Document Version: 0.3

Date: 2007/12/19

Product Specifications

31.5" WXGA Color TFT-LCD Module
Model Name: T315XW02 VK

() Preliminary Specifications
(*) Final Specifications

Contents

Record of Revision

Version	Date	No	Old Description	New Description	Remark
0.0	07/11/09		First issue		
0.1	07/12/12	1	General information	Update AA size, outline dimension, surface treatment data	
		2	Absolute Maximum Rating	Add min value (Vcc, Vin, V)	
		3	Electrical Specification	Update table 3-1 data	
		4	Interface connection	Update pin 38 & 39 definition	
		5	Block diagram	Update drawing	
		6	Backlight electrical spec	Correct V$_{BLON}$ unit to VDC	
		7	Input spec	Update CN1 type, PWM duty=80%	
		8	Backlight Diagram	Update backlight diagram	
		9	Signal Timing Spec	Update timing spec (60Hz & 48Hz)	
		10	Signal Timing Waveforms	Update waveforms	
		11	Power Sequence	Update power sequence table	
		12	Optical Spec	Update contrast min, luminance variation spec, white coordinates	
		13	Mechanical characters	Update weight & surface treatment data	
		14	Section 6 Reliability	Update reliability items	
		15		Add section 7-4	
		16	Section 8 Packing	Update label	
0.2	07/12/17	1	Backlight Diagram	Update backlight diagram	
		2	Optical Spec	Update CR & brightness	
		3	Reliability	Update vibration (with carton) condition	
		4	2-D drawing	Update drawing	
		5		Add section7-5	
0.3	07/12/19	1	Signal Timing Spec	Add horizontal frequency	

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1. General Description

This specification applies to the 31.51 inch Color TFT-LCD Module T315XW02 VK. This LCD module has a TFT active matrix type liquid crystal panel 1366x768 pixels, and diagonal size of 31.51 inch. This module supports 1366x768 XGA-WIDE model (Non-interlace). 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. The T315XW02 VK has been designed to apply the 10-bit 1 channel LVDS interface method. It is intended to support displays where high brightness, high color gamut, wide viewing angle, high color saturation, and high color depth are very important.

General Information

Items	Specification	Unit	Note
Active Screen Size	31.5	inch	
Display Area	697.685 (H) x 392.256(V)	mm	
Outline Dimension	741(H)*435(V)*50.1(D)	mm	With inverter
Driver Element	a-Si TFT active matrix		
Display Colors	1073.7M	Colors	
Number of Pixels	1366 x 768	Pixel	
Pixel Pitch	0.51075	mm	
Pixel Arrangement	RGB vertical stripe		
Display Mode	Normally Black		
Surface Treatment	3H, total Haze=11%		
RoHS	RoHS compliance		

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2. Absolute Maximum Ratings

The following are maximum values which, if exceeded, may cause permanent damage to the unit.

| Item	Symbol	Min	Max	Unit	Conditions
Tcon Board Power Voltage	Vcc	-0.5	17	[Volt]	Note 1
Input Voltage of Setup pin	Vin	-0.5	4.6	[Volt]	Note 1
Input Voltage of LVDS signal	V	-0.5	TBD	[Volt]	Note 1
BLU Input Voltage	VDDB	-0.3	27	[Volt]	Note 1
BLU Brightness Control Voltage	VBLON	-0.3	5.2	[Volt]	Note 1
Operating Temperature	TOP	0	50	[^{o}C]	Note 2
Operating Humidity	HOP	10	90	[%RH]	Note 2, 3
Storage Temperature	TST	-20	60	[^{o}C]	Note 2
Storage Humidity	HST	10	90	[%RH]	Note 2
Panel Surface Temperature		-	65	[^{o}C]	Note 2
PWM Duty			100%		

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: Limited by inverter.
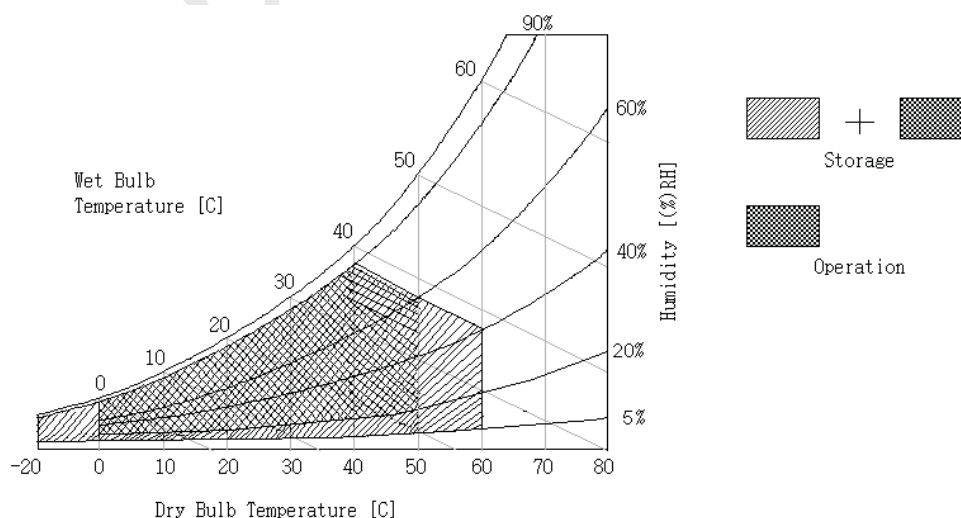
3. Electrical Specification

The T315XW02 VK requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input power for the BLU, is to power inverter.

