Shenzhen Leadtek Electronics Co.,Ltd

PRODUCT SPECIFICATION

TFT-LCD   MODULE

Module No：LTK173FTBBM11-V0

☑ Preliminary Specification

☐ Approval Specification

Designed by	Checked by	Approved by
jona	*Jerry*	*lan*

Final Approval by Customer

Approved by	Comment
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※The specification of "TBD" should refer to the measured value of sample . If there is difference between the design specification and measured value, we naturally shall negotiate and agree to solution with customer.

1.Document Revision History

Version	Contents	Date	Note
V0	Initial version	2023.10.06	

2. General Description

NO	Item	Specification	Unit
1	LCD Size	TFT"17.3	inch
2	Panel Type	IPS	mm
3	Display Resolution	1366 x RGB x 512	pixel
4	Display Mode	Normally Black	-
5	Number of Colors	16.7	-
6	Viewing Direction	ALL	-
7	LCM Module size	435.80(W)×178.60(H)×13.20(T)	mm
8	Panel Active Area	409.80(W)×153.60(H)	mm
9	Pixel Pitch	0.3 (H) x 0.3(V)	mm
10	LCM Driver	-	
11	Light Source	White LED	
12	LCM Interface	LVDS	bit

Note : Please refer to the mechanical drawing

3. Mechanical Drawing

13

13.20

435.80

409.80

178.60

153.60

409.60

backlight cable
L=800mm

4-M3

90
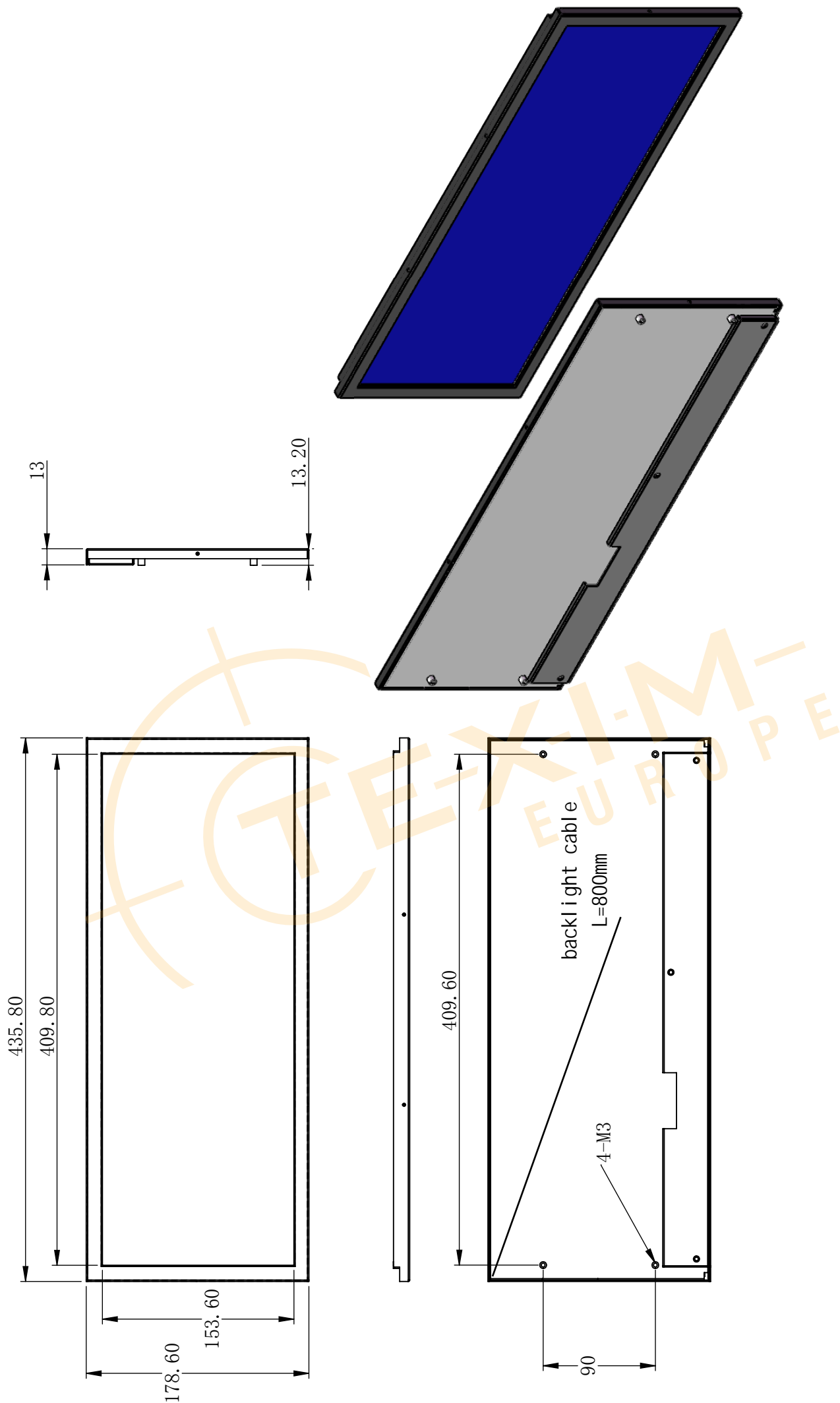
4.0 Interface Connection

