

- ☐ Preliminary Specifications
☒ Final Specifications

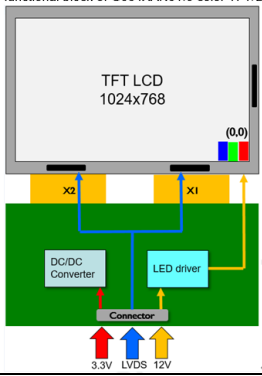
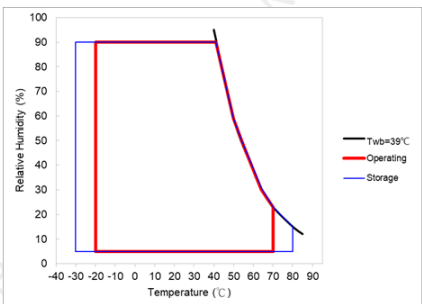
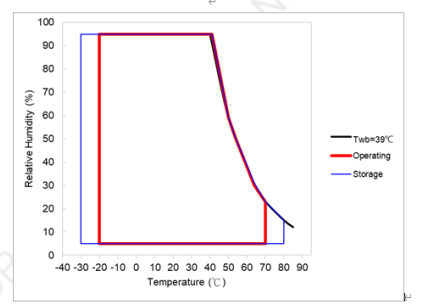
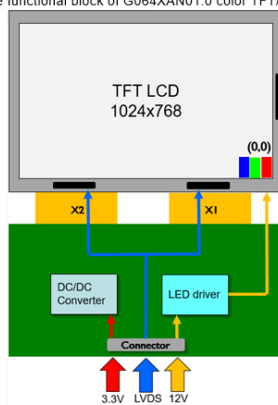
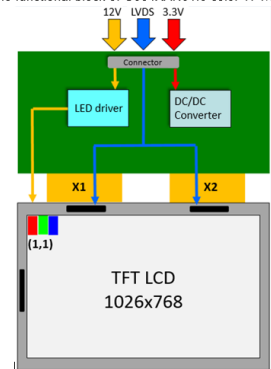
Module	6.4 Inch Color TFT-LCD
Model Name	G064XAN01.0

Customer	Date	Approved by	Date
		<u>Castor Chan</u>	<u>2024/8/12</u>
Checked & Approved by		Prepared by	
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Record of Revision

Version and Date		Page	Old description		New Description																																																													
0.0	2023/10/05	All	First Edition																																																															
0.1	2023/11/02	5	Surface Treatment	Anti-glare, Hardness 3H	Surface Treatment ^{1,2}	Anti-glare, Hardness 3H, Haze 28.5% ^{1,2}																																																												
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	18 6.4 The Input Data Format 8 bits LVDS Input JEIDA only DE mode SEL68 = "High" for 6 bits LVDS Input RxCLKIN RxIN0: G0, R5, R4, R3, R2, R1, R0 RxIN1: B1, B0, G5, G4, G3, G2, G1 RxIN2: DE, B5, B4, B3, B2 SEL68 = "Low" or "NC" for 8 bits LVDS Input RxCLKIN: NS-like format RxIN0: G0, R5, R4, R3, R2, R1, R0 RxIN1: B1, B0, G5, G4, G3, G2, G1 RxIN2: DE, B5, B4, B3, B2 RxIN3: RSV, B7, B6, G7, G6, R7, R6 Note1: Please follow PSWG Note2: R/G/B data 7:MSB, R/G/B data 0:LSB	6.4 The Input Data Format 8 bits LVDS Input JEIDA only DE mode CLK+/-, D0+/-, D1+/-, D2+/-, D3+/- 8 BIT COLOR BIT ORDER: MSB (R6, R5, R4, R3, R2, R1, R0), LSB (B6, B5, B4, B3, B2, B1, B0)	
0.3 2023/11/27	11 4.1 Absolute Ratings of TFT LCD Module Item, Symbol, Min, Max, Unit, Remark LogicLCD Drive Voltage: VDD, -0.3, 5, [Volt] LED Driver Input Voltage: VCC, -0.3, 26.5, [Volt] LED ON/OFF, PWM: VLED ON/OFF, VFWM ON, -0.3, 26.5, [Volt]	4.1 Absolute Ratings of TFT LCD Module Item, Symbol, Min, Max, Unit, Remark LogicLCD Drive Voltage: VDD, -0.3, 5, [Volt] LED Driver Input Voltage: VCC, -0.3, 26.5, [Volt] LED ON/OFF, PWM: VLED ON/OFF, VFWM ON, -0.3, 26.5, [Volt]	
0.4 2023/12/08	15 5.2.1 Parameter guideline for LED Following characteristics are measured under stable condition at 25°C. (Room Temperature) Symbol, Parameter, Min, Typ, Max, Unit, Remark VCC: Input Voltage, 10.8, 12, 13.2, [Volt] Ivcc: Input Current, TBD, TBD, [A], 100% PWM Duty Pvcc: Power Consumption, TBD, TBD, [Watt], 100% PWM Duty Iinrush LED: Inrush Current, 3, A, VLED rising time ~ 470us F_PWM: Dimming Frequency, 200, 20K, [Hz] VLED ON/OFF: On Control Voltage, 2.5, 3.3, 5.5, Volt; Off Control Voltage, 0.8, Volt; Note 4, 5 VFWM ON: Swing Voltage, 2.5, 3.3, 5.5, [Volt] Dimming duty cycle: 100, % PLED: LED Power Consumption, TBD, TBD, [Watt] Operation Life: 50,000, Hrs, Ir= 20 mA, Ta= 25°C	5.2.1 Parameter guideline for LED Following characteristics are measured under stable condition at 25°C. (Room Temperature) Symbol, Parameter, Min, Typ, Max, Unit, Remark VCC: Input Voltage, 10.8, 12, 13.2, [Volt] Ivcc: Input Current, TBD, TBD, [A], 100% PWM Duty Pvcc: Power Consumption, TBD, TBD, [Watt], 100% PWM Duty Iinrush LED: Inrush Current, 3, A, VLED rising time ~ 470us F_PWM: Dimming Frequency, 200, 1000, [Hz] VLED ON/OFF: On Control Voltage, 2.5, 3.3, 5.5, Volt; Off Control Voltage, 0.8, Volt; Note 4, 5 VFWM ON: Swing Voltage, 2.5, 3.3, 5.5, [Volt] Dimming duty cycle: 10, 100, % PLED: LED Power Consumption, TBD, TBD, [Watt] Operation Life: 50,000, Hrs, Ir= 20 mA, Ta= 25°C	
1.0 2024/07/15	8 Color / Chromaticity Coordinates (CIE 1931) Red x, Red y, Green x, Green y, Blue x, Blue y, White x, White y Simulation typical The real chromaticity of R/G/B will be updated by first sample measured	Color / Chromaticity Coordinates (CIE 1931) Red x, Red y, Green x, Green y, Blue x, Blue y, White x, White y 0.541, 0.292, 0.291, 0.537, 0.108, 0.070, 0.263, 0.279 0.591, 0.342, 0.341, 0.587, 0.158, 0.120, 0.313, 0.329 0.641, 0.392, 0.391, 0.637, 0.208, 0.170, 0.363, 0.379	
	13 5.1.1 LCD Electrical Specification Symbol, Parameter, Min, Typ, Max, Units, Remark VDD: LogicLCD Input Voltage, 3.0, 3.3, 3.6, [Volt] Ivdd: LCD Input Current, TBD, [mA], Note1 Pvdd: LCD Power consumption, TBD, [Watt], Note1 Iinrush LCD: LCD Inrush Current, TBD, [A], Note2 VDDpp: Allowable LogicLCD Drive Ripple Voltage, 100, [mV] p-p, Note1	5.1.1 LCD Electrical Specification Symbol, Parameter, Min, Typ, Max, Units, Remark VDD: LogicLCD Input Voltage, 3.0, 3.3, 3.6, [Volt] Ivdd: LCD Input Current, 200, 240, [mA], Note1 Pvdd: LCD Power consumption, 0.66, 0.8, [Watt], Note1 Iinrush LCD: LCD Inrush Current, 2, [A], Note2 VDDpp: Allowable LogicLCD Drive Ripple Voltage, 100, [mV] p-p, Note1	