3-1 Electrical Characteristics

Parameter			Values			Unit	Notes
			Min	Typ	Max		
LCD:							
Power Supply Input Voltage		Vcc	11	12.0	13	Vdc	1
Power Supply Input Current		Icc	-	1.3	1.5	A	2
Power Consumption		Pc	-	15.6	18	Watt	2
Inrush Current		I_{RUSH}	-	-	4	Apeak	3
LVDS Interface	Differential Input High Threshold Voltage	VTH			100	mV	4
	Differential Input Low Threshold Voltage	VTL	100			mV	4
	Common Input Voltage	VCIM	0.8	1.2	1.6	V	
CMOS Interface	Input High Threshold Voltage	VIH (High)	2.0			Vdc	
	Input Low Threshold Voltage	VIL (Low)			0.8	Vdc	
Backlight Power Consumption		PDDB	83.6	88	92.4	Watt	PWM80%
Life Time			30000			Hours	5

Note :

1. The ripple voltage should be controlled under 10% of V$_{CC}$

2. Vcc=12.0V, $f_v = 60$Hz, fCLK=79.7Mhz , 25℃, Test Pattern : White Pattern

3. Measurement condition :
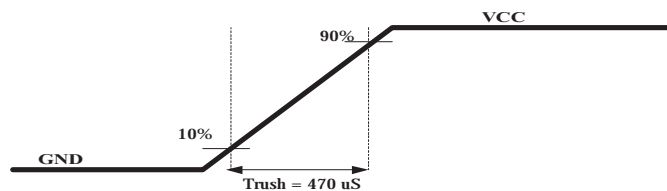
4. VCIM = 1.2V

VTH
VCIM
VTL
0V
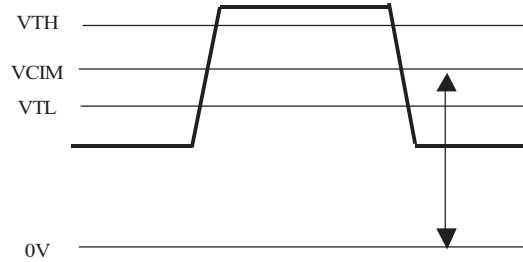
5. The relative humidity must not exceed 80% non-condensing at temperatures of 40 ℃ or less. At temperatures greater than 40℃, the wet bulb temperature must not exceed 39℃. When operate at low temperatures, the brightness of CCFL will drop and the life time of CCFL will be reduced.

3-2 Interface Connections

- LCD connector : FI-RE41S-HF (JAE)

| PIN No.	Description	PIN No.	Description
1	VDD (12V)	21	RXCLK+
2	VDD (12V)	22	GND
3	VDD (12V)	23	RX3-
4	VDD (12V)	24	RX3+
5	VDD (12V)	25	GND
6	GND	26	RX4-
7	GND	27	RX4+
8	GND	28	GND
9	GND	29	SCL
10	GND	30	SDA
11	RX0-	31	Tcon error
12	RX0+	32	BINT
13	GND	33	NC
14	RX1-	34	NC
15	RX1+	35	NC
16	GND	36	NC
17	RX2-	37	VCA
18	RX2+	38	TG-RST
19	GND	39	PE-SEL
20	RXCLK-	40	SA_MODE
		41	BUS_SW

Note:
1. All GND (ground) pins should be connected together and should also be connected to the LCD's metal frame. All Vcc (power input) pins should be connected together.

Block diagram for TFT-LCD module
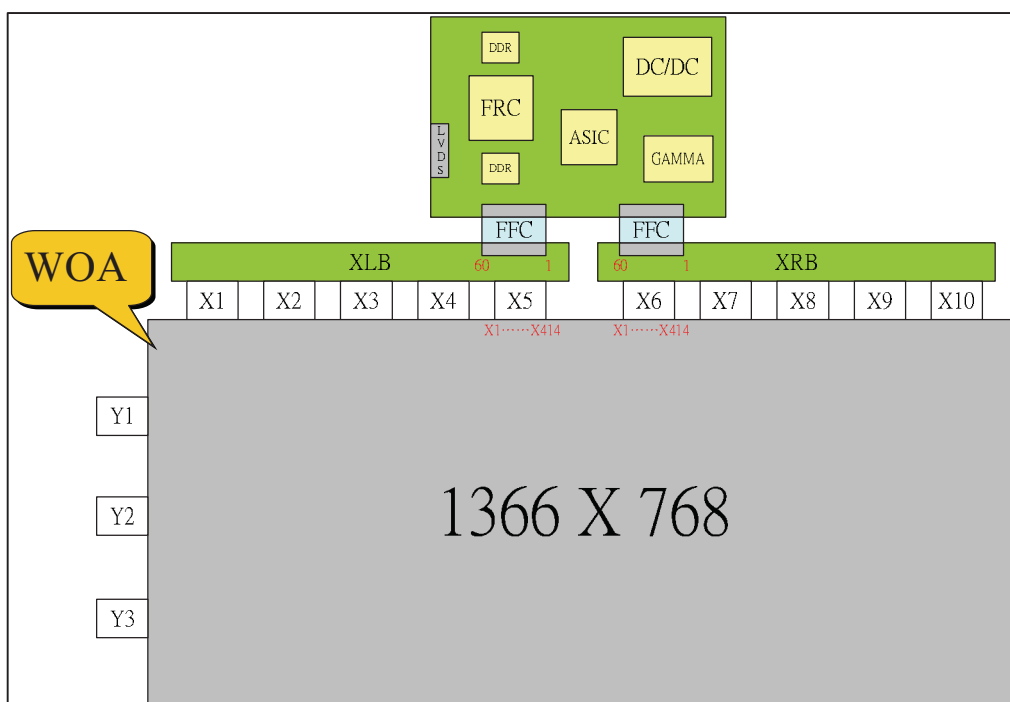
3-3 BACKLIGHT CONNECTOR PIN CONFIGURATION –

