unit	mm
Paper Size	A3
Approved	Checked
Drawn	Deng Junjie

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