4.4.1 Connector Type

4.4.2 Connector Pin Assignment

Pin No	Symbol	Function	Remark
1	NC	No connection	
2	CE	No connection	internal use
3	CTL	No connection	internal use
4	GND	GND Ground	
5	RX0-	Negative LVDS differential data input. Channel 0	
6	RX0+	Positive LVDS differential data input. Channel 0	
7	GND	Ground	
8	RX1-	Negative LVDS differential data input. Channel 1	
9	RX1+	Positive LVDS differential data input. Channel 1	
10	GND	Ground	
11	RX2-	Negative LVDS differential data input. Channel 2	
12	RX2+	Positive LVDS differential data input. Channel 2	
13	GND	Ground	
14	RXCLK-	Negative LVDS differential clock input.	
15	RXCLK+	Positive LVDS differential clock input.	
16	GND	Ground	
17	RX3-	Negative LVDS differential data input. Channel 3	
18	RX3+	Positive LVDS differential data input. Channel 3	
19	GND	Ground	
20	NC	Not connection, this pin should be open.	
21	NC	Not connection, this pin should be open.	
22	NC	Not connection, this pin should be open.	
23	GND	Ground	
24	GND	Ground	
25	GND	Ground	
26	VCC	5V Power supply	
27	VCC		
28	VCC		
29	VCC		
30	VCC		

5.0 Electrical Characteristics

5.1.1 Absolute Maximum Rating

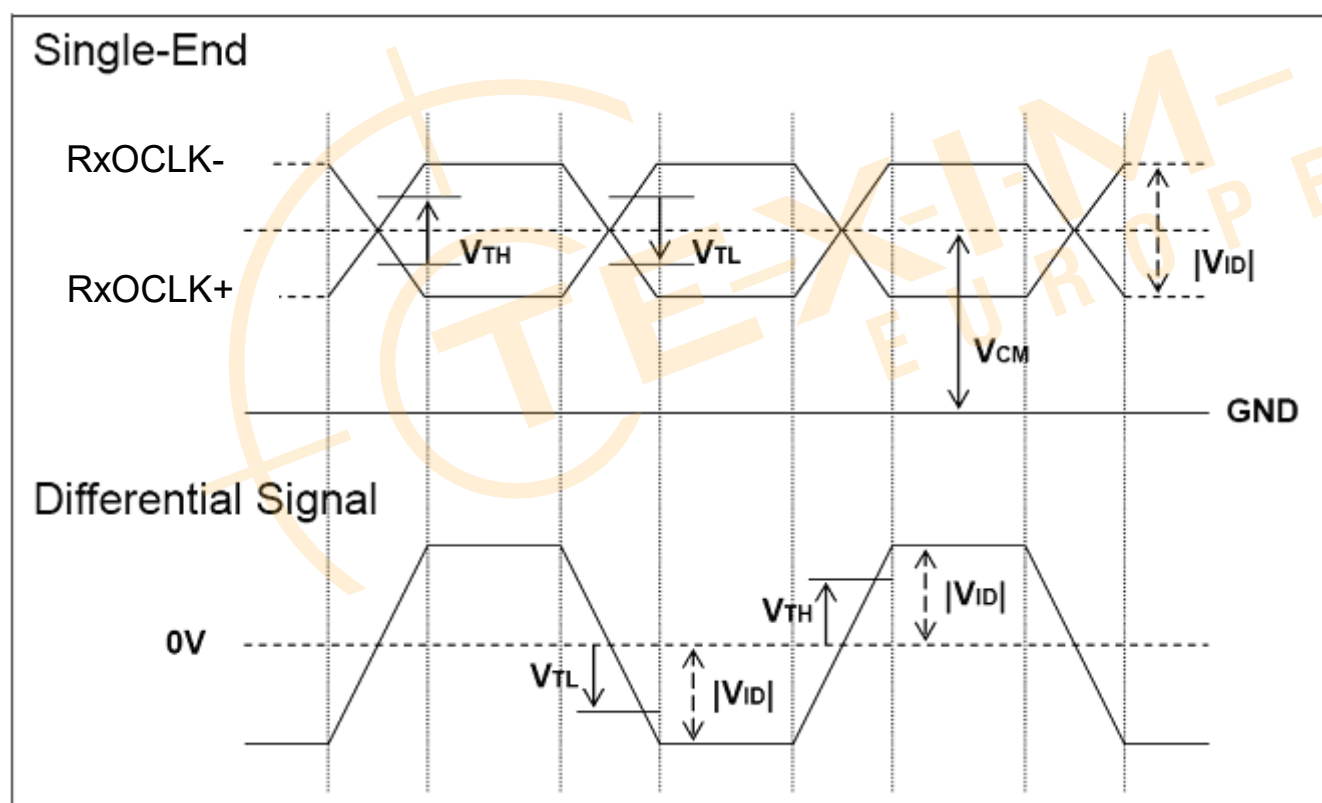Permanent damage may occur if exceeding the following maximum rating.

