Pre-Product Specification Sheet

产品规格书

Customer 客户名称	DIVA
Model Name 产品型号	CCSF650-002A
Qisda P/N Qisda 物料号	EM.6ED10.00C
Diva P/N Diva 物料号	2AAD665023T (T0207)
LCM Model LCM 型号	G650ZVN01.0
Date 日期	20250515
Version 版本	V1.9

設計驗證
工程課
2025 -05- 19
發行
旺矽科技開發股份有限公司

Customer's Approval		REHEO	
Approved By	Date	Approved By	Date
Approved By	Date	Approved By	Date
Approved By	Date	Approved By	Date

Revision History

Version	Revise Date	Page	Content	Author
V1.0	2024/03/05	-	Initial Release	Songlin. Pan
V1.1	2024/03/11	P4	Power Consumption Total=255.5W (typ.)	Songlin. Pan
		P7	Modify the Contrast Ratio MIN value to 2100:1.	
		P9	Add Note 6	
		P20	(3).VIH is standardized to 5.5V. The frequency range of F_EPWM is adjusted, and the specification of D-EPWM is revised to a minimum of 5%.	
V1.2	2024/03/28	P31	更新包装方案，由平放→竖放	Songlin. Pan
V1.3	2024/06/04	P26	更新 Pixel highlight 规格	Weilong.Feng
V1.4	2024/06/12	P26 P27	模组料号更新，外观检验规格更新	Songlin. Pan Weilong.Feng
V1.5	2024/06/21	P26	外观检验规格更新，增加 LCM 背面螺柱监控规格	Weilong.Feng
V1.6	2024/07/05	P25	成品标签贴附位置更新	Songlin. Pan
V1.7	2024/07/10	P24	图纸更新，增加贴合管控	Songlin. Pan
V1.8	2024/08/20	P31	更新增加外包装标签	Songlin. Pan
V1.9	2025/05/15	P27	更新均一性管控标准	Songlin. Pan

Table of Contents

1.0 General Description…….4

2.0 Absolute Maximum Ratings……6

3.0 Optical Specification……..……..…7

4.0 Interface Specification……..……..…….9

5.0 Sigan Timing Specification…….……14

6.0 Backlight Specification……..……..20

7.0 Mechanical Characteristics……..……..…….……..23

8.0 Quality Requierment…….……...……..…….……..26

9.0 Reliability Test Items…….....29

10.0 InternationalStandard..…….……29

11.0 Packing …….……...30

12.0 Handling & Cautions…….…….....32

1. GENERAL DESCRIPTION

1.1 Introduction

This specification applies to the 64.5 inch Color TFT-LCD Module G650ZVN01.0. This LCD module has a TFT active matrix type liquid crystal panel 3840 x 2160 pixels, and diagonal size of 64.5 inch. This module supports 3840 x 2160 mode. Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 10-bit gray scale signal for each dot.

G650ZVN01.0 has been designed to apply the 8 lane V by one interface method. It is intended to support displays where high brightness, wide viewing angle, high color saturation, and high color depth are very important.

1.2 General information

Table 1-1 General Specifications

Parameter	Specification	Unit	Remarks
Active Screen Size	64.5	Inch	
Display Area	1428.48(H)X803.52(V)	mm	
Outline Dimension	1450.38(H)X825.42(V)X31.1(D)	mm	
Driver Element	a-Si TFT active matrix		
Display Colors	8 bit + FRC (1.07 billion)	Colors	
Number of Pixels	3840(H)xRGBx2160(V)	pixels	
Pixel Pitch	0.372(H)X0.372(V)	mm	
Display Operation Mode	Normally Black,VA		
Nominal lnput Voltage VDD	12V	V	
Power Consumption	Total=255.5(TYP)	W	
Surface Treatment	(HCLR)	mm	
Rotate Function	Unachievable		Note 1
Display Orientation	Portrait/Landscape Enabled		Note 2
Frame Rate	60	Hz	
LED Lifetime	50K	Hours	

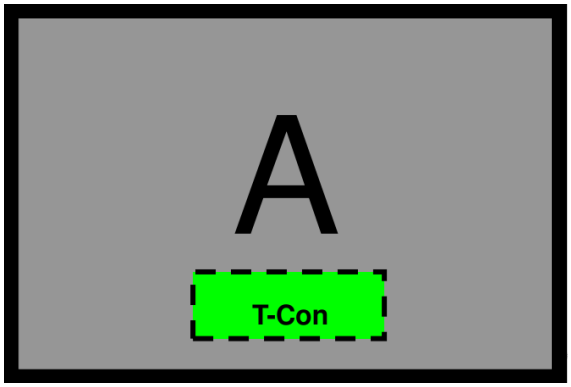
Note1: Rotate Function refers to LCD display could be able to rotate. This function does not work in this model.

Note2：

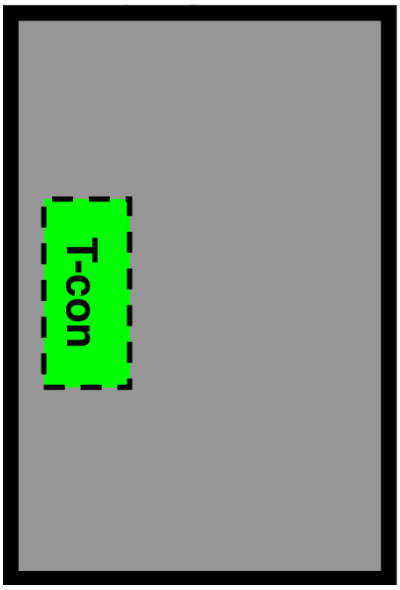
(1) Landscape Mode: The default placement is T-Con Side on the lower side and the image is shown upright via viewing from the front.

(2) Portrait Mode: The default placement is that T-Con side has to be placed on the left side via viewing from the front.

Landscape (Front view)



Portrait (Front view)



2. Absolute Maximum Ratings

The followings are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

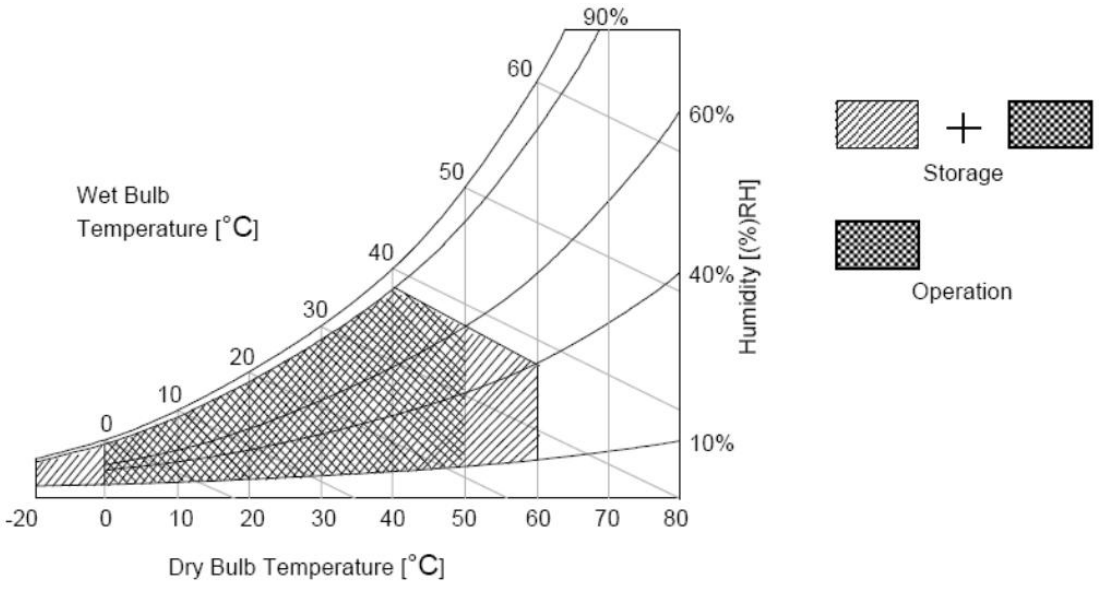
Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	-0.3	14	Volt	Note 1
Input Voltage of Signal	Vin	-0.3	4	Volt	Note 1
Operating Temperature	TOP	0	50	℃	Note 2
Operating Humidity	HOP	10	90	%RH	Note 2
Storage Temperature	TST	-20	+60	℃	Note 2
Storage Humidity	HST	10	90	%RH	Note 2
Panel Surface Temperature	PST		65	℃	Note 3

Note 1: Duration:50 msec.

Note 2 : Maximum Wet-Bulb should be 39℃ and No condensation.

The relative humidity must not exceed 90% non-condensing at temperatures of 40℃ or less. At temperatures greater than 40℃the wet bulb temperature must not exceed 39℃.

