



Product Specification

AU OPTRONICS CORPORATION

() Preliminary Specifications

(V) Final Specifications

Module	10.1" SD+ 16:9 Color TFT-LCD
Model Name	B101EW01 V2
Note ()	LED Backlight with driving circuit design

Customer

Date

All

7/23/2009

Checked &
Approved by

Date

Note: This Specification is subject to change without notice.

Approved by

Date

Howard Lee

7/23/2009

Prepared by

Carol Tang

7/23/2009

**NBBU Marketing Division /
AU Optronics corporation**



Contents

1. Handling Precautions.....	4
2. General Description	5
2.1 General Specification.....	5
2.2 Optical Characteristics	6
3. Functional Block Diagram	11
The following diagram shows the functional block of the 10.1 inches wide Color TFT/LCD	
40 Pin (One ch/connector Module).4. Absolute Maximum Ratings.....	11
4. Absolute Maximum Ratings.....	12
4.1 Absolute Ratings of TFT LCD Module.....	12
4.2 Absolute Ratings of Environment.....	12
5. Electrical characteristics	13
5.1 TFT LCD Module.....	13
5.2 Backlight Unit	15
6. Signal Characteristic.....	16
6.1 Pixel Format Image.....	16
6.2 The input data format.....	17
6.3 Integration Interface Requirement.....	18
6.4 Interface Timing.....	20
6.5 Power Sequence.....	21
6.5.1 Panel Power Sequence	21
7. Panel Reliability Test	23
7.1 Vibration Test.....	23
7.2 Shock Test.....	23
7.3 Reliability Test	23
8. Mechanical Characteristics.....	24
8.1 LCM Outline Dimension	24
9. Shipping and Package.....	26
9.1 Shipping Label Format.....	26
9.2 Carton Package	27
9.3 Shipping package of palletizing sequence	27
10. Appendix	28
10.1 EDID description.....	28
10.1 IIS description.....	31



Product Specification

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Record of Revision

Version and Date	Page	Old description	New Description	Remark
0.1 2009/04/15	All	First Edition for Customer		
0.2 2009/04/27	22		Update timing drawing	
0.3 2009/05/07	21	Clock frequency max 90MHz	Clock frequency max 80MHz	
	26	HW control table [Radium IC]	HW control table [Novatek IC]	
	27	Carton Package (1 layer)	Carton Package (2 layer)	
	28~31		Update EDID	
0.4 2009/05/18	21	Clock Frequency 62.18 MHz	Clock Frequency 61.5 MHz	
	26	Shipping Label Format	Add Lenovo barcode information	
	32~39		Add Appendix IIS description	
1.0 2009/06/04	23~24		2D drawing update	
	27~29		EDID update	
1.1 2009/07/20	15	PWM duty ratio min 5%	PWM duty ratio min 1% (remark frequency <5KHz)	
	21~22	Panel power sequency	Update timing drawing and setting	
2.0 2009/07/23	5~6	Response time 16ms typ	Response time 16ms typ / 32ms max	

1. Handling Precautions

- 1) Since front polarizer is easily damaged, pay attention not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
- 6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 7) Do not open nor modify the Module Assembly.
- 8) Do not press the reflector sheet at the back of the module to any directions.
- 9) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) After installation of the TFT Module into an enclosure (Notebook PC Bezel, for example), do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
- 12) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
- 13) Disconnecting power supply before handling LCD modules, it can prevent electric shock, DO NOT TOUCH the electrode parts, cables, connectors and LED circuit part of TFT module that a LED light bar build in as a light source of back light unit. It can prevent electrostatic breakdown.



2. General Description

B101EW01 V2 is a Color Active Matrix Liquid Crystal Display composed of a TFT LCD panel, a driver circuit, and LED backlight system. The screen format is intended to support 1280(H) x 720(V) screen and 262k colors (RGB 6-bits data driver) with LED backlight driving circuit. All input signals are LVDS interface compatible.

B101EW01 V2 is designed for a display unit of notebook style personal computer and industrial machine.

2.1 General Specification

The following items are characteristics summary on the table at 25 °C condition:

Items	Unit	Specifications			
Screen Diagonal	[mm]	255.54(10.1W")			
Active Area	[mm]	222.72(H) X 125.28(V)			
Pixels H x V		1280x3(RGB) x 720			
Pixel Pitch	[mm]	0.1740 (H) x 0.1740 (V)			
Pixel Arrangement		R.G.B. Vertical Stripe			
Display Mode		Normally White			
White Luminance Note: I _{LED} is LED current	[cd/m ²]	180 typ (Note1)			
Luminance Uniformity (5P)		1.25 max			
Contrast Ratio		500 typ			
Response Time	[ms]	16 typ, 32ms max			
Nominal Input Voltage VDD	[Volt]	+3.3 typ.			
Power Consumption	[Watt]	Typ	Max	Note	
		2.7W	2.9W	Type I , V _{in} =12V	
		3.1W	3.3W	Type I , V _{in} =5V	
		@ Black pattern			
Weight	[Grams]	175 max.			
Physical Size (w/ bracket & PCBA)	[mm]		L	W	T
		Max	233.5	147	3.6
		Typical	233.0	146.5	
		Min	232.5	146.0	-
Electrical Interface		1 channel LVDS			



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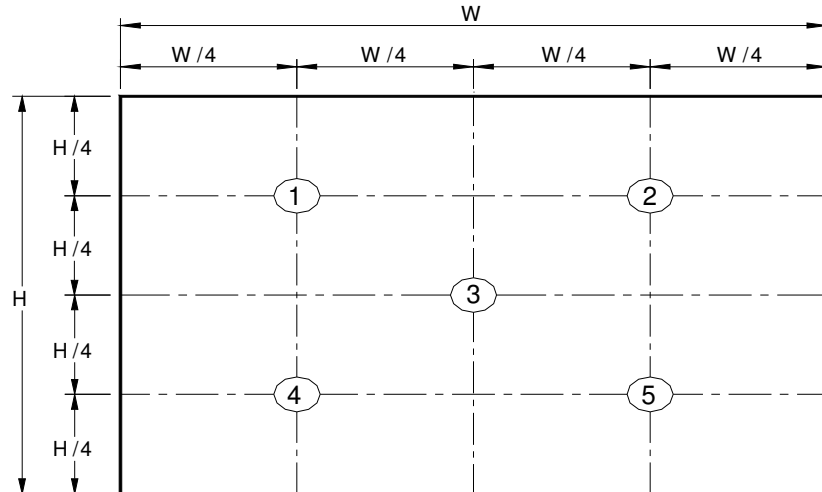
Glass Thickness	[mm]	0.5
Surface Treatment		Anti-Glare
Support Color		262K colors (RGB 6-bit)
Temperature Range Operating Storage (Non-Operating)	[°C] [°C]	0 to +50 -20 to +60
RoHS Compliance		RoHS Compliance

2.2 Optical Characteristics

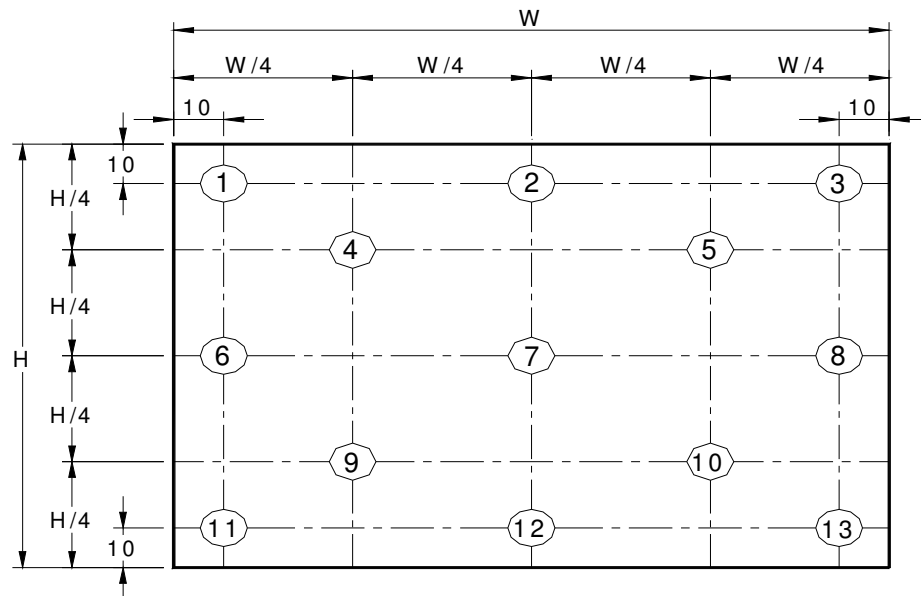
The optical characteristics are measured under stable conditions at 25°C (Room Temperature) :

