ALC-170006-02-1

~ 17” High Brightness TFT LCD

2017/4/24

Preliminary Specifications v.0.0

(√) Preliminary Specifications

( ) Final Specifications

[This specification is subject to change without notice.]

Company Confidential

Customer Name	Customer Approval

CiVUE Optotech Inc.		
Approved by	Checked by	Prepared by
周秉毅	汪慈伶	吳婧瑜

PROPRIETARY NOTICE

RECORD OF REVISION

Version	Date	Page	Original Description	New Description	ECN#
0.0	2017/04/24	All	First draft	All	N/A

TABLE OF CONTENTS

1. General Description

This specification applies to the 17 inch Color TFT-LCD Module ALC-170006-02-1.

The display supports the SXGA (1280(H) x 1024(V)) screen format and 16.7M colors. All input signals are Dual Channel LVDS interface compatible.

1.1 Display Characteristics

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

Items	Unit	Specifications
Screen Diagonal	[mm]	432 (17.0”)
Active Area	[mm]	337.920(H) × 270.336(V)
Pixels H x V		1280 × 3(RGB) × 1024
Pixel Pitch	[mm]	0.264(per one triad) × 0.264
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		Normally White
White Luminance	[cd/m2]	1200 (Typ.)
Contrast Ratio		700 : 1 (Typ.)
Optical Response Time	[msec]	TBD
Nominal Input Voltage VDD	[Volt]	+5.0 (Typ.)
Power Consumption	[Watt]	23.41 (Typ.)
Weight	[Grams]	1600 (Max.)
Physical Size (H x V x D)	[mm]	358.5(H) x 296.5(V) x 12.45(D) (Typ.)
Electrical Interface		Dual Channel LVDS
Surface Treatment		Anti-glare type, Hardness 3H
Support Color		16.7M colors (8-bits)
Temperature Range Operating Storage (Non-Operating)	 [℃] [℃]	 -30 to +85 -30 to +85
RoHS Compliance		RoHS Compliance

1.2 Optical Characteristics

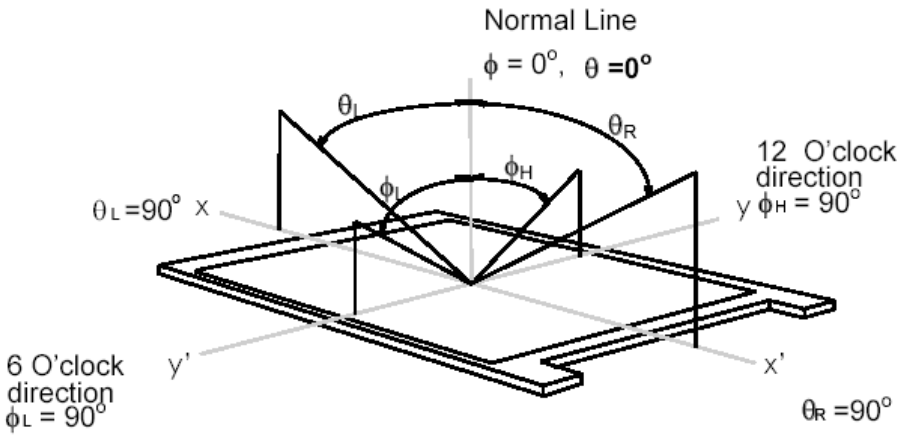
The optical characteristics are measured under stable conditions at 25℃ (Room Temperature):

Item	Unit	Conditions	Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	70 70	80 80	-	**1**
		Vertical (Up) CR = 10 (Down)	50 60	70 70	-	
Luminance Uniformity	[%]	9 Points	75	80	-	**2, 3**
Contrast Ratio			500	700	-	**4**
White Luminance	[cd/m^2]		1000	1200	-	**4**
Optical Response Time	[msec]	Rising	-	TBD	-	**5**
		Falling	-	TBD	-	
		Rising + Falling	-	TBD	-	
Color / Chromaticity Coordinates (CIE 1931)		Red x	TBD	TBD	TBD	
		Red y	TBD	TBD	TBD	
		Green x	TBD	TBD	TBD	
		Green y	TBD	TBD	TBD	
		Blue x	TBD	TBD	TBD	
		Blue y	TBD	TBD	TBD	
		White x	TBD	TBD	TBD	
		White y	TBD	TBD	TBD	
NTSC	[%]			72		

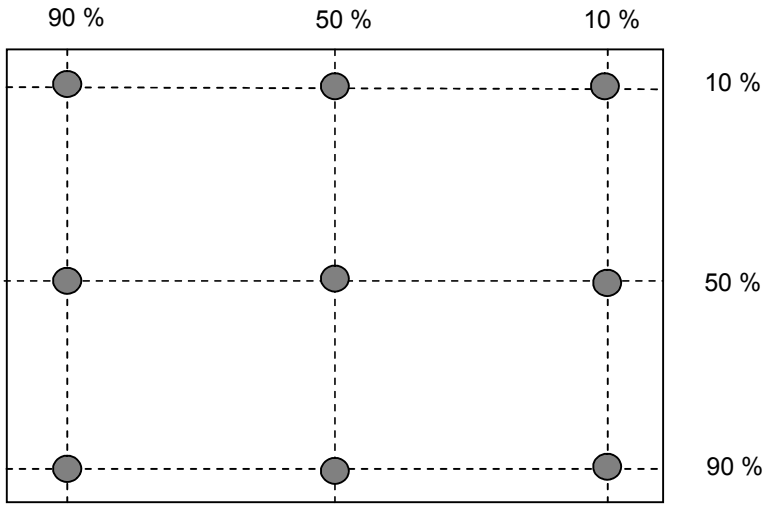
Optical Equipment: BM-5A, BM-7, PR880, or equivalent

