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	LCM	P0	2016.06.02	1 OF 33

NV140FHM-N61

Preliminary Product Specification

Rev. P0

CHONGQING BOE OPTOELECTRONICS TECHNOLOGY CO.,LTD

PRODUCT GROUP

www.szguangzhuo.com 广卓液晶屏 echodeng61@hotmail.com jimei@jimeihk.com +86-13411884959

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REVISION HISTORY

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P0

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Initial Release

2016.06.02

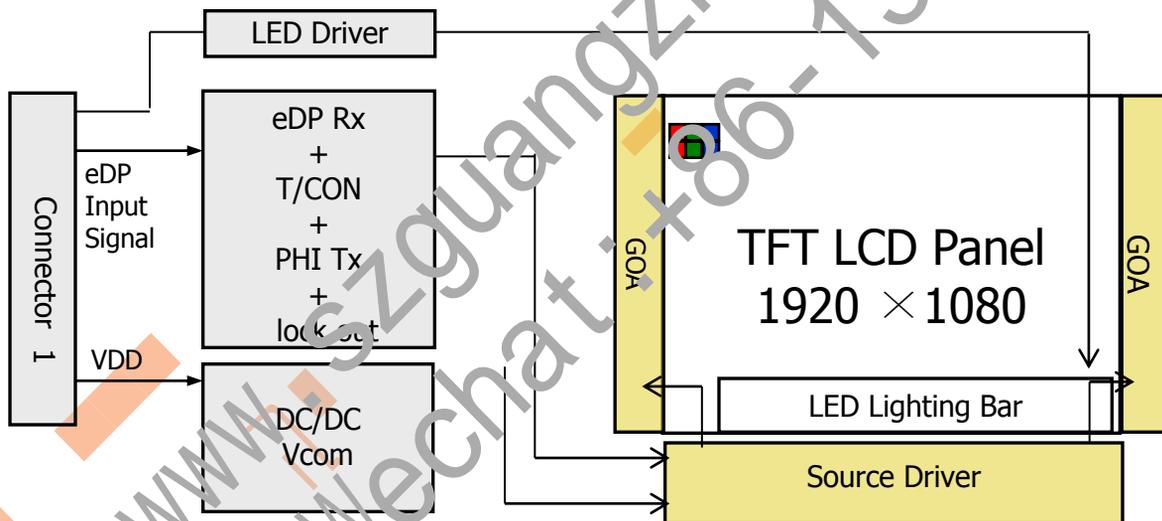
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1.0 GENERAL DESCRIPTION

1.1 Introduction

NV140FHM-N61 is a color active matrix TFT LCD module using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 14.0 inch diagonally measured active area with FHD resolutions (1920 horizontal by 1080 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical Stripe and this module can display 16.7M colors. The TFT LCD panel used for this module is a low reflection and higher color type. Therefore, this module is suitable for Notebook PC. The LED Driver for back-light driving is built in this model. All input signals are eDP1.3 interface compatible



1.2 Features

Interface with 2.7Gbps Link Rates

- Thin and light weight
- 6+2(FRC)bit color depth, display 16.7M colors
- Single LED Lighting Bar. (Down side/Horizontal Direction)
- Green Product (RoHS & Halogen free product)
- On board LED Driving circuit
- Low driving voltage and low power consumption
- On board EDID chip

1.0 General Description

1.3 Application

- Notebook PC Without Touch function

1.4 General Specification

1.4.1.General LCM Specification(Table 1.)

<Table 1. General Specifications>

Parameter	Specification	Unit	Remarks
Active area	309.31 (H) x 173.99 (V)	mm	
Number of pixels	1920 (H) x 1080 (V)	pixels	
Pixel pitch	0.1611 (H) x 0.1611 (V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	16.7M	colors	
Display mode	Normally Black		
Dimensional outline	315.01(H)*195.84(V) (W/PCB)*2.4(Max) 315.01 (H)*195.84(V)(W/O PCB)*2.4(Max)	mm	
Weight	220(max)	g	
Back	Lower Down side, 1-LED Lighting Bar type		Note 1
Power consumption	P _D : 0.85	W	@mosaic pattern
	P _{BL} :3.0	W	
	P _{total} :3.85	W	

Notes : 1. LED Lighting Bar (40*LED Array)

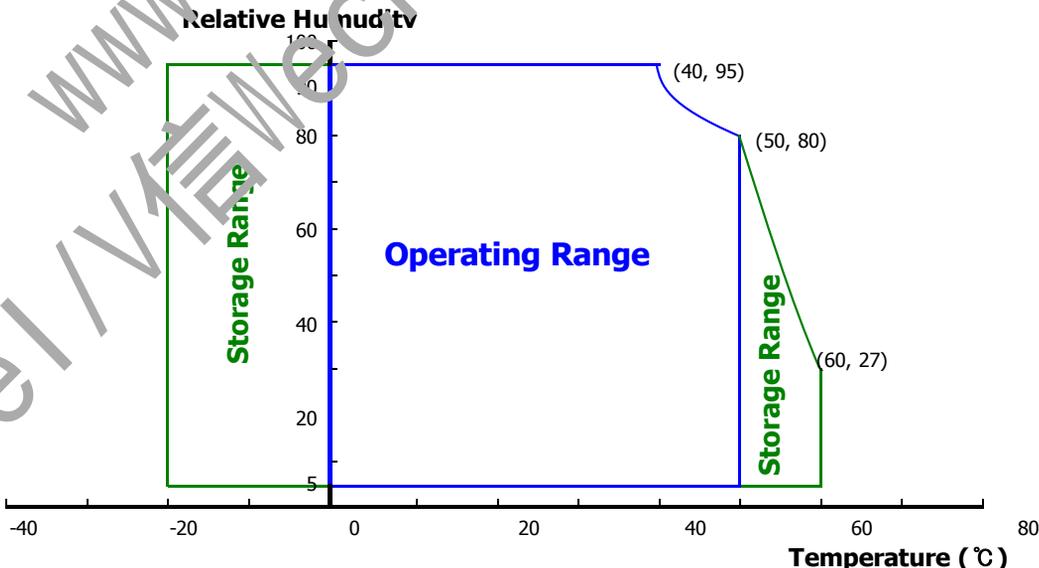
2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. Absolute Maximum Ratings > $T_a = -25 \sim +2^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	V_{DD}	-0.5	1.0	V	Note 1
Logic Supply Voltage	V_{IN}	$V_{SS}-0.3$	$V_{DD}+0.3$	V	
Operating Temperature	T_{OP}	0	+50	$^\circ\text{C}$	Note 2
Storage Temperature	T	-20		$^\circ\text{C}$	

- Notes : 1. Permanent damage to the device may occur if maximum values are exceeded functional operation should be restricted to the condition described under normal operating conditions.
2. Temperature and relative humidity range are shown in the figure below.
 95 % RH Max. ($40^\circ\text{C} \geq T_a$)
 Maximum wet - bulb temperature at 39°C or less. ($T_a > 40^\circ\text{C}$) No condensation.