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
White Luminance ILED=20mA		5 points average	153	180	-	cd/m ²	1, 4, 5
Viewing Angle	θ_R	Horizontal (Right)	40	45	-	degree	4, 9
	θ_L	CR = 10 (Left)	40	45	-		
	ϕ_H	Vertical (Upper)	10	15	-		
	ϕ_L	CR = 10 (Lower)	30	35	-		
Luminance Uniformity	δ_{5P}	5 Points	-	-	1.25		1, 3, 4
Luminance Uniformity	δ_{13P}	13 Points	-	-	1.60		2, 3, 4
Contrast Ratio	CR		400	500	-		4, 6
Cross talk	%				4		4, 7
Response Time	T_r	Rising	-	-	-	msec	4, 8
	T_f	Falling	-	-	-		
	T_{RT}	Rising + Falling	-	16	32		
Color / Chromaticity Coodinates	Red	R_x	0.551	0.581	0.611		4
		R_y	0.307	0.337	0.367		
	Green	G_x	0.302	0.332	0.362		
		G_y	0.545	0.575	0.605		
	Blue	B_x	0.130	0.160	0.190		
		B_y	0.108	0.138	0.168		
	White	W_x	0.283	0.313	0.343		
		W_y	0.299	0.329	0.359		
NTSC	%		-	45	-		

Note 1: 5 points position (Ref: Active area)



Note 2: 13 points position (Ref: Active area)



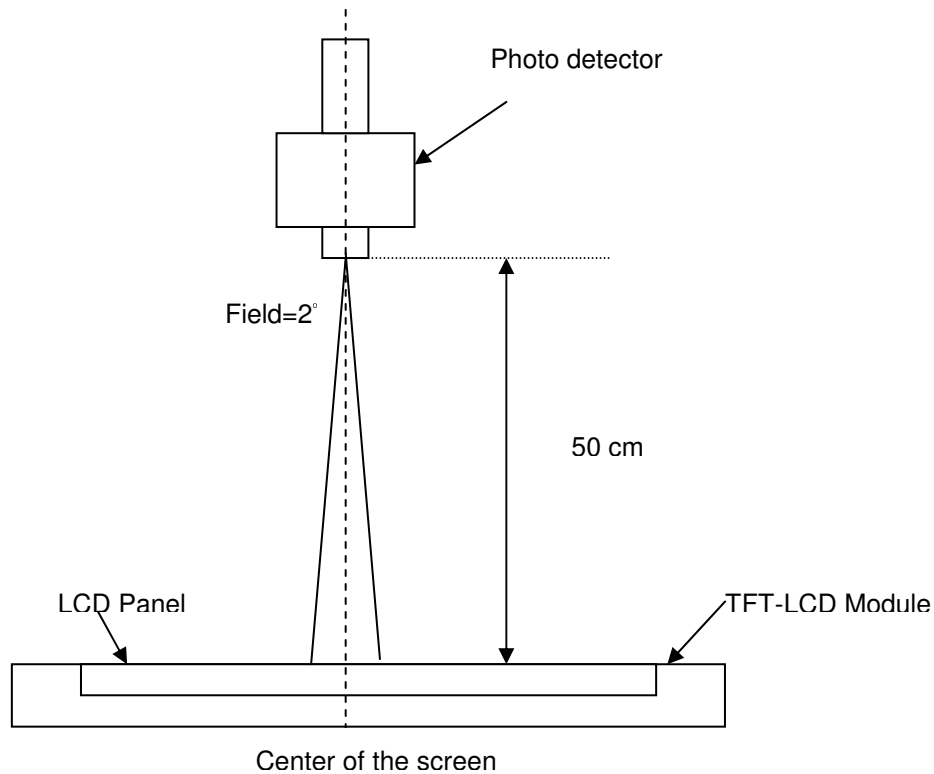
Note 3: The luminance uniformity of 5 or 13 points is defined by dividing the maximum luminance values by the minimum test point luminance

$$\delta_{W5} = \frac{\text{Maximum Brightness of five points}}{\text{Minimum Brightness of five points}}$$

$$\delta_{W13} = \frac{\text{Maximum Brightness of thirteen points}}{\text{Minimum Brightness of thirteen points}}$$

Note 4: Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room, and it should be measured in the center of screen.



Note 5 : Definition of Average Luminance of White (Y_L):

Measure the luminance of gray level 63 at 5 points , $Y_L = [L(1) + L(2) + L(3) + L(4) + L(5)] / 5$

$L(x)$ is corresponding to the luminance of the point X at Figure in Note (1).

Note 6 : Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

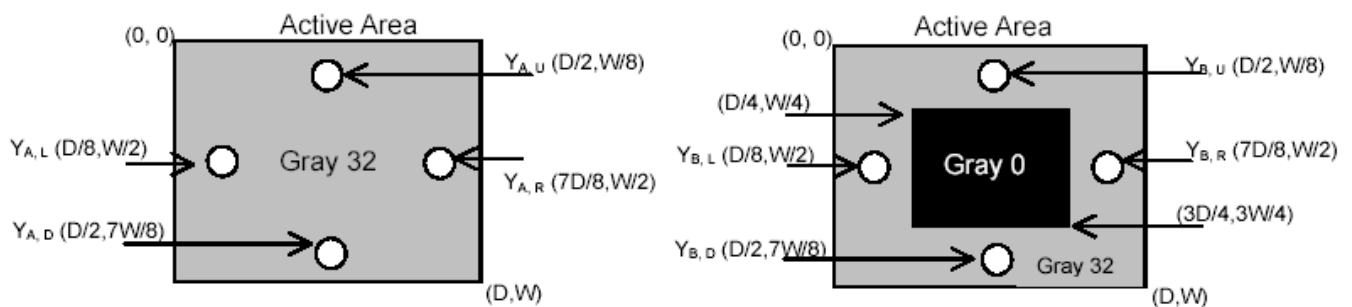
Note 7 : Definition of Cross Talk (CT)

$$CT = |Y_B - Y_A| / Y_A \times 100 (\%)$$

Where

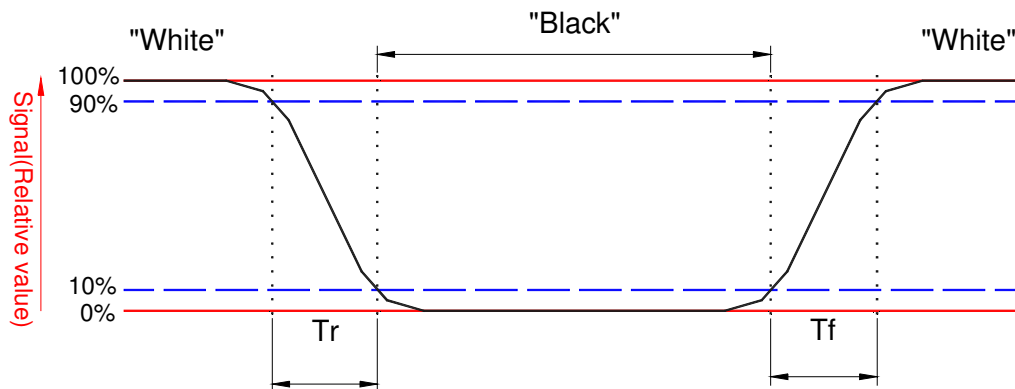
Y_A = Luminance of measured location without gray level 0 pattern (cd/m²)

Y_B = Luminance of measured location with gray level 0 pattern (cd/m²)



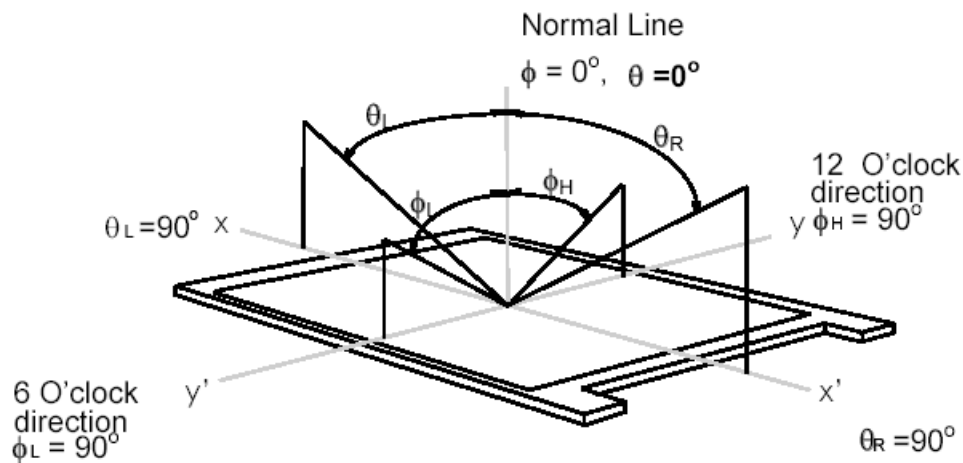
Note 8: Definition of response time:

The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (falling time) and from "White" to "Black" (rising time), respectively. The response time interval between the 10% and 90% of amplitudes. Refer to figure as below.