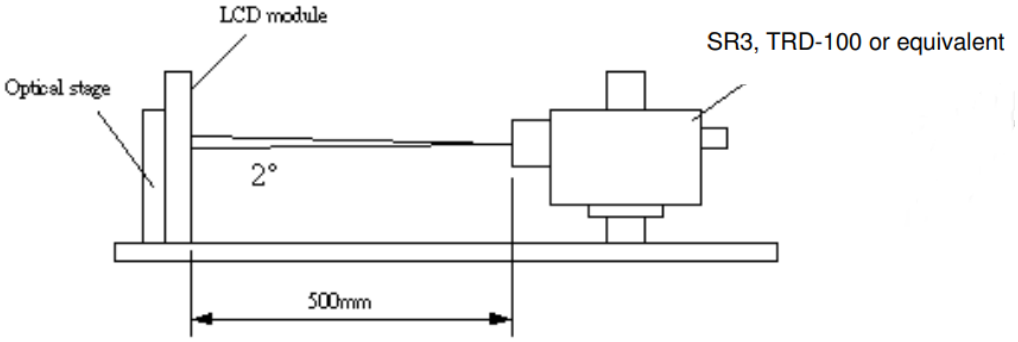
Note 3: Surface temperature is measured at 50℃ Dry condition.



3. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in a dark environment at 25°C. The values specified are at an approximate distance 500 mm from the LCD surface at a viewing angle of φ and θ equal to 0°.

Fig.1 presents additional information concerning the measurement equipment and method.



Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	2100	3000	-		Note 1
Surface Luminance (White)		LWH	650	800	-	cd/m2	Note 2
Luminance Variation		δWHITE(9P)	-	-	1.33		Note 3
Response Time (G to G)		Tγ	-	8.5	16	ms	Note 4
Color Gamut		NTSC		72	-	%	
Gamma		Gma	1.9	2.2	2.5		
Color Coordinates		%		72	-		
White luminance uniformity		xw	Typ-0.03	0.292	Typ+0.03		
		yw		0.307			
Reproduction Of color	Red	xR		0.649			
		yR		0.336			
	Green	xG		0.316			
		yG		0.628			
	Blue	xB		0.154			
		yB		0.054			
Viewing Angle							Note 5 Note 6
x axis, right(φ=0°)		θr	-	88	-	Degree	
x axis, left(φ=180°		θl	-	88	-	Degree	
y axis, up(φ=90°)		θu	-	88	-	Degree	
y axis, down (φ=270°)		θd	-	88	-	Degree	

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

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance of } L_{on5}}{\text{Surface Luminance of } L_{off5}}$$

Note 2：Surface luminance is luminance value at point 5 across the LCD surface 50cm from the surface with all pixels displaying white. From more information see FIG 2. LED current IF = typical value (without driver board), LED input VDDB =24V, IDDB. = Typical value (with driver board), LWH=Lon5 where Lon5 is the luminance with all pixels displaying white at center 5 location.

Note 3：The variation in surface luminance, δWHITE is defined (center of Screen) as: δWHITE(9P)= Maximum(Lon1, Lon2,…,Lon9)/ Minimum(Lon1, Lon2,…Lon9)

Note 4：Response time Tγ is the average time required for display transition by switching the input signal for five luminance ratio (0%,25%,50%,75%,100% brightness matrix) and is based on Frame rate = 60Hz to optimize.

Measured Response Time		Target				
		0%	25%	50%	75%	100%
Start	0%					
	25%	25% to 0%				
	50%	50% to 0%	50% to 25%		50% to 75%	50% to 100%
	75%	75% to 0%	75% to 25%	75% to 50%		75% to 100%
	100%	100% to 0%	100% to 25%	100% to 50%	100% to 75%	

Tγ is determined by 10% to 90% brightness difference of rising or falling period. (As illustrated) The response time is defined as the following figure and shall be measured by switching the input signal for “any level of gray(bright) “ and “any level of gray(dark)”.

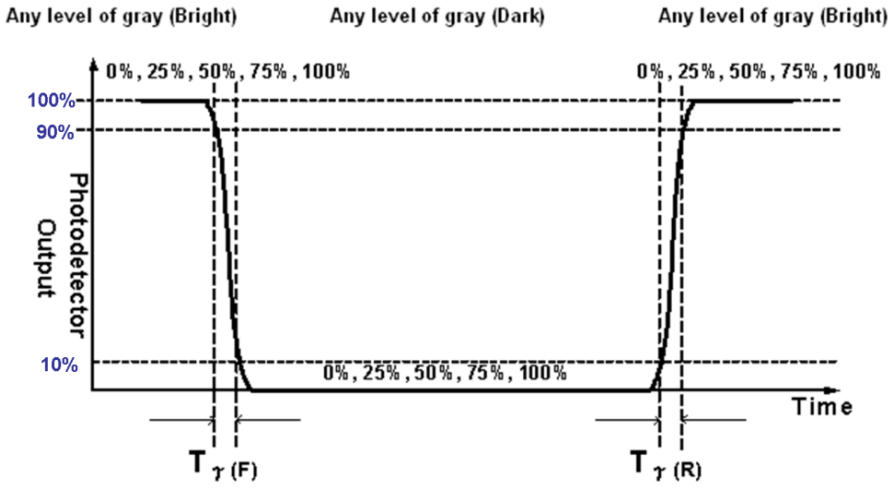
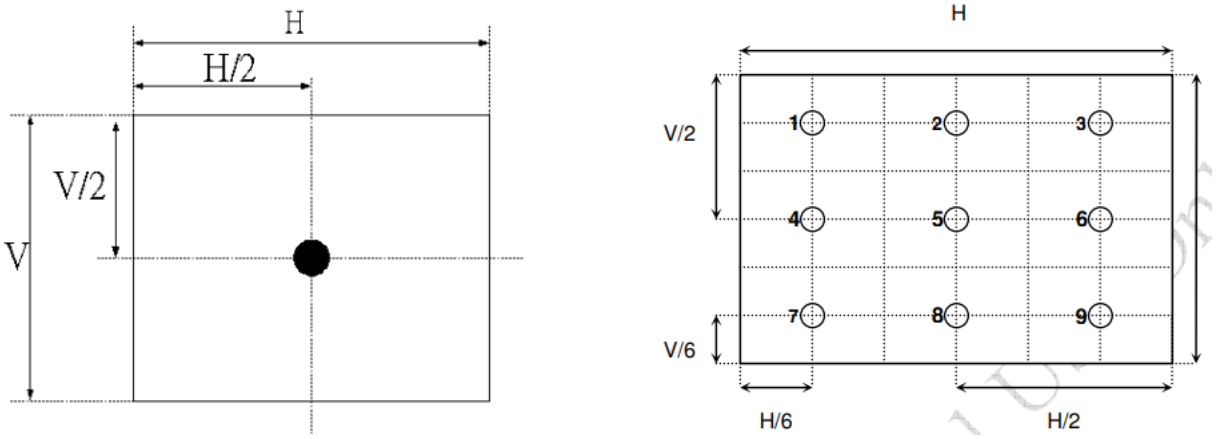
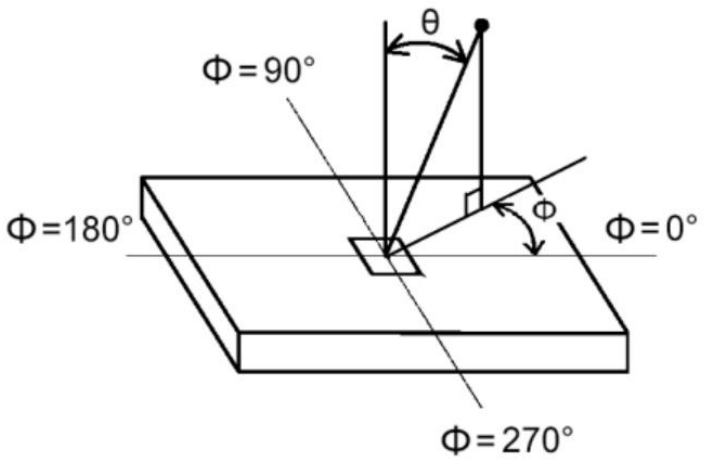


FIG. 2 Luminance



Note 5：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 surface. For more information see FIG3.

FIG.3 Viewing Angle



Note 6：Contrast Ration (Specifications based on design Values and measurement Data for 1 piece)

(@viewing angle of 40°)≥700：1

(@viewing angle of 20°)≥1800：1

4. Interface Specification

4.1 Input Power

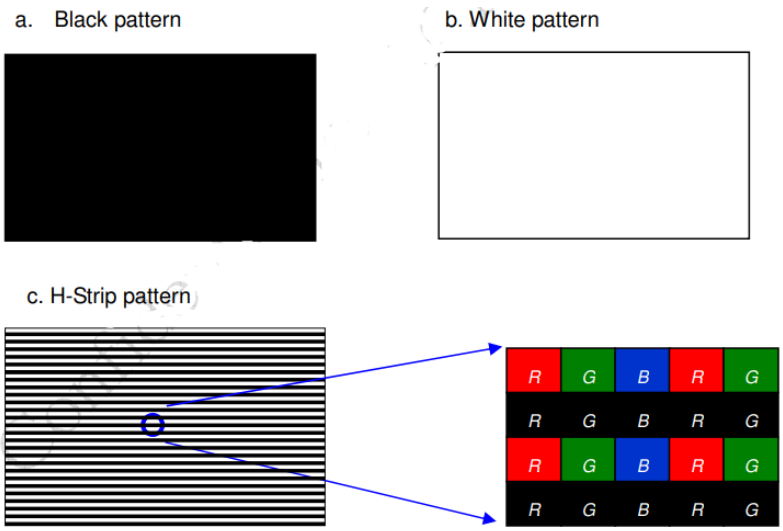
The G650ZVN01.0 module requires power inputs which are employed to power the LCD electronics and to drive the TFT array and liquid crystal.

