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TITLE : DV650QUM-N00
Product Preliminary Specification
Rev.P2

HEFEI BOE Display TECHNOLOGY CO. LTD

SPEC. NUMBER z_T][ThhTW[Y	PRODUCT GROUP TFT-LCD	Rev. P2	ISSUE DATE 2019.03.14	PAGE 1 OF33
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1. GENERAL DESCRIPTION

The DV650QUM-N00 is a Color Active Matrix Liquid Crystal Display with LED backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive display type which is operating in the normally black mode. It has a 64.5 inch diagonally measured active display area with UHD resolutions (3840 horizontal by 2160 vertical pixel array)). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this open cell can display 1.07G colors.

It is intended to support LCD TV, PCTV where high brightness, super wide viewing angle, high color gamut, high color depth and fast response time are important

-PCBI:BOE HV650QUB-F90 (Skyworh PN: 7712-1650000-2290)

T-CON (Skyworh PN: 7712-3650000-0310)

General Features

Active Screen Size	64.53 inches diagonal (1428.48(H)h803.52(V))	
Pixel Pitch	0.372(H) x0.372(V)	
Pixel Format	3840 (H) x2160(V)	
Color Depth	8bit+FRC, 1.07G colors	
Luminance, White	TYP 500 nits	
Viewing Angle (CR>10)	Viewing angle free (R/L 178 (Typ.), U/D 178 (Typ.))	
Power Consumption	Total	Typ:229.6 , Max:280.8
	Logic	Typ:12W ,Max:36W
	BLU	Typ:217.6 ,Max:244.8
Display Mode	Normally black	
Surface Treatment	Haze 1%, 3H, Anti-glare treatment (Front Polarizer) Haze 1%, 3H, Anti-glare treatment (Bottom Polarizer)	
Lift Time	50000 Hrs	
Remark	7*24 Hrs Continuous Operation Horizontal and Perpendicular compatibility	

MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal(H)	1449.48	1450.48	1451.48	mm	
	Vertical(V)	824.42	825.42	826.42	mm	
	Depth(D)	31	32	33	mm	
Weight			18.895		kg	

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2. Absolute Maximum Ratings

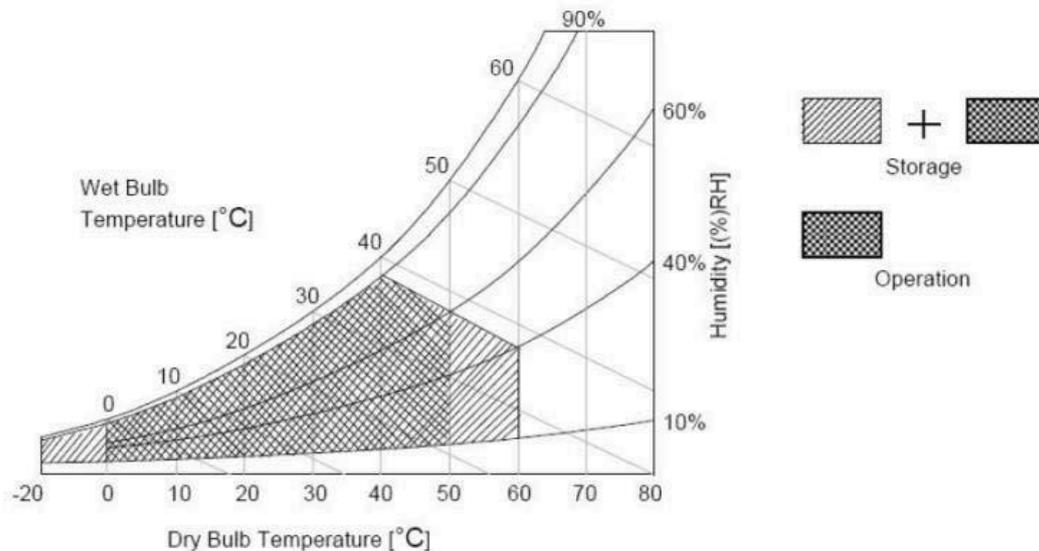
The following items are maximum values which, if exceeded, may cause faulty operation or damage to the LCD module.

Table 1. ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value		Unit	Note
		Min	Max		
Backlight Input Voltage LED Bar Circuit	VBL	98.6	122.4	VRMS	
Operating Temperature	TOP	0	+50	°C	1
Storage Temperature	TST	-20	+60	°C	
Operating Ambient Humidity	HOP	10	80	%RH	
Storage Humidity	HST	10	80	%RH	

Note 1 : Temperature and relative humidity range are shown in the figure below.

Note 2 : Wet bulb temperature should be 39 °C max. and no condensation of water.



ZU Electrical Specifications

3.1.TFT LCD Open Cell

< Table 3. Open Cell Electrical Specifications >

[Ta=25±2℃]

Parameter	Symbol	Values			Unit	Remark	
		Min	Typ	Max			
Power Supply Input Voltage	VDD	10.8	12	13.2	Vdc		
Power Supply Ripple Voltage	VRP	-	-	1140	mV		
Power Supply Current	IDD	-	800	2000	mA	Note 1	
Power Consumption	PDD	-	9.6	26.4	Watt		
Rush current	IRUSH	-	-	10	A	Note 2	
V by One Interface	Differential Input High Threshold Voltage	VLVTH	-	-	+50	mV	-
	Differential Input Low Threshold Voltage	VLVTL	-50	-	-	mV	-
	Common Input Voltage	VLVC	-	-	-	V	-
	Terminating Resistor	Rt	90	100	110	ohm	-
CMOS Interface	Input High Threshold Voltage	VIH	-	2.31	-	V	
	Input Low Threshold Voltage	VIL	0.8	-	-	V	

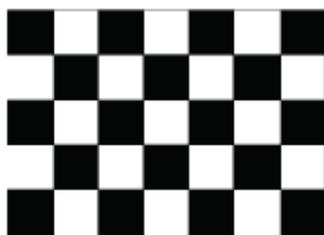
Note 1 : The supply voltage is measured and specified at the interface connector of LCM.

The current draw and power consumption specified is for VDD=12.0V,

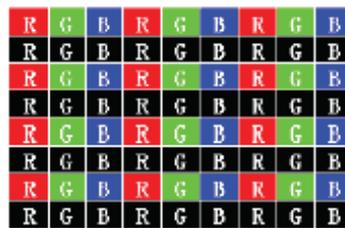
Frame rate $f_v=60\text{Hz}$ and Clock frequency = 74.25MHz.

Test Pattern of power supply current

Note 2 : The duration of rush current is about 2ms and rising time of Power Input is 0.5ms(min)



a) Typ : Mosaic 7X5 (L0/L255)



b) Max : Horizontal 1 Line (L0/L255)



c) Flicker Test Pattern

3.2 Backlight Module

3.2.1 LED LIGHTBAR UNIT CHARACTERISTICS (Ta = 25 ± 2 °C)

Symbol	Unit	Parameter			Symbol	Unit
		Symbol	Value	Symbol		
Symbol	Unit	Symbol	Value	Symbol	Unit	
m	mm	Symbol	108.8	Symbol	mm	
m	mm	T	2000	T	h	
w	mm	Symbol	217.6	Symbol	mm	
s	mm	Symbol	T	Symbol	X	

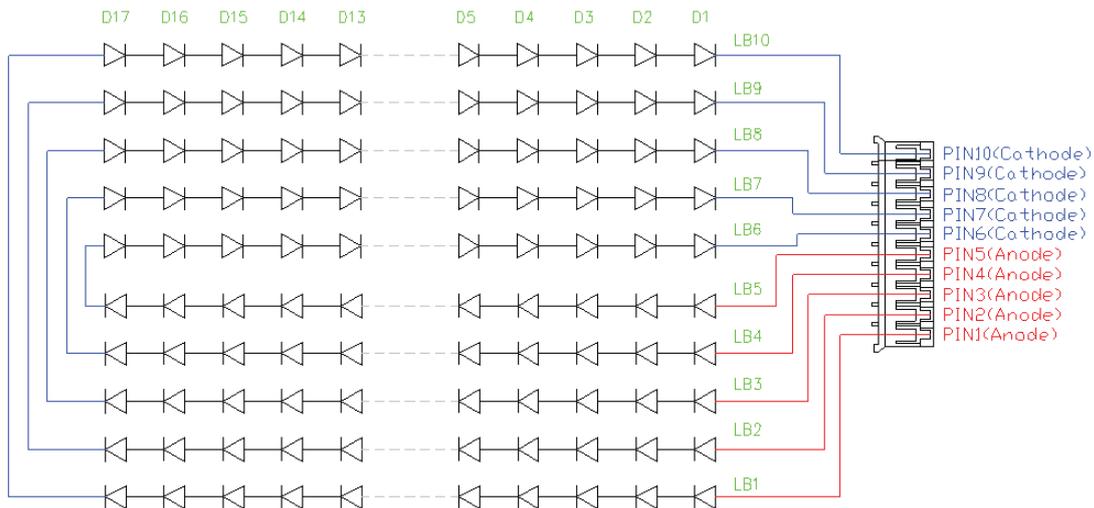
Note

(1) The lifetime is defined as the time which luminance of the LED decays to 30% compared to the initial value, Operating condition: Continuous operating at Ta = 25±2°C