3-3.1 Electrical specification

ITEM	SYMBOL	CONDITION		MIN	TYP	MAX	UNIT	Note
Input Voltage	V_{DDB}	---		21.6	24	26.4	VDC	
Input Current (Stable Condition)	I_{DDB}	VDDB=24V		3.48	3.66	3.85	ADC	1
Input Power (Stable Condition)	P_{DDB}	VDDB=24V		83.5	88	92.4	W	1
ON/OFF Control Voltage	V_{BLON}	ON	VDDB=24V	2.0	---	5.0	VDC	1,2
		OFF	VDDB=24V	0.0	---	0.8	VDC	
ON/OFF Control Current	I_{BLON}	VDDB=24V		0.0	---	1.5	mADC	

Note1: Condition : VDDB=24.0 V, PWM=80% (Ta=25±5℃, Turn on for 45minutes),
Note2: Measurement condition Rising time = 20 ms (VDDB : 20%~80%);

3-3.2 Input specification

CN1: S14B-PH-SM4-TB (JST)

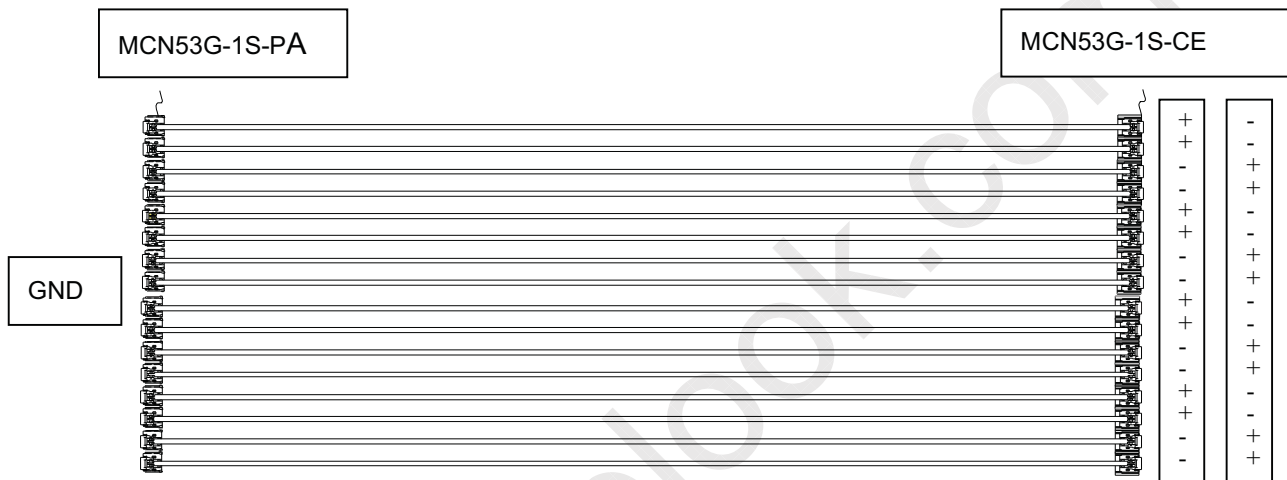| No	Symbol	Description
1	VDDB (Main Power)	DC input 24 VDC
2	VDDB (Main Power)	DC input 24 VDC
3	VDDB (Main Power)	DC input 24 VDC
4	VDDB (Main Power)	DC input 24 VDC
5	VDDB (Main Power)	DC input 24 VDC
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	GND	Ground
11	DET	Panel status detect (Normal:Low, Fail:Open Collector)
12	VBLON (Enable Pin)	BACKLIGHT ON / OFF(ON:2.0V ~ 5.0 V, OFF: 0 ~ 0.8 V)
13	Reserved	Reserved.
14	PWM	External dimming control: 20%~80% duty PWM Dimmer 120 Hz-180 Hz

Note

PWM Dimmer

ON 2V-5V   OFF 0V-0.8V
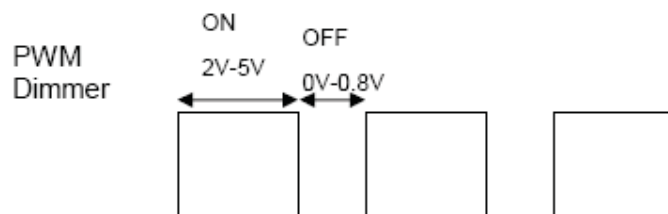
f(PWM)=120Hz-180Hz
Duty=ON/(ON+OFF)*100% :