Note 1: 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 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 2: 9 points position

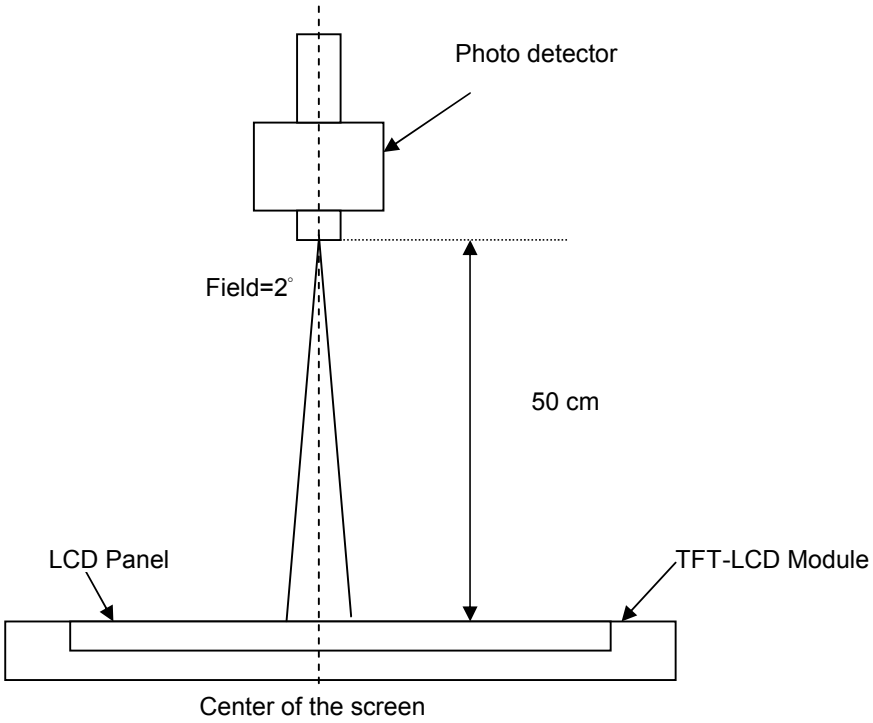


Note 3: The luminance uniformity of 9 points is defined by dividing the maximum luminance values by the minimum test point luminance

$$\delta_{W9} = \frac{\text{Minimum Luminance of 9 points}}{\text{Maximum Luminance of 9 points}}$$

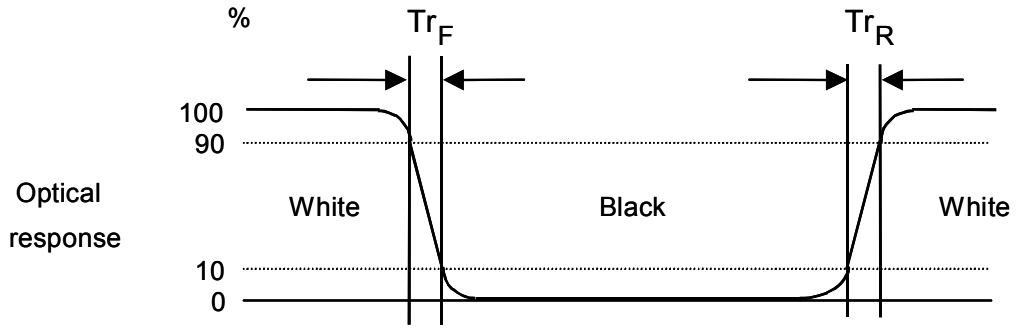
Note 4: Measurement method

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



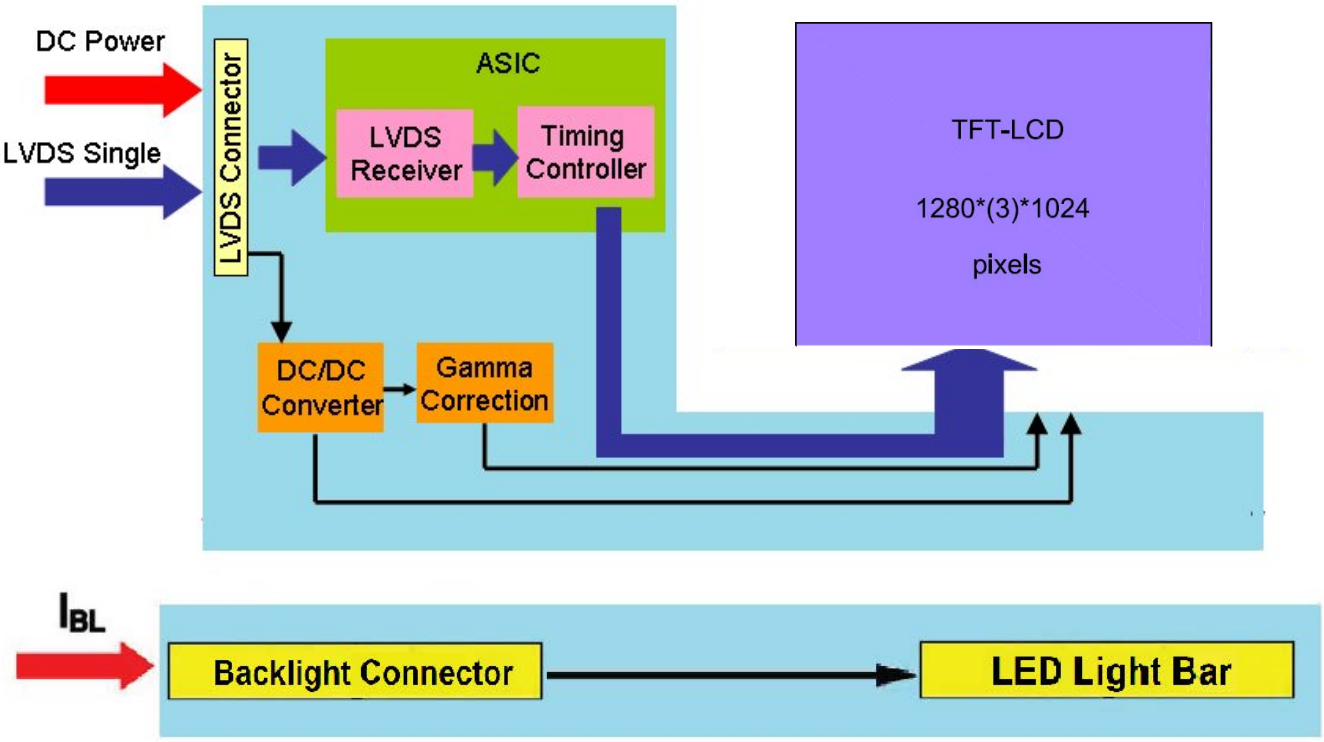
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from “Full Black” to “Full White” (rising time), and from “Full White” to “Full Black” (falling time), respectively. The response time is interval between the 10% and 90% of amplitudes. Please refer to the figure as below.