-LED Bar Block Diagram

LED Numbers: 20bar / BLU

Total 170LED / BLU



3.3 LED Constant current source LED

3.3.1 Input Electrical Characteristics

NO	Item	Symbol	Min	Type	Max	Unit
1	Input Voltage	Vin	20.8	24	26	V
2	Input Current	Iin		10	12.5	A
3	Input Power	Pin		244.8	300	W
4	Brightness Voltage	Vadj	0(bright)	---	5 ^o dark	V
5	Control Voltage	Enable Von=1.5---5.0V Disable Voff=0---0.5V				

3.3.2 Output electrical characteristics

	Symbol	Test Conditions	Min	Type	Max	Unit
Output Current (per group)	Iout	Vin=24.0V; Vout=57V; Ta=28 ^o C		400	500	mA
Output Voltage	Vout	Vin=24.0V; Ta=28 ^o C	50	122.5	185	V
Efficiency	η	Vin=24.0V; Vout=57V;		92.5		%
Output total group	Ggp			5		
The Total Output Current	R	According to the backlight parameters to adjust output current		2000	2500	MA
output power	W out	Vin=24.0V; Vout=122.4V;		244.8	300	W

The parameter of upon will change when the LCD module changes

3.3.3 Pin assignments

Input connector: CN1

Pin No.	Symbol	Description	Parameter
1	+24V	Supply voltage	22~26V
6	GND	Ground	0V
13	ADJ	Dimming control	0V=Brightness Max 5V=Brightness Min
12	N/F	Standby/Operation	On =1-5.0V Off=0-0.5V
14	NC		

Output socket	Pin No.	Symbol	Description	Parameter
CN2	1	A+	Output voltage	60-185V
	2	B+	Output voltage	60-185V
	3	C+	Output voltage	60-185V
	4	D+	Output voltage	60-185V
	5	E+	Output voltage	60-185V
	6	A-	Ground	0
	7	B-	Ground	0
	8	C-	Ground	0
	9	D-	Ground	0
	10	E-	Ground	0

The above output parameters are determined according to the optical requirement. The products are not intended for use in systems in which failures of product could result in personal injury.



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SAMPLE TEST REPORT

CUSTOMER:								
MOOEL NO.	XY-CC6575H							
1.Input Charcteristics								
Parameter	Symbo l/	Min	Typ	Max	Unit	Remark	Spec.Limit	Pass/Fail
nput Voltage	Vin	20	24	26	V	Input D C	21.5~25V	Pass
Input Current	Iin		10	12.5	\$	9DGM 0 9	\$a12.\$ \$	Pass
Input Power	Pin		244.8	300	:		130~300:	Pass
Input Voltage O N/offcontrol	Von/Of f	2.5~5	2.5~5	2.5~5	V	On	2.5~5V	Pass
		0~0.5	0~0.5	0~0.5	V	Off	0~0.5V	Pass
2.Output Characteristics								
Parameter	Symbo l	Min	Typ	Max	Unit	Remark	Spec.Limit	Pass/Fail
Output Voltage	+	Ç0	122.8	18\$	9		Ç0a18\$	Pass
Output Current	+		400	\$00	P\$		390a\$00	Pass
Low temperatur e test	00,(24VDC - 10%) The sample OK							

Please do not live in the assembly of the product, so as to avoid short circuit caused the product damage and other circuit board fault
 Use this product to correspond to the required voltage, current parameter, otherwise cause the load capacity is insufficient or excessive flow, the impact of LED life

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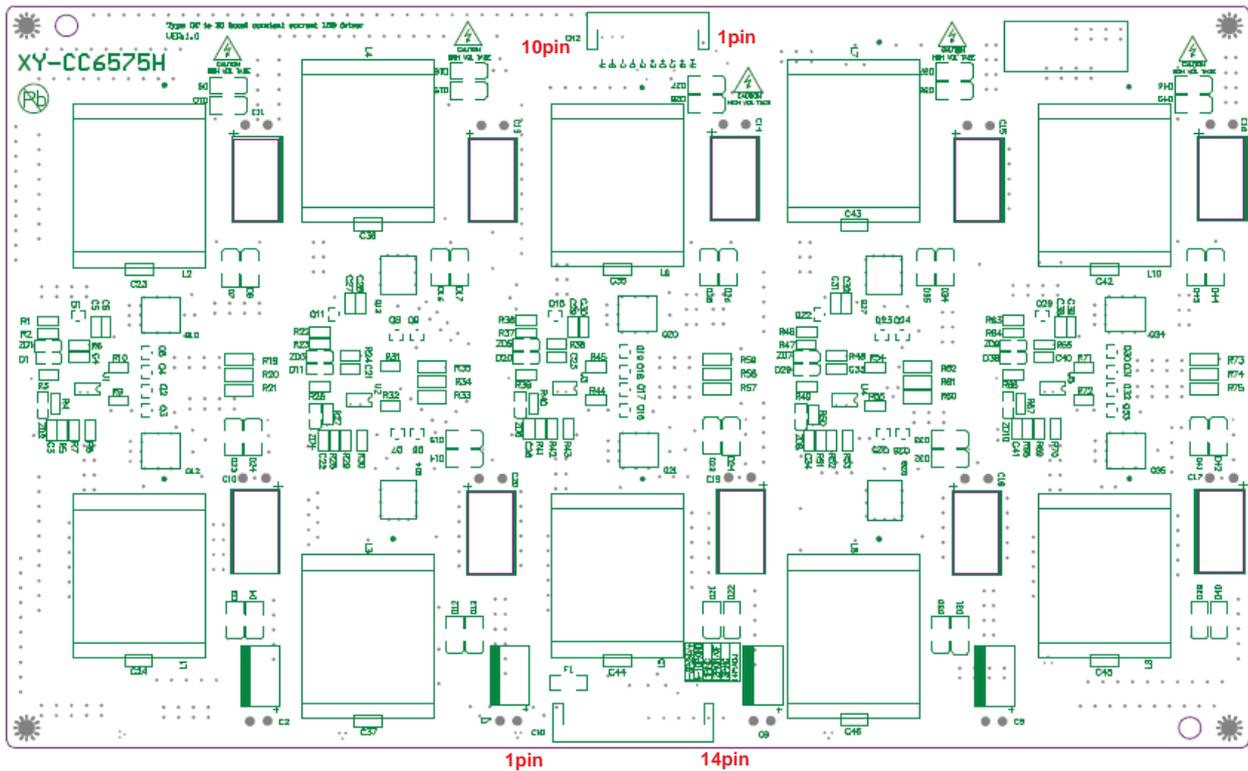
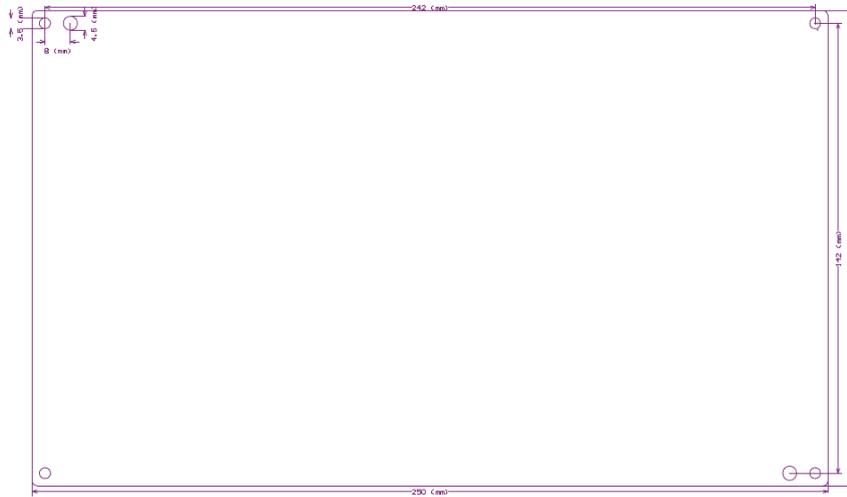
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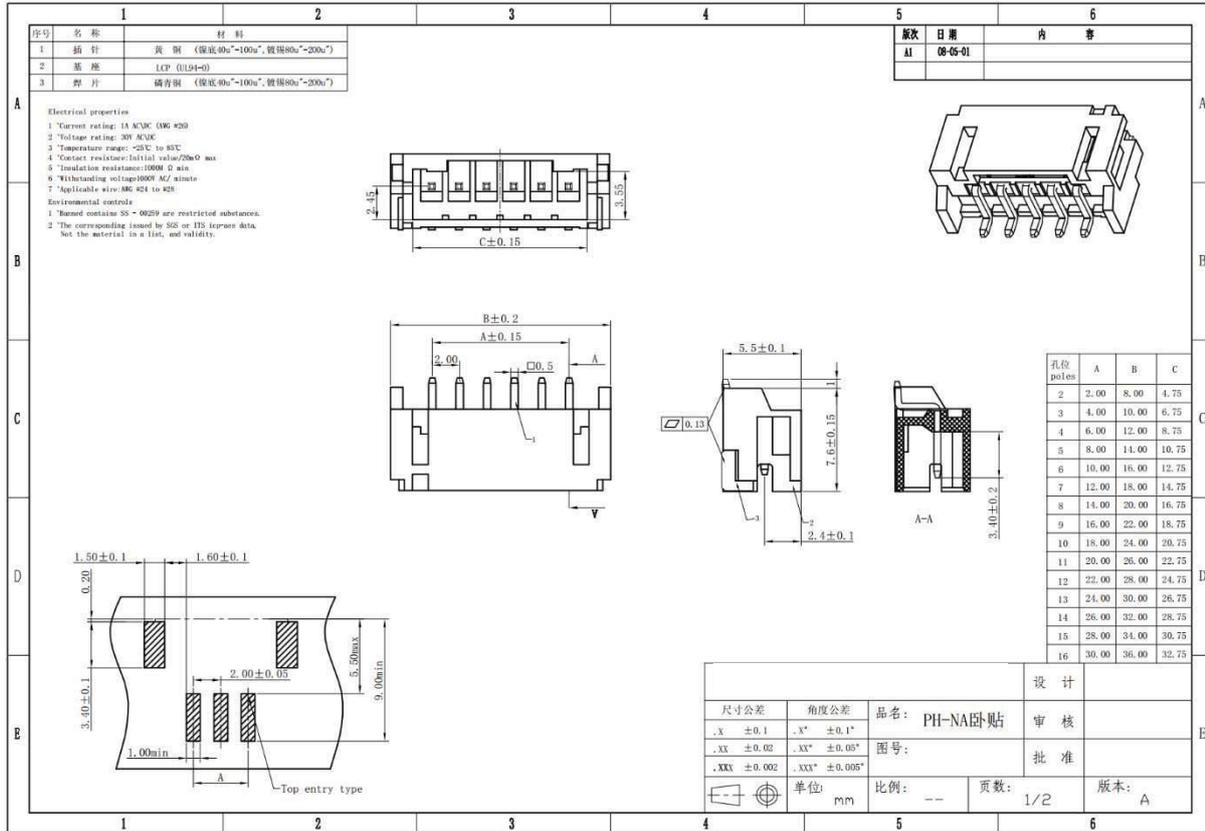
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3.3.4 Mechanical Dimension



