

CUSTOMER APPROVE

SPECIFICATION

FOR

DOUBLE LIN TFT-LCD MODULE

195LY7C1-01

Edition : Preliminary spec 1.0

Date of issue : 2018-03-14

CELL Model : T215HVN01.1

APPROVED	CHECKED	PREPARED
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Revision History

Date	Rev	Page	Old Description	New Description	Remark
2018-03-14	1.0	20	The specification was first issued		

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1.0 SCOPE

This specifications is applicable to double lin digital technology LCD. 's 19.5" diagonal module : " 195LY7C1-01 "designed for TFT-LCD TV.

1.1 Features

- Super Wide viewing angle
- Super High contrast ratio
- Super Fast response time
- High color saturation
- DE(Data Enable) only mode
- LVDS Interface
- RoHS compliance

1.2 Application

TFT-LCD TV
Multi-Media Display

1.3 General Specifications

Item	Specifications	Unit	Note
Driving Method	a-Si TFT active matrix		Note 1
Active Area	476.64(H) x 136.41(V)	mm	
Screen diagonal(in)	19.5	in	
Number of Pixels	1920 x540	pixel	
Pixel arrangement	RGB Vertical stripe		
Transmissive Mode	Normally black		
Surface Treatment	Haze 25%, 3H		
Display Colors	8-bit (D), 16.7M	color	

1.4 Mechanical Specification

Item		Min	Typ	Max	Unit	Note
Weight			TB D		g	-
Module Size	Horizontal(H)	(TYP)-0.5	497.4	(TYP)+0.5	mm	to inverter cover
	Vertical (V)		158.4		mm	
	Depth(D)		15.7		mm	

Note 1: Please refer to the "outline dimension" for more information of back and front outline dimensions.

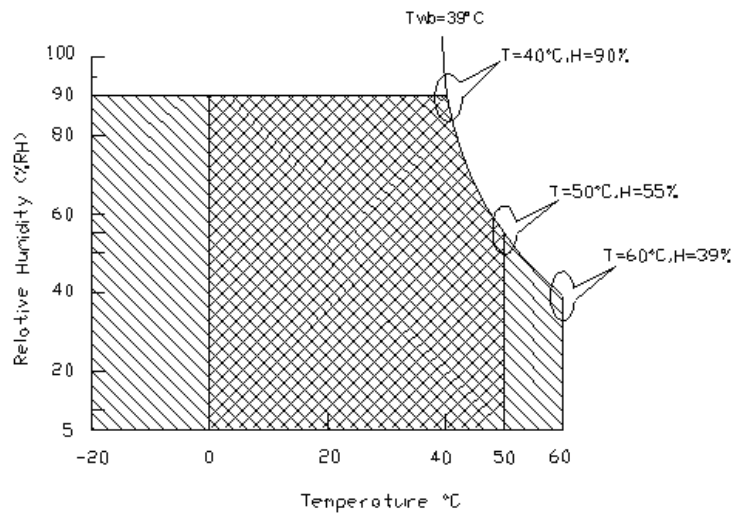
2.0 ABSOLUTE MAXIMUM RATINGS

Permanent damage may occur if exceeding the following maximum rating.

Symbol	Description	Min.	Max.	Unit	Remark
TOP	Operating Temperature	0	+50	[oC]	Note 2-1
TGS	Glass surface temperature (operation)	0	+65	[oC]	Note 2-1 <i>Function judged</i>
HOP	Operation Humidity	5	90	[%RH]	Note 2-1
TST	Storage Temperature	-20	+60	[oC]	
HST	Storage Humidity	5	90	[%RH]	

Note 2-1: Temperature and relative humidity range are shown as the below figure.

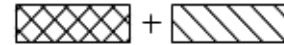
1. 90% RH Max ($T_a \leq 39^\circ\text{C}$)
2. Max wet-bulb temperature at 39°C or less. ($T_a \leq 39^\circ\text{C}$)
3. No condensation



Operating Range



Storage Range



3.0 ELECTRICAL SPECIFICATIONS

3.1 Absolute Maximum Rating

Permanent damage may occur if exceeding the following maximum rating.

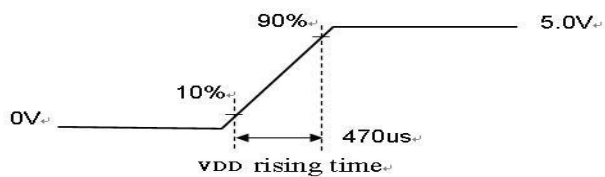
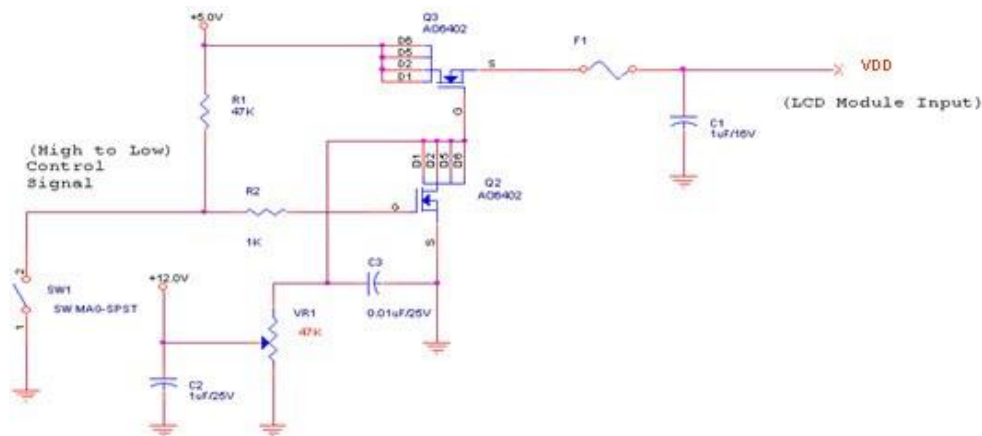
Symbol	Description	Min	Max	Unit	Remark
VDD	Power Supply Input Voltage	GND-0.3	6.0	[Volt]	Ta=25°C