RxIN0

RxIN1

RxIN2

RxIN3

G0

R5

R4

R3

R2

R1

R0

B1

B0

G5

G4

G3

G2

G1

DE

B5

B4

B3

B2

RSV

B7

B6

G7

G6

R7

R6

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P _{VCC}	Power Consumption	-	1.32	1.584	[Watt]	100% PWM Duty																																																																																																																																																																	
I _{INRUSH LED}	Inrush Current	-	-	3	A	V _{LED} rising time ~ 470us																																																																																																																																																																	
F _{FRM}	Dimming Frequency	200	-	1000	[Hz]	4)																																																																																																																																																																	
V _{LED ON/OFF}	On Control Voltage	2.5	3.3	5.5	Volt	Note 4, 5																																																																																																																																																																	
	Off Control Voltage	-	-	0.8	Volt																																																																																																																																																																		
V _{FRM SWD}	Swing Voltage	2.5	3.3	5.5	[Volt]	4)																																																																																																																																																																	
4)	Dimming duty cycle	10	-	100	%	4)																																																																																																																																																																	
P _{LED}	LED Power Consumption	-	1.14	1.2	[Watt]	4)																																																																																																																																																																	
Operation Life		50,000	-	-	Hrs	I _F = 20 mA, T _A = 25°C																																																																																																																																																																	
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	Off Control Voltage ³⁾	-	-	0.8 ³⁾	Volt ³⁾																																																																																																																																																																		
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	19	6.5.2 Input Timing Diagram	6.5.2 Input Timing Diagram																																																																																																																																																																				
	21	7.1 TFT-LCD Signal : LVDS Connector ⁴⁾ <table><tr><th>Connector Name / Designation³⁾</th><th>Signal Connector³⁾</th></tr><tr><td>Manufacturer³⁾</td><td>HIROSE or compatible³⁾</td></tr><tr><td>Connector Model Number³⁾</td><td>FH75-60(30)SA-1SH(16)³⁾</td></tr></table>	Connector Name / Designation ³⁾	Signal Connector ³⁾	Manufacturer ³⁾	HIROSE or compatible ³⁾	Connector Model Number ³⁾	FH75-60(30)SA-1SH(16) ³⁾	7.1 TFT-LCD Signal : LVDS Connector ⁴⁾ <table><tr><th>Connector Name / Designation³⁾</th><th>Signal Connector³⁾</th></tr><tr><td>Manufacturer³⁾</td><td>HIROSE⁴⁾</td></tr><tr><td>Connector Model Number³⁾</td><td>FH75-60(30)SA-1SH(16)³⁾</td></tr></table>	Connector Name / Designation ³⁾	Signal Connector ³⁾	Manufacturer ³⁾	HIROSE ⁴⁾	Connector Model Number ³⁾	FH75-60(30)SA-1SH(16) ³⁾																																																																																																																																																								
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1.2 2024/07/27	24	10.1 Shipping Label (on the rear side of TFT-LCD display) ⁴⁾	10.1 Shipping Label (on the rear side of TFT-LCD display) ⁴⁾																																																																																																																																																																				
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			11.4 National Test Lab Requirement The display module will satisfy all requirements for compliance to: IEC/UL 62368-1-
1.4	2024/08/05	12	3. Functional Block Diagram The following diagram shows the functional block of G064XAN01.0 color TFT/LCD module:
1.5	2024/08/12	24	10.1 Shipping Label (on the rear side of TFT-LCD display)

1. Operating Precautions

- 1) Since front polarizer is easily damaged, please be cautious and not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or soft cloth.
- 5) Since the panel is made of glass, it may be broken or cracked if dropped or bumped on hard surface.
- 6) To avoid ESD (Electro Static Discharge) damage, be sure to ground yourself before handling TFT-LCD Module.
- 7) Do not open nor modify the module assembly.
- 8) Do not press the reflector sheet at the back of the module to any direction.
- 9) In case if a module has to be put back into the packing container slot after it was taken out from the container, do not press the center of the LED light bar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
- 10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) TFT-LCD Module is not allowed to be twisted & bent even force is added on module in a very short time. Please design your display product well to avoid external force applying to module by end-user directly.
- 12) Small amount of materials without flammability grade are used in the TFT-LCD module. The TFT-LCD module should be supplied by power complied with requirements of Limited Power Source (IEC 62368-1), or be applied exemption.
- 13) Severe temperature condition may result in different luminance, response time and LED ignition voltage.
- 14) The data on this specification sheet is applicable when LCD module is placed in landscape position.
- 15) Continuous displaying fixed pattern may induce image sticking. It's recommended to use screen saver or shuffle content periodically if fixed pattern is displayed on the screen.

2. General Description

This specification applies to the Color Active Matrix Liquid Crystal Display G064XAN01.0 composed of a TFT-LCD display, a driver and power supply circuit and a LED backlight system. The screen format is intended to support XGA (1024(H) x 768(V)) screen and 16.7M colors (8-bits). LED driving board for backlight unit is included in G064XAN01.0. All input signals are LVDS interface compatible.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25 °C condition:

Items	Unit	Specifications
Screen Diagonal	[inch]	6.4
Active Area	[mm]	129.792 (H) x 97.344 (V)
Pixels H x V		1024 x 3(RGB) x 768
Pixel Pitch	[mm]	0.12675 x 0.12675
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		Normally Black, AHVA
Nominal Input Voltage VDD	[Volt]	3.3 (typ.)
Typical Power Consumption	[Watt]	2 W (LCD: 0.55 W/LED BLU: 1.45 W) (The real power will be updated by first sample measured)
Weight	[Grams]	110 (max.)
Physical Size	[mm]	140.762 (W) x 110.524 (H) x 6.2 (D)
Electrical Interface		LVDS
Surface Treatment		Anti-glare, Hardness 3H, Haze 28.5%
Support Color		16.7M colors
Temperature Range Operating Storage (Non-Operating)	[°C] [°C]	-20 to +70 -30 to +80
RoHS Compliance		RoHS Compliance

