( ) Preliminary Specifications
(V) Final Specifications

Module	5.7 Inch Color TFT-LCD
Model Name	G057QTN01.0

Customer	**Date**	**Approved by**	**Date**
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Checked & Approved by		**Prepared by**	
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Note: This Specification is subject to change without notice.	Audio-Video Business Unit / AU Optronics corporation

Contents

Record of Revision

Version and Date	Page	Old description	New Description
0.0 2013/7/20	All	First Edition	
0.1 2013/9/25	6	Brightness, typ 450, min 350	Brightness, typ 500, min 400
1.0 2014/1/15	5		Power consumption 1.9W
	11		VDD Current and Power IDD / VDD Current / -- / 115 / 130 / [mA] / All Black Pattern (VDD=3.3V, at 60Hz) Irush / LCD Inrush Current / -- / -- / 1.5 / [A] / Note 1 PDD / VDD Power / -- / 0.46 / 0.51 / [Watt] / All Black Pattern (VDD=3.3V, at 60Hz)
	12	Input voltage for RL/UD Input Voltage for RL/UD: High / VIH / 0.7VDD / -- / VDD / Volt Input Voltage for RL/UD: Low / VIL / 0 / -- / 0.3VDD / Volt	Input voltage for RL/UD Input Voltage for RL/UD: High / VIH / 0.7VDD / -- / VDD / Volt Input Voltage for RL/UD: Low / VIL / 0 / -- / 0.2VDD / Volt
	12		LED input current and power I_{LED} / Input Current / -- / 0.12 / 0.14 / A P_{LED} / Power Consumption / -- / 1.44 / 1.68 / W
		LED power 0.13W	LED power 1.28W
2.0 2014/3/20	6	2.2 Optical Characteristics Color / Chromaticity	2.2 Optical Characteristics Color / Chromaticity: add RGBxy data
	12	5.1.2 Signal Electrical Characteristics Input Voltage for RL/UD	5.1.2 Signal Electrical Characteristics Input Voltage for RL/UD: max 0.2VDD

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) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
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 Reflector edge. Instead, press at the far ends of the LED Reflector 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 (IEC60950-1 or UL60950-1), or be applied exemption.
13) Severe temperature condition may result in different luminance, response time.
14) Continuous operating TFT-LCD Module under high temperature environment may accelerate LED light bar exhaustion and reduce luminance dramatically.
15) The data on this specification sheet is applicable when TFT-LCD module is placed in landscape position.
16) Continuous displaying fixed pattern may induce image sticking. It’s recommended to use screen saver or moving content periodically if fixed pattern is displayed on the screen.

2. General Description

G057QTN01.0 is a Color Active Matrix Liquid Crystal Display composed of a TFT-LCD display, a driver circuit, and a backlight system. The screen format is intended to support QVGA (320(H) x 240(V)) screen and 262K (RGB 6-bits). All input signals are CMOS interface compatible.

G057QTN01.0 is designed for industrial display applications.

2.1 Display Characteristics

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

Items	Unit	Specifications
Screen Diagonal	[inch]	5.7
Active Area	[mm]	115.2(H) x 86.4(V)
Pixels H x V		320x3(RGB)x240
Pixel Pitch	[mm]	0.36 x 0.36
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN, Normally White
Nominal Input Voltage VDD	[Volt]	3.3 typ.
Typical Power Consumption	[Watt]	1.9 W (LCD: 0.46 W/LED BLU: 1.44 W) @ All black pattern, Full Load and V_{LED}=12V
Weight	[Grams]	150g (typ.), 165g (max.)
Physical Size	[mm]	144.0(H)x 104.6(V) x 12.3(D) (typ.)
Electrical Interface		CMOS 6-bit Parallel RGB
Surface Treatment		Anti-Glare, Hardness 3H
Support Color		262K colors
Temperature Range Operating Storage (Non-Operating)	 [^{o}C] [^{o}C]	 -30 to +85 -30 to +85
RoHS Compliance		RoHS Compliance
Light Bar Unit		LED, Replaceable

2.2 Optical Characteristics

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

Item	Unit	Conditions	Min.	Typ.	Max.	Note
White Luminance	[cd/m2]	V_{LED}=12V,D_{PWM}=100% (center point)	400	500	-	1
Uniformity		5 Points			1.3	1, 2, 3
Contrast Ratio			500	700	-	4
Cross talk	%		-	1.2	1.5	5
Response Time	[msec]	Rising	-	15	20	6
	[msec]	Falling	-	10	15	
	[msec]	Raising + Falling	-	25	35	
Viewing Angle	[degree] [degree]	Horizontal (Right) CR = 10 (Left)	70 70	80 80	- -	7
	[degree] [degree]	Vertical (Upper) CR = 10 (Lower)	60 60	70 70	- -	
Color / Chromaticity Coordinates (CIE 1931)		White x	0.263	0.313	0.363	
		White y	0.279	0.329	0.379	
		Red x	0.491	0.541	0.591	
		Red y	0.253	0.303	0.353	
		Green x	0.279	0.329	0.379	
		Green y	0.559	0.609	0.659	
		Blue x	0.111	0.161	0.211	
		Blue y	0.064	0.114	0.164	
Color Gamut	%			50		

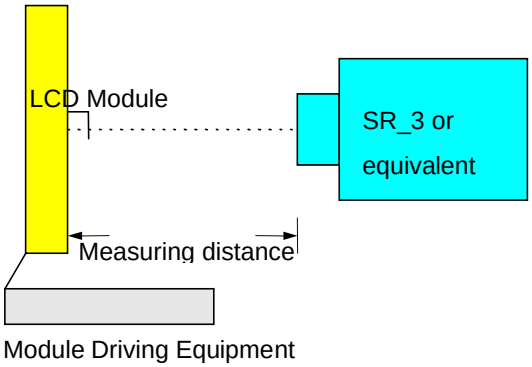
Note 1: Measurement method

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

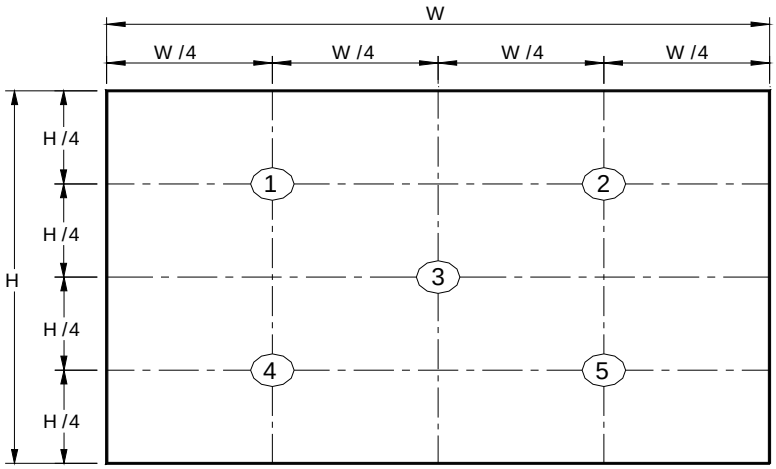
Aperture 1° with 50cm viewing distance

Test Point Center

Environment *< 1 lux*



Note 2: Definition of 9 points position (Display active area: 115.2(H) x 86.4(V)



Note 3: The luminance uniformity of 9 points is defined by dividing the minimum luminance values by the maximum test point luminance

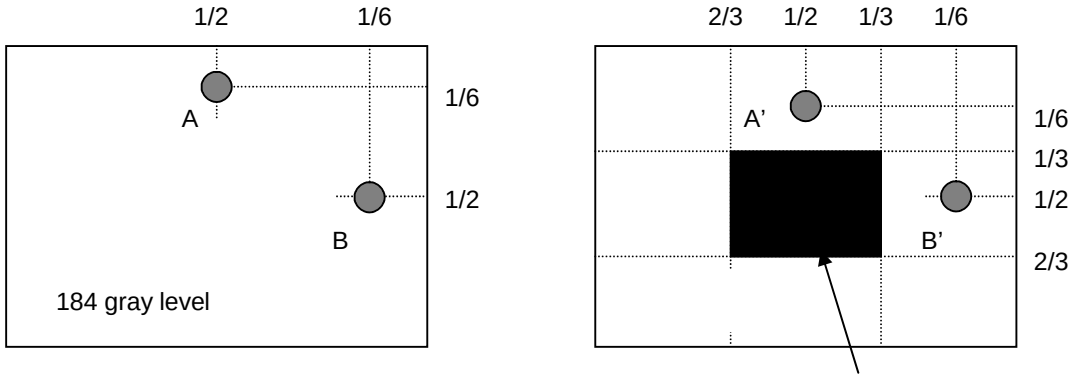
$$\delta_{W9} = \frac{\text{Minimum Brightness of nine points}}{\text{Maximum Brightness of nine points}}$$

Note 4： Definition of contrast ratio (CR):

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

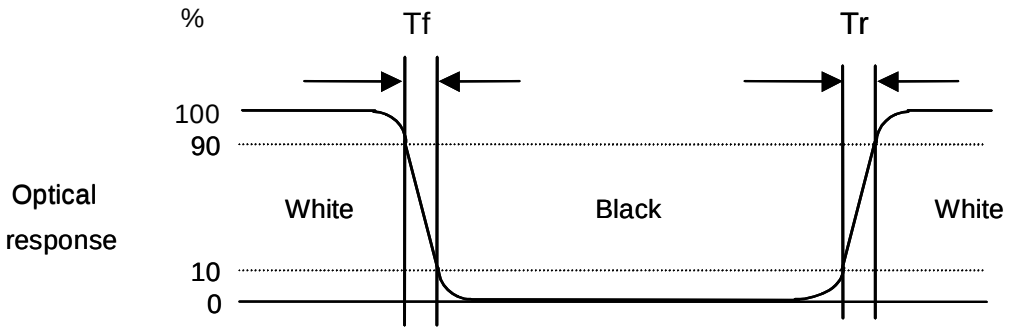
Note 5： Definition of cross talk (CT)

CT = | YB – YA | / YA × 100 (%)
Where
YA = Luminance of measured location without gray level 0 pattern (cd/m2)
YB = Luminance of measured location with gray level 0 pattern (cd/m2)



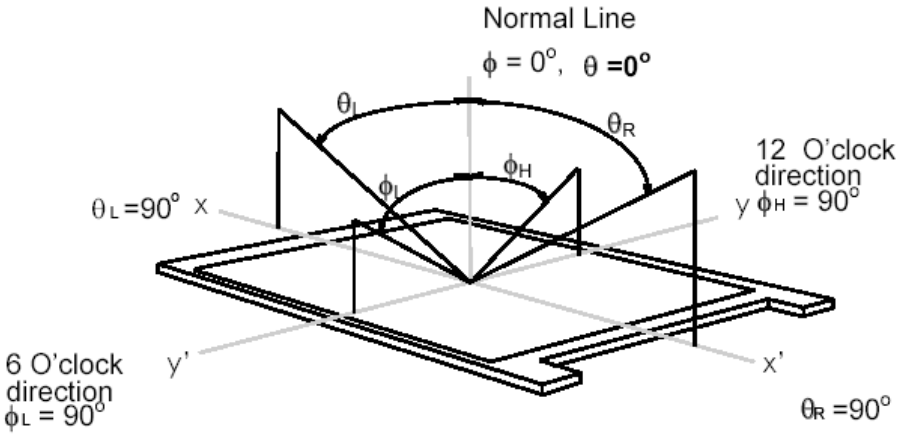
Note 6: Definition of response time:

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 7: 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.



Note 8: Note 8: Definition of Gamma Value

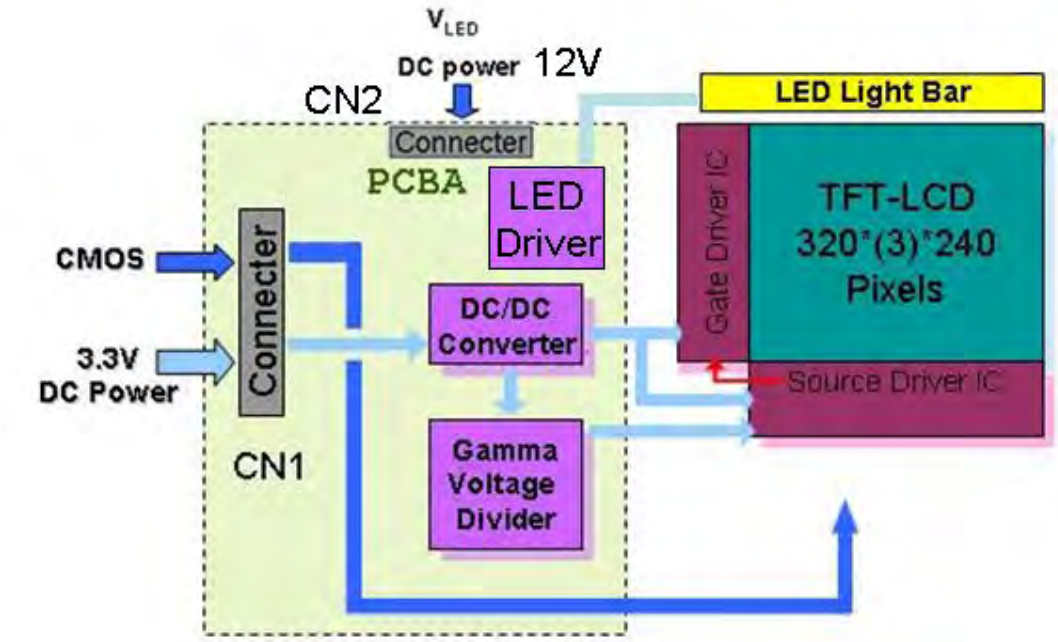
Generally, Gamma Value is defined as the slope of a Gray Level – Luminance curve in log-log space, that is

γ = d log(Luminance) / d log(Gray Level)

The Gamma Value defined in this spec is Linear Regression (γ 1, γ 2, γ 3…, γ 16). γ 1 to γ 16 are the section gamma of the following 17 sampling points, GL(0), GL(16), GL(32), GL(48), GL(64), GL(80), GL(96), GL(112), GL(128), GL(144), GL(160), GL(176), GL(192), GL(208), GL(224), GL(240) and GL(255), in 8 bits input.

3. Functional Block Diagram

The following diagram shows the functional block of the 15 inch 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	Ta= 25°C
LCD Input Signal Voltage	VIN	-0.3	+5	Volt	Ta= 25°C
LED BLU Drive Voltage	V_{LED}	24	28.8	Volt	Ta= 25°C
LED Dimming Input Voltage	V_{PWM}	0	8	Volt	Ta= 25°C
LED On/Off Input Voltage	$V_{LED\ On/Off}$	0	20	Volt	Ta= 25°C

4.2 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit	Remark
Operating Temperature	TOP	-30	+85	℃	Note 1, 2
Operation Humidity	HOP	5	90	%RH	Note 1, 2
Storage Temperature	TST	-30	+85	℃	Note 1
Storage Humidity	HST	5	90	%RH	Note 1

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

Note 2: Only operation is guaranteed. Optical performance should be evaluated at 25℃ only.

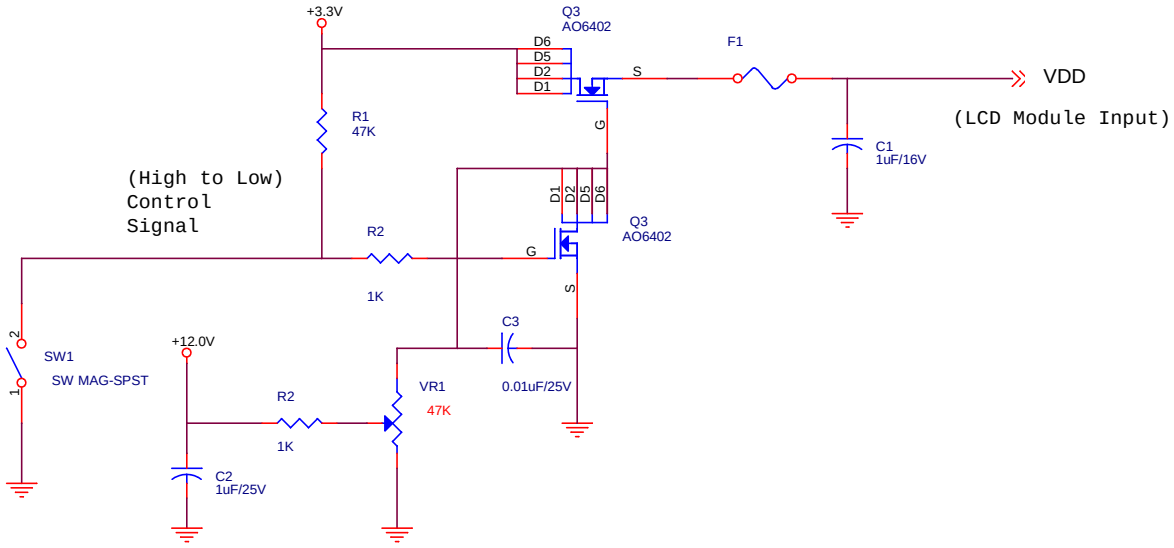
5. Electrical Characteristics

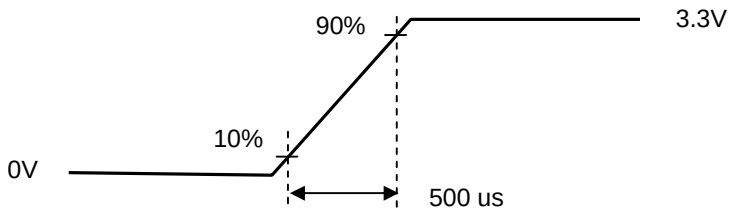
5.1 TFT LCD Module

5.1.1 Power Specification

Symbol	Parameter	Min	Typ	Max	Units	Remark
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	
IDD	VDD Current	-	115	130	[mA]	All Black Pattern (VDD=3.3V, at 60Hz)
Irush	LCD Inrush Current	-	-	1.5	[A]	Note 1
PDD	VDD Power		0.46	0.51	[Watt]	All Black Pattern (VDD=3.3V, at 60Hz)
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	mVp-p	All Black Pattern (VDD=3.3V, at 60Hz)

Note 1: Measurement condition:





VDD rising time

5.1.2 Signal Electrical Characteristics

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remarks
Logic Input Voltage for Display Signals	High	VIH	0.7VDD	-	VDD	Volt	
	Low	VIL	0	-	0.3VDD	Volt	
Input Voltage for RL/UD	High	VIH	0.7VDD	-	VDD	Volt	
	Low	VIL	0	-	0.2VDD	Volt	

5.2 Backlight Unit

5.2.1 Parameter guideline for LED

Following characteristics are measured under stable condition using a LED driving board at 25℃ (Room Temperature).

Symbol	Parameter	Min	Typ	Max	Units	Remark
V_{LED}	Input Voltage	9	12	20	Volt	
I_{LED}	Input Current	-	0.12	0.14	A	V_{LED} =12V, D_{PWM} =100%
P_{LED}	Power Consumption	-	1.44	1.68	W	V_{LED} =12V, D_{PWM} =100%
$Irush_{LED}$	Inrush Current	-		1.5	A	V_{LED} =12V, D_{PWM} =100%
$V_{PWM\ DIM}$	Dimming control Voltage High	2.0	3.3	5	Volt	Note 1,2
	Dimming control Voltage Low	-	-	0.15	Volt	
F_{PWM}	Dimming Frequency	200		30K	Hz	
D_{PWM}	Dimming duty cycle	1		100	%	
$V_{LED\ On/Off}$	On Control Voltage	2	3.3	5	Volt	Note 3, 4
	Off Control Voltage	-	-	0.8	Volt	
I_F	LED Forward Current		50		mA	Ta = 25oC
V_F	LED Forward Voltage				Volt	IF = 50mA, Ta = -30oC
		24	25.6	28.8	Volt	IF = 50mA, Ta = 25oC
					Volt	IF = 50mA, Ta = 85oC
P_{LED}	LED Power		1.28		Watt	
Operating Life		50000	-	-	Hrs	Note 5, 6

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

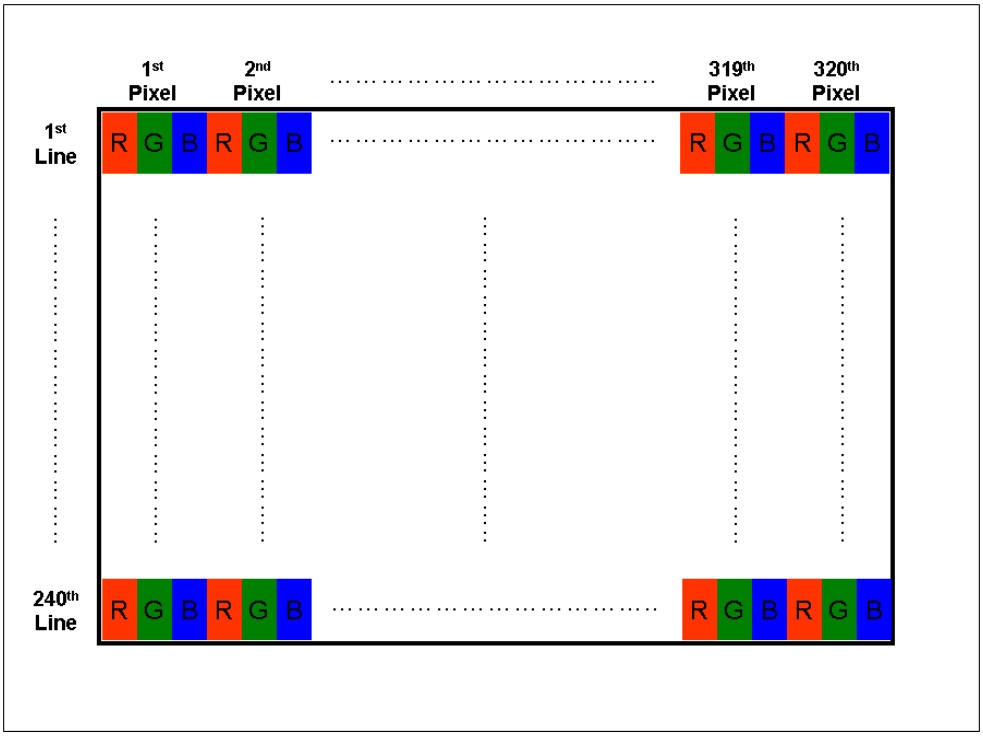
Note 2: If G057QTN01.0 module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

Note 3: Operating life means brightness goes down to 50% initial brightness. Min. operating life time is estimated data.

6. Signal Characteristic

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.

R/L=Low or NC; U/D=High or NC

R/L=High; U/D=High or NC

R/L=Low or NC; U/D=Low

R/L=High; U/D=Low

6.3 TFT- LCD Interface Signal Description

Pin#	Signal Name	Description
1	GND	Ground
2	DOTCLK	Dot clock
3	NC	NC
4	NC	NC
5	GND	Ground
6	R0	Red data(LSB)
7	R1	Red data
8	R2	Red data
9	R3	Red data
10	R4	Red data
11	R5	Red data(MSB)
12	GND	Ground
13	G0	Green data(LSB)
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data(MSB)
19	GND	Ground
20	B0	Blue data(LSB)
21	B1	Blue data
22	B2	Blue data
23	B3	Blue data
24	B4	Blue data
25	B5	Blue data(MSB)
26	GND	Ground
27	DE	Data enable signal
28	VDD	Power supply (3.3V Typ. Only)
29	VDD	Power supply (3.3V Typ. Only)
30	R/L	Horizontal reverse scan
31	U/D	Vertical reverse scan
32	NC	NC
33	GND	Ground

Note 1: “Low” stands for 0V. “High” stands for 3.3V. “NC” stands for ”No Connection”.

6.4 The Input Data Format

This product displays 262,144 colors in terms of the 64 grey levels on RGB respectively. The following table demonstrates the display of input data.

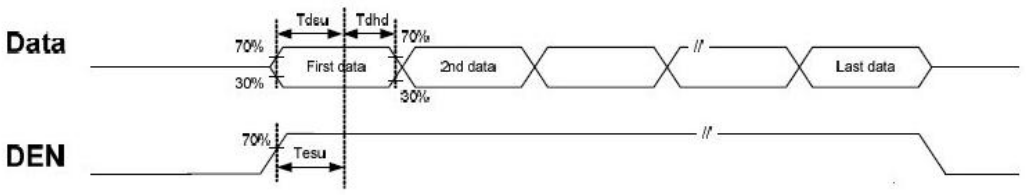
Display colors		Data signal (0 : Low level, 1: High level)																	
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red grayscale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑ ↓ bright																		
		1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Green grayscale	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	1	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	↑ ↓ bright																		
		0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
		0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Blue grayscale	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	0	0	0	0	0	1
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	↑ ↓ bright																		
		0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
		0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

6.5 Interface Timing

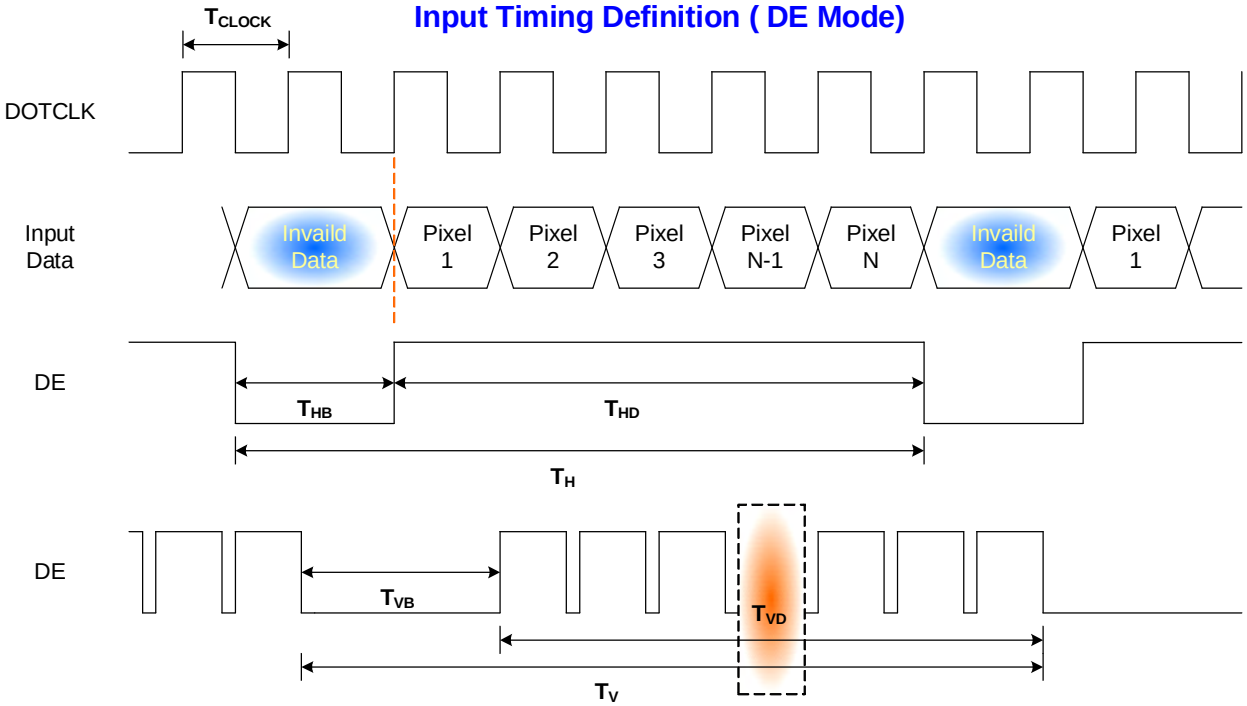
6.5.1 Timing Characteristics

Signal	Parameter		Symbol	Min.	Typ.	Max.	Unit
Clock Timing	Clock frequency		1/ T_{Clock}	6.2	6.4	12.1	MHz
Data	Setup Time		Tdsu	8			
	Hold Time		Tdhd	8			
DE	Setup Time		Tesu	8			
Hsync Timing	Horizontal Section	Period	T_V	406	408	560	T_{Line}
		Active	T_{VD}		320		
		Blanking	T_{VB}	86	88	240	
Vsync Timing	Vertical Section	Period	T_H	254	263	360	T_{Clock}
		Active	T_{HD}		240		
		Blanking	T_{HB}	14	23	120	
Frame Rate			F	-	60	-	Hz

Note: DE mode only.



6.5.2 Input Timing Diagram



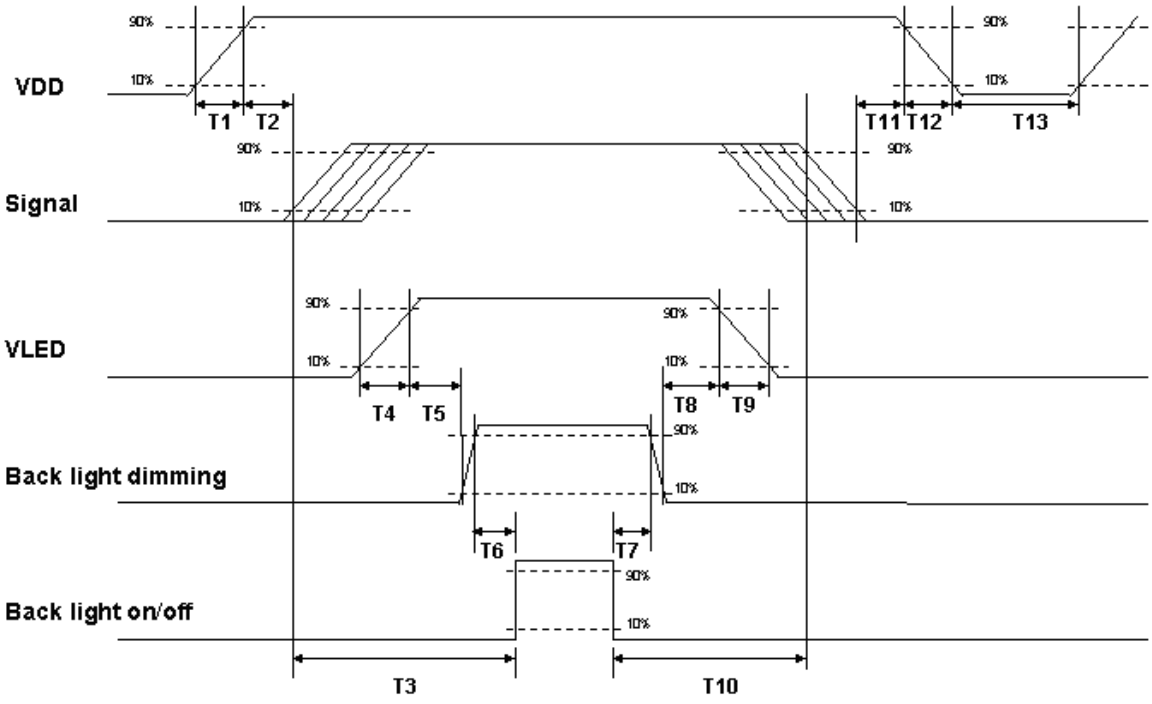
6.6 LED Backlight Unit Interface Signal Description

Pin #	Symbol	Pin Description
1	V_{LED}	12V input
2	V_{LED}	12V input
3	GND	Ground
4	GND	Ground
5	PWM DIM	1~100% PWM dimming
6	LED On/Off	0V-Off; 2~5V/NC-On

Note 1: “NC” stands for ”No Connection

6.7 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	30	40	50	[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 & Pin Assignment

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 (CN1): LCD Connector

Manufacturer	Starconn
Connector Model Number	089H33-000100-G2-R, compatible with MS2406P33M

Pin#	Symbol	Pin#	Symbol	Pin#	Symbol
1	GND	12	GND	23	B3
2	DOTCLK	13	G0	24	B4
3	NC	14	G1	25	B5
4	NC	15	G2	26	GND
5	GND	16	G3	27	DE
6	R0	17	G4	28	VDD
7	R1	18	G5	29	VDD
8	R2	19	GND	30	R/L
9	R3	20	B0	31	U/D
10	R4	21	B1	32	NC
11	R5	22	B2	33	GND

7.2 LED Backlight Unit (CN2): Backlight Connector

Manufacturer	JST
Connector Model Number	SM06B-SRKS-G-TB compatible with JST SM06B-SRSS-TB (LS) (SN)
Mating Connecter Model Number	JST SHR-06V-BKHF-B or compatible

Pin #	Symbol	Pin #	Symbol
1	V_{LED}	4	GND
2	V_{LED}	5	PWM DIM
3	GND	6	LED ON/OFF

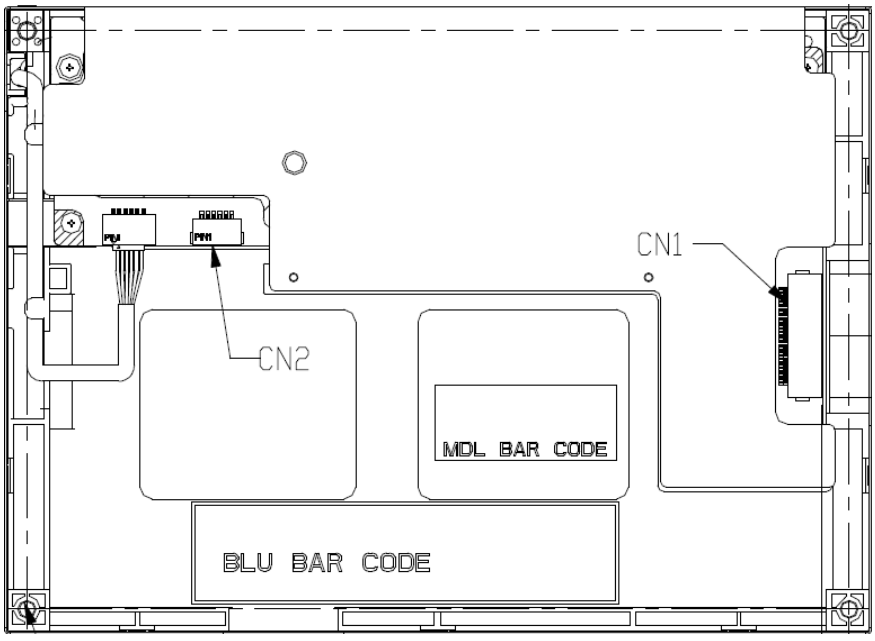
7.3 LED Light Bar Input (CN3): Light Bar Connector

Manufacturer	STM or compatible
Connector Model Number	P24021P6 or compatible
Mating Connecter Model Number	SM06B-SHLK-G-TF or compatible

Pin #	Symbol	Pin Description	Cable color
1	AN1	Channel 1 LED anode	Red
2	AN2	Channel 2 LED anode	Red
3	AN3	Channel 3 LED anode	Red
4	CA1	Channel 1 LED cathode	White
5	CA2	Channel 2 LED cathode	Blue
6	CA3	Channel 3 LED cathode	Black

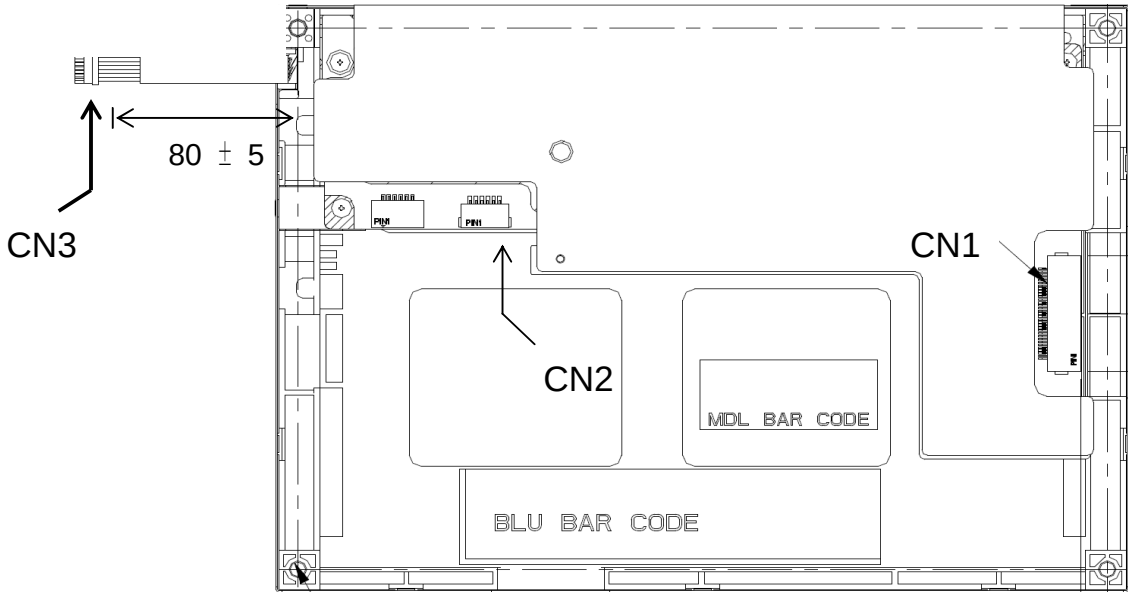
7.4 Connector Illustration

7.4.1PIN 1 definition of CN1 and CN2



(Rear side of TFT-LCD)

7.4.2 PIN 1 definition of CN3



(Rear side of TFT-LCD)

8. Reliability Test Criteria

Items	Required Condition	Note
Temperature Humidity Bias	40°C/90%,300 hours	Note 2
High Temperature Operation	85°C,300 hours	Note 2
Low Temperature Operation	-30°C,300 hours	Note 2
Hot Storage	85°C,300 hours	Note 2
Cold Storage	-30°C,300 hours	Note 2
Thermal Shock Test	-20°C/30 min ,60°C/30 min ,100cycles	Note 2
Hot Start Test	85°C/1 Hr (min.), power on/off per 5 minutes, repeat 5 times	Note 2
Cold Start Test	-30°C/1 Hr (min.), power on/off per 5 minutes, repeat 5 times	Note 2
Shock Test (Non-Operating)	50G,20ms,Half-sine wave,(±X, ±Y, ±Z)	Note 2
Vibration Test (Non-Operating)	1.5G, (10~200Hz, P-P) 30 mins/axis (X, Y, Z)	Note 2
On/off test	On/10 sec, Off/10 sec, 30,000 cycles	Note 1,2
ESD	Contact Discharge:±8KV,150pF(330Ω)1sec,8 points,25 times/ point Air Discharge: ±15KV, 150pF(330Ω)1sec, 8 points, 25 times/ point	Note 2
Altitude Test	Operating: 14,000 ft, Ramp: 2000 ft/min, 8hrs Non-operating: 40,000 ft, Ramp: 2000 ft/min, 24hrs	Note 2

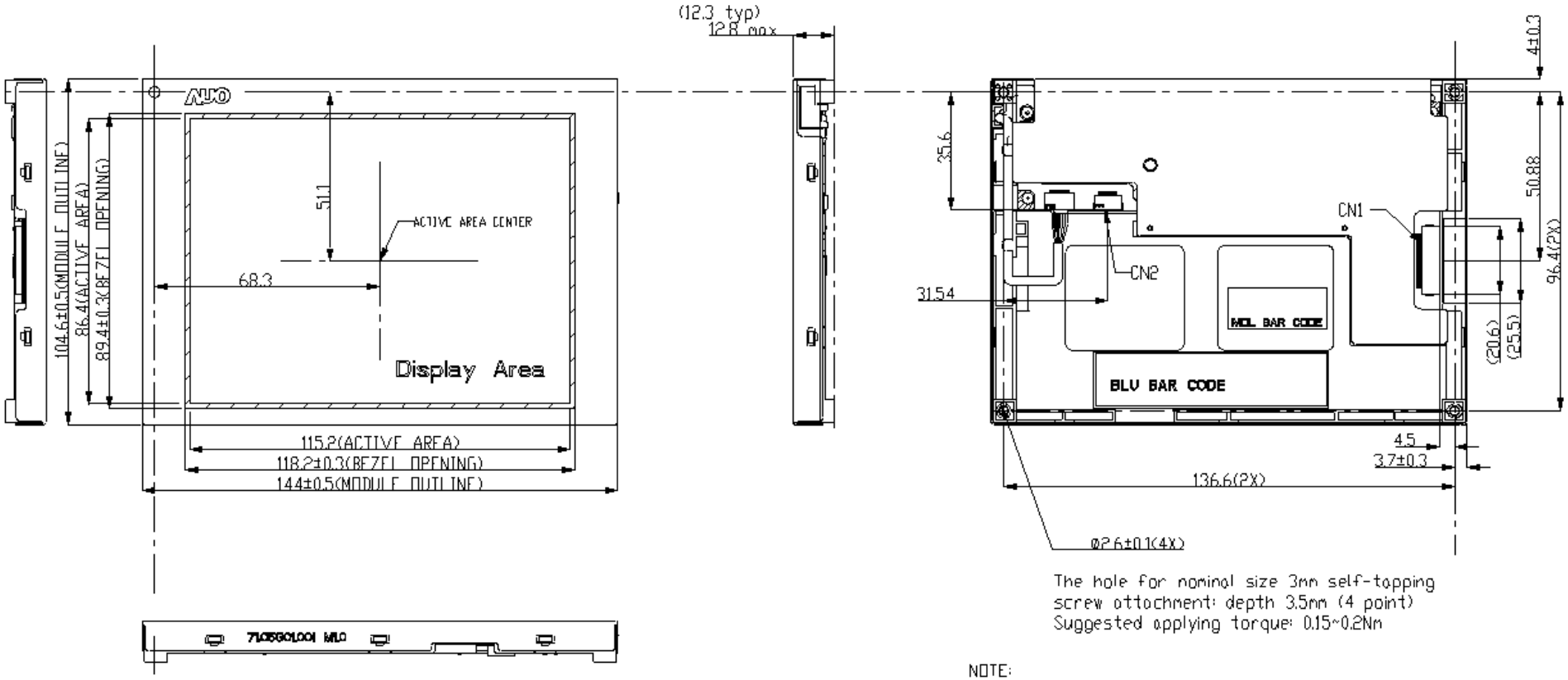
Note 1: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost

. 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.
- To inspect TFT-LCD module after reliability test, please store it at room temperature and room humidity for 24 hours at least in advance.
- No function failure occurs.