3.2 Recommended Operating Condition

Symbol	Description	Min	Typ	Max	Unit	Remark
VDD	Power supply Input voltage	4.5	5.0	5.5	[Volt]	
IDD	Power supply Input Current (RMS)	-	0.62	0.74	[A]	VDD= 5.0V, Black Pattern, Fv=60Hz
			0.7	0.84	[A]	VDD= 5.0V, Black Pattern, Fv=75Hz
PDD	VDD Power Consumption	-	3.1	3.7	[Watt]	VDD= 5.0V, Black Pattern, Fv=60Hz
			3.5	4.2	[Watt]	VDD= 5.0V, Black Pattern, Fv=75Hz
IRush	Inrush Current	-	-	3.0	[A]	Note 3-1
VDDrp	Allowable VDD Ripple Voltage	-	-	500	[mV]	VDD= 5.0V, Black Pattern, Fv=75Hz

Note ote 3-1: Inrush Current measurement:

Test circuit:



The duration of VDD rising time: 470us.

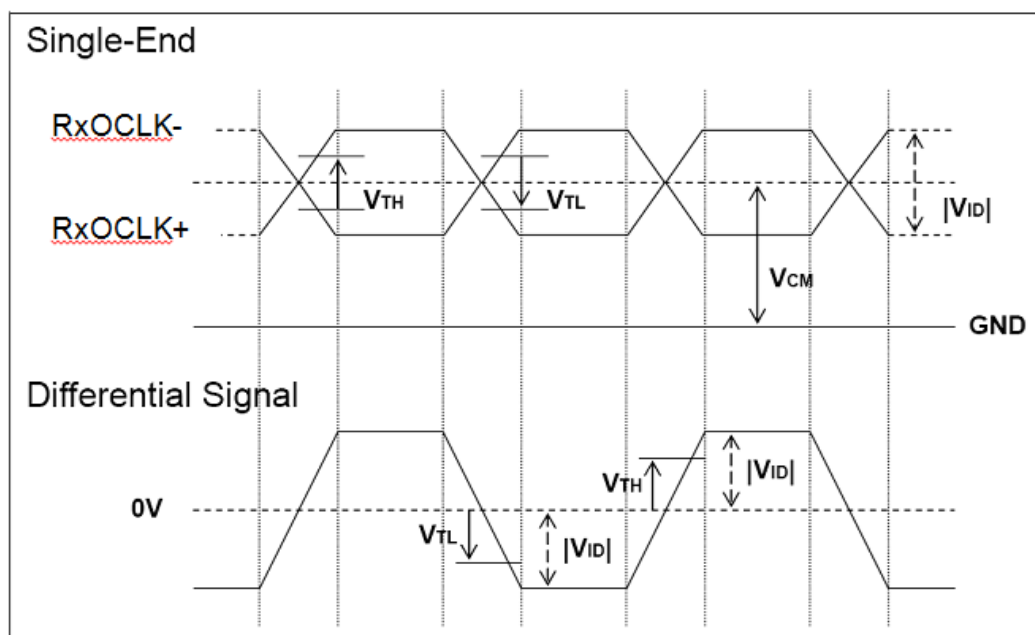
3.2 LVDS Specification

a. DC Characteristics:

Symbol	Description	Min	Typ	Max	Units	Condition
V_{TH}	LVDS Differential Input High Threshold	-	-	+100	[mV]	$V_{CM} = 1.2V$
V_{TL}	LVDS Differential Input Low Threshold	-100	-	-	[mV]	$V_{CM} = 1.2V$
$ V_{ID} $	LVDS Differential Input Voltage	100	-	600	[mV]	
V_{CM}	LVDS Common Mode Voltage	+1.0	+1.2	+1.5	[V]	$V_{TH}-V_{TL} = 200mV$

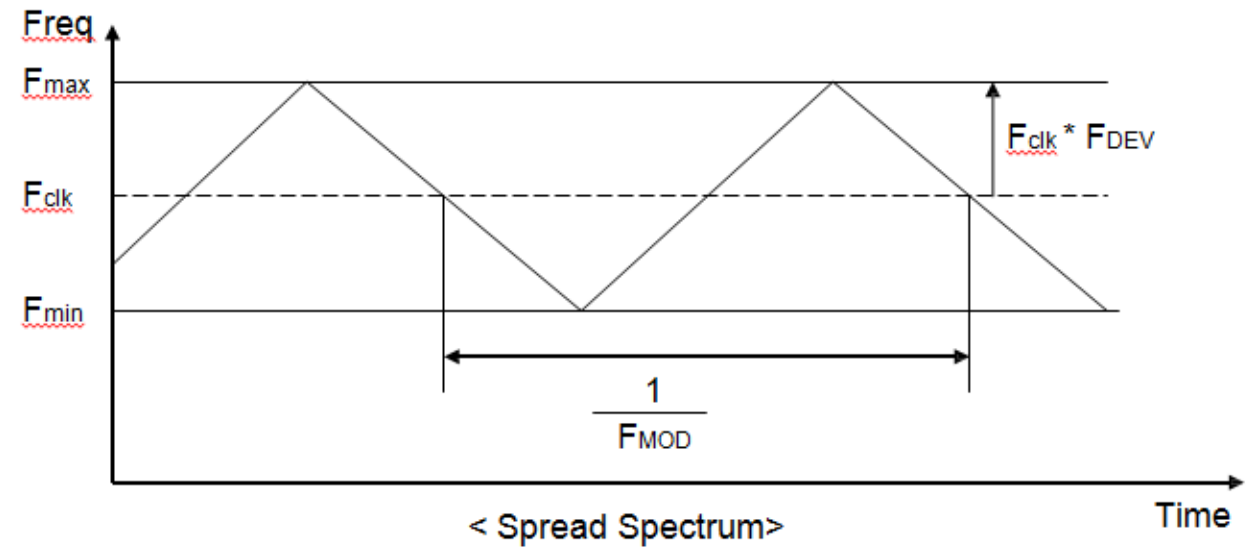
LVDS Signal Waveform:

Use RxOCLK- & RxOCLK+ as example.



b. AC Characteristics:

Symbol	Description	Min	Max	Unit	Remark
F_{DEV}	Maximum deviation of input clock frequency during Spread Spectrum	-	± 3	%	
F_{MOD}	Maximum modulation frequency of input clock during Spread Spectrum	-	200	KHz	



F_{clk} : LVDS Clock Frequency

3.4 Backlight Unit

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
LightBar Voltage	V_L	61	—	71.4	V	DUTY 100%
LightBar Current	I_L	—	240	360	mA	DUTY 100%
Power Consumption	P_{BL}	—	—	—	W	
LED Life Time	L_{BL}	50000	—	—	H	(1)

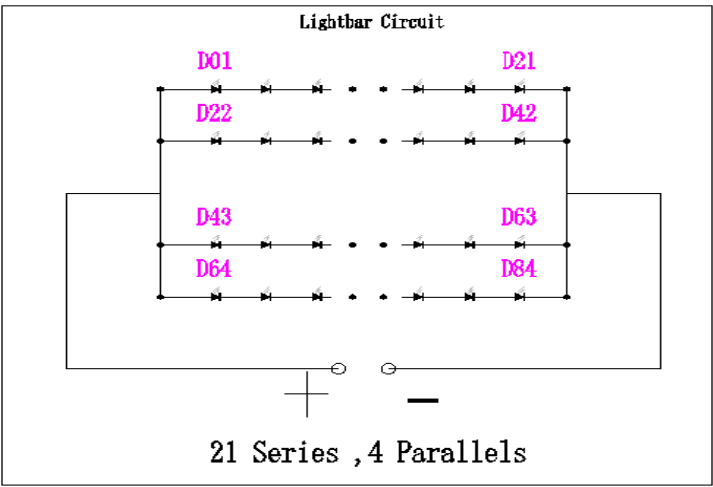
Note (1) The lifetime is defined as the time which luminance of the LED decays to 50% compared to the initial value, Operating condition: Continuous operating at $T_a = 25 \pm 2^\circ\text{C}$, $I_L = 240\text{mA}$

3.4.1 Backlight brightness / Module brightness

Module brightness: $\geq 500\text{cd}/\text{m}^2$

Homogeneity: $\geq 75\%$

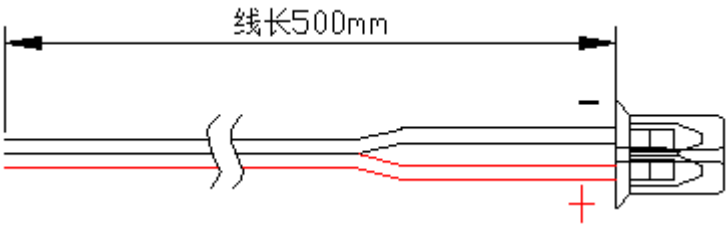
3.4.2 Backlight circuit diagram



PER LED light bar circuit is(4)Parallel (21)Series, Backlight circuit is(4)Parallel (21)Series

3.4.3 Backlight UNIT Connector Definition

Backlight Input connector model: PH2.0-2Pin



4.0 OPTICAL SPECIFICATION

Optical characteristics are determined after the unit has been ‘ON’ and stable in a dark environment at $25 \pm 2\text{ }^{\circ}\text{C}$. The values are specified at distance 50cm from the LCD surface at a viewing angle of and equal to 0° .

FIG. 1 shows additional information concerning the measurement equipment and method.4.2 Optical Specifications

