SPECIFICATIONS FOR LCD MODULE

Customer	
Customer part no.	
Ampire part no.	**AM-1024600YATZQW-TA6H**
Approved by	
Date	

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

Approved by	Checked by	Organized by
Patrick	Mark	Tank

*This specification is subject to change without notice.

Intelligent Display Solutions, Unit 2, Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire, RG19 4EW
Telephone : +44 (0)1635 294600 Fax : +44 (0)1635 869200 Email: info@i-lcd.com
www.i-lcd.com A division of Intelligent Group Solutions Ltd

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2020/08/10	--	New Release	Tank

Intelligent Display Solutions, Unit 2, Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire, RG19 4EW
Telephone : +44 (0)1635 294600 Fax : +44 (0)1635 869200 Email: info@i-lcd.com
www.i-lcd.com A division of Intelligent Group Solutions Ltd

1. Features

This module is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This TFT LCD has a 9.0 (16:9) inch diagonally measured active display area with WSVGA (1024 horizontal by 600 vertical pixel) resolution.

(1) 9 (16:9 diagonal) inch configuration.
(2) 16.2M color by 6bit + FRC.
(3) ROHS design.
(4) HDMI Board
(5) Projective Capacitive Touch

a. Interface : USB
b. Touch Controller: EXC3132 + EXC5440

2. PHYSICAL SPECIFICATIONS

Item	Specifications	unit
LCD size	9 inch (Diagonal)	
Resolution	1024 (RGB) x 600	dot
Dot pitch	0.192(W) x 0.19025(H)	mm
Active area	196.608(W) x 114.15(H)	mm
Module size	211.1(W) x 126.5(H) x 11.8(D)	mm
Display Mode	Normally Black	
Color arrangement	RGB Vertical stripe	
interface	LVDS	
Brightness	425	cd/m^2

3. ABSOLUTE MAX. RATINGS

Item	Symbol	Values		UNIT	Note
		Min.	Max.		
Power Consumption	Logic System	--	0.7	W	
	B/L System	--	3.25		
Operation temperature	TOP	-20	70	℃	
Storage temperature	TST	-30	80	℃	

4. ELECTRICAL CHARACTERISTICS

4-1 Typical Operation Conditions

Typical operating conditions (GND=0V)

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Power supply		V_{DD}	3.0	3.3	3.6	V	
Input Voltage for logic	H Level	V_{IH}	0.7 V_{DD}	--	V_{DD}	V	Note 1
	L Level	V_{IL}	0	--	0.3 V_{DD}	V	
Power Supply current		I_{DD}		23		mA	Note 2

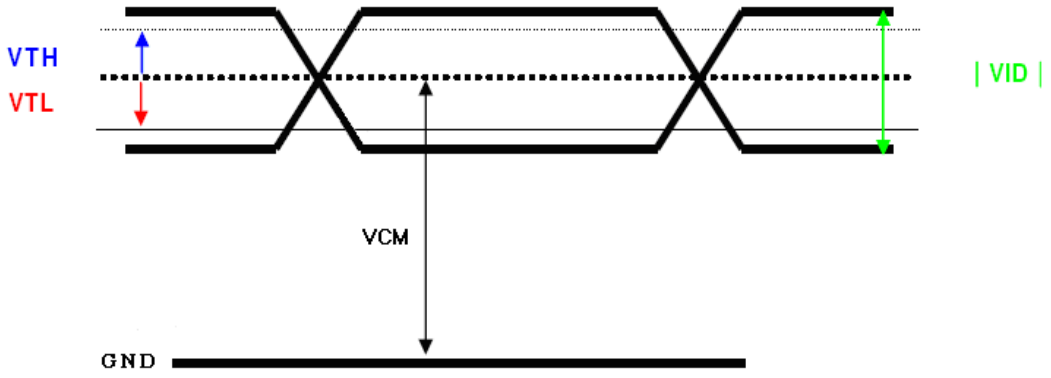
Note1: SELB , U/D, L/R

Note2: TFT power supply current.

