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SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

SPEC. NUMBER	PRODUCT GROUP	Rev.	ISSUE DATE	PAGE
	TFT-LCD	O	2016.03.24	1 OF 34

PRODUCT SPECIFICATION

FOR

APPROVAL

Model Name	NT140WHM-N41
Description	14.0 HD color TFT-LCD with LED backlight / Anti-Glare surface
Prepared by	xxxx / Engineer
Checked by	xxxx / Manager
Approved by	xxxx / Dept. Manager

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Customer	
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Please return one copy for confirmation with your signature and comments	

Customer
<div style="text-align: center;"><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div> <p>Please return one copy for confirmation with your signature and comments</p>

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SPEC. NUMBER

PRODUCT GROUP

Rev.

ISSUE DATE

PAGE

TFT-LCD

O

2016.03.24

2 OF 34

NT140WHM-N41**Final Product Specification****Rev. O****CHONGQING BOE DISPLAY TECHNOLOGY**

<div>BOE</div>		PRODUCT GROUP		REV	ISSUE DATE
		TFT- LCD PRODUCT		O	2016.03.24
SPEC. NUMBER		SPEC. TITLE NT140WHM-N41 Final Product Specification			PAGE 3 OF 34
REVISION HISTORY					
REV.	ECN No.	DESCRIPTION OF CHANGES		DATE	PREPARED
P0	-	Initial Release		2016.01.31	王云志
O	-	Final Release		2016.03.24	王云志

3

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 4 OF 34

Contents

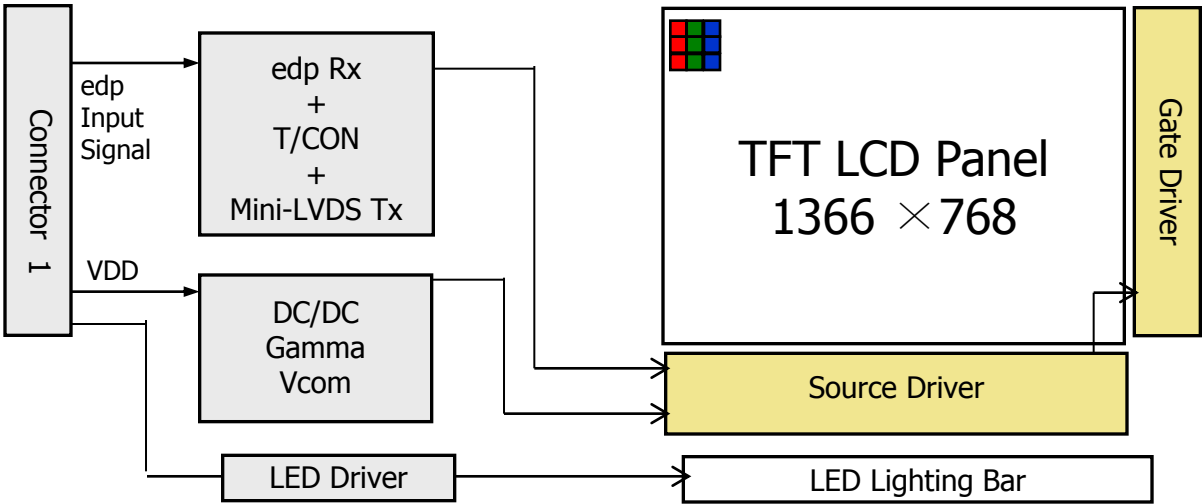
No.	Items	Page
1.0	General Description	5
2.0	Absolute Maximum ratings	7
3.0	Electrical specifications.	8
4.0	Optical specifications.	11
5.0	Interface Connection	16
6.0	Signal Timing Specification	19
7.0	Input Signals, Display Colors & Gray Scale of Colors	21
8.0	Power Sequence	22
9.0	Connector description	23
10.0	Mechanical Characteristics	24
11.0	Reliability Test	25
12.0	Handling & Cautions.	25
13.0	Label	26
14.0	Packing information	28
15.0	Mechanical Outline Dimension	29
16.0	EDID Table	31

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE	PAGE	
	NT140WHM-N41 Final Product Specification	5 OF 34	

1.0 GENERAL DESCRIPTION

1.1 Introduction

NT140WHM-N41 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 HD resolutions (1366 horizontal by 768 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical Stripe and this module can display 6-bit+FRC 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 eDP interface compatible.



1.2 Features

- 1 lane eDP Interface with 1.62Gbps Link Rates
- Thin and light weight
- 6-bit+FRC color depth
- Single LED Lighting Bar. (Down side/Horizontal Direction)
- Data enable signal mode
- Side Mounting Frame
- Green Product (RoHS & Halogen free product)
- On board LED Driving circuit
- Low driving voltage and low power consumption
- On board EDID chip

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 6 OF 34

1.3 Application

- Notebook PC (Wide type)

1.4 General Specification

The followings are general specifications at the model NT140WHM-N41 (listed in Table 1.)

<Table 1. General Specifications>

Parameter	Specification	Unit	Remarks
Active area	309.40(H) × 173.95(V)	mm	
Number of pixels	1366 (H) × 768 (V)	pixels	
Pixel pitch	0.2265(H) × 0.2265 (V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	6-bit+FRC	colors	
Display mode	Normally White		
Dimensional outline	320.9(H)*205.6 (V)*3.0(Max)	mm	
Weight	275(max)	g	
Surface treatment	Anti-Glare		
Back-light	Down edge side, 1-LED Lighting Bar type		Note 1
Power consumption	PD : 0.6	W	
	PBL :2.0	W	
	Ptotal :2.6	W	

Notes : 1. LED Lighting Bar (27*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 >

