SPECIFICATIONS FOR LCD MODULE

CUSTOMER	
CUSTOMER PART NO.	
AMPIRE PART NO.	**AM-1024768JTZQW-T03H**
APPROVED BY	
DATE	

☐ **Preliminary Specification**
☑ **Formal Specification**

APPROVED BY	CHECKED BY	ORGANIZED BY
Patrick	*Mark*	*Mantle*

*This specification is subject to change without notice.

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2020/07/31	--	New Release	Mantle

1. Features

8 inch Amorphous-TFT-LCD (Thin Film Transistor Liquid Crystal Display) module. This module is composed of a 8" TFT-LCD panel and LED backlight and LED driving board.

(1) Construction: 8" a-Si TFT active matrix, White LED Backlight.
(2) Resolution (pixel): 1024(R.G.B) X 768
(3) Number of the Colors : 16.7M colors (R , G , B 8 bit digital each)
(4) LCD type :SFT with Normally Black
(5) HDMI Board
(6) Projective Capacitive Touch Panel
- Touch Controller: ILI2511
- Interface: USB

2. PHYSICAL SPECIFICATIONS

Item	Specifications	unit
LCD size	8 inch (Diagonal)	
Resolution	1024 x (RGB) x 768	dot
Pixel pitch	0.158(H) x 0.158(V)	mm
Active area	162.05(W) x 121.54(H)	mm
Module size	183.43(W) x 138.35(H) x 4.86(D)	mm
Surface treatment(Up Polarizer)	HC	
Color arrangement	RGB-stripe	
Contrast Ratio	1200:1	
Brightness	390	cd/m^2
Driver IC	RM51150+HX8684B	

3. ABSOLUTE MAX. RATINGS

3.1 TFT Absolute Maximum Ratings

Item	Symbol	Values		UNIT	Note
		Min.	Max.		
Power voltage	VCC	-0.3	5.0	V	Note1
	AVDD	-0.5	13.5		Base on IC Spec
	VGH	-0.3	42		
	VGL	VGH-42	0.3		
Operation temperature	T_{OP}	-20	70	℃	
Storage temperature	T_{ST}	-30	80	℃	
Relative Humidity Note 2	RH	--	≤95	%	Ta≤40°C
		--	≤85	%	40°C<Ta≤50°C
		--	≤55	%	50°C<Ta≤60°C
		--	≤36	%	60°C<Ta≤70°C
		--	≤24	%	70°C<Ta≤80°C
Absolute Humidity	AH	--	≤70	g/m^3	Ta>70°C

Note1: Input voltage include RxIN0±, RxIN1±, RxIN2± and RxCLKI±.

Note2: Ta means the ambient temperature.

It is necessary to limit the relative humidity to the specified temperature range.

Condensation on the module is not allowed.

4. ELECTRICAL CHARACTERISTICS

4-1 Typical Operation Conditions

AGND=GND=0V, Ta=25℃

Item	Symbol	Min	Typ.	Max	Unit	Remark
Digital Supply Voltage	DVDD	3	3.3	3.6	V	-
Analog Supply Voltage	AVDD	12.4	12.6	12.8	V	-
Gate On Voltage	VGH	22	23	24	V	-
Gate Off Voltage	VGL	-7.5	-7	-6.5	V	-

4-2 Power Consumption

AGND=GND=0V, Ta=25℃

Item	Symbol	Condition	Min	Typ.	Max	Unit	Remark
Digital Supply Current	IVCC	DVDD=3.3V	-	TBD	-	mA	-
Analog Supply Current	IAVDD	AVDD=12.6V	-	TBD	-	mA	-
Gate On Current	IVGH	VGH=23.0V	-	TBD	-	mA	-
Gate Off Current	IVGL	VGL=-7.0V	-	TBD	-	mA	-
Power Consumption	Pane l& Gamma		-	TBD	-	mW	-

Note1: Checkered Black pattern for Typ.

4-3 LED Driving Conditions

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
LED voltage	V_F	8.4	9.3	10.2	V	Note(1)
LED forward Current	I_F	--	180	225	mA	Ta=25℃
Power Consumption	W_{BL}	--	1.674	2.295	W	
LED life time	--	20	30	--	kHr	I_F=20mA

Note (1) The constant current source is needed for white LED back-light driving.

Note (2) Brightness to be decreased to 50% of the initial value. Ta=25℃

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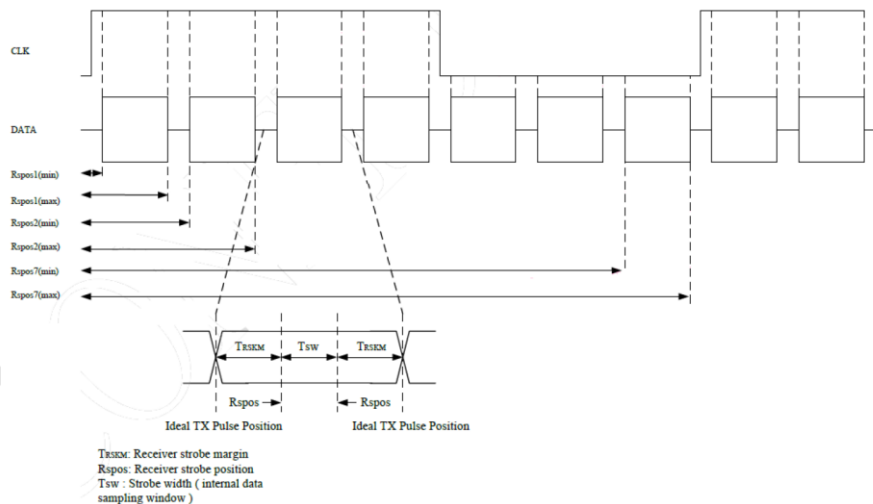
4-4 Block Diagram

LCD Panel
8 inch
1024(RGB)×768

Gate Driver IC

Source Driver IC
(With TCON)

LED Backlight

C-TP
(at costumer)

VGH
VGL
VDD
GND
AVDD
VCOM
RXIN0-/+
RXIN1-/+
RXIN2-/+
RXCLKIN-/+
RXIN3-/+
Reset
STBYB
SELB
L/R
U/D
CABCEN1
CABCEN0
DIMO

LED Anode
LED Cathode

C-TP_VDD
C-TP_GND
C-TP_Reset
C-TP_SCL
C-TP_SDA
C-TP_INT
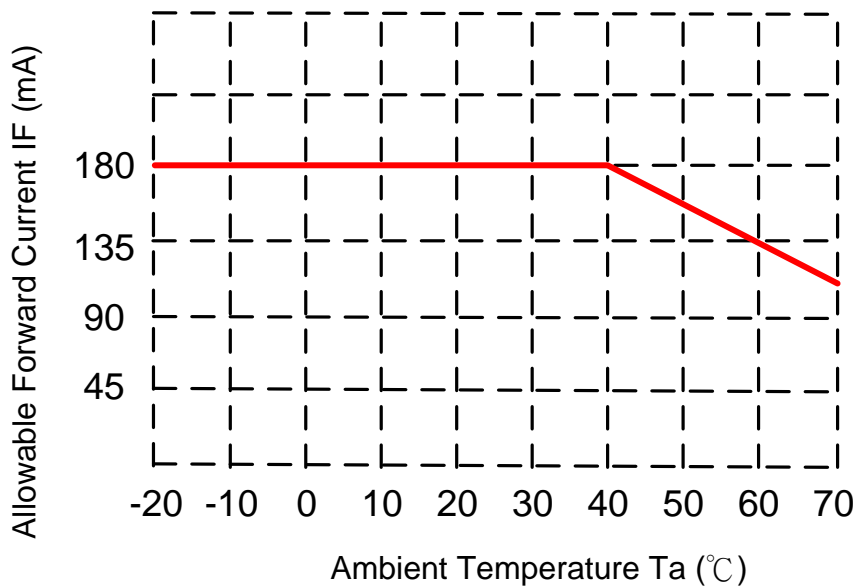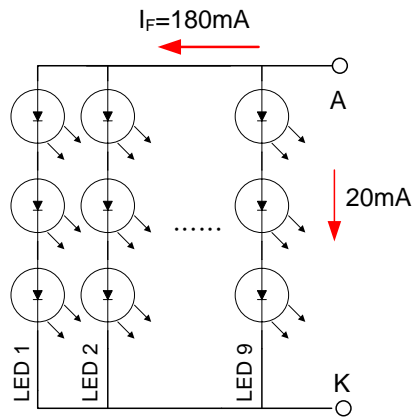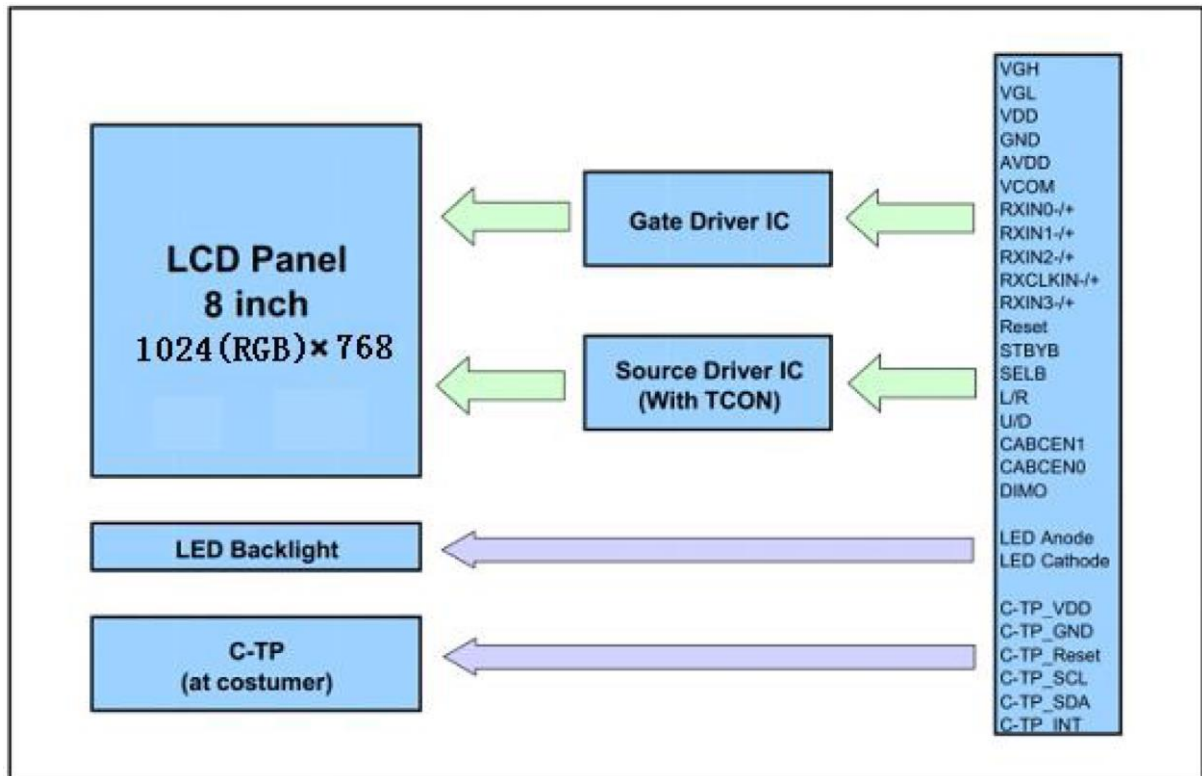
5. Timing Chart

