



Product Specification

E185HVN-A01

- ☐ Preliminary Specifications
☒ Final Specifications



Module	18.5" High Brightness TFT-LCD
Model Name	E185HVN-A01
Document Version	Rev.01

Customer

Approved by

Date

Notice: This Specification is subject to change without notice.

Approved By	Prepared By
	

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Product Specification

E185HVN-A01

Revised Record				
Version	Date	Revised Content/Summary	Page	Remark
01	2018/03/13	First Edition	All	



Product Specification

E185HVN-A01

1.0 General Description

This specification applies to the 18.5 inch-wide Color AHVA (IPS-like) TFT-LCD Module E185HVN-A01. The display supports the FHD [1920(H) x 1080(V)] screen format and 16.7M colors (True 8 bit). All input signals are LVDS interface compatible.

1.1 Display Characteristics

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

ITEMS	Unit	SPECIFICATIONS
Screen Diagonal	[mm]	469.16(18.47")
Active Area	[mm]	408.96 (H) x 230.04 (V)
Pixels H x V		1920x1080
Pixel Pitch	[um]	213 (per one triad) x 213
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		AHVA mode, Normally black
White Luminance (Center)	[cd/m ²]	1000 cd/m ² (Typ.)
Contrast Ratio		1000 (Typ.)
Optical Response Time	[msec]	20ms
Nominal Input Voltage VDD	[Volt]	5 V (Typ)
Power Consumption (VDD line + LED line)	[Watt]	25.75W
Weight	[Grams]	1200 (Typ)
Physical Size	[mm]	430.4 (W) x 254.6 (H) Typ. x 12.0(D)Typ
Electrical Interface		Dual LVDS
Support Color		16.7M colors, True 8 bit
Surface Treatment		Anti-Glare, 3H
RoHS Compliance		RoHS Compliance
Temperature Range		
Operating	[°C]	-20~ 70
Storage (Shipping)	[°C]	-20~ 70

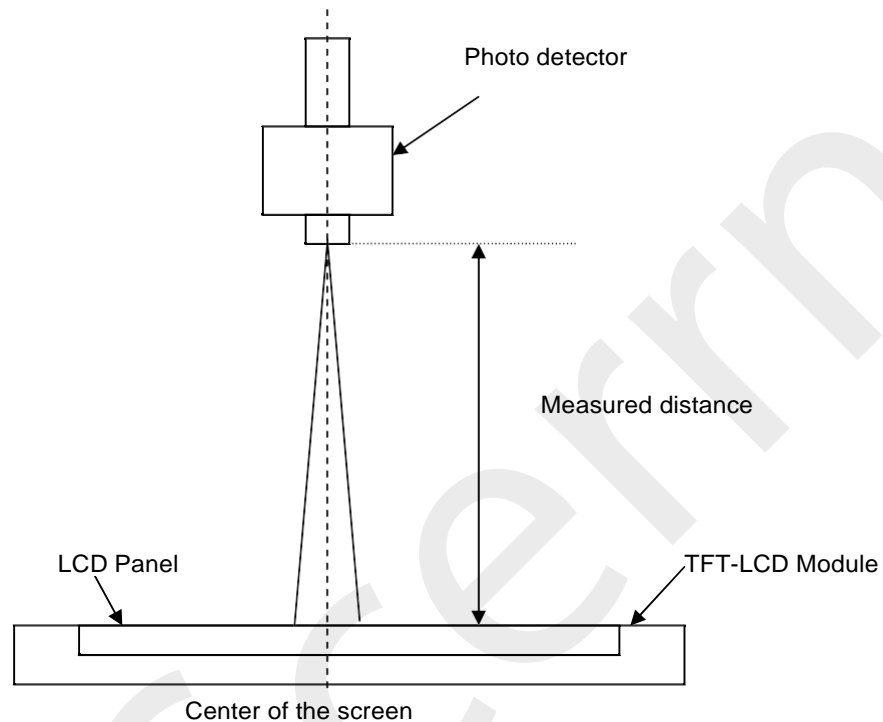
1.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25 °C:

Item	Unit	Conditions	Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR >10 (Left)		89 89	- -	2
		Vertical (Up) CR > 10 (Down)		89 89	- -	
Contrast ratio		Normal Direction	800	1000	-	3
Response Time	[msec]	Raising Time (T _{rR})		10	20	4
		Falling Time (T _{rF})		10	20	
		Raising + Falling		20	40	
Color / Chromaticity Coordinates (CIE)		Red x	0.596	0.646	0.696	5
		Red y	0.283	0.333	0.383	
		Green x	0.255	0.305	0.355	
		Green y	0.565	0.615	0.665	
		Blue x	0.105	0.155	0.205	
		Blue y	0.010	0.060	0.110	
Color Coordinates (CIE) White		White x	0.249	0.299	0.349	5
		White y	0.265	0.315	0.365	
Central Luminance	[cd/m ²]		800	1000		6
Luminance Uniformity	[%]		80	85		7
Color Gamut	%			70		

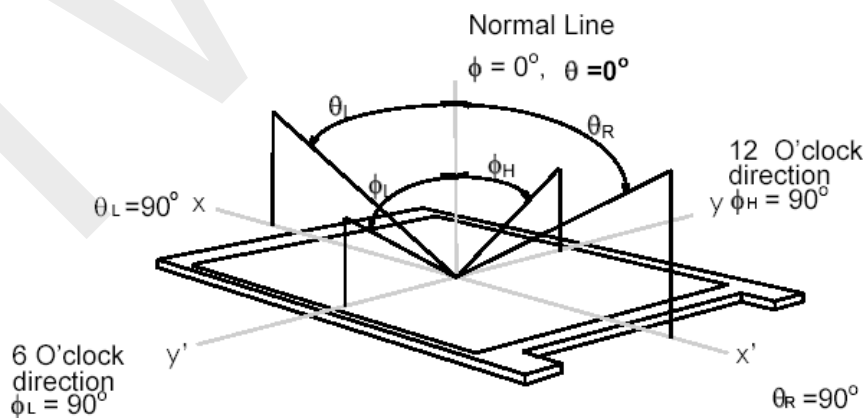
Note 1: Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35°C). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.