Ta=25+/-2°C

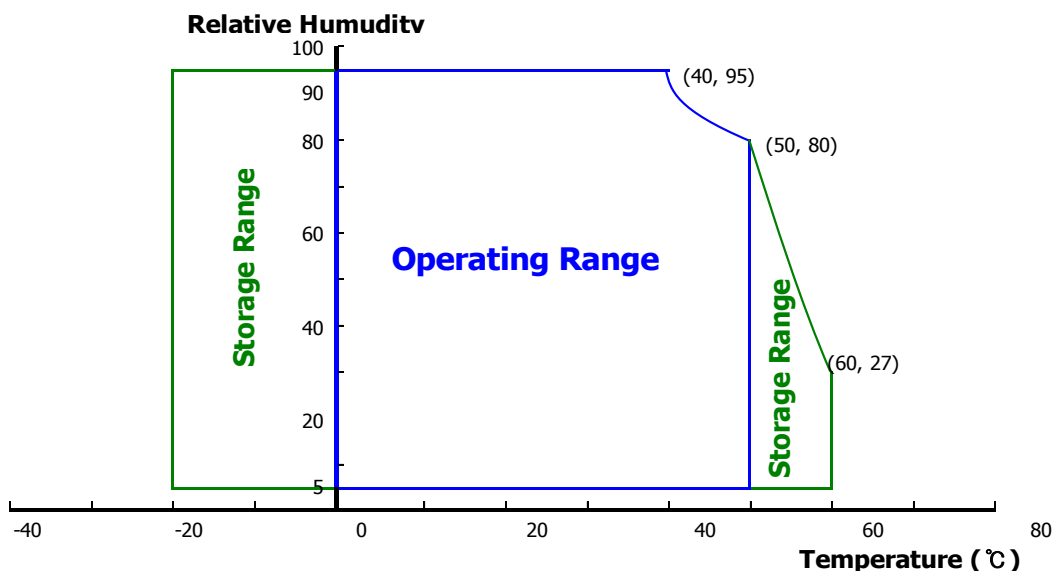
Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	V _{DD}	-0.3	4.0	V	Note 1
Logic Supply Voltage	V _{IN}	V _{ss} -0.3	V _{DD} +0.3	V	
Operating Temperature	T _{OP}	0	+50	°C	Note 2
Storage Temperature	T _{ST}	-20	+60	°C	

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 °C ≥ Ta)

Maximum wet - bulb temperature at 39 °C or less. (Ta > 40 °C) No condensation.



BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 8 OF 34	

3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

< Table 3. Electrical specifications >

Ta=25+/-2°C

Parameter		Min.	Typ.	Max.	Unit	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 _{DD}	-	180	275	mA	Note 1
Positive-going Input Threshold Voltage		V _{IT+}	-	-	100	mV	V _{cm} = 1.2V typ.
Negative-going Input Threshold Voltage		V _{IT-}	-100	-	-	mV	
Differential Input Voltage		V _{ID}	380	-	1200	mV	
CABC enable	High level	-	2.0	-	3.5	V	
	Low level	-	0	-	0.6	V	
Bist enable	High level	-	2.0	-	3.5	V	
	Low level	-	0	-	0.6	V	
Power Consumption		P _D	-	0.6	0.9	W	Note 1
		P _{BL}	-	-	2.0	W	Note 2
		P _{total}	-	-	2.9	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) Typ : Mosaic Pattern

b) Max: Skip sub pixel255

2. Calculated value for reference (V_{LED} × I_{LED})

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 9 OF 34	

3.2 Backlight Unit

< Table 4. LED Driving guideline specifications >

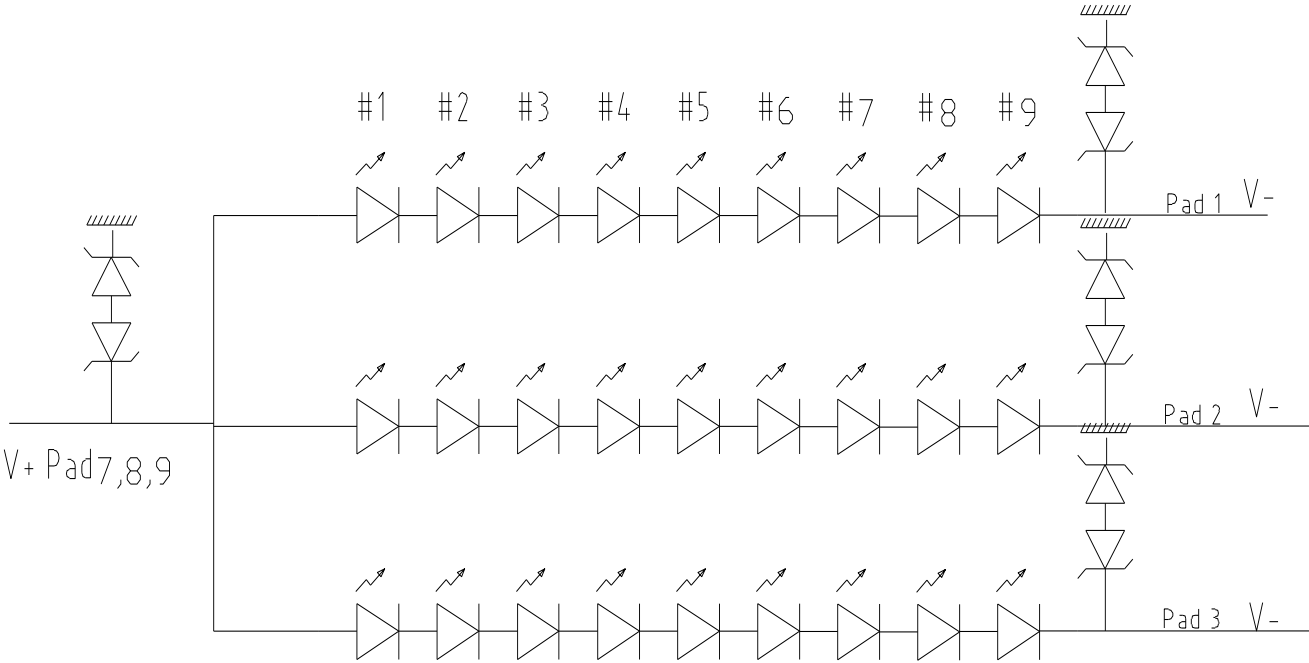
Ta=25+/-2° C

Parameter		Min.	Typ.	Max.	Unit	Remarks	
LED Forward Voltage		V _F	-	-	3.0	V	-
LED Forward Current		I _F	-	21.6	-	mA	-
LED Power Consumption		P _{LED}	-	-	2.0	W	Note 1
LED Life-Time		N/A	15,000	-	-	Hour	IF = 20mA
Power supply voltage for LED Driver		V _{LED}	5	12	21	V	
EN Control Level	Backlight on	-	2.2	-	5.0	V	
	Backlight off	-	0	-	0.6	V	
PWM Control Level	PWM High Level	-	2.2	-	5.0	V	
	PWM Low Level	-	0	-	0.6	V	
PWM Control Frequency		F _{PWM}	100	-	10,000	Hz	
Duty Ratio		-	1	-	100	%	

- Notes : 1. Power supply voltage 12V for LED Driver,
 Calculator Value for reference $IF \times VF \times 27 / \text{efficiency} = P_{LED}$
 2. The LED Life-time define as the estimated time to 50% degradation of initial luminous.