Symbol	Description	Min	Max	Unit	Remark
VDD	Power Supply Input Voltage	GND-0.3	5.0	[Volt]	Ta=25

5.1.2 Recommended Operating Condition

Symbol	Description	Min	Typ	Max	Unit	Remark
VDD	Power supply Input voltage	4.5	5.0	5.0	[Volt]	
IDD	Power supply Input Current (RMS)	-	0.6	0.72	[A]	VDD= 5.0V, Black Pattern, Fv=60Hz
			0.72	0.87	[A]	VDD= 5.0V, Black Pattern, Fv=75Hz
PDD	VDD Power Consumption	-	3	3.6	[Watt]	VDD= 5.0V, Black Pattern, Fv=60Hz
			3.6	4.32	[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

5.1.3 Electrical Characteristics
5.1.3.1 Absolute Maximum Rating
Permanent damage may occur if exceeding the following maximum rating.

Parameter		Min.	Typ.	Max.	Unit	Remarks
Power supply voltage for Back light	V_{LED}	-	45	50	V	
Power supply Current for Back light	I_{LED}	-	360	-	mA	
Power supply for Back light	P_{LED}	-	16.2	-	W	Note 1
LED Life Time	T_{LED}	30000			Hrs	Note 2,3

5.1.4 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.

6.0 Absolute Maximum Rating of Environment

Permanent damage may occur if exceeding the following maximum rating.

Symbol	Description	Min.	Max.	Unit	Remark
TOP	Operating Temperature	0	+50	[^{o}C]	*Note 2-1*
TGS	Glass surface temperature (operation)	0	+60	[^{o}C]	*Note 2-1* *Function judged only*
HOP	Operation Humidity	5	90	[%RH]	*Note 2-1*
TST	Storage Temperature	-20	+60	[^{o}C]	
HST	Storage Humidity	5	90	[%RH]	

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

1. 90% RH Max (Ta $\leqq$ 39℃)
2. Max wet-bulb temperature at 39   or less. (Ta $\leqq$ 39℃)
3. No condensation

Operating Range [XXXX]   Storage Range [XXXX] + [\\\\]
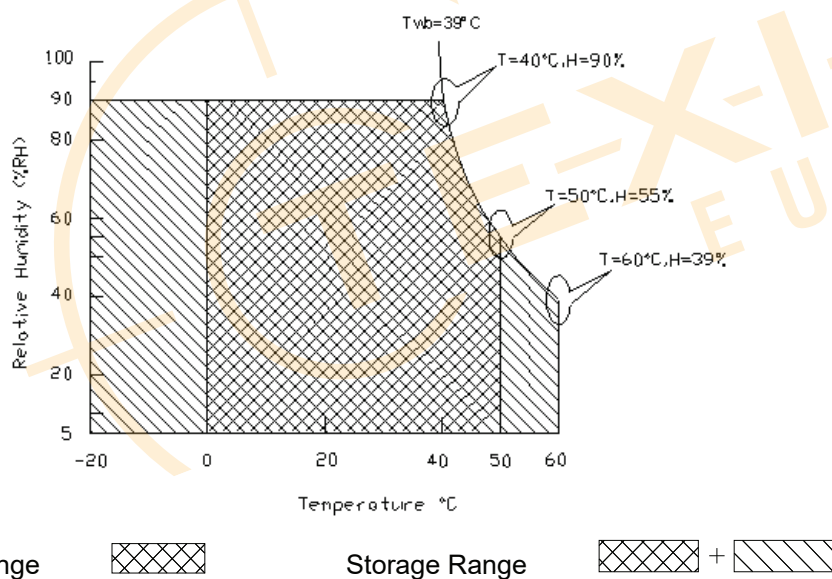
7. Optical Characteristics

The optical characteristics are measured on the following test condition.