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply Input Voltage		VDD	10.8	12	13.2	V	Note 1
Power Supply Input Current	White pattern	IDD	-	1.5	1.8	A	Note 2
Power Consumption	White pattern	PC	-	18	21.6	Watt	
Inrush Current		IRUSH	-	-	5	A	Note 3

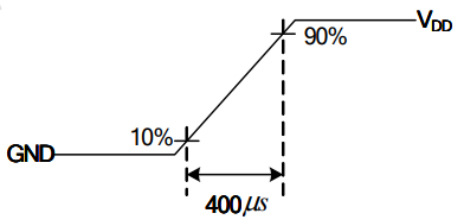
Note 1：The ripple voltage should be fewer than 5% of VDD.

Note 2：Test Condition:

(1) VDD = 12.0V, (2) Fv = 60Hz, (3) Fclk= 74.25MHz, (4) Temperature = 25 ℃
(5) Power dissipation check pattern. (Only for power design)



Note 3：Measurement condition : Rising time = 400us



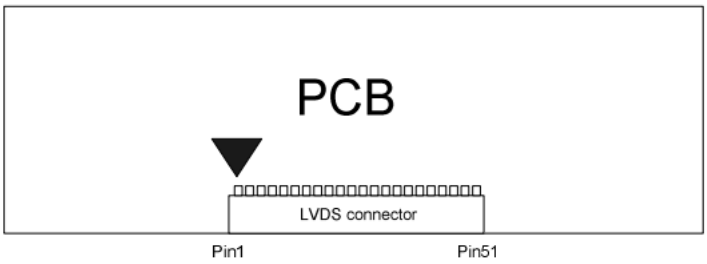
Note 4：Heavy Duty Pattern could be up to max power : 39.72(W)

4.2 Input Connection

LCD connector: (P-Two) 187059-51221 / (Starconn) 115E51-0000RA-M3-R / (JAE) SJ11346-FI-RTE51SZ-HF

Pin	Symbol	Description	Remark	Pin	Symbol	Description	Remark
1	VDD	12Vin		27	GND	Ground	
2	VDD	12Vin		28	RX0N	Vx1 lane 0	
3	VDD	12Vin		29	RX0P	Vx1 lane 0	
4	VDD	12Vin		30	GND	Ground	
5	VDD	12Vin		31	RX1N	Vx1 lane 1	
6	VDD	12Vin		32	RX1P	Vx1 lane 1	
7	VDD	12Vin		33	GND	Ground	
8	VDD	12Vin		34	RX2N	Vx1 lane 2	
9	N.C.	No connection	Note 2	35	RX2P	Vx1 lane 2	
10	GND	Ground		36	GND	Ground	
11	GND	Ground		37	RX3N	Vx1 lane 3	
12	GND	Ground		38	RX3P	Vx1 lane 3	
13	GND	Ground		39	GND	Ground	
14	GND	Ground		40	RX4N	Vx1 lane 4	
15	N.C.	No connection		41	RX4P	Vx1 lane 4	
16	N.C.	No connection		42	GND	Ground	
17	N.C.	No connection	Note 2	43	RX5N	Vx1 lane 5	
18	N.C.	No connection	Note 2	44	RX5P	Vx1 lane 5	
19	N.C.	No connection	Note 2	45	GND	Ground	
20	N.C.	No connection	Note 2	46	RX6N	Vx1 lane 6	
21	N.C.	No connection	Note 2	47	RX6P	Vx1 lane 6	
22	N.C.	No connection	Note 2	48	GND	Ground	
23	N.C.	No connection	Note 2	49	RX7N	Vx1 lane 7	
24	GND	Ground		50	RX7P	Vx1 lane 7	
25	HTPND	Vx1 HTPDN		51	GND	Ground	
26	LOCKN	Vx1 LOCK					

Note 1: Pin number start from the left side as the following figure.



Note 2: Please leave this pin unoccupied. It cannot be connected with any signal (Low/GND/High).

4.3 Input Data Format

4.3.1 V by one color data mapping

Mode	Packer input & Unpacker output		30bpp RGB / YCbCr444 (10bit)
4byte mode	Byte0	D[0]	R/Cr[2]
		D[1]	R/Cr[3]
		D[2]	R/Cr[4]
		D[3]	R/Cr[5]
		D[4]	R/Cr[6]
		D[5]	R/Cr[7]
		D[6]	R/Cr[8]
		D[7]	R/Cr[9]
	Byte1	D[8]	G/Y[2]
		D[9]	G/Y[3]
		D[10]	G/Y[4]
		D[11]	G/Y[5]
		D[12]	G/Y[6]
		D[13]	G/Y[7]
		D[14]	G/Y[8]
		D[15]	G/Y[9]
	Byte2	D[16]	B/Cb[2]
		D[17]	B/Cb[3]
		D[18]	B/Cb[4]
		D[19]	B/Cb[5]
		D[20]	B/Cb[6]
		D[21]	B/Cb[7]
		D[22]	B/Cb[8]
		D[23]	B/Cb[9]
	Byte3	D[24]	-
		D[25]	-
		D[26]	B/Cb[0]
		D[27]	B/Cb[1]
		D[28]	G/Y[0]
		D[29]	G/Y[1]

		D[30]	R/Cr[0]
		D[31]	R/Cr[1]

4.3.2 Color Input Data Reference

The brightness of each primary color (red, green and blue) is based on the 10 bit gray scale data input for the color; the higher the binary input, the brighter the color. The table below provides a reference for color versus data input.

COLOR DATA REFERENCE

Color		Input Color Data																													
		RED										GREEN										BLUE									
		MSB									LSB	MSB									LSB	MSB									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	B0
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	0	0
	Red(1023)	1	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	0
	Green(1023)	0	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	0
	Blue(1023)	0	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	1
	Cyan	0	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	1
	Magenta	1	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	1
	Yellow	1	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	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	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	0	0	0
	RED(001)	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	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	0	0	0
	RED(1023)	1	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	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	0	0	0
	GREEN(001)	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

	GREEN(1022)	0	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	0	0
	GREEN(1023)	0	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	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	0	0	0
	BLUE(001)	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

	BLUE(1022)	0	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	0
	BLUE(1023)	0	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	1

5. Signal Timing Specification

5.1 Input Timing

5.1.1 Timing table

Timing Table (DE only Mode)

Signal	Item	Symbol	Min.	Typ.	Max	Unit
Vertical Section	Period	Tv	2200	2250	2715	Th
	Active	Tdisp (v)		2160		
	Blanking	Tblk (v)	40	90	555	Th
Horizontal Section	Period	Th	530	550	600	Tclk
	Active	Tdisp (h)		480		
	Blanking	Tblk (h)	50	70	120	Tclk
Clock	Frequency	Fclk=1/Tclk	66	74.25	77	MHz
Vertical Frequency	Frequency	Fv	47	60	63	Hz
Horizontal Frequency	Frequency	Fh	120	135	139.2	KHz

Notes:

(1) Display position is specific by the rise of DE signal only. Horizontal display position is specified by the rising edge of 1st DCLK after the rise of 1st DE, is displayed on the left edge of the screen.