<div>BOE</div>	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 10 OF 34

3.3 LED structure



BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE	PAGE	
	NT140WHM-N41 Final Product Specification	11 OF 34	

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 $\theta\varnothing=0$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta\varnothing=90$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta\varnothing=180$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta\varnothing=270$ ($=\theta_6$) as the 6 o'clock direction ("bottom"). While scanning θ and/or \varnothing , 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 '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	40	45	-	Deg.	Note 1
		Θ_9		40	45	-	Deg.	
	Vertical	Θ_{12}		15	20	-	Deg.	
		Θ_6		30	40	-	Deg.	
Luminance Contrast ratio		CR	$\Theta = 0^{\circ}$	400	500	-		Note 2
Luminance of White	5 Points	Y_w	$\Theta = 0^{\circ}$ ILED =20mA	187	220	-	cd/m ²	Note 3
White Luminance uniformity	5 Points	$\Delta Y5$		80	-	-		Note 4
	13 Points	$\Delta Y13$		65	-	-		
White Chromaticity		x_w	$\Theta = 0^{\circ}$	-0.03	0.313	+0.03		Note 5
		y_w			0.329			
Reproduction of color	Red	x_R	$\Theta = 0^{\circ}$	-0.03	0.590	+0.03		
		y_R			0.350			
	Green	x_G			0.330			
		y_G			0.555			
	Blue	x_B			0.153			
		y_B			0.119			
Gamut					45		%	
Response Time (Rising + Falling)		T_{RT}	Ta= 25° C $\Theta = 0^{\circ}$	-	12	16	ms	Note 6
Cross Talk		CT	$\Theta = 0^{\circ}$	-	-	2.0	%	Note 7

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 12 OF 34	

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.

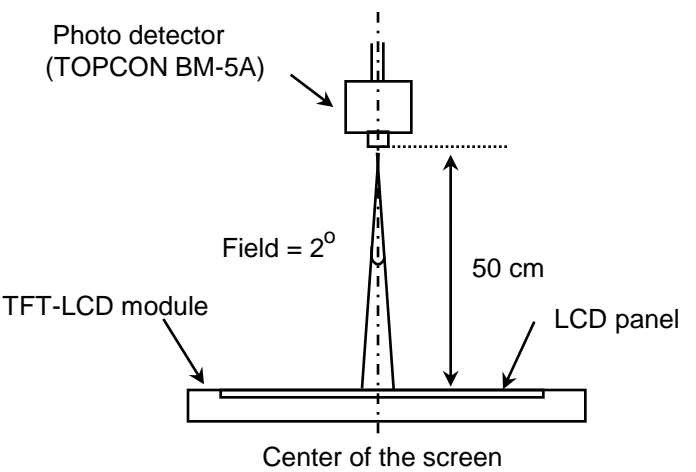
6. The electro-optical response time measurements shall be made as FIGURE 4 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td.

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).

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE	PAGE	
	NT140WHM-N41 Final Product Specification	13 OF 34	

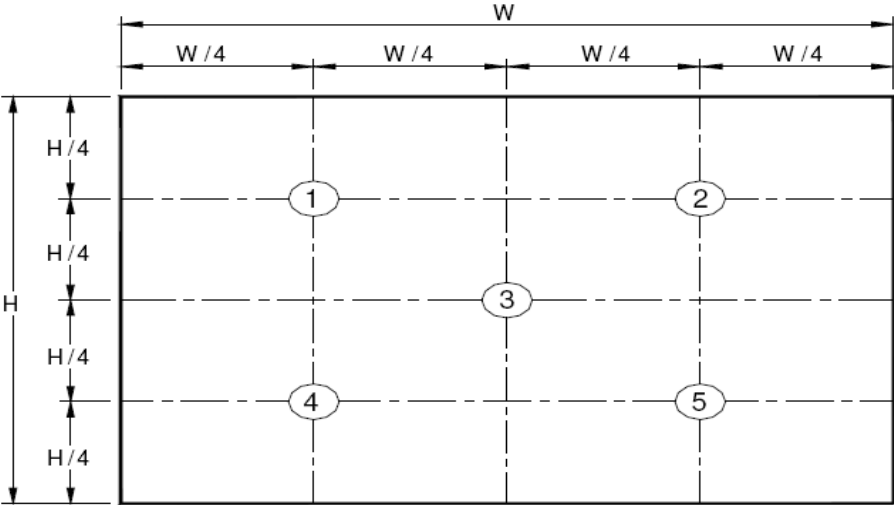
4.3 Optical measurements

Figure 1. Measurement Set Up



Optical characteristics measurement setup

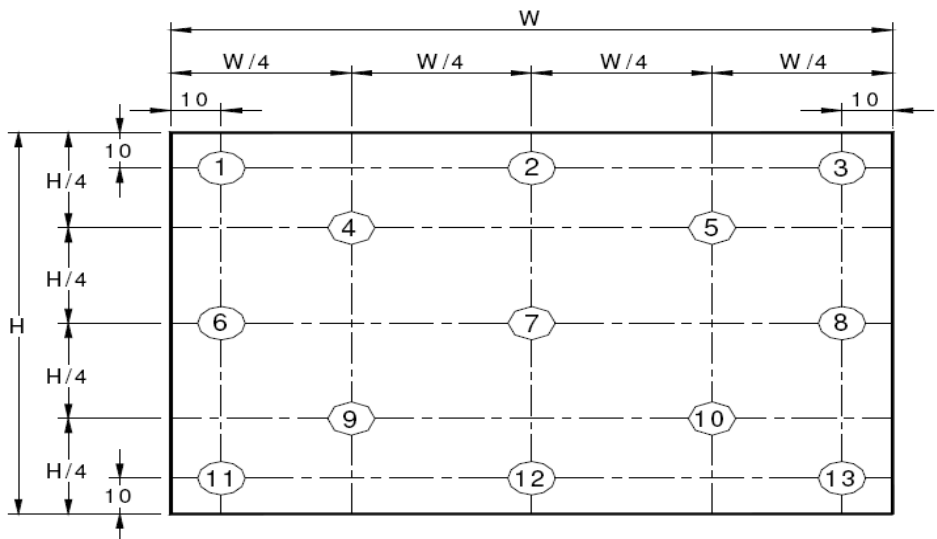
Figure 2. White Luminance and Uniformity Measurement Locations (5 points)



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.