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3-3.3. Backlight Diagram

MCN53G-1S-PA

MCN53G-1S-CE

GND

3-4 Signal Timing Specifications

This is the signal timing required at the input of the User connector. All of the interface signal timing should be satisfied with the following specifications for it's proper operation.
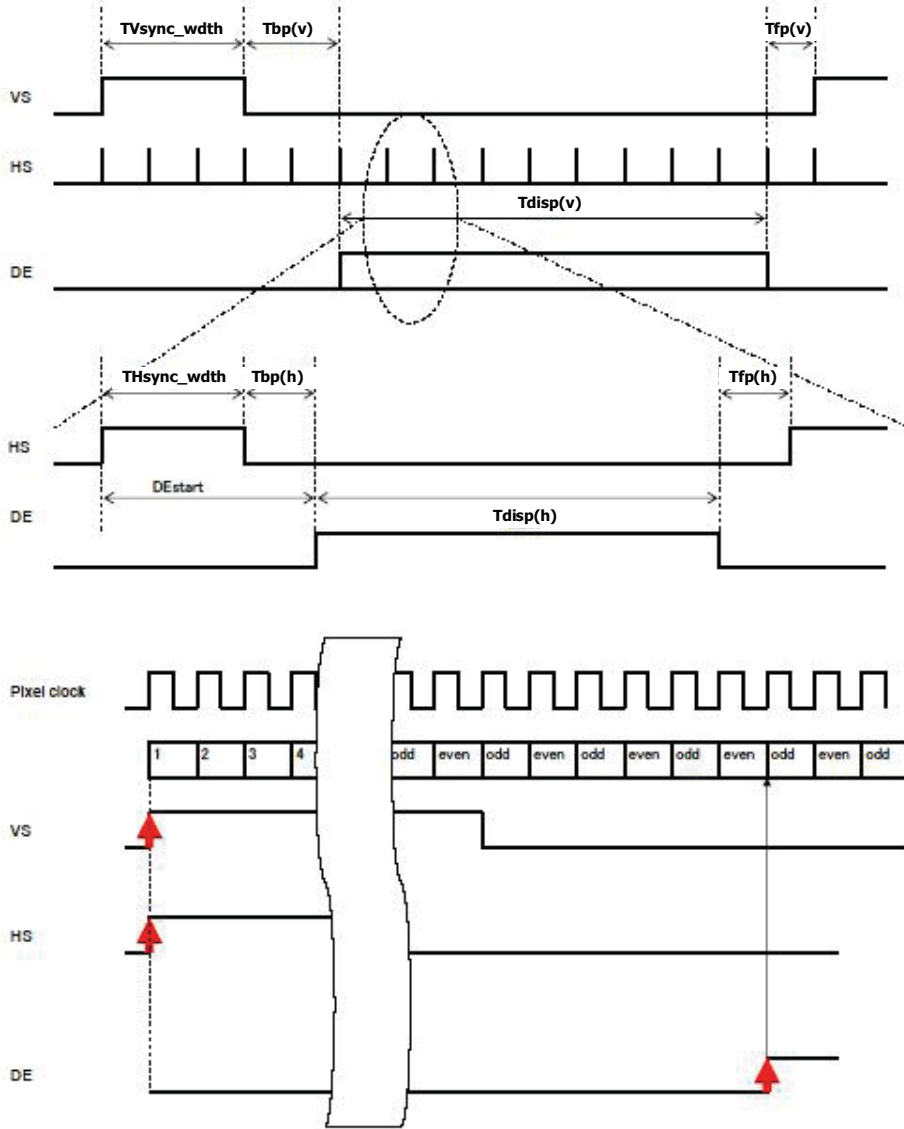
* Timing Table

60Hz

Signal	Symbol	min.	typ.	Max	Unit
Vertical Section	Tv		863		Th
	Tdisp(v)		768		Th
	Tfp(v)		72		Th
	Tbp(v)		19		Th
	TVsync_wdth		4		Th
Horizontal Section	Th		1548		Tclk
	Tdisp(h)		1366		Tclk
	Tfp(h)		92		Tclk
	Tbp(h)		50		Tclk
	THsync_wdth		32		Tclk
Pixel Clock	1/Tclk	78	79.7	82	Mhz
Vertical Frequency	Fv		59.7		Hz
Horizontal Frequency	Fh		51.5		kHz

48Hz

Signal	Symbol	min.	typ.	Max	Unit
Vertical Section	Tv		963		Th
	Tdisp(v)		768		Th
	Tfp(v)		172		Th
	Tbp(v)		19		Th
	TVsync_wdth		4		Th
Horizontal Section	Th		1724		Tclk
	Tdisp(h)		1366		Tclk
	Tfp(h)		276		Tclk
	Tbp(h)		50		Tclk
	THsync_wdth		32		Tclk
Pixel Clock	1/Tclk	78	79.7	82	Mhz
Vertical Frequency	Fv		48		Hz
Horizontal Frequency	Fh		46.22		kHz