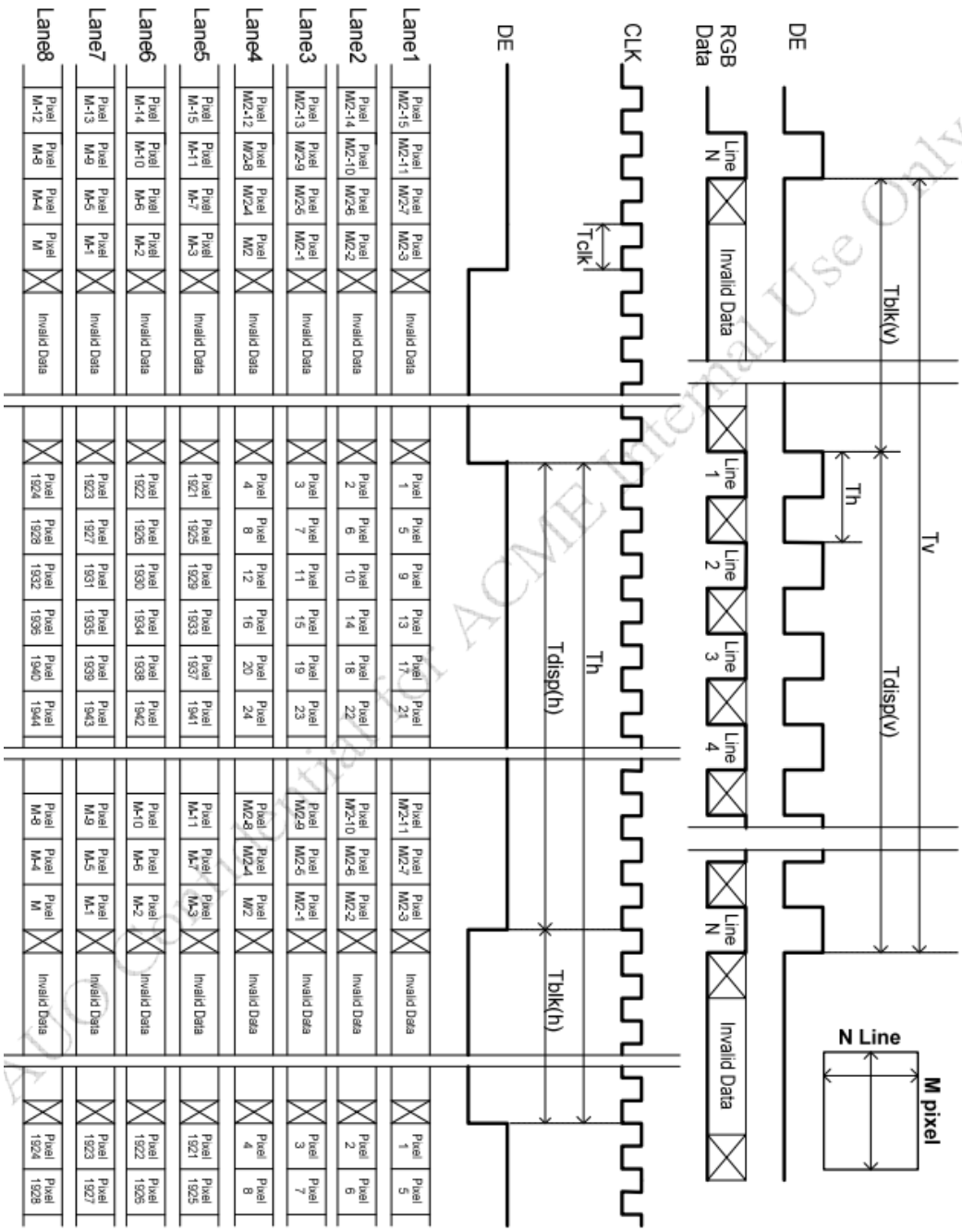
(2) Vertical display position is specified by the rise of DE after a “Low” level period equivalent to eight times of horizontal period. The 1st data corresponding to one horizontal line after the rise of 1st DE is displayed at the top line of screen.

(3) If a period of DE “High” is less than 3840 DCLK or less than 2160 lines, the rest of the screen displays black.

(4) The display position does not fit to the screen if a period of DE “High” and the effective data period do not synchronize with each other.

5.1.2. Signal Timing Waveform

Two Section Mode



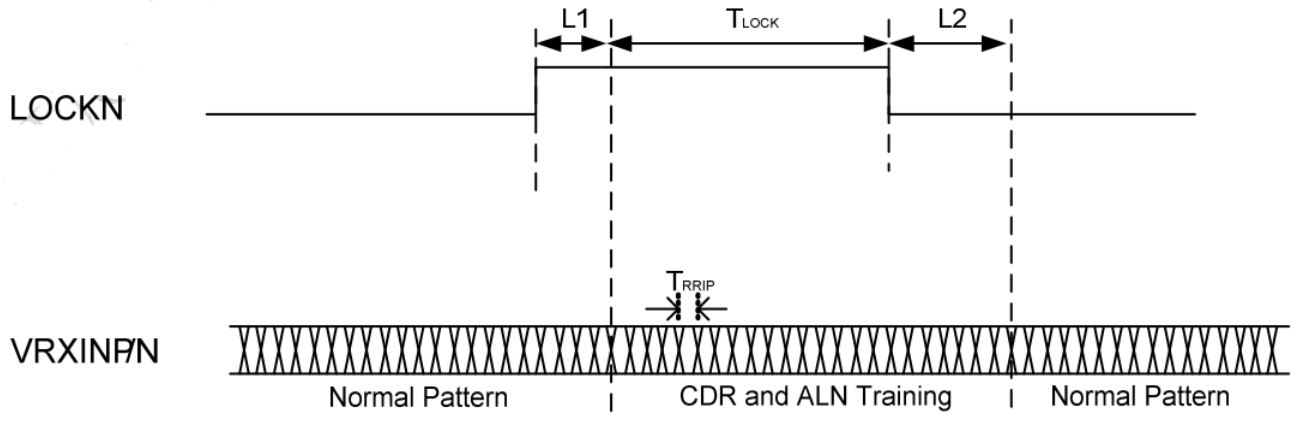
5.2 Input interface characteristics

V by One spec

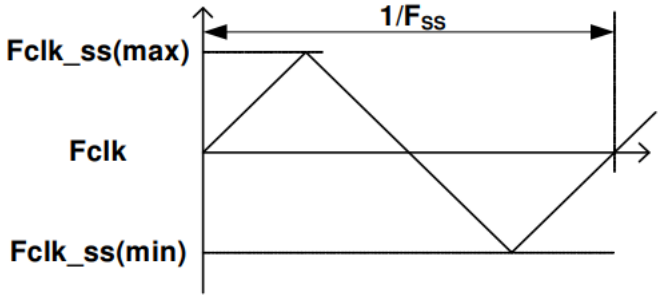
Item		Symbol	Min.	Typ.	Max	Unit	Remark
V-by-one Interface	VRXINP/N input each bit Period	TRRIP (UI)	310	-	379	ps	10bit Note 1
	Receiver Clock : Spread Spectrum Modulation range	Fclk_ss	Fclk -0.5%	-	Fclk +0.5%	MHz	Note 2

	Receiver Clock : Spread Spectrum Modulation frequency	Fss	30			KHz	Note 2
	CDR training pattern time	TLOCK	-	500	-	us	Note 1
	Latency from LOCKN 'HIGH' to clock training pattern	L1	0	-	-	us	Note 1
	Latency from LOCKN 'LOW' to normal 8b10b data	L2	-	-	70	us	Note 1
	CML Differential Input High Threshold	VRTH	50	-	-	mVDC	
	CML Differential Input Low Threshold	VRTL	-	-	-50	mVDC	
	CML Common mode Bias Voltage	VRCT	0.8	0.9	1.0	Vdc	
	Intra-pair skew	TINTRA	-	-	0.3	UI	Note 3
	Intra-pair skew	TINTER	-	-	5	UI	Note 4
	Eye diagram at receiver	A_X	-	0.25	-	UI	Note 5
		A_Y	-	0	-	mV	
		B_X	-	0.3	-	UI	
		B_Y	-	50	-	mV	
		C_X	-	0.7	-	UI	
		C_Y	-	50	-	mV	
		D_X	-	0.75	-	UI	
		D_Y	-	0	-	mV	
		E_X	-	0.7	-	UI	
		E_Y	-	-50	-	mV	
		F_X	-	0.3	-	UI	
		F_Y	-	-50	-	mV	

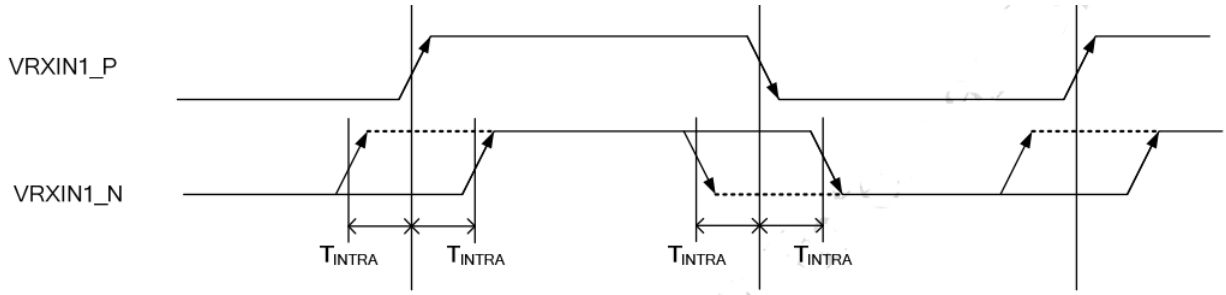
Note 1: V-by-one Signal diagram



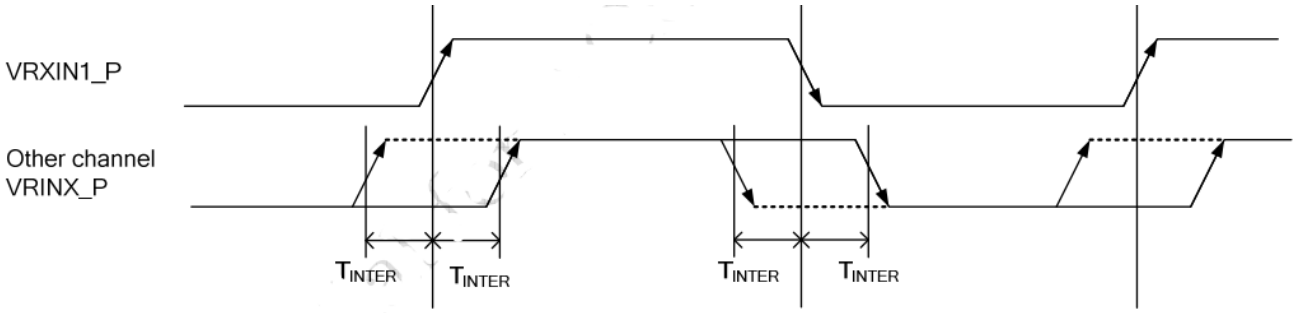
Note 2: Receiver Clock SSCG (Spread spectrum clock generator) is defined as below figures.