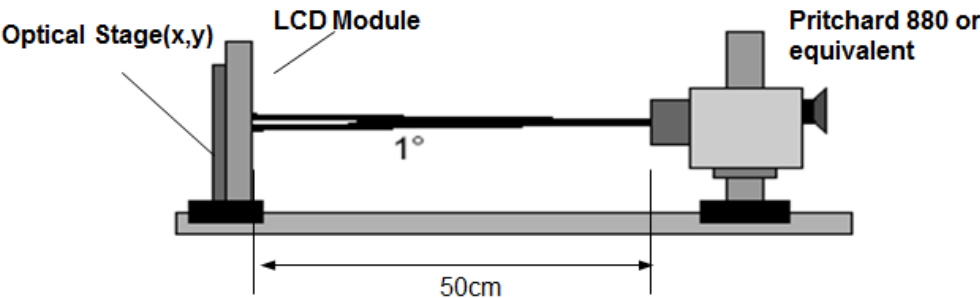


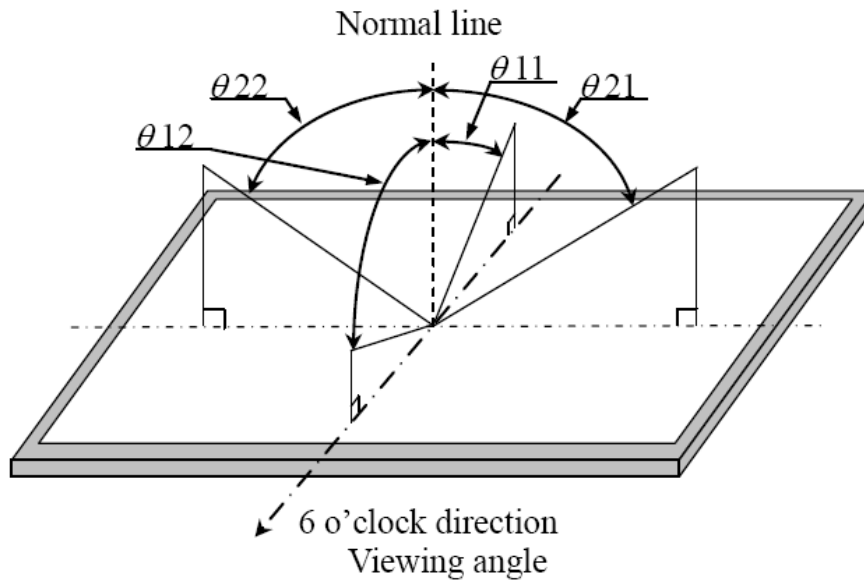
FIG. 1 Optical Characteristic Measurement Equipment and Method

Table 3. OPTICAL CHARACTERISTICS

Ta= $25 \pm 2\text{ }^{\circ}\text{C}$, VDD,H_VDD,VGH,VGL=typ,fV=60Hz,
Light Source : D65 Standard

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Chromaticity (CIE 1931)	Red	Rx	$=0^{\circ}$, Y Viewing Angle at Normal Direction	Typ - 0.03	0.652	Typ + 0.03	-	(1)
		Ry			0.335			
	Green	Gx			0.321			
		Gy			0.625			
	Blue	Bx			0.153			
		By			0.057			
	White	Wx			0.313			
		Wy			0.329			
	Crosstalk	CT			2	-	%	(1)
— Center Luminance of White (Center of Screen)		L	$=0^{\circ}$, Y Viewing Angle at Normal Direction	Min.	700 Typ.	-	cd/ m ²	(1)、 (4)
Contrast Ratio		CR		2000	30 00	-	-	(1)、 (2)
Response Time		TR		-	13	28	ms	(1)、 (3)
		TF			5	8		
White Homogeneity		W		75%		-	-	(4)、 (5)、 (6)
Viewing Angle	Horizontal	+x	CR ≥ 10	75	89	-	Deg.	(1)、 (3)
		-x		75	89	-		
	Vertical	+Y		75	89	-		
		-Y		75	89	-		

[Note 1] Definitions of viewing angle range:



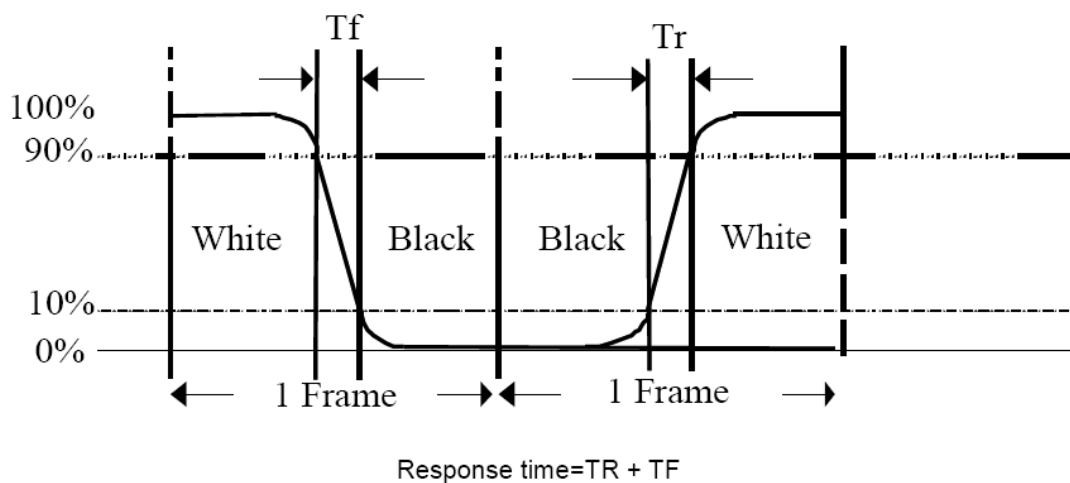
[Note 2] Definition of contrast ratio:

The contrast ratio is defined as the following.

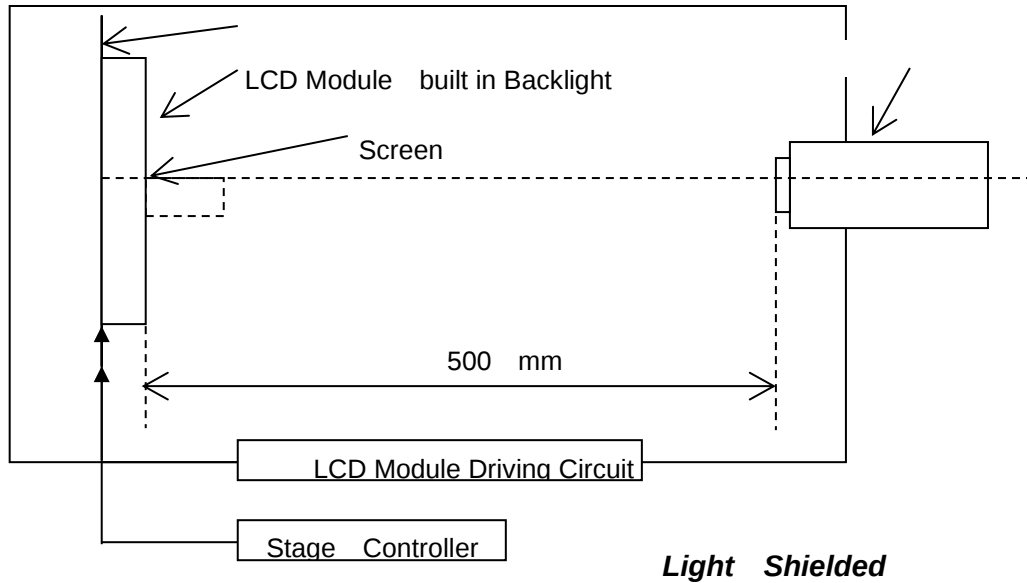
$$\text{Contrast Ratio} = \frac{\text{Luminance (Brightness) with white screen}}{\text{Luminance (Brightness) with black screen}}$$

[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.