3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 3. Electrical specifications >

Ta: 25+/-2°C

Parameter		Min.	Typ.	Max.	t	Remarks
Power Supply Voltage	V _{DD}	3.0	3.3	3.6	V	Note 1
Permissible Input Ripple Voltage	V _{RF}	-	-	100	mV	At V _{DD} = 3.3V
Power Supply Current	I _{DD1}	-	440	455	mA	Note 1
Positive-going Input Thresh old Voltage	V _{DD2}	-	-	803	mA	
Differential Input Voltage	V _{ID}	120	-	1320	mV	
Power Consumption	P _D	-	-	0.85	W	
	P _{D1}	-	1.45	1.5	w	
	P _{D2}	-	-	2.65	W	Note 1
	P _{BL}	-	-	3.0	W	Note 2
	P _{total}	-	-	3.85	W	

Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.

The current draw and power consumption specified is for 3.3V at 25°C.

a) I_{DD1}/P_{D1} max in R/G/B Pattern, work in normal Patterns

b) I_{DD2}/P_{D2} max in 1H1Line Pattern, work in extremely special Pattern.

c) P_D : Mosaic Pattern

3.2 Backlight Unit

< Table 4. LED Driving guideline specifications

Ta = 25±2°C

Parameter		Min.	Typ.	Max.	Unit	Remarks	
LED Forward Voltage		V _F	-	-	3.0	V	-
LED Forward Current		I _F	-	22.3	-	mA	-
LED Power Consumption		P _{LED}	-	-	3.0	W	Note 1
LED Life-Time		N/A	15,000	-	-	Hour	I _F = 22.8mA
Power supply voltage for LED Driver		V _{LED}	5	12	-	V	
EN Control Level	Backlight on		2.0	-	5.0	V	
	Backlight off		0	-	1.0	V	
PWM Control Level	PWM High		2.0	-	5.0	V	
	PWM Low Level		0	-	0.1	V	
PWM Control Frequency		F _{PWM}	200	-	10,000	Hz	
Duty Ratio			1	-	100	%	

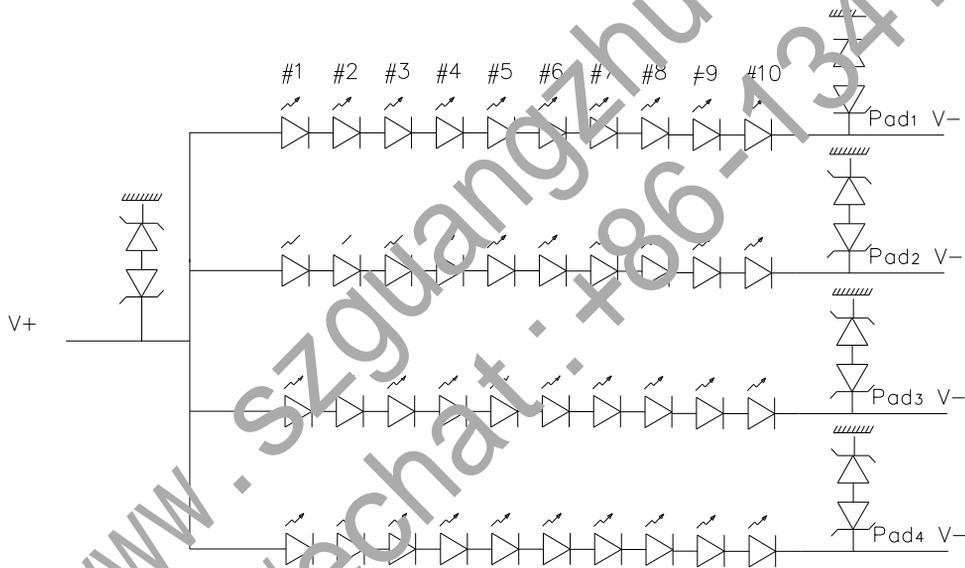
Notes : 1. Power supply voltage 12V for LED Driver

Calculator Value for reference $I_F \times V_F \times 40 / \text{efficiency} = P_{LED}$

2. The LED Life-time define as the estimated time to 50% degradation of initial luminous.

3. 1% duty cycle is achievable with a dimming frequency less than 1KHz.

3.3 LED structure



4.0 OPTICAL SPECIFICATION

4.1 Overview

The test of Optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = $25 \pm 2^\circ\text{C}$) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and ϕ equal to 0° . We refer to $\theta=0^\circ$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta=90^\circ$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta=180^\circ$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta=270^\circ$ ($=\theta_6$) as the 6 o'clock direction ("bottom"). While scanning θ and/or ϕ , the center of the measuring spot on the Display surface shall stay fixed. The backlight should be operating for 30 minutes prior to measurement. VDD shall be $3.3 \pm 0.3\text{V}$ at 25°C . Optimum viewing angle direction is 6 o'clock.

4.2 Optical Specifications

<Table 5. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	θ_3	CR > 10	-	85	-	Deg.	Note 1
		θ_9		-	85	-	Deg.	
	Vertical	θ_{12}		-	85	-	Deg.	
		θ_6		-	85	-	Deg.	
Luminance Contrast ratio		CR	$\theta = 0^\circ$	600	800	-	-	
Luminance of White	5 Points	Y_w	$\theta = 0^\circ$ ILFD = 22.3mA	255	300	345	-	Type.
White Luminance uniformity	5 Points	ΔY_5		-	80%	-	-	Type.
	13 Points	ΔY_{13}	-	60%	-	-		
White Chromaticity		x_w	$\theta = 0^\circ$	0.283	0.313	0.343	-	
		y_w		0.299	0.329	0.359	-	
Reproduction of color	Red	x_R	$\theta = 0^\circ$	-0.03	0.649	+0.03	-	
		y_R			0.346		-	
		x_G			0.329		-	
	Green	y_G			0.623		-	
		Blue			x_B		0.151	-
					y_B		0.064	-
Gamut		-	-	-	72	-	%	
Response Time (Rising + Falling)		T_{RT}	Ta = 25°C $\theta = 0^\circ$	-	30	35	Ms	Note 6
Cross Talk		CT	$\theta = 0^\circ$	-	-	2	%	

Notes :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).

2. Contrast measurements shall be made at viewing angle of $\theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state .
(see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Center Luminance of white is defined as luminance values of 5 point average across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.

4. The White luminance uniformity on LCD surface is then expressed as : $\Delta Y = \text{Minimum Luminance of 5(or 13) points} / \text{Maximum Luminance of 5(or 13) points}$.
(see FIGURE 2 and FIGURE 3).