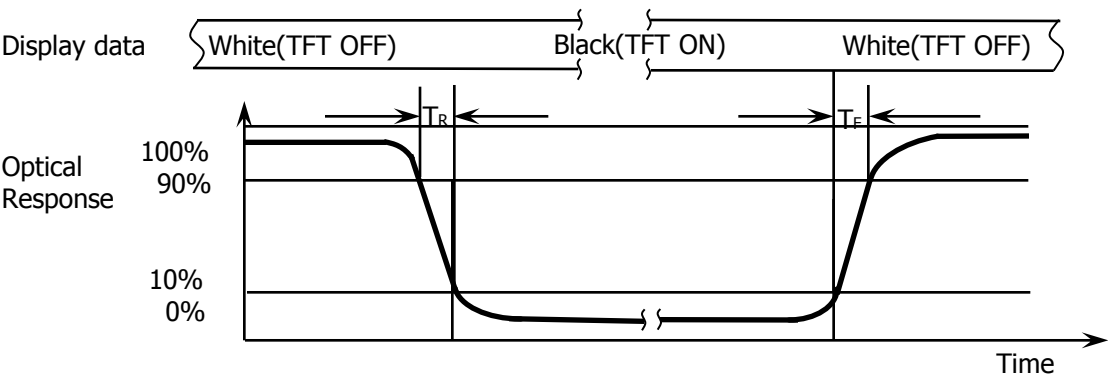
BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 14 OF 34	

Figure 3. Uniformity Measurement Locations (13 points)



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

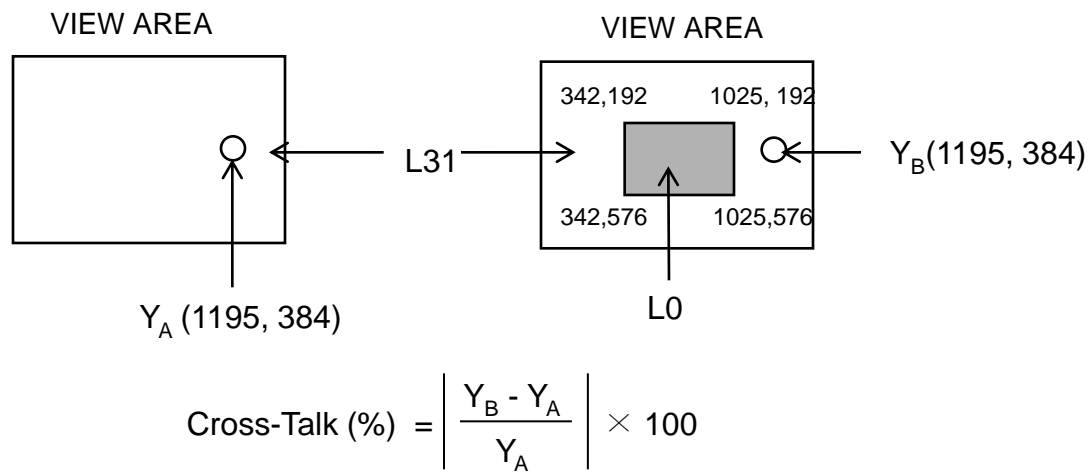
Figure 4. Response Time Testing



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 Td and 90% to 10% is Tr.

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 15 OF 34

Figure 5. Cross Modulation Test Description



Where:

- Y_A = Initial luminance of measured area (cd/m²)
- Y_B = Subsequent luminance of measured area (cd/m²)

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 (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 (Refer to FIGURE 5).

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 16 OF 34	

5.0 INTERFACE CONNECTION.

5.1 Electrical Interface Connection

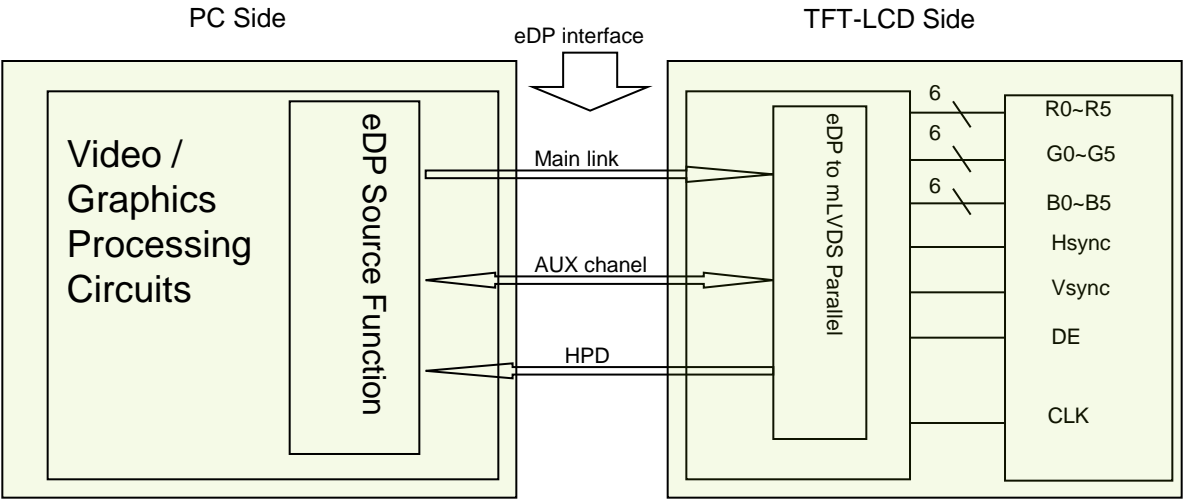
The electronics interface connector is STM. The mating connector part number is I-PEX 20454-030T or Compatible. The connector interface pin assignments are listed in Table 6.

<Table 6. Pin Assignments for the Interface Connector>

Terminal	Symbol	Functions
Pin No.	Symbol	Description
1	CABC_ENABLE	Enable
2	H_GND	Ground
3	NC	No Connection
4	NC	No Connection
5	H_GND	Ground
6	LANE0_N	eDP RX channel 0 negative
7	LANE0_P	eDP RX channel 0 positive
8	H_GND	Ground
9	AUX_CH_P	eDP AUX CH positive
10	AUX_CH_N	eDP AUX CH negative
11	H_GND	Ground
12	LCD_VCC	Power Supply, 3.3V (typ.)
13	LCD_VCC	Power Supply, 3.3V (typ.)
14	LCD_Self_Test	Panel self test enable
15	H_GND	Ground
16	H_GND	Ground
17	HPD	Hot plug detect output
18	BL_GND	LED Ground
19	BL_GND	LED Ground
20	BL_GND	LED Ground
21	BL_GND	LED Ground
22	BL_ENABLE	LED enable pin(+3.3V Input)
23	BL_PWM	System PWM Signal Input
24	NC	No Connection
25	NC	No Connection
26	BL_POWER	LED Power Supply 5V-21V
27	BL_POWER	LED Power Supply 5V-21V
28	BL_POWER	LED Power Supply 5V-21V
29	BL_POWER	LED Power Supply 5V-21V
30	NC	No Connection