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3-5 Signal Timing Waveforms

3-6 Color Input Data Reference

The brightness of each primary color (red, green and blue) is based on the 8 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.
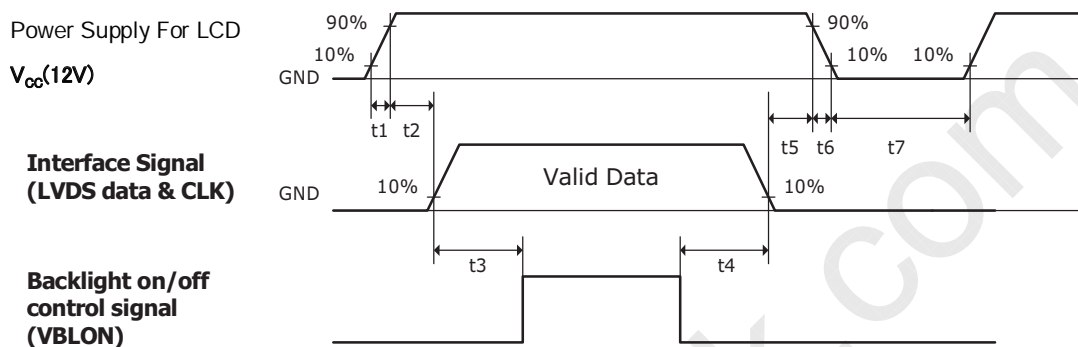
COLOR DATA REFERENCE

Color		Input Color Data																													
		RED MSB LSB										GREEN MSB LSB										BLUE 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(255)	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(255)	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(255)	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
RED	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(254)	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(255)	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	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(254)	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(255)	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	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(254)	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(255)	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

3-7 Power Sequence for LCD Module

3-7.1 Power Sequence for LCD

Power Supply For LCD

V_{cc}(12V)

Interface Signal
(LVDS data & CLK)

Backlight on/off
control signal
(VBLON)

Parameter	Values			Units
	Min.	Typ.	Max.	
t1	0.47		5	ms
t2	80			ms
t3	100			ms
t4	200		-	ms
t5			50	ms
t6				ms
t7	1000		-	ms

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4. Optical Specification

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in a dark environment at 25℃. The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of Φ and θequal to 0°.

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

SR3 or equivalent
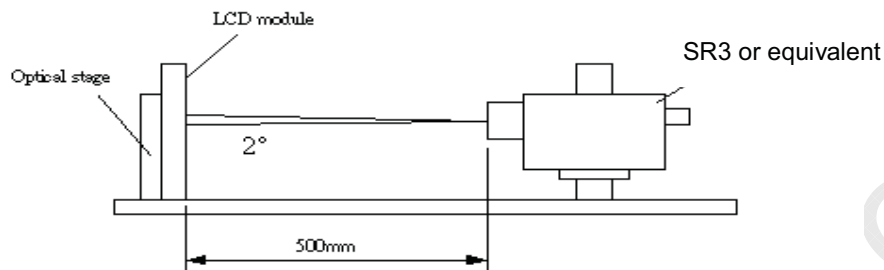
Parameter		Symbol	Values			Units	Notes
			Min.	Typ.	Max.		
Contrast Ratio		CR	2000	2500			1
Surface Luminance, white		LWH	450	540		cd/㎡	2
Luminance Variation		δ_WHITE 9 p			1.30		3
Response Gray to Gray time		Tγ		6.5		ms	4
Color Gamut		NTSC		88		%	
Color Coordinates							
	RED	R_X		0.650			
		R_Y		0.330			
	GREEN	G_X		0.218			
		G_Y	Typ.-0.03	0.656	Typ.+0.03		
	BLUE	B_X		0.149			
		B_Y		0.058			
	WHITE	W_X		0.28			
		W_Y		0.28			
Viewing Angle							
	x axis, right(φ=0°)	θ_r	75	89		Degree	6
	x axis, left(φ=180°)	θ_l	75	89			
	y axis, up(φ=90°)	θ_u	75	89			
	y axis, down (φ=0°)	θ_d	75	89			

Note:

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

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

2. Surface luminance is luminance value at point 1 across the LCD surface 50cm from the surface with all pixels displaying white. From more information see FIG 2. When PWM 80% L_{WH}=Lon5 , where Lon5 is the luminance with all pixels displaying white at center 5 location.

3. The variation in surface luminance, δWHITE is defined (center of Screen) as:

$$\delta_{WHITE(9P)} = \text{Maximum}(L_{on1}, L_{on2}, \ldots, L_{on9}) / \text{Minimum}(L_{on1}, L_{on2}, \ldots L_{on9})$$

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 f_v=60Hz to optimize.

	0%	25%	50%	75%	100%
0%		t:0%-25%	t:0%-50%	t:0%-75%	t:0%-100%
25%	t:25%-0%		t:25%-50%	t:25%-75%	t:25%-100%
50%	t:50%-0%	t:50%-25%		t:50%-75%	t:50%-100%
75%	t:75%-0%	t:75%-25%	t:75%-50%		t:50%-100%
100%	t:100%-0%	t:100%-25%	t:100%-50%	t:100%-75%	