Test Condition:

1. Equipment setup: Please refer to *Note 2-2*.
2. Panel Lighting time: 30 minutes
3. VDD=5.0V, Fv=60Hz,Is=60mA,Ta=25

Symbol	Description		Min.	Typ.	Max.	Unit	Remark
L_w	White Luminance (Center of screen)		900	1000	-	[cd/m2]	*Note 2-2* *By SR-3*
L_{uni}	Luminance Uniformity (9 points)		75	80	-	[%]	*Note 2-3* *By SR-3*
CR	Contrast Ratio (Center of screen)		600	1000	-	-	*Note 2-4* *By SR-3*
θ_R	Horizontal Viewing Angle (CR=10)	Right	75	89	-	[degree]	*Note 2-5* *By SR-3*
θ_L		Left	75	89	-		
Φ_H	Vertical Viewing Angle (CR=10)	Up	70	89	-		
Φ_L		Down	70	89	-		
θ_R	Horizontal Viewing Angle (CR=5)	Right	75	89	-		
θ_L		Left	75	89	-		
Φ_H	Vertical Viewing Angle (CR=5)	Up	70	89	-		
Φ_L		Down	70	89	-		
T_R	Response Time	Rising Time	-	3.8	5.5	[msec]	*Note 2-6* *By TRD-100*
T_F		Falling Time	-	1.2	2.5		
-		Rising + Falling	-	5	8		
R_x	Color Coordinates (CIE 1931)	Red x	0.615	0.645	0.675	-	*By SR-3*
R_y		Red y	0.303	0.333	0.363		
G_x		Green x	0.290	0.320	0.350		
G_y		Green y	0.596	0.626	0.656		
B_x		Blue x	0.123	0.153	0.183		
B_y		Blue y	0.027	0.057	0.087		
W_x		White x	0.283	0.313	0.343		
W_y		White y	0.299	0.329	0.359		
CT	Crosstalk		-	-	1.5	[%]	*Note 2-7* *By SR-3*
F_{dB}	Flicker (Center of screen)		-	-	-20	[dB]	*Note 2-8* *By SR-3*

Note 2-2: Equipment setup :

Photo detector (SR-3, TRD-100)

Measured distance (50cm)
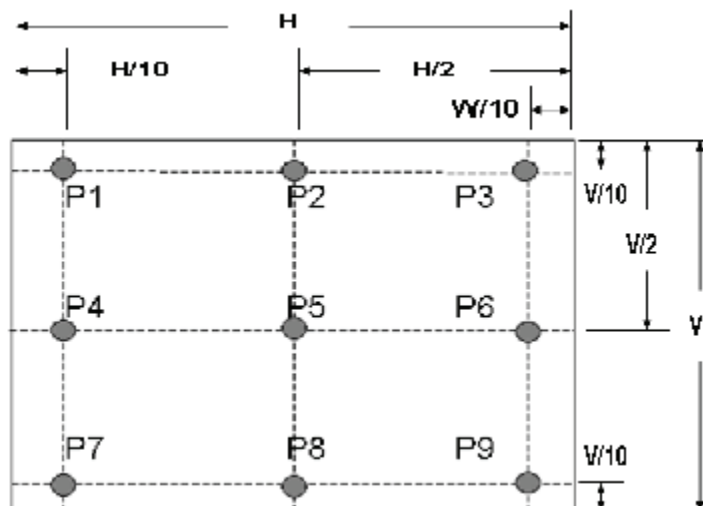
LCD Panel

TFT-LCD Module

Center of the screen
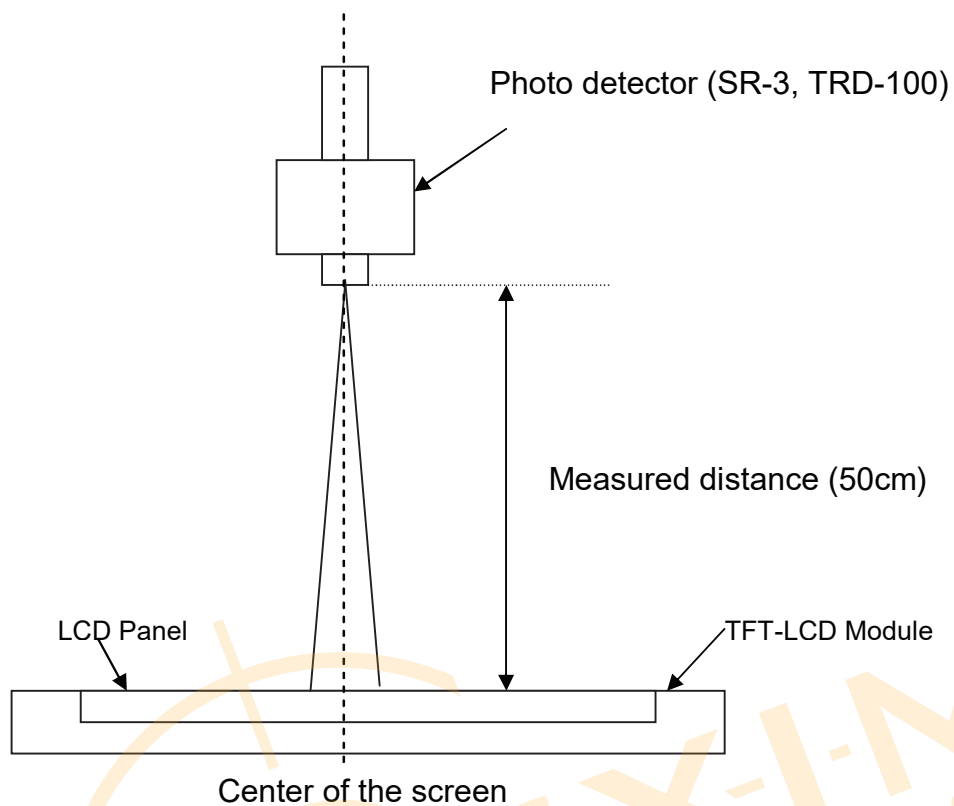
Note 2-3: Luminance Uniformity Measurement