2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
White Luminance	[cd/m ²]	Center point	310	390	-	Note 1
Uniformity	%	5 Points	75	80	-	Note 2, 3
Contrast Ratio			800	1000	-	Note 4
Response Time	[msec]	Rising	-	15	20	Note 5
	[msec]	Falling	-	10	15	
	[msec]	Raising + Falling	-	25	35	
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	80	85	-	Note 6
	[degree]		80	85	-	
	[degree]	Vertical (Upper) CR = 10 (Lower)	80	85	-	
	[degree]		80	85	-	
Color / Chromaticity Coordinates (CIE 1931)		Red x	0.541	0.591	0.641	
		Red y	0.292	0.342	0.392	
		Green x	0.291	0.341	0.391	
		Green y	0.537	0.587	0.637	
		Blue x	0.108	0.158	0.208	
		Blue y	0.070	0.120	0.170	
		White x	0.263	0.313	0.363	
		White y	0.279	0.329	0.379	
Color Gamut	%			50	-	

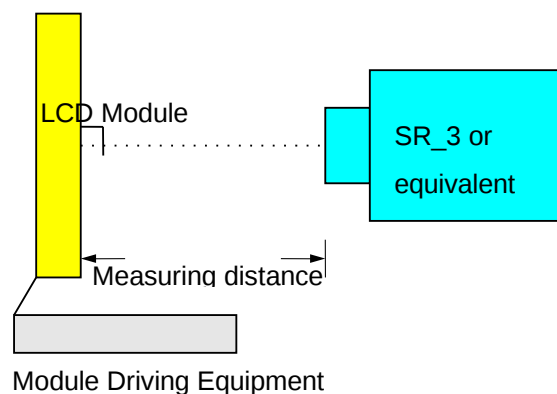
Note 1: Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR_3 or equivalent)

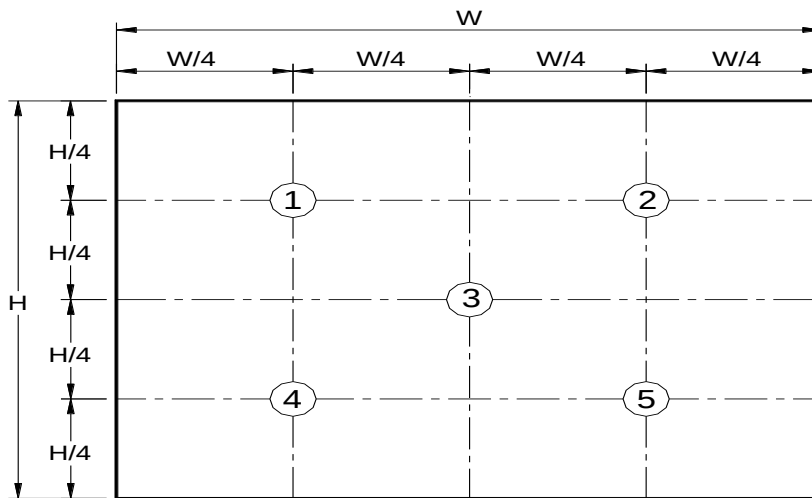
Aperture 1" with 50cm viewing distance

Test Point Center

Environment < 1 lux



Note 2: Definition of 5 points position (Display active area: 147.84mm (W) x 55.44mm (H))



Note 3: The luminance uniformity of 5 points is defined by dividing the minimum luminance values by the maximum test point luminance

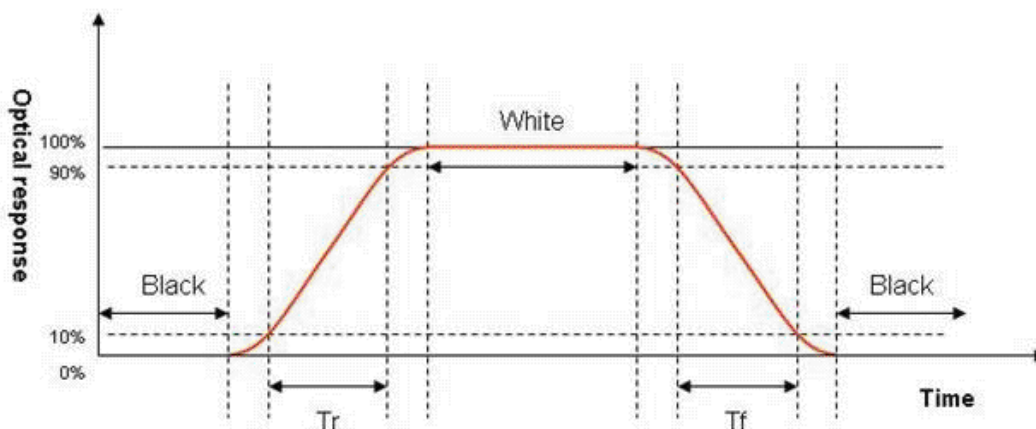
$$\delta_{w5} = \frac{\text{Minimum Brightness of five points}}{\text{Maximum Brightness of five points}}$$

Note 4: Definition of contrast ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

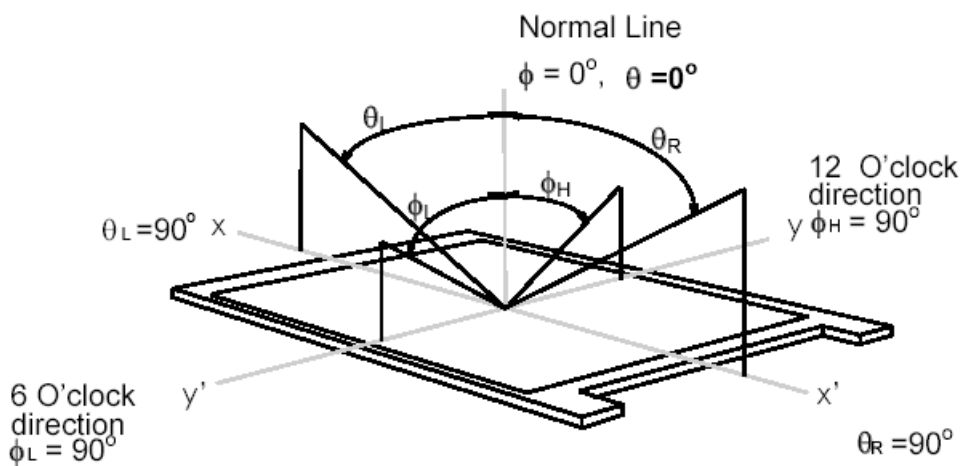
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "White" to "Black" (falling time) and from "Black" to "White" (rising time), respectively. The response time interval is between 10% and 90% of amplitudes. Please refer to the figure as below.



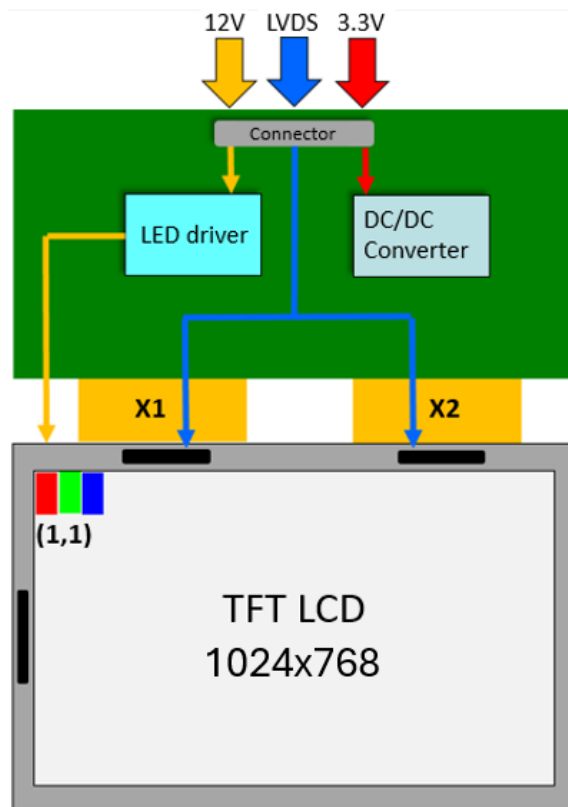
Note 6: Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as below: 90° (θ) horizontal left and right, and 90° (Φ) vertical high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated to its center to develop the desired measurement viewing angle.