2. Functional Block Diagram

The following diagram shows the functional block of ALC-170006-02-1:



3. Absolute Maximum Ratings

An absolute maximum ratings of the module is as following:

3.1 TFT LCD

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	-0.3	+6	[Volt]	***Note 1,2***
Signal Voltage	RxOINi-/+, RxEINi-/+	-0.3	4	[Volt]	***Note 1,2, i=0,1,2,3***
Signal Voltage	RxOCLKON-/+ RxECLKIN-/+	-0.3	4	[Volt]	***Note 1,2***

3.2 Backlight Unit

Item	Symbol	Min	Max	Unit	Conditions
Backlight Forward Current	I_{BL}	-	0.50	A	-

3.3 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit	Conditions
Operating Temperature	TOP	-30	+85	[°C]	***Note 3***
Operation Humidity	HOP	8	90	[%RH]	
Storage Temperature	TST	-30	+85	[°C]	
Storage Humidity	HST	8	90	[%RH]	

Note 1: With in Ta (25℃)

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

Note 3: Temperature and relative humidity range are shown as the below

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

4. Electrical Characteristics

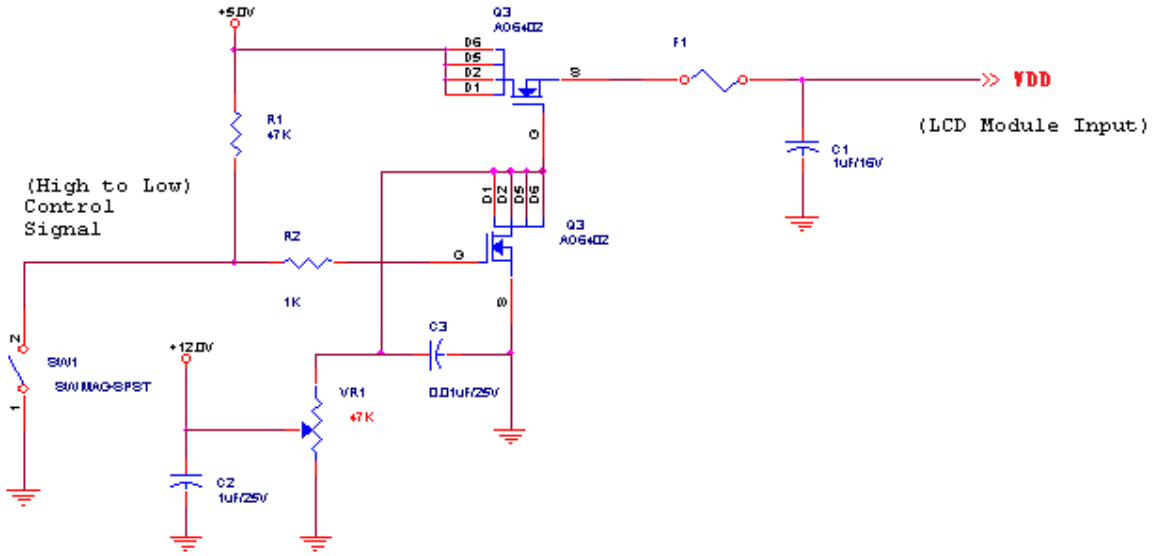
4.1 TFT LCD

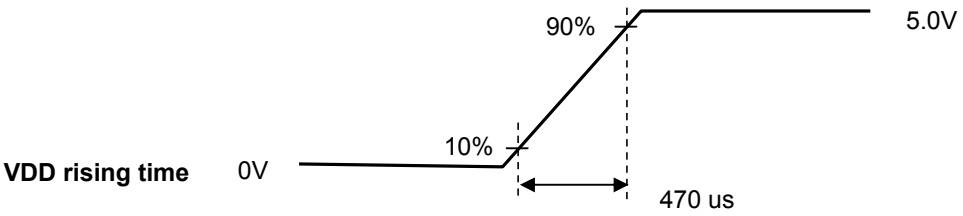
4.1.1 Power Specification

Input power specifications are as follows:

Symble	Parameter	Min.	Typ.	Max.	Unit	Condition
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	±10%
IDD	Input Current	-	1.4	1.68	[A]	VDD=5V , All Black Pattern, at 75Hz
IRush	Inrush Current	-	-	TBD	[A]	Note
PDD	VDD Power	-	7	8.4	[Watt]	VDD=5V , All Black Pattern, at 75Hz
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	200	[mV] p-p	VDD=5V , All Black Pattern, at 75Hz

Note: Measurement conditions:





4.1.2 Signal Electrical Characteristics

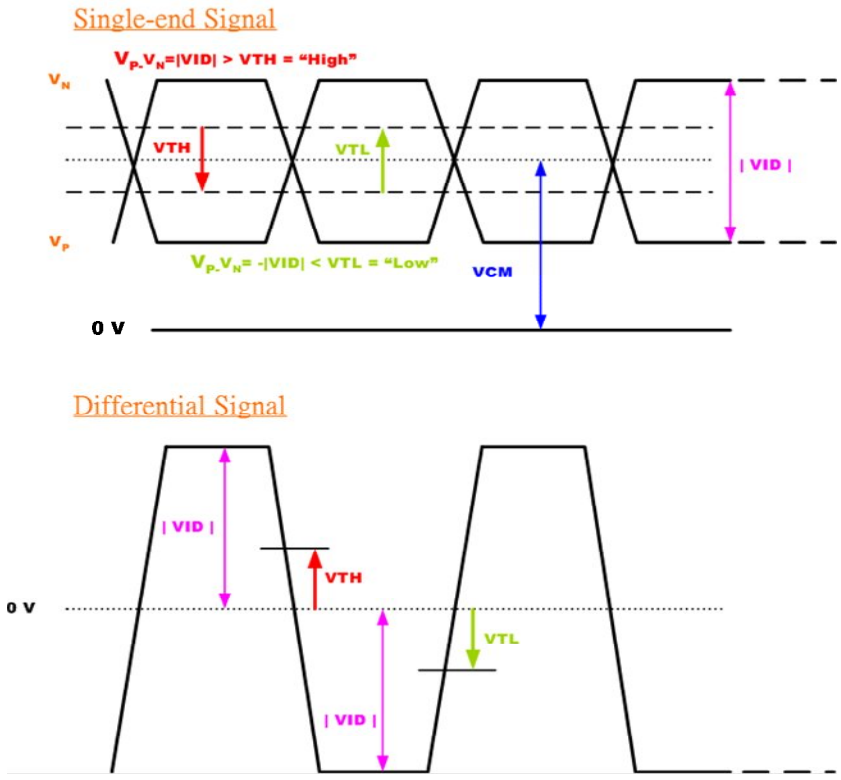
Input signals shall be low or Hi-Z state when VDD is off.

It is recommended to refer the specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Each signal characteristics are as follows;

Symbol	Parameter	Min	Typ	Max	Units	Condition
V_{TH}	Differential Input High Threshold	-	-	+100	[mV]	V_{CM} = 1.2V ***Note***
V_{TL}	Differential Input Low Threshold	-100	-	-	[mV]	V_{CM} = 1.2V ***Note***
$\lvert V_{ID} \rvert$	Input Differential Voltage	100	400	600	[mV]	***Note***
V_{CM}	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	V_{TH}-V_{TL} = 200mV (max) ***Note***

Note: LVDS Signal Waveform



4.2 Backlight Unit

Following characteristics are measured under a stable condition using an inverter at 25℃ (Room Temperature):

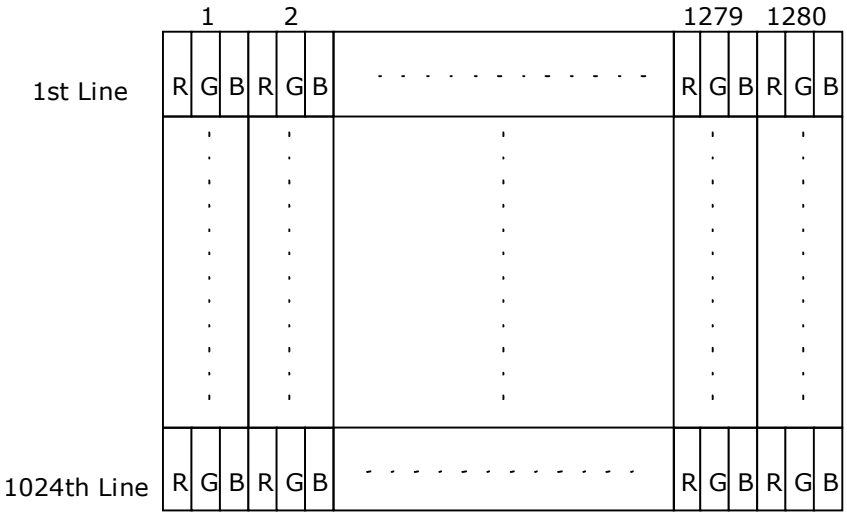
Symbol	Parameter	Min	Typ	Max	Units	Condition
I_{BL}	Backlight Forward Current	-	0.48	0.50	A	-
V_{BL}	Backlight Forward Voltage	-	34.2	41	Volt	-
P_{BL}	Backlight Power Consumption	-	16.41	20.5	Watt	-
L_{BL}	Backlight Life Time	-	70,000	-	Hrs	***Note***

Note: The LED life-time define as the estimated time to 50% degradation of initial luminous.