Note 2: Definition of viewing angle measured by ELDIM (EZContrast 88)

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 follows; 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 about its center to develop the desired measurement viewing angle.

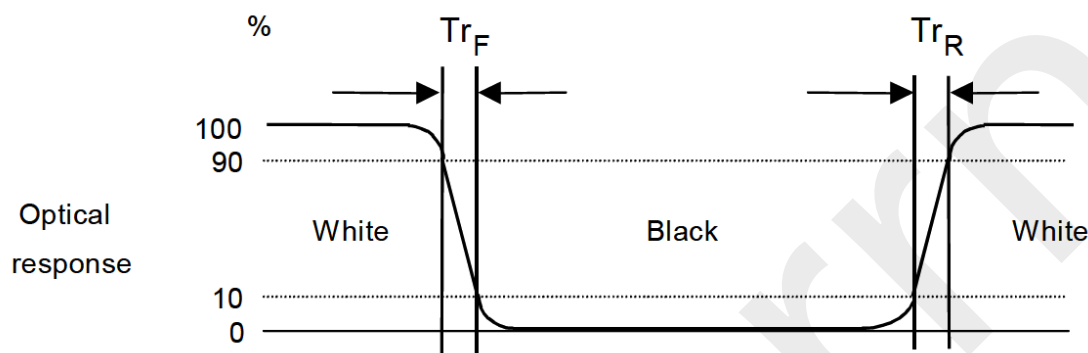


Note 3: Contrast ratio is measured by TOPCON SR-3

Note 4: Definition of Response time measured by Westar TRD-100A

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

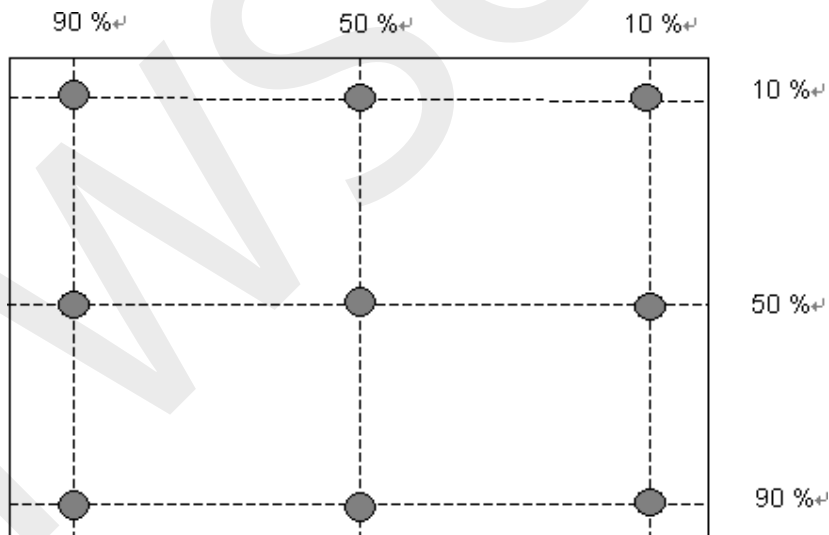
$Tr_R + Tr_F = 5 \text{ msec (typ.)}$.



Note 5: Color chromaticity and coordinates (CIE) is measured by TOPCON SR-3

Note 6: Central luminance is measured by TOPCON SR-3

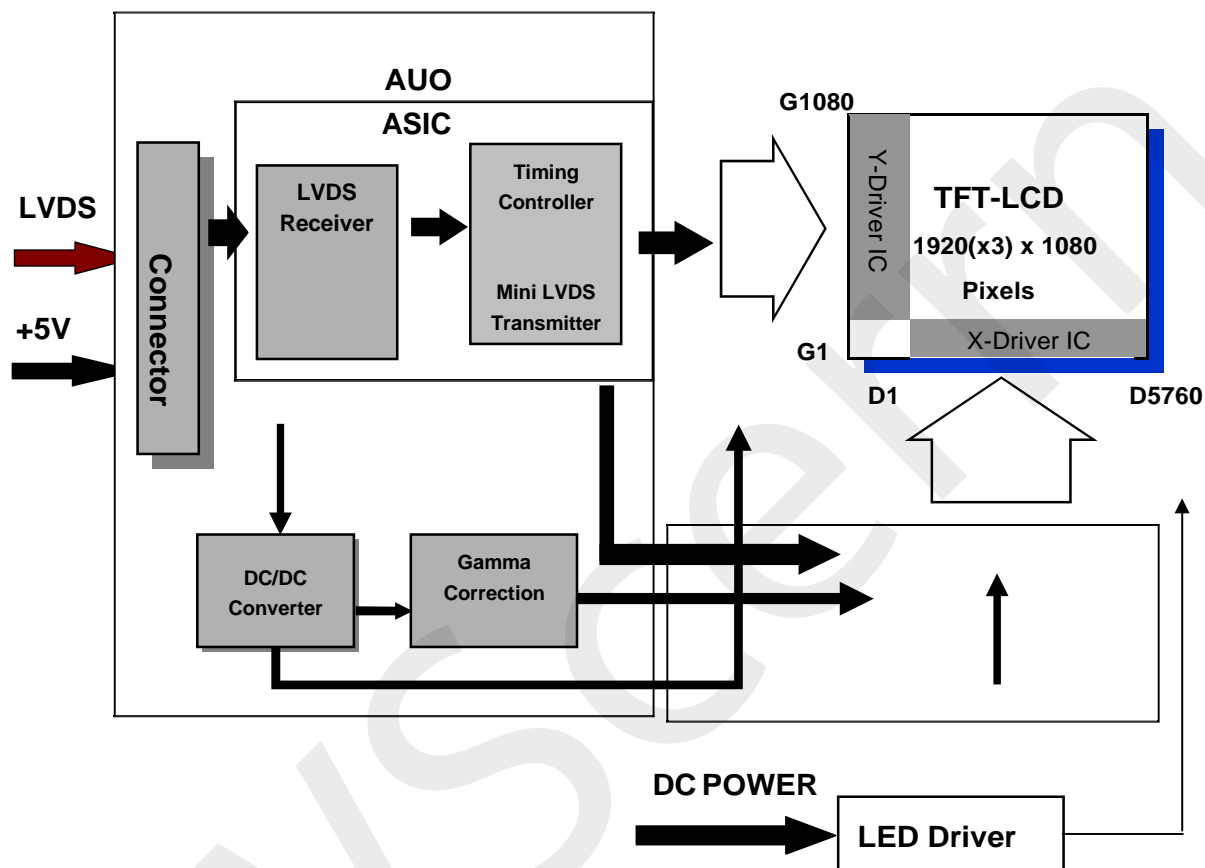
Note 7: Luminance uniformity of these 9 points is defended as below and measured by TOPCON SR-3