5.1 AC Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Conditions
Clock Frequency	R_{xFCLK}	20	-	71	MHz	
Input data skew margin	T_{RSKM}	500	–	–	ps	|VID|= 400mV, R_{XVCM}=1.2V R_{XFCLK}=71MHz
Clock high time	T_{LVCH}	–	$4/(7* R_{xFCLK})$	–	ns	
Clock low time	T_{LVCL}	–	$3/(7* R_{xFCLK})$	–	ns	
PLL wake-up time	T_{enPLL}	–	–	150	us	

T_{RSKM}: Receiver strobe margin
Rspos: Receiver strobe position
Tsw : Strobe width (internal data sampling window)
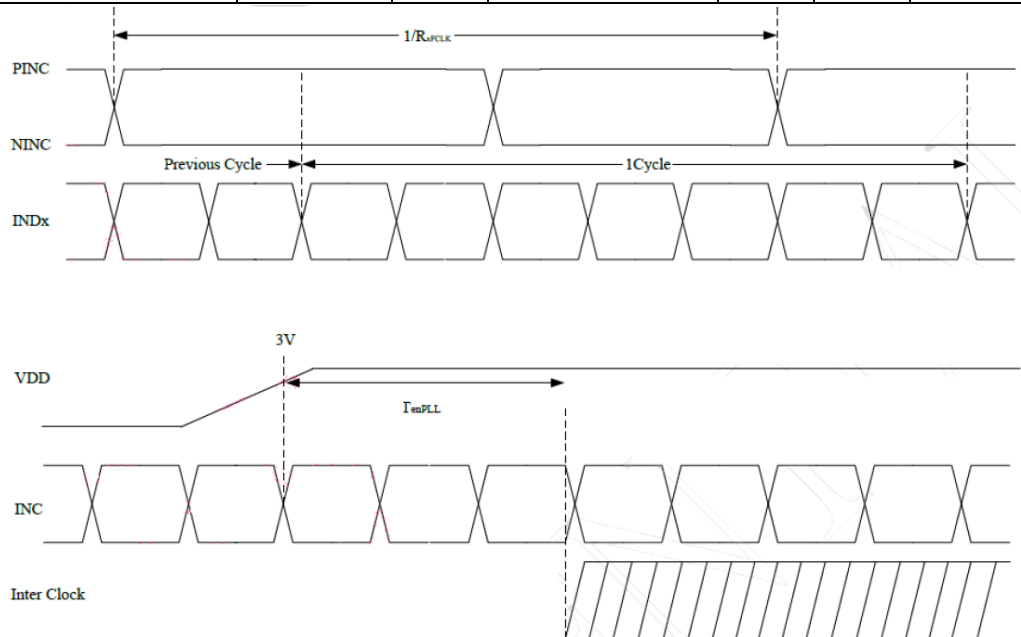
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Modulation Frequency	SSC_{MF}	23	-	93	kHz	
Modulation Rate	SSC_{MR}	-	-	+/-3	%	LVDS clock=71MHz center spread

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5.2 DC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Differential input high Threshold voltage	R_{XVTH}	–	–	0.2	V	R_{XVCM}=1.2V
Differential input Low Threshold voltage	R_{XVTL}	-0.2	–	–	V	
Input voltage range (singled-end)	R_{XVIN}	0	–	VDD-1.2	V	
Differential input common mode voltage	R_{XVCM}	$\lvert V_{ID}\rvert/2$	–	VDD-1.2-$\lvert V_{ID}\rvert/2$	V	
Differential input voltage	$\lvert V_{ID}\rvert$	0.2	–	0.6	V	
Differential input leakage Current	RV_{Xliz}	-10	–	10	uA	
LVDS Digital Operating Current	Iddlvds	–	15	30	mA	Fclk=65MHz,VDD=3.3V
LVDS Digital Stand-by Current	Istlvds	–	10	50	uA	Clock & all functions are stopped

Single-end signals

$PINDx-NINDx= -\lvert V_{ID}\rvert < R_{XVTL} =$ "LOW"

R_xVCM

$PINDx-NINDx= \lvert V_{ID}\rvert > R_{XVTH} =$ "HIGH"