Definition:

$$\text{Luminance Uniformity} = \frac{\text{Minimum Luminance of 9 Points (P1} \sim \text{P9)}}{\text{Maximum Luminance of 9 Points (P1} \sim \text{P9)}}$$

a.Test pattern: White Pattern

Note 2-4: Contrast Ratio Measurement

Definition:

$$\text{Contrast Ratio} = \frac{\text{Luminance of White pattern}}{\text{Luminance of Black pattern}}$$

a. Measured position: Center of screen (P5) & perpendicular to the screen ($\theta = \Phi = 0°$)

Note 2-5: Viewing angle measurement

Definition: The angle at which the contrast ratio is greater than 10 & 5 .

a. Horizontal view angle: Divide to left & right (θ_L & θ_R)
   Vertical view angle: Divide to up & down (Φ_H & Φ_L)
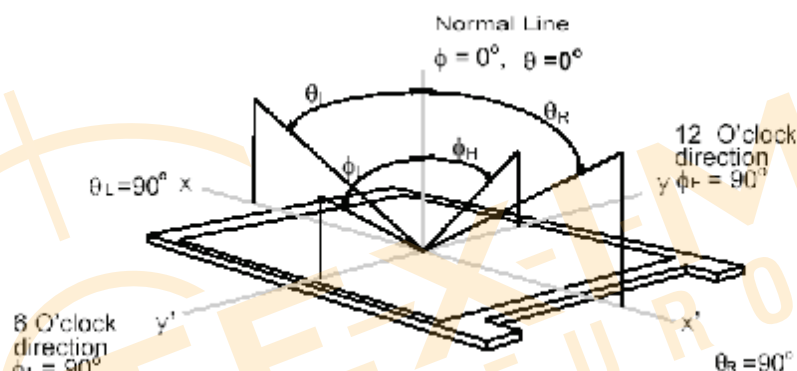
Note 2-6: Response time measurement

The output signals of photo detector are measured when the input signals are changed from "Black" to "White" (rising time, T_R), and from "White" to "Black" (falling time, T_F), respectively. The response time is interval between the 10% and 90% of optical response. (*Black & White color definition: Please refer section 3.4.3*)
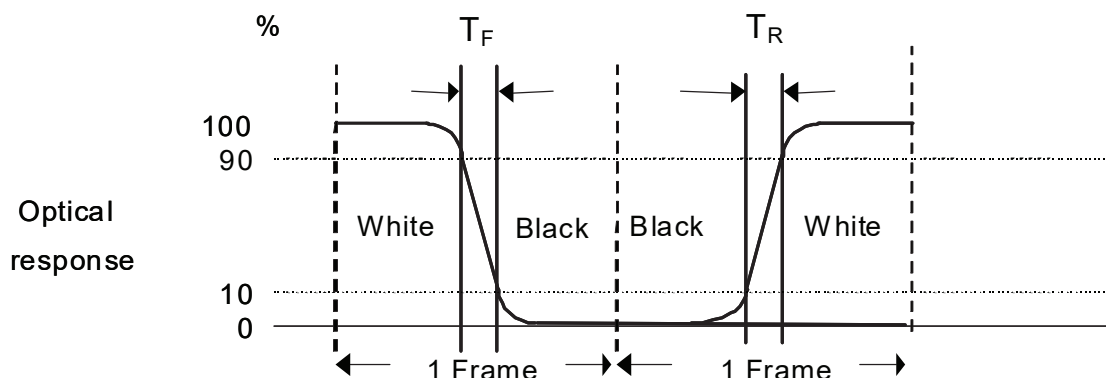
Note 2-7: Crosstalk measurement

Definition:

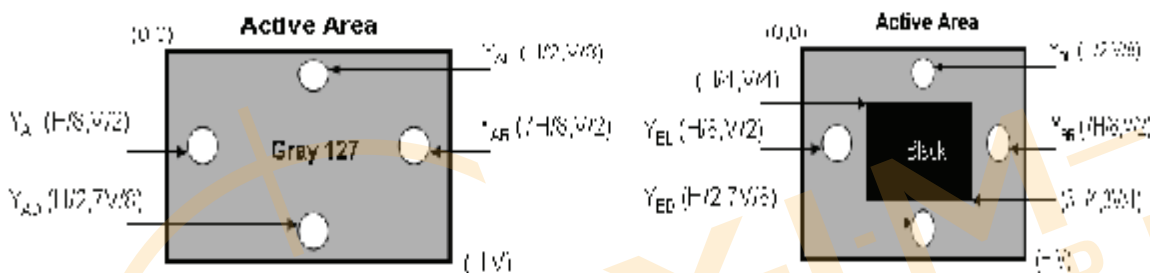$CT = Max. (CT_H, CT_V);$

Where

a. Maximum Horizontal Crosstalk :