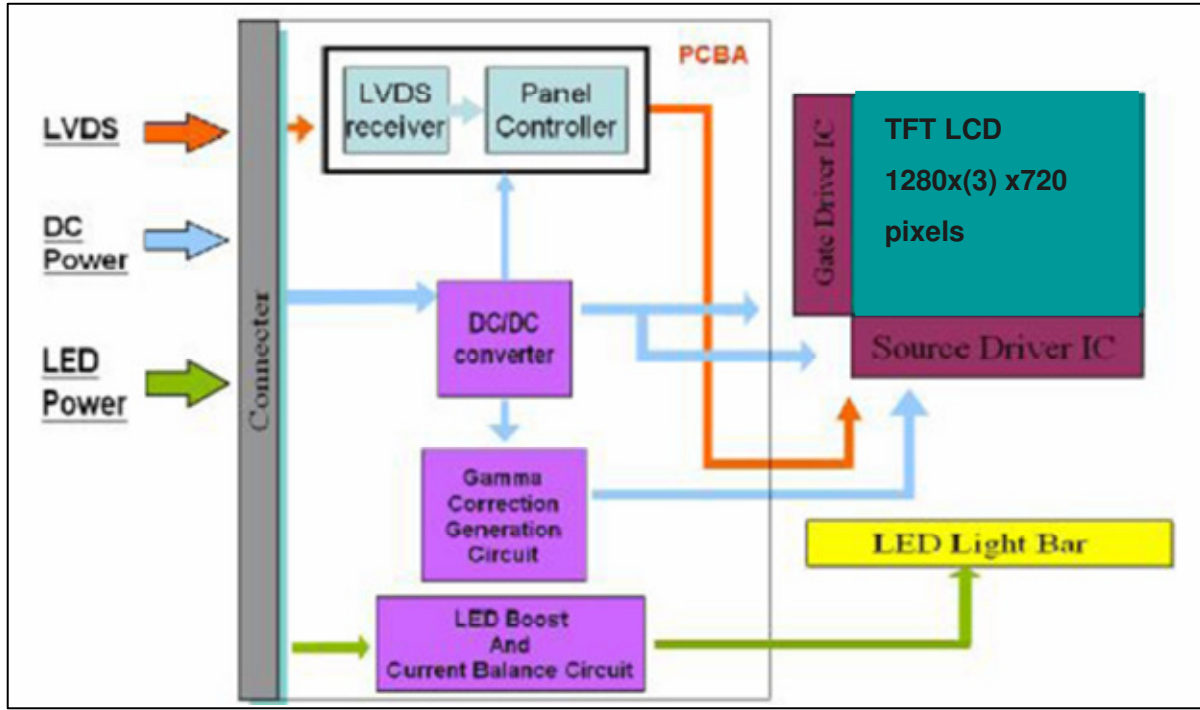
Note 9. Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (ϕ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



3. Functional Block Diagram

The following diagram shows the functional block of the 10.1 inches wide Color TFT/LCD 40 Pin (One ch/connector Module).



4. Absolute Maximum Ratings

An absolute maximum rating of the module is as following:

4.1 Absolute Ratings of TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	V _{in}	-0.3	+4.0	[Volt]	Note 1,2

4.2 Absolute Ratings of Environment

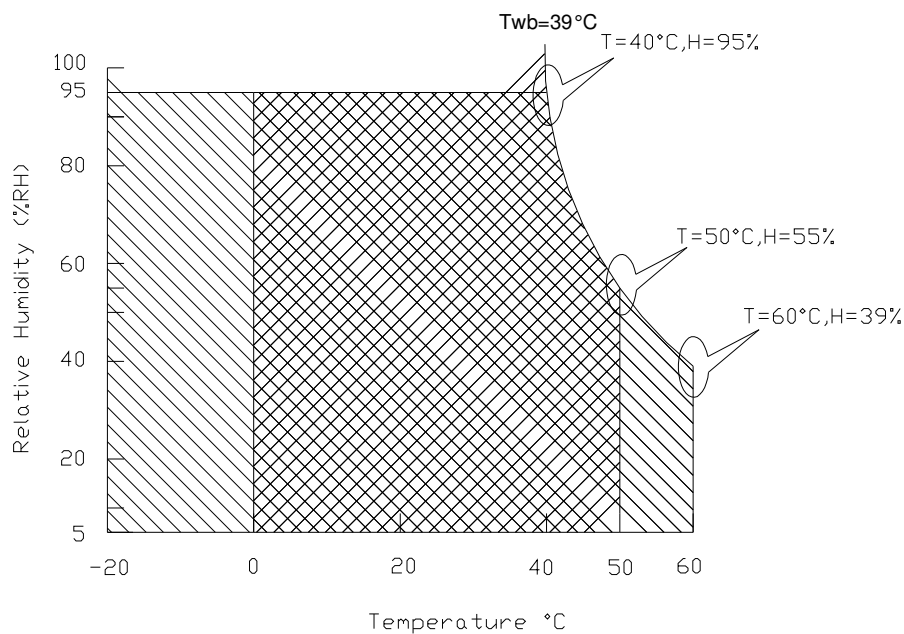
Item	Symbol	Min	Max	Unit	Conditions
Operating Temperature	TOP	0	+50	[°C]	Note 4
Operation Humidity	HOP	5	95	[%RH]	Note 4
Storage Temperature	TST	-20	+60	[°C]	Note 4
Storage Humidity	HST	5	95	[%RH]	Note 4

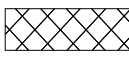
Note 1: At T_a (25°C)

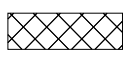
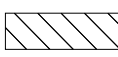
Note 2: Permanent damage to the device may occur if exceed maximum values

Note 3: LED specification refer to section 5.2

Note 4: For quality performance, please refer to AUO IIS (Incoming Inspection Standard).



Operating Range 

Storage Range  + 

5. Electrical characteristics

5.1 TFT LCD Module

5.1.1 Power Specification

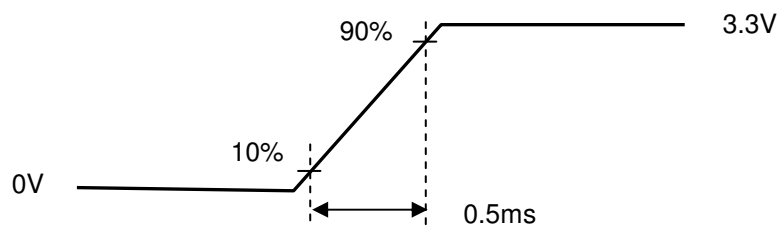
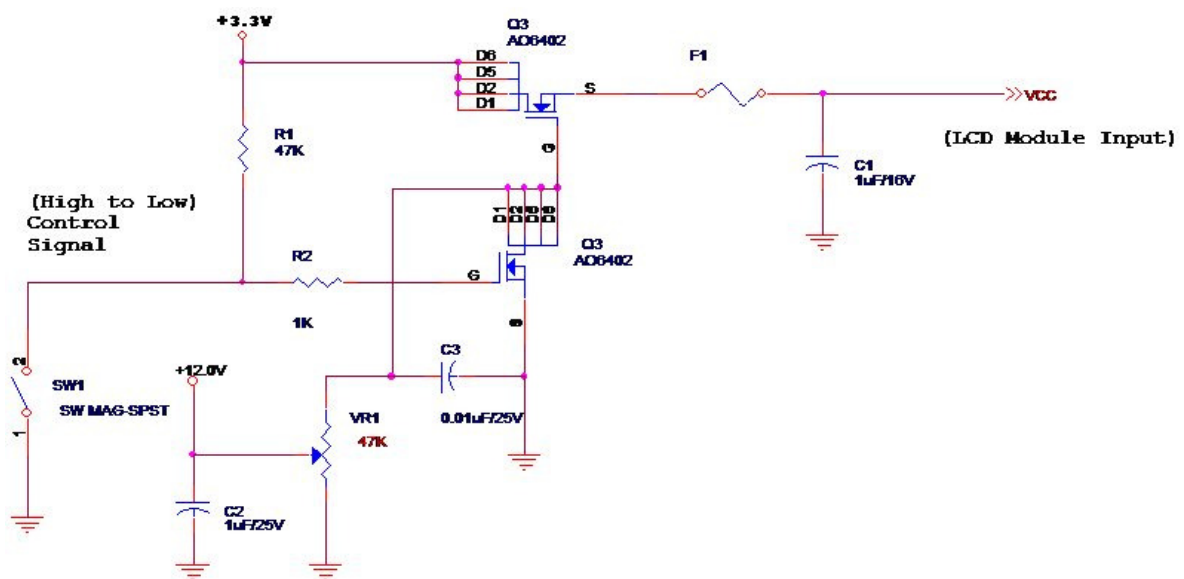
Input power specifications are as follows;