$$\text{Uniformity} = \frac{\text{Minimum Luminance in 9 points (1 - 9)}}{\text{Maximum Luminance in 9 Points (1 - 9)}}$$

2.0 Functional Block Diagram

The following diagram shows the functional block of the 18.5 inch Color TFT-LCD Module:



I/F PCB Interface:

FI-XB30SSRLA-HF-16-R3500 (JAE)

Mating Type:

FI-X30HL or FI-X30C2L-NPB

3.0 Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

3.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	-0.3	+5.5	[Volt]	Note 1,2

3.2 Absolute Ratings of Environment

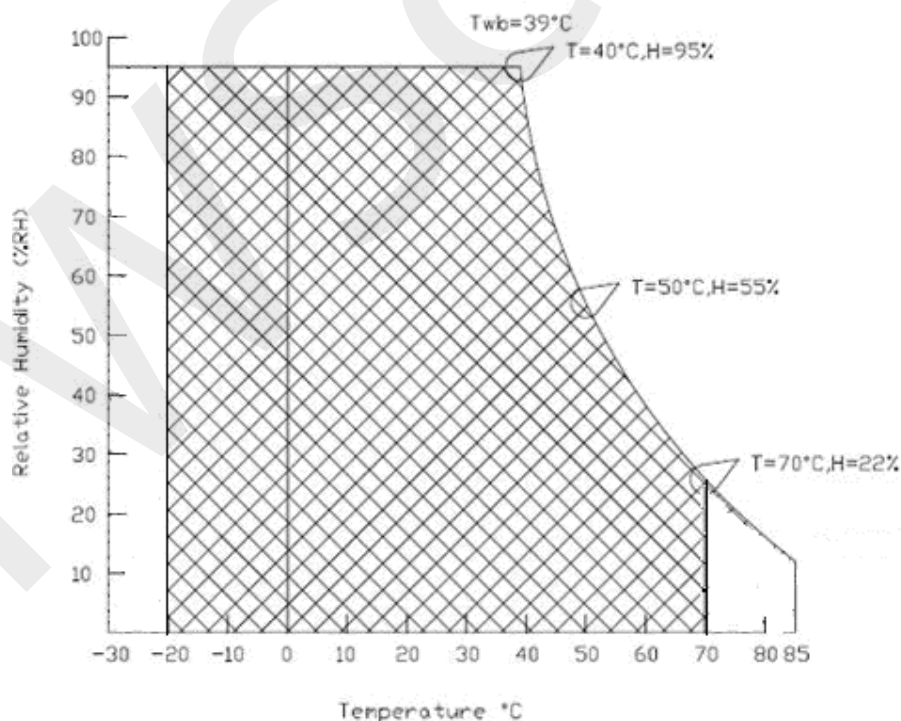
Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	-20	70	[°C]	Note 3 & 4
Operation Humidity	HOP	5	95	[%RH]	
Storage Temperature	TST	-20	70	[°C]	
Storage Humidity	HST	5	95	[%RH]	

Note 1: With in Ta (25 °C)

Note 2: Permanent damage to the device may occur if exceeding maximum values

Note 3: For quality performance, please refer to AUO IIS(Incoming Inspection Standard).

Note 4: Operation Temperature +70°C is defined as panel surface temperature.