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 17 OF 34

5.2. eDP Interface



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

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 18 OF 34

5.3.eDP Input signal

Lane 0	
R0-5:0	G0-5:4
G0-3:0	B0-5:2
B0-1:0	R1-5:0
G1-5:0	B1-5:4
B1-3:0	R2-5:2
R2-1:0	G2-5:0
B2-5:0	R3-5:4
R3-3:0	G3-5:2
G3-1:0	B3-5:0

5.4 Back-light & LCM Interface Connection

Interface Connector: PF040-B09B-C09 or Equivalent

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

Pin No	Symbol	Description	Pin No	Symbol	Description
1	LED1	LED cathode connection	6	NC	No Connection
2	LED2	LED cathode connection	7	Vout	LED anode connection
3	LED3	LED cathode connection	8	Vout	LED anode connection
4	NC	No Connection	9	Vout	LED anode connection
5	NC	No Connection			

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 19 OF 34

6.0 SIGNAL TIMING SPECIFICATION

6.1 NT140WHM-N41 is operated by the DE only.

Item		Symbols	Min	Typ	Max	Unit
Clock	Frequency	1/Tc	69.4	70.12	80	MHz
	High Time	Tch	-	4/7	-	Tc
	Low Time	Tcl	-	3/7	-	Tc
Frame Period		Tv	778	780	820	lines
			-	60	-	Hz
			-	16.7	-	ms
Vertical Display Period		Tvd	768	768	768	lines
One line Scanning Period		Th	1486	1498	1626	clocks
Horizontal Display Period		Thd	1366	1366	1366	clocks

Note※: This Module can support low frame refresh rate 50Hz & 40Hz.

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 20 OF 34

6.2 eDP Rx Interface Timing Parameter
The specification of the eDP Rx interface timing parameter is shown in Table 8.

<Table 8. 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	100	0	1320	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	-	60	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	LRX_SKEW_INTRA_PAIR	-	-	150	ps	

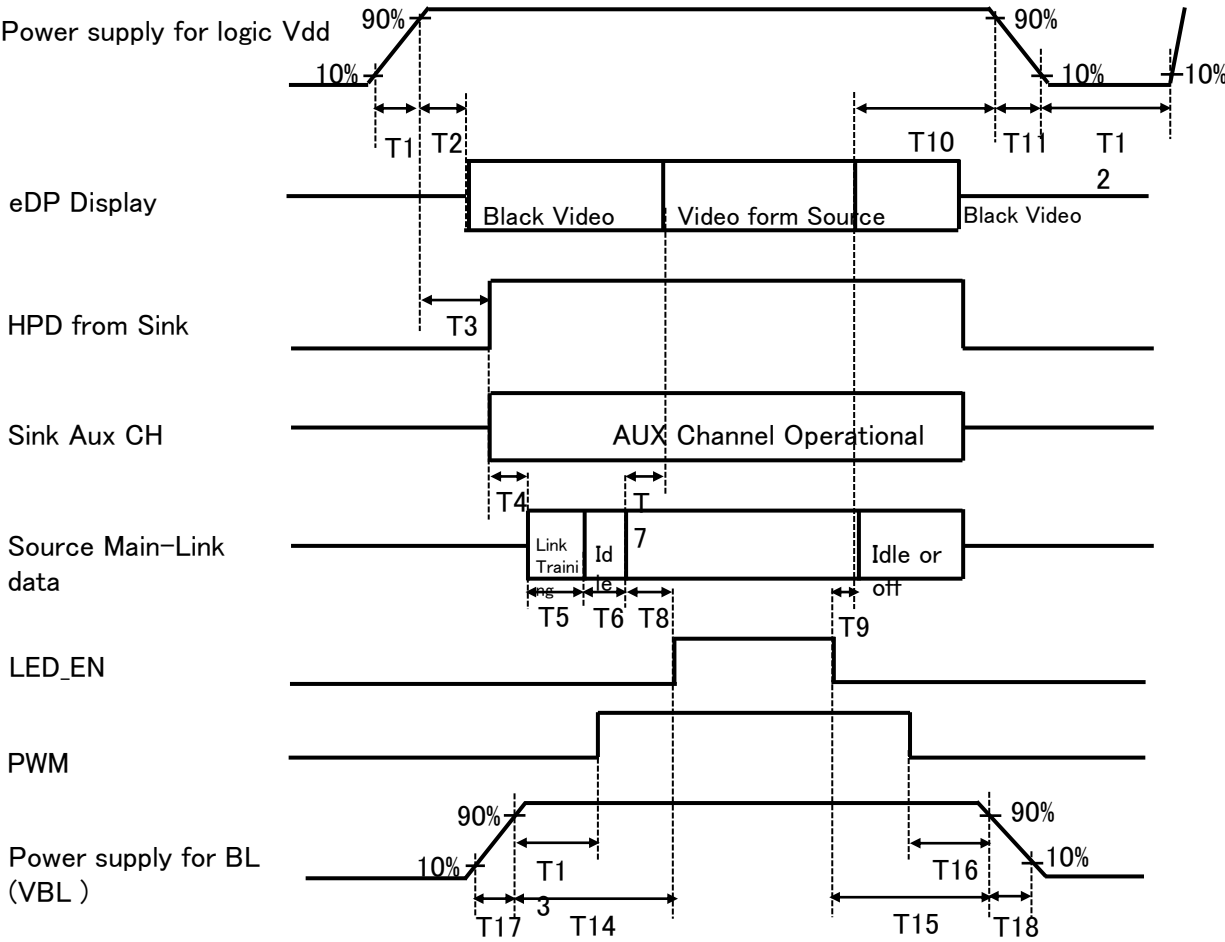
7.0 INPUT SIGNALS, BASIC DISPLAY COLORS & GRAY SCALE OF COLORS

	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

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE	PAGE	
	NT140WHM-N41 Final Product Specification	22 OF 34	

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
 - 0 ms ≤ T11 ≤ 10 ms
 - 150ms ≤ T12
 - 0ms ≤ T15
 - 0ms ≤ T16
 - 0ms ≤ T18

Notes:

- When the power supply VDD is 0V, keep the level of input signals on the low or keep high impedance.
- Do not keep the interface signal high impedance when power is on. Back Light must be turn on after power for logic and interface signal are valid.