Symble	Parameter	Min	Typ	Max	Unit	Note
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	
PDD	VDD Power	-	0.7	0.8	[Watt]	Note 1/2
IDD	IDD Current	-	-	250	[mA]	Note 1/2
IRush	Inrush Current	-	-	1500	[mA]	Note 3
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	[mV] p-p	

Note 1 : Maximum Measurement Condition : Black Pattern

Note 2 : Typical Measurement Condition: Mosaic Pattern

Note 3 : Measure Condition



5.1.2 Signal Electrical Characteristics

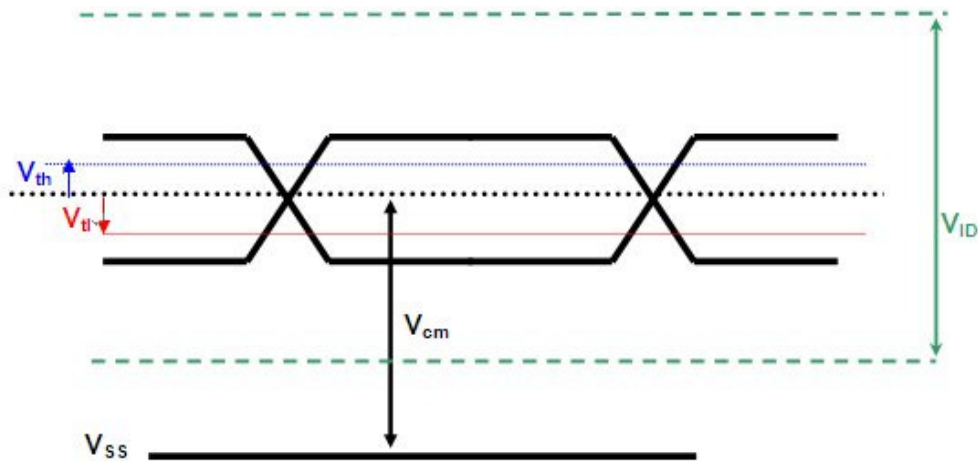
Input signals shall be low or High-impedance state when VDD is off.

It is recommended to refer the specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Signal electrical characteristics are as follows;

Parameter	Condition	Min	Max	Unit
V_{th}	Differential Input High Threshold ($V_{cm}=+1.2V$)		100	[mV]
V_{tl}	Differential Input Low Threshold ($V_{cm}=+1.2V$)	-100	-	[mV]
V_{ID}	Differential Input Voltage	100	600	[mV]
V_{cm}	Differential Input Common Mode Voltage	1.125	1.375	[V]

Note: LVDS Signal Waveform



5.2 Backlight Unit

5.2.1 LED characteristics

Parameter	Symbol	Min	Typ	Max	Units	Condition
Backlight Power Consumption	PLED	-	2.0	2.1	[Watt]	(Ta=25°C), Note 1 Type I, V_{in} =12V
		-	2.4	2.5	[Watt]	(Ta=25°C), Note 1 Type II, V_{in}=5V
LED Life-Time	N/A	12,000	-	-	Hour	(Ta=25°C), Note 2 I _F =20 mA

Note 1: Calculator value for reference $P_{LED} = V_F \text{ (Normal Distribution)} * I_F \text{ (Normal Distribution)} / \text{Efficiency}$

Note 2: The LED life-time define as the estimated time to 50% degradation of initial luminous

Note 3: This panel will support lower duty ratio at PWM conditional frequency. The PWM frequency constrain between 100 Hz to 300 Hz and a same typical 200Hz. The duty ratio support from 5% to 100%.

5.2.2 Backlight input signal characteristics

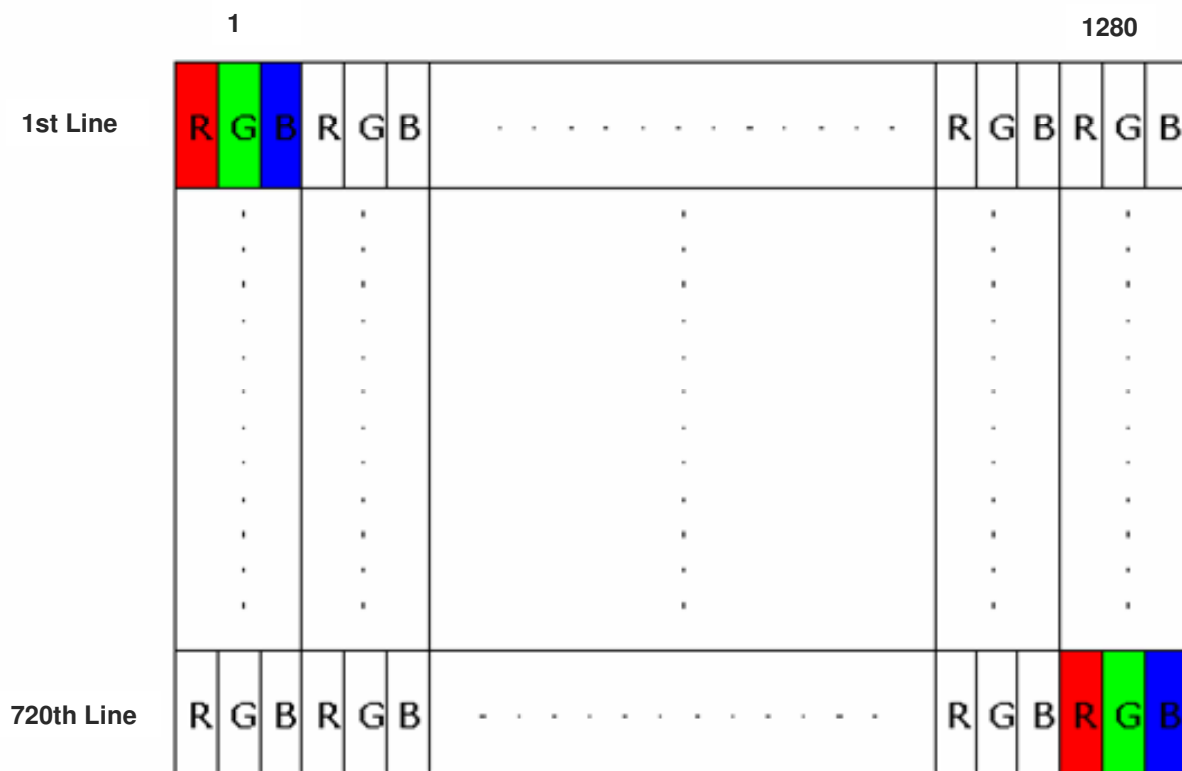
Parameter	Symbol	Min	Typ	Max	Units	Remark
LED Power Supply	VLED	6.0	12.0	21.0	[Volt]	Type I, Note 1
		4.5	5	5.5	[Volt]	Type II, Note 1
LED Enable Input High Level	VLED_EN	2.5	-	5.5	[Volt]	PWM Frequency <5K Hz PWM Frequency ≥500 Hz
LED Enable Input Low Level		-	-	0.8	[Volt]	
PWM Logic Input High Level	VPWM_EN	2.5	-	5.5	[Volt]	
PWM Logic Input Low Level		-	-	0.8	[Volt]	
PWM Input Frequency	FPWM	100	-	1K	Hz	
PWM Duty Ratio	Duty	1	--	100	%	
PWM Duty Ratio	Duty	15	--	100	%	

Note 1: **Type I** and **II** is an independent of design parameter. It should be separated from system design.

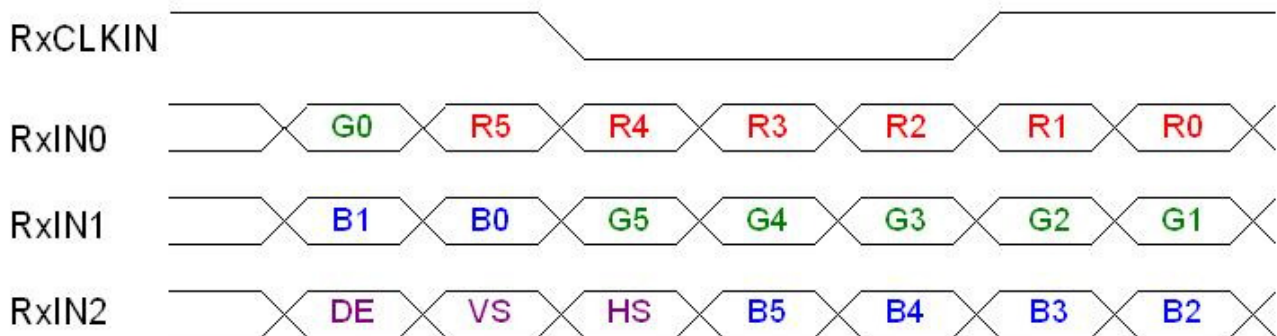
6. Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



6.2 The input data format



Signal Name	Description	
R5 R4 R3 R2 R1 R0	Red Data 5 (MSB) Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0 (LSB)	Red-pixel Data Each red pixel's brightness data consists of these 6 bits pixel data.
G5 G4 G3 G2 G1 G0	Green Data 5 (MSB) Green Data 4 Green Data 3 Green Data 2 Green Data 1 Green Data 0 (LSB)	Green-pixel Data Each green pixel's brightness data consists of these 6 bits pixel data.
B5 B4 B3 B2 B1 B0	Blue Data 5 (MSB) Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0 (LSB)	Blue-pixel Data Each blue pixel's brightness data consists of these 6 bits pixel data.
RxCLKIN	Data Clock	The typical frequency is 54.2MHZ. The signal is used to strobe the pixel data and DE signals. All pixel data shall be valid at the falling edge when the DE signal is high.
DE	Display Timing	This signal is strobed at the falling edge of RxCLKIN. When the signal is high, the pixel data shall be valid to be displayed.
VS	Vertical Sync	The signal is synchronized to RxCLKIN .
HS	Horizontal Sync	The signal is synchronized to RxCLKIN .