4.0 Electrical characteristics

4.1 TFT LCD Module

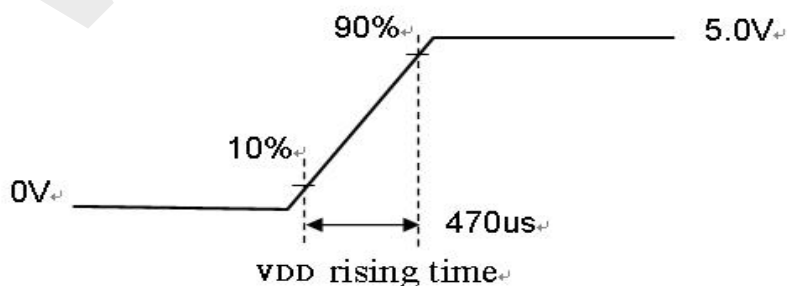
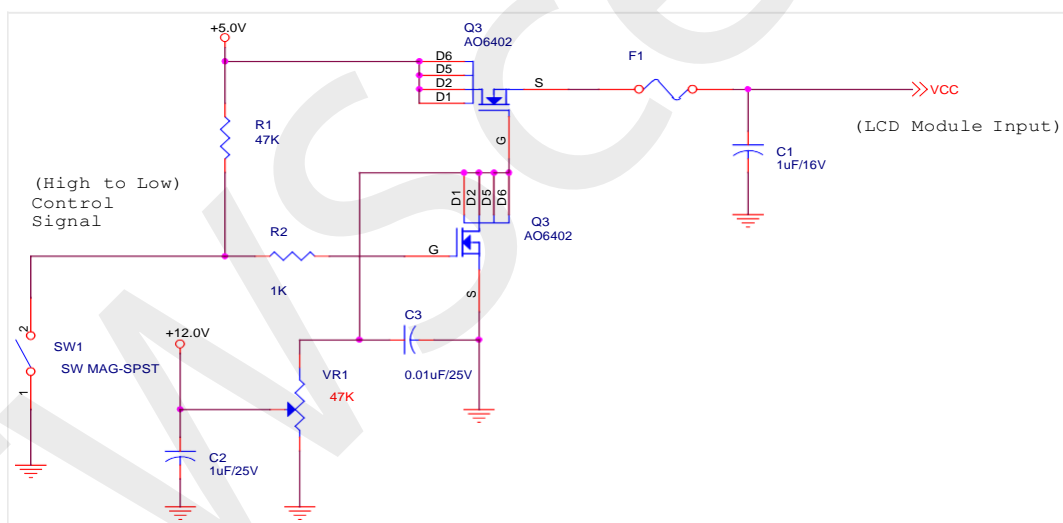
4.1.1 Power Specification

Input power specifications are as follows:

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	+/-10%
IDD	Input Current	-	0.8	1	[A]	VDD= 5.0V, All White Pattern At 60Hz,
PDD	VDD Power	-	4	5.5	[Watt]	VDD= 5.0V, All White Pattern At 60Hz
IRush	Inrush Current	-	2.7	3.4	[A]	Note 1
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	300	[mV] p-p	VDD= 5.0V, All White Pattern At 60Hz

Note 1: Measurement conditions:

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



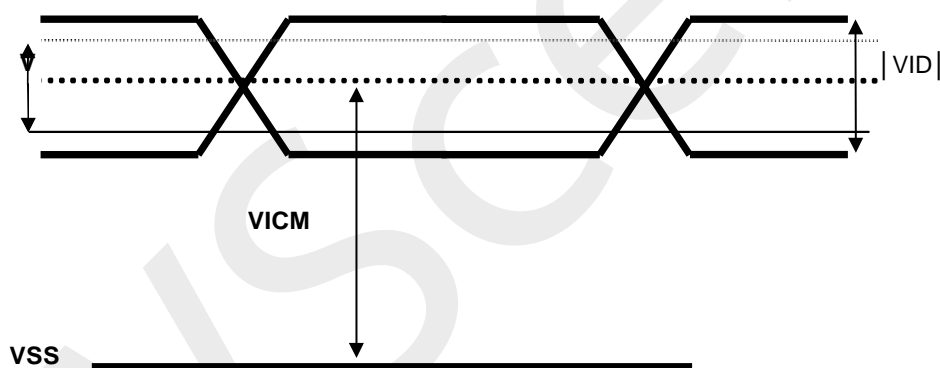
4.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off. Please refer to specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Characteristics of each signal are as follows:

Symbol	Parameter	Min	Typ	Max	Units	Condition
VTH	Differential Input High Threshold	-		100	[mV]	VICM = 1.2V Note 1
VTL	Differential Input Low Threshold	-100		-	[mV]	VICM = 1.2V Note 1
VID	Input Differential Voltage	100	400	600	[mV]	Note 1
VICM	Differential Input Common Mode Voltage	1.125	-	1.375	[V]	VTH-VTL = 200mV (max) Note 1

Note 1: LVDS Signal Waveform



4.2 Backlight Unit

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

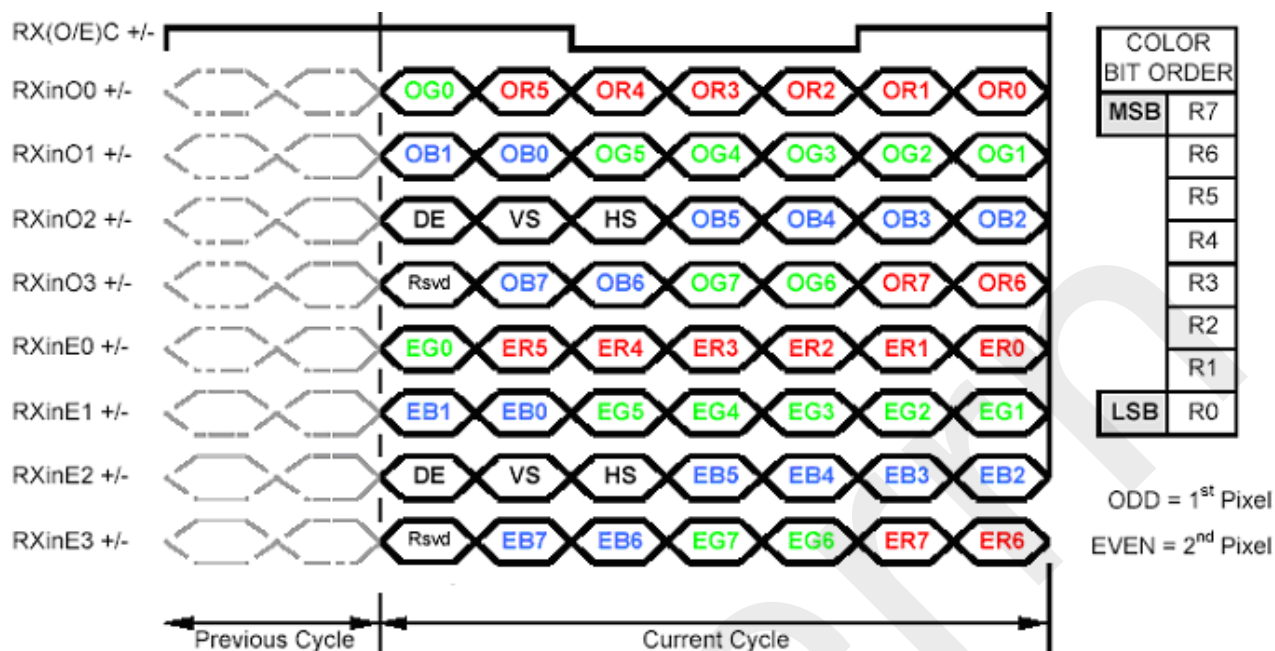
Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
I_L	Current of LED Backlight	-	750	-	[mA]	
V_L	Voltage of LED Backlight		29		[Volt]	
P_{LED}	LED Light Bar Power Consumption	-	21.75	-	[Watt]	
LT_{LED}	LED Life Time	50,000	-	-	Hrs	$I_L=750mA$, $T_a= 25$