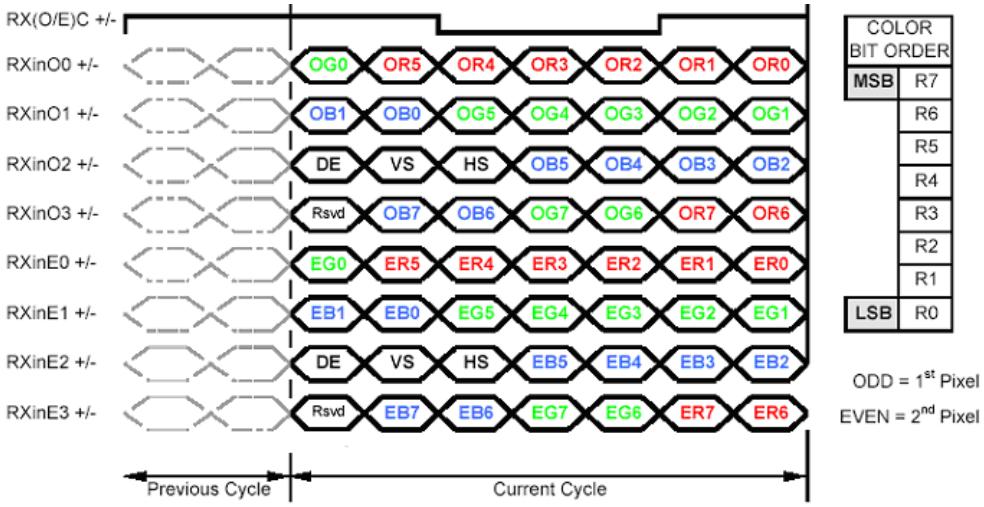
5. Signal Characteristic

5.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



5.2 The Input Data Format



Note1: Normally, DE, VS, HS on EVEN channel are not used.

Note2: Please follow PSWG.

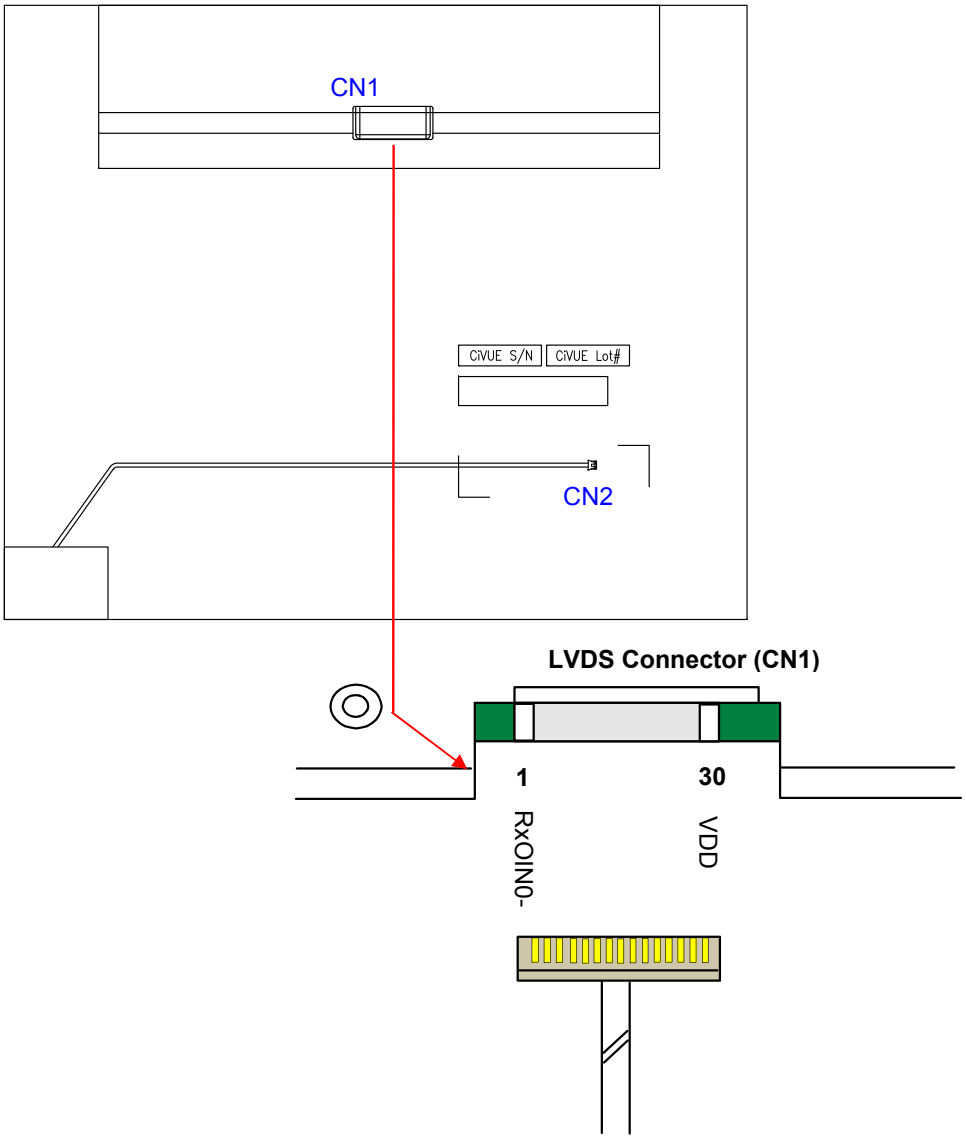
Note3: 8-bit in

5.3 Signal Description

The module is using a pair of LVDS receiver SN75LVDS82DGG (Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. LVDS transmitter shall be SN75LVDS82DGG (negative edge sampling) or compatible. The first LVDS port (RxOxxx) transmits odd pixels while the second LVDS port (RxExxx) transmits even pixels.