Differer $\lvert V_{ID}\rvert$

R_xVCM

GND

Differential signals

PINDx-NINDx

R_xVTH
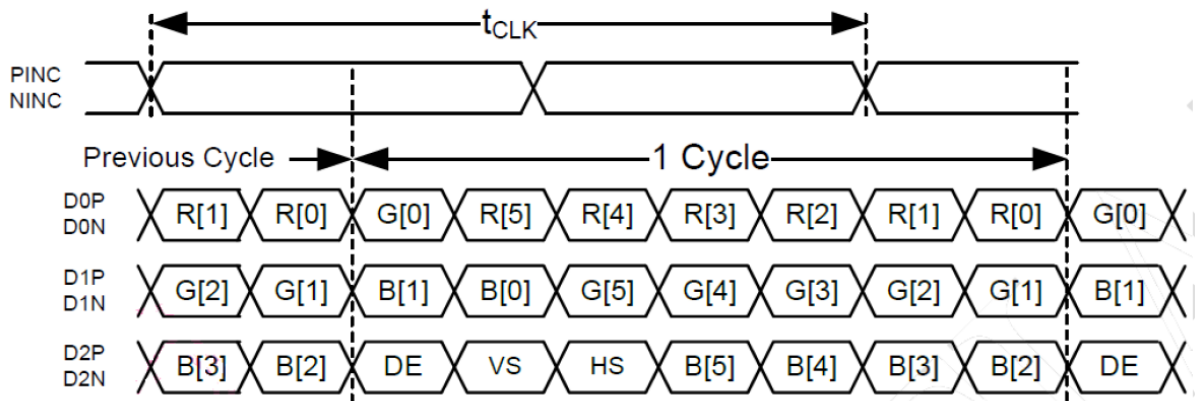
0V

$\lvert V_{ID}\rvert$
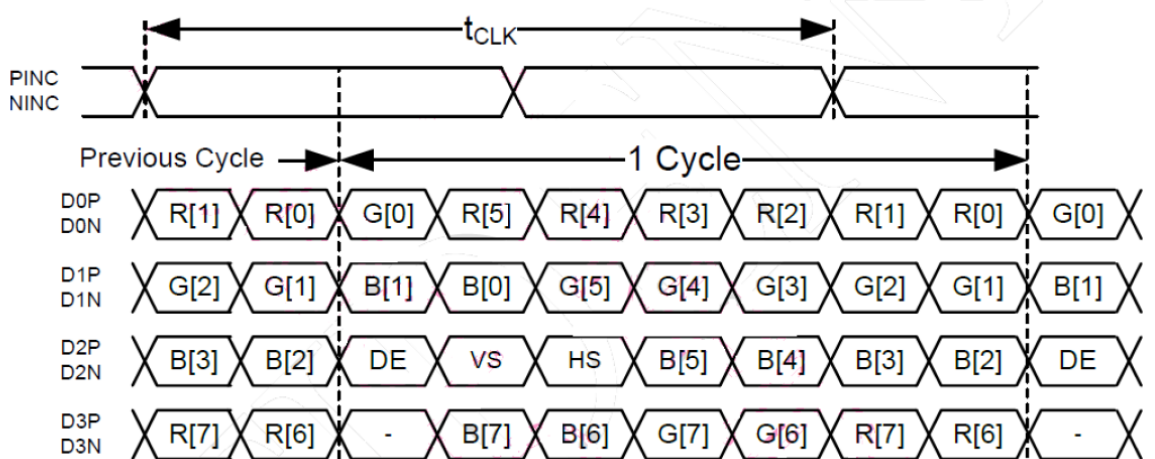
R_xVTL

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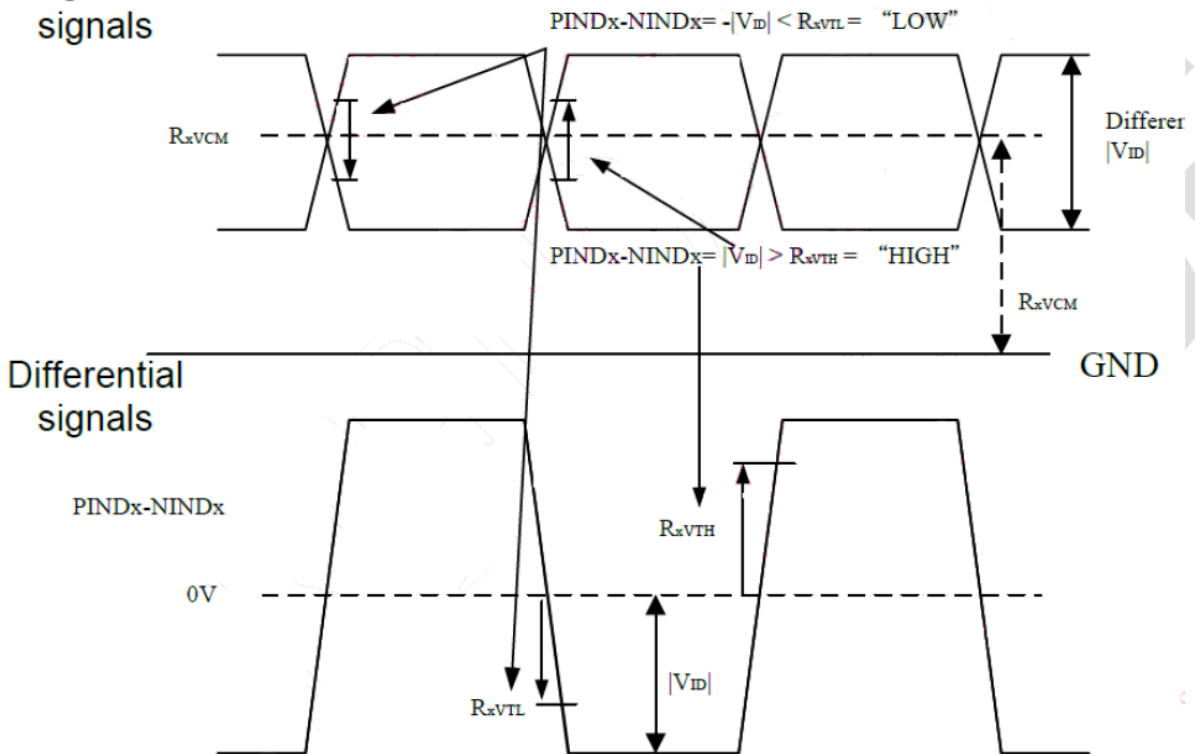
5.3 Data input format

5.3.1 LVDS data mapping

6-bit LVDS input (SELB = "H")

8-bit LVDS input (SELB = "L")


5.3.2 Parallel RGB input timing table

● **DE mode**

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	52	65	71	MHz
Horizontal Display Area	thd		1024		DCLK
HSD Period	th	1114	1344	1400	DCLK
HSD Blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd		768		T_H
VSD period	t_V	778	806	845	T_H
VSD Blanking	tvbp+tvfp	10	38	77	T_H

DE mode(1024x768)

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5.4 Power ON/OFF Sequence

Item	Symbol	Min	Typ.	Max	Unit
VDD on to Reset signal	T1	1	-	-	
Reset to Standby off	T2	0	-	-	
Standby off to Display signal on	T3	1	-	-	
Display signal to AVDD on	T4	33.2	-	-	
AVDD on to VGL on	T5	16.6	-	-	
VGL on to VGH on	T6	16.6	-	-	
VGH on to B/L on	T7	200	-	-	ms
B/L off to Standby on	T8	500	-	-	
Standby on to VGL off	T9	33.2	-	-	
VGL off to VGH off	T10	16.6	-	-	
VGH off to AVDD off	T11	16.6	-	-	
AVDD off to Display signal off	T12	16.6	-	-	
Display signal off to VDD and Reset off	T13	16.6	-	-	
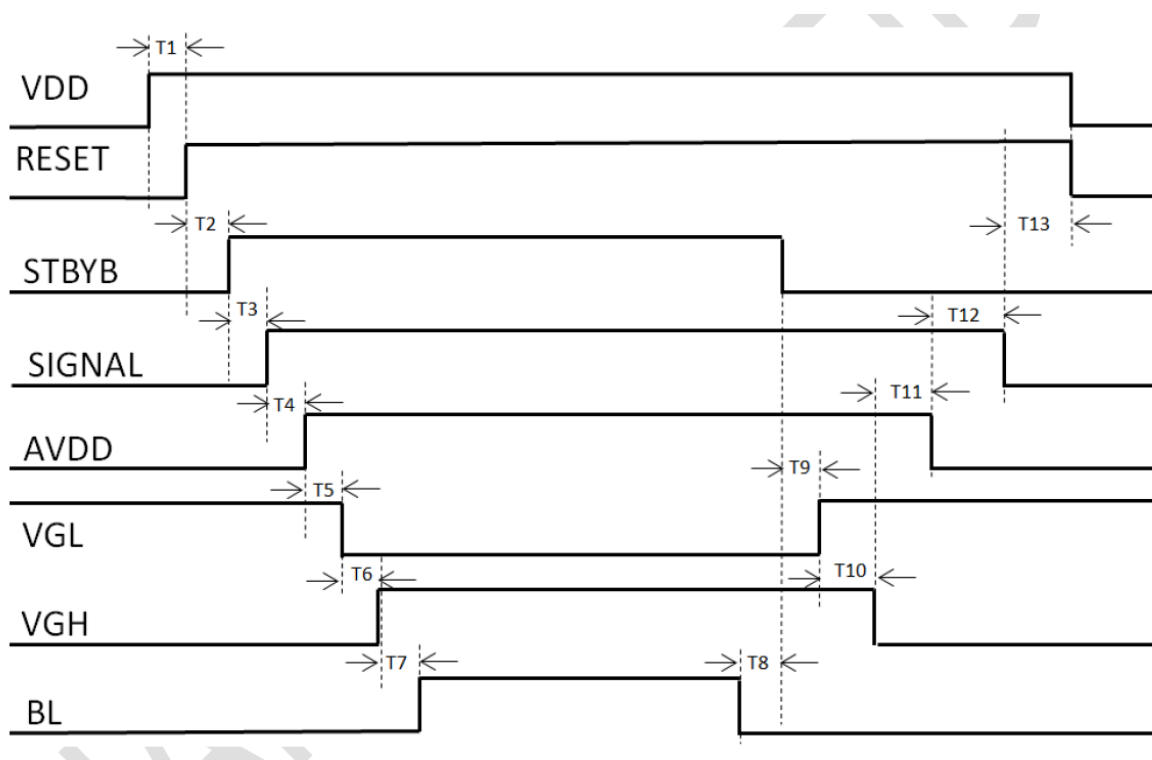
6. Optical Specifications

6.1 TFT Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	75	85	-	Degree	Note 2
		θB		75	85	-		
		θL		75	85	-		
		θR		75	85	-		
Contrast Ratio		CR	θ=0°	1500	1800	-		Left/right 0° Top/bottom 5°
Response Time		T_{ON} T_{OFF}	25℃	-	35	45	ms	Note1 Note4
Chromaticity	White	x		-0.05	0.310	+0.05		Note5 Note1
		y			0.329			
	Red	x			0.587			
		y			0.330			
	Green	x			0.358			
		y			0.586			
	Blue	x			0.156			
		y			0.098			
Uniformity		U		80	85	-	%	Note1、Note6
NTSC				45	50	-	%	
Luminance		L		312	390	-	cd/m^2	Note7

Test Conditions:

1. I_F= 180mA, the ambient temperature is 25℃.

2. The test systems refer to Note 1 and Note2.

Note 1 : Definition of optical measurement system.

    The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view : 1° / Height : 500mm.)
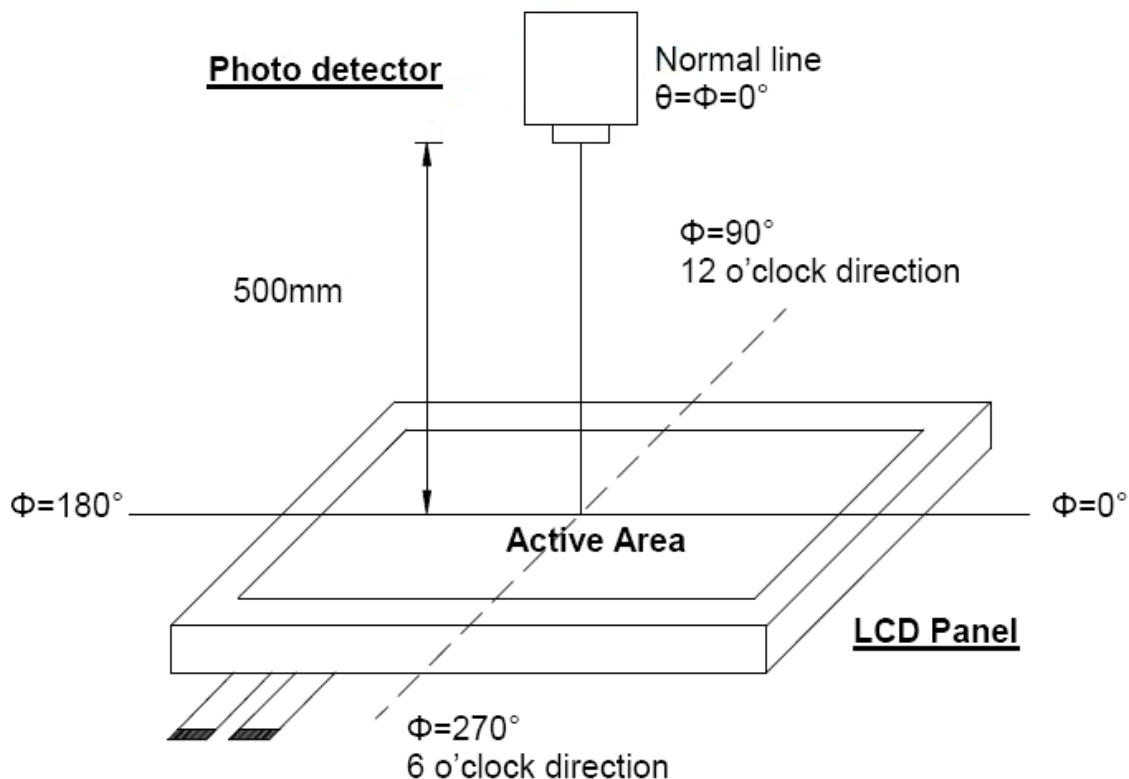