$CT_H = Max. (| Y_{BL} - Y_{AL} | / Y_{AL} \times 100 \%, | Y_{BR} - Y_{AR} | / Y_{AR} \times 100 \%);$

Maximum Vertical Crosstalk:

$CT_V = Max. (| Y_{BU} - Y_{AU} | / Y_{AU} \times 100 \%, | Y_{BD} - Y_{AD} | / Y_{AD} \times 100 \%);$

b. $Y_{AU}, Y_{AD}, Y_{AL}, Y_{AR}$ = Luminance of measured location without Black pattern

$Y_{BU}, Y_{BD}, Y_{BL}, Y_{BR}$ = Luminance of measured location with Black pattern

Note 2-8: Flicker measurement

a. Test pattern: It is listed as following.

Gray level = L0

Gray level = L127

R: Red, G: Green, B:Blue

b. Measured position: Center of screen (P5) & perpendicular to the screen (θ=Φ=0°)

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	

< Spread Spectrum>
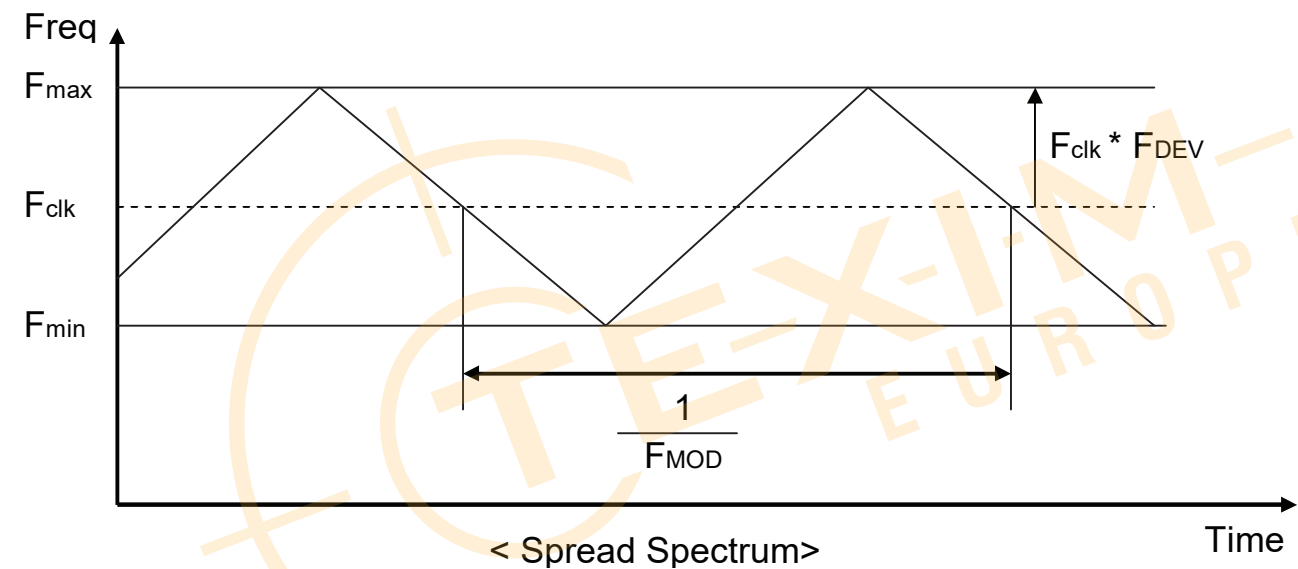
Fclk: LVDS Clock Frequency

3.4.5 Input Timing Specification

It only support DE mode, and the input timing are shown as the following table.