LVDS Connector Pin Assignment (CN1)

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 Ground
25	GND (AGMODE)	Power Ground
26	GND	Power Ground
27	GND	Power Ground
28	VDD	+5.0V Power Supply
29	VDD	+5.0V Power Supply
30	VDD	+5.0V Power Supply


CN1
CiVUE S/N
CiVUE Lot#
CN2
LVDS Connector (CN1)
1
30
RxOIN0-
VDD

5.4 Timing Characteristics

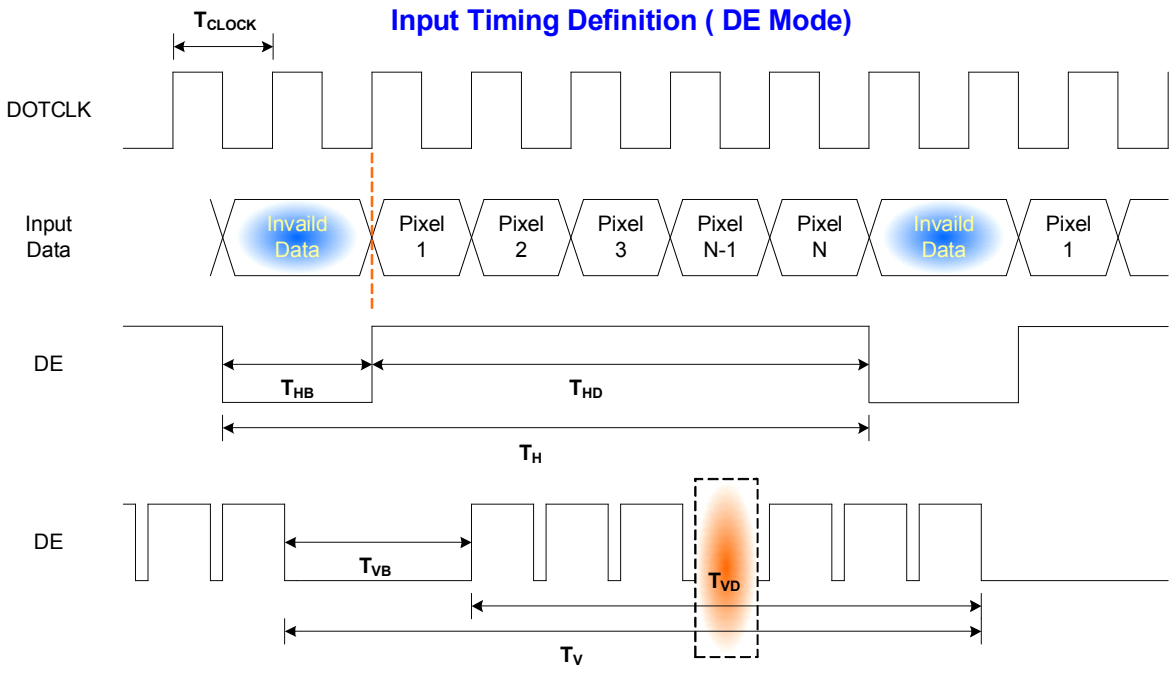
5.4.1 Timing Characteristics

Basically, interface timings described here is not actual input timing of LCD module but output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

Signal	Item	Symbol	Min	Typ	Max	Unit
Vertical Section	Period	Tv	1034	1066	1150	Th
	Active	Tdisp(v)	1024	1024	1024	Th
	Blanking	Tbp(v)+Tfp(v)+PWvs	10	42	126	Th
Horizontal Section	Period	Th	750	844	2048	Tclk
	Active	Tdisp(h)	640	640	640	Tclk
	Blanking	Tbp(h)+Tfp(h)+PWhs	110	204	-	Tclk
Clock	Period	Tclk	14.81	18.52	25	ns
	Frequency	Freq	40	54	70	MHz
Frame rate	Frame rate	F	49	60	76	Hz

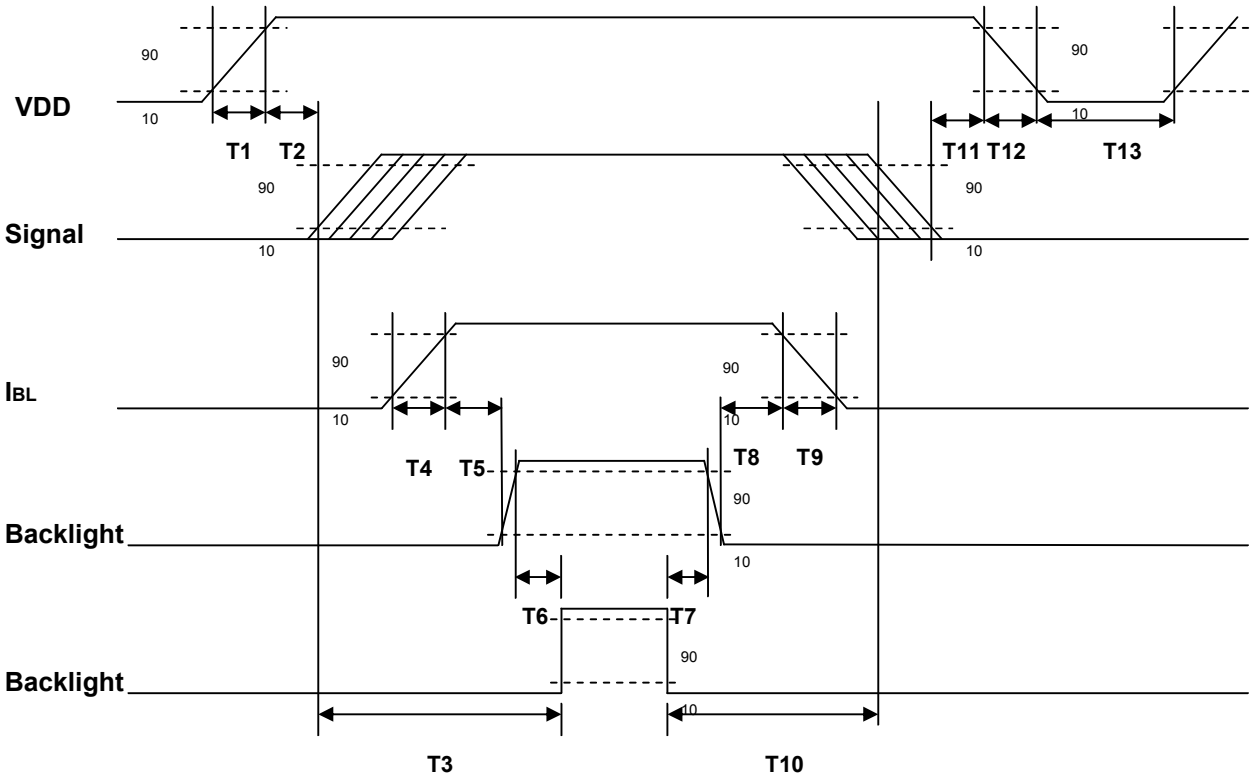
Note : DE mode only

5.4.2 Timing Diagram



5.5 Power ON/OFF Sequence

VDD power and LED on/off sequence is 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 Sequence Timing