Note 3: V-by-one Intra-pair Skew

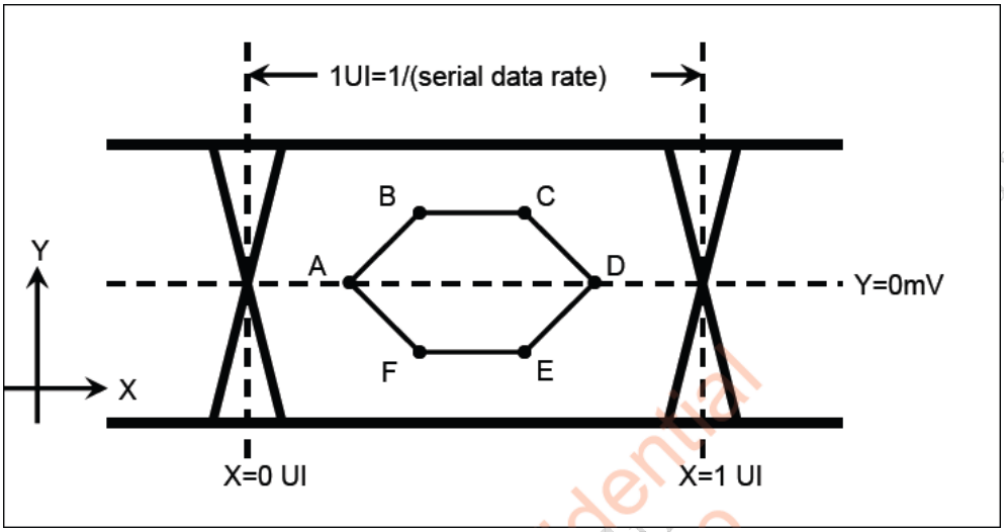


Note 4: V-by-one Inter-pair Skew



Note 5: Eye diagram at receiver

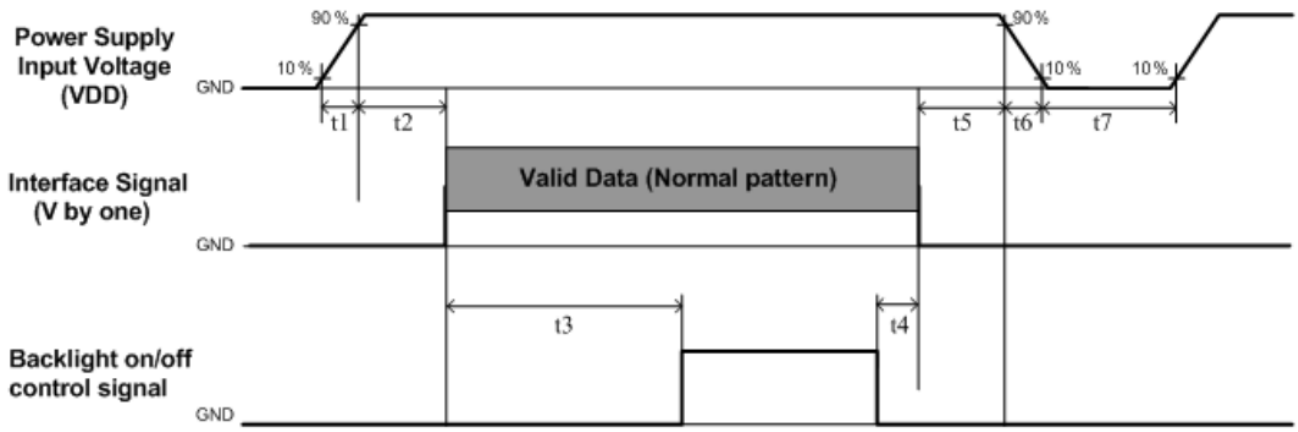
Eye Mask



Example of Eye diagram



5.3 Power Sequence for LCD



Parameter	Values			Unit
	Min.	Type.	Max.	
t1	0.4	---	30	ms
t2	40	---	---	ms
t3	640	---	---	ms
t4	0*1	---	---	ms
t5	0	---	---	ms
t6	---	---	---*2	ms
t7	1000*3	---	---	ms

Note:

1. t4=0: concern for residual pattern before BLU turn off.
2. t6: voltage of VDD must decay smoothly after power-off. (customer system decide this value)
3. When the power supply input voltage(VDD) is off, be sure to pull down the valid and the invalid data to 0V.

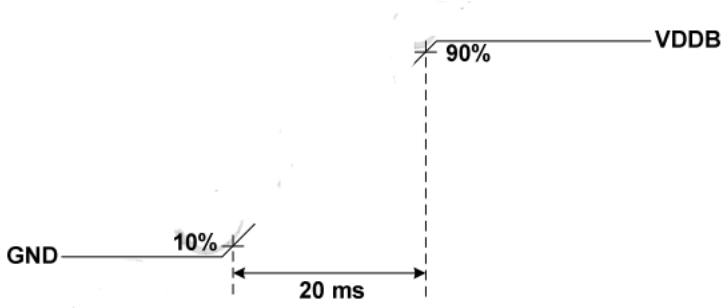
6. Backlight Specification

6.1 Electrical specification

	Item	Symbol		Condition	Min	Typ	Max	Unit	Note
1	Power Supply Input Voltage	VDDB		-	22.8	24	25.2	V	-
2	Power Supply Input Current	IDDB		VDDB=24V		9.89	11.06	A	1
3	Power Consumption	PDDB		VDDB=24V		237.5	265.47	Watt	1
4	Inrush Current	IRUSH		VDDB=24V			14	A	2
5	Control signal votlage	Vsignal	Hi	VDDB=24V	2	-	5.5	V	-
			Low	VDDB=24V	0	-	0.8		3
6	Control signal current	Isignal		VDDB=24V	-	-	1.5	mA	-
7	External PWM Duty ratio (input duty ratio)	D_EPWM		VDDB=24V	20	-	100	%	4
8	External PWM Frequency	F_EPWM		VDDB=24V	14k	-	20k	Hz	4
9	DET status signal	DET	Hi	VDDB=24V	Open Collector			V	5
			Lo	VDDB=24V	0	-	0.8	V	5
10	Input Impedance	Rin		VDDB=24V	300	-	-	Kohm	
11	LED lifetime	LTLED			(50,000)	-	-	Hr	6

Note 1: Dimming ratio= 100%,（Ta=25±5℃, Turn on for 45minutes）

Note 2: MAX input current while DB turn on, measurement condition VDDB rising time=20ms(VDDB: 10%~90%)



Note 3: When BLU off (VDDB = 24V, VBLON = 0V), IDDB (max) = 0.1A

Note 4: Less than 5% dimming control is functional well and no backlight shutdown happened Note 5:

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Normal: 0~0.8V; Abnormal: Open collector

Note 6: The lifetime (MTTF) is defined as the time which luminance of LED is 50% compared to its original value. [Operating condition: Continuous operating at Ta = 25±2℃, for single LED only]

6.2 Input Pin Assignment

The G650ZVN01.0 module requires 2 power input (12-pin & 14-pin)

LED DB connector: CI0114M1HRL-NH(CviLux) or equivalent

pin	Symbol	Description	Remark
1	VDDB	Power Supply Input Voltage	
2	VDDB	Power Supply Input Voltage	
3	VDDB	Power Supply Input Voltage	
4	VDDB	Power Supply Input Voltage	
5	VDDB	Power Supply Input Voltage	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	GND	Ground	
10	GND	Ground	
11	DET	BLU status detection:	Note 1
12	VBLON	BLU On-Off control:	Note 2,3
13	NC	NC	Note 4
14	PDIM	External PWM	Note 2,5

LED DB connector: CI0112M1HRL-NH(CviLux)

pin	Symbol	Description	Remark
1	VDDB	Power Supply Input Voltage	
2	VDDB	Power Supply Input Voltage	
3	VDDB	Power Supply Input Voltage	
4	VDDB	Power Supply Input Voltage	
5	VDDB	Power Supply Input Voltage	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	GND	Ground	
10	GND	Ground	
11	NC	NC	Note 4
12	NC	NC	Note 4