Note 2 : Definition of viewing angle range
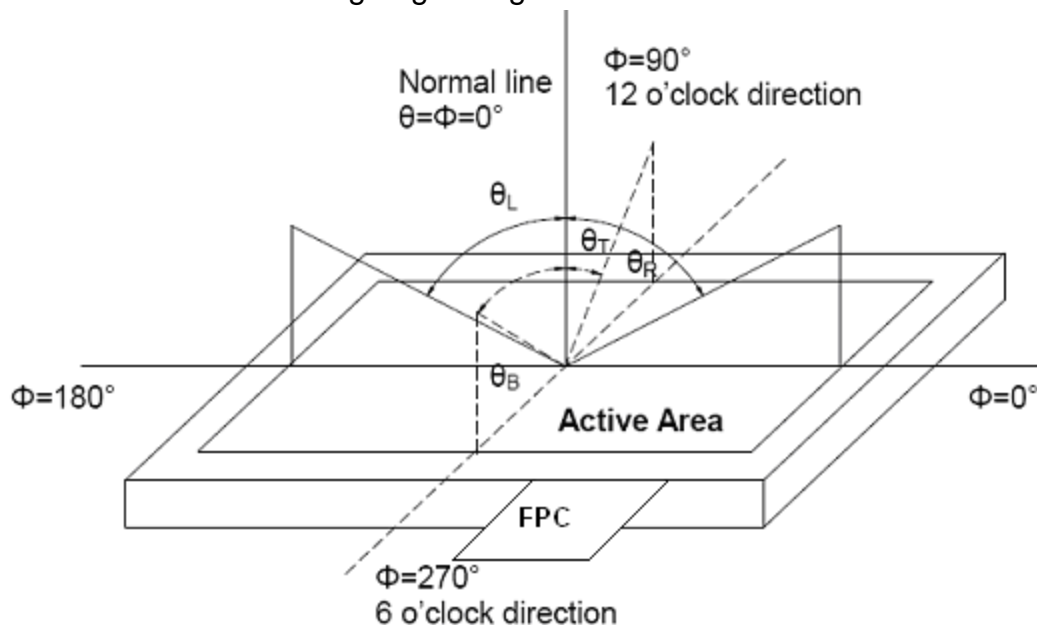
Note 3 : Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.
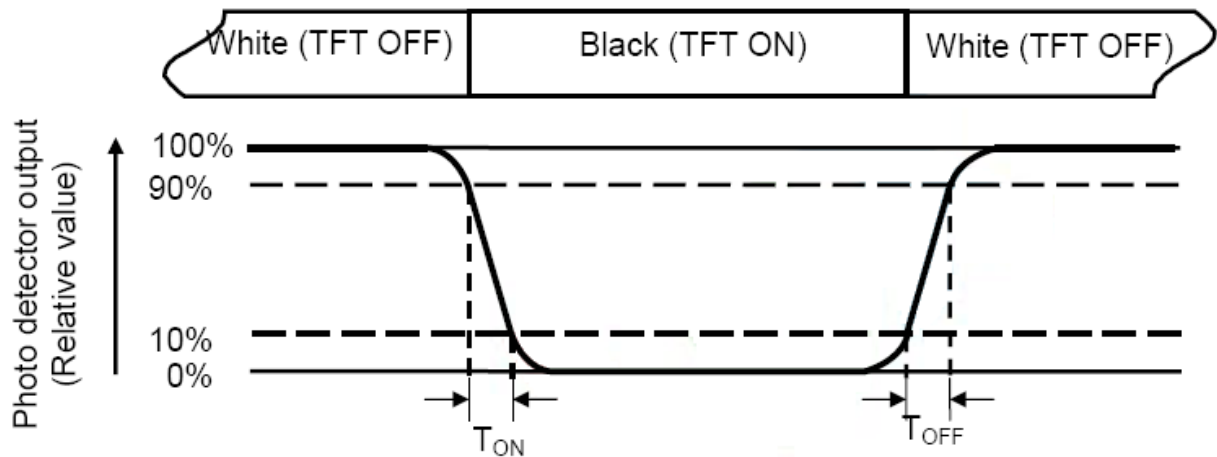
Note 4 : Definition of contrast ratio

$$\text{Contrast Ratio(CR)} = \frac{Luminance\ measured\ when\ LCD\ on\ the\ \text{"White"}\ state}{Luminance\ measured\ when\ LCD\ on\ the\ \text{"Black"}\ state}$$

Note 5 : Definition of color chromaticity (CIE1931)

Color coordinated measured at center point of LCD.

Note 6 : All input terminals LCD panel must be ground when measuring the center area of the panel.

Note 7 : Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer to bellow figure). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity}(Y_u) = \frac{B_{min}}{B_{max}}$$

L ----- Active area length   W ----- Active area width
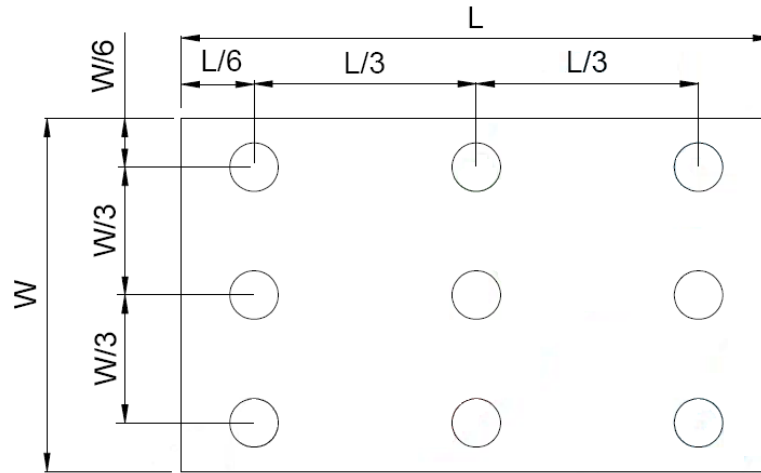
Bmax : The measured maximum luminance of all measurement position.

Bmin : The measured minimum luminance of all measurement position.

7. INTERFACE

Pin No	Symbol	I/O	Function	Remark
1	NC	-	No connection	
2	VDD	P	Power Voltage for digital circuit	
3	VDD	P	Power Voltage for digital circuit	
4	NC	---	No connection	
5	Reset	I	Global reset pin	
6	STBYB	I	Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are GND	
7	GND	P	Ground	
8	RXIN0-	I	- LVDS differential data input	
9	RXIN0+	I	+ LVDS differential data input	R[0]~G[0]
10	GND	P	Ground	
11	RXIN1-	I	- LVDS differential data input	
12	RXIN1+	I	+ LVDS differential data input	G[1]~B[1]
13	GND	P	Ground	
14	RXIN2-	I	- LVDS differential data input	
15	RXIN2+	I	+ LVDS differential data input	DE/VS/HS/B[2]~B[5]
16	GND	P	Ground	
17	RXCLKIN-	I	- LVDS differential clock input	
18	RXCLKIN+	I	+ LVDS differential clock input	
19	GND	P	Ground	
20	RXIN3-	I	- LVDS differential data input	
21	RXIN3+	I	+ LVDS differential data input	R[6]/R[7]/G[6]/G[7]/B[6]/ B[7]
22	GND	P	Ground	
23	NC	---	No connection	
24	NC	---	No connection	
25	GND	P	Ground	
26	NC	---	No connection	
27	DIMO	O	Backlight CABC controller signal output	Note1
28	SELB	I	6bit/8bit mode select No	Note2
29	AVDD	P	Power for Analog Circuit	
30	GND	P	Ground	
31	LED-	P	LED Cathode	
32	LED-	P	LED Cathode	
33	L/R	I	Horizontal inversion	Note3
34	U/D	I	Vertical inversion N	Note3
35	VGL	P	Gate OFF Voltage	

36	CABCEN1	I	CABC H/W enable pin	Note4
37	CABCEN0	I	CABC H/W enable pin	Note4
38	VGH	P	Gate ON Voltage	
39	LED+	P	LED Anode	
40	LED+	P	LED Anode	

I/O----definition, I----Input, O----Output, P----Power, No used I/O pin please fix to GND level

Note1: PWM output after CABC function;

Note2: LVDS mode 6bits/8bits input select pin. If LVDS input data in 6 bits, SELB must be set to high. If LVDS input data in 8 bits, SELB must be set to low.

Note3: When L/R="0", set right to left scan direction, L/R="1" set left to right scan direction. When U/D="0", set top to bottom scan direction, U/D="1" set bottom to top scan direction.

Note4:

CABC_EN【1：0】 CABC H/W enable pin. Normally pull low.

CABC_EN="00", CABC off. (Default mode)

CABC_EN="01", user interface image.

CABC_EN="10", still picture.

CABC_EN="11", moving image.

8. Touch Panel

ITEM	SPECIFICATION
Type	Projective Capacitive Touch Panel
Activation	Multi-finger
X/Y Position Reporting	Absolute Position
Touch Force	No contact pressure required
Calibration	No need for calibration
Report Rate	Approx. 100 points/sec
Interface	USB
Control IC	ILI2511
Bonding method	TP module to LCM: Tape bonding

Specify the normal operating condition
(GND=0V)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	VIN	4.75	5.0	5.25	V	
Power Consumption	I_{VIN}		T.B.D		mA	

Interface

Pin No.	Symbol	Function
1	DGND	Power GND
2	DA-	Data -
3	DA+	Data +
4	VIN	USB Power
5	NA	No connection
6	NA	No connection

9. RELIABILITY TEST CONDITIONS

Test Item	Test Conditions	Note
High Temperature Operation	70±3°C , t=240 hrs	
Low Temperature Operation	-20±3°C , t=240 hrs	
High Temperature Storage	80±3°C , t=240 hrs	1,2
Low Temperature Storage	-30±3°C , t=240 hrs	1,2
Thermal Shock Test	-30°C ~ 80°C 30 m in. ~ 30 min. (1 cycle) Total 100cycle	1,2
Storage Humidity Test	60 °C, Humidity 90%, 240 hrs	1,2
Vibration Test (Packing)	Sweep frequency : 10 ~ 50 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis	2

Note 1: Condensation of water is not permitted on the module.