Note: Output signals from any system shall be low or High-impedance state when VDD is off.

6.3 Integration Interface Requirement

6.3.1 Connector Description

Physical interface is described as for the connector on module.

These connectors are capable of accommodating the following signals and will be following components.

Connector Name / Designation	For Signal Connector
Manufacturer	IPEX
Type / Part Number	IPEX 20455-040E-12
Mating Housing/Part Number	IPEX 20453-040T-11 or compatible

6.3.2 Pin Assignment

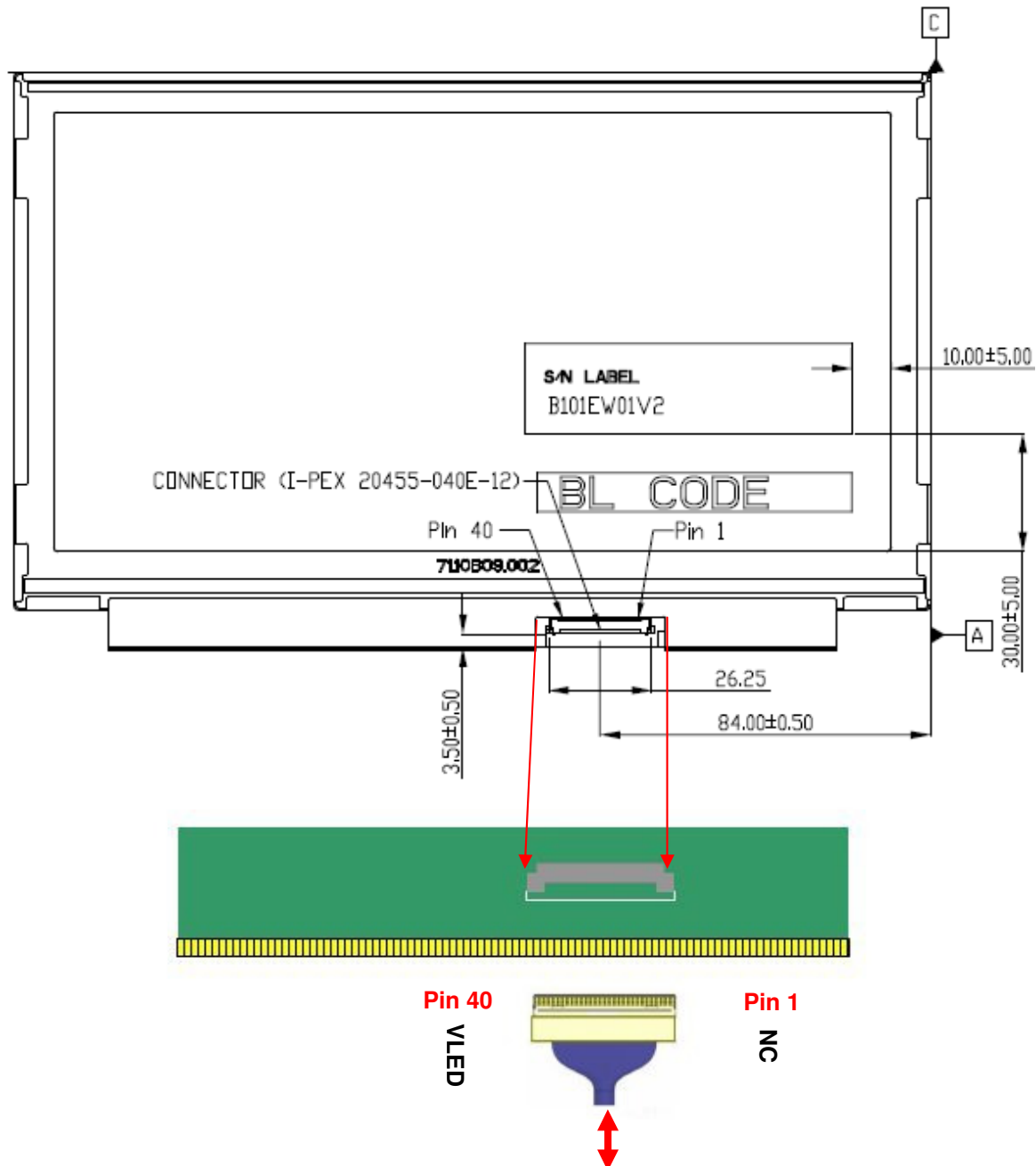
LVDS is a differential signal technology for LCD interface and high speed data transfer device.

Pin	Signal	Description
1	GND	Ground
2	AVDD	Power Supply +3.3V
3	AVDD	Power Supply +3.3V
4	VEDID	EDID +3.3V Power
5	NC	No Connection (Reserve)
6	CLK_EDID	EDID Clock Input
7	DAT_EDID	EDID Data Input
8	Rin0-	-LVDSdifferential data input(R0-R5,G0)
9	Rin0+	+LVDSdifferential data input(R0-R5,G0)
10	GND	Ground
11	Rin1-	-LVDSdifferential data input(G1-G5,B0-B1)
12	Rin1+	+LVDSdifferential data input(G1-G5,B0-B1)
13	GND	Ground
14	Rin2-	-LVDSdifferential data input(B2-B5,HS,VS,DE)
15	Rin2+	+LVDSdifferential data input(B2-B5,HS,VS,DE)
16	GND	Ground
17	ClkIN-	-LVDSdifferential clock input
18	ClkIN+	+LVDSdifferential clock input
19	GND	Ground-Shield
20	LVDS_EN	LVDS Enable
21	NC	No Connection (Reserve)
22	GND	Ground-Shield
23	NC	No Connection (Reserve)
24	NC	No Connection (Reserve)
25	GND	Ground-Shield
26	NC	No Connection (Reserve)
27	NC	No Connection (Reserve)
28	GND	Ground-Shield
29	NC	No Connection (Reserve)

30	NC	No Connection (Reserve)
31	VLED_GND	LED Ground
32	VLED_GND	LED Ground
33	VLED_GND	LED Ground
34	NC	No Connection (Reserve)
35	VPWM_EN	System PWM Logic Input Level
36	VLED_EN	LED enable input level
37	NC	No Connection (Reserve)
38	VLED	LED Power Supply
39	VLED	LED Power Supply
40	VLED	LED Power Supply

LVDS is a differential signal technology for LCD interface and high speed data transfer device.

Note1: Start from right side



Note1: Input signals shall be low or High-impedance state when VDD is off.