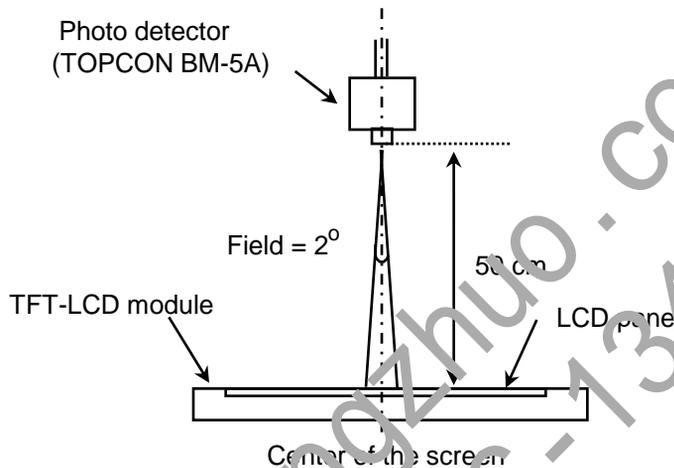
5. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

6. The electro optical response time measurements shall be made as FIGURE 4 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

7. Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance (YA) of a 25mm diameter area, with all display pixels set to a gray level, to the luminance (YB) of that same area when any adjacent area is driven dark.
(See FIGURE 5).

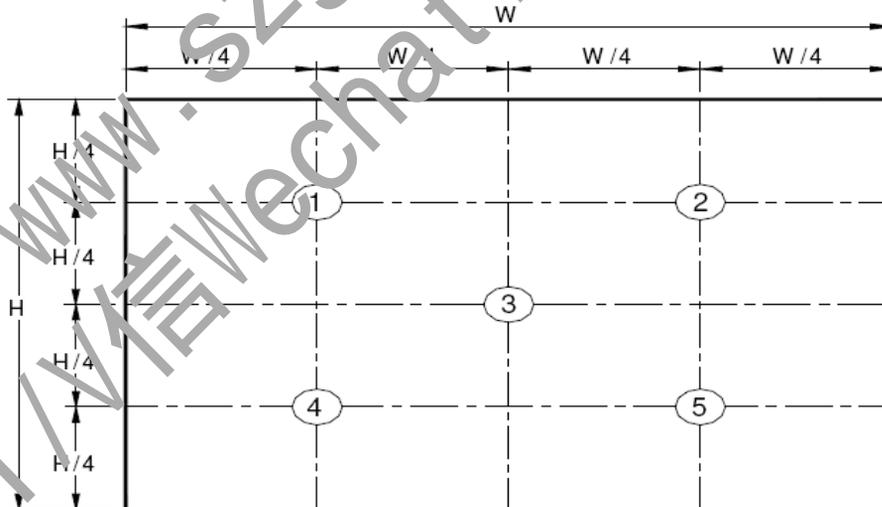
4.3 Optical measurements

Figure 1. Measurement Set Up



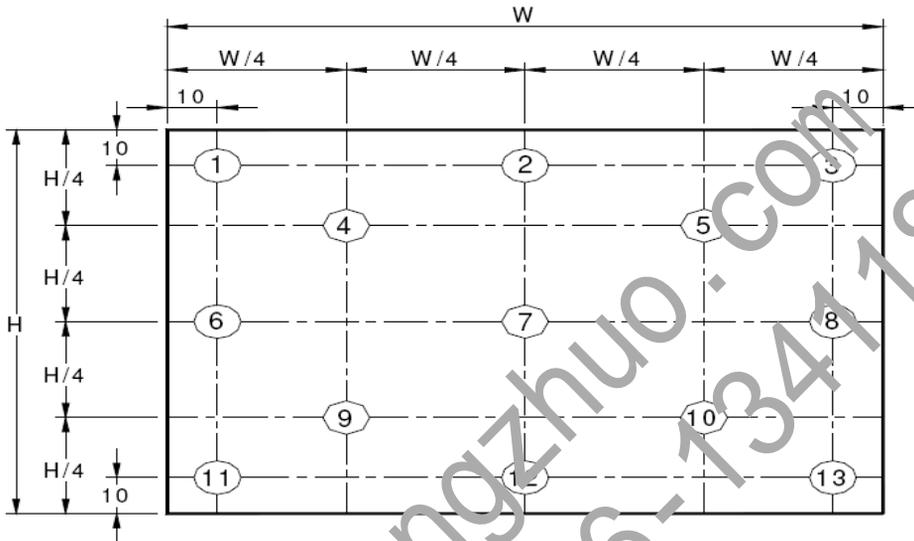
Optical characteristics measurement setup

Figure 2. White Luminance and Uniformity Measurement Locations (5 points)



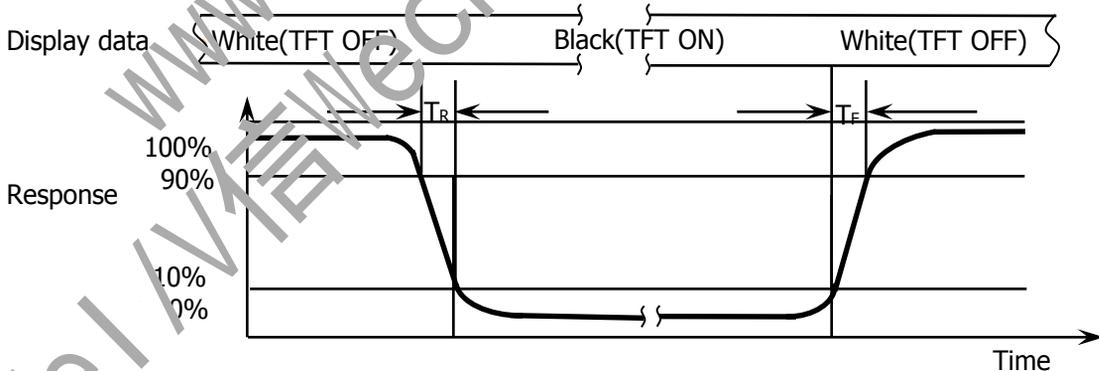
Center Luminance of white is defined as luminance values of center 5 points across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display.