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

Note 2: If E185HVN-A01 module is driven by high current or at high ambient temperature & humidity condition.
The operating life will be reduced.

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

5.2 The input data format



Note1: Normally DE mode only. VS and HS on EVEN channel are not used.

Note2: Please follow VESA.

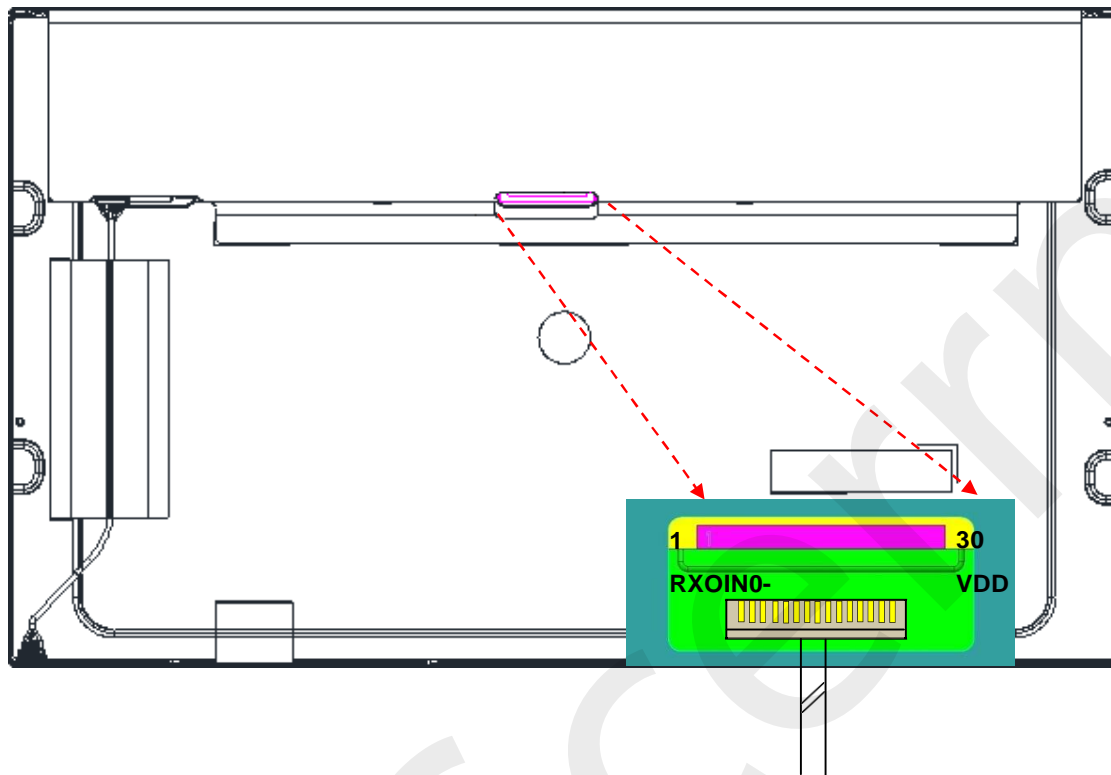
Note3: 8-bits signal input.

5.3 Signal Description

The module using a pair of LVDS receiver **SN75LVDS82 / SN75LVDS83** (Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. Transmitter shall be SN75LVDS83(negative edge sampling) or compatible. The first LVDS port(RxOxxx) transmits odd pixels while the second LVDS port(RxExxx) transmits even pixels.