Note 2: The module should be inspected after 1 hour storage in normal conditions
(15-35°C, 45-65%RH).

Note 3 : The module shouldn't be tested more than one condition, and all the test
conditions are independent.

Note 4 : All the reliability tests should be done without protective film on the module.

Definitions of life end point:

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.
- Appearance and display quality should not have degraded noticeably.
- Contrast ratio should be greater than 50% of the initial value.

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10. General Precautions

10.1 Handling Precautions

1. Display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

2. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

3. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

4. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

5. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

   — Isopropyl alcohol

   — Ethyl alcohol

   Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

   — Water

   — Ketone

   — Aromatic solvents

6. Do not attempt to disassemble the LCD Module.

7. If the logic circuit power is off, do not apply the input signals.

8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

   a. Be sure to ground the body when handling the LCD Modules.

   b. Tools required for assembly, such as soldering irons, must be properly ground.

   c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

   d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

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10.2 Storage precautions

1. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.
2. The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:
   Temperature : 0℃ ～ 40℃
   Relatively humidity: ≤80%
3. The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 General Precautions

1. Do not keep the LCD at the same display pattern continually. The residual image will happen and it will damage the LCD. Please use screen saver.
2. The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.
3. TP needs to work in environment with stable stray capacitance. In order to minimize the variation in stray capacitance, all conductive mechanical parts must not be floating. Intermittent floating any conductive part around the touch sensor may cause significant stray capacitance change and abnormal touch function. It is recommended to keep all conductive parts having same electrical potential as the GND of the touch controller module.
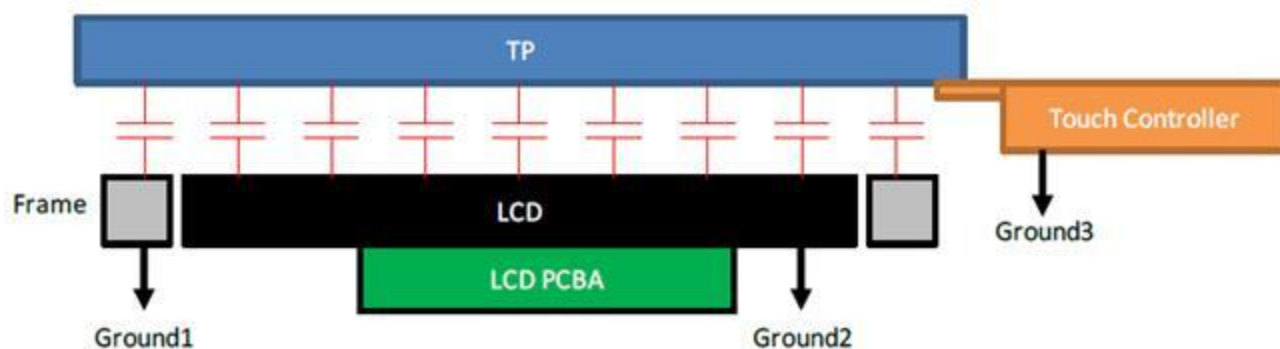
GND1, GND2 and GND3 should be connected together to have the same ground

10.4 Mechanism

The square adhesive tape which is between the touch panel and display can't provide well supporting in the long term and high ambient temperature condition. Whether upright or horizontal position the support holder which is in the back side of the display is needed. Do not let the display floating.

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11. OUTLINE DIMENSION

Note:
1. Unless indicated, Tolerance "±0.3".
2. UV Glue For OLB Protection.
3. Matched connector:FH12A-40S-0.5SH.

Pin assignment table (connector):

1	NC
2	VDD
3	VDD
4	NC
5	RESET
6	STBYB
7	GND
8	RXIN0−
9	RXIN0+
10	GND
11	RXIN1−
12	RXIN1+
13	GND
14	RXIN2−
15	RXIN2+
16	GND
17	RXCLKIN−
18	RXCLKIN+
19	GND
20	RXIN3−
21	RXIN3+
22	GND
23	NC
24	NC
25	GND
26	NC
27	DIM0
28	SELB
29	AVDD
30	GND
31	LED−
32	LED−
33	L/R
34	U/D
35	VGL
36	CABCEN1
37	NC
38	VGH
39	LED+
40	LED+

1	DGND
2	DA−
3	DA+
4	VIN
5	NA
6	NA

LED_A
LED_K
LED circuit

Component area T=1.5mm
Insulation tape
A Block
Single layer
Component Area Height 1.0Max
P0.5x(40−1)=19.5±0.05 W=0.3±0.03
R G B

Dimensions:
79.095±1.0
(38.25±1.0)
35.0±0.3
0.5±0.1
(20.5±0.2)
40
(67.018±0.3)
0.15825
0.05275
0.15825
(5.55)
(9.226)
(9.5)
(9.626)
(10.026)
(10.526)
(9155±0.3)
183.43±0.3 (LCM Outline)
172.0±0.3 (T/P)
164.64±0.3 (Bezel Opening)
164.1±0.2 (A,A for T/P)
163.848 (Up POL)
163.048 (V,A)
162.048 (A,A)

121.536 (A,A) — (6.25)
122.536 (V,A) — (5.75)
123.34 (Up POL) — (5.35)
123.51±0.2 (A,A for T/P) — (5.263)
124.136±0.3 (Bezel Opening) — (4.95)
128.9±0.3 (T/P) — (2.543)
42.588±0.5
138.348±0.3 (LCM Outline)

Stiffener L=4.0
Contact L=3.5±0.3
Contact L=3.0
Stiffener L=5.0±0.3
0.3±0.05
0.3±0.05
4.855±0.3
3.75±0.3

		TOLERANCE GRADE(±)		
		DIM.	A	B
		MM		
		DWN.	MILLY	DATE 11-14-19
		CHK.		DATE
		APPD.		DATE

PARTS NO.LCM 1024768J-T03

1	1024768J-03 LCM	7
2	80060PD NY 电容T/P	8
3	80060OPG-T FPC (USB)	9
4	ILI2511	10
5		11
6		12

REV.	REVISION RECORD	DATE	NAME
0	NEW RELEASE	11-14-19	MILLY

TITLE: 1024768J-T03 (8.0")
DWG. NO.: *19192MA
SHEET 1 OF 1

1	NC	21	RXIN3+

Pin assignment table:

1	NC	21	RXIN3+
2	VDD	22	GND
3	VDD	23	NC
4	NC	24	NC
5	RESET	25	GND
6	STBYB	26	NC
7	GND	27	DIMO
8	RXIN0-	28	SELB
9	RXIN0+	29	AVDD
10	GND	30	GND
11	RXIN1-	31	LED-
12	RXIN1+	32	LED-
13	GND	33	L/R
14	RXIN2-	34	U/D
15	RXIN2+	35	VGL
16	GND	36	CABCEN1
17	RXCLKIN-	37	NC
18	RXCLKIN+	38	VGH
19	GND	39	LED+
20	RXIN3-	40	LED+

1	DGND
2	DA-
3	DA+
4	VIN
5	NA
6	NA

Note:
1. Unless indicated, Tolerance "±0.3".
2. UV Glue For OLB Protection.
3. Matched connector:FH12A-40S-0.5SH.

LED circuit

LED_A

LED_K

1	1024768J-03 LCM	7	
2	80060PD NY 電客T/P	8	
3	80060PG-T FPC (USB)	9	
4	ILI2511	10	
5		11	
6		12	

Back View

SUS304 T=0.2mm (無需接地)

SUS304 T=0.2mm

Single layer

26.0
8.0
8.0
5.0±0.3
0.5
3.5
P0.5x5
54.0±1.0
30.0±0.3
40.0±0.3
79.095±1.0

TOLERANCE GRADE(±)	A	B	DIM.
			MM
			IE NO.
			DWN. MILLY
			CHK.
			APPD.
			DATE 11-14-19'
			DATE
			DATE

PARTS NO.LCM-1
1024768J-T03

TITLE 1024768J-T03
(8.0")
DWG. NO. *191193MA
SHEET 1 OF 1

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	11-14-19'	MILLY

SPECIFICATIONS FOR
LCD MODULE

CUSTOMER	
CUSTOMER PART NO.	
AMPIRE PART NO.	**HDMI Board Rev.D**
APPROVED BY	
DATE	

☑ **Approved For Specifications**
☐ **Approved For Specifications & Sample**

APPROVED BY	CHECKED BY	ORGANIZED BY

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2018/06/19	-	New Release	Mark

1. Features

HDMI to LCD interface board

- Single Power input: 12V / 2A power input. (Connector: PJ1 or PJ2).
- LCD LVDS output: 24 BIT Single LVDS
- HDMI Digital input : (Connector: HDMI1)
  - ◆ HDMI 1.4a Compliant
  - ◆ Single-link (Type A HDMI) on-chip TMDS receiver up to 225MHz. Support long cable.
  - ◆ Do not support HDCP.