Figure 3. Uniformity Measurement Locations (13 points)



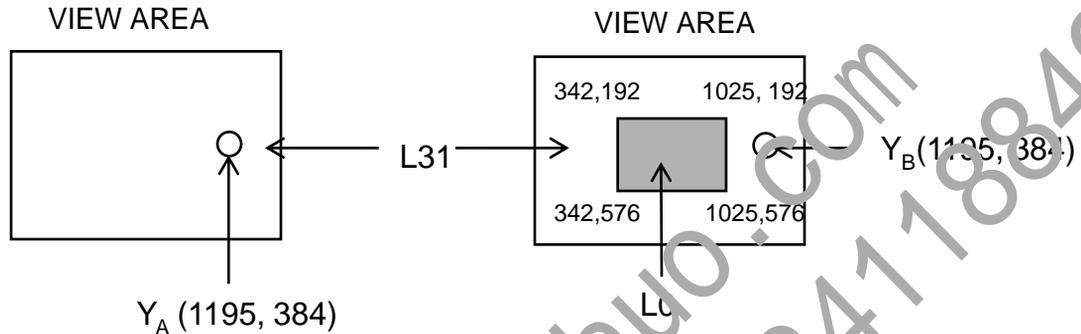
The White luminance uniformity on LCD surface is then expressed as : $\Delta Y5 = \text{Minimum Luminance of five points} / \text{Maximum Luminance of five points}$ (see FIGURE 2) , $\Delta Y13 = \text{Minimum Luminance of 13 points} / \text{Maximum Luminance of 13 points}$ (see FIGURE 3).

Figure 4 Response Time Testing



The electro-optical response time measurements shall be made as shown in FIGURE 4 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_d and 90% to 10% is T_r .

Figure 5. Cross Modulation Test Description



$$\text{Cross-Talk (\%)} = \left| \frac{Y_B - Y_A}{Y_A} \right| \times 100$$

Where:

Y_A = Initial luminance of measured area (cd/m^2)

Y_B = Subsequent luminance of measured area (cd/m^2)

The location measured will be exactly the same in both patterns

Cross Talk of one area of the LCD surface by another shall be measured by comparing the luminance (Y_A) of a 25mm diameter area, with all display pixels set to a gray level, to the luminance (Y_B) of that same area when any adjacent area is driven dark (Refer to FIGURE 5).

5.0 INTERFACE CONNECTION.

5.1 Electrical Interface Connection

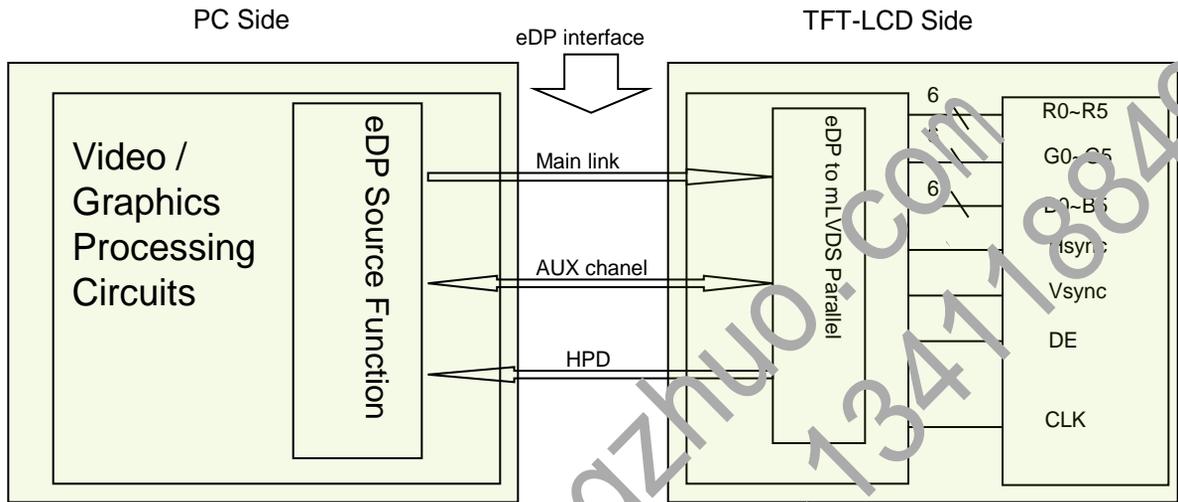
The electronics interface connector is UJU_IS050-L30B-C10.

The connector interface pin assignments are listed in Table 6.

<Table 6. Pin Assignments for the Interface Connector>

Terminal	Symbol	Functions
Pin No.	Symbol	Description
1	CABC_Enable	CABC (not enable)
2	H-GND	Ground
3	LAN1_N	Complement Signal Link_Lane1
4	LAN1_P	True Signal Link_Lane1
5	H-GND	Ground
6	LAN0_N	Complement Signal Link_Lane0
7	LAN0_P	True Signal Link_Lane0
8	H-GND	High Speed Ground
9	AUXP	True Signal Link_Auxiliary Channel
10	AUXN	Complement Signal Link_Auxiliary Channel
11	H-GND	Ground
12	LCD_VCC	Power Supply, 3.3V (typ.)
13	LCD_VCC	Power Supply, 3.3V (typ.)
14	BIST	Panel self test enable
15	H-GND	Ground
16	H-GND	Ground
17	HPD	HPD(Hot Plug Detect) Signal Pin
18	BL_GND	High Speed Ground
19	BL_GND	High Speed Ground
20	BL_GND	High Speed Ground
21	BL_GND	High Speed Ground
22	BL_EN	Backlight on/off Control pin
23	BL_PWM	Back light PWM Dimming
24	Hsync	Line synchronization
25	NC	No connection
26	BL_PWR	Backlight power
27	BL_PWR	Backlight power
28	BL_PWR	Backlight power
29	BL_PWR	Backlight power
30	NC	No connection

5-2. eDP Interface



Note. Transmitter : DP501 or
Transmitter is not contained in Module.

5.3 Back-light & LCM Interface Connection

<Table 7. Pin Assignments for the BLU & LCM Connector>

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	LED	LED cathode connection	6	GND	GND
2	LED	LED cathode connection	7	NC	No Connection
3	LED	LED cathode connection	8	VOUT	LED anode connection
4	LED	LED cathode connection	9	VOUT	LED anode connection
5	NC	No Connection	10	VOU	LED anode connection

6.0 SIGNAL TIMING SPECIFICATION

6.1 The NV140FHM-N61 is operated by the DE only.

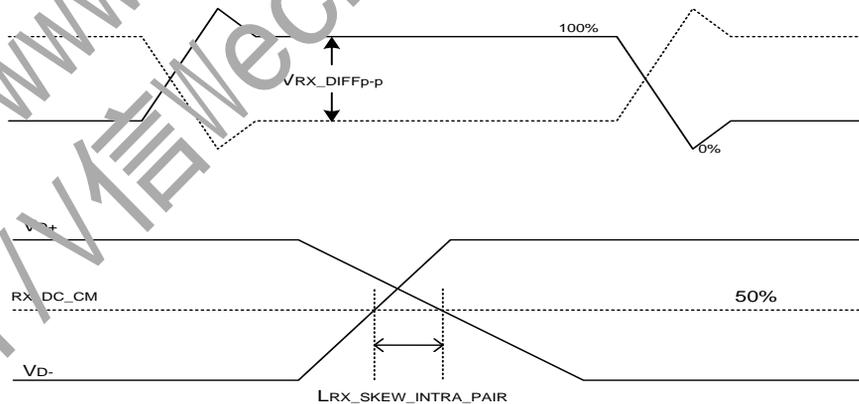
Item		Symbols	Min	Typ	Max	Unit
Clock	Frequency	1/Tc	100	148.5	160	MHz
Frame Period		Tv	1112	1125	1238	lines
			-	60	-	Hz
			25	16.67	15.15	ms
Vertical Display Period		Tvd	-	1080	-	lines
One line Scanning Period		Th	2080	2200	2400	clocks
Horizontal Display Period		Thd	-	1920	-	clocks

6.2 eDP Rx Interface Timing Parameter

The specification of the eDP Rx interface timing parameter is shown in Table 8.