6.4 Interface Timing

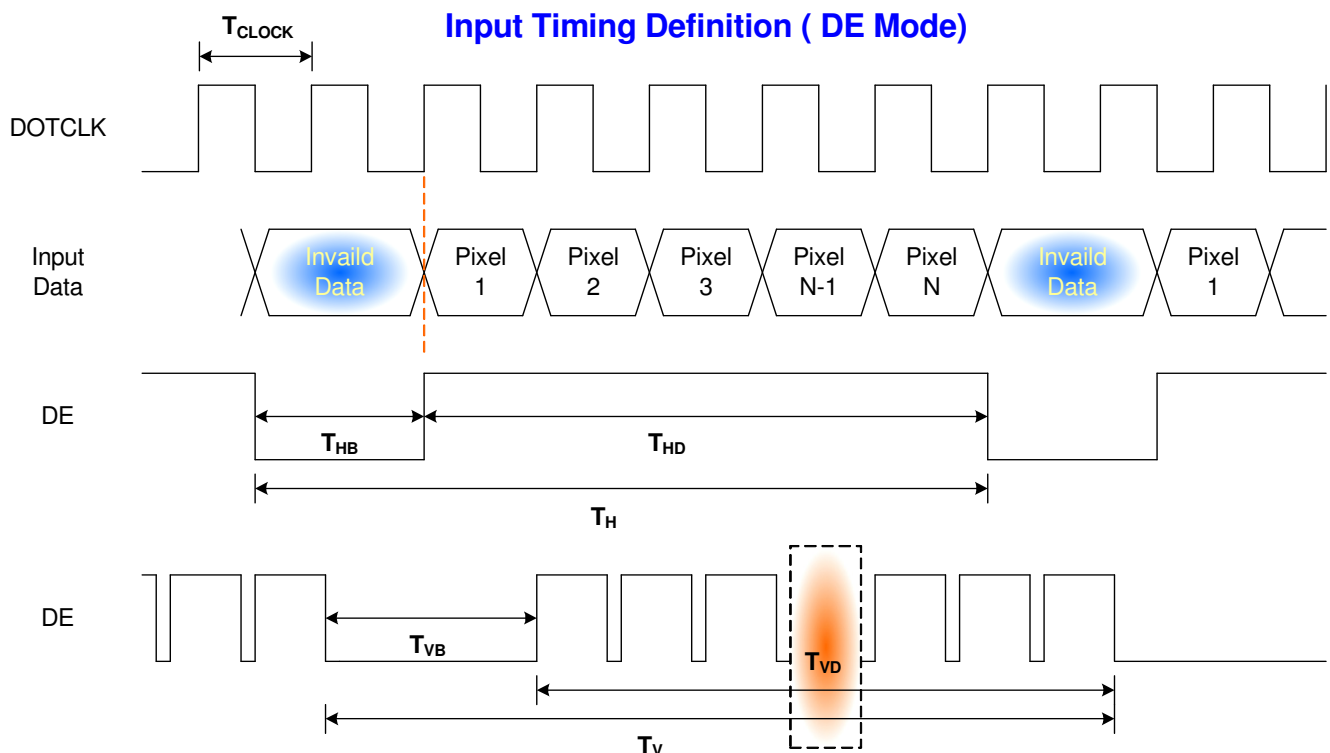
6.4.1 Timing Characteristics

Basically, interface timings should match the 1280 x 720 /60Hz manufacturing guide line timing.

Parameter		Symbol	Min.	Typ.	Max.	Unit
Frame Rate		-		60		Hz
Clock frequency		1/ T_{Clock}	57.2	61.5	80	MHz
Vertical Section	Period	T_V	728	736	1023	T_{Line}
	Active	T_{VD}	720	720	720	
	Blanking	T_{VB}	8	16	303	
Horizontal Section	Period	T_H	1310	1408	2047	T_{Clock}
	Active	T_{HD}	1280	1280	1280	
	Blanking	T_{HB}	30	128	767	

Note : DE mode only

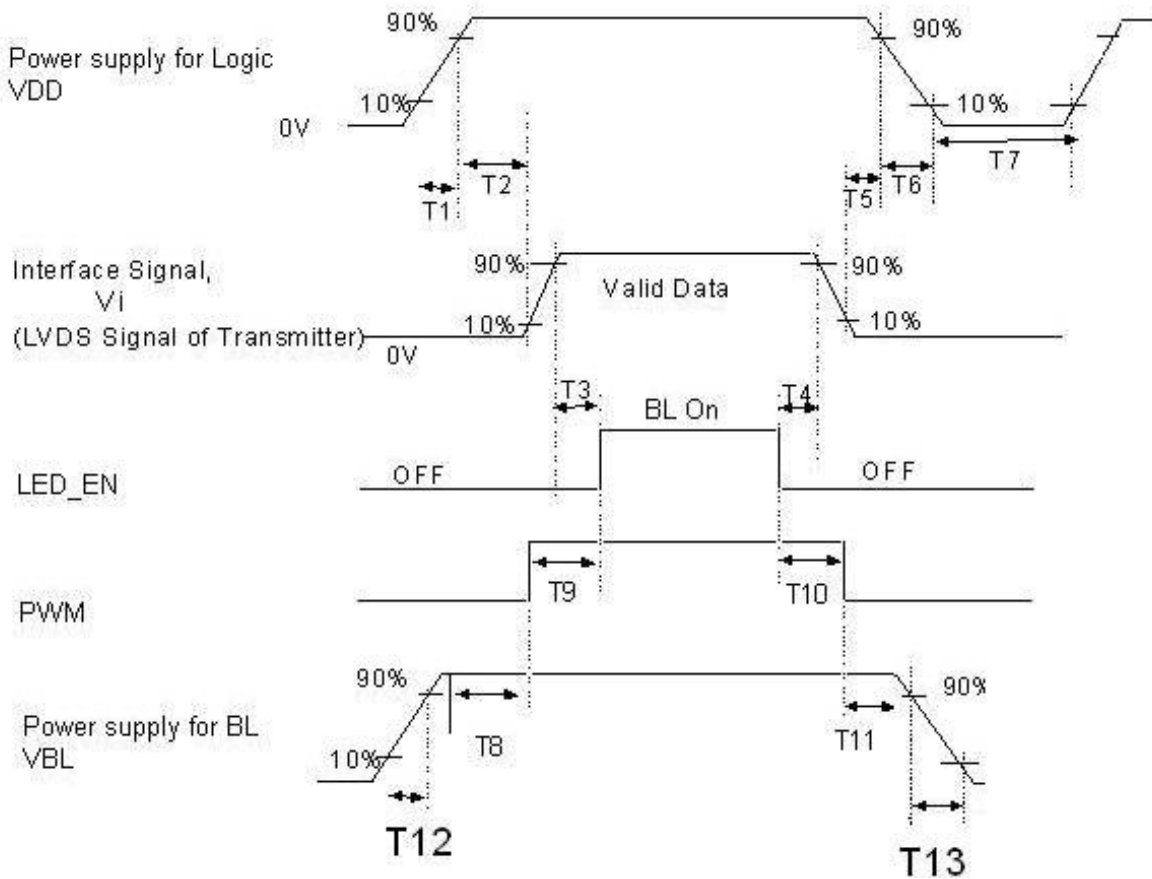
6.4.2 Timing diagram



6.5 Power Sequence

6.5.1 Panel Power Sequence

VDD power and LED 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.



Parameter	Value		
	Min.(ms)	Typ.(ms)	Max.(ms)
T1	0.5	-	10
T2	0	-	50
T3	200	-	-
T4	0	-	-
T5	0	-	-
T6	0	-	10
T7	150	-	-
T8	0	-	-
T9	0	-	-
T10	0	-	-
T11	0	-	-
T12	0.5	-	-
T13	0	-	-

Note 1 : If $T4 < 200\text{ms}$, the display garbage may occur. We suggest $T4 > 200\text{ms}$ to avoid the display garbage.

Note 2 : If $T1$ or $T2 < 0.5\text{ ms}$, the inrush current may cause the damage of fuse. If the $T1$ or $T12 < 0.5\text{ms}$, the inrush current $I^2 t$ is under typical melt of fuse Spec., there's no above mentioned problem.

7. Panel Reliability Test

7.1 Vibration Test

Test Spec:

- Test method: Non-Operation
- Acceleration: 1.5 G
- Frequency: 10 - 500Hz Random
- Sweep: 30 Minutes each Axis (X, Y, Z)

7.2 Shock Test

Test Spec:

- Test method: Non-Operation
- Acceleration: 220 G , Half sine wave
- Active time: 2 ms
- Pulse: X,Y,Z .one time for each side