Date: 2020/07/31
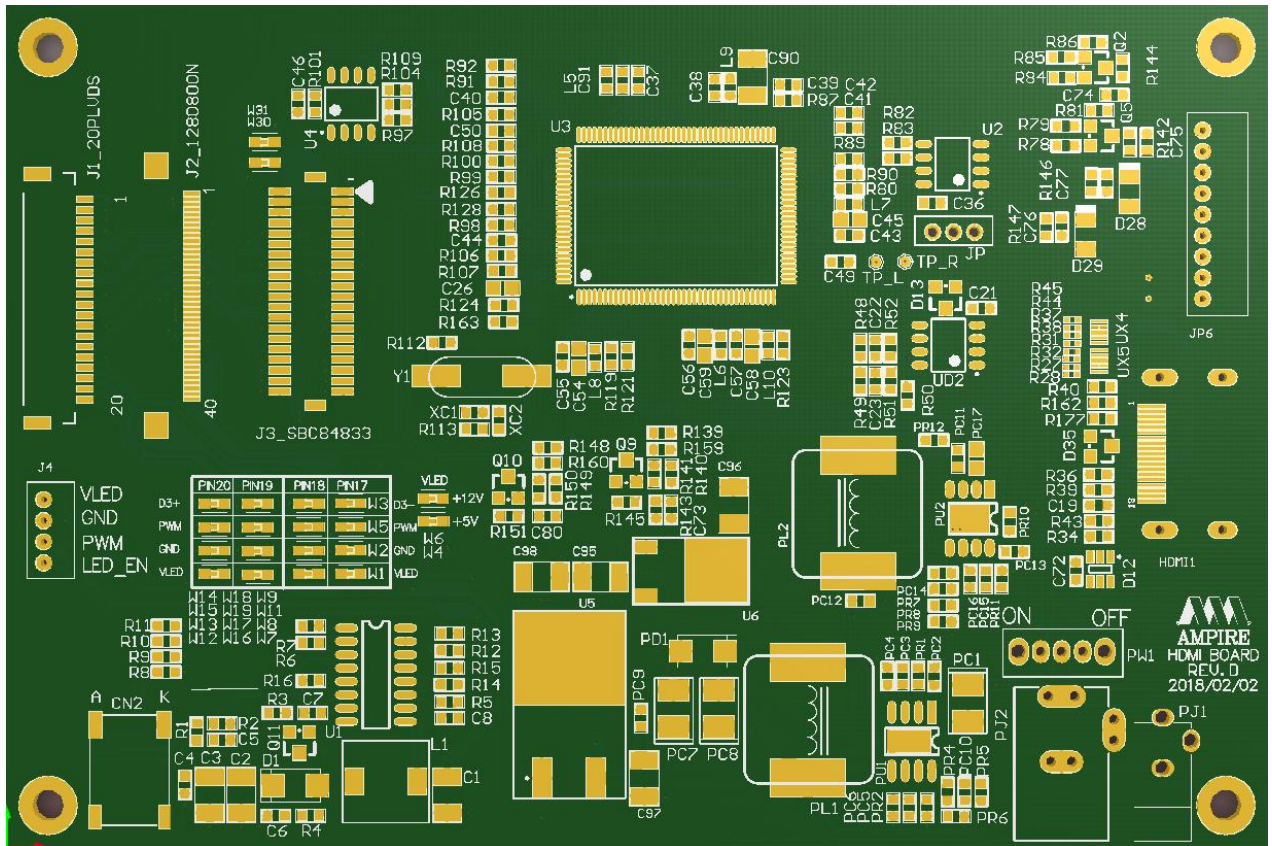
2. Support input video format :

Resolution	V Sync	Resolution	V Sync
640x480	60	1280x800	60
640x480	72	1280x800	75
640x480	75	1280x960	60
800x600	56	1280x1024	60
800x600	60	1280x1024	75
800x600	72	1360x768	60
800x600	75	1366x768	60
848x480	60	1400x1050	60
1024x768	60	1400x1050	75
1024x768	70	1440x900	60
1024x768	75	1440x900	75
1152x864	75	1600x900	60
1280x720	60	1680x1050	60
1280x768	60	1680x1050	75
1280x768	75	1920x1080	60

3. CONNECTOR

3.1 POWER CONNECTOR (PJ1、PJ2)

PIN	Symbol	Description
1	+12V	POWER SUPPLY +12V
3	GND	POWER SUPPLY GROUND

Date: 2020/07/31
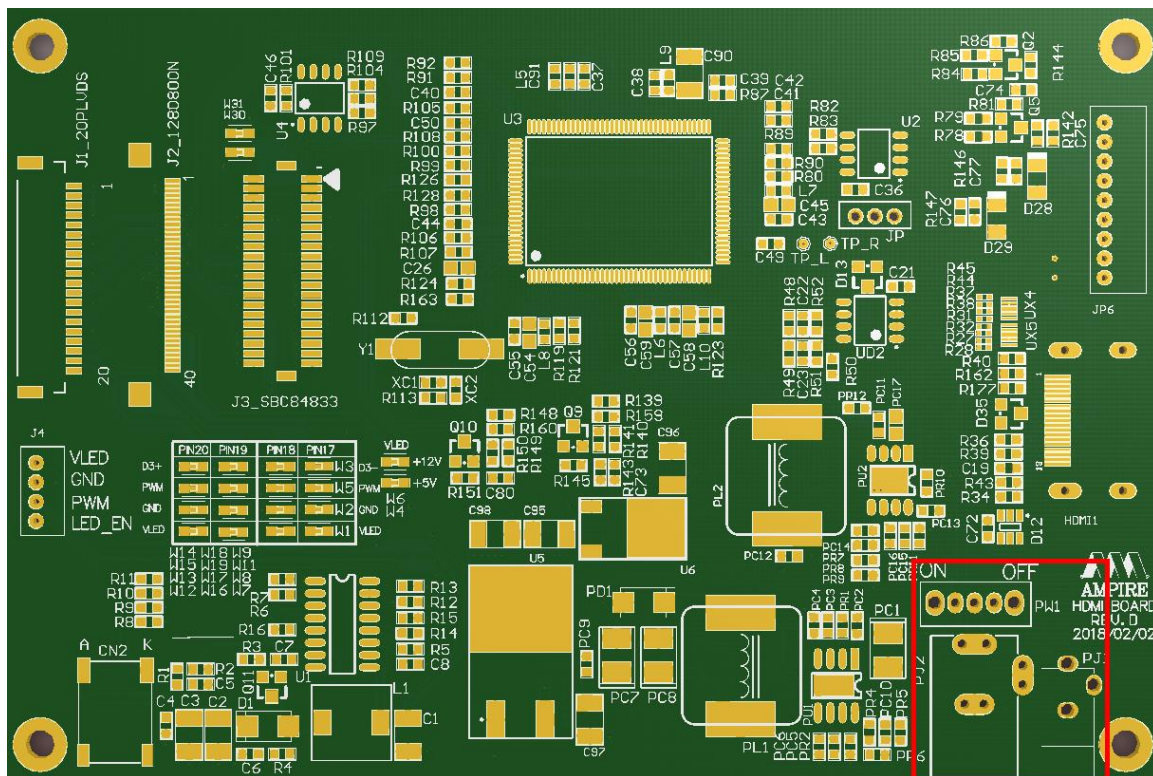
3.2   J1_20PIN LVDS

Pin No.	Symbol	Function
1	VDD	POWER SUPPLY:3.3V
2	VDD	POWER SUPPLY:3.3V
3	GND	Power Ground
4	GND	Power Ground
5	IN0-	Transmission Data of Pixels
6	IN0+	Transmission Data of Pixels
7	GND	Power Ground
8	IN1-	Transmission Data of Pixels 1
9	IN1+	Transmission Data of Pixels 1
10	GND	Power Ground
11	IN2-	Transmission Data of Pixels 2
12	IN2+	Transmission Data of Pixels 2
13	GND	Power Ground
14	CLK-	Sampling Clock
15	CLK+	Sampling Clock
16	GND	Power Ground
17	JUMP	JUMP
18	JUMP	JUMP
19	GND	Power Ground
20	JUMP	JUMP
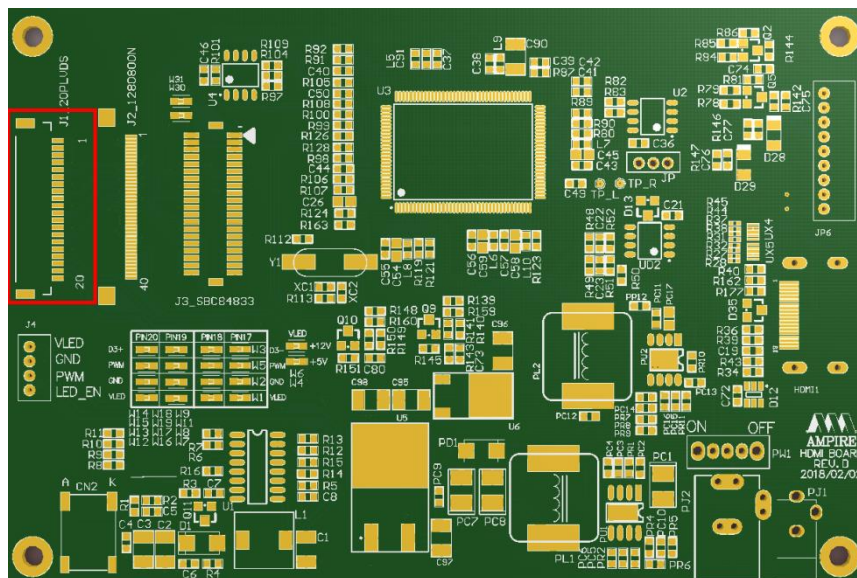
3.3   J2_40PIN LVDS