1RWH: 1. 7KH WKLFNQHVV RI WKH ERDUG LV 1100 (LQFOXGLQJ FRPSRQHVV)

3.3.5 Conector Type



Note

- The Connector used in this product is 14Pin.
- This Connector is used for Converter's input.

4. Interface Connections

4.1 Open Cell Input Signal& Power

- V by one Connector : F05035-51P-H(昶通)or Equivalent.

< Table 7. Open Cell Input Connector Pin Configuration >

Pin No	Symbol	Description	Pin No	Symbol	Description
1	VDD	Power Supply +12.0V	27	GND	Ground
2	VDD	Power Supply +12.0V	28	Rx0n	V-by-One HS Data Lane 0
3	VDD	Power Supply +12.0V	29	Rx0p	V-by-One HS Data Lane 0
4	VDD	Power Supply +12.0V	30	GND	Ground
5	VDD	Power Supply +12.0V	31	Rx1n	V-by-One HS Data Lane 1
6	VDD	Power Supply +12.0V	32	Rx1p	V-by-One HS Data Lane 1
7	VDD	Power Supply +12.0V	33	GND	Ground
8	VDD	Power Supply +12.0V	34	Rx2n	V-by-One HS Data Lane 2
9	NC	No Connection	35	Rx2p	V-by-One HS Data Lane 2
10	GND	Ground	36	GND	Ground
11	GND	Ground	37	Rx3n	V-by-One HS Data Lane 3
12	GND	Ground	38	Rx3p	V-by-One HS Data Lane 3
13	GND	Ground	39	GND	Ground
14	GND	Ground	40	Rx4n	V-by-One HS Data Lane 4
15	NC	No Connection	41	Rx4p	V-by-One HS Data Lane 4
16	NC	No Connection	42	GND	Ground
17	NC	No Connection	43	Rx5n	V-by-One HS Data Lane 5
18	SDA	Tcon_SDA_IN	44	Rx5p	V-by-One HS Data Lane 5
19	SCL	Tcon_SCL_IN	45	GND	Ground
20	NC	No Connection	46	Rx6n	V-by-One HS Data Lane 6
21	NC	No Connection	47	Rx6p	V-by-One HS Data Lane 6
22	Section	L : 1 division, H : 2 division Default: L	48	GND	Ground
23	NC	No Connection	49	Rx7n	V-by-One HS Data Lane 7
24	GND	Ground	50	Rx7p	V-by-One HS Data Lane 7
25	HTPDN	Hot plug detec	51	GND	Ground
26	LOCKN	Lock detect			

Note 1: NC (Not Connected) : This pins are only used for BOE internal operations.

Note 2: BIST : This pin is used for selecting display pattern mode when input DE or input CLOCK quits toggling.

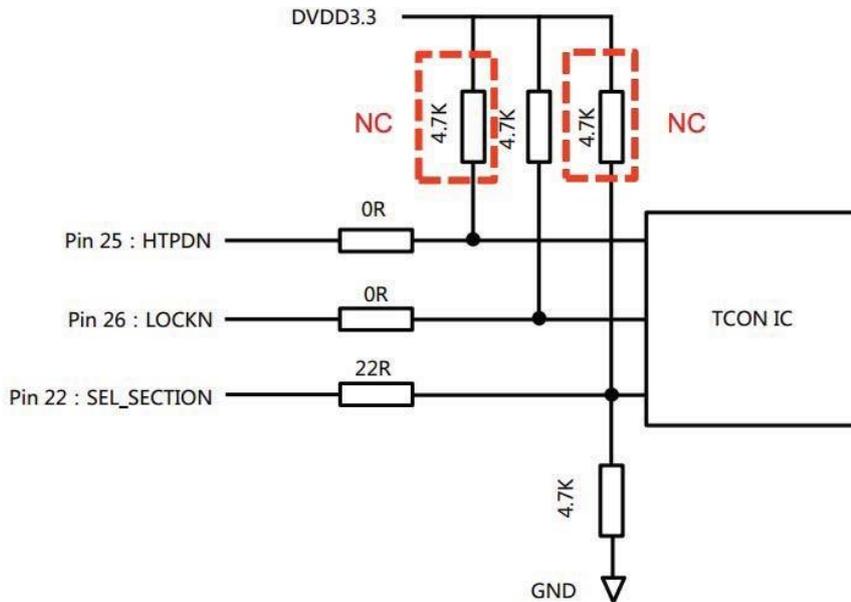
BIST Pattern



4. Interface Connections

4.1 Open Cell Input Signal& Power

- Notes :
1. NC (Not Connected) : This pins are only used for BOE internal operations.
 2. BIST : This pin is used for selecting display pattern mode when input DE or input CLOCK quits toggling.
 3. Circuit Block Diagram of HTPDN/LOCKN/SEL_SECTION.



4. Interface Connections

4.2 V by one Misc. Setting.-1 Section

- a) System side have to put pull high resistor on LOCKN/HTPDN pins.
- b) V by one data mapping as follows.

< Table 8. V by one setting &data mapping Table >

1 Section								
Hactive = 3840								
	Port0		Port1		Port2		Port3	
	Lane0	Lane1	Lane2	Lane3	Lane4	Lane5	Lane6	Lane7
V Blanking	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP

	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR
Line 1	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 5	Pixel 6	Pixel 7	Pixel 8
	Pixel 9	Pixel 10	Pixel 11	Pixel 12	Pixel 13	Pixel 14	Pixel 15	Pixel 16

	Pixel 3833	Pixel 3834	Pixel 3835	Pixel 3836	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840
H Blanking	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP

	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE
Line 2	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 5	Pixel 6	Pixel 7	Pixel 8
	Pixel 9	Pixel 10	Pixel 11	Pixel 12	Pixel 13	Pixel 14	Pixel 15	Pixel 16

	Pixel 3833	Pixel 3834	Pixel 3835	Pixel 3836	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840

4. Interface Connections

4.3 V by one Misc. Setting.-2 Section

- a) System side have to put pull high resistor on LOCKN/HTPDN pins.
- b) V by one data mapping as follows.