V_{DD}=3.3, f_V =60Hz, Ta=25℃, Display pattern: All White

Switching Characteristics of LVDS Receiver

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential Input High Threshold	VTH	--	--	100	mV	VCM=1.2V
Differential Input Low Threshold	VTL	-100	--	--	mV	
Input current	IIN	-10	--	+10	uA	
Differential input Voltage	|VID|	0.2	--	0.6	V	
Common Mode Voltage Offset	VCM	$\frac{\|VID\|}{2}$	1.25	2.4-$\frac{\|VID\|}{2}$	V	



Intelligent Display Solutions, Unit 2, Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire, RG19 4EW
Telephone : +44 (0)1635 294600 Fax : +44 (0)1635 869200 Email: info@i-lcd.com
www.i-lcd.com A division of Intelligent Group Solutions Ltd

4-2 LED Driving Conditions

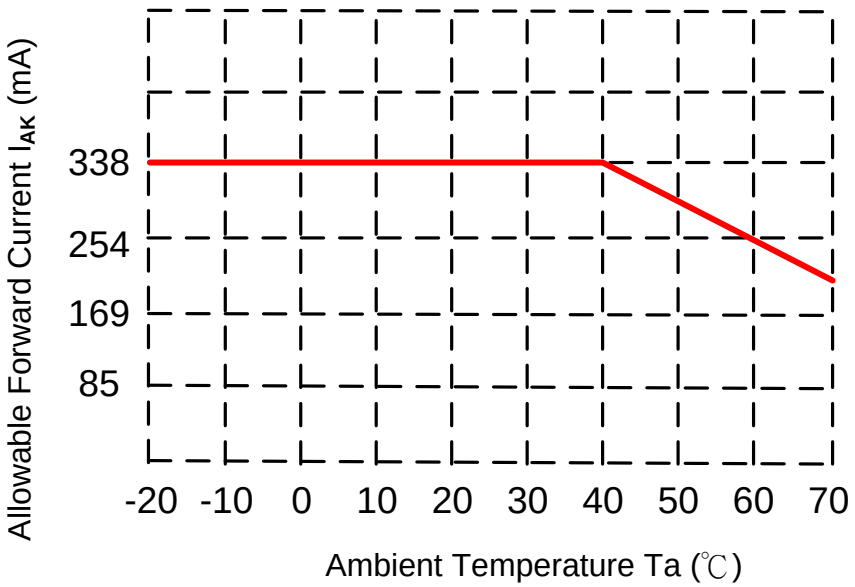
Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
LED Driver Power Voltage	V_{LED}	-	5	-	V	
LED Driver Current Consumption	I_{LED}	--	865	--	mA	VLED=5V ADJ=5V (duty 100%)
ADJ Input Voltage	V_{ADJ}	1.2	--	V_{LED}	V	duty=100% Note(3)
ADJ Frequency	F_{ADJ}	100	200	500	Hz	
ADJ Duty cycle		5		100	%	
LED Voltage	V_F	--	9	9.6	V	Ta=25℃
LED forward Current	I_{AK}	--	338	--	mA	

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℃

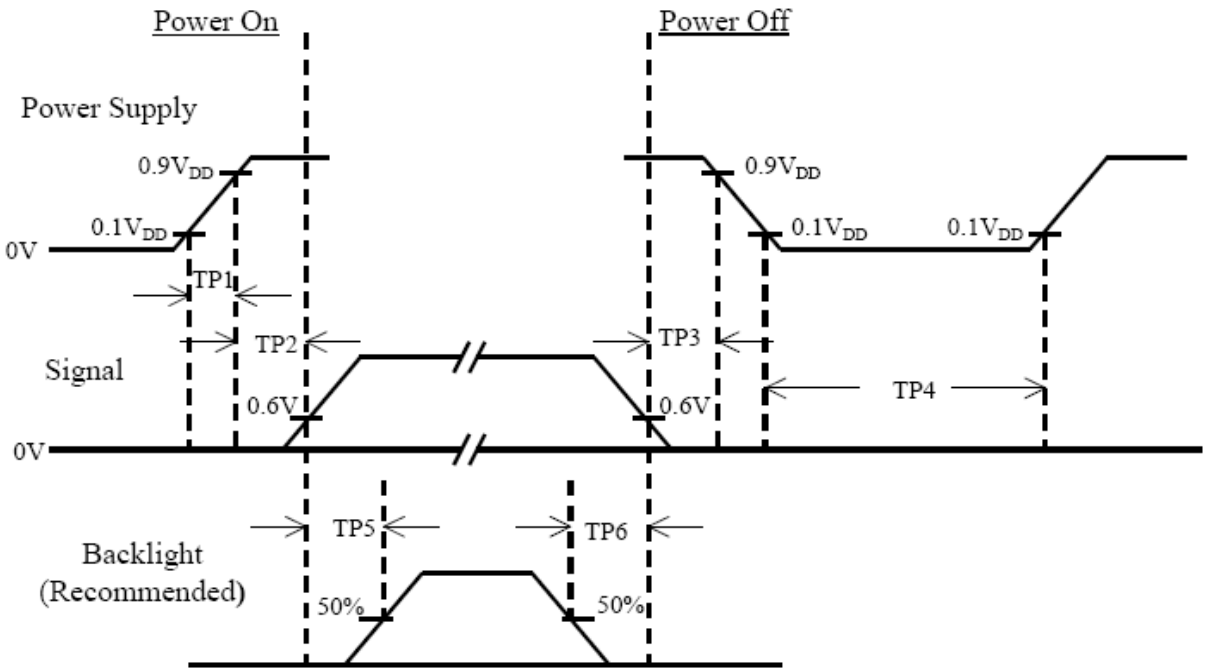
Note (3) VLEDADJ is PWM signal input. It is for brightness control.