7.3 Reliability Test

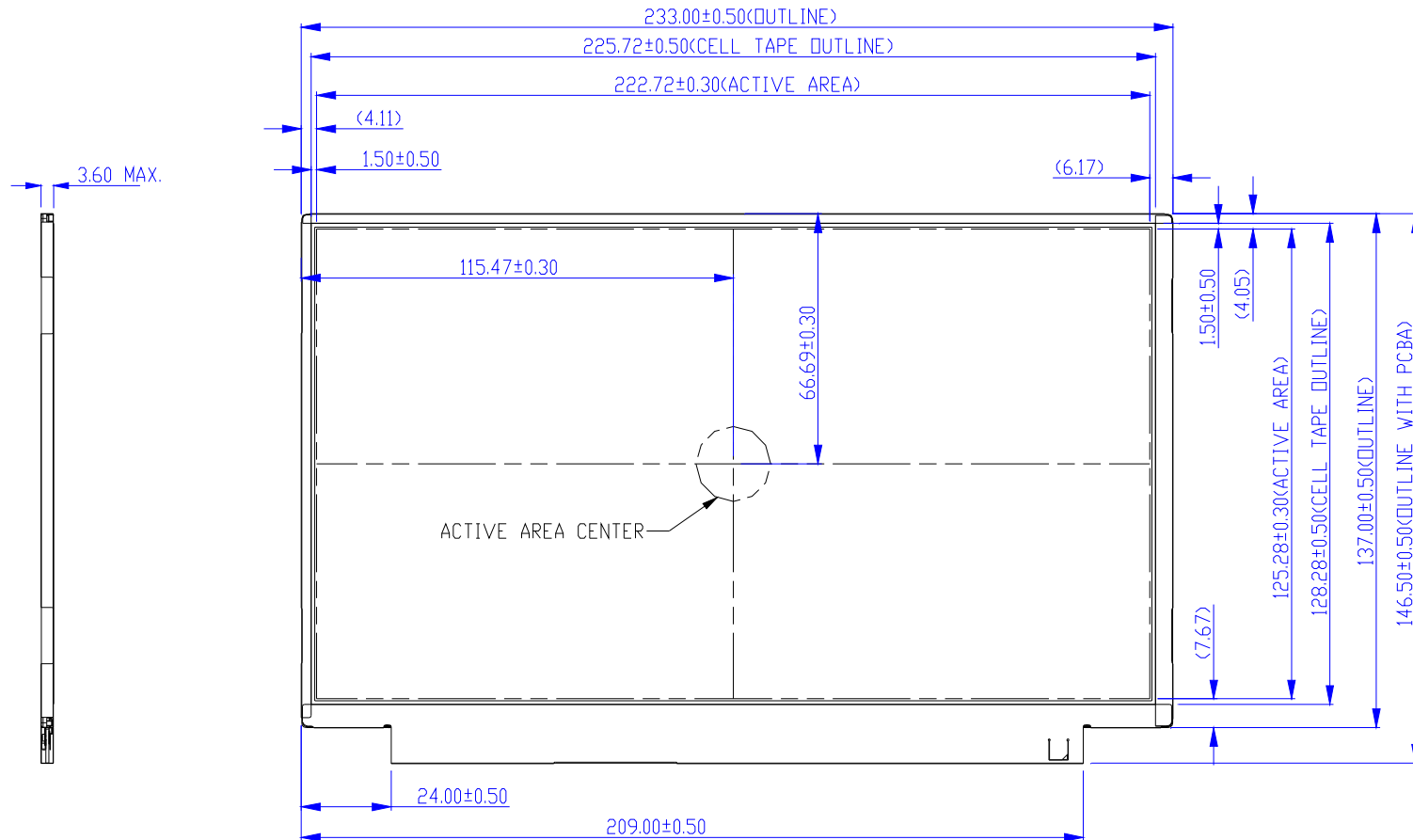
Items	Required Condition	Note
Temperature Humidity Bias	Ta= 40°C, 90%RH, 300h	
High Temperature Operation	Ta= 50°C, Dry, 300h	
Low Temperature Operation	Ta= 0°C, 300h	
High Temperature Storage	Ta= 60°C, 35%RH, 300h	
Low Temperature Storage	Ta= -20°C, 50%RH, 250h	
Thermal Shock Test	Ta=-20°C to 60°C, Duration at 30 min, 100 cycles	
ESD	Contact : ±8 KV Air : ±15 KV	Note 1

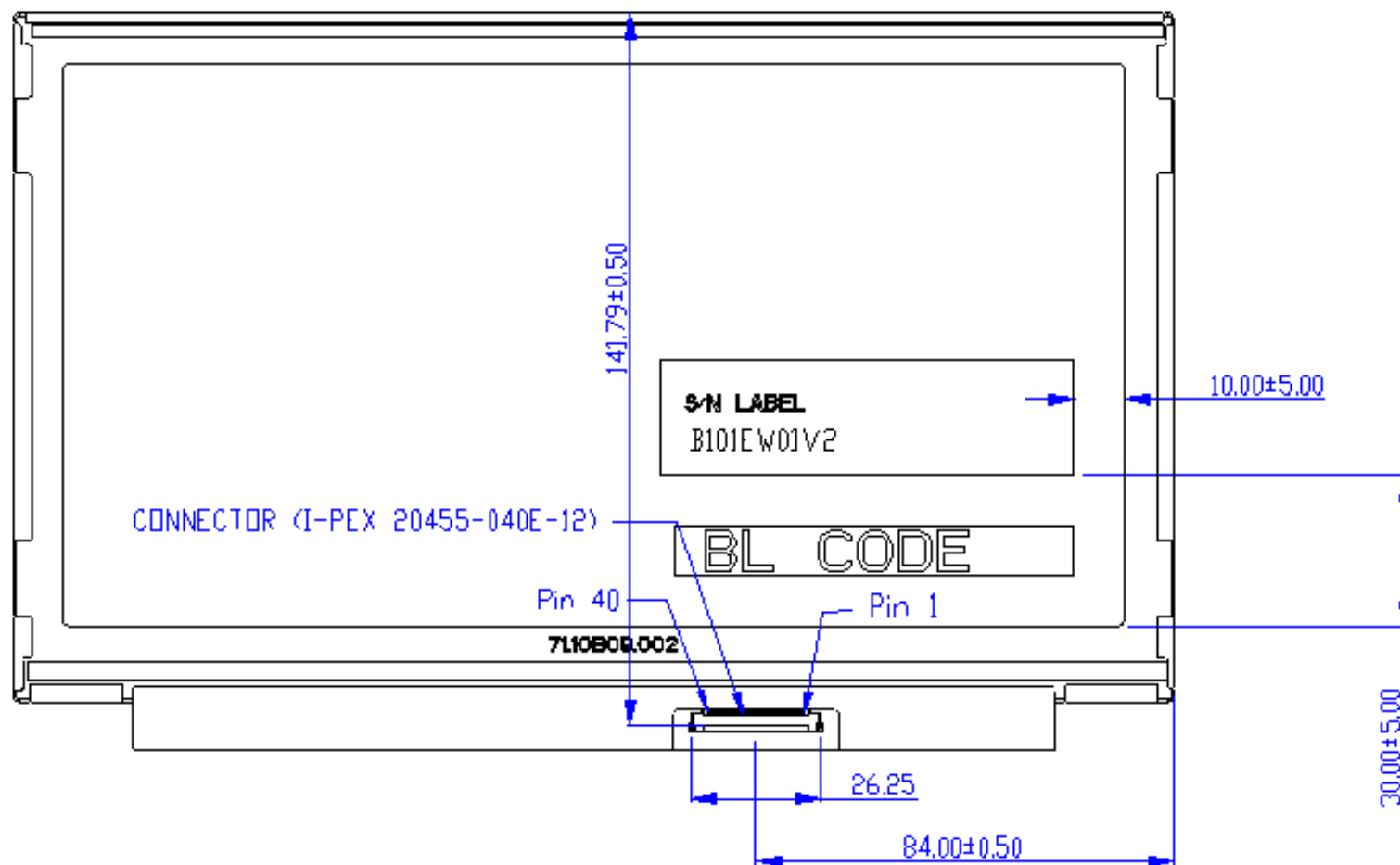
Note1: According to EN 61000-4-2 , ESD class B: Some performance degradation allowed. No data lost
. Self-recoverable. No hardware failures.