3. Functional Block Diagram

The following diagram shows the functional block of G064XAN01.0 color TFT/LCD module:



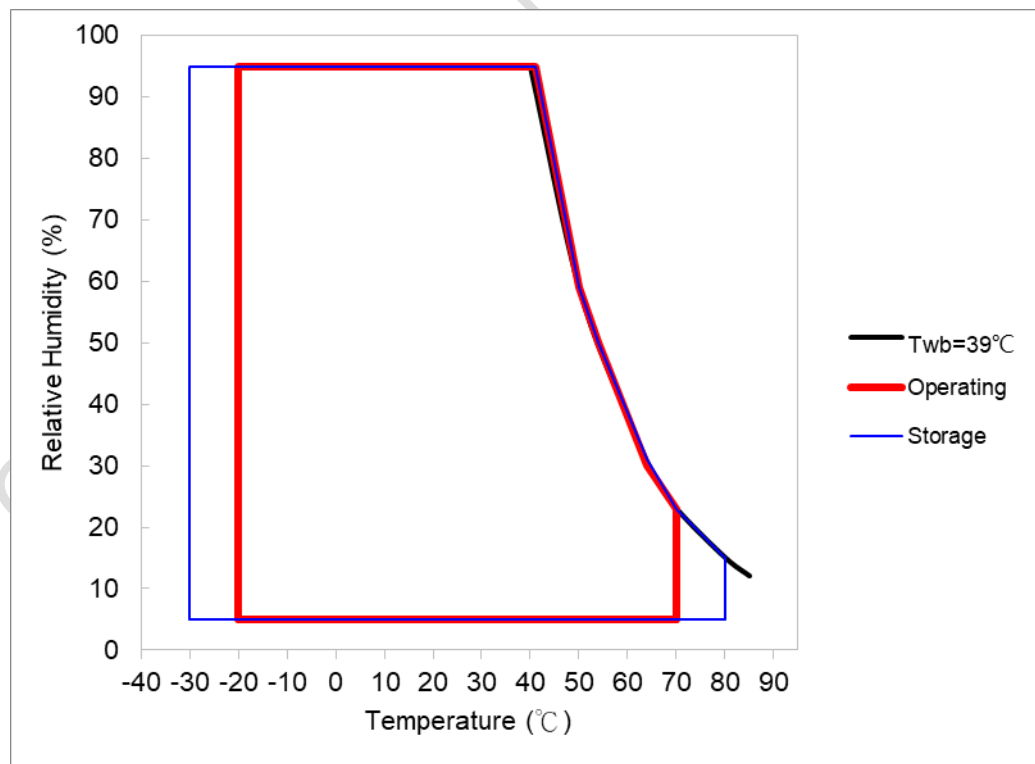
4. Absolute Maximum Ratings

4.1 Absolute Ratings of TFT LCD Module

Item	Symbol	Min	Max	Unit	Remark
Logic/LCD Drive Voltage	VDD	-0.3	5	[Volt]	
LED Driver Input Voltage	VCC	-0.3	26.5	[Volt]	
LED ON/OFF, PWM	V _{LED ON/OFF} , V _{PWM DIM}	-0.3	26.5	[Volt]	

4.2 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit	Remark
Operating Temperature	TOP	-20	+70	°C	Note 1, 2
Operation Humidity	HOP	5	95	%RH	Note 1, 2
Storage Temperature	TST	-30	+80	°C	Note 1
Storage Humidity	HST	5	95	%RH	Note 1



Note 1: Maximum Wet-Bulb should be 39°C and no condensation.

Note 2: Only operation is guaranteed. Optical and display performance should be evaluated at 25°C only.

5. Electrical Characteristics

5.1 TFT LCD Module

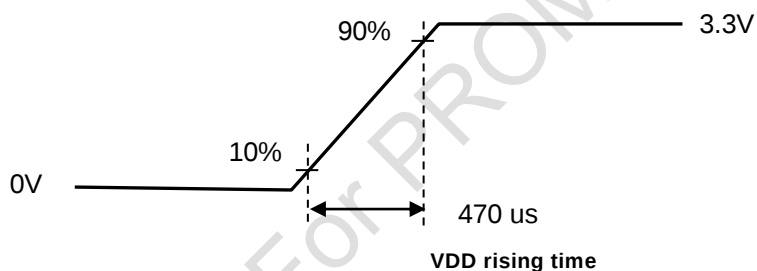
5.1.1 LCD Electrical Specification

Symbol	Parameter	Min	Typ	Max	Units	Remark
VDD	Logic/LCD Input Voltage	3.0	3.3	3.6	[Volt]	
I_{VDD}	LCD Input Current	-	200	240	[mA]	Note1
P_{VDD}	LCD Power consumption	-	0.66	0.8	[Watt]	Note1
I_{rush LCD}	LCD Inrush Current	-	-	2	[A]	Note2
VDD_{rp}	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	[mV] p-p	Note1

Note 1: Typical power measurement condition: White Pattern at VDD=3.3V, Frame rate=60Hz

Maximum power measurement condition: Red/Green/Blue Pattern at VDD=3.3V, Frame rate=60Hz

Note 2: Measurement condition:



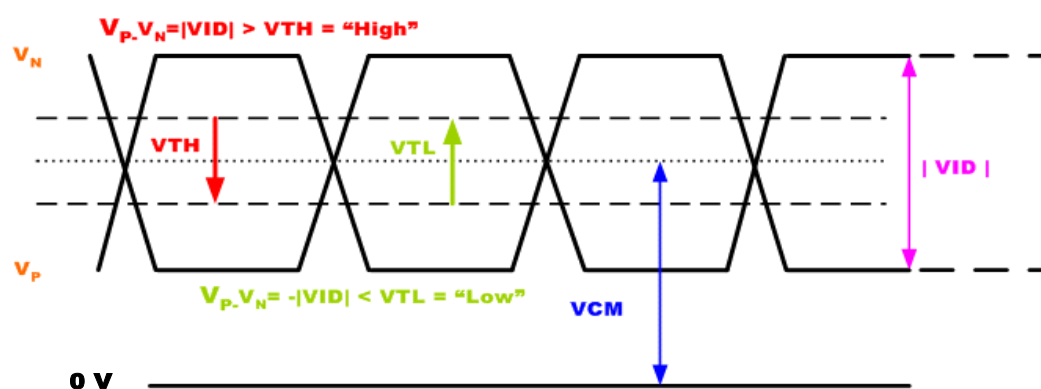
5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off.