PIN #	SIGNAL NAME	DESCRIPTION
1	RXOIN0-	Negative LVDS differential data input (Odd data)
2	RXOIN0+	Positive LVDS differential data input (Odd data)
3	RXOIN1-	Negative LVDS differential data input (Odd data)
4	RXOIN1+	Positive LVDS differential data input (Odd data)
5	RXOIN2-	Negative LVDS differential data input (Odd data, H-Sync,V-Sync,DSPTMG)
6	RXOIN2+	Positive LVDS differential data input (Odd data, H-Sync,V-Sync,DSPTMG)
7	GND	Power Ground
8	RXOCLKIN-	Negative LVDS differential clock input (Odd clock)
9	RXOCLKIN+	Positive LVDS differential clock input (Odd clock)
10	RXOIN3-	Negative LVDS differential data input (Odd data)
11	RXOIN3+	Positive LVDS differential data input (Odd data)
12	RXEIN0-	Negative LVDS differential data input (Even data)
13	RXEIN0+	Positive LVDS differential data input (Even data)
14	GND	Power Ground
15	RXEIN1-	Negative LVDS differential data input (Even data)
16	RXEIN1+	Positive LVDS differential data input (Even data)
17	GND	Power Ground
18	RXEIN2-	Negative LVDS differential data input (Even data)
19	RXEIN2+	Positive LVDS differential data input (Even data)
20	RXECLKIN-	Negative LVDS differential clock input (Even clock)
21	RXECLKIN+	Positive LVDS differential clock input (Even clock)
22	RXEIN3-	Negative LVDS differential data input (Even data)
23	RXEIN3+	Positive LVDS differential data input (Even data)
24	GND	Power GND
25	NC	NC
26	NC	NC
27	NC	NC
28	VDD	+5.0V Power Supply
29	VDD	+5.0V Power Supply
30	VDD	+5.0V Power Supply

Note1: Start from left side



Note2: Input signals of clock shall be the same timing.

Note3: Please follow TV VESA Pin Assignment.

5.4 Timing Characteristics

Signal	Item	Symbol	Min	Typ	Max	Unit
V-section	Period	Tv	1090	1100	1160	Th
	Active	Tdisp(v)	1080	1080	1080	Th
	Blanking	Tbp(v)+Tfp(v)+PWvs	10	20	80	Th
H-section	Period	Th	1000	1088	1120	Tclk
	Active	Tdisp(h)	960	960	960	Tclk
	Blanking	Tbp(h)+Tfp(h)+PWhs	40	128	160	Tclk
Clock	Period	Tclk	11.76	13.89	15.38	ns
	Frequency	Freq.	60	72	87.5	MHz
Frame Rate	Frame Rate	1/Tv	50	60	75	Hz

Note 1: Only DE mode operation.

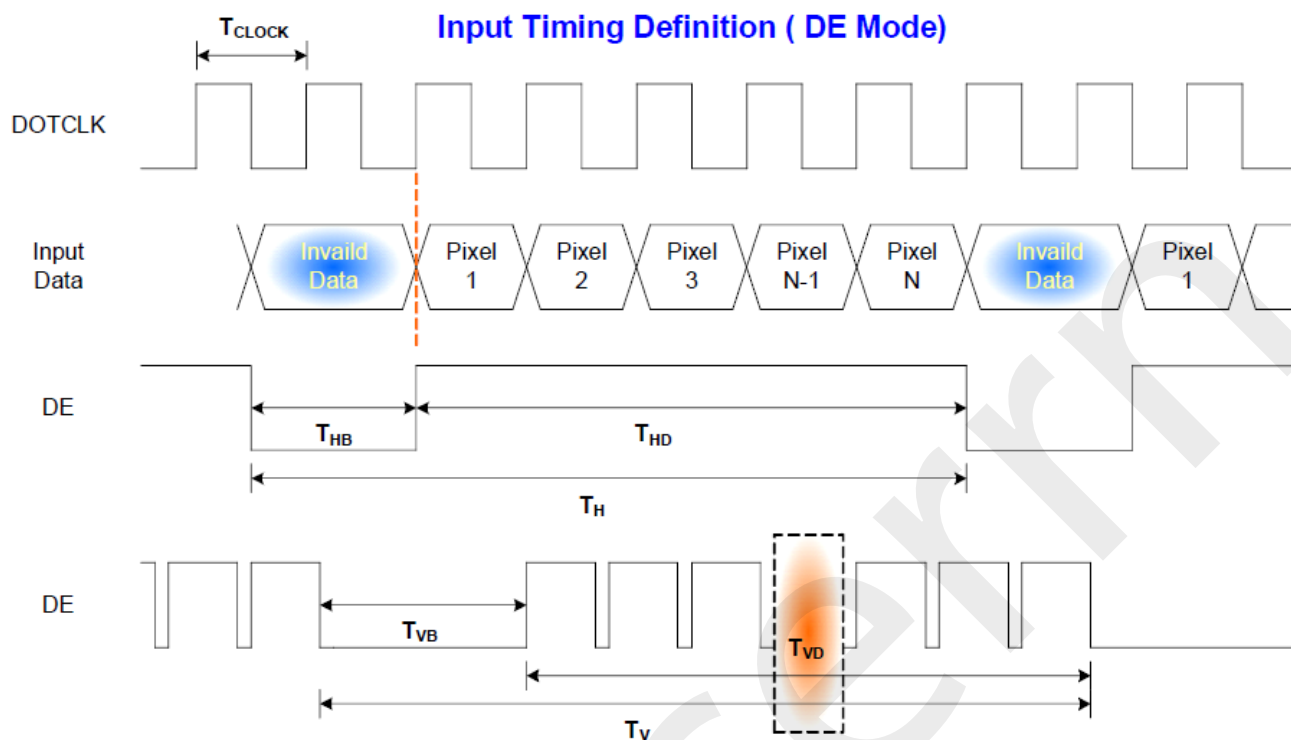
The input of Hsync & Vsync signal does not have an effect upon the LCD normal operation.

Note 2: The performance of the electro-optical characteristics may be influenced by variance of the vertical

refresh rates.