Remark: MTBF (Excluding the LED): 30,000 hours with a confidence level 90%

8. Mechanical Characteristics

8.1 LCM Outline Dimension





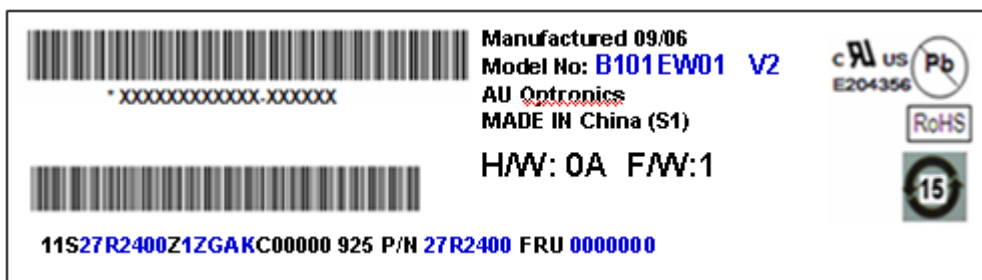


Product Specification

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9. Shipping and Package

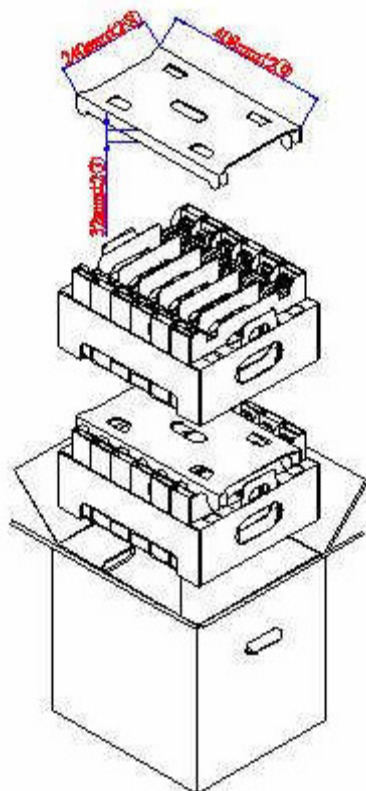
9.1 Shipping Label Format



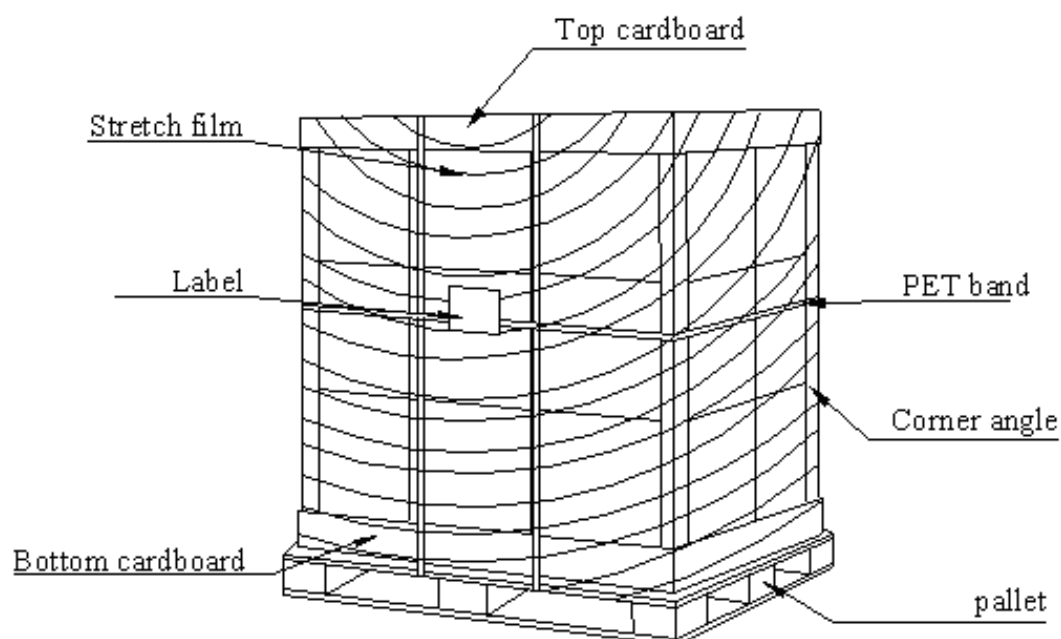
* H/W code control table :

IC Combination		Control Code	H/W
Source	Novatek	OAXXG	OA
Gate	Novatek		

9.2 Carton Package



9.3 Shipping package of palletizing sequence





10. Appendix

10.1 EDID description

B101EW01 V2 EDID Code

Address	FUNCTION	Value	Value	Value
HEX		HEX	BIN	DEC
00	Header	00	00000000	0
01	Header	FF	11111111	255
02	Header	FF	11111111	255
03	Header	FF	11111111	255
04	Header	FF	11111111	255
05	Header	FF	11111111	255
06	Header	FF	11111111	255
07	Header	00	00000000	0
08	ID Manufacturer Name	30	00110000	48
09		AE	10101110	174
0A	ID Product Code	11	00010001	17
0B		40	01000000	64
0C	ID Serial Number (32-bit serial number)	00	00000000	0
0D		00	00000000	0
0E		00	00000000	0
0F		00	00000000	0
10	Week of Manufacture	01	00000001	1
11	Year of Manufacture	13	00010011	19
12	EDID Structure version	01	00000001	1
13	EDID Revision	03	00000011	3
14	Video Input Definition	80	10000000	128
15	Max H Image Size(cm)	16	00010110	22
16	Max V Image Size(cm)	0D	00001101	13
17	Display gamma (gamma x 100)-100	78	01111000	120
18	Feature support(DPMS)	EA	11101010	234
19	Red/Green Low Bits	D1	11010001	209
1A	Blue/White Low Bits	15	00010101	21
1B	Red x	94	10010100	148
1C	Red y	56	01010110	86
1D	Green x	55	01010101	85
1E	Green y	93	10010011	147
1F	Blue x	29	00101001	41
20	Blue y	23	00100011	35
21	White x	50	01010000	80
22	White y	54	01010100	84
23	Established Timing 1	00	00000000	0
24	Established Timing 2	00	00000000	0
25	Manufacturer's Timings	00	00000000	0
26	Standard Timing Identification #1	01	00000001	1
27		01	00000001	1
28	Standard Timing Identification #2	01	00000001	1



Product Specification

AU OPTRONICS CORPORATION

29		01	00000001	1
2A	Standard Timing Identification #3	01	00000001	1
2B		01	00000001	1
2C	Standard Timing Identification #4	01	00000001	1
2D		01	00000001	1
2E	Standard Timing Identification #5	01	00000001	1
2F		01	00000001	1
30	Standard Timing Identification #6	01	00000001	1
31		01	00000001	1
32	Standard Timing Identification #7	01	00000001	1
33		01	00000001	1
34	Standard Timing Identification #8	01	00000001	1
35		01	00000001	1
36	Pixel Clock/10,000 (LSB)	06	00000110	6
37	Pixel Clock/10,000 (MSB) /	18	00011000	24
38	Horizontal Active	00	00000000	0
39	Horizontal Blanking	70	01110000	112
3A	Horizontal Active : Horizontal Blanking	50	01010000	80
3B	Vertical Active	D0	11010000	208
3C	Vertical Blanking	10	00010000	16
3D	Vertical Active : Vertical Blanking	20	00100000	32
3E	Horizontal Sync. Offset	30	00110000	48
3F	Horizontal Sync Pulse Width	20	00100000	32
40	Vertical Sync Offset : Sync Width	36	00110110	54
41	Horizontal Vertical Sync Offset/Width upper 2bits	00	00000000	0
42	Horizontal Image Size	DE	11011110	222
43	Vertical Image Size	7D	01111101	125
44	Horizontal & Vertical Image Size	00	00000000	0
45	Horizontal Border	00	00000000	0
46	Vertical Border	00	00000000	0
47	Flags	18	00011000	24
48	Pixel Clock/10,000 (LSB) (Slow Refresh rate)	03	00000011	3
49	Pixel Clock/10,000 (MSB) / (Slow Refresh rate)	14	00010100	20
4A	Horizontal Active	00	00000000	0
4B	Horizontal Blanking	70	01110000	112
4C	Horizontal Active : Horizontal Blanking	50	01010000	80
4D	Vertical Active	D0	11010000	208
4E	Vertical Blanking	10	00010000	16
4F	Vertical Active : Vertical Blanking	20	00100000	32
50	Horizontal Sync. Offset	30	00110000	48
51	Horizontal Sync Pulse Width	20	00100000	32
52	Vertical Sync Offset : Sync Width	36	00110110	54
53	Horizontal Vertical Sync Offset/Width upper 2bits = 0	00	00000000	0
54	Horizontal Image Size	DE	11011110	222
55	Vertical Image Size	7D	01111101	125
56	Horizontal & Vertical Image Size	00	00000000	0



Product Specification

AU OPTRONICS CORPORATION

57	Horizontal Border	00	00000000	0
58	Vertical Border	00	00000000	0
59	Flags	18	00011000	24
5A	Flag	00	00000000	0
5B	Flag	00	00000000	0
5C	Flag	00	00000000	0
5D	Data Type Tag	0F	00001111	15
5E	Flag	00	00000000	0
5F	(Horizontal active pixel /8)-31	81	10000001	129
60	Image Aspect Ratio	0A	00001010	10
61	Middle Refresh Rate	32	00110010	50
62	(Horizontal active pixel /8)-31	81	10000001	129
63	Image Aspect Ratio	0A	00001010	10
64	Low Refresh Rate	28	00101000	40
65	Brightness(1/10nit)	12	00010010	18
66	Feature flag	09	00001001	9
67	Reserved	00	00000000	0
68	LCD Supplier manufacture Code (3 character ID)	06	00000110	6
69		AF	10101111	175
6A	LCD Supplier Product code	56	01010110	86
6B	LCD Supplier Product code	32	00110010	50
6C	Flag	00	00000000	0
6D	Flag	00	00000000	0
6E	Flag	00	00000000	0
6F	Data Type Tag	FE	11111110	254
70	Flag	00	00000000	0
71	Model Name	42	01000010	66
72	Model Name	31	00110001	49
73	Model Name	30	00110000	48
74	Model Name	31	00110001	49
75	Model Name	45	01000101	69
76	Model Name	57	01010111	87
77	Model Name	30	00110000	48
78	Model Name	31	00110001	49
79	Model Name	20	00100000	32
7A	Model Name	56	01010110	86
7B	Model Name	32	00110010	50
7C	Model Name	20	00100000	32
7D	Model Name	0A	00001010	10
7E	Extension flag	00	00000000	0
7F	Checksum	E3	11100011	227