Note 4: The measure method



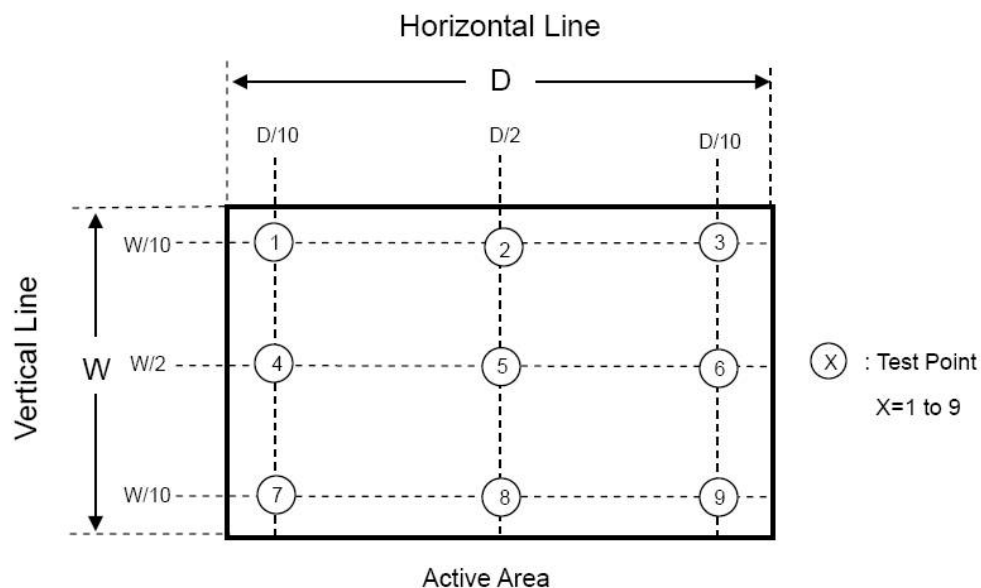
Note (5) Definition of white variation() Measure the luminance of gray level 255 at 9 points
Measurement Setup:

The LCD module should be stabilized at given temperature for 30min to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30min in a windless room.

Note (6) Definition of White Variation (W):

Measure the luminance of gray level 255 at 9 points

$$W = \text{Minimum} [L (1), L (2), L (3), L (4), L (5) \dots L (9)] / \text{Maximum} [L (1), L (2), L (3), L (4), L (5) \dots L (9)]$$



5.0 INTERFACE CONNECTION

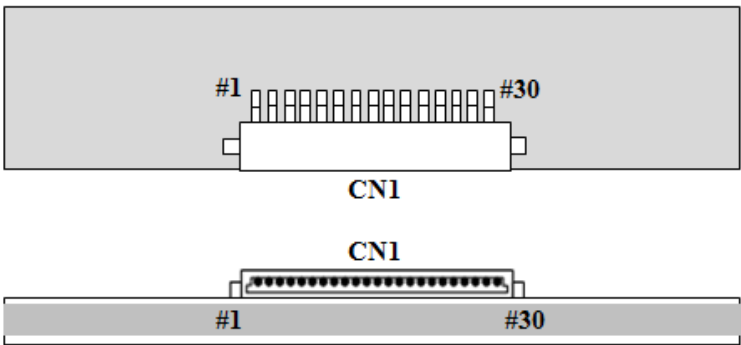
5.1 Connector Type

TFT-LCD Connector	Manufacturer	P-TWO	STM
	Part Number	AL230F-A0G1D-P	MSCKT2407P30HB
Mating Connector	Manufacturer	JAE	
	Part Number	FI-X30HL (Locked Type)	

5.2 Connector Pin Assignment

PIN #	Symbol	Description	Remark
1	RxO0-	Negative LVDS differential data input (Odd data)	
2	RxO0+	Positive LVDS differential data input (Odd data)	
3	RxO1-	Negative LVDS differential data input (Odd data)	
4	RxO1+	Positive LVDS differential data input (Odd data)	
5	RxO2-	Negative LVDS differential data input (Odd data)	
6	RxO2+	Positive LVDS differential data input (Odd data)	
7	GND	Ground	
8	RxOCLK-	Negative LVDS differential clock input (Odd clock)	
9	RxOCLK+	Positive LVDS differential clock input (Odd clock)	
10	RxO3-	Negative LVDS differential data input (Odd data)	
11	RxO3+	Positive LVDS differential data input (Odd data)	
12	RxE0-	Negative LVDS differential data input (Even data)	
13	RxE0+	Positive LVDS differential data input (Even data)	
14	GND	Ground	
15	RxE1-	Negative LVDS differential data input (Even data)	
16	RxE1+	Positive LVDS differential data input (Even data)	
17	GND	Ground	
18	RxE2-	Negative LVDS differential data input (Even data)	
19	RxE2+	Positive LVDS differential data input (Even data)	
20	RxECLK-	Negative LVDS differential clock input (Even clock)	
21	RxECLK+	Positive LVDS differential clock input (Even clock)	
22	RxE3-	Negative LVDS differential data input (Even data)	
23	RxE3+	Positive LVDS differential data input (Even data)	
24	GND	Ground	
25	NC	No connection (for AUO test only. Do not connect)	
26	NC	No connection (for AUO test only. Do not connect)	