< Table 9. V by one setting &data mapping Table >

2 Section								
Hactive = 3840								
	Port0		Port1		Port2		Port3	
	Lane0	Lane1	Lane2	Lane3	Lane4	Lane5	Lane6	Lane7
V Blanking	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP

	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR	FSBE SR
Line 1	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 1921	Pixel 1922	Pixel 1923	Pixel 1924
	Pixel 5	Pixel 6	Pixel 7	Pixel 8	Pixel 1925	Pixel 1926	Pixel 1927	Pixel 1928

	Pixel 1917	Pixel 1918	Pixel 1919	Pixel 1920	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840
H Blanking	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP

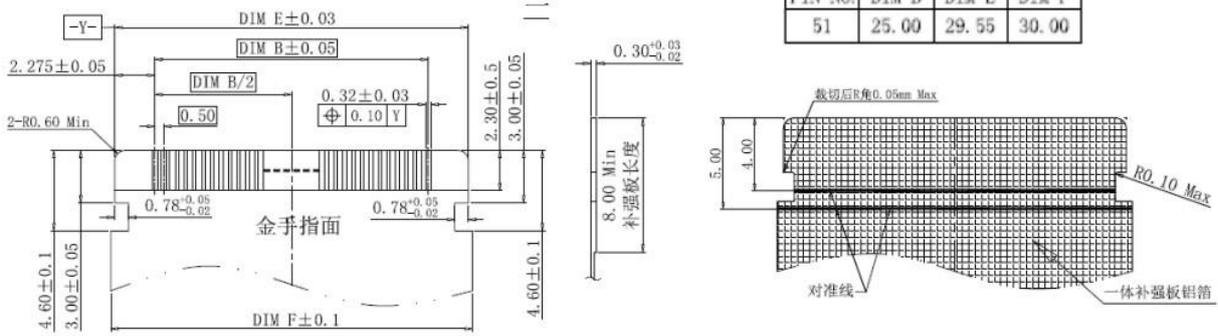
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE
Line 2	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 1921	Pixel 1922	Pixel 1923	Pixel 1924
	Pixel 5	Pixel 6	Pixel 7	Pixel 8	Pixel 1925	Pixel 1926	Pixel 1927	Pixel 1928

	Pixel 1917	Pixel 1918	Pixel 1919	Pixel 1920	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840

4. Interface Connections

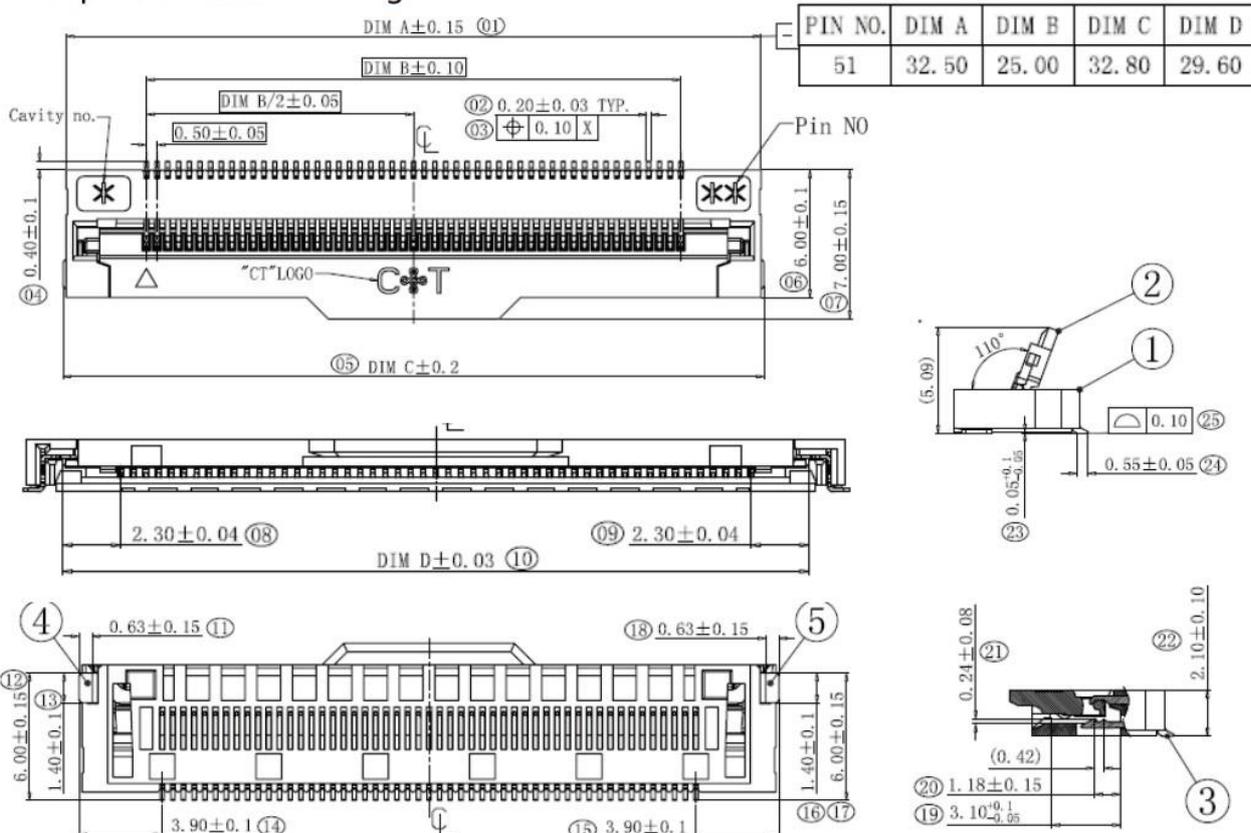
4.4 TCON Board Input CNT &FFC Drawing

-FFC Drawing



Note 1: This FFC drawing are supplied by the connector vendor.

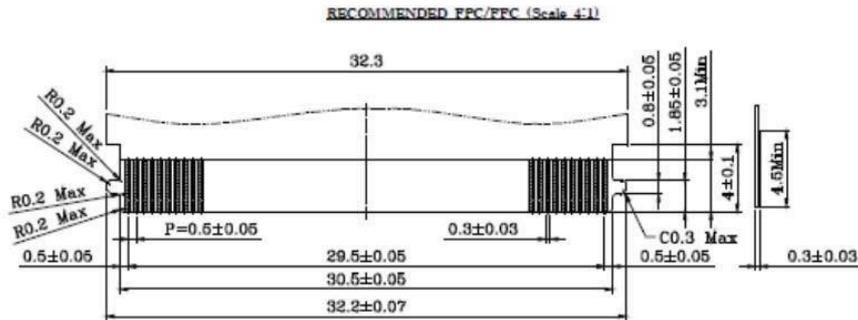
-51pin Connector Drawing



4. Interface Connections

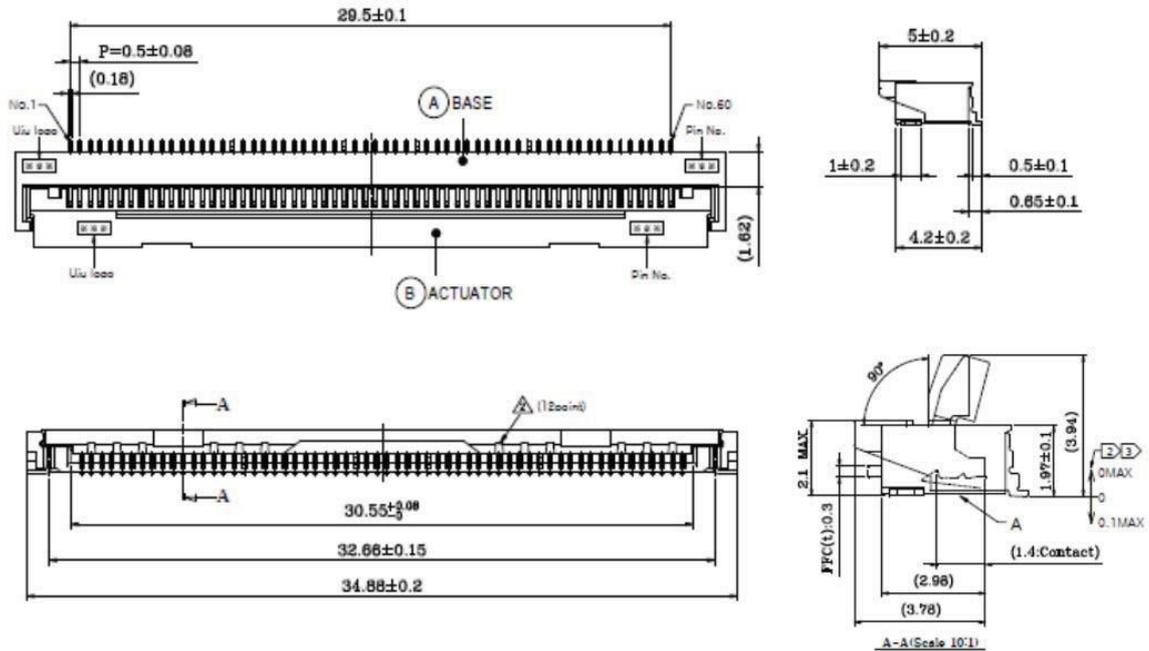
4.6 XPCBA CNT & FPC Drawing

-FPC Drawing



Note 1: This FPC drawing are supplied by the connector vendor.