<Table 9. eDP Rx Interface Timing Specification>

Item	Symbol	Min	Typ	Max	Unit	Remark
Spread spectrum clock	SSC		0.5		%	
Differential peak-to-peak input voltage at package pins	VRX-DIFFp-p	500	0	1000	mV	
Rx input DC common mode voltage	VRX_DC_CM	-	GND	-	V	
Differential termination resistance	RRX-DIFF	80	-	100	Ω	
Single-ended termination resistance	RRX-SE	40	-	50	Ω	
Rx short circuit current limit	IRX_SHORT			20	mA	
Intra-pair skew at Rx package pins (HBR) RX intra-pair skew tolerance at HBR	RX_SKEW_INTRA_PAIR	-		150	ps	

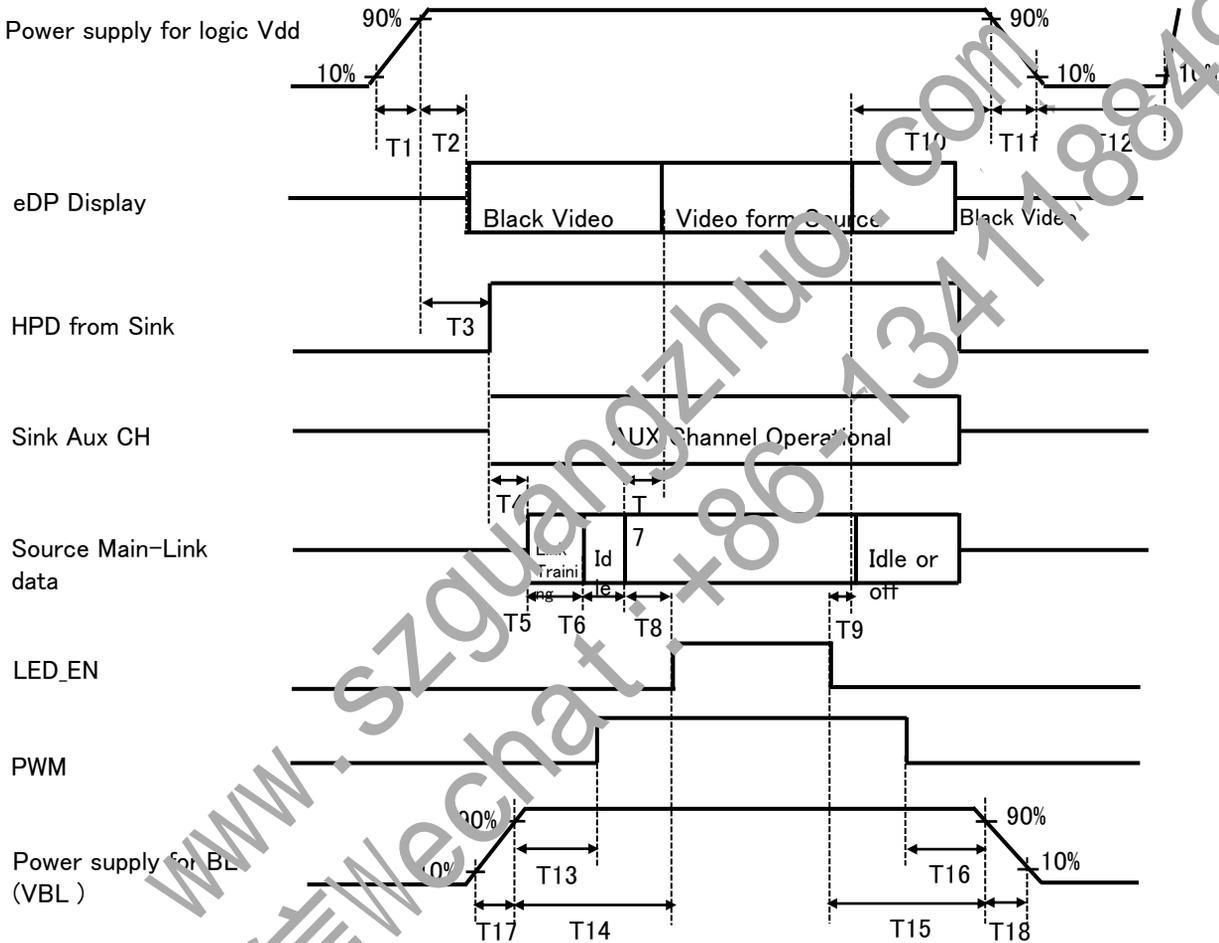


7.0 INPUT SIGNALS, BASIC DISPLAY COLORS & GRAY SCALE OF COLORS

	Colors & Gray scale	Data signal																	
		R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	B4	B5
Basic colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Light Blue	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Purple	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray scale of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△																		
	▽																		
	Brighter	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	▽	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
Gray scale of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	△																		
	▽																		
	Brighter	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0
	▽	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0
Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	
Gray scale of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	△																		
	▽																		
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	
Gray scale of White & Black	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
	Darker	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
	△																		
	▽																		
	Brighter	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1
	▽	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1
White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

8.0 POWER SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



- 0.5ms ≤ T1 ≤ 10 ms
- 0ms < T2 ≤ 200 ms
- 0ms ≤ T3 ≤ 200 ms
- 0ms ≤ T13
- 0ms ≤ T14
- 0ms ≤ T17
- 0ms ≤ T7 ≤ 50ms
- 0ms ≤ T10 ≤ 500 ms
- 3ms ≤ T11 ≤ 10 ms
- 150ms ≤ T12
- 0ms ≤ T15
- 0ms ≤ T16
- 0ms ≤ T18

Notes:

1. When the power supply VDD is 0V, keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on. Back Light

9.0 Connector Description

Physical interface is described as for the connector on LCM.

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

9.1 TFT LCD Module

Connector Name /Description	For Signal Connector
Manufacturer	UJU
Type/ Part Number	IS050
Mating housing/ Part Number	PEX 20454

10.0 MECHANICAL CHARACTERISTICS

10.1 Dimensional Requirements

FIGURE 6 shows mechanical outlines for the model NV140FHM-N61
Other parameters are shown in Table 9.