Parameter	Value			Unit
	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]

6. 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

6.1.1 LVDS Connector (CN1)

Connector Name / Designation	Interface Connector
Manufacturer	HRS
Type Part Number	MDF76URW-30S-1H(55)
Mating Housing Part Number	MDF76-30P-1C

6.1.2 LVDS Connector Pin Assignment

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

6.2 Backlight Unit

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

6.2.1 Backlight Connector (CN2)

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

6.2.2 Backlight Connector Pin Assignment

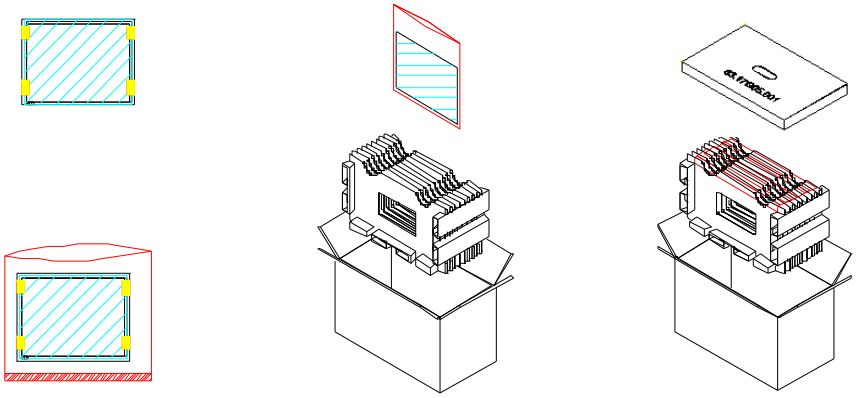
Pin#	Symbol	Description	Remark
1	Power	Input Power	Red Color
2	GND	Ground	White Color

7. Packaging

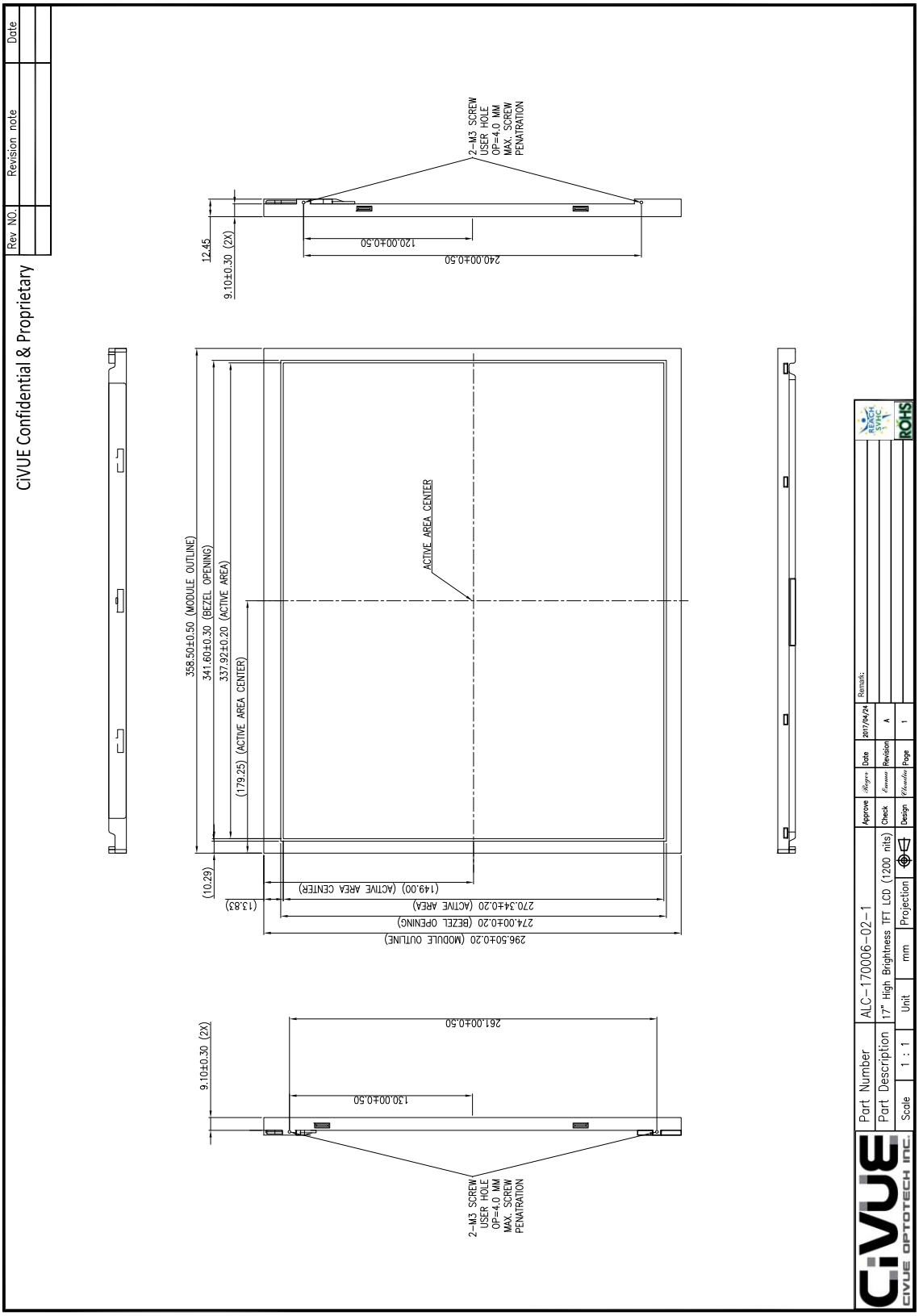
Max capacity：8 TFT-LCD module per carton