-60pin Connector Drawing



5. SIGNAL TIMING SPECIFICATION

5.1 Timing Parameters

< Table 12. Timing Table >

Item	Symbols	Min	Typ	Max	Unit	
Frequency	1/Tc	69	74.5	77	MHz	
Vertical	Frame Rate	F	57	60	62	Hz
	Total	T _V	2180	2250	2450	T _H
	Display	T _{VD}	2160			T _H
	Blank	T _{VB}	20	90	290	T _H
Horizontal	Total	T _H	530	550	570	T _{CLK}
	Display	T _{HD}	-	480	-	T _{CLK}
	Blank	T _{HB}	50	70	90	T _{CLK}

Item	Symbols	Min	Typ	Max	Unit	
Frequency	1/Tc	69	74.5	77	MHz	
Vertical	Frame Rate	F	47	50	51	Hz
	Total	T _V	2180	2700	2715	T _H
	Display	T _{VD}	2160			T _H
	Blank	T _{VB}	20	540	555	T _H
Horizontal	Total	T _H	530	550	570	T _{CLK}
	Display	T _{HD}	-	480	-	T _{CLK}
	Blank	T _{HB}	50	70	90	T _{CLK}

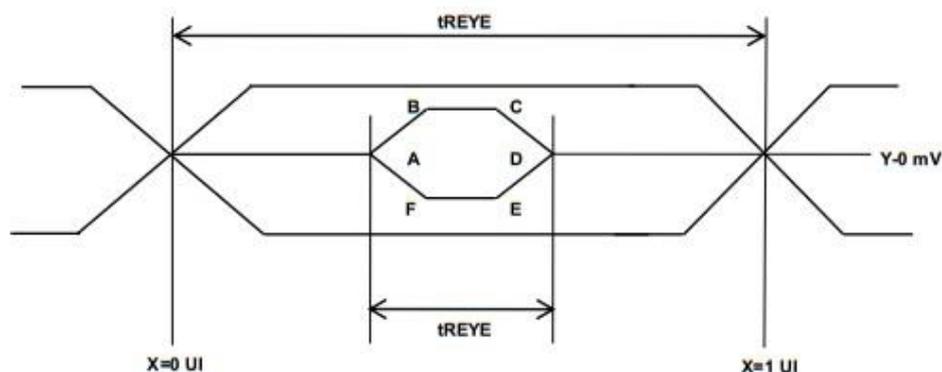
Note 1: This product is DE only mode. The input of Hsync & Vsync signal does not have an effect on normal operation.

5. SIGNAL TIMING SPECIFICATION

5.2 V by one Input Signal Timing

< Table 11. Signal Timing Table >

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Unit Interval(VBO Operation Bit Rate)	tRBIT	3-byte	380	tTCIP/30	1667	PS
		4-byte	285	tTCIP/40	1250	PS
		5-byte	266	tTCIP/50	1000	PS
Eye Width at Package Pin	tREYE	-	-	1	-	UI
Eye Width Position A at Package Pin	tA	-	-	0.25	-	UI
Eye Width Position B at Package Pin	tB	-	-	0.3	-	UI
Eye Width Position Cat Package Pin	tC	-	-	0.7	-	UI
Eye Width Position D at Package Pin	tD	-	-	0.75	-	UI
Eye Width Position E at Package Pin	tE	-	-	0.7	-	UI
Eye Width Position F at Package Pin	tF	-	-	0.3	-	UI
Intra – pair Skew	TTOSK_intra	-	-0.3	-	0.3	UI
Inter – pair Skew	TTOSK_inter	-	-5	-	5	UI
SSCG	-	30KHz modulation	-0.5		0.5	%



5. SIGNAL TIMING SPECIFICATION

5.3 V by one data mapping

< Table 8. V by one setting & data mapping Table >

1 Section								
Hactive = 3840								
	Port0		Port1		Port2		Port3	
	Lane0	Lane1	Lane2	Lane3	Lane4	Lane5	Lane6	Lane7
V Blanking	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP

	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR	FSBE_SR
Line 1	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 5	Pixel 6	Pixel 7	Pixel 8
	Pixel 9	Pixel 10	Pixel 11	Pixel 12	Pixel 13	Pixel 14	Pixel 15	Pixel 16

	Pixel 3833	Pixel 3834	Pixel 3835	Pixel 3836	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840
H Blanking	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS	FSBS
	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP

	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP	FSBP
	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE	FSBE
Line 2	Pixel 1	Pixel 2	Pixel 3	Pixel 4	Pixel 5	Pixel 6	Pixel 7	Pixel 8
	Pixel 9	Pixel 10	Pixel 11	Pixel 12	Pixel 13	Pixel 14	Pixel 15	Pixel 16

	Pixel 3833	Pixel 3834	Pixel 3835	Pixel 3836	Pixel 3837	Pixel 3838	Pixel 3839	Pixel 3840

5. SIGNAL TIMING SPECIFICATION

5.4 Input Signals, Basic Display Colors and Gray Scale of Colors

< Table 13. Input Signal and Display Color Table >

Color	Input Color Data																												
	MSB RED LSB										MSB GREEN LSB										MSB BLUE LSB								
	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	G9	G8	G7	G6	G5	G4	G3	G2	G1	G0	B9	B8	B7	B6	B5	B4	B3	B2	B1
Basic Color	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
	Red(1023)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1023)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Blue(1023)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	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	1	1	1	1	1	1	1	1	1	1
R	RED(000)	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	
	RED(001)	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	0	

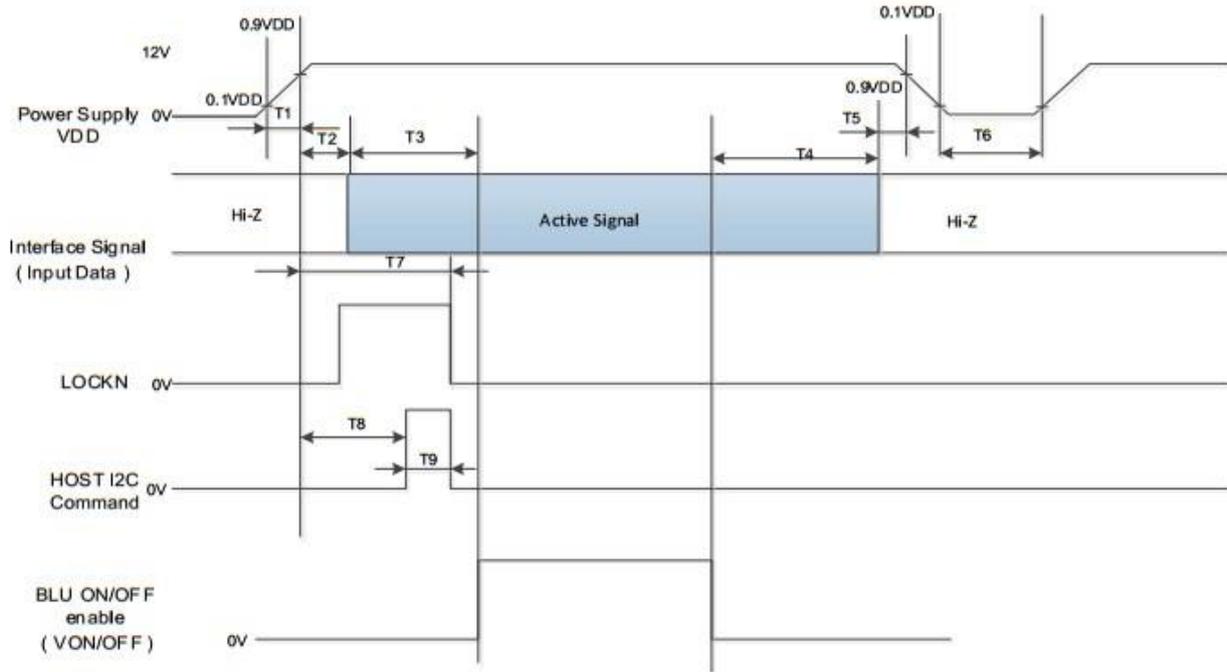
	RED(1022)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(1023)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	Green (000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green (000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	

	Green (1022)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
	Green (1023)	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
B	Blue(000)	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	
	Blue(000)	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	

	Blue(1022)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
	Blue(1023)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

5. SIGNAL TIMING SPECIFICATION

5.5 Power Sequence



< Table 14. Sequence Table >

Parameter	Values			Units
	Min	Typ	Max	
T1	0.5	-	10	ms
T2	0	-	-	ms
T3	200	-	-	ms
T4	100	-	-	ms
T5	0	-	-	ms
T6	1	-	-	s
T7	-	-	200	ms
T8	0	-	1200	ms
T9	Depends on I2C command			ms

Note 1: Even though T1 is over the specified value, there is no problem if I2T spec of fuse is satisfied.