5. Tγ is the response time between any two gray scale and is based on f_v=60Hz to optimize.

6. 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. 2 Luminance
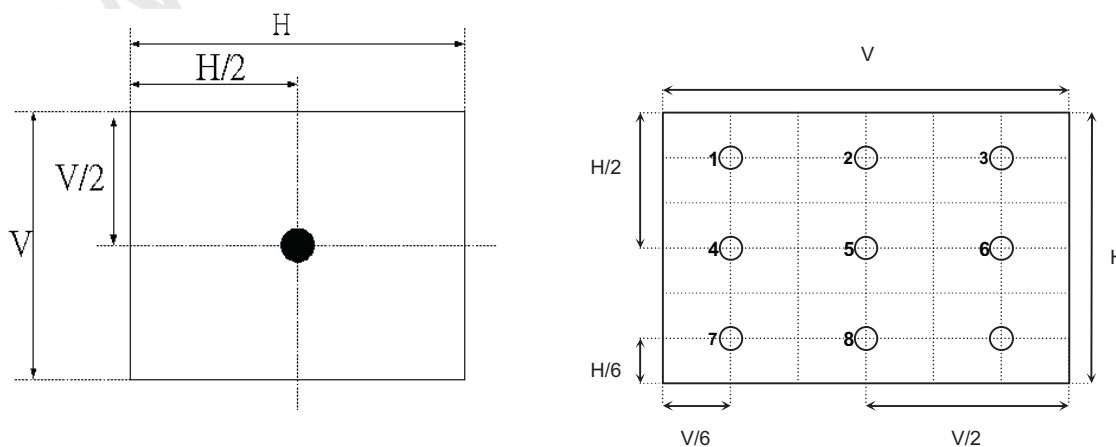
FIG.3 Viewing angle
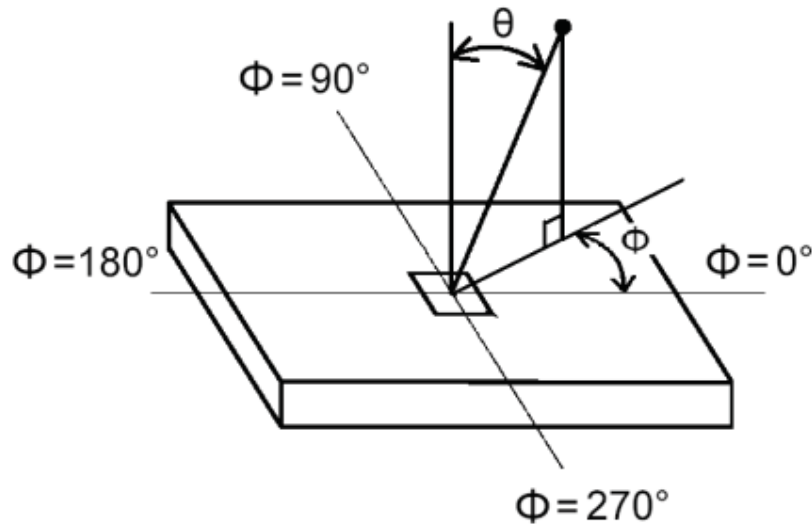
5. Mechanical Characteristics

The contents provide general mechanical characteristics for the model T315XW02 VK. In addition the figures in the next page are detailed mechanical drawing of the LCD.

Outline Dimension	Horizontal	741.0mm
	Vertical	435.0mm
	Depth	50.1mm
Bezel Opening	Horizontal	704.6mm
	Vertical	398.6mm
Active Display Area	Horizontal	697.68mm
	Vertical	392.26mm
Weight	Typ. 6550 g	
Surface Treatment	AG –SR6, Haze = 11	
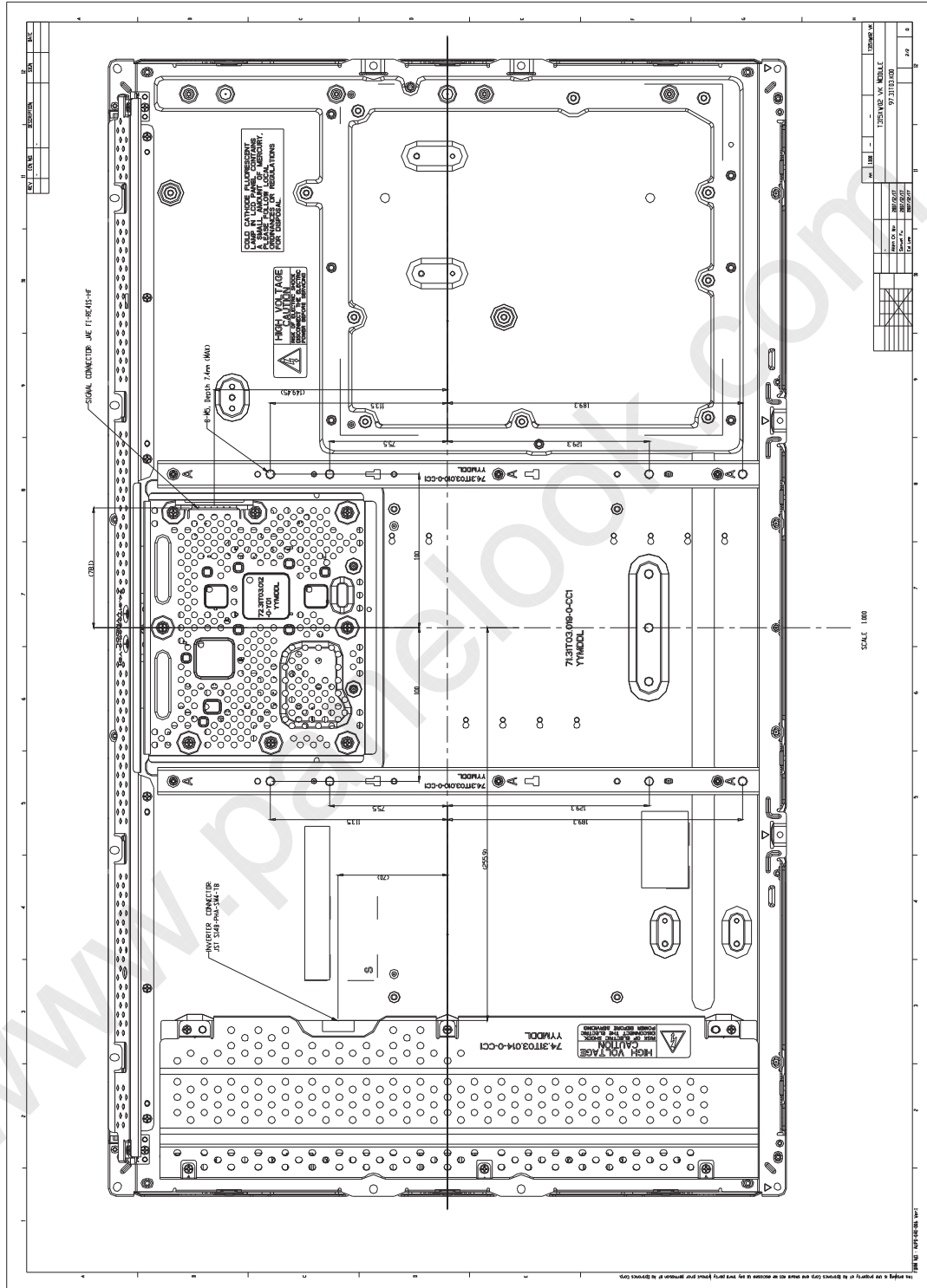
T315XW02 VK   -   Spec. Ver 0.3