Symbol	Description		Min.	Typ.	Max.	Unit	Remark
Tv	Vertical Section	Period	1036	1066	1873	Th	
Tdisp (v)		Active	1024	1024	1024	Th	
Tblk (v)		Blanking	12	42	849	Th	
Fv		Frequency	50	60	76	Hz	
Th	Horizontal Section	Period	730	844	1320	Tclk	
Tdisp (h)		Active	640	640	640	Tclk	
Tblk (h)		Blanking	90	204	680	Tclk	
Fh		Frequency	51.8	64	93.7	KHz	*Note 3-3*
Tclk	LVDS Clock	Period	14.6	18.5	26	ns	1/Fclk
Fclk		Frequency	37.8	54	68.4	MHz	*Note 3-4*

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

Fh (Min.) = Fclk (Min.) / Th (Min.);
Fh (Typ.) = Fclk (Typ.) / Th (Typ.);
Fh (Max.)= Fclk (Max.) / Th (Min.);

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

Fclk (Min.) = Fv (Min.) x Th (Min.) x Tv (Min.);
Fclk (Typ.) = Fv (Typ.) x Th (Typ.) x Tv (Typ.);
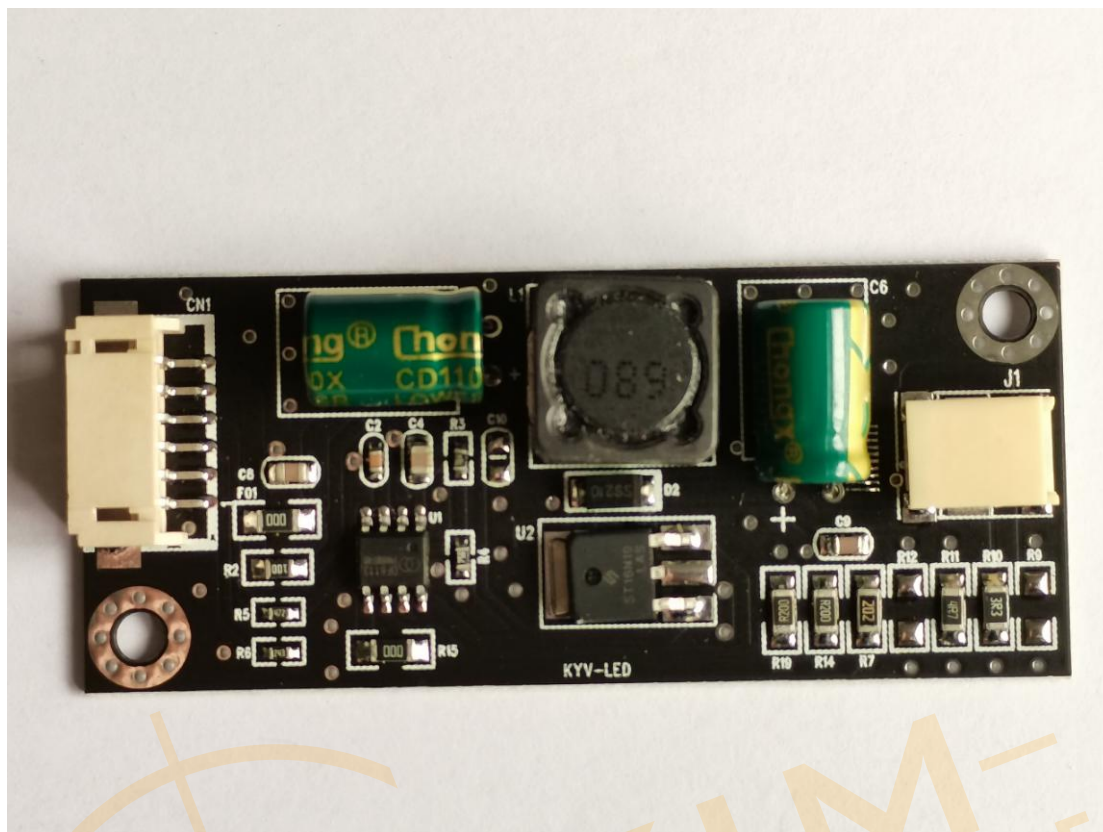Fclk (Max.) = Fv (Max.) x Th (Typ.) x Tv (Typ.);

8.0 Constant flow plate

8.1. "to32(LED backlight)display/ 10.2" to 42
"(LED backlight)display

9.0 Screen print of the

exterior
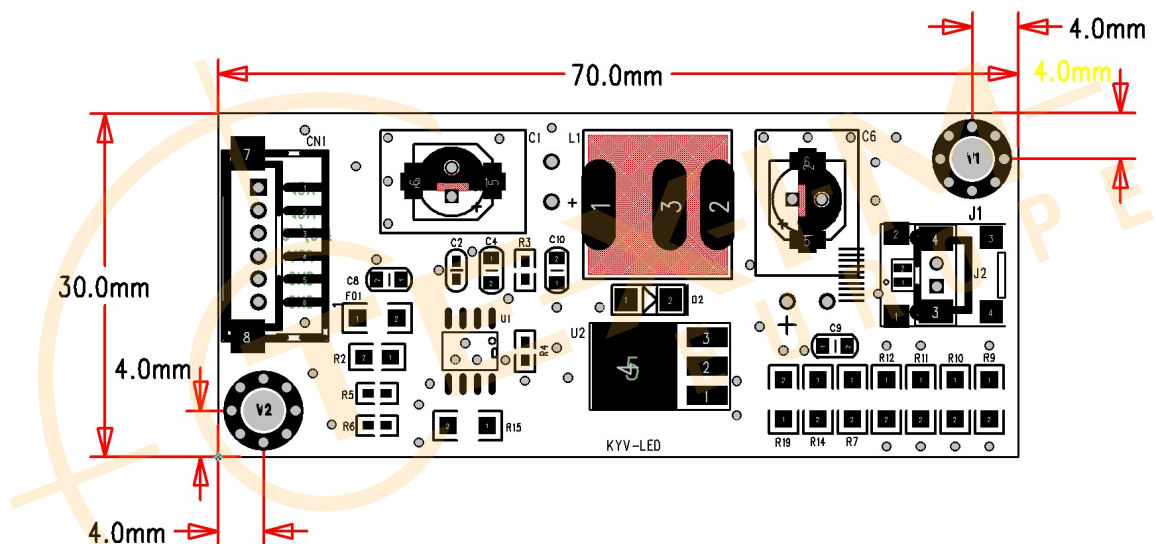
Length: 70mm Width: 30mm Height: 10mm (component
height +PCB board thickness)