| Pin #	Singnal Name	Description	Remarks
1	NC	Not Connect	-
2	VDD	Power Supply, 3.3V (typical)	-
3	VDD	Power Supply, 3.3V (typical)	
4	NC	Not Connect	
5	NC	Not Connect	
6	NC	Not Connect	
7	NC	Not Connect	
8	LV0N	-LVDS differential data input	
9	LV0P	+LVDS differential data input	
10	GND	Ground	
11	LV1N	-LVDS differential data input	
12	LV1P	+LVDS differential data input	
13	GND	Ground	
14	LV2N	-LVDS differential data input	
15	LV2P	+LVDS differential data input	
16	GND	Ground	
17	LVCLKN	-LVDS differential data input	
18	LVCLKP	+LVDS differential data input	
19	GND	Ground	
20	LV3N	-LVDS differential data input	
21	LV3P	+LVDS differential data input	
22	GND	Ground	
23	LED_GND	Ground for LED Driving	
24	LED_GND	Ground for LED Driving	
25	LED_GND	Ground for LED Driving	
26	NC	Not Connect	
27	LED_PWM	PWM Input signal for LED driver	
28	LED_EN	LED Enable Pin	
29	Not Connect	NC	
30	NC	Not Connect	
31	LED_VCC	Power Supply for LED Driver	
32	LED_VCC	Power Supply for LED Driver	
33	LED_VCC	Power Supply for LED Driver	
34	NC	Not Connect	
35	BIST	BIST pin	
36-40	NC	Not Connect	
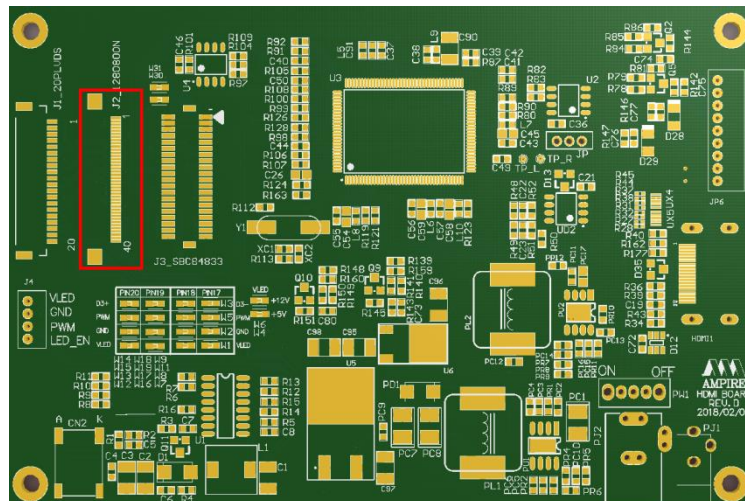
JUMP FOR PIN17 to PIN20 and VLED

- **These jump only for J1_20PLVDS**
- **For Design reference only. These supply voltage and signals do not need to input by end user.**

Date: 2020/07/31
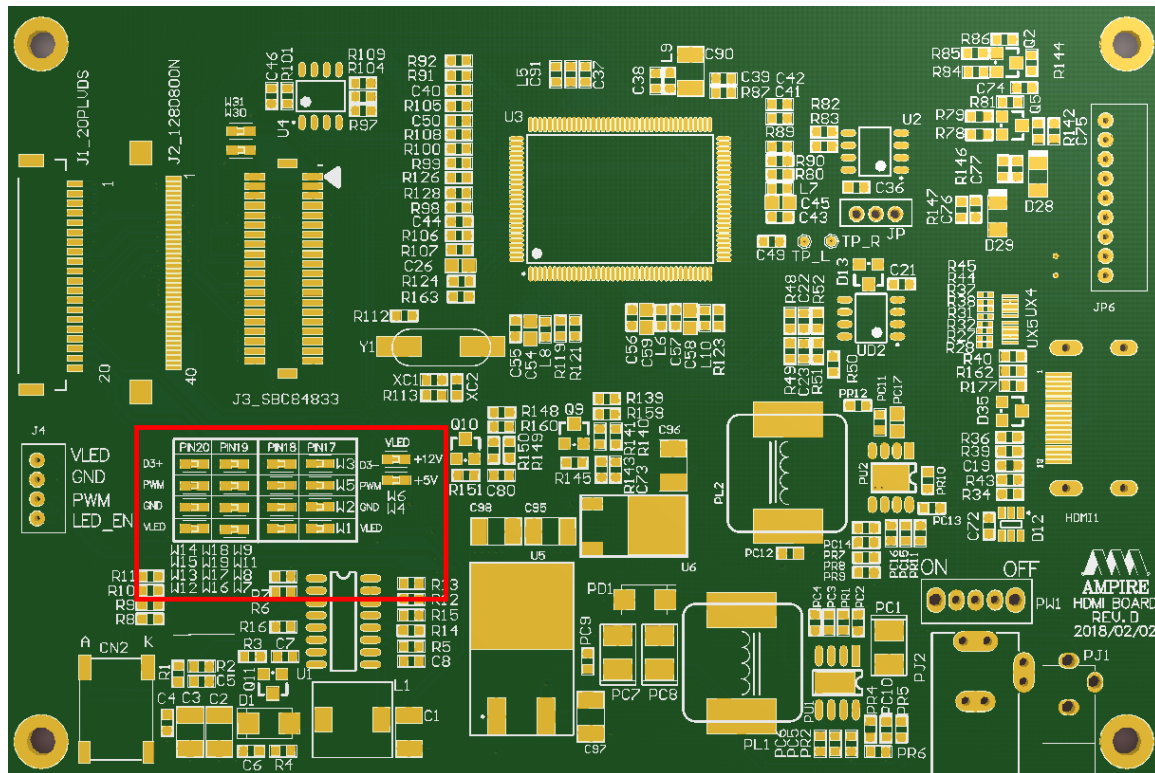
3.4   J3   40PIN LVDS

Pin #	Singnal Name	Description	Remarks
1	VDD	Power Supply, 3.3V (typical)	-
2	VDD	Power Supply, 3.3V (typical)	-
3	VDD	Power Supply, 3.3V (typical)	
4	VDD	Power Supply, 3.3V (typical)	
5	VDD	Power Supply, 3.3V (typical)	
6	VDD	Power Supply, 3.3V (typical)	
7	NC	Not Connect	
8	NC	Not Connect	
9	GND	Ground	
10	GND	Ground	
11	LV8N	-LVDS differential data input	
12	LV5N	-LVDS differential data input	
13	LV8P	+LVDS differential data input	
14	LV5P	+LVDS differential data input	
15	GND	Ground	
16	GND	Ground	
17	LVCLK1N	-LVDS differential data input	
18	LV6N	-LVDS differential data input	
19	LVCLK1P	+LVDS differential data input	
20	LV6P	+LVDS differential data input	
21	GND	Ground	
22	GND	Ground	
23	LV0N	-LVDS differential data input	
24	LV7N	-LVDS differential data input	
25	LV0P	+LVDS differential data input	
26	LV7P	+LVDS differential data input	
27	GND	Ground	
28	GND	Ground	
29	LV1N	-LVDS differential data input	
30	LV3N	-LVDS differential data input	
31	LV3P	+LVDS differential data input	
32	LV7P	+LVDS differential data input	
33	GND	Ground	
34	GND	Ground	
35	LV2N	-LVDS differential data input	
36	LVCLK0N	-LVDS differential data input	
37	LV2P	+LVDS differential data input	
38	LVCLK0P	+LVDS differential data input	
39	GND	Ground	
40	GND	Ground	
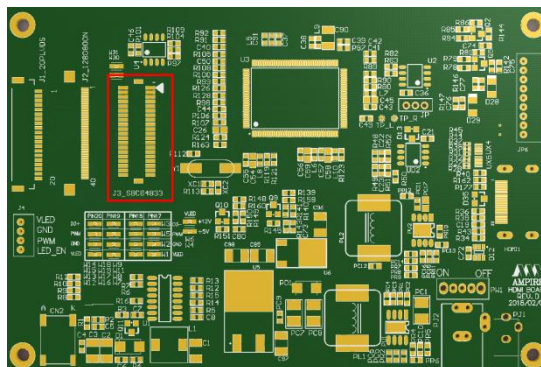
3.5　J4　BackLight　Contrller　Connector

Pin No.	Symbol	I/O	Description	Note
1	VLED	P	Voltage for LED circuit (5.0V or 12V)	
2	GND	I	Power ground	
3	ADJ	P	Adjust the LED brightness by PWM	
4	LED_EN	I	LED BLU ON/OFF. High level: ON; Low level: OFF.	
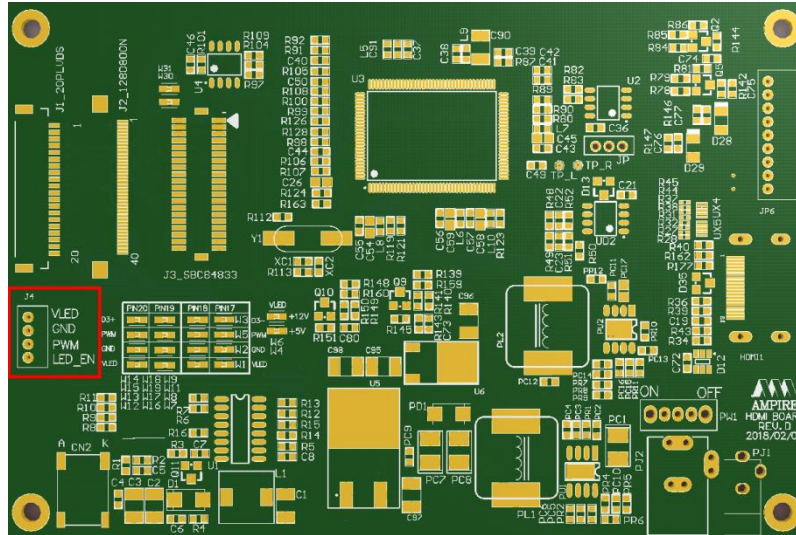
3.6　BackLight　A,K　Connector
● **Only for external backlight connector**