27	NC	No connection (for AUO test only. Do not connect)	
28	VDD	Power Supply Input Voltage	
29	VDD	Power Supply Input Voltage	
30	VDD	Power Supply Input Voltage	



5.3 LVDS Interface (Tx; THC63LVDF83A or Equivalent)

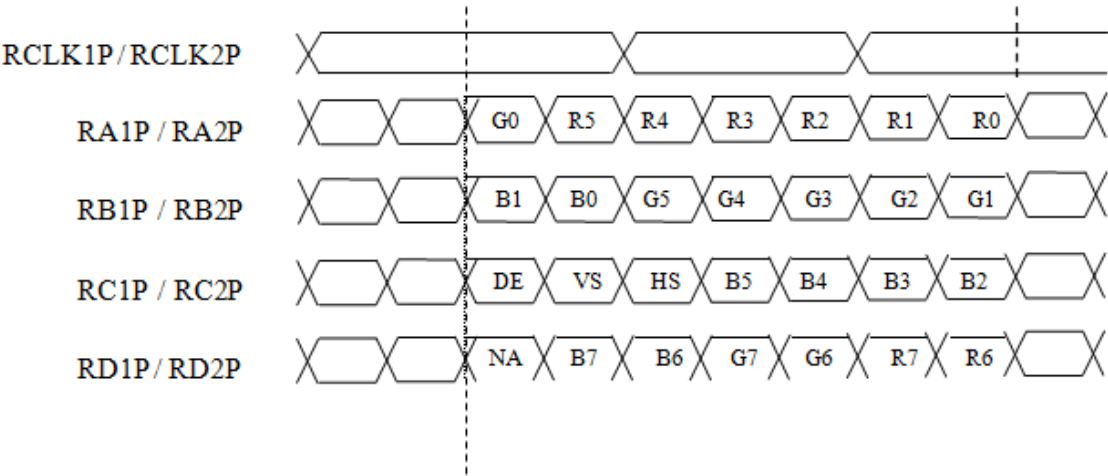


Fig. 4.5 VESA format

6.0 INTERFACE TIMING

6.1 Timing Table (DE Only Mode)

Symbol	Description	Min.	Typ.	Max.	Unit	Remark
Tv	Vertical Section	Period	1092	1130	1818	Th
Tdisp (v)		Active	1080	1080	1080	Th
Tblk (v)		Blanking	12	50	738	Th
Fv		Frequency	50	60	76	Hz
Th	Horizontal Section	Period	1034	1050	1100	Tclk
Tdisp (h)		Active	960	960	960	Tclk
Tblk (h)		Blanking	74	90	140	Tclk
Fh		Frequency	55	68	91	KHz
Tclk	LVDS Clock	Period	10.6	14.0	17.7	ns
Fclk		Frequency	56.5	71.2	94.0	MHz

Note 3-3: The equation is listed as following. Please don't exceed the above recommended value.

$$Fh (\text{Min.}) = Fclk (\text{Min.}) / Th (\text{Min.});$$

$$Fh (\text{Typ.}) = Fclk (\text{Typ.}) / Th (\text{Typ.});$$

$$Fh (\text{Max.}) = Fclk (\text{Max.}) / Th (\text{Min.});$$

Note 3-4: The equation is listed as following. Please don't exceed the above recommended value.

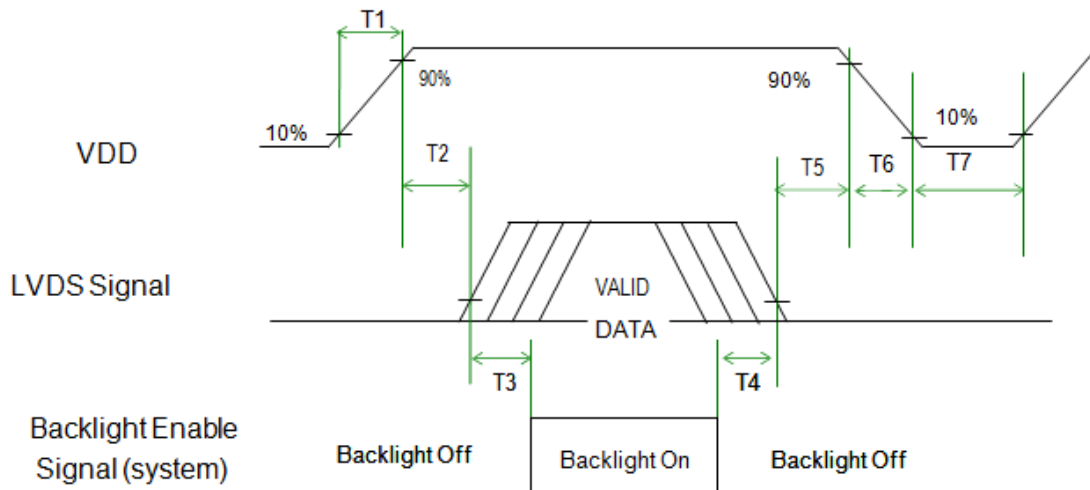
$$Fclk (\text{Min.}) = Fv (\text{Min.}) \times Th (\text{Min.}) \times Tv (\text{Min.});$$

$$Fclk (\text{Typ.}) = Fv (\text{Typ.}) \times Th (\text{Typ.}) \times Tv (\text{Typ.});$$

$$Fclk (\text{Max.}) = Fv (\text{Max.}) \times Th (\text{Typ.}) \times Tv (\text{Typ.});$$

6.2 Power On/Off Sequence

VDD power, LVDS signal and backlight on/off sequence are as following. LVDS signals from any system shall be Hi-Z state when VDD is off.