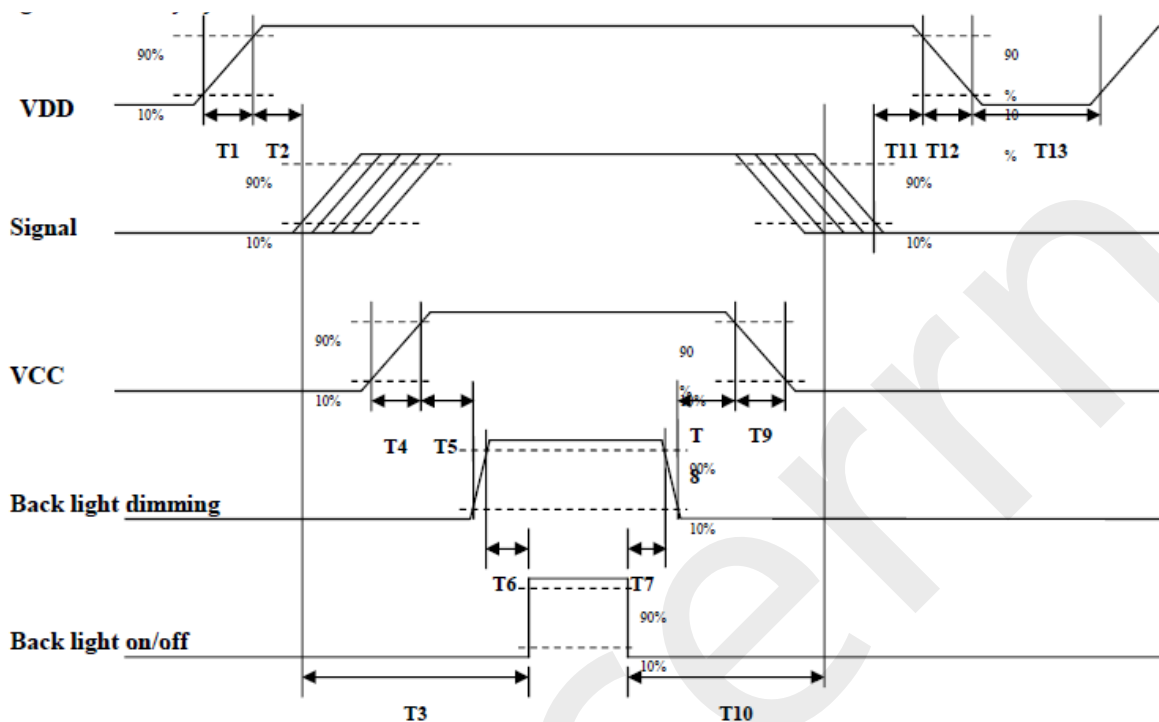
Note 3: Horizontal period should be even.

5.5 Timing diagram



5.6 Power ON/OFF Sequence

VDD power and LED on/off sequence are as follows. 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	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	0.5	16	50	[ms]
T12	-	-	100	[ms]
T13	1000	-	-	[ms]

6.0 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.

6.1 TFT LCD Module

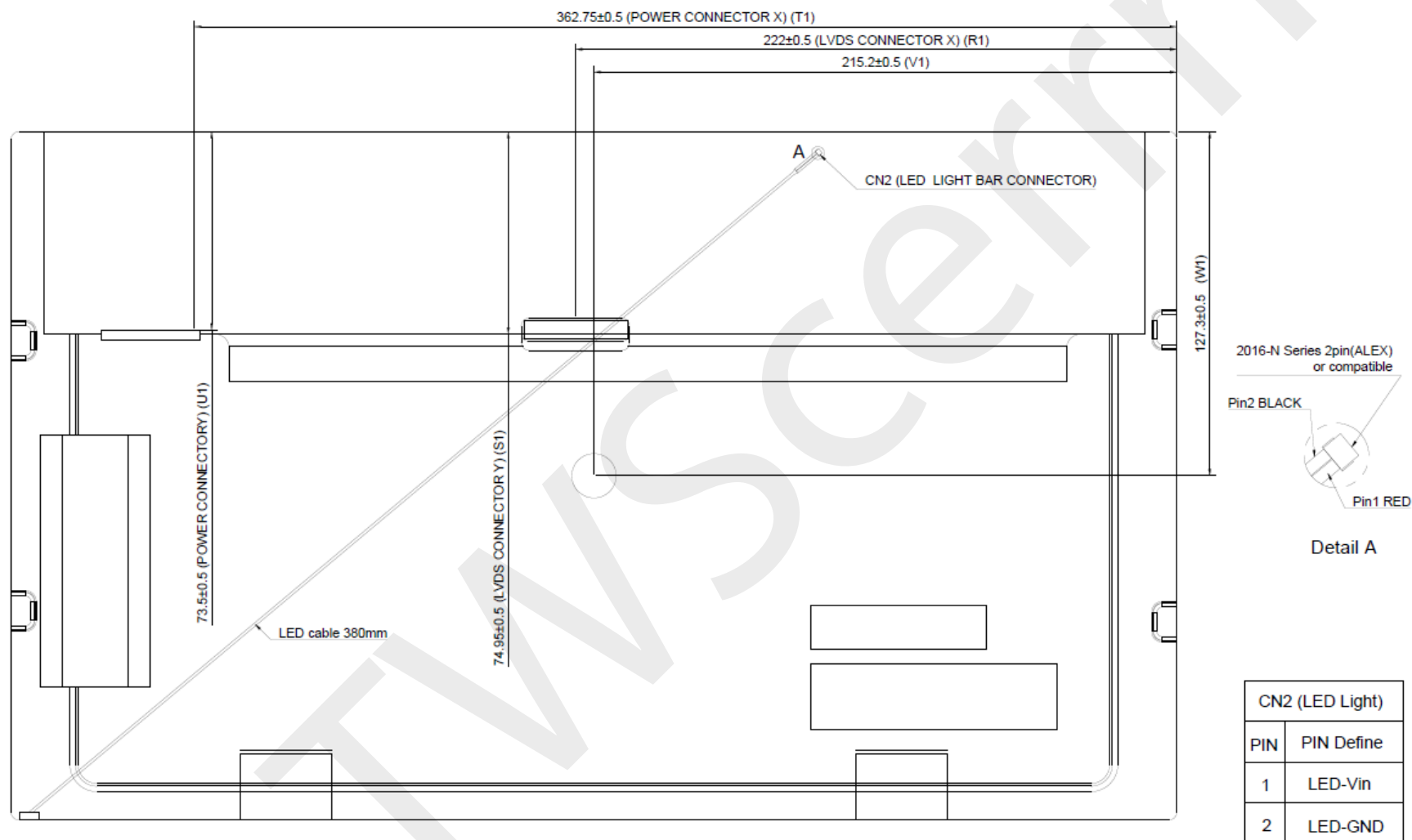
Connector Name / Designation	Interface Connector / Interface card
Manufacturer	JAE
Type Part Number	FI-XB30SSRLA-HF-16-R3500 (JAE)
Mating Housing Part Number	FI-X30HL or FI-X30C2L-NPB