Front

T315XW02 VK   -   Spec. Ver 0.3   20/29

Back

6. Reliability

Environment test condition

	Test Items	Q'ty	Conditions
1	High Temperature Stroage	3	60℃ 300 hrs
2	Low Temperature Stroage	3	-20℃, 300 hrs
3	High Temperature Operation	3	50℃, 300 hrs
4	Low Temperature Operation	3	-5℃, 300 hrs
5	Vibration (non-operation)	3	(10 ~ 300Hz/1.5G/11min SR, XYZ 30min/axis) Vibration level : 1.5G RMS, Bandwidth : 10-300Hz Duration: X, Y, Z 30min,
6	Shock　(non-operation)	3	Shock level: 50G Waveform: have sine wave, 11ms Direction: ±X,±Y, ±Z One time each direction
7	Vibration (With carton)	3	Random wave (1.5 Grms 10~200Hz) 30mins / Per each X.Y.Z axes
8	Drop (With carton)	3	Height: 46cm 1 corner, 3 edges, 6 surfaces (ASTMD4169-I)

7. International Standard

7-1. Safety

(1) UL6500, Underwriters Laboratories, Inc. (AUO file number : E204356)

Standard for Safety of Information Technology Equipment Including electrical Business Equipment.

(2) CAN/CSA C22.2 No. 950-95 Third Edition, Canadian Standards Association, Jan. 28, 1995

Standard for Safety of Information Technology Equipment Including Electrical Business Equipment.

(3) EN60950 : 1992+A2: 1993+A2: 1993+C3: 1995+A4: 1997+A11: 1997

IEC 950: 1991+A1: 1992+A2: 1993+C3: 1995+A4:1996

IEC 60065 (AUO Certificate number : JPTUV-008549)

European Committee for Electro technical Standardization (CENELEC)

EUROPEAN STANDARD for Safety of Information Technology Equipment Including Electrical Business Equipment.

7-2. EMC

a) 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

b) C.I.S.P.R "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." International Special committee on Radio Interference.

c) EN 55022 "Limits and Methods of Measurement of Radio Interface Characteristics of Information Technology Equipment." European Committee for Electrotechnical Standardization. (CENELEC), 1998

7-3 Green

Green Mark Description:

a) For Pb Free products, AUO will add　　　for identification.

b) For RoHS compatible products, AUO will add　　　for identification.

Note. The Green Mark will be present only when the green documents have been ready by AUO Internal Green Team. (The definition of green design follows the AUO green design checklist.)

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7-4 EMI (Reference)

Item	Min	Typ	Max	Unit
EMI Level　Note1)	---	---	-6	dB(μV/m)
SSCG	---	----	---	ps

Note 1)

  a) Criteria: CISPR22

  b) Signal generator : PSG200-1(Sony EMCS)

  c) EMI site : SONY EMCS Ichinomiya Tec. Or using correlation value

7-5 Input Spread Spectrum Specification (Reference)

Items	Min	Typ	Max	Unit
Modulation Rate	---	---	±2.0	%
Modulation Frequency	---	---	40	kHz

8. Packing

Panel label:

TW7A6110079:   T: Taiwan, A/B: China

00079: Panel Serial Number

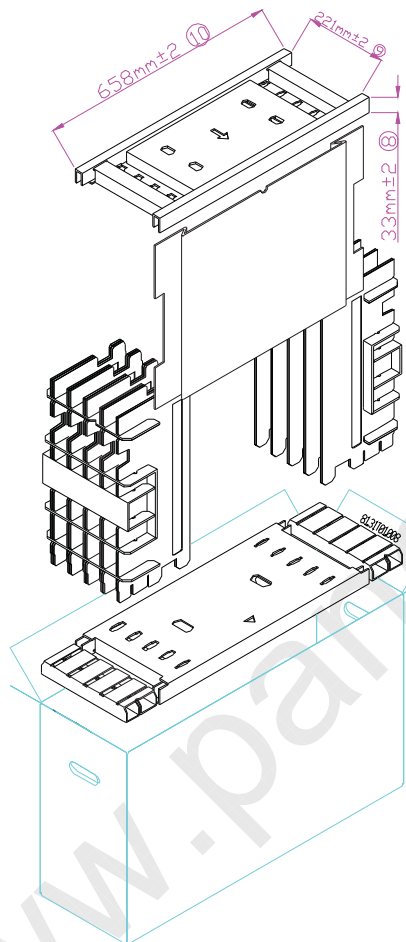NM1100: AUO internal code

Manufactured 07/44: 2007 week 44

Made In Taiwan: Taiwan made

Carton Label:
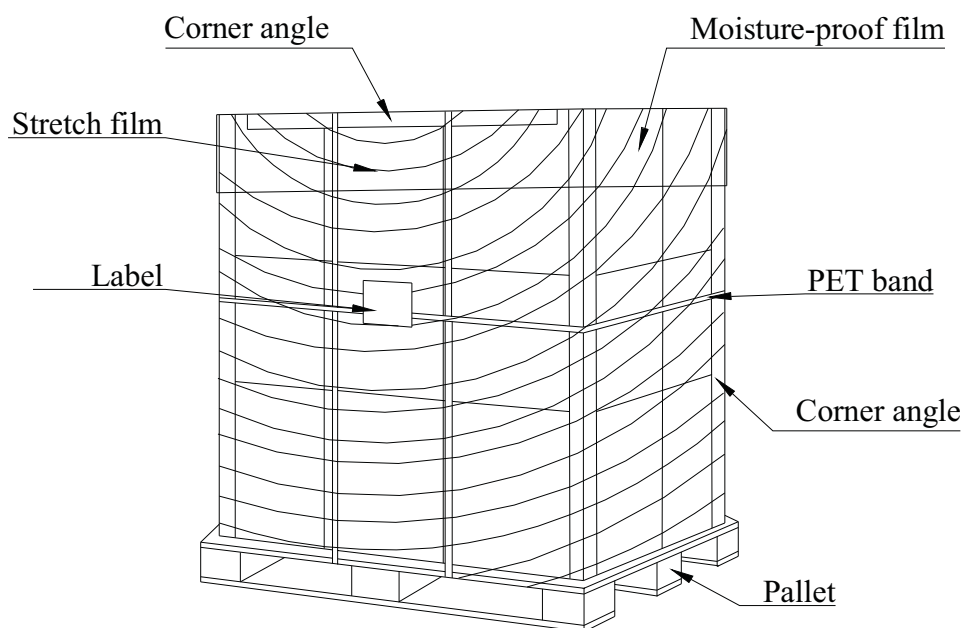
Carton:

4pcs/Carton

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Palletizing sequence:

(1) By air : (4*1) *2 layers, one pallet put 8 boxes, total 32 pcs module.

(2) By sea : HQ container (4*1) * 4 layers, one pallet put 16 boxes, total 64 pcs module.

	Item	Specification			Packing
		Qty.	Dimension	Weight (kg)	Remark
1	Packing BOX	4pcs/box	878(L)mm*290(W)mm*535(H)mm	33	
2	Pallet	1	114(L)mm*890 (W)mm*120(H)mm	10	
3	Boxes per Pallet	8 boxes/Pallet			
4	Panels per Pallet	32 pcs/pallet			
5	Pallet after packing	52 pallet/container	1140(L)mm*890(W)mm*120(H)mm	274	

Corner angle   Moisture-proof film

Stretch film

Label   PET band

Corner angle

Pallet

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9. PRECAUTIONS

Please pay attention to the followings when you use this TFT LCD module.

9-1 MOUNTING PRECAUTIONS

(1) You must mount a module using holes arranged in four corners or four sides.

(2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.

(3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to the resist external force.

(4) You should adopt radiation structure to satisfy the temperature specification.

(5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.

(6) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)

(7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front/ rear polarizers. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer.

(8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.

(9) Do not open the case because inside circuits do not have sufficient strength.

9-2 OPERATING PRECAUTIONS

(1) The device listed in the product specification sheets was designed and manufactured for TV application

(2) The spike noise causes the mis-operation of circuits. It should be lower than following voltage:
V=±200mV(Over and under shoot voltage)

(3) Response time depends on the temperature.(In lower temperature, it becomes longer..)

(4) Brightness depends on the temperature. (In lower temperature, it becomes lower.) And in lower temperature, response time (required time that brightness is stable after turned on) becomes longer.

(5) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.

(6) When fixed patterns are displayed for a long time, remnant image is likely to occur.

(7) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interface.

9-3 ELECTROSTATIC DISCHARGE CONTROL

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.

9-4 PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.

9-5 STORAGE

When storing modules as spares for a long time, the following precautions are necessary.

(1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5℃ and 35℃ at normal humidity.

(2) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

9-6 HANDLING PRECAUTIONS FOR PROTECTION FILM

(1) The protection film is attached to the bezel with a small masking tape. When the protection film is peeled off, static electricity is generated between the film and polarizer. This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.

(2) When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of flue still on the Bezel after the protection film is peeled off.

(3) You can remove the glue easily. When the glue remains on the Bezel or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.