Note1: DET status

DET	BLU status
0 ~ 0.8V	Normal
Open collector	Abnorma

Recommend pull high R > 10K ohm, pull high voltage VDD = 3.3V

Note2: input control signal threshold voltage definition

Item	Symbo	Min.	Typ.	Max.	Unit
Input High Threshold Voltage	VIH	2	-	5.5	V
Input Low Threshold Voltage	VIL	0	-	0.8	V

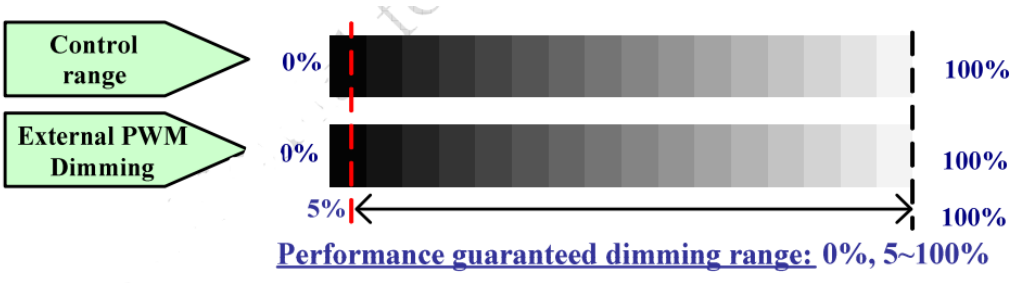
Note3: VBLON

Mode selection

VBLON	Note
H or OPEN	BL On
L	BL Off

Note4: Please leave this pin unoccupied. It cannot be connected by any signal (Low/GND/High).

Note5: PDIM



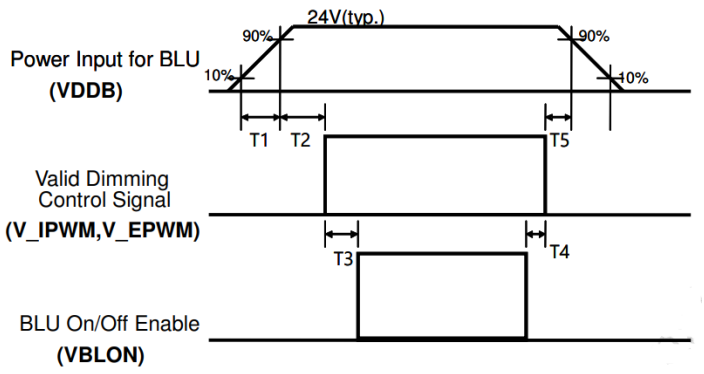
External PWM function dimming ratio 0%~100%, Judge condition as below:

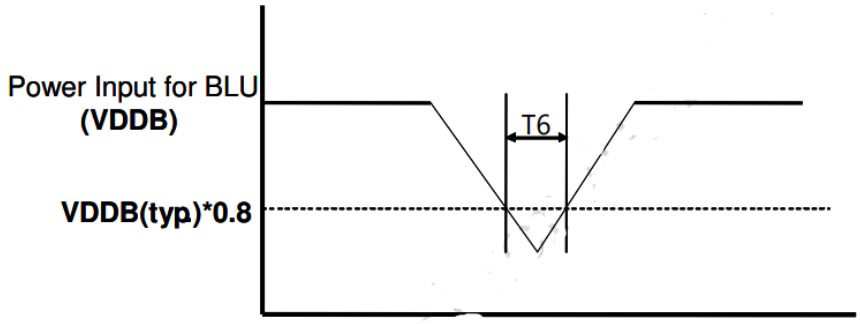
1.Backlight module must be lighted ON normally.

2.All protection function must work normally.

3.Uniformity and flicker could be guaranteed at External PWM function dimming ratio 5%~100%

6.3 Power Sequence for Backlight





Dip condition

Parameter	Min	Typ	Max	Units
T1	20	-	-	ms *1
T2	250	-	-	ms
T3	200			ms
T4	0	-	-	ms
T5	0	-	-	ms
T6	-	-	1000	Ms*2

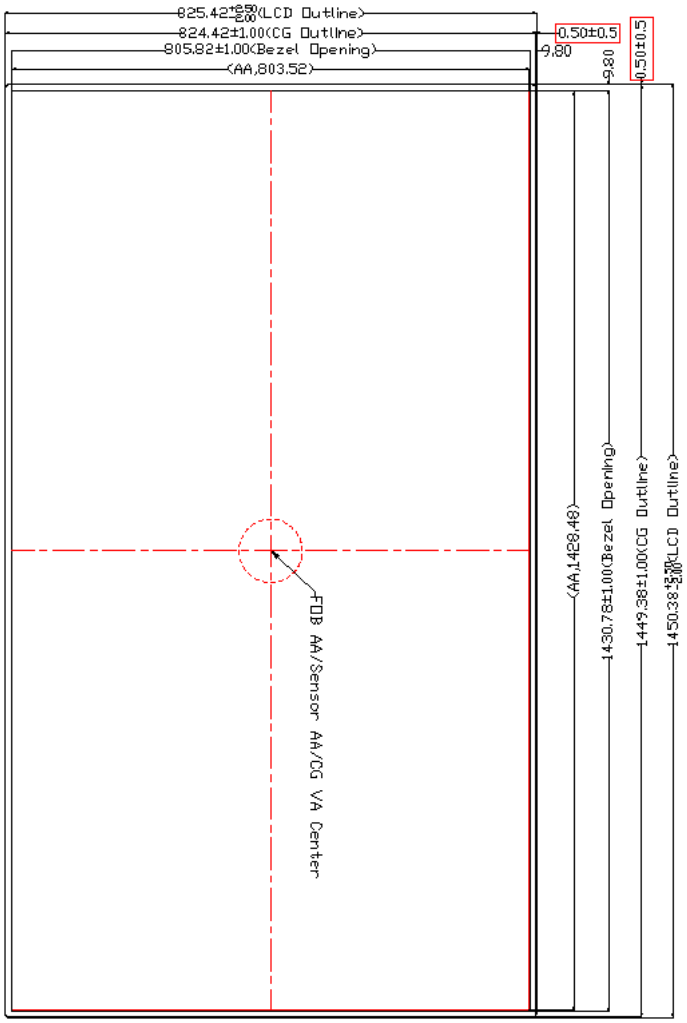
Note:1. T6 describes VDDB dip condition and VDDB couldn’t lower than 10% VDDB.

7. Mechanical Characteristics

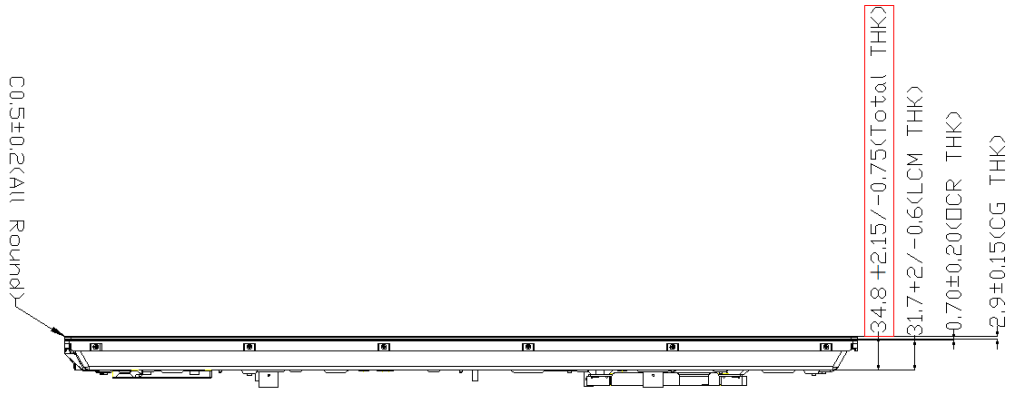
The contents provide general mechanical characteristics for the model G650ZVN01.0. In addition the figures in the next page are detailed mechanical drawing of the LCD.