Power Sequence Timing

Symbol	Value			Unit	Remark
	Min.	Typ.	Max.		
T1	0.5	-	10	[ms]	
T2	0	-	50	[ms]	
T3	500	-	-	[ms]	
T4	100	-	-	[ms]	
T5	0		50	[ms]	Note 3-5 Note 3-6
T6	0	-	150	[ms]	Note 3-6
T7	1000	-	-	[ms]	

Note 3-5 : Recommend setting T5 = 0ms to avoid electronic noise when VDD is off.

Note 3-6 : During T5 and T6 period , please keep the level of input LVDS signals with Hi-Z state.

7.0 LABELS

7.1 Panel Label

- 1 Model No: 195LY7C1-01
- 2 RoHS
- 3 Product Code: YEN195180312G0001
 - A----Open cell Manufacturer (Y--AUO, Q--CMO, L--LG, J--BOE, H--COST)
 - B----Backlight Type (D--DLED, E--ELED)
 - C----Brightness Code (H--High Brightness, N--Normal Brightness, L--Low Brightness)
 - DEF----Product Size (195—19.5”)
 - GH----Year (17--2017,18--2018)
 - IJ----Months (1,2,3.....9,10,11,12)
 - KL---- Days (01,02,03.....12...31)
 - M---- Line (作业流水线别)
 - NOPQ: (产品流水码 0000-9999)
- 4 Cell Type: T215HVN01.1
- 5 Made IN CHINA
- 6 INPut: Current Voltage

195LY7C1-01

ROHS



YEN195180312G0001

CELL : T215HVN01 MADE IN CHINA

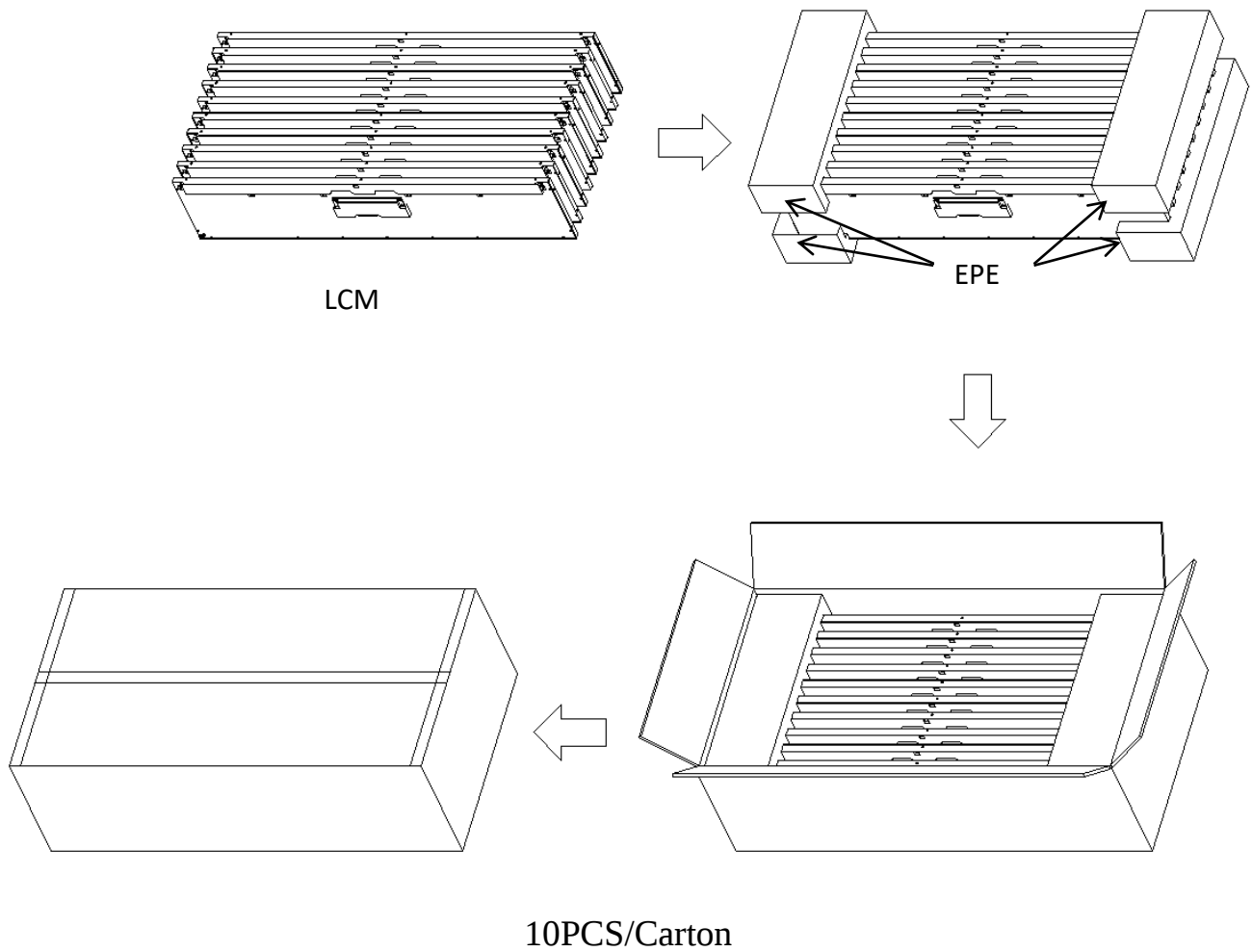
INPUT : 240MA 60-70V 700cd/m2

7.2 Caution Label

	CAUTION HIGH VOLTAGE RISK OF ELECTRIC SHOCK. DISCONNECT THE ELECTRIC POWER BEFORE SERVICING
COLD CATHODE FLUORESCENT LAMP IN LCD PANEL CONTAINS A SMALL AMOUNT OF MERCURY. PLEASE FOLLOW LOCAL ORDINANCES OR REGULATIONS FOR DISPOSAL	