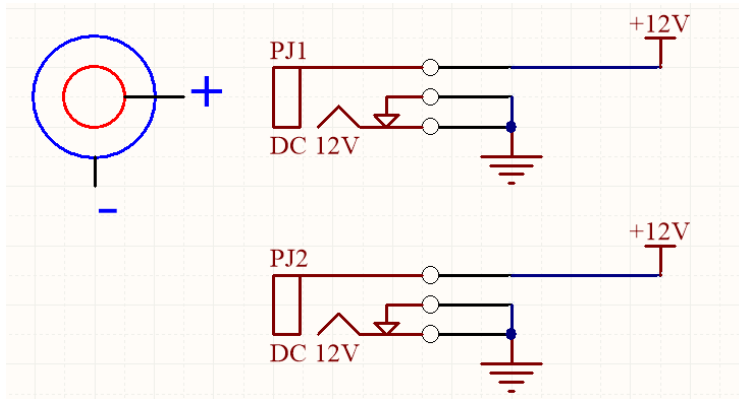| Pin No.	Symbol	Description
1	A	Anode
2	K	Cathode
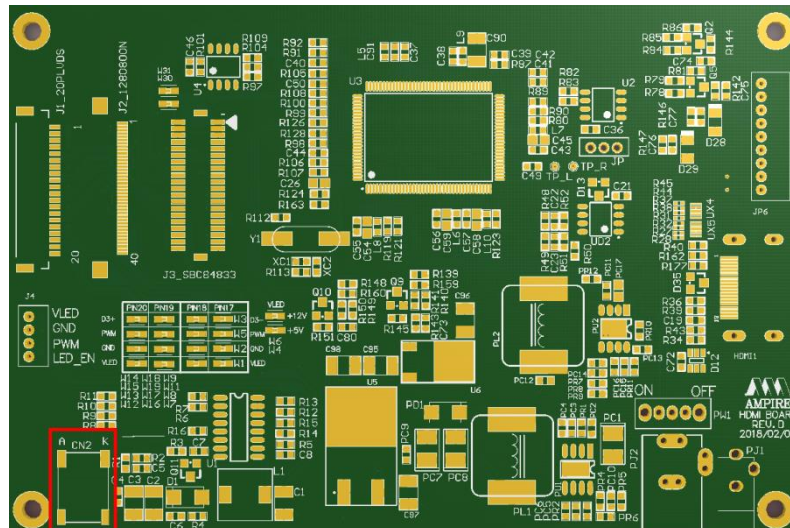
3.7 JP6 Keypad connector for HDMI Board

- **Optional item**
- **If customer need, please check with Ampire sales for new part no. and sample.**

Date: 2020/07/31
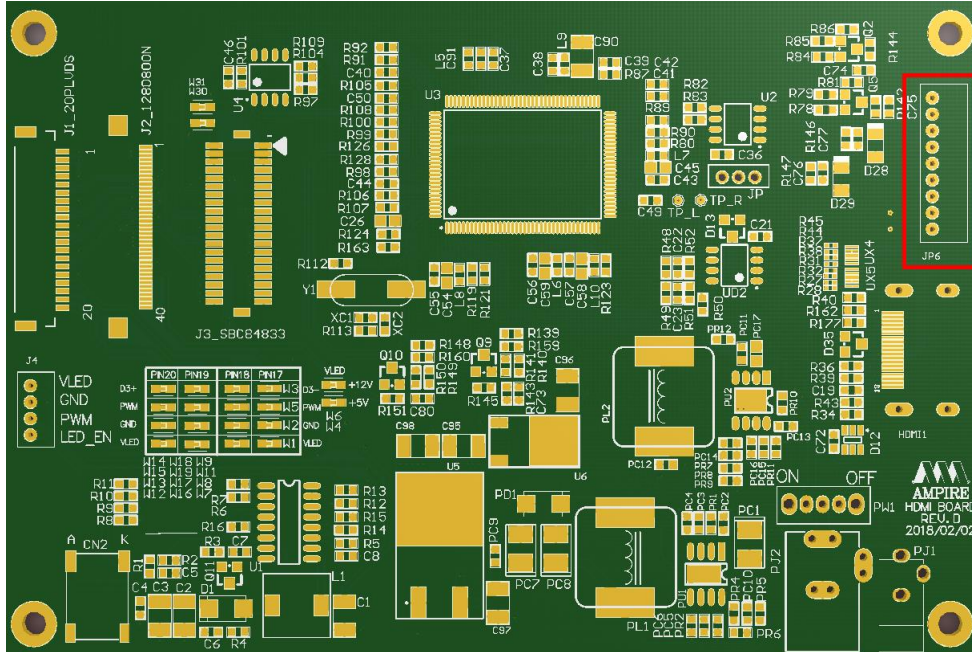
4. INTERFACE PIN CONNECTION
INTERFACE (HDMI Interface Board)
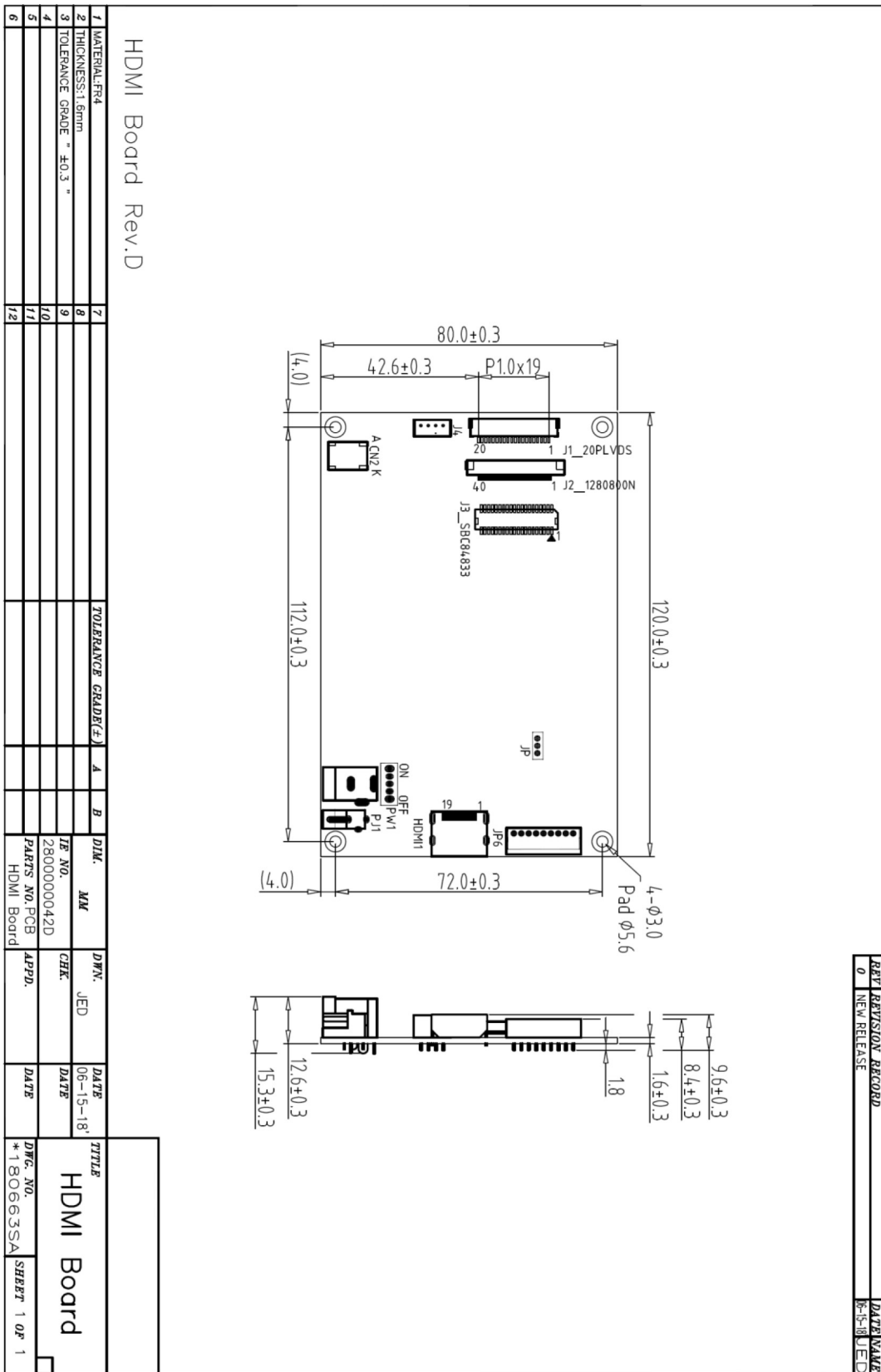
- **PJ1 & PJ2 Power Supply Power Jack:**

Inner terminal is positive. Outer terminal is GND

Date: 2020/07/31

- **HDMI1: HDMI Type A Connector**

HDMI			
PIN	**SIGNAL**	**PIN**	**SIGNAL**
1	TMDS Data2+	11	TMDS Clock Shield (Ground)
2	TMDS Data2 Shield (Ground)	12	TMDS Clock-
3	TMDS Data2-	13	CEC (not used)
4	TMDS Data1+	14	Reserved (No Connection)
5	TMDS Data1 Shield (Ground)	15	SCL
6	TMDS Data1-	16	SDA
7	TMDS Data0+	17	DDC/CED (Ground)
8	TMDS Data0 Shield (Ground)	18	+5V input
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+		

Date: 2020/07/31

HDMI Board Rev.D

6	5	4	3	2	1		
		TOLERANCE GRADE " ±0.3 "	THICKNESS:1.6mm	MATERIAL:FR4			
12	11	10	9	8	7		

				TOLERANCE GRADE(±)		DIM.	MM
					A		
					B		

IE. NO. 2800000042D
PARTS NO.PCB HDMI Board

DWN. JED	CHK	APPD.
DATE 06-15-18'	DATE	DATE

TITLE HDMI Board

DWG. NO. *180663SA

SHEET 1 OF 1

80.0±0.3
42.6±0.3
P1.0x19
(4.0)
112.0±0.3
120.0±0.3
72.0±0.3
(4.0)
4-Φ3.0
Pad Φ5.6

J4
20 1 J1_20PLVDS
40 1 J2_1280800N
J3_SBC84833
A CN2 K
JP
ON OFF
Pw1
P J1
19 1
HDMI1
JP6

15.3±0.3
12.6±0.3
1.8
1.6±0.3
8.4±0.3
9.6±0.3

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	6-15-18	JED

6. Photo