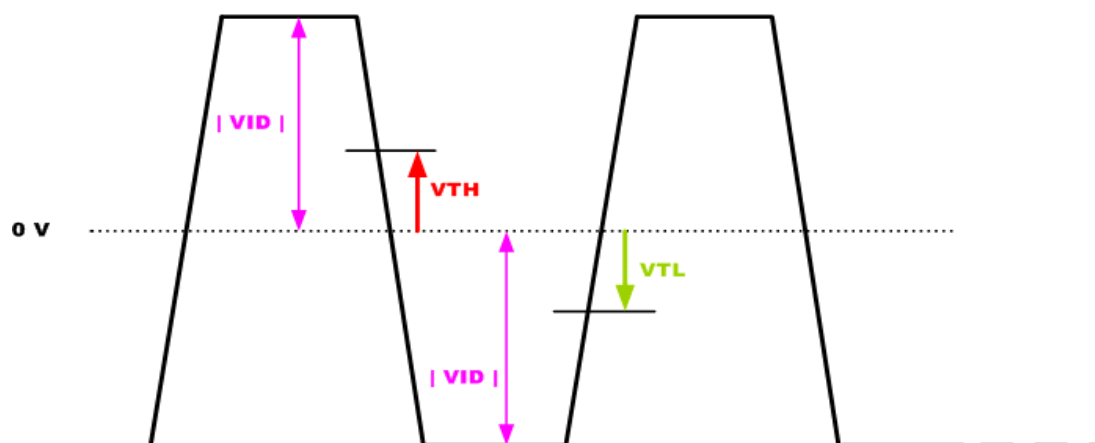
Symbol	Item	Min.	Typ.	Max.	Unit	Remark
VTH	Differential Input High Threshold	-	-	100	[mV]	VCM=1.2V
VTL	Differential Input Low Threshold	-100	-	-	[mV]	VCM=1.2V
 VID 	Input Differential Voltage	100	400	600	[mV]	
VICM	Differential Input Common Mode Voltage	1.1	-	1.45	[V]	VTH/VTL=+-100mV

Note: LVDS Signal Waveform.

Single-end Signal



Differential Signal



5.2 Backlight Unit

5.2.1 Parameter guideline for LED

Following characteristics are measured under stable condition at 25°C. (Room Temperature):

Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
VCC	Input Voltage	10.8	12	13.2	[Volt]	
I _{VCC}	Input Current	-	0.110	0.132	[A]	100% PWM Duty
P _{VCC}	Power Consumption	-	1.32	1.584	[Watt]	100% PWM Duty
I _{INRUSH LED}	Inrush Current	-	-	3	[A]	V _{LED} rising time ~ 470us
F _{PWM}	Dimming Frequency	200	-	1000	[Hz]	
V _{LED ON/OFF}	On Control Voltage	2.5	3.3	5.5	[Volt]	Note 4,5
	Off Control Voltage	-	-	0.8	[Volt]	
V _{PWM DIM}	Swing Voltage	2.5	3.3	5.5	[Volt]	
	Dimming duty cycle	10	-	100	[%]	
P _{LED}	LED Power Consumption	-	1.14	1.2	[Watt]	
Operation Life		50,000		-	[Hrs]	I _F = 20 mA, T _a = 25°C

Note 1: T_a means ambient temperature of TFT-LCD module.

Note 2: VCC, I_{VCC}, I_{rush LED}, P_{VCC} are defined for LED backlight.(100% duty of PWM dimming)

Note 3: I_F, V_F are defined for one channel LED. There are three LED channel in back light unit.

Note 4: PWM dimming function can be operated by PWM signal. PWM duty cycle can adjust white Luminance.

(PWM High: ON and PWM Low: OFF)

Note 5: PWM signal can not be floating and pull-down to ground when waiting.

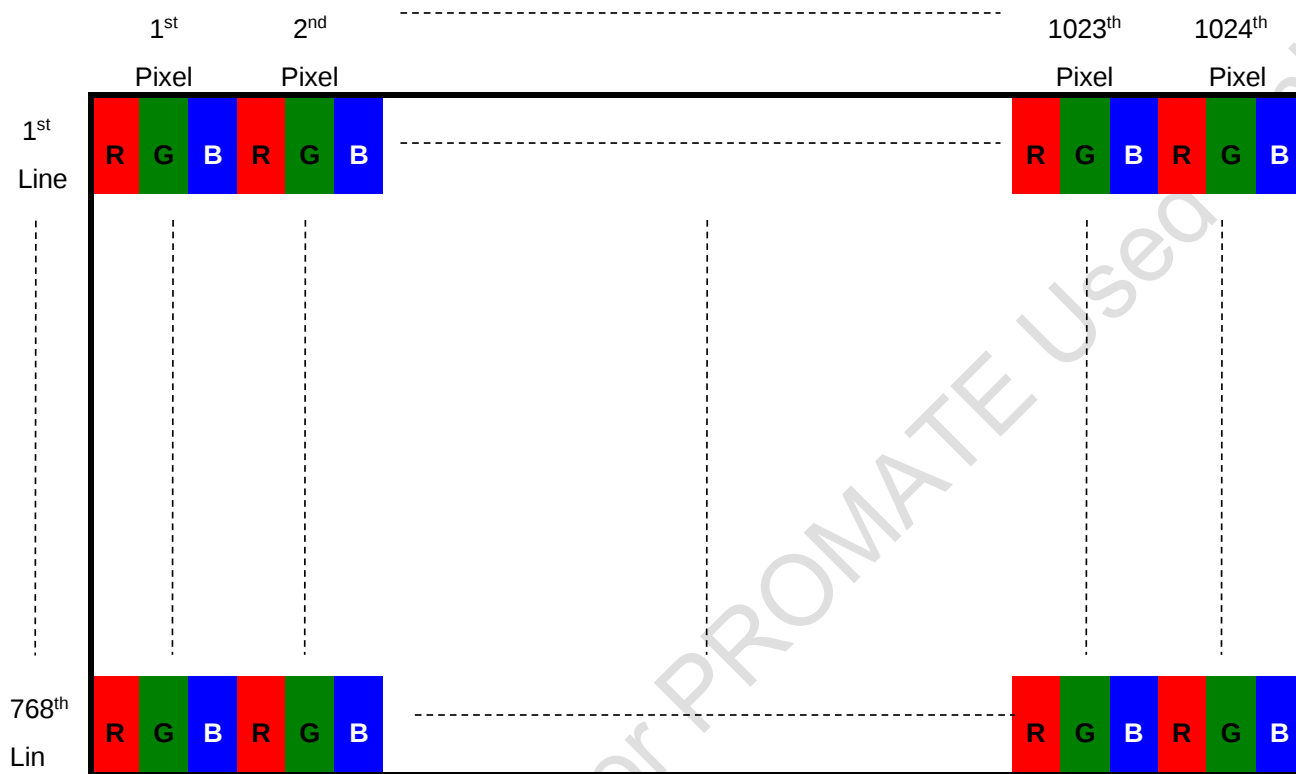
Note 6: If G064XAN01.0 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 7: Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

6. Signal Characteristics

6.1 Pixel Format Image

Following figure shows the relationship between input signal and LCD pixel format.



6.2 Scanning Direction

The following figures show the image seen from the front view. The arrow indicates the direction of scan.