Note 2: Even though T4 is over the specified value, there is no problem if I2T spec of fuse is satisfied.

Note 3: Back Light must be turn on after power for logic and interface signal are valid.

Note 4: HTPN(Hotplug) signal is pulled low on Tcon Board.

6. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable in a dark environment at 25 - 28°C. The values are specified at an approximate distance 50cm from the LCD surface at a viewing angle of 8 and 0 equal to 0°.

It is presented additional information concerning the measurement equipment and method in FIG. 1.

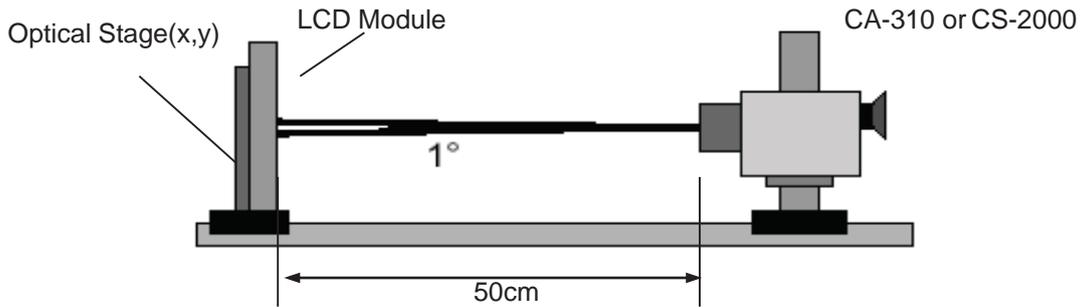


FIG. 1 Optical Characteristic Measurement Equipment and Method

Table 9. OPTICAL CHARACTERISTICS

{0d Y\Y1jS p0d\WW0hS h0000dZWt00

Parameter	Symbol	Value			Unit	Note	
		Min	Typ	Max			
Contrast Ratio	CR	800	1200	-		1	
Surface Luminance, white	L _{WH}	450	500	-	cd/m ²	2	
Luminance Variation	6 _{WHITE} 9P	71	75	-	%	3	
Response Time	Gray-to-Gray	G to G	8	10	ms	4	
Color Coordinates [CIE1931]	RED	R _x	Typ -0.03	0.63	Typ +0.03		
		R _y		0.33			
	GREEN	G _x		0.29			
		G _y		0.61			
	BLUE	B _x		0.15			
		B _y		0.06			
	WHITE	W _x		0.28			
		W _y		0.29			
Color Uniformity	WHITE	εW _y , εW _y	-	-	0.015	7	
Color Gamut			72		%	NTSC	
Color Temperature			8000	-	12000	K	
Viewing Angle (CR>10)							
	x axis, right (∓=0°)	0r	-	89	-	degree	5
	x axis, left (∓=180°)	0l	-	89	-		
	y axis, up (∓=90°)	0u	-	89	-		
	y axis, down (∓=270°)	0d	-	89	-		
Gray Scale			-	-	-	6	

Note : 1. Contrast Ratio(CR) is defined mathematically as :

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

It is measured at center 1-point.

2. Surface luminance are determined after the unit has been 'ON' and 1 Hour after lighting the backlight in a dark environment at 25 - 27°C. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying white. For more information see the FIG. 2.

3. The variation in surface luminance , 6 WHITE is defined as :

$$6 \text{ WHITE}(9P) = \text{Minimum}(L_{on1}, L_{on2}, L_{on3}, L_{on4}, L_{on9}) / \text{Maximum}(L_{on1}, L_{on2}, L_{on3}, L_{on4}, L_{on9})$$

Where L_{on1} to L_{on9} are the luminance with all pixels displaying white at 9 locations .

For more information, see the FIG. 2.

4. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD module surface. For more information, see the FIG. 4.

5. Gray scale specification

Gamma Value is approximately 2.2.

Measuring point for surface luminance & luminance variation **CA-310** ,Contact method)

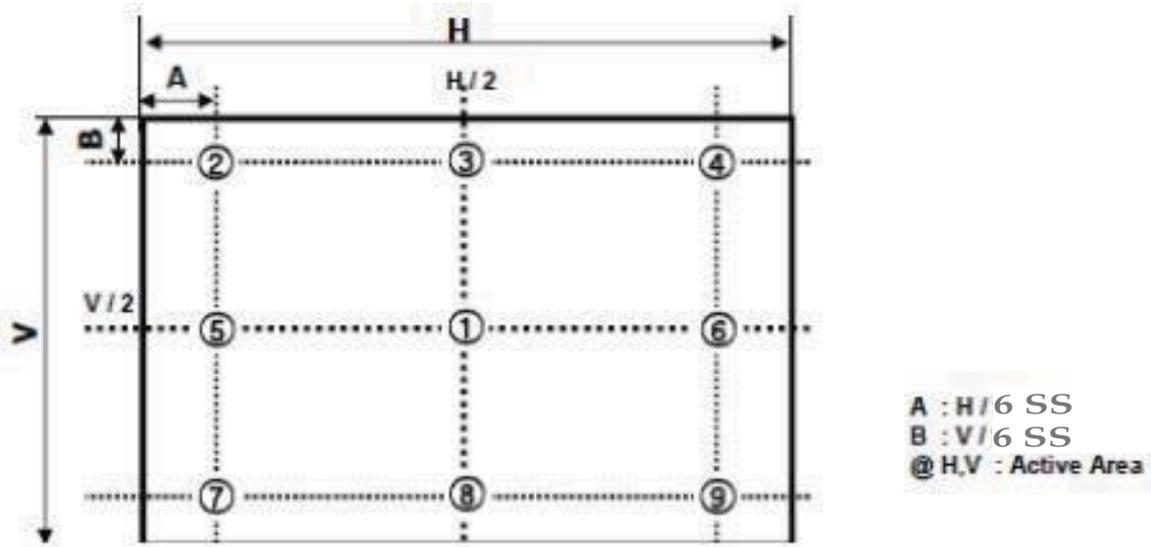


FIG. 2 9 Points for Luminance Measure

Response time is defined as the following figure and shall be measured by switching the input signal for "Gray(N)" and "Gray(M)".