Please use ADJ to reduce the $I_{AK,}$ when operated over 40℃ ambient temperature.



Intelligent Display Solutions, Unit 2, Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire, RG19 4EW
Telephone : +44 (0)1635 294600 Fax : +44 (0)1635 869200 Email: info@i-lcd.com
www.i-lcd.com A division of Intelligent Group Solutions Ltd

4-3 Power Sequence



Item	Min.	Typ.	Max.	Unit	Remark
TP1	0.5	--	10	msec	
TP2	0	--	50	msec	
TP3	0	--	50	msec	
TP4	500	--	--	msec	
TP5	200	--	--	msec	
TP6	200	--	--	msec	

Note：

(1) The supply voltage of the external system for the module input should be the same as the definition of VDD.

(2) Apply the lamp voltage within the LCD operation range. When the back-light turns on before the LCD operation or the LCD turns off before the back-light turns off, the display may momentarily become white.

(3) In case of VDD = off level, please keep the level of input signal on the low or keep a high impedance.

(4) TP4 should be measured after the module has been fully discharged between power off and on period.

(5) Interface signal shall not be kept at high impedance when the power is on.

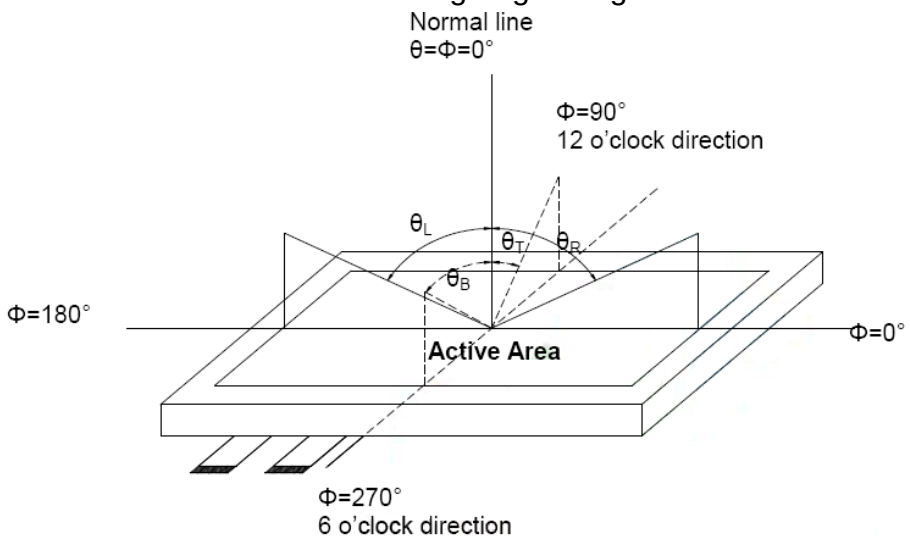
5. Optical Specifications

Item	Symbol	Condition	Values			Unit	Note
			Min.	Typ.	Max.		
Viewing angle (CR≧10)	θ L	Φ = 180° (9 o'clock)	75	85	--	degree	Note1
	θ R	Φ = 0° (3 o'clock)	75	85	--		
	θ T	Φ = 90° (12 o'clock)	75	85	--		
	θ B	Φ = 270° (6 o'clock)	75	85	--		
Response time	TON	Normal θ =Φ=0°	--	18	--	msec	Note3
	TOFF		--	17	--	msec	
Contrast ratio	CR		640	800	--	--	Note4
Color chromaticity	WX		0.260	0.310	0.360	--	Note5 Note6
	WY		0.280	0.330	0.380	--	
Luminance	L		340	425	--	cd/m^2	Note6

Test Conditions:

