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《新规
New



产品规格书

Product Specification

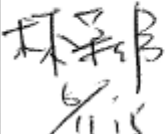
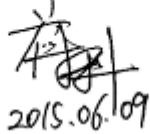
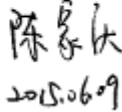
产品名
Product TFT-LCD MOUDLE

机种名
Model LM215DU1A

【接收印栏】

- ※ 本基准书由封面、附件等全 21 页构成。
如果对该规格书有异议，请在下订单前提出。
- ※ This Product Specification have 21 pages including the coversheet and Appendices. Please negotiate the objection point before purchase order.

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1. GENERAL DESCRIPTION

1.1 OVERVIEW

This module is color active matrix LCD module incorporating amorphous silicon TFT(Thin Film Transistor) LCD panel. It is composed of a color TFT-LCD panel, driver ICs, LED Backlight...etc. Graphics and texts can be displayed on a 1920×RGB×1080 dots panel with about 16.7M colors (R/G/B 6bits+Hi FRC data in each color) by using LVDS(Low Voltage Differential Signaling) to interface, +5V of DC supply voltage.

In order to improve the response time of LCD, this module applies the Over Shoot driving (O/S driving) technology for the control circuit. In the O/S driving technology, signals are being applied to the Liquid Crystal according to a pre-fixed process as an image signal of the present frame when a difference is found between image signal of the previous frame and that of the current frame after comparing them.

1.2 CHARACTERISTICS

CHARACTERISTICS ITEMS	SPECIFICATIONS
Screen Diagonal [in]	21.5"
Pixels [lines]	1920 × 1080
Active Area [mm]	476.64 (H) x 268.11 (V)
Pixel Pitch [mm]	0.24825 (H) x 0.24825 (V)
Pixel Arrangement	RGB vertical stripe
Display Mode(VA mode)	Normally Black
Surface treatment (Without the protection film)	Anti-glare,3H

1.3 MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Remark
Module Size	Horizontal (H)	495.1	495.6	496.1	mm	[Note 1]
	Vertical (V)	291.7	292.2	292.7	mm	[Note 1]
	Depth (D)	9.8	10.3	10.8	mm	[Note 1]
Weight		-	1620	-	g	

[Note 1] Please refer to the attached drawings for more information of front and back outline dimensions and the dimension of bosses are not included.

2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-20	+60	°C	[Note 1,3]
Operating Ambient Temperature	T _{OP}	0	50	°C	[Note 1,2,3]

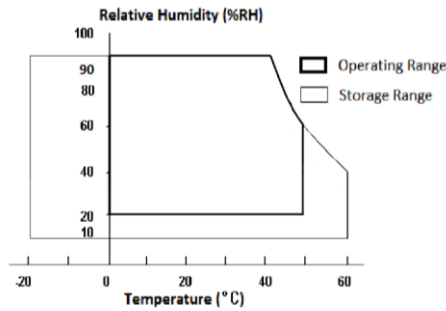
Storage Condition: With shipping package.

[Note 1] Temperature and relative humidity range is shown in the figure below.

*1) 90 %RH Max. (Ta ≦ 40 °C).

*2) Wet-bulb temperature should be 40 °C Max. (Ta > 40 °C).





*3) No condensation.

[Note 2] The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 50°C with LCD module alone in a temperature controlled chamber. The range of operating temperature may degrade in case of improper thermal management in your product design.

[Note 3] The rating of environment is base on LCD module. Leave LCD cell alone, this environment condition can't be guaranteed. Except LCD cell, the customer has to consider the ability of other parts of LCD module and LCD module process.

3. ELECTRICAL CHARACTERISTICS

3.1 ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Condition	Ratings	Unit	Remark
+5V supply voltage	VCC	Ta=25°C	0 ~ +6	V	
Storage temperature	Tstg	-	-20 ~ +60	°C	
Operation temperature	Topa	-	0 ~ +50	°C	

3.2 CONTROL CIRCUIT DRIVING

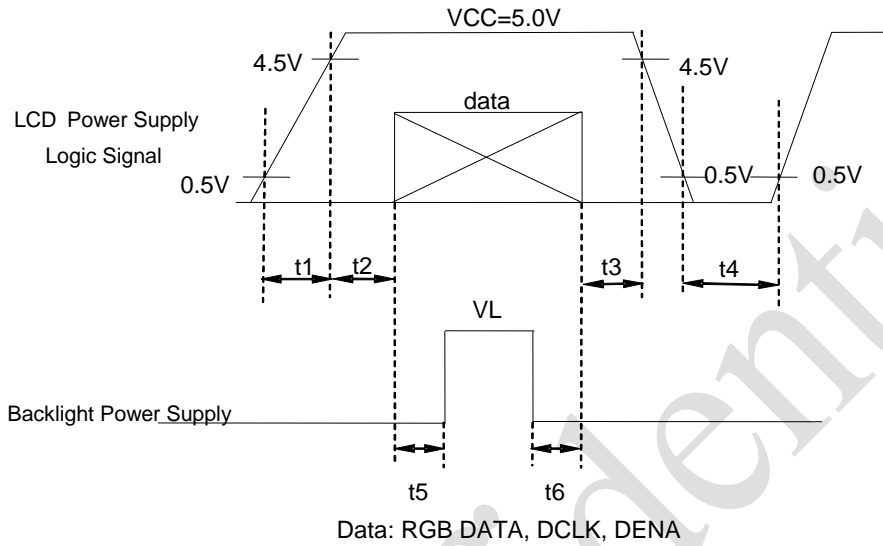
Parameter		Symbol	Min	Typ	Max	Unit	Remark
+5V supply voltage	Supply voltage	VCC	4.5	5.0	5.5	V	[Note 1]
	Current dissipation	ICC	—	900	1000	mA	VCC=5.0V,60Hz White Pattern
			—	1000	1150	mA	VCC=5.0V,60Hz White Pattern O/S Driving
	IRush	—	—	3	A	[Note 2]	
Permissible input ripple voltage		VRP	—	—	300	mVp-p	VCC=5.0V
Differential Input Threshold Voltage	High	VTH	—	—	100	mV	VCM=1.2V [Note 3]
	Low	VTL	-100	—	—	mV	
Input Differential Voltage		VID	100	—	600	mV	[Note 3]
Differential Input Common Mode Voltage		VCM	1.0	1.2	1.5	V	[Note 3]
Power consumption		P	—	4.5	5.0	W	Without O/S Driving
			—	5.0	5.75	W	With O/S Driving



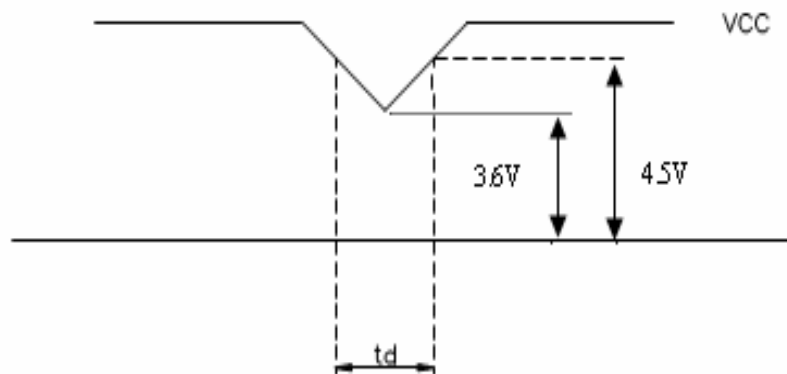
[VCM]: Common mode voltage of LVDS driver.

[Note1] Power, data sequence

- $0.50\text{ms} \leq t1 \leq 10\text{ms}$ $t4 \geq 1 \text{ sec}$
- $0.01\text{ms} < t2 \leq 50\text{ms}$ $t5 \geq 500\text{ms}$
- $0.01\text{ms} < t3 \leq 50\text{ms}$ $t6 \geq 200\text{ms}$



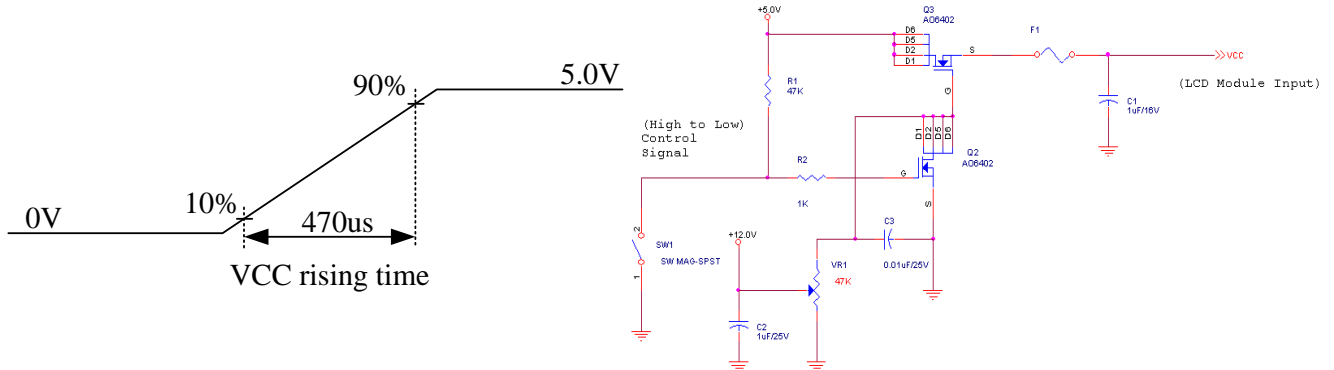
- ※ Data: CLKIN±, RIN0±, RIN1±, RIN2±, RIN3±
- ※ About the relation between data input and back light lighting, please base on the above-mentioned input sequence.
- ※ When back light is switched on before panel operation or after a panel operation stop, it may not display normally. But this phenomenon is not based on change of an incoming signal, and does not give damage to a liquid crystal display.
- ※ VCC-dip conditions:
 - (1) When $3.6\text{V} \leq VCC(\text{min}) < 4.5\text{V}$, $t_d \leq 10 \text{ ms}$
 - (2) When $VCC < 3.6 \text{ V}$, VCC-dip conditions should also follow the VCC-turn-on conditions.



[Note2]

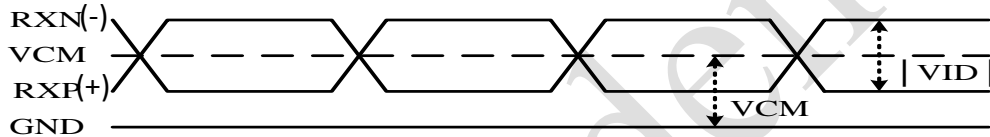
IRush Measurement Condition:

The duration of rising time of power input is 470us.



[Note 3] CLKIN+/CLKIN-, RIN0+/RIN0-, RIN1+/RIN1-, RIN2+/RIN2-, RIN3+/RIN3-

[Single-end Signals]



[Differential Signal]



3.3 LED LIGHTBAR SPECIFICATION FOR BACKLIGHT

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Input Voltage	V_{pin}	49.3	56.1	61.2	VDC	Duty 100% [Note 1,4]
LED Light bar Current per input pin	I_{pin}	-	60	63	mADC	Duty 100% [Note 1]
LED Life Time	LT	30,000	-	-	Hrs	[Note 2]
Power Consumption	PBL	11.83	13.46	14.69	W	[Note 3]
Dimming Duty Ratio	-	20	-	100	%	

[Note 1] Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

[Note 2] The life time of LED is defined as the time when it continues to operate under the condition at $T_a = 25 \pm 2^\circ\text{C}$ and $I_{pin} = 60\text{mA}$ until the brightness becomes $\leq 50\%$ of its original value.

[Note 3] $P_{BL} = V_{pin} \times I_{pin} \times (4)$ input pins.

[Note 4] Recommendation for LED driver power design: Due to there are electrical property deviation in LED & monitor set system component after long time operation. CPL strongly recommend the design value of LED driver board OVP(over voltage protection) should be 10% higher than max. value of LED Input Voltage (V_{pin}) at least.



4. INTERFACE PIN CONNECTION

4.1 TFT LCD MODULE

CN1 (Interface signals and +5V DC power supply) Shown on the next table.

Using connector: MSCKT2407P30HB (STM) or compatible

Matching connector: PK2407P30W (STM) or compatible

Pin No.	Symbol	Function	Remark
1	RxOIN0-	Negative LVDS DATA input(ODD)	LVDS
2	RxOIN0+	Positive LVDS DATA input(ODD)	LVDS
3	RxOIN1-	Negative LVDS DATA input(ODD)	LVDS
4	RxOIN1+	Positive LVDS DATA input(ODD)	LVDS
5	RxOIN2-	Negative LVDS DATA input(ODD)	LVDS
6	RxOIN2+	Positive LVDS DATA input(ODD)	LVDS
7	GND	Ground	
8	RxOCLK-	Negative LVDS Clock input(ODD)	LVDS
9	RxOCLK+	Positive LVDS Clock input(ODD)	LVDS
10	RxOIN3-	Negative LVDS DATA input(ODD)	LVDS
11	RxOIN3+	Positive LVDS DATA input(ODD)	LVDS
12	RxEIN0-	Negative LVDS DATA input(EVEN)	LVDS
13	RxEIN0+	Positive LVDS DATA input(EVEN)	LVDS
14	GND	Ground	
15	RxEIN1-	Negative LVDS DATA input(EVEN)	LVDS
16	RxEIN1+	Positive LVDS DATA input(EVEN)	LVDS
17	GND	Ground	
18	RxEIN2-	Negative LVDS DATA input(EVEN)	LVDS
19	RxEIN2+	Positive LVDS DATA input(EVEN)	LVDS
20	RxCLK-	Negative LVDS Clock input(EVEN)	LVDS
21	RxCLK+	Positive LVDS Clock input(EVEN)	LVDS
22	RxEIN3-	Negative LVDS DATA input(EVEN)	LVDS
23	RxEIN3+	Positive LVDS DATA input(EVEN)	LVDS
24	GND	Ground	
25	NC	No connection(Do not connect)	
26	NC	No connection(Do not connect)	
27	NC	No connection(Do not connect)	
28	VDD	POWER +5V	
29	VDD	POWER +5V	
30	VDD	POWER +5V	



4.4 COLOR DATA INPUT ASSIGNMENT

Colors & Gray scale	Data signal																								
	Gray Scale	R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7
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	
	Blue	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
	Green	—	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
	Cyan	—	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red	—	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	—	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
	Yellow	—	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	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
Gray Scale of Red	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↑	GS1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Darker	GS2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↑	↓				↓							↓								↓				
	↓	↓				↓							↓								↓				
	Brighter	GS253	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↓	GS254	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red	GS255	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale of Green	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↑	GS1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Darker	GS2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
	↑	↓				↓							↓								↓				
	↓	↓				↓							↓								↓				
	Brighter	GS253	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	
	↓	GS254	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	
	Green	GS255	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	
Gray Scale of Blue	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↑	GS1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
	Darker	GS2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
	↑	↓				↓							↓								↓				
	↓	↓				↓							↓								↓				
	Brighter	GS253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	
	↓	GS254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	
	Blue	GS255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	

0: Low level voltage,

1: High level voltage.

Each basic color can be displayed in 256 gray scales from 8 bit data signals. According to the combination of total 24 bit data signals, the 16,7M colors display can be achieved on the screen.



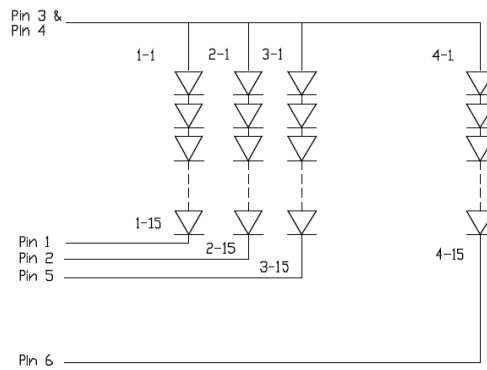
4.5 BACKLIGHT INTERFACE CONNECTION

LED light bar connector type : CI1406M1HRK-NH manufactured by CVILUX or equivalent.

Pin No.	Signal name
1	ILED (current out)
2	ILED (current out)
3	VLED (voltage in)
4	VLED (voltage in)
5	ILED (current out)
6	ILED (current out)

4.6 BACKLIGHT UNIT

The backlight unit contains one lightbar.



Electrical Circuit of lightbar

5. INTERFACE TIMING

5.1 INPUT SIGNAL TIMING SPECIFICATIONS

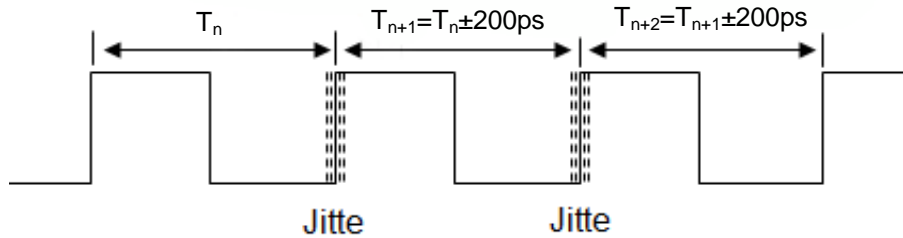
(a) The input signal timing specifications are shown as the following table and timing diagram.

Item		Symbol	Min	Typ.	Max.	Unit		
LCD Timing	DCLK	Freq.	F _{CLK}	55	72	90	MHz	
		Cycle	T _{CLK}	18.18	13.89	11.11	ns	
		Input cycle to cycle jitter	T _{RCL}	-	-	200	ps	
		Spread Spectrum Modulation range	F _{clk_mod}	F _{clk} -2%	-	F _{clk} +2%	MHz	
		Spread Spectrum Modulation frequency	F _{SSM}	30	-	100	KHz	
	DE	Horizontal	Horizontal effective time	T _{HA}	960	960	960	T _{CLK}
			Horizontal blank time	T _{HB}	32	100	115	T _{CLK}
			Horizontal total time	T _H	992	1060	1075	T _{CLK}
		Vertical	Vertical frame Rate	Fr	50	60	75	Hz
			Vertical total time	T _V	1084	1130	1170	T _H
Vertical effective time	T _{VA}		1080	1080	1080	T _H		
	Vertical blank time	T _{VB}	4	50	90	T _H		



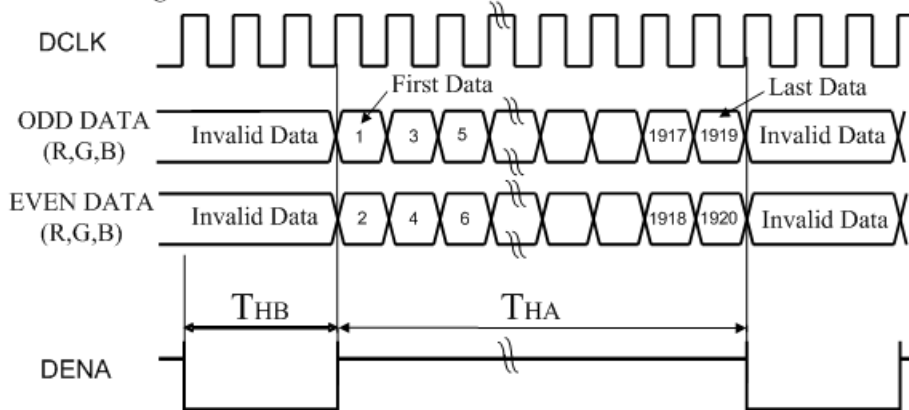
[Note]

- *1) DE (data enable) usually is positive.
- *2) DCLK still inputs during blanking.
- *3) DE mode only.
- *4) It may cause flicker at 50Hz.
- *5) The input cycle to cycle jitter is defined as below figure, $T_{RCL} = |T_{n+1} - T_n|$

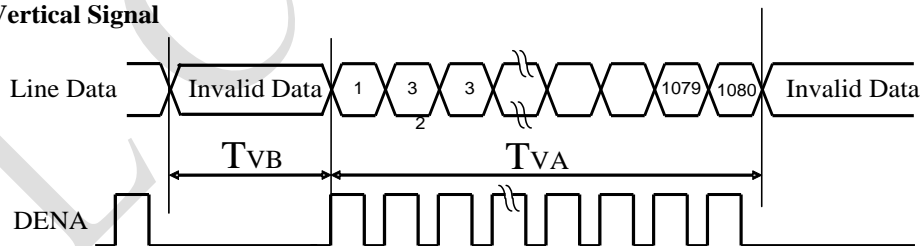


(b) Timing Chart

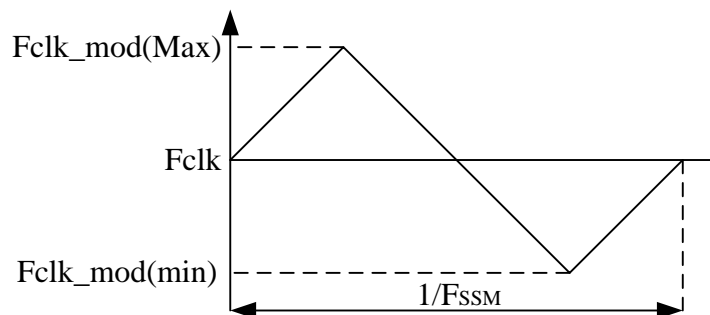
a. Horizontal Signal



b. Vertical Signal



(c) SSCG (Spread spectrum clock generator)



6. OPTICAL CHARACTERISTICS

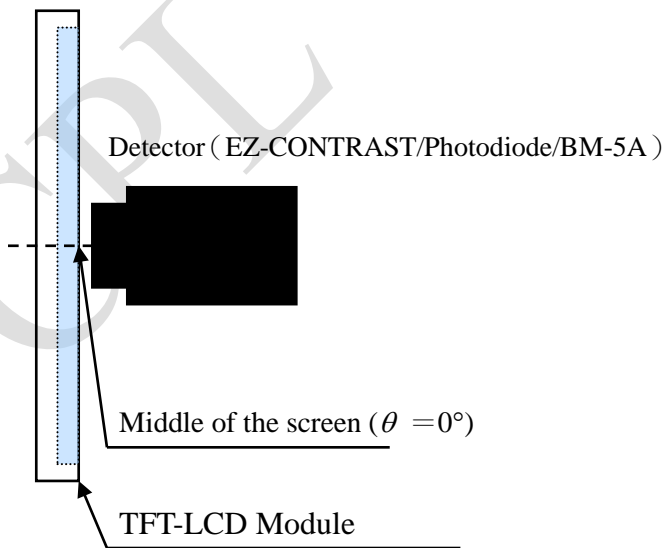
6.1 OPTICAL SPECIFICATION

Ta=25°C

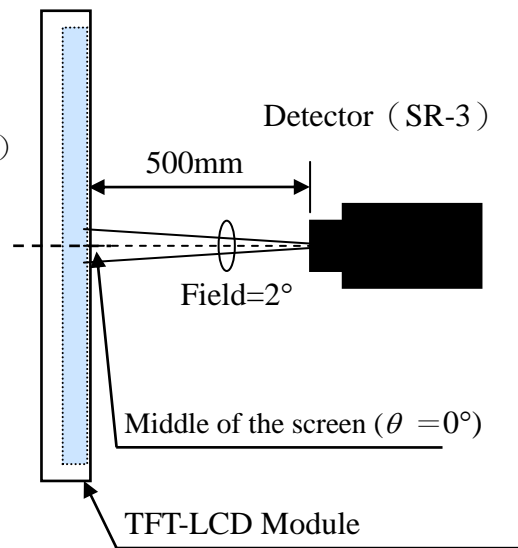
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark	
Luminance	L	$\theta = 0$ deg.	200	250	-	cd/m ²	[Note 1,5]	
Luminance uniformity	ΔL	$\theta = 0$ deg.	75	-	-	%	[Note 1,7]	
Contrast ratio	CR	$\theta = 0$ deg.	2000	3000	-	-	[Note2,5]	
Response time	Tr+Tf		-	25	-	ms	Tr+Tf [Note3,5]	
	τ_{DRV}		-	8	-	ms	[Note4,5,6]	
Chromaticity of white	x		Typ-0.03	Typ+0.03	0.313	-	[Note 5]	
	y				0.329	-		
Chromaticity of red	x				0.646	-		
	y				0.347	-		
Chromaticity of green	x				0.322	-		
	y				0.630	-		
Chromaticity of blue	x				0.155	-		
	y	0.061			-			
Color Gamut	C.G	-	72	-	%			
Viewing angle range	Horizontal	$\theta 21$	$CR \geq 10$	-	88	-	Deg.	[Note1,5]
		$\theta 22$		-	88	-		
	Vertical	$\theta 11$		-	88	-	Deg.	
		$\theta 12$		-	88	-		

*The measurement shall be executed 30 minutes after lighting at rating.

* The optical characteristics are measured using the following equipment.



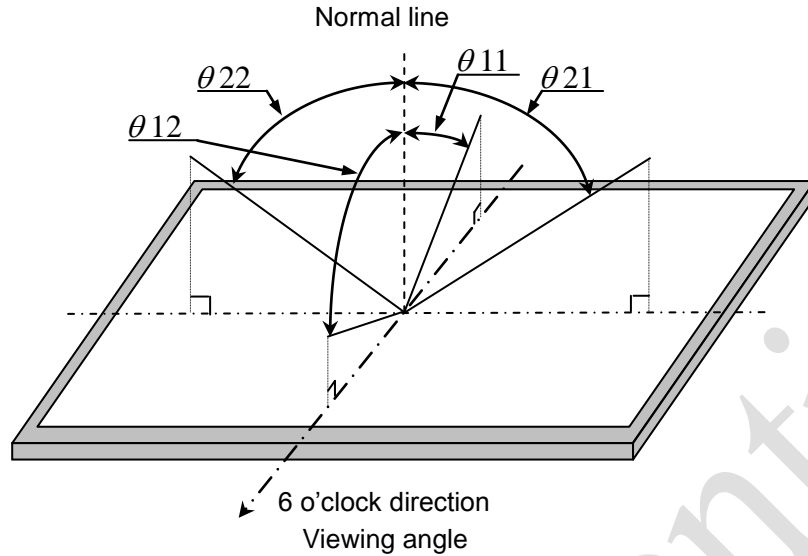
Measurement of viewing angle range, Response time.



Measurement of Contrast, Luminance, Chromaticity.



[Note 1] Definitions of viewing angle range:



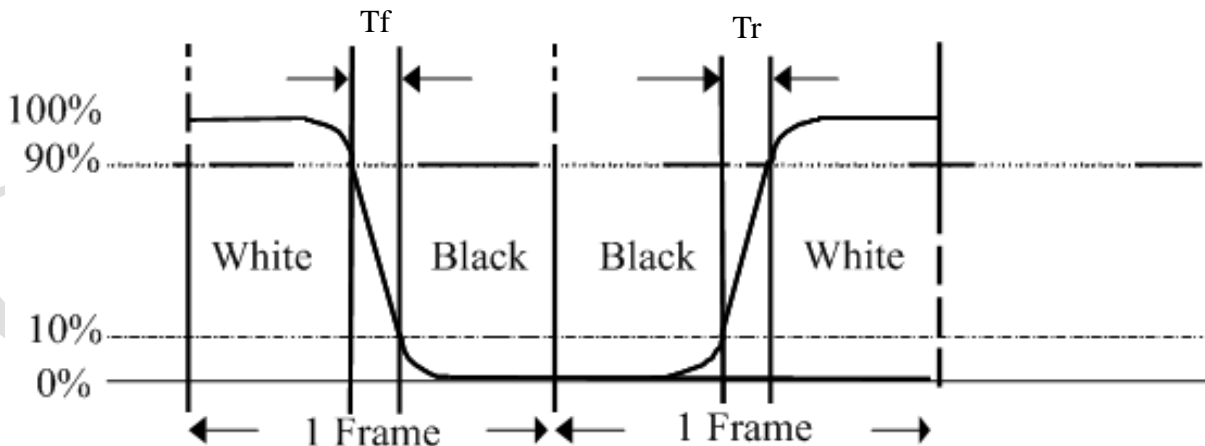
[Note 2] Definition of contrast ratio:

The contrast ratio is defined as the following.

$$\text{Contrast Ratio} = \frac{\text{Luminance (Brightness) with white screen}}{\text{Luminance (Brightness) with black screen}}$$

[Note 3] Definition of response time

The output signals of photo detector are measured when the input signals are changed from “Full Black” to “Full White” (rising time, Tr), and from “Full White” to “Full Black” (falling time, Tf), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.



Response time=Tr+ Tf



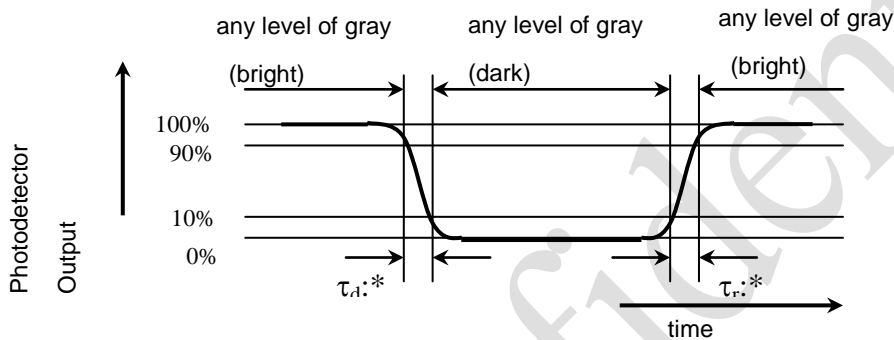
[Note 4] Definition of response time

The response time (τ_{DRV}) is defined as the following figure and shall be measured by switching the input signal for “any level of gray (0%, 25%, 50%, 75% and 100%) and “any level of gray (0%, 25%, 50%, 75% and 100%).

	0%	25%	50%	75%	100%
0%		$\tau_r:0\%-25\%$	$\tau_r:0\%-50\%$	$\tau_r:0\%-75\%$	$\tau_r:0\%-100\%$
25%	$\tau_d:25\%-0\%$		$\tau_r:25\%-50\%$	$\tau_r:25\%-75\%$	$\tau_r:25\%-100\%$
50%	$\tau_d:50\%-0\%$	$\tau_d:50\%-25\%$		$\tau_r:50\%-75\%$	$\tau_r:50\%-100\%$
75%	$\tau_d:75\%-0\%$	$\tau_d:75\%-25\%$	$\tau_d:75\%-50\%$		$\tau_r:75\%-100\%$
100%	$\tau_d:100\%-0\%$	$\tau_d:100\%-25\%$	$\tau_d:100\%-50\%$	$\tau_d:100\%-75\%$	

$\tau^*:x-y...$ response time from level of gray(x) to level of gray(y)

$$\tau_{DRV} = \sum (\tau^*:x-y)/20$$



[Note 5] This shall be measured at center of the screen.

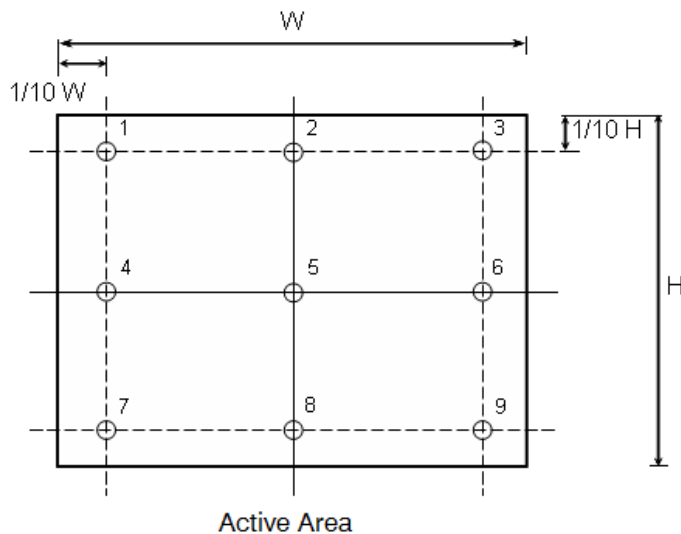
[Note 6] This value is valid when O/S driving is used at typical input time value.

[Note 7] Definition of Luminance and Luminance uniformity:

Luminance: To measure at the center position “5” on the screen (NO.5).

Luminance uniformity: L_w (MAX) and L_w (MIN) are the maximum and minimum luminance value measure at the position “1~9” on the screen (NO.1~9) and the equation:

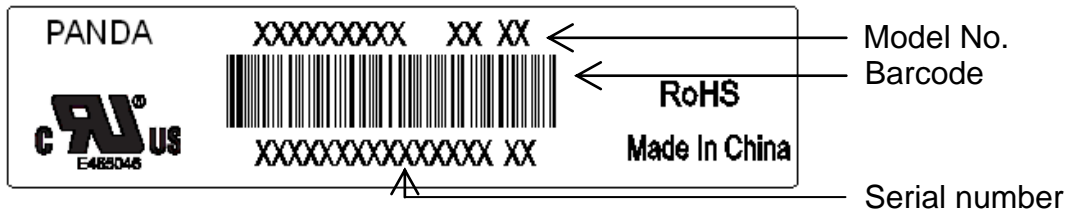
$$\Delta L_w = L_w(\text{MIN}) / L_w(\text{MAX}) \times 100\%$$



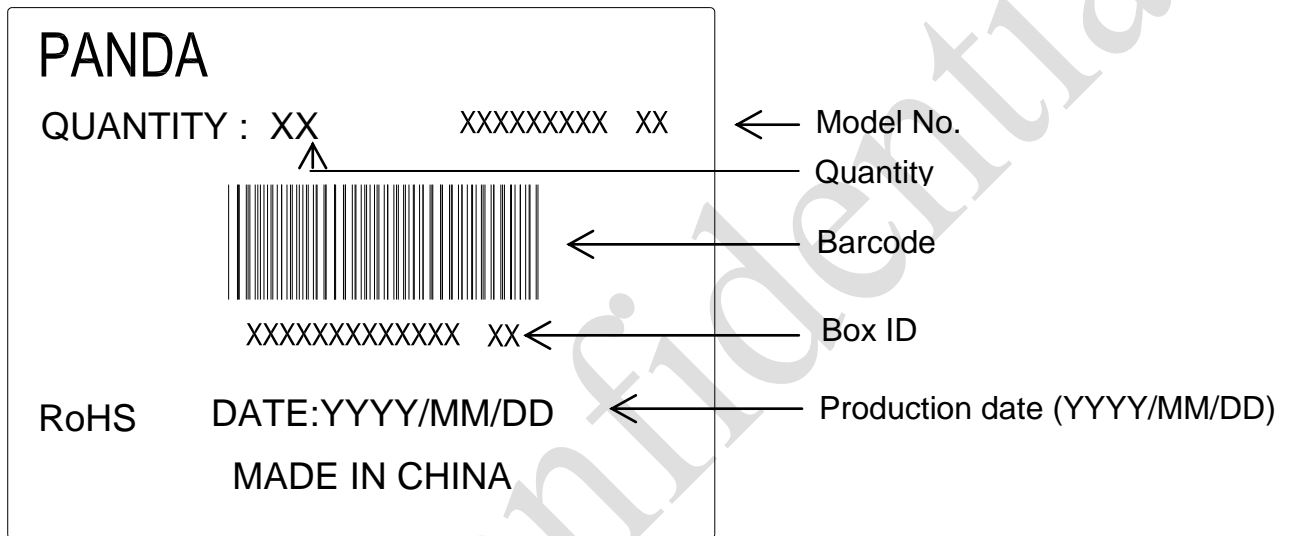
7. DEFINITION OF LABELS

7.1 MODULE LABEL

The label is stuck on the back side of the Module.



7.2 PACKING LABEL

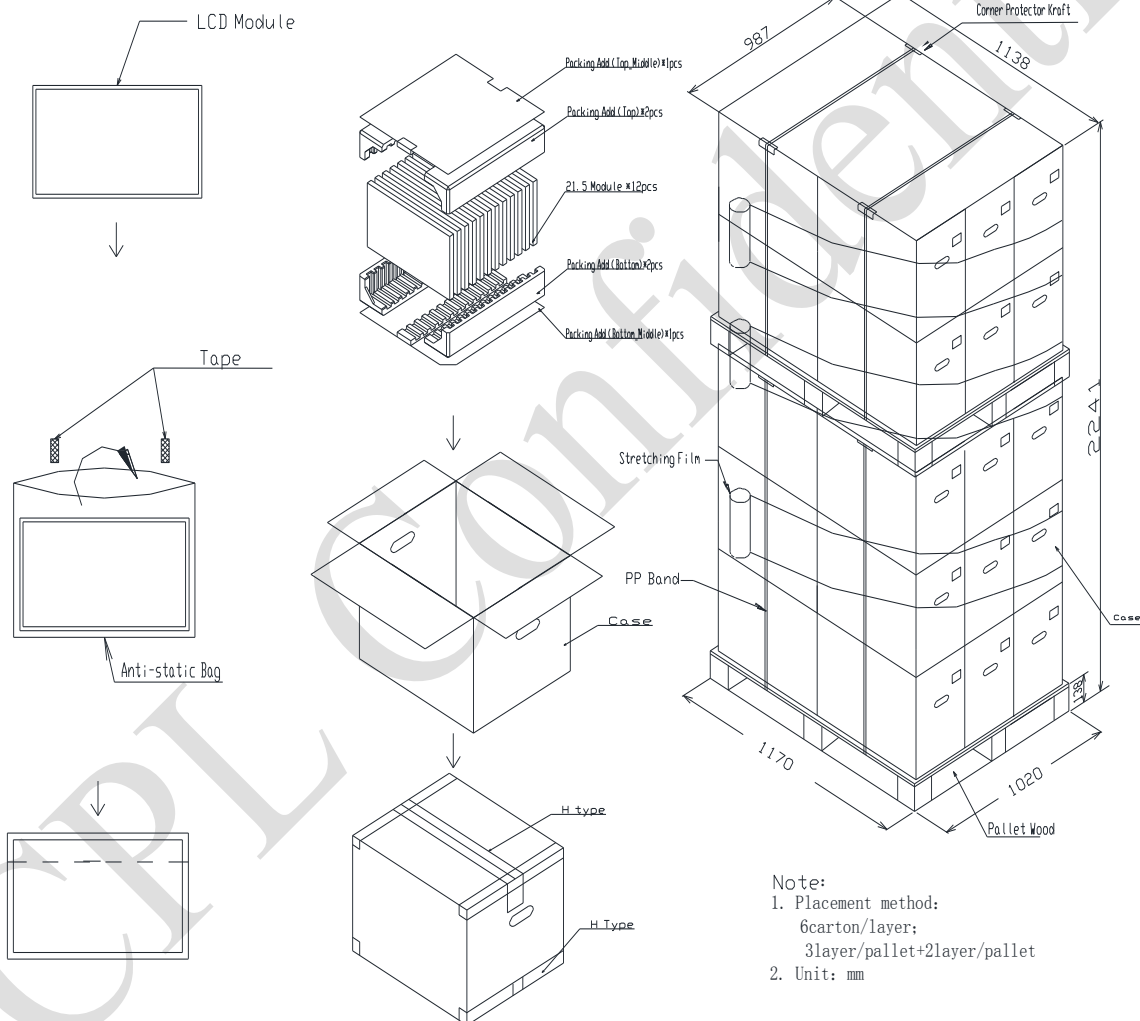


8. PACKING

8.1 PACKING SPECIFICATIONS

PILING NUMBER OF CARTON	30(18 carton/pallet + 12 carton/pallet)
Packing quantity in one carton	12 pcs
Carton size	569(L)x329(W)x399(H) mm
Pallet size	1170(L)x1020(W)x138(H) mm
Total mass of one carton filled with full module	22 kg

8.2 PACKING METHOD



9. CARTON STORAGE CONDITION

Temperature: 0°C to 40°C

Humidity: 80%RH or less

Reference condition: 20°C to 35°C, 80%RH or less (summer)

5°C to 15°C, 80%RH or less (winter)

The total storage time (40°C, 80%RH): 240h or less

Sunlight Be sure to shelter a product from the direct sunlight.

Atmosphere Harmful gas, such as acid and alkali which bites electronic components and/or wires must not be detected.

Be sure to put cartons on pallet or base, don't put it on floor, and store them with removing from wall.

Please take care of ventilation in storehouse and around cartons, and control changing temperature is within limits of natural environment.

10. PRECAUTIONS

10.1 ASSEMBLY AND HANDLING PRECAUTIONS

- (a) Do not apply rough force such as bending or twisting to the module during assembly.
- (b) It is recommended to assemble or to install a module into the user's system in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (c) Since the LCM consists of TFT and electronic circuits with CMOS-ICs, which are very weak to electrostatic discharge, person who is handling an LCM should be grounded through adequate methods such as an anti-static wrist band. Connector pins should not be touched directly with bare hands.

Reference: Process control standard is shown as follow,

	item	Management standard value and performance standard
1	Anti-static mat(shelf)	1to50 [Mega ohm]
2	Anti-static mat(floor, desk)	1to100 [Mega ohm]
3	Ionizer	Attenuate from ±1000V to ±100V within two seconds.
4	Anti-static wrist band	0.8 to 10 [Mega ohm]
5	Anti-static wrist band entry and ground resistance	Below 1000 [ohm]
6	Temperature	22 to 26 [°C]
7	Humidity	60 to 70 [%]

- (d) Do not apply pressure or impulse to the module to prevent the damage of LCD panel and backlight.
- (e) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.
- (f) Be sure to turn off the power supply when inserting or disconnecting the cable.
- (g) Do not disassemble the module.
- (h) Front polarizer can easily be damaged, so please pay attention on it.
- (i) Using a absorbent cotton or other soft cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (j) Since long contact with drops of water may cause discoloration or spots, please wipe off them as soon as possible.
- (k) The Panel will be broken or chipped when it is dropped or bumped against a hard substance.



- (l) Applying too much force and stress to PWB and drivers may cause a malfunction electrically and mechanically.
- (m) Please be careful since image retention may occur when a fixed pattern is displayed for a long time.
- (n) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (o) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD modules in the specified storage conditions.
- (p) This LCM is corresponded to RoHS.
- (q) When any question or issue occurs, it shall be solved by mutual discussion.

10.2 SAFETY PRECAUTIONS

- (a) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (b) After the module's end of life, it is not harmful in case of normal operation and storage.

11. Reliability test items

(a) Environment test condition(LCM)

Test item	Condition
High temperature storage test	Ta= 60°C, 240h
Low temperature storage test	Ta=-20°C, 240h
High temperature and high humidity storage test	Ta=50°C, 80%RH, 240h (No condensation)
High temperature operation test	Ta= 50°C, 240h
Low temperature operation test	Ta= 0°C, 240h
Thermal Shock Test	-20°C/30min, 60°C/30min, 100 cycles
On/Off Test	On/10sec, Off/10sec, 30,000 cycles

(b) Shock & Vibration(LCM)

Test item	Condition
Shock (Non-Operation)	Shock level: 50 Grms Waveform: half sine wave, 20ms Direction: ±X,±Y,±Z One time each direction
Vibration (Non-Operation)	Wave form: Random Vibration level: 1.5 Grms Bandwidth: 10-200 Hz Duration: X,Y,Z each direction per 30 min

[Result evaluation criteria]

Under the display quality test condition with normal operation state, there shall be no change, which may affect practical display function.

12. Mechanical Drawing



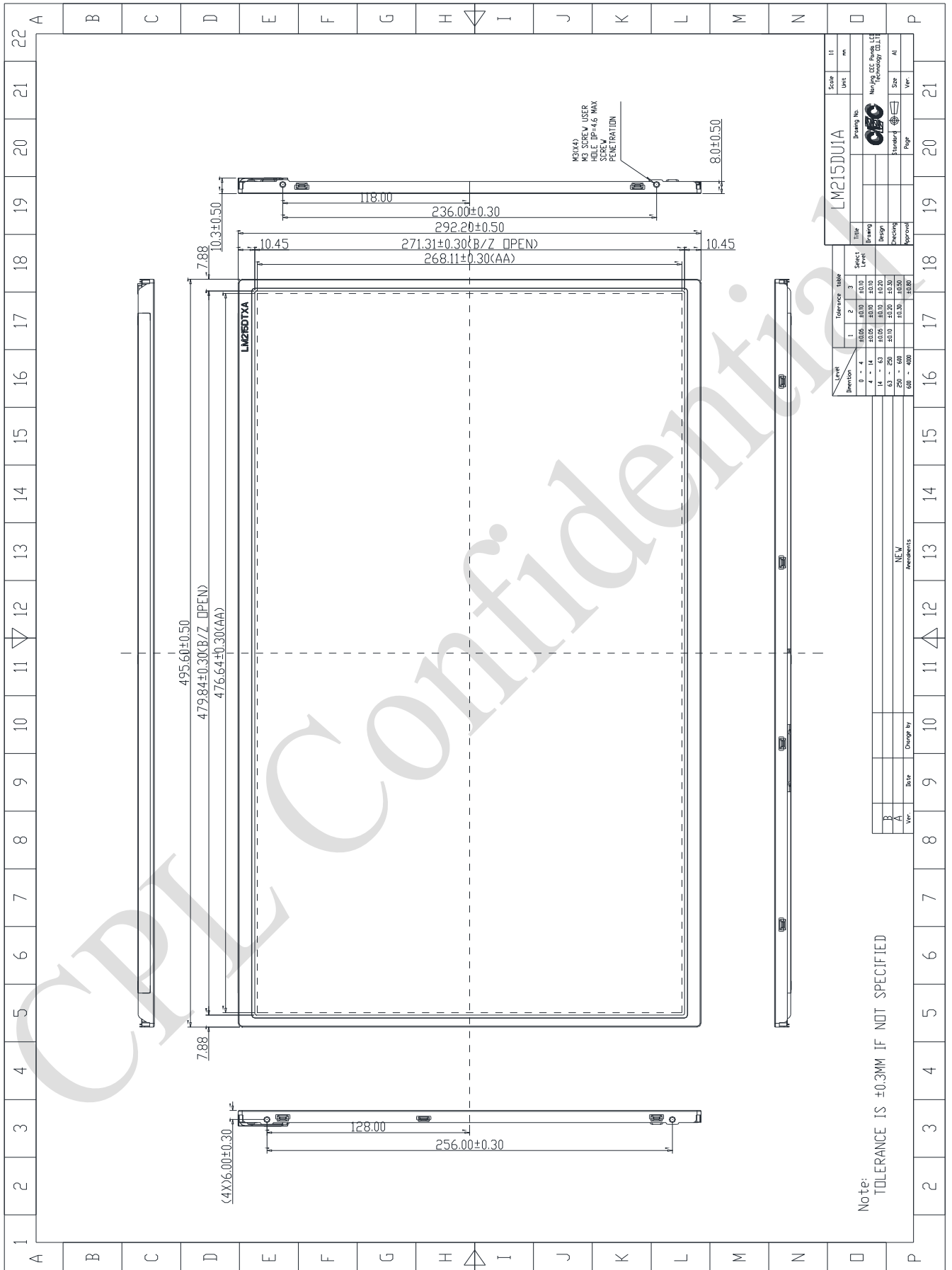


Fig.3-1. Front outline drawing