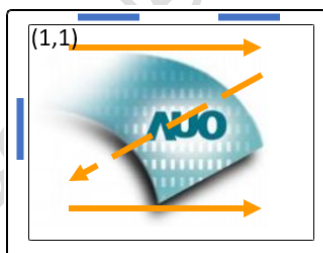


Fig. 1 Normal scan (Pin56, **Reverse** = High)

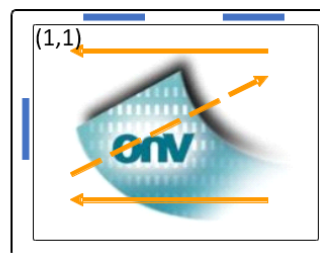


Fig. 2 Reverse scan (Pin56, **Reverse** = NC or Low)

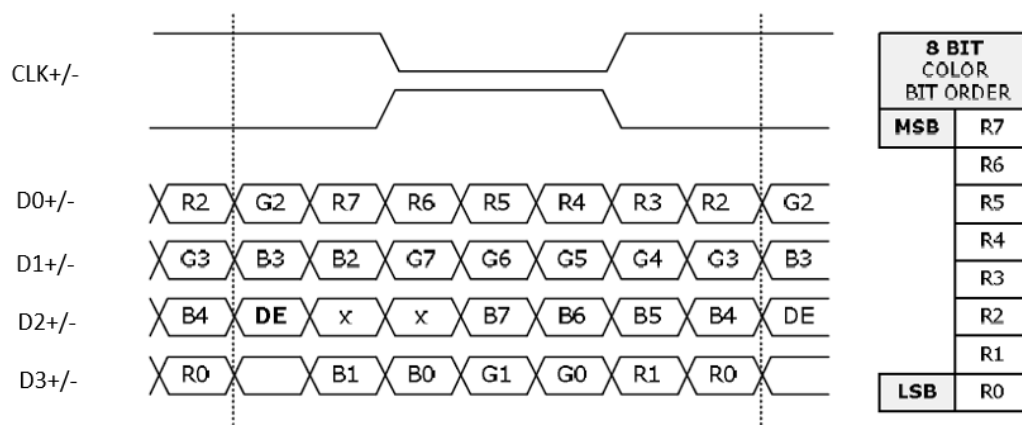
6.3 TFT-LCD Interface Signal Description

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

Pin No	Signal Name	Pin Function Description
1	VLED	12V Power supply
2	VLED	12V Power supply
3	GND	Ground
4	GND	Ground
5	PWM	Backlight Adjust
6	EN	Enable pin
7	GND	Ground
8	GND	Ground
9	VCC	3.3V Power supply
10	VCC	3.3V Power supply
11	GND	Ground
12	GND	Ground
13	Link0-	LVDS Channel 0-
14	Link0+	LVDS Channel 0+
15	GND	Ground
16	Link1-	LVDS Channel 1-
17	Link1+	LVDS Channel 1+
18	GND	Ground
19	Link2-	LVDS Channel 2-
20	Link2+	LVDS Channel 2+
21	GND	Ground
22	CLKIN-	LVDS Clock-
23	CLKIN+	LVDS Clock+
24	GND	Ground
25	Link3-	LVDS Channel3-
26	Link3+	LVDS Channel3+
27	NC	NC
28	DPS	Reverse Scan Function (H: Normal ; L or NC: Reverse)
29	NC	NC
30	NC	NC

6.4 The Input Data Format

8 bits LVDS Input JEIDA only DE mode



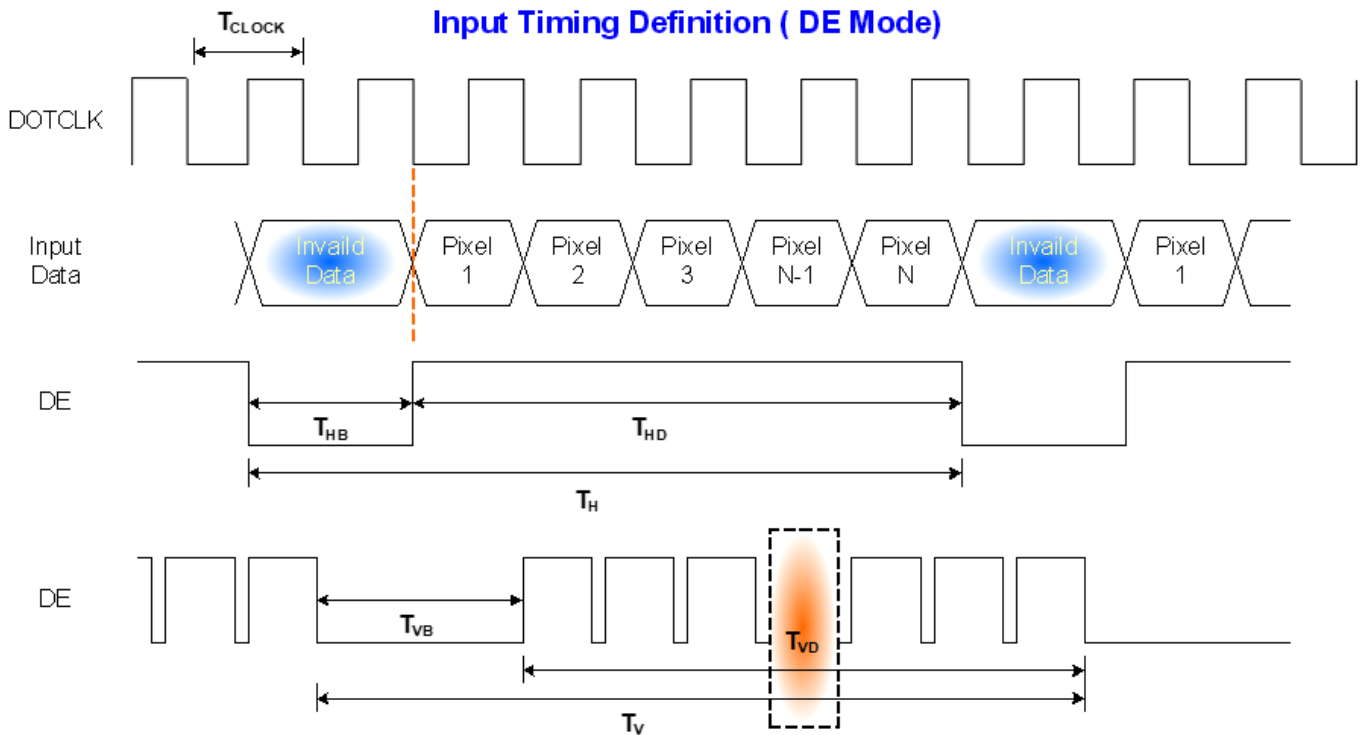
6.5 TFT-LCD Interface Timing

6.5.1 Timing Characteristics

Signal	Symbol	Min.	Typ.	Max.	Unit
Clock Frequency	$1/T_{\text{Clock}}$	52	67	70	MHz
Vertical Section	Period	T_V	780	832	T_{Line}
	Active	T_{VD}	768	768	
	Blanking	T_{VB}	23	64	
Horizontal Section	Period	T_H	1114	1344	T_{Clock}
	Active	T_{HD}	1024	1024	
	Blanking	T_{HB}	90	320	
Frame Rate	F	59	60	61	Hz