<Table 9. Dimensional Parameters>

Parameter	Specification	Unit
Active Area	309.31 (H) x 173.09	
Number of pixels	1920 (H) x 1080	
Pixel pitch	0.1611 (H) x 0.1611 (V)	mm
Pixel arrangement	RGB Vertical stripe	
Display colors	16.7M	
Display mode	Normally Black	
Dimensional outline	315.01 (H)*195.84 (V) (W/PCB)*2.4(Max) 315.01 (H)*185.34 (V) (W/O PCB)*2.4(Max)	mm
Weight	220(max)	gram
Back Light	Connector :IS050-L30B-C10	
	LED, Horizontal-LED Array type	

10.2 Mounting

See FIGURE 6

10.3 and Polarizer Hardness

The surface of the LCD has a Anti Glare coating to minimize reflection and a coating to reduce scratching.

10.4 Light Leakage

Light leakage shall be checked by naked eye Applying Limit sample and/or 10% ND filter with conditions as follow:

1. With a viewing distance of 300mm from the screen.
2. With overhead light less than 300lux
3. Viewing angle Within 45 degrees at Left/Right/Upper/Lower.
4. Check pattern with Black, White and 32-gray (Half-gray) screens.

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www.szguangzhuo.com 广卓液晶屏 echodeng61@hotmail.com jimei@jimeihk.com +86-13411884959

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(4) Cautions for the atmosphere

- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

(5) Cautions for the module characteristics

- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

(6) Other cautions

- Do not disassemble and/or re-assemble LCD module.
- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

11.0 RELIABILITY TEST

The Reliability test items and its conditions are shown in below.

<Table 10. Reliability test>

No	Test Items	Conditions
1	High temperature storage test	Ta = 60 °C , 240 hrs
2	Low temperature storage test	Ta = -20 °C , 240 hrs
3	High temperature & high humidity operation test	Ta = 40 °C , 90%RH, 240 hrs
4	High temperature operation test	Ta = 50 °C , 240 hrs
5	Low temperature operation test	Ta = 0 °C , 240 hrs
6	Thermal shock	Ta = -40 °C ↔ 80 °C (0.5 hr), 100 cycle
7	Drop (non-operating)	60cm/1 corner/3 edges/6 faces
8	Shock test (non-operating)	220G, Half Sine Wave 2msec ± X, ± Y, ± Z Once for each direction
9	Electro-static discharge test (non-operating)	Air : 150 pF, 330Ω, 15 KV Contact : 150 pF, 330Ω, 8 KV

12.0 HANDLING & CAUTIONS

- (1) Cautions when taking out the module
 - Pick the pouch only, when taking out module from a shipping package.
- (2) Cautions for handling the module
 - As the electrostatic discharges may break the LCD module, handle the LCD module with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.
 - As the LCD panel and back light element are made from fragile glass material, impulse and pressure to the LCD module should be avoided.
 - As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.
 - Do not pull the interface connector in or out while the LCD module is operating.
 - Put the module display side down on a flat horizontal plane.
 - Handle connectors and cables with care.
- (3) Cautions for the operation
 - When the module is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the LCD panel would be damaged.
 - Obey the supply voltage sequence. If wrong sequence is applied, the module

(4) Cautions for the atmosphere

- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

(5) Cautions for the module characteristics

- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

(6) Other cautions

- Do not disassemble and/or re-assemble LCD module.
- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

13.0 LABEL

(1) MDL label



1. BOE
2. BOE module ID
3. PPID
4. TBSPN
5. FPID Quick Response code

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(2) High voltage caution label

	<p>HIGH VOLTAGE CAUTION</p>	<p>COLD CATHODE FLUORESCENT LAMP IN LCD PANEL CONTAINS A SMALL AMOUNT OF MERCURY. PLEASE FOLLOW LOCAL OR DINANCES OR REGULATIONS FOR DISPOSAL.</p>
	<p>KEEP OFF ELECTRIC SHOCK. DISCONNECT THE ELECTRIC POWER BEFORE SERVICING</p>	

(3) Box label

BOE CHONGQING BOE OPTOELECTRONICS TECHNOLOGY CO.

MODEL: XXXXXXX-XXX 1 X

SERIAL NO: XXXXXXXXXX 3 DATE: XXXXXXXX 4

BOX ID 条形码


 RoHS Compliant

X-XXXXXX 5 XXXX 6 XXXXX 7

1. Module Name
2. Qty
3. Box ID
4. Packing Date
5. Blank
6. FG-Code
7. Blank

Total Size: 110

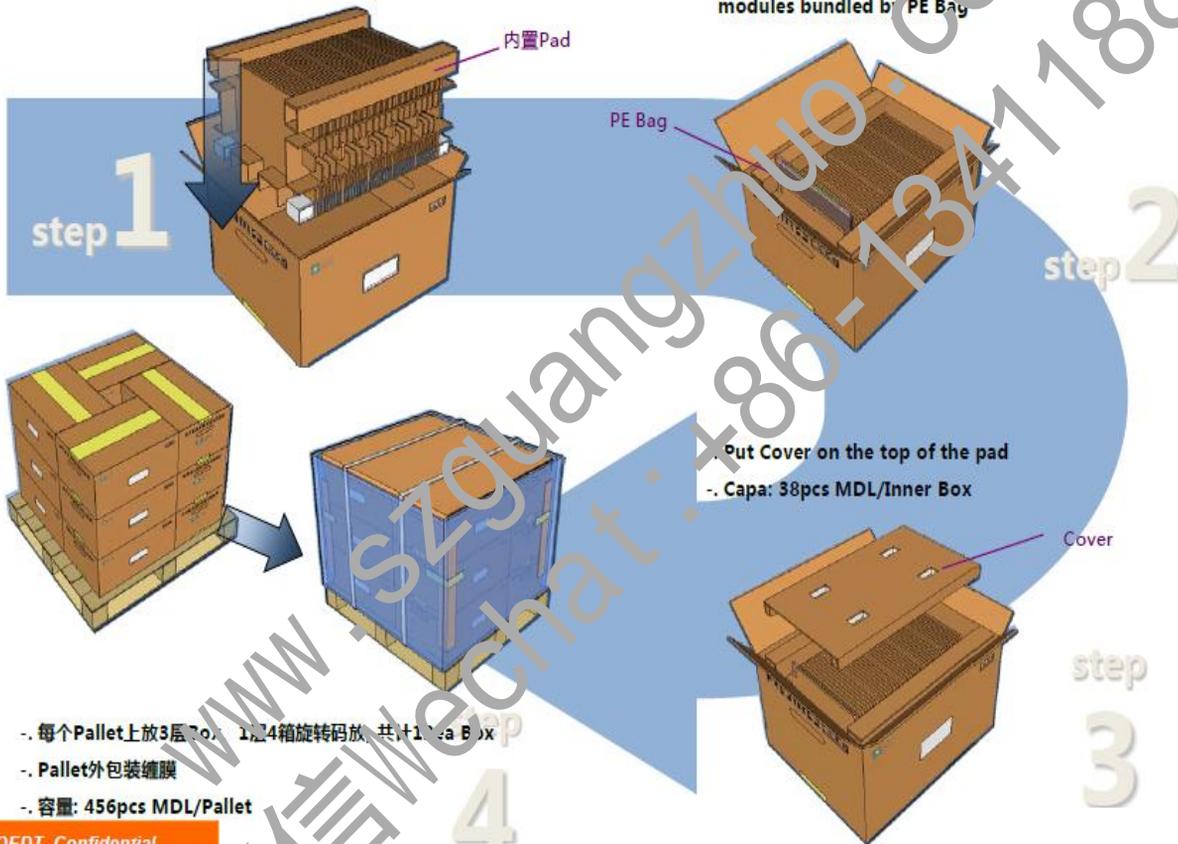
Code	Digit	1	2	3	4	5	6	7	8	9	10	11	12	13
Code		S	L	S	F	1	2	3	D	0	0	0	6	8
Description		Products GBN		Grade	Line	Year		Month	Revision Code	Serial No				