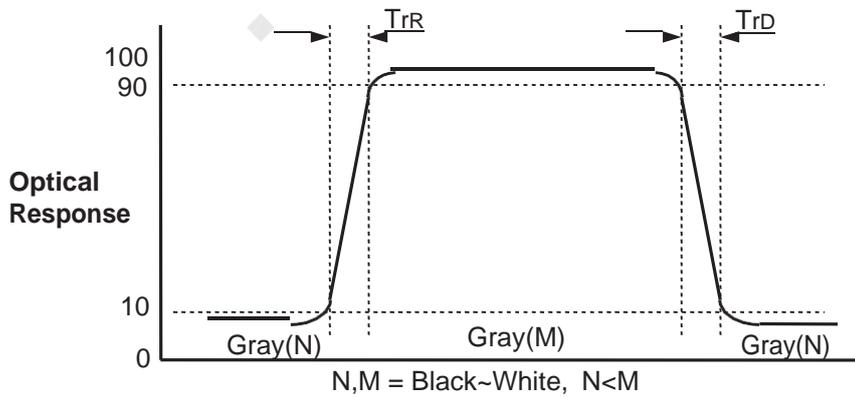


FIG. 3 Response Time

Definitions of viewing angle range

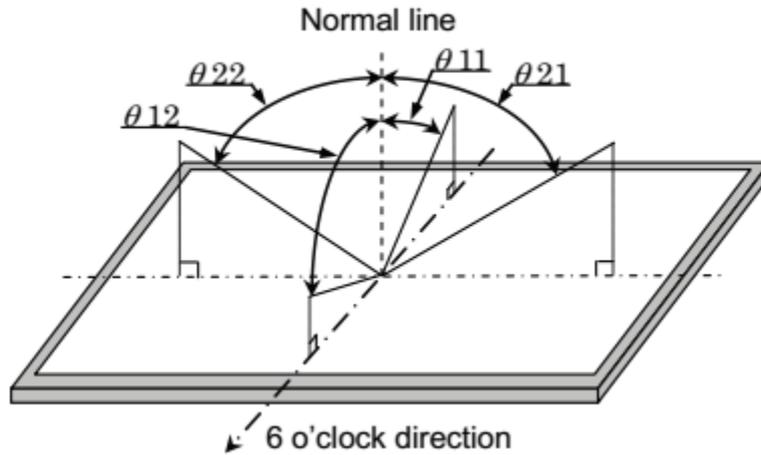


FIG. 4 Viewing Angle

BOE

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REV

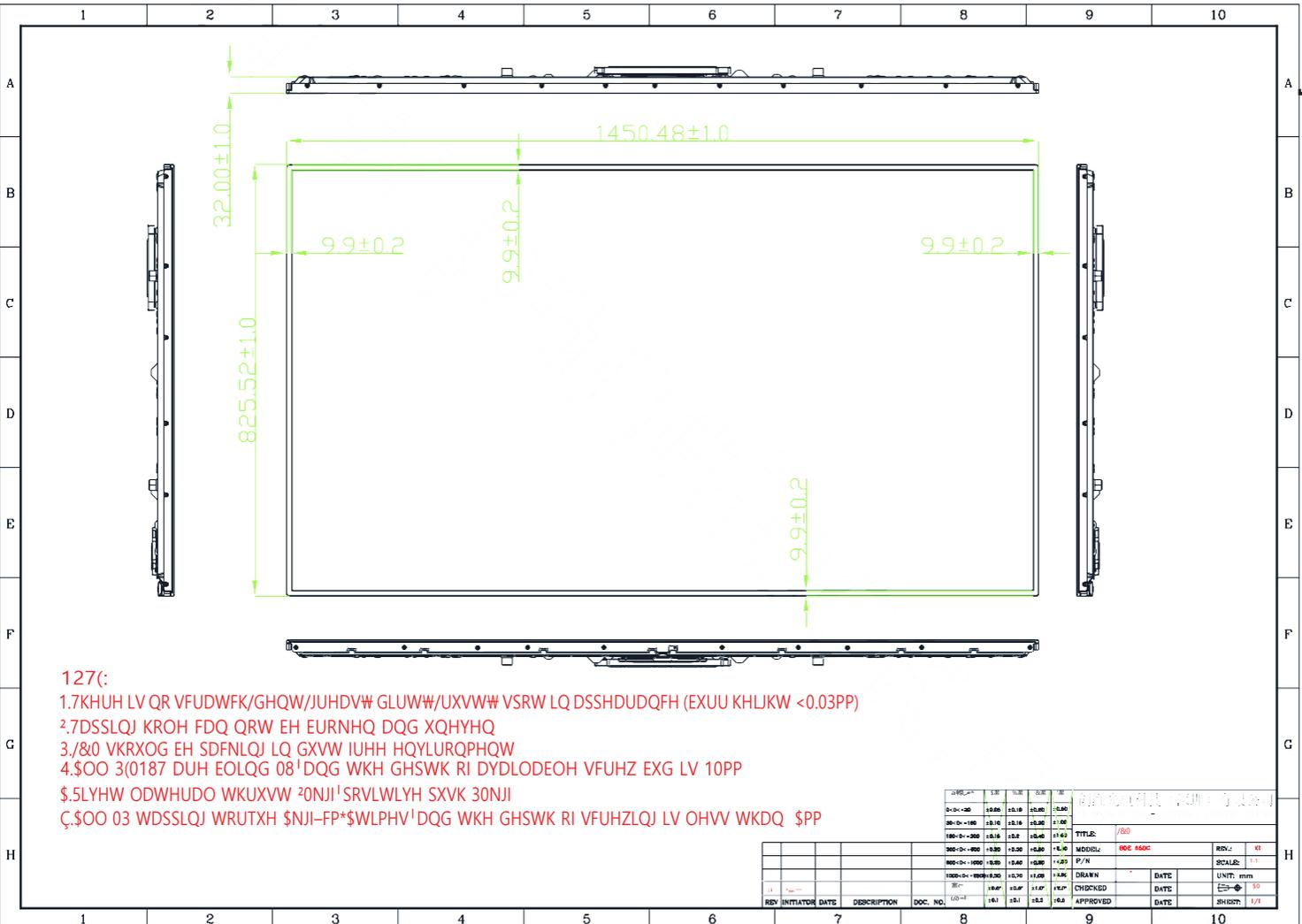
ISSUE DATE

TFT-LCD PRODUCT

Rev.P2

2019.03.14

7. FRONT VIEW and REAR VIEW [FRONT VIEW]



SPEC. NUMBER
z_TJlThtwly

SPEC. TITLE
DV650QUM-N00 Product Specification Rev. P2

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BOE

PRODUCT GROUP

TFT-LCD PRODUCT

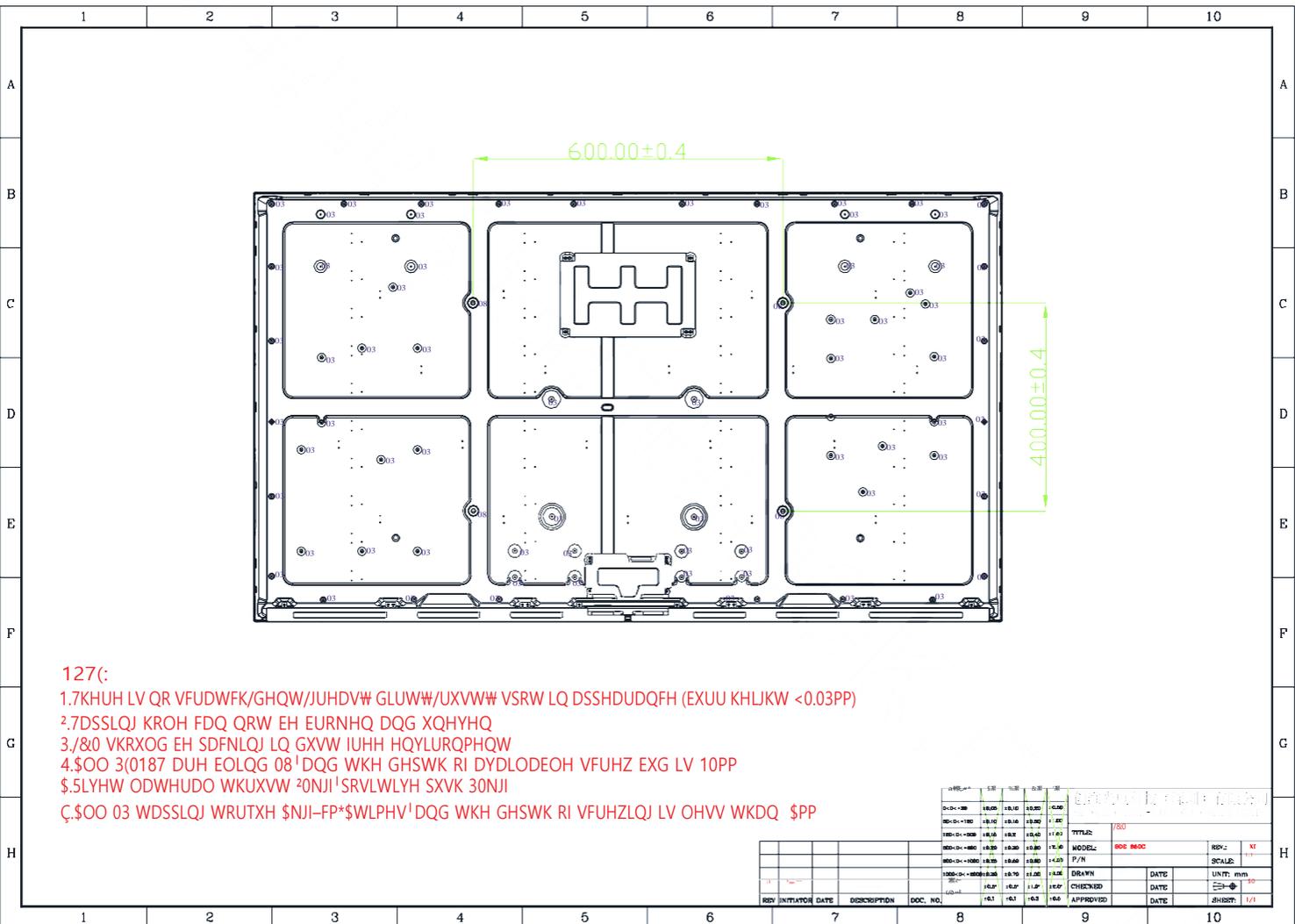
REV

Rev.P2

ISSUE DATE

2019.03.14

[REAR VIEW]



127(;

1.7KHUH LV QR VFUDWFK/GHQW/JUHDV# GLUW#/UXVW# VSRW LQ DSSHUDUDQFH (EXUU KHLJKW <0.03PP)