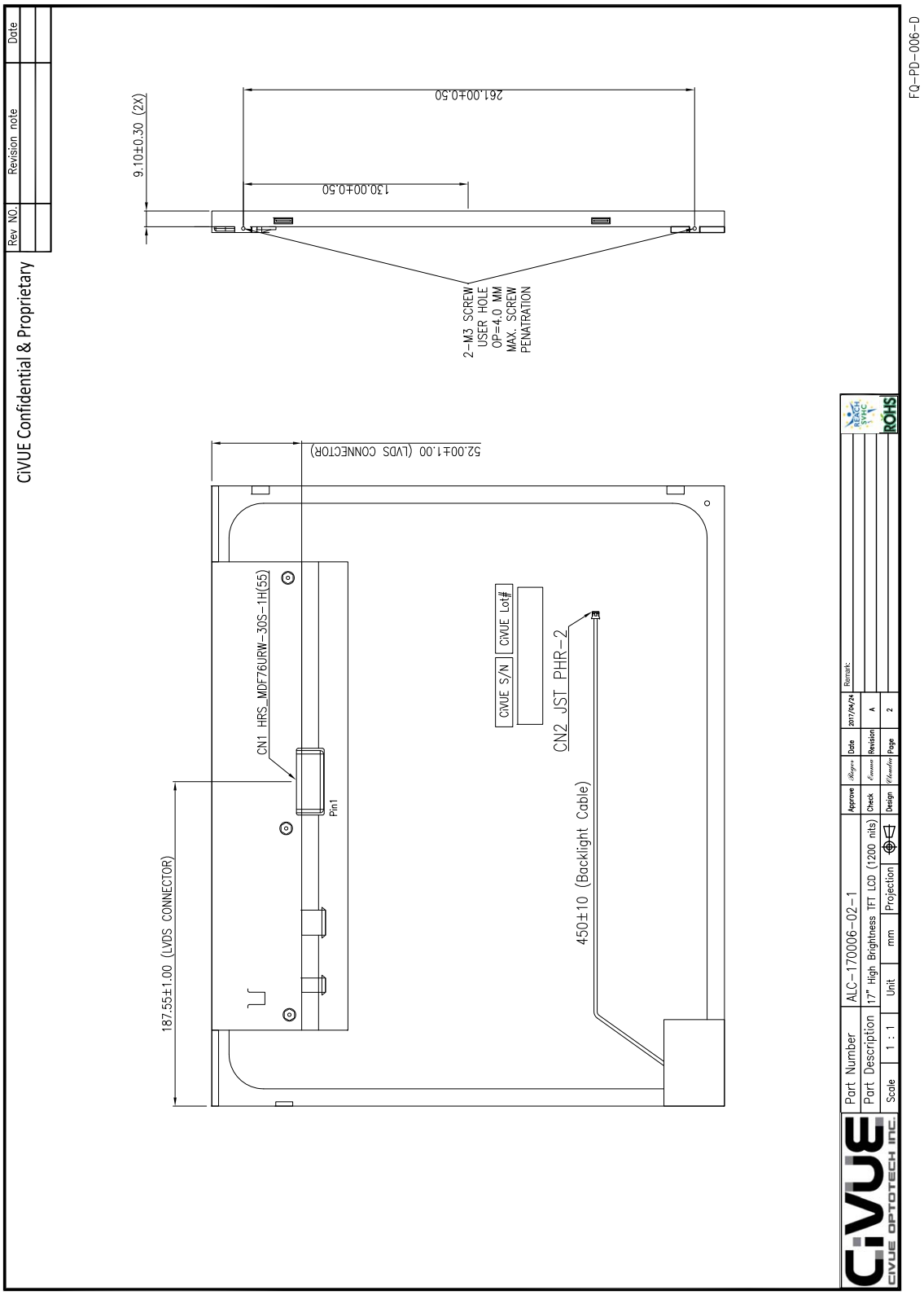
Max weight: 13.5 kg per carton

Outside dimension of carton: 448(L)mm*283(W)mm*397(H)mm



8. Mechanical Characteristics




CiVUE Confidential & Proprietary
Rev NO.
Revision note
Date
9.10±0.30 (2X)
261.00±0.50
130.00±0.50
2-M3 SCREW
USER HOLE
OP=4.0 MM
MAX. SCREW
PENATRATION
52.00±1.00 (LVDS CONNECTOR)
CN1 HRS_MDF76URW-30S-1H(55)
Pin1
187.55±1.00 (LVDS CONNECTOR)
CiVUE S/N
CiVUE Lot#
CN2 JST PHR-2
450±10 (Backlight Cable)
Part Number
ALC-170006-02-1
Part Description
17" High Brightness TFT LCD (1200 nits)
Scale
1 : 1
Unit
mm
Projection
Approve
Check
Design
Date
Revision
Page
Remark:
FQ-PD-006-D

CIVUE OPTOTECH INC.

4F-2, No. 609, Sec. 1, Wanshou Road

Guishan Dist.Taoyuan City 333, Taiwan

Phone: +886-2-8200-6060

Fax: +886-2-8200-6161

Email: sales@civueopto.com