8.0 PACKAGING

8.1 Carton(internal package)



8.2 Pakaging Mark



9.0 PRECAUTION

9.1 Assembly And Handling Precautions

1. Do not apply rough force such as bending or twisting to the module during assembly.
- 2 To assemble or install module into user's system can be in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
3. It's not permitted to have pressure or impulse on the module because the LCD panel and Bac- klight will will be damaged.
4. Always follow the correct power sequence when LCD module is connecting and operating.This can prevent damage to the CMOS LSI chips during latch-up.
5. Do not pull the I/F connector in or out while the module is operating .
- 6.Do not disassemble the module.
- 7.Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
8. It is dangerous that moisture come into or contacted the LCD module, because moisture may damage LCD module when it is operating.
9. High temperature or humidity may reduce the performance of module. Please store LCD module within the specified stored conditions.
10. When ambient temperature is lower than 10 °C may reduce the display quality. For example, the response time will become slowly, and the starting voltage of CCFL will be higher than room temperature.

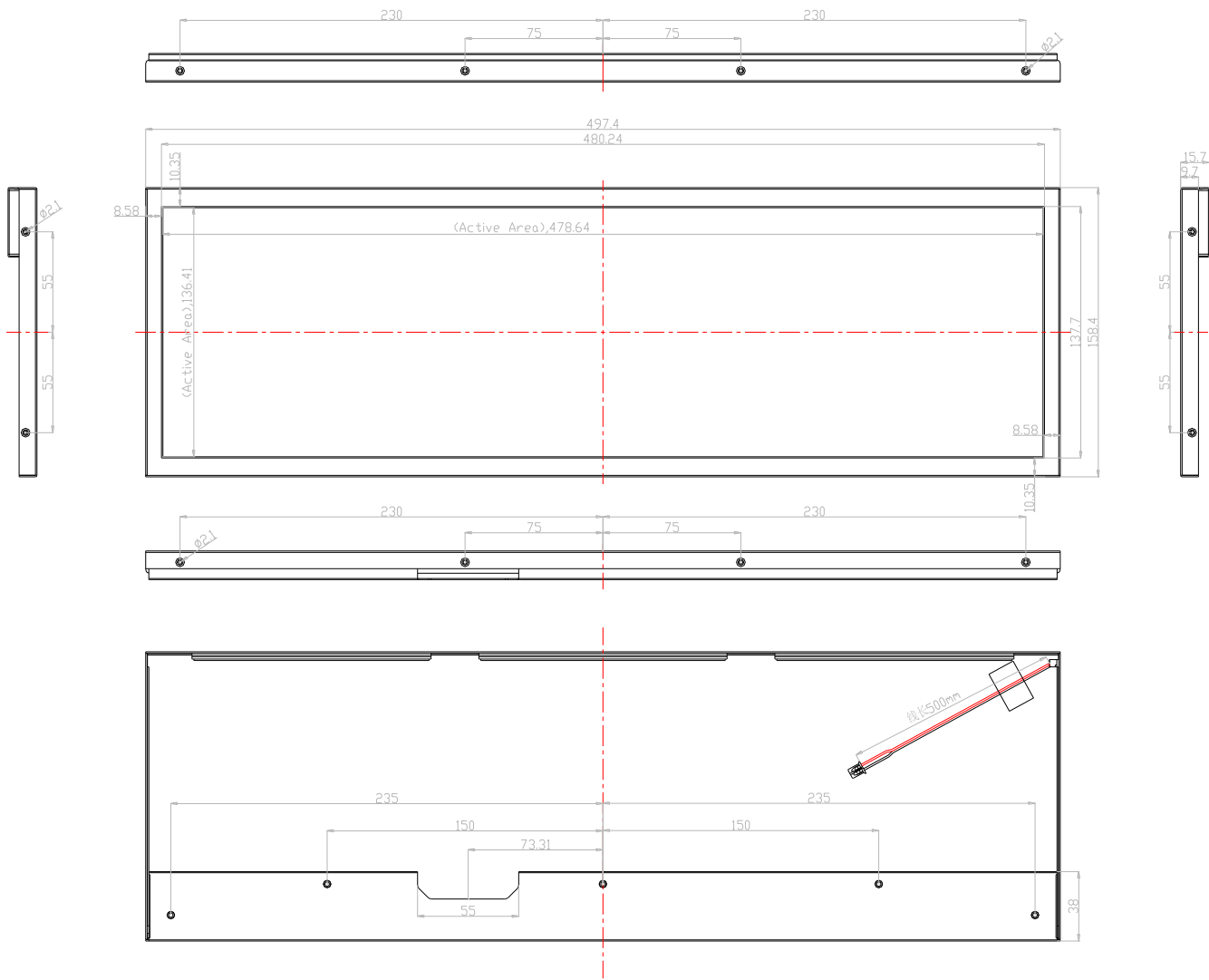
9.2 Safety Precautions

1. The startup voltage of Backlight is approximately 2000 Volts. It may cause electrical shock while assembling with inverter. Do not disassemble the module or insert anything into the Backlight unit.
- 2.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.
- 3.After the modlule's end of life, it is not harmful in case of normal operation and storage.

10.0 OUTLINE DIMENSION

Unit :mm

Standard Tolerance : ± 0.5



11.0 IMPRESSION DRAWING