Item		Dimension	Unit	Remark
Outline Dimension	Horizontal	1450.38	mm	
	Vertical	825.42	mm	
	Depth (Dmin)	31.1	mm	Front bezel to Back Bezel
	Depth (Dmax)	47.8	mm	Front Bezel to DB Cover
	Bezel opening	1216(H)x686.8(V)	mm	
	Bezel Width	9.8/9.8/9.8/9.8	mm	U/D/L/R
	Display Area	1428.48 (H)x803.52 (V)	mm	
Weight	18		Kg	

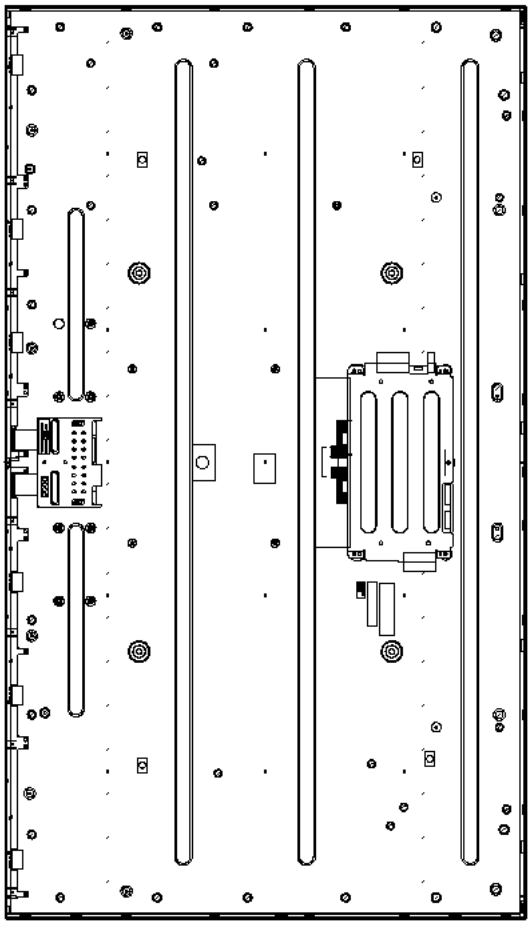
Front View



Side View



Back View



8. Quality Requirement

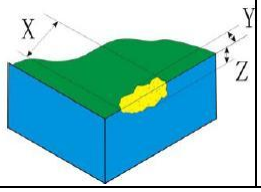
The defect categories covered in this specification include defects in the active area such as dot defects, blemishes, and partly / completely malfunctioning displays as well as visual appearance of the complete product and packaging of the product.

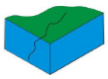
8.1 Inspection Conditions

Item	Condition	
Ambient lighting	Cosmetic：600~800Lux Function：300 to 700 Lux	
Temperature /Humidity	Temperature: 20 ~ 25℃ Humidity: 65±5%	
Driving condition	Equipment	Product specific test tool
Inspection method	Supply voltage	Typical voltages as given in the specification
	Distance	100±5 cm from display
	Viewing angle	Standard viewing angle of inspection shall be perpendicular to the display. Inspection at other viewing angles shall not exceed 45 of perpendicular viewing angle

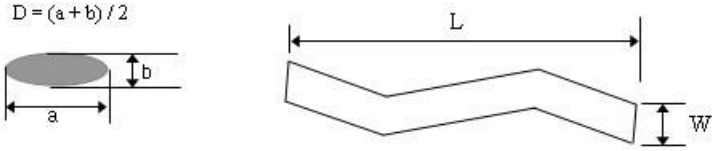
8.2 Visual Inspection Criteria

Defect category and legend	Inspection standard	Defect grade		
		Critical	Major	Minor
Foreign fiber / Scratch / other linear defects	W≦0.2 Disregarded 0.2<W≦0.25, L≦10, N≤10 ; 0.2<W≦0.25, 10 ≦L≦30, N≤3 per 10cm diameter circle W>0.25, L>30, N=0		●	
Non-feeling scratch & Line defects	W≦0.25 Disregarded 0.25<W≦0.5, L≦50 (accumulated), N≤6. Minimum distance between two defects = 100 mm. W>0.5, N=0		●	
Black / White Spots / Particles / Bubble / Dent / other dot defects	D≤0.6 Disregarded 0.6<D≦1.2, N≦12 D＞1.2, N=0		●	

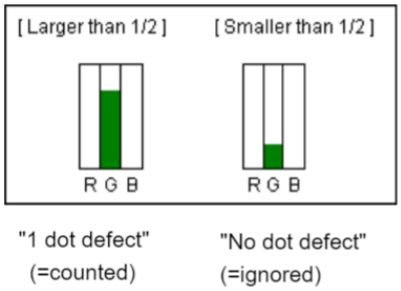
Pixel highlight	D≤0.6 Disregarded 0.6<D≦1.2, N≦12 D > 1.2, N=0		●	
Pixel dark spot	>1/2 spot area, visible under 2%ND filter When the LCD module is displayed in black mode, the screen appears bright.R.G or B 1 point: N≤2 Less than or equal to half the sub-pixel size: N≤12		●	
All points are defective	>1/2 spot area, visible under 2%ND filter When the LCD module is displayed in bright mode, the screen displays a dark color.R.G or B 1 point: N≤12 2 adjacent points (horizontal and vertical) : ≤2 pairs Total black spots: N≤14		●	
Total amount of full dot defects	0.6<D≦0.8, N≦ 8 0.8<D≦1.0, N≦ 4 1.0<D≦1.2, N≦ 4		●	
Abnormal Display / Bright Line / Dark Line / No Display	Not allowed			●
FPC OPEN	Not allowed	●		
FPC oxidized, dirty, deformed	Not allowed		●	
FPC deformed	Does not affect function Accept		●	
Mura / Light leakage	Invisible is OK while 2% ND filter apply at L128. Movable mura is OK after lightly patting on the mura area.		●	
uniformity	10% H≤35% The standards are tentatively set. The actual performance will be determined based on the final outcome of the product and will be discussed further. 80% H≤ 22%		●	
Glass chipping 	X≤1mm, Y≤1mm, Z≤T/3 忽略; X > 1mm, Y > 1mm, Z > 1/3T, N=0 Does not affect function Accept		●	

Glasscrack 	Not allowed		●	
LCM studs	Studs must not be loose, missing, untapped, or crooked, broken, more material, less material, cracked, warped, etc; Does not affect assembly accept		●	
Visually, the cracks were all NG				

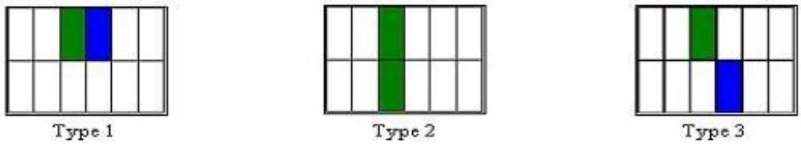
Note 1: D=Diameter, L=Length, W=Width, N=Number，DS=Distance



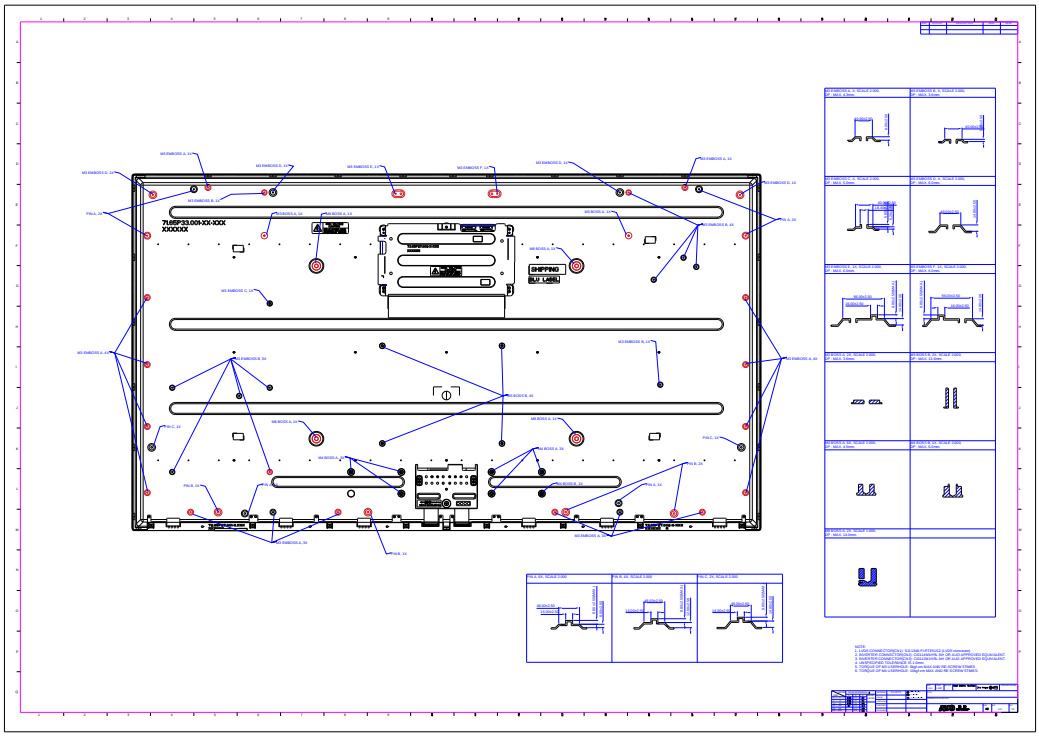
Note 2: Dot smaller than 1/2 of sub-pixel size will not counted as “1 dot” defect.