9.1 Appearance picture

10. Interface definition

CN1 Input interface

Pin sequence number	Definition	Description
1	VCC	Power 12V
2	VCC	Power 12V
3	EN	**Backlight control switch**
4	DIM	Backlight brightness adjustment 0-5V
5	GND	Power ground
6	GND	Power ground

11. Reliability Test

reliability test items are listed as following table. (*Bare Panel only*)

Items	Condition	Remark
Temperature Humidity Bias (THB)	Ta= 50℃, 80%RH, 300hours	
High Temperature Operation (HTO)	Ta= 50℃, 50%RH, 300hours	
Low Temperature Operation (LTO)	Ta= 0℃, 300hours	
High Temperature Storage (HTS)	Ta= 60℃, 300hours	
Low Temperature Storage (LTS)	Ta= -20℃, 300hours	
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Sweep: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)	
Drop Test	Height: 61 cm, package test	
Thermal Shock Test (TST)	-20℃/30min, 60℃/30min, 100 cycles	*Note 5-1*
On/Off Test	On/10sec, Off/10sec, 30,000 cycles	
ESD (Electro Static Discharge)	Contact Discharge: ± 15KV, 150pF(330Ω) 1sec, 8 points, 25 times/ point.	*Note 5-2*
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 8 points, 25 times/ point.	
Altitude Test	Operation:18,000 ft Non-Operation:40,000 ft	

Note 5-1: a. A cycle of rapid temperature change consists of varying the temperature from -20 ℃ to 60℃, and back again. Power is not applied during the test.

        b. After finish temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 5-2: EN61000-4-2, ESD class B: Certain performance degradation allowed
                    No data lost
                    Self-recoverable
                    No hardware failures.

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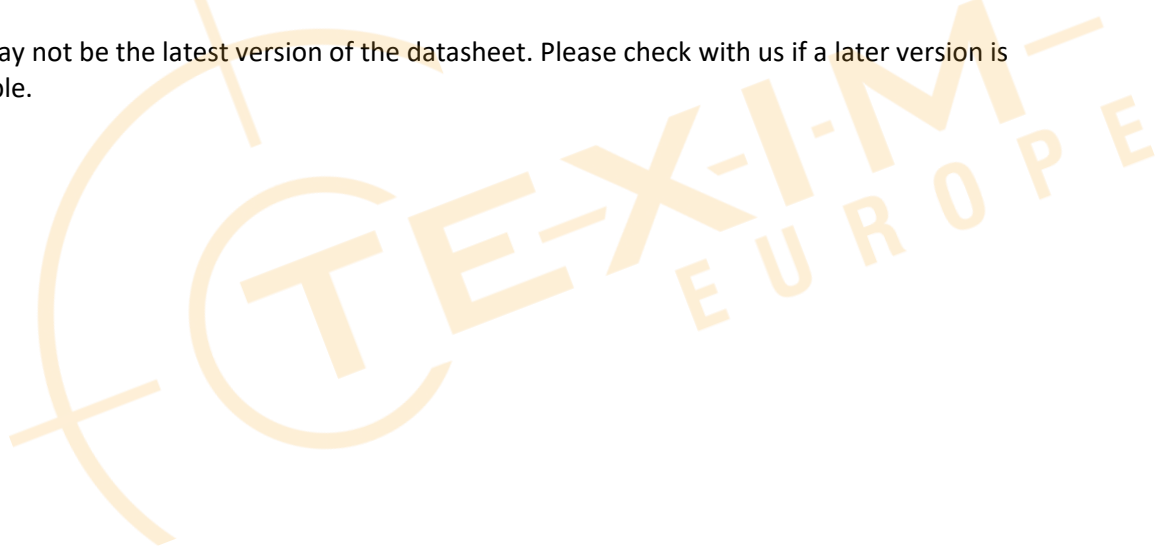
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