14.0 PACKING INFORMATION

14.1 Packing order

- Put Pad into the inner box

- Put module into the paper spacer and modules bundled by PE Bag



- 每个Pallet上放3层70. 1层4箱旋转码放, 共计11个Box
- Pallet外包装缠膜
- 容量: 456pcs MDL/Pallet

BOEDT Confidential

14.2 Notes

- Box Dimension: TBD
- Package Quantity in one Box: 25pcs
- Total Weight: TBD

15.0 MECHANICAL OUTLINE DIMENSION

Figure 6. Outline Dimensions (Front view)

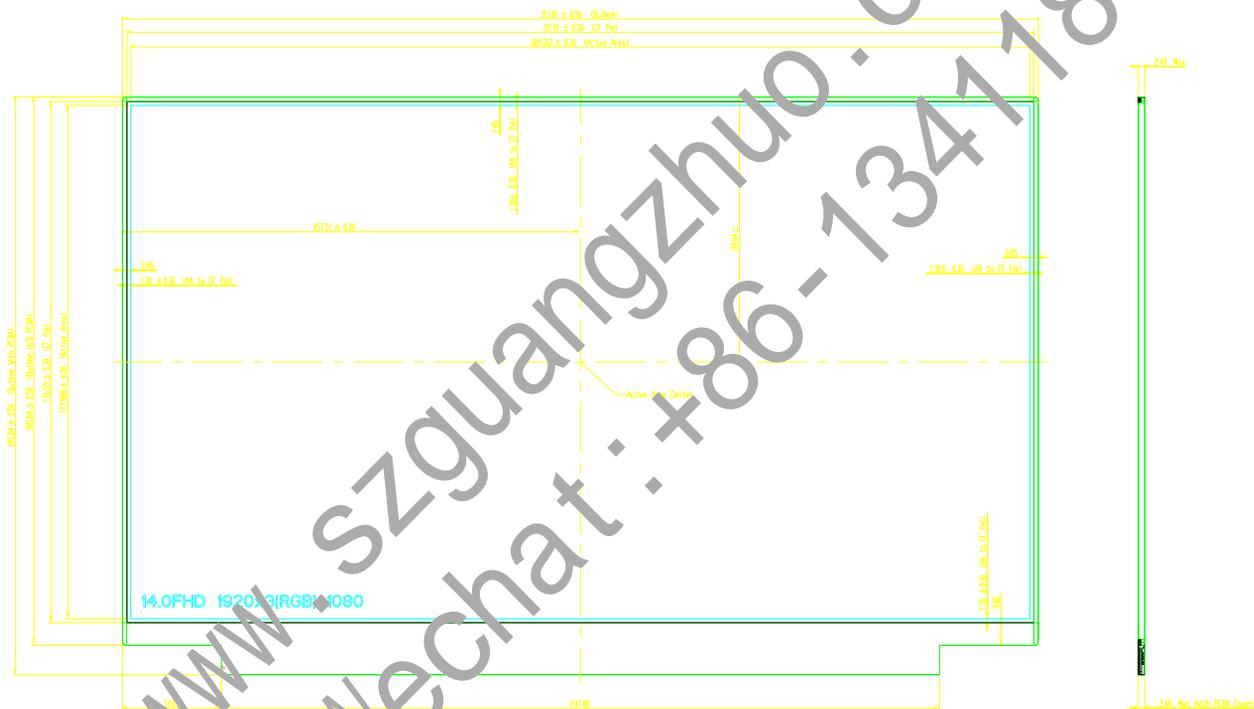
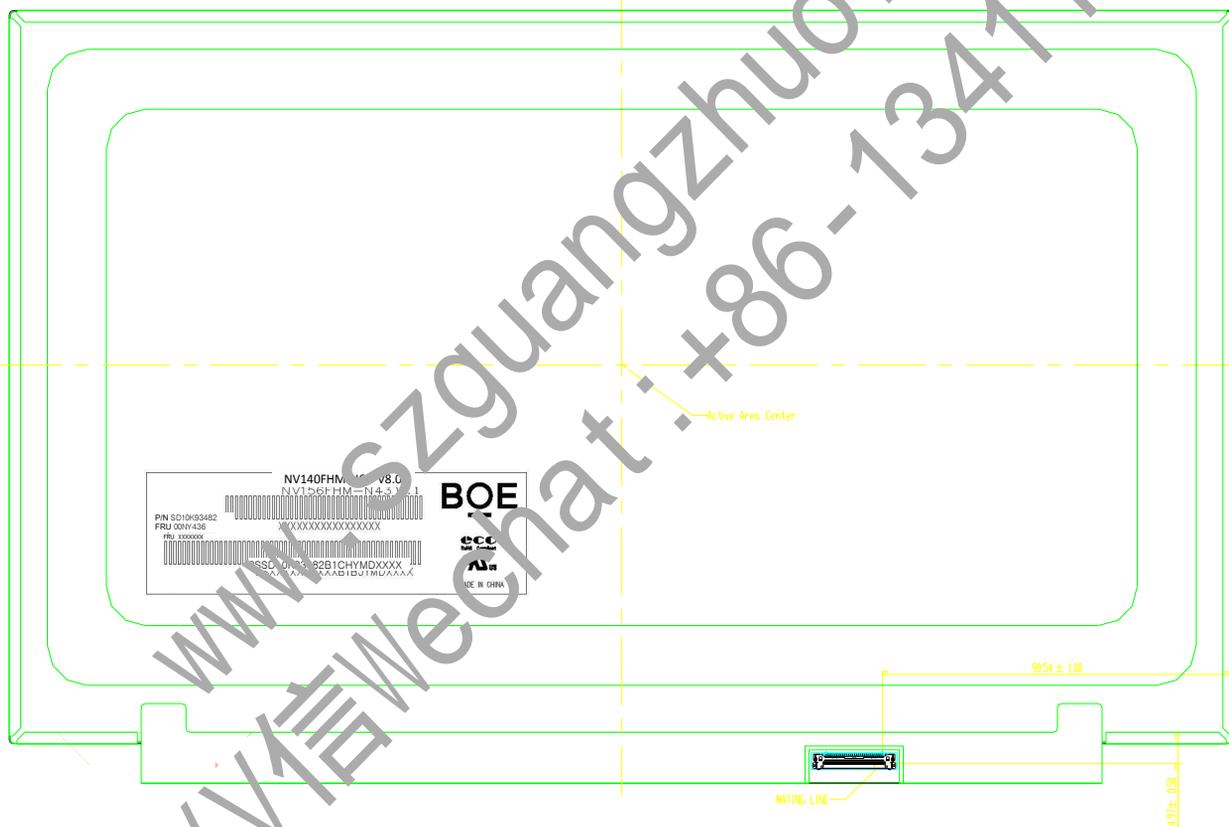