	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 23 OF 34

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	STM or Compatible
Type/ Part Number	MSAK24025P30 or Compatible
Mating housing/ Part Number	I-PEX 20454-030T or Compatible

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 24 OF 34	

10.0 MECHANICAL CHARACTERISTICS

10.1 Dimensional Requirements

FIGURE 6 shows mechanical outlines for the model NT140WHM-N41 .
Other parameters are shown in Table 9.

<Table 9. Dimensional Parameters>

Parameter	Specification	Unit
Active Area	309.40(H) × 173.95(V)	
Number of pixels	1366 (H) X 768 (V) (1 pixel = R + G + B dots)	
Pixel pitch	0.22629 (H) X 0.22629 (V)	
Pixel arrangement	RGB Vertical stripe	
Display colors	6-bit+FRC	
Display mode	Normally white	
Dimensional outline	320.9(H)×205.6 (V)×3.0(Max)	mm
Weight	275 (max)	gram
Back Light	Connector : PF040-B09B-C09	
	LED, Horizontal-LED Array type	

10.2 Mounting

See FIGURE 6.

10.3 Anti-Glare and Polarizer Hardness.

The surface of the LCD has an AG coating to minimize reflection and a coating to reduce scratching.

10.4 Light Leakage

There shall not be visible light from the back-lighting system around the edges of the screen as seen from a distance 50cm from the screen with an overhead light level of 350lux.

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 25 OF 34	

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 = 50 °C , 80%RH, 240 hrs
4	High temperature operation test	Ta = 50 °C , 240 hrs
5	Low temperature operation test	Ta = -5 °C , 240 hrs
6	Thermal shock	Ta = -20 °C ↔ 60 °C (0.5 hr), 100 cycle
7	Vibration test (non-operating)	1.5G, 10~500Hz, Half Sine X,Y,Z / Sweep rate : 1 hour
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 would be damaged.

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 26 OF 34

- (4) Cautions for the atmosphere

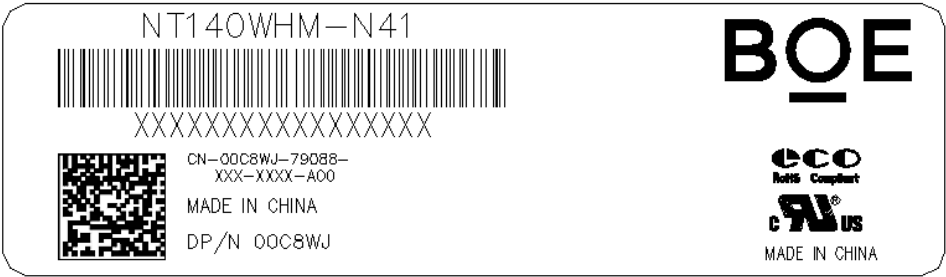
 - Dew drop atmosphere should be avoided.
 - Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.
- (5) Cautions for the module characteristics

 - 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) Product label



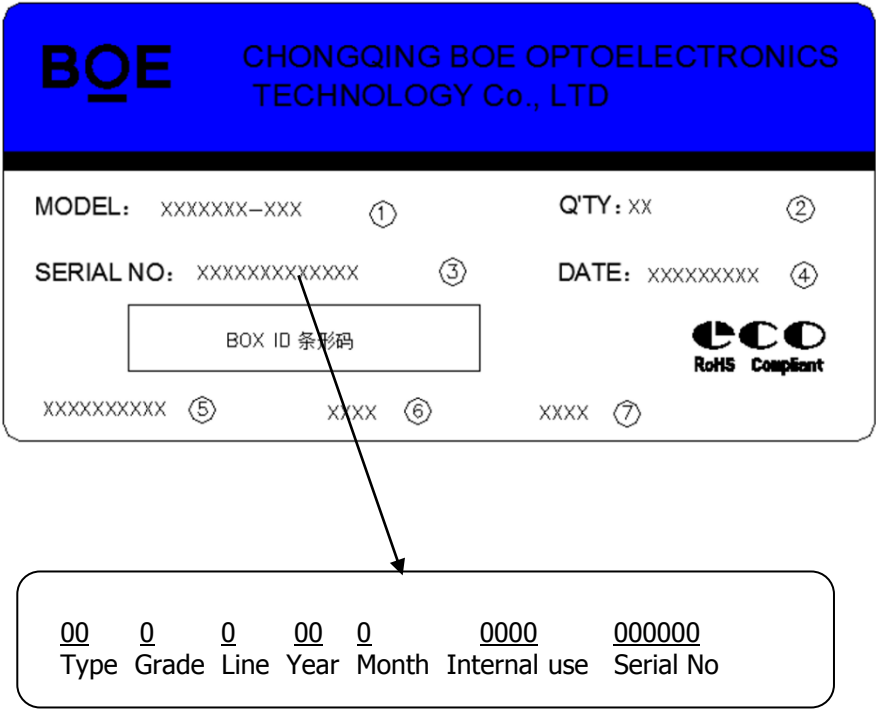
1	2	3	4	5	6	7
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X

Type designation	No 5. Month (1, 2, 3, ..., 9, X, Y, Z)
No 1. Control Number	No 6. Product Identification (FG)
No 2. Rank / Grade	No 7. Serial Number
No 3. Line classification	
No 4. Year (10 : 2010, 11: 2011, ...)	

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification	PAGE 27 OF 34	

(2) Box label

Label Size: 100*50
Contents
Model:
Q`ty: 38 Module Q`ty in one box
Serial No.: Box Serial No. See next figure for detail description.
Date: Packing Date
Internal use of Product



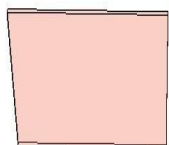
序列号标注部分需打印, 说明如下:

1. **FG-CODE**(前12位)
2. 产品数量
3. **Box ID**
4. 包装日期
5. 客户端段物料号(客户端)---暂不打印,预留空间
6. FG-Code后四位
7. 供应商代码 ---暂不打印

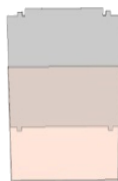
Total Size:100×50mm

14.0 PACKING INFORMATION

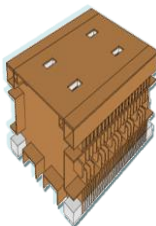
14.1 Packing order



EPE Spacer



PE Bag



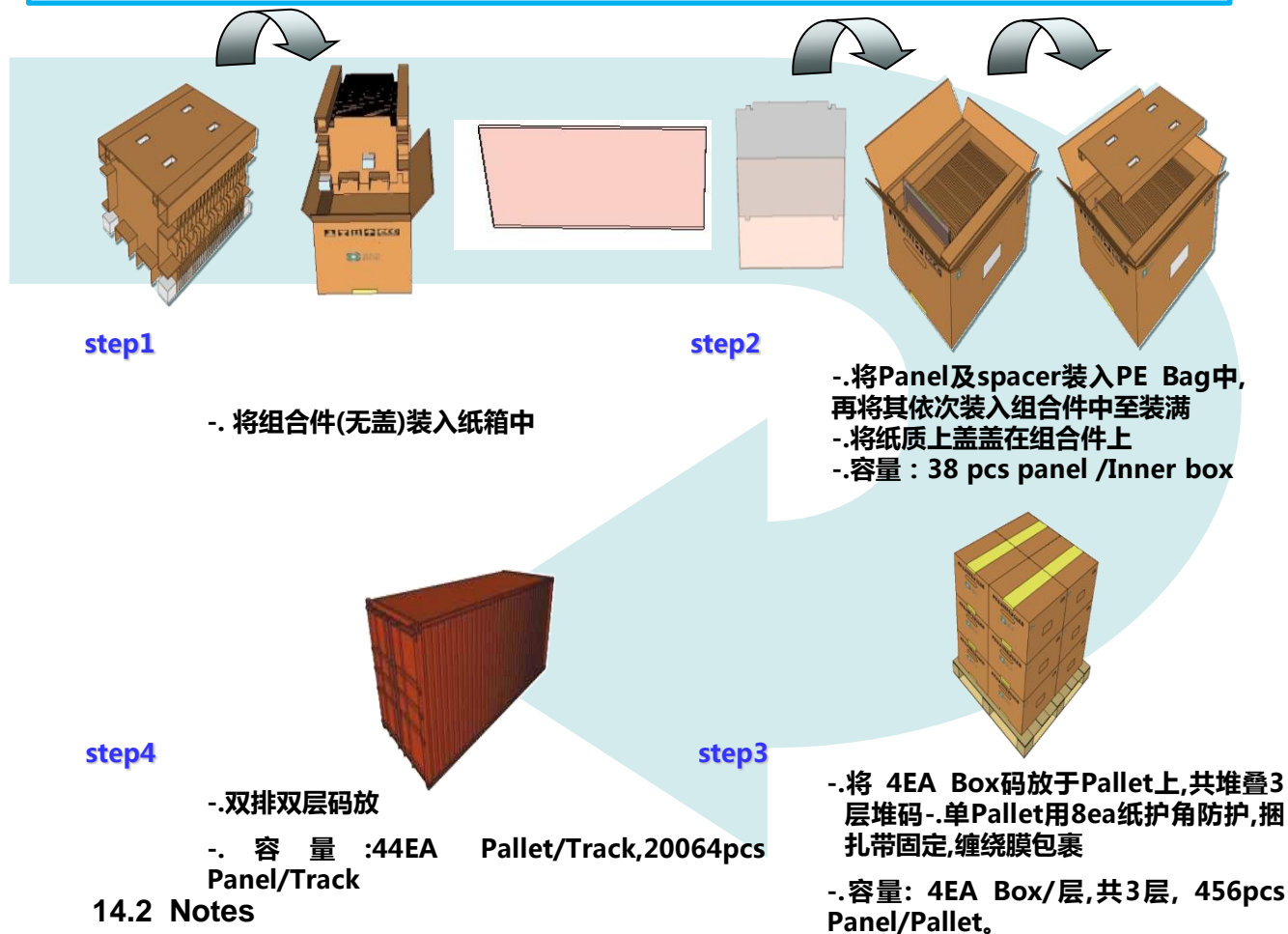
组合件



Inner Box



Pallet Packing

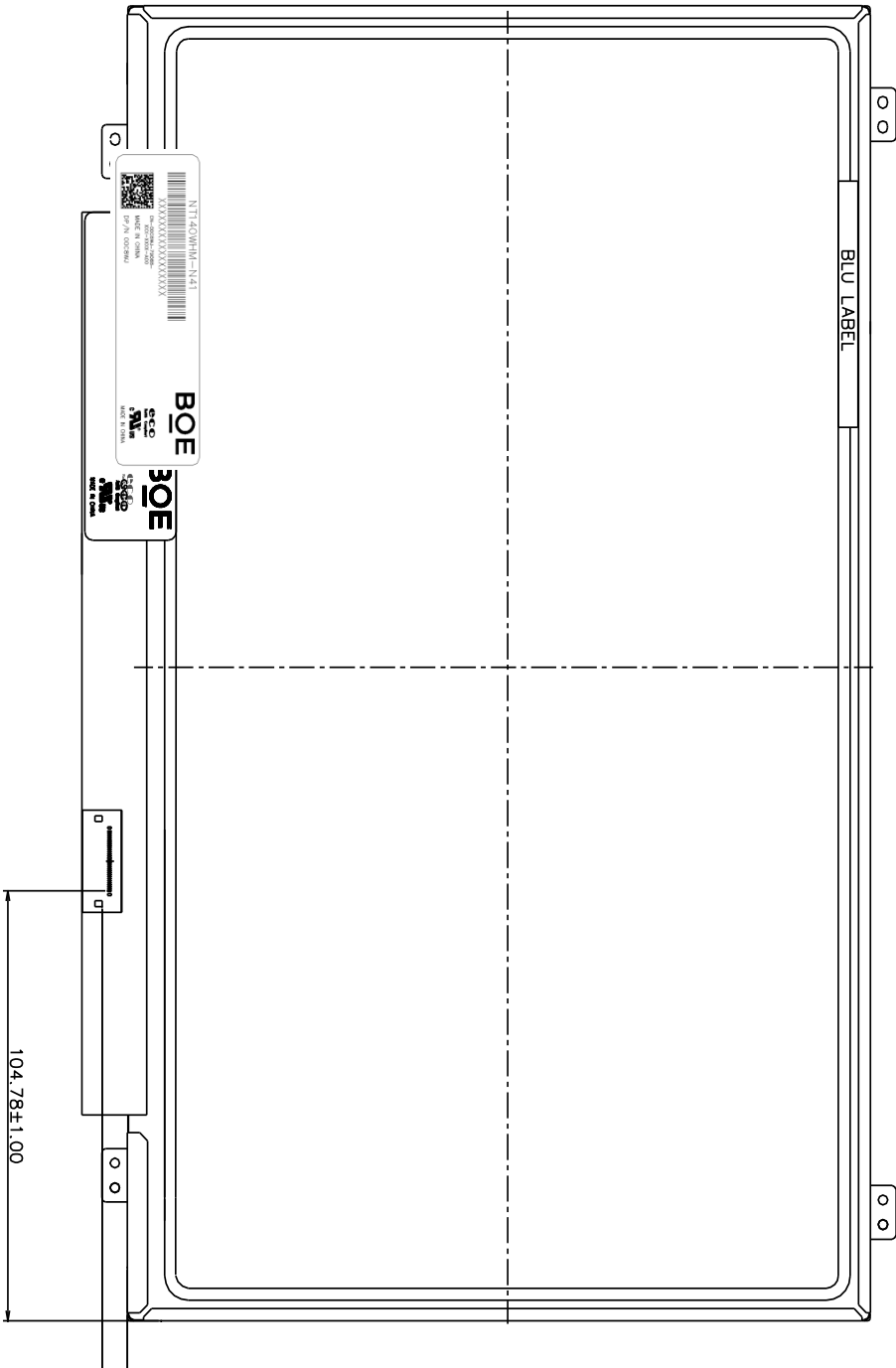


14.2 Notes

- Box Dimension:
- Package Quantity in one Box:
- Total Weight:

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 30 OF 34

Figure 7. TFT-LCD Module Outline Dimensions (Rear view)



16.EDID Table

Address (HEX)	Function	Hex	Dec	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	B6	182	1718	ID = 1718
0B		06	6		
0C	32-bit serial No.	00	0	0	
0D		00	0	0	
0E		00	0	0	
0F		00	0	0	
10	Week of manufacture	01	1	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 #	04	4	4	EDID Rev. 0.4
14	Video input definition	95	149	-	digital signal/DP input
15	Max H image size	1F	31	31	31 cm (Approx)
16	Max V image size	11	17	17	17 cm (Approx)
17	Display Gamma	78	120	2.2	Gamma curve = 2.2
18	Feature support	02	2	-	Refer to right table
19	Red/Green low bits	24	36	-	Red / Green Low Bits
1A	Blue/White low bits	10	16	-	Blue / White Low Bits
1B	Red x high bits	97	151	0.590	Red (x) = 10010111 (0.59)
1C	Red y high bits	59	89	0.350	Red (y) = 01011001 (0.35)
1D	Green x high bits	54	84	0.330	Green (x) = 01010100 (0.33)
1E	Green y high bits	8E	142	0.555	Green (y) = 10001110 (0.555)
1F	Blue x high bits	27	39	0.153	Blue (x) = 00100111 (0.153)
20	BLue y high bits	1E	30	0.119	Blue (y) = 00011110 (0.119)
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 1	00	0	-	
24	Established timing 2	00	0	-	
25	Established timing 3	00	0	-	

Address (HEX)	Function	Hex	Dec	Input values.	Notes
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		01	1		
36	Detailed timing/monitor descriptor #1	64	100	70.1	70.1217MHz Main clock
37		1B	27		
38		56	86	1366	Hor Active = 1366
39		77	119	119	Hor Blanking = 119
3A		50	80	-	4 bits of Hor. Active + 4 bits of Hor. Blanking
3B		00	0	768	Ver Active = 768
3C		13	19	19	Ver Blanking = 19
3D		30	48	-	4 bits of Ver. Active + 4 bits of Ver. Blanking
3E		30	48	48	Hor Sync Offset = 48
3F		20	32	32	H Sync Pulse Width = 32
40		36	54	3	V sync Offset = 3 line
41		00	0	6	V Sync Pulse width : 6 line
42		35	53	309	Horizontal Image Size = 309 mm (Low 8 bits)
43		AD	173	173	Vertical Image Size = 173 mm (Low 8 bits)
44		10	16	-	4 bits of Hor Image Size + 4 bits of Ver Image Size
45		00	0	0	Hor Border (pixels)
46		00	0	0	Vertical Border (Lines)
47		1A	26		Refer to right table

Address (HEX)	Function	Hex	Dec	Input values.	Notes
48	Detailed timing/monitor descriptor #2	70	112	60.0	60MHz Main clock
49		17	23		
4A		56	86	1366	Hor Active = 1366
4B		8C	140	140	Hor Blanking = 140
4C		50	80	-	4 bits of Hor. Active + 4 bits of Hor. Blanking
4D		00	0	768	Ver Active = 768
4E		3E	62	62	Ver Blanking = 62
4F		30	48	-	4 bits of Ver. Active + 4 bits of Ver. Blanking
50		30	48	48	Hor Sync Offset = 48
51		20	32	32	H Sync Pulse Width = 32
52		36	54	3	V sync Offset = 3 line
53		00	0	6	V Sync Pulse width : 6 line
54		35	53	309	Horizontal Image Size = 309 mm (Low 8 bits)
55		AD	173	173	Vertical Image Size = 173 mm (Low 8 bits)
56		10	16	-	4 bits of Hor Image Size + 4 bits of Ver Image Size
57		00	0	0	Hor Border (pixels)
58		00	0	0	Vertical Border (Lines)
59		1A	26		
5A	Detailed timing/monitor descriptor #3	00	0		ASCII Data Sting Tag
5B		00	0		
5C		00	0		
5D		FE	254		
5E		00	0		
5F		30	48	0	D/PN:0C8WJ
60		43	67	C	
61		38	56	8	
62		57	87	W	
63		4A	74	J	
64		80	128	10000000	EDID:A00
65		4E	78	N	BOE PN
66		54	84	T	
67		31	49	1	
68		34	52	4	
69		4E	78	N	
6A		34	52	4	
6B		31	49	1	

BOE	PRODUCT GROUP	REV	ISSUE DATE
	TFT- LCD PRODUCT	O	2016.03.24
SPEC. NUMBER	SPEC. TITLE NT140WHM-N41 Final Product Specification		PAGE 34 OF 34

Address (HEX)	Function	Hex	Dec	Input values.	Notes
6C	Detailed timing/monitor descriptor #4	00	0		Product Name Tag (ASCII)
6D		00	0		
6E		00	0		
6F		00	0		
70		00	0		
71		01	1	-	6-bit Color Depth & FRC
72		41	65	-	WLED & singal light bar & one light bar
73		21	33	-	Frame rate 40Hz~65Hz
74		96	150	10010110	Light Controller:PWM & Max. Luminance 220
75		00	0	00000000	Front Surface: AG & RGB v-stripe
76		10	16	00010000	NTSC & DBC
77		00	0	00000000	no Motion Blur & no Active Gamma
78		00	0	00000000	no Wireless Enhancement & no In-Cell Scanner
79		09	9	00001010	1lane edp1.2
7A		01	1	00000001	Built-In Self Test
7B		0A	10		
7C		20	32		
7D		20	32		
7E	Extension flag	00	0		
7F	Checksum	F3	243	-	