9. Mechanical Characteristics

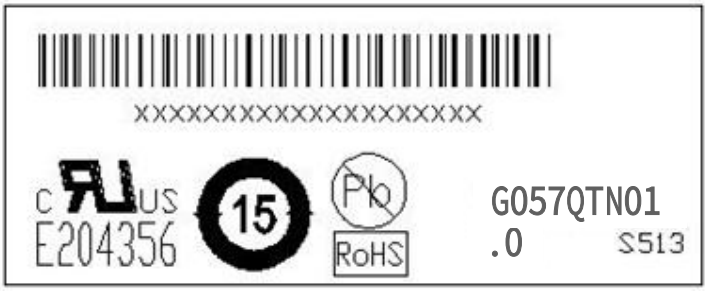


The hole for nominal size 3mm self-tapping screw attachment: depth 3.5mm (4 point)
Suggested applying torque: 0.15~0.2Nm

NOTE:
1.CN1:I/F CONNCTOR IS 089H33-000100-G2-R (STARCONN)
CN2:LED DRIVER CONNECTOR IS SM06B-SRKS(HF)(JST)
2.TOLERANCE IS ±0.5 IF NOT SPECIFIED.

10. Label and Packaging

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

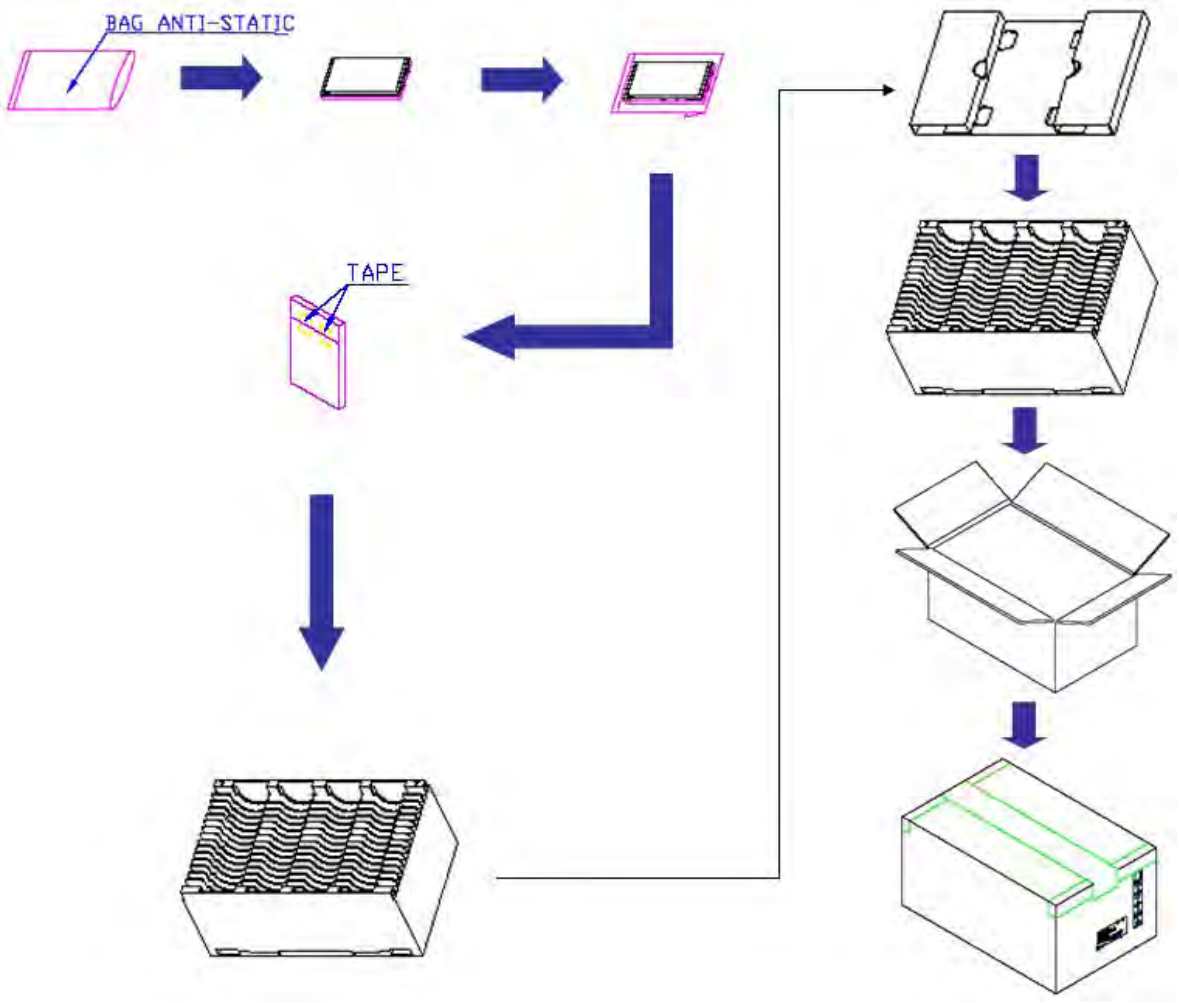


10.2 Carton Package

Max. capacity: 60 pieces TFT-LCD module per carton

Max. weight: 12.95 kg per carton

Outside dimension of carton: 520(L)mm* 340(W)mm* 250(H)mm



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 AUO toxicologist.

11.2.2 Flammability

All components including electrical components that do not meet the flammability grade UL94-V1 in the module will complete the flammability rating exception approval process.

The printed circuit board will be made from material rated 94-V1 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:

UL 60950-1, Second Edition	U.S.A. Information Technology Equipment