Figure 7. Outline Dimensions (Rear view)



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16.0 EDID Table

Address (HEX)	Function	Hex	Dec	crc	Input values.	Notes
00	Header	00	0		0	EDID Header
01		FF	255		255	
02		FF	255		255	
03		FF	255		255	
04		FF	255		255	
05		FF	255		255	
06		FF	255		255	
07		00	0		0	
08	ID Manufacturer Name	09	9		BOE	ID = BOE
09		E5	229			
0A	ID Product Code	DF	223		1759	ID = 1759
0B		06	6			
0C	32-bit serial No.	00	0			
0D		00	0			
0E		00	0			
0F		00	0			
10	Week of manufacture	01	1			
11	Year of Manufacture	1A	26		2016	Manufactured in 2016
12	EDID Structure Ver.	01	1		1	EDID Ver 1.0
13	EDID revision #	03	3		3	EDID Rev. 0.3
14	Video input definition	A5	165		-	digital signal/DP input
15	Max H image size	1F	31			31 cm (Approx)
16	Max V image size	11	17			17 cm (Approx)
17	Display Gamma	78	120		2.2	Gamma curve = 2.2
18	Feature support	02	2			RGB display, Preferred Timing mode/RGB 4:4:4
19	Red/Green low bits	86	134		Gamut 2.09%	Red / Green Low Bits
1A	Blue/White low bits	31	49			Blue / White Low Bits
1B	Red x high bits	A3	163			Red (x) = 10010110 (0.589)
1C	Red y high bits	54	84		0.328	Red (y) = 01011100 (0.362)
1D	Green x high bits	4F	78		0.306	Green (x) = 01011011 (0.356)
1E	Green y high bits	52	82		0.607	Green (y) = 10010010 (0.572)
1F	Blue x high bits	25	37		0.145	Blue (x) = 00101010 (0.165)
20	Blue y high bits	0E	14		0.058	Blue (y) = 00100010 (0.134)
21	White x high bits	50	80		0.313	White (x) = 01010000 (0.313)
22	White y high bits	54	84		0.329	White (y) = 01010100 (0.329)
23	Established timing	00	0		-	
24	Established timing 2	00	0		-	
25	Established timing 3	00	0		-	
26	Standard timing #1	01	1			Not Used
27		01	1			
28	Standard timing #2	01	1			Not Used
29		01	1			
2A	Standard timing #3	01	1			Not Used
2B		01	1			
2C	Standard timing #4	01	1			Not Used
2D		01	1			
2E	Standard timing #5	01	1			Not Used
2F		01	1			
30	Standard timing #6	01	1			Not Used
31		01	1			
32	Standard timing #7	01	1			Not Used
33		01	1			
34	Standard timing #8	01	1			Not Used
35	Standard timing #9	01	1			Not Used

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16.0 EDID Table

Address (HEX)	Function	Hex	Dec	crc	Input values.	Notes
36	Detailed timing/monitor descriptor #1	2C	44		141.24	141.24MHz Main clock
37		37	55			
38		80	128		1920	1920 pixels
39		DE	222		222	222 pixels (If 4Lane model please check data)
3A		70	112		-	(Hbp= 142 pixels) (If 4Lane model please check data)
3B		38	56		1080	1080 lines
3C		14	20		20	20 lines
3D		40	64		-	(Vbp= 11 lines)
3E		30	48		60	48 pixels
3F		20	32		32	32 pixels
40		36	54		3	3 lines / 6 lines
41		00	0			
42		35	53		53	309 mm
43		AD	173		173	173 mm
44		10	16			
45		00	0		0	0 pixels
46	00	0		0	0 lines	
47	1A	26				Non interlaced , Normal display, no stereo , Digital separate , Vertical Polarity Negative , Horizontal Polarity Positive
48	Detailed timing/monitor descriptor #2	23	35		112.99	112.99MHz Main clock
49		2C	44			
4A		80	128		1920	1920 pixels
4B		DE	222		222	222 pixels (If 4Lane model please check data)
4C		70	112		-	(Hbp= 142 pixels) (If 4Lane model please check data)
4D		38	56		1080	1080 lines
4E		14	20		20	20 lines
4F		40	64		-	(Vbp= 11 lines)
50		30	48		48	48 pixels
51		20	32		32	32 pixels
52		36	54		3	3 lines / 6 lines
53		00	0			
54		00	0			309 mm
55		00	0			173 mm
56		00	0		-	
57		00	0		0	0 pixels
58	00	0		0	0 lines	
59	1A	26				
5A	00	0				ASCII Data Sting Tag
5B	00	0				
5C	00	0				
5D	FE	254				
5E	00	0				Manufacture name : BOECQ
5F	42	66		B		
60	4F	79		O		
61	45	69		E		
62	20	32				
63	43	67		C		
64	51	81		Q		
65	0A	10				
66	20	32				
67	20	32				
68	20	32				
69	20	32				
6A	20	32				
6B	20	32				

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16.0 EDID Table

Address (HEX)	Function	Hex	Dec	crc	Input values.	Notes
6C	Detailed timing/monitor descriptor #4	00	0			Product Name Tag (ASCII)
6D		00	0			
6E		00	0			
6F		FE	254			
70		00	0			Model name: NV140FHM-N61
71		48	72		[H]	
72		56	86		[V]	
73		31	49		[1]	
74		34	52		[4]	
75		30	48		[0]	
76		46	70		[F]	
77		48	72		[H]	
78		4D	77		[M]	
79		2D	45		[D]	
7A		4E	78		[N]	
7B		36	54		[6]	
7C	31	49		[1]		
7D	00	0				
7E	Extension flag	73	115			
7F	Checksum	73	115			