6.1.1 Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	RxOIN0-	2	RxOIN0+
3	RxOIN1-	4	RxOIN1+
5	RxOIN2-	6	RxOIN2+
7	VSS	8	RxOCLKIN-
9	RxOCLKIN+	10	RxOIN3-
11	RxOIN3+	12	RxEIN0-
13	RxEIN0+	14	VSS
15	RxEIN1-	16	RxEIN1+
17	VSS	18	RxEIN2-
19	RxEIN2+	20	RxECLKIN-
21	RxECLKIN+	22	RxEIN3-
23	RxEIN3+	24	VSS
25	NC	26	NC
27	NC	28	VCC
29	VCC	30	VCC

Product Specification

E185HVN-A01





Product Specification

DB-LB0C-06

☐ Preliminary Specifications

☒ Final Specifications



Product	LED Driver Board
Model Name	DB-LB0C-06
Document Version	Rev.01

Customer

Approved by

Date

Notice: This Specification is subject to change without notice.

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Product Specification

DB-LB0C-06

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Product Specification

DB-LB0C-06

Revised Record				
Version	Date	Revised Content/Summary	Page	Remark
01	2018/01/05	First Edition	All	

1. General Description

This Product Specification is made to be the standard of Elite manufactured LED Driving Board such a standard will be followed in Taiwan Screen production, shipment, and quality inspection.



2. Feature

- 30W LED Driver
- Constant-Current Control
- Support PWM Dimming



Product Specification

DB-LB0C-06

3. Protection

Item	Max.	Remark
Over current protection (OCP)	Depending on LED B/L	
Over voltage protection (OVP)	56V(Note1)	

Note : When the LED string is opened, over voltage protection will limit the output to approximately 56V

4. Optional Backlight Driving Condition

Item	Symbol	Min.	TYP.	Max.	Unit	Remark
LED Voltage	V_{LED}		29		V	
LED Current	I_{LED}		750		mA	

5. Absolute maximum ratings

Parameter	Symbol	Min.	TYP	Max.	Unit	Remark
Input Voltage	V_{in}	10.8	12	15	V	
Output Voltage	V_{out}			50	V	
Output Current	I_{out}			1000	mA	

6. Interface Characteristics

Parameter	Symbol	Min.	TYP.	Max.	Unit	Remark
Backlight ON Voltage	INVON	1.25	5	Vin	V	
Backlight OFF Voltage	INVON			0.4	V	
PWM Control	PWM	3.3	5		V	
PWM Control Frequency	PWM	85	100		Hz	
PWM Control Duty	PWM	0		100	%	

7.Environmental

Item	Symbol	Conditions	MIN	MAX	Unit	Remark
Operating Temperature	Top	Ha=90%RH	0	60	°C	
Storage Temperature	Tstg	Ha=95%RH	-20	85	°C	

8. Connector Socket

8.1 Connector Type

Connector (J1)

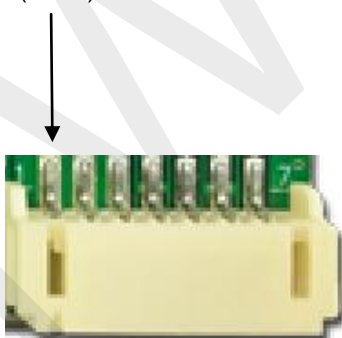
Connector Name / Designation	For Signal Connector
Manufacturer	JST or compatible
Type / Part Number	S7B-PH-SM4-TB or compatible
Mating Housing / Part Number	PHR-7 or compatible

Connector (J2 & J3)

Connector Name / Designation	For Signal Connector
Manufacturer	JST or compatible
Type / Part Number	S2B-PH-SM4-TB or compatible
Mating Housing / Part Number	PHR-2 or compatible

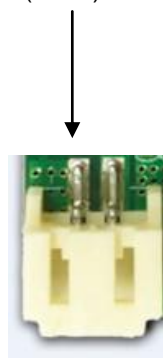
J1 S7B-PH-SM4-TB

(Pin 1)



J2 & J3 S2B-PH-SM4-TB

(Pin 1)





Product Specification

DB-LB0C-06

8.2 Pin Definition

Connector (J1)

PIN No.	Symbol	Description
1	Vin	Power Input (+12V)
2	Vin	Power Input (+12V)
3	Vin	Power Input (+12V)
4	GND	Ground
5	PWM	PWM Brightness Control
6	GND	Ground
7	EN	Backlight on/off Control (5V / 0V)

Connector (J2 & J3)

PIN No.	Symbol	Description
1	V_LED+	LED Power +
2	V_LED-	LED Power -

Weight: MAX. 20g