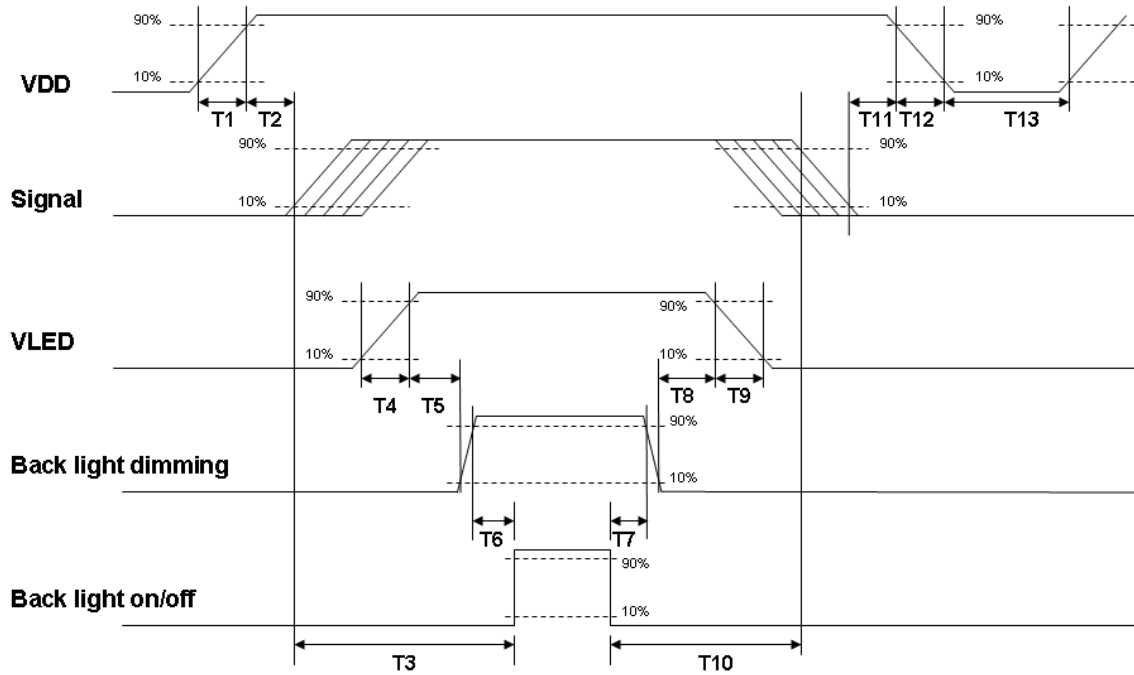
Note : DE mode.

6.5.2 Input Timing Diagram



6.6 Power ON/OFF Sequence

VDD power and LED on/off sequence is as below. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Power ON/OFF sequence timing

Parameter	Value			Units
	Min.	Typ.	Max.	
T1	0.5	-	10	[ms]
T2	0	20	80	[ms]
T3	200	--	--	[ms]
T4	0.5	--	10	[ms]
T5	10	-	-	[ms]
T6	10	-	-	[ms]
T7	0	-	-	[ms]
T8	10	-	-	[ms]
T9	--	--	10	[ms]
T10	110	--	--	[ms]
T11	0	16	50	[ms]
T12	-	-	10	[ms]
T13	1000	-	-	[ms]

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

7. Connector

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT-LCD Signal : LVDS Connector

Connector Name / Designation	Signal Connector
Manufacturer	HIROSE
Connector Model Number	FH75-60(30)SA-1SH(16)

8. Reliability Test Criteria

Items	Required Condition	Note
Temperature Humidity Bias	60 °C, 90%RH, 300 hours	2,3
High Temperature Operation	70 °C, 300 hours	2,3
Low Temperature Operation	-20 °C, 300 hours	2,3
Hot Storage	80 °C, 300 hours	2,3
Cold Storage	-30 °C, 300 hours	2,3
Thermal Shock Test	-20°C / 30 min, 60°C / 30 min, 100cycles, 40°C minimum ramp rate	2,3
Shock Test (Non-Operating)	50G,20ms,Half-sine wave, ($\pm X$, $\pm Y$, $\pm Z$)	2
Vibration Test (Non-Operating)	1.5G, 10~200~10Hz, Sine wave, 30mins/axis, 3 direction (X, Y, Z)	2
On/off test	On/10 sec, Off/10 sec, 30,000 cycles	2,4
ESD	Contact Discharge: $\pm 8KV$, 150pF(330 Ω) 1sec, 8 points, 25 times/ point Air Discharge: $\pm 15KV$, 150pF(330 Ω) 1sec, 8 points, 25 times/ point	1,2

Note 1: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost
Self-recoverable. No hardware failures.

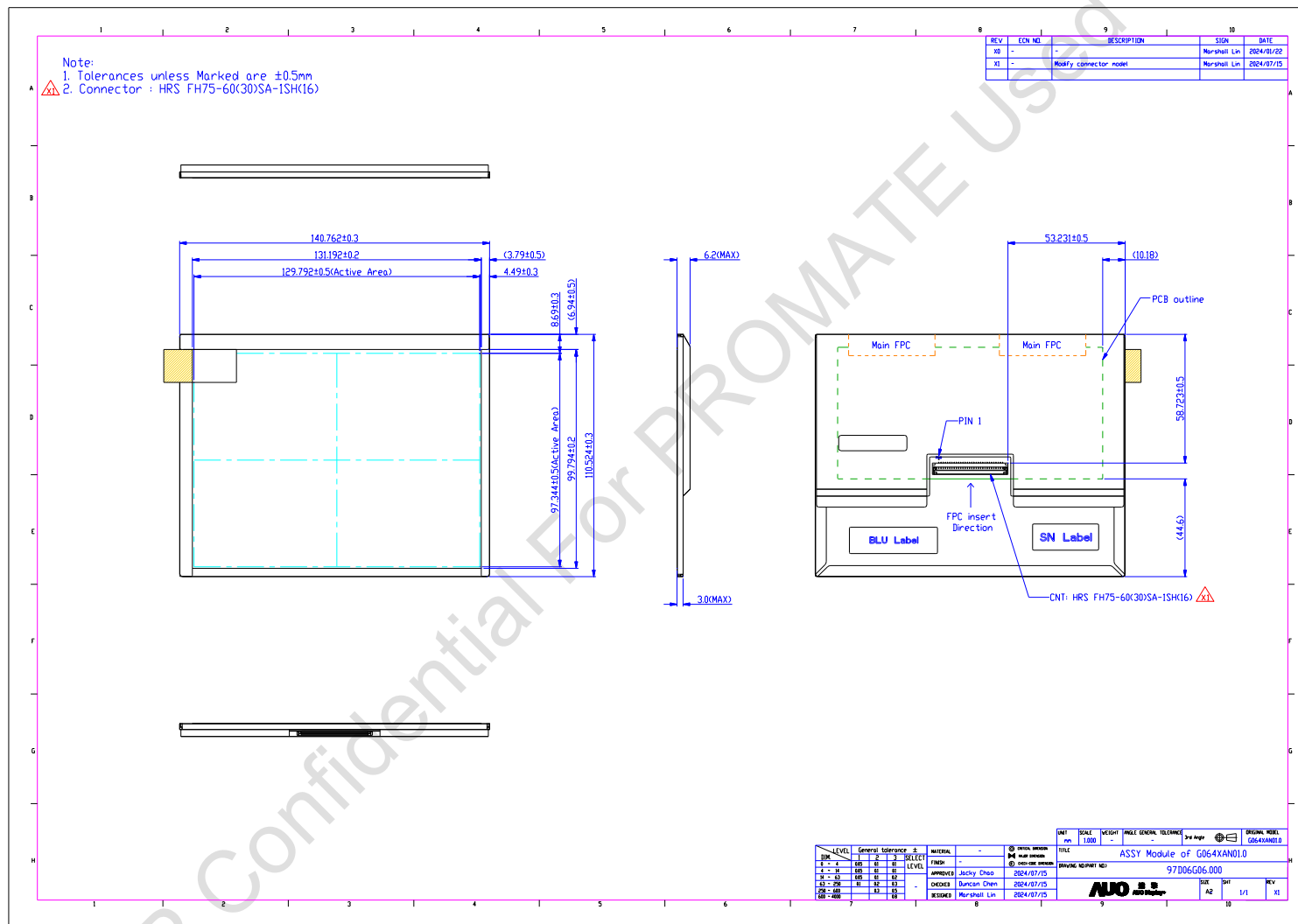
Note 2:

- Water condensation is not allowed for each test items.
- Each test is done by new TFT-LCD module. Don't use the same TFT-LCD module repeatedly for reliability test.
- The reliability test is performed only to examine the TFT-LCD module capability.
- In the standard condition, there is not display function NG issue occurred.

Note3: To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 2 hours at least in advance.

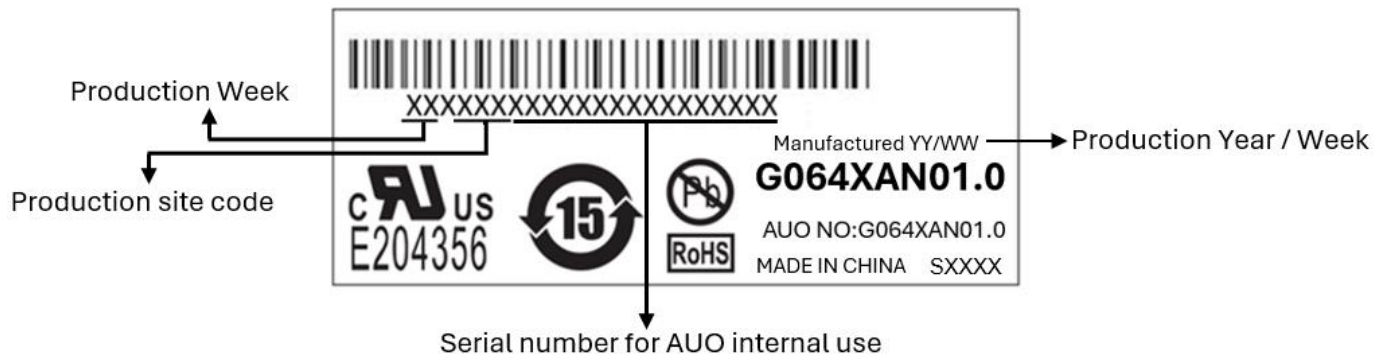
Note4: Judged by the on/off testing results of ADP's standard w/o functional fail.

9. Mechanical Characteristics

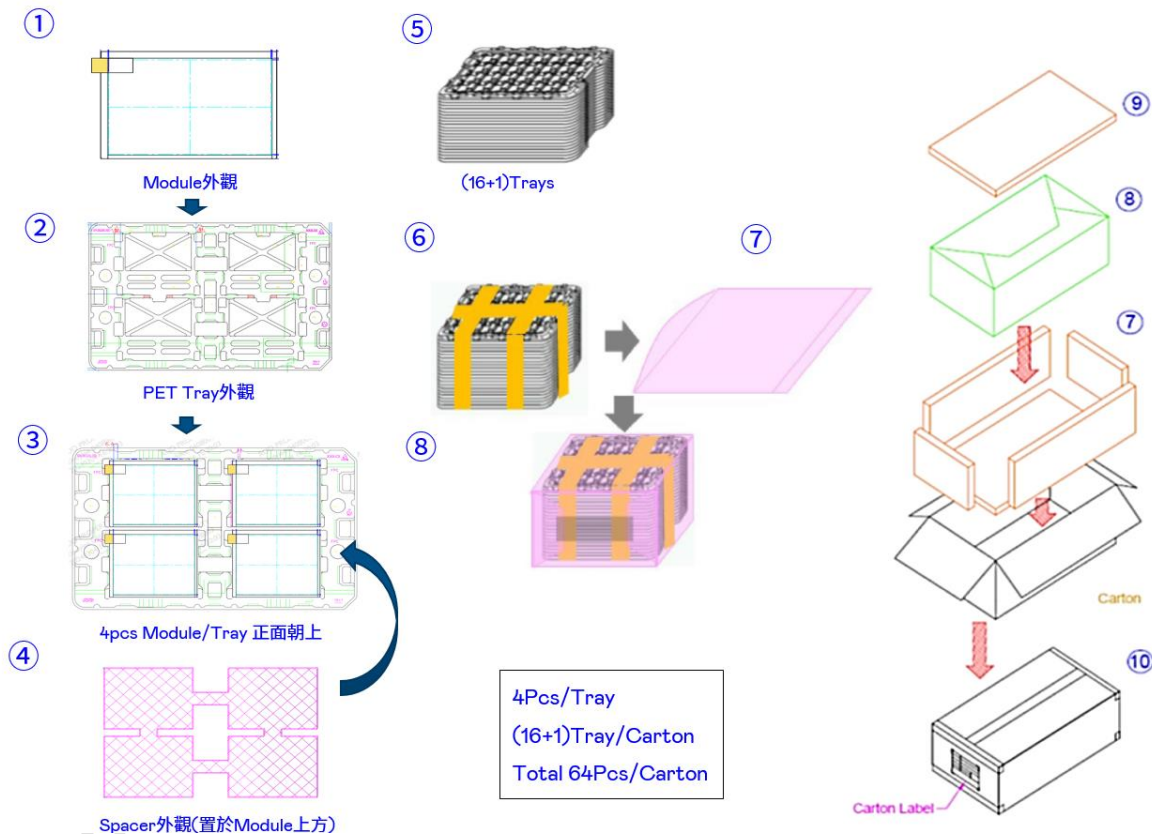


10. Label and Packaging

10.1 Shipping Label (on the rear side of TFT-LCD display)



10.2 Carton Package



11. Safety

11.1 Sharp Edge Requirements

There will be no sharp edges or comers on the display assembly that could cause injury.

11.2 Materials

11.2.1 Toxicity

There will be no carcinogenic materials used anywhere in the display module. If toxic materials are used, they will be reviewed and approved by the responsible ADP toxicologist.

11.2.2 Flammability

All components including electrical components that do not meet the flammability grade UL 94 V-1 in the module will complete the flammability rating exception approval process.

The printed circuit board will be made from material rated UL 94 V-1 or better. The actual UL flammability rating will be printed on the printed circuit board.

11.3 Capacitors

If any polarized capacitors are used in the display assembly, provisions will be made to keep them from being inserted backwards.

11.4 National Test Lab Requirement

The display module will satisfy all requirements for compliance to: IEC/UL 62368-1