Note 3:adjacent dots defect



Note 4: LCM studs monitor drawing(red mark)


715EP33.009-XX-XXX
XXXXXX
SHIPPING
SET VIEW

9. Reliability Test Items

	Test Item	Q'ty	Condition
1	High temperature storage test	3	60℃, 500hrs
2	Low temperature storage test	3	-20℃, 500hrs
3	High temperature operation test	3	50℃, 500hrs
4	Low temperature operation test	3	-10℃, 500hrs
5	Vibration test (With carton)	1(PKG)	Random wave (1.04Grms 2~200Hz) Duration : X,Y,Z 20min per axes
6	Drop test (With carton)	1(PKG)	Height: 25.4 cm Direction: Only bottom flat twice (ASTMD4169-I)

10. International Standard

10.1 Safety

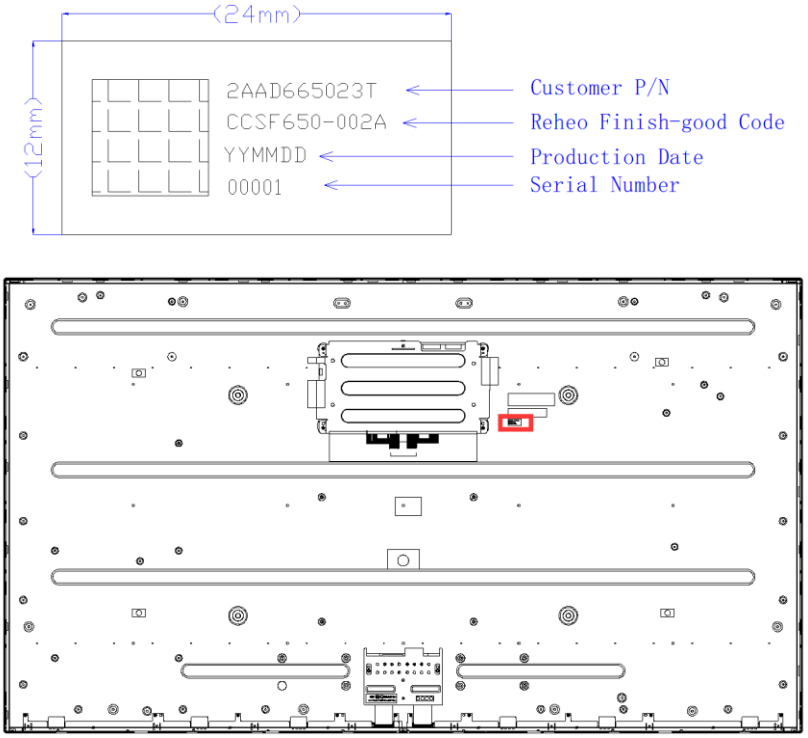
1. UL 60950-1; Standard for Safety of Information Technology Equipment Including electrical Business Equipment.
2. IEC 60950-1; Standard for Safety of International Electrotechnical Commission
3. EN 60950-1; European Committee for Electrotechnical Standardization (CENELEC), EUROPEAN STANDARD for Safety of Information Technology Equipment Including Electrical Business Equipment.

10.2 EMC

1. ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electrical Equipment in the Range of 9kHz to 40GHz. "American National standards Institute(ANSI), 1992
2. C.I.S.P.R "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." International Special committee on Radio Interference.
3. EN 55022 "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." European Committee for Electrotechnical Standardization. (CENELEC), 1998

11. Packing

11.1 Module Label



Customer P/N: 2AAD665023T

EHEO Finish-good Code: CCSF650-002A

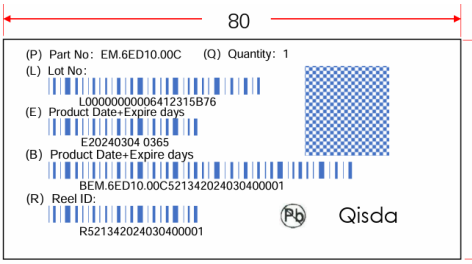
Serial Number: 5 digits, start from 00001, update everyday

Production Date: 6 digits, e.g.,240108

QR code Format：

2AAD665023T_ CCSF650-002A_00001_YYMMDD

11.2 Box Label

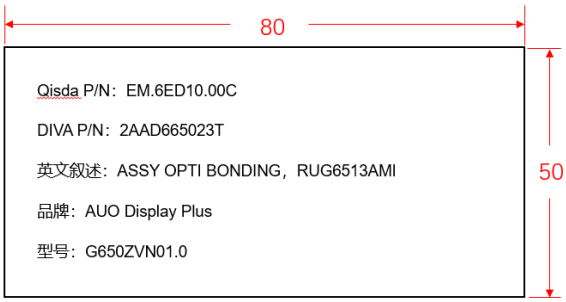


二维码中的内容应包括L码、E码、B码及R码，每项内容用";"分开，且内容只放于一行之中：
L000000000006412315B76;
E20240304 0365;
BEM.6ED10.00C;
R003720240304000001;

10、客户的代码有2个：
①.台湾钰纬：52134
②.苏州钰纬：82588
出货时需根据客户来选择客户代码。

1、一维码使用精度为7μ的code128码，二维码使用精度为23μ的DataMtrix码；
2、P码：客户P/N号；
3、Q码：数量；
4、L码：Lot No：L000000000006412315B76,共21位，其中首位L为标识码，其余为Lot，若lot不足20位则前面加0来满足20位的长度；
5、E码：E20240304 0365,共14位，其中首位E为标识码，中间8位为年月日，后面1位空格，最后4位为质保期，若质保期不足4位则前面加0满足4位的长度；
6、B码：BEM.6ED10.00C521342024030400001,共31位，其中首位B为标识码，后面12位为客户P/N号，再后面5位为厂商代码，再8位为日期，再5位为数量00001，若不足5位则在前面加0满足5位的长度；
7、R码：R521342024030400001,共19位，其中首位R为标识码，52134为厂商代码，后面8位为日期，最后5位为产品流水号，若产品流水号不足5位，则在前面加0满足5位的长度，无论料号是否一样，R码均不允许重复；
8、有无铅标识；
9、右下角为Qisda的logo，字体为Century Gothic；

Box Label 1



Box Label 2

11.3 Packing Methods



12. Handling & Cautions

12.1 Mounting Method

Excessive stress or pressure on the glass of this product should be avoided. Care must be taken to ensure that no torsional or compressive forces are applied to the product when it is mounted.
If the customer's set presses the main parts of the product, it may show the phenomenon of abnormal display. But this phenomenon does not mean malfunction.
To determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.
Mount a product with the specified mounting parts.

12.2 Caution of Handling and Cleaning

Since the product is mainly made of glass, do not apply strong mechanical impact or static load onto it.
Handling with care since shock, vibration, and careless handling may seriously affect the product.
If it falls from a high place or receives a strong shock, the glass maybe broken.
If the use of a chemical is unavoidable, use soft cloth with solvent recommended below to clean the product's surface.
IPA (Isopropyl Alcohol), Ethyl Alcohol, Tri-chloro, tri-florothane.
Please handle FPC with care.

12.3 Caution against Static Charge

Do not input any signals before power is turn on, and ground your body, work/assembly area, assembly equipment to protect against static electricity.
Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from the surface, if possible, under ESD control device like ion blower, and the humidity of working room should be kept over 50%RH to reduce the risk of static charge.
Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.
In handling the product, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary.

12.4 Caution for Operation

It is indispensable to drive this product within the specified voltage limit. An electro-chemical reaction due to DC drive may cause undesirable deterioration
of this product. so, the use of DC drive should avoid.
Do not connect or disconnect this product to or from the system when power is on.
Never use this product under abnormal conditions of high temperature and high humidity.
When it is exposed to drastic fluctuation of temperature (hot to cold or cold to hot), the product may be affected.
Response time will increase at temperature extremely lower than the operating temperature.

range and on the other hand this product may turn black at temperature above its operational range. However, those phenomena do not mean malfunction. This product will revert to normal operation once the temperature returns to the recommended temperature range for normal operation.
Do not display a fixed pattern for a long time because it may cause image sticking.
If it is un-avoided, please use a screen saver.
Do not disassemble and/or re-assemble the product.

12.5 Packing

Avoid intense shock and falls from a height.
To prevent the product from degradation, do not operate or store them exposed directly to sunshine or high temperature/humidity for long periods.

12.6 Storage

A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.
Relative humidity of the environment should therefore be kept below 60%RH.
Do not store the product near organic solvents or corrosive gasses.
Keep the product safe from vibration, shock, and pressure.
Black or white air-bubbles may be produced if the product is stored for long time in the lower temperature or mechanical shocks are applied onto the product.
In the case of storing for a long period of time for the purpose or replacement use,the following ways are recommended.
Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.
Store in a dark place where neither exposure to direct sunlight nor light is.
Keep temperature in the specified storage temperature range.
If possible, store the product in the packaging situation when it was delivered.

12.7 Safety

For the crash damaged or unnecessary this product, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol and should be burned up later.
In the case of this product is broken, watch out whether liquid crystal leaks out or not. If your hands touch the liquid crystal, wash your hands cleanly with water and soap as soon as possible.
If you swallow the liquid crystal by mistake, wash your mouth thoroughly with water and then drink a large amount of water; induce vomiting, and consult a physician.
If the liquid crystal touches your eyes, flush your eyes with running water for at least fifteen minutes.
If the liquid crystal touches your skin or clothes, remove it and wash the affected part of your skin or clothes with soap and running water.

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