2.7DSSLQJ KROH FDQ QRW EH EURNHQ DQG XQHYHQ

3./80 VKRXOG EH SDFNLQJ LQ GXVW IUHH HQYLURQPHQW

4.\$OO 3(0187 DUH EOLQG 08¹DQG WKH GHSWK RI DYDLODEOH VFUHZ EXG LV 10PP

\$.5LYHW ODWHUDO WKUXVW 20NJI¹SRVLWLYH SXVK 30NJI

Ç.\$OO 03 WDSSLQJ WRUTXH \$NJI-FP*\$WLPHV¹DQG WKH GHSWK RI VFUHZLQJ LV OHVV WKDQ \$PP

SPEC. NUMBER
z_TJlThTWjY

SPEC. TITLE
DV650QUM-N00 Product Specification Rev. P2

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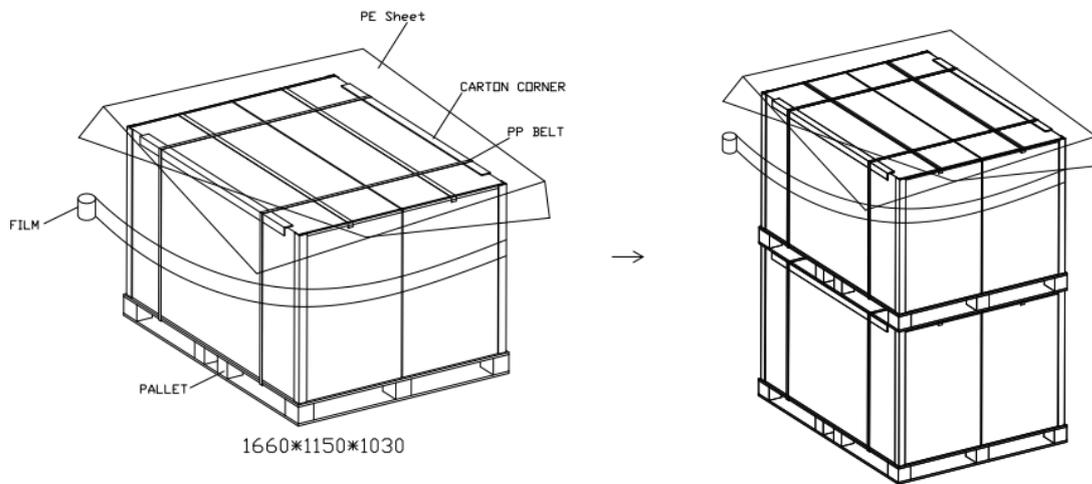
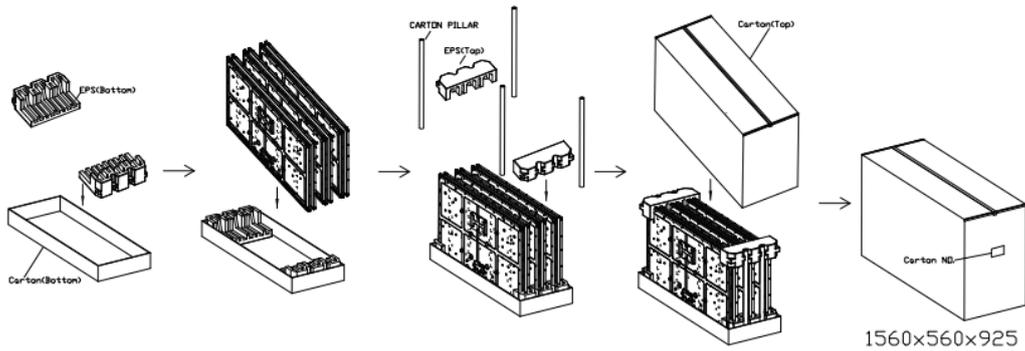
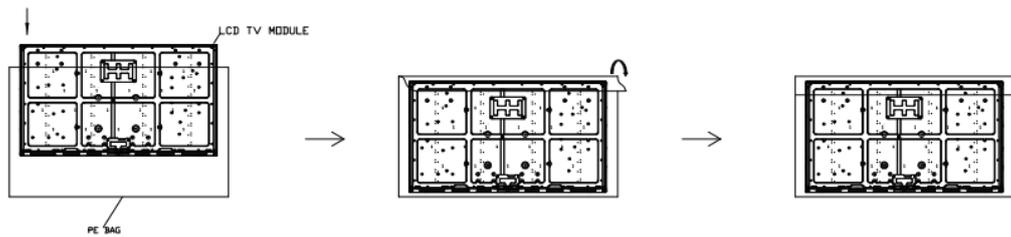
A4(210 X 297)

8. Packing

8.1 PACKING SPECIFICATIONS

- (1) 6LCD TV modules / 1 Box
- (2) Box dimensions: 1560(L) x560(W) x925(H)mm
- (3) Weight: approximately 121.745Kg (6 modules per box)

8.2 PACKING METHOD



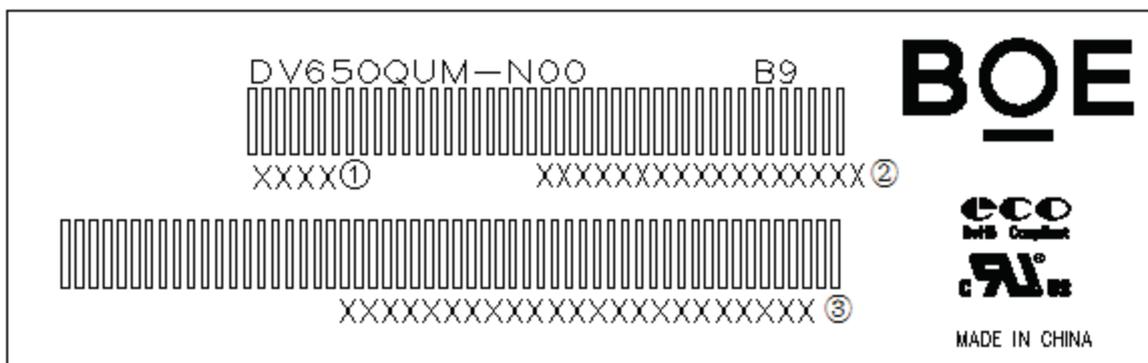
9. DEFINITION OF LABELS

zks s^ %Æ

.K HGX IUJK TGSKVRGZK OY VGYZKJ UT KGIN SUJ[RK GY ORR{YZXGZOUT, GTJ OZY JKLOTOZOUTY GXK GY LURRUJOTM K^VRGTGZOUT.

2GHKR 90`K 8OSS2^u 25SS^u

2GHKR 6OIZ|XK □



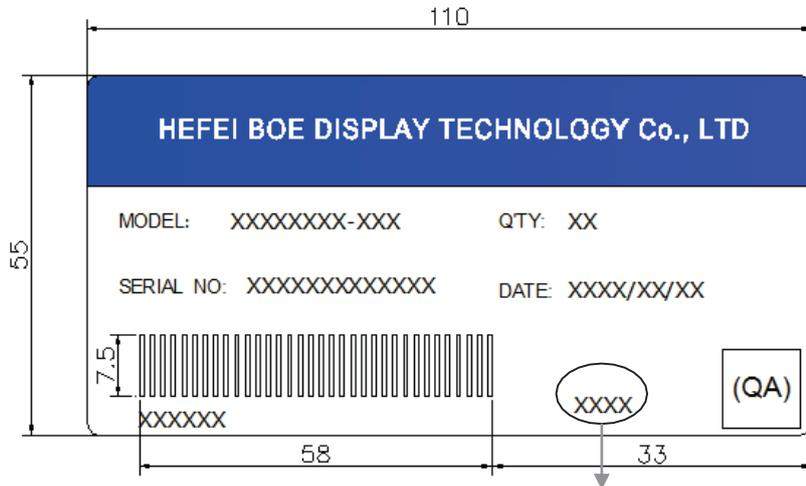
3φ ω+φjÿ 33*2/* 266/*

MDL ID Naming Rule:

*OMOZ	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
UJK	9	2	9	9	1	6	3	5	9	4	2	0	•	•	0	0	0
*KYIXOVZOUT	3UJKR UJK /-(4		-X GJ K	20T K	?KGX		3 UT ZN	3UJKR +^ZKTYOUT UJK (2GYZ 4 *OMOZY 5L ,--)5*+)				9KXOGR 4U 00001-@@@@@					

(5> 2GHKR

- 2GHKR 90`K 110 SS (2) × 55 SS (=)
-)UTZKTZY
 - 3UJKR * <6507;3-400-*840;--)UJK
 - 7FZ_ 6 2)3 0T UTK HU^.
 - 9KXOGR 4U. (U^ 9KXOGR 4U.
 - *GZK 6GIQ0TM *GZK
 - , -)UJK , -)UJK UL 6XUJ[IZ



2GYZ LU[X JOMOZY UL ,--)UJK

Box ID Naming Rule:

*0MOZ	1	2	3	4	5	6	7	8	9	10	11	12	13
)UJK	9	2	9	9	1	6	3	5	9	4	2	0	0
*KYIXOVZOUT	6XUJ[IZY -(4		-XGJK	20TK	?KGX	3UT ZN	8KVOYUT)UJK	9KXOGR 4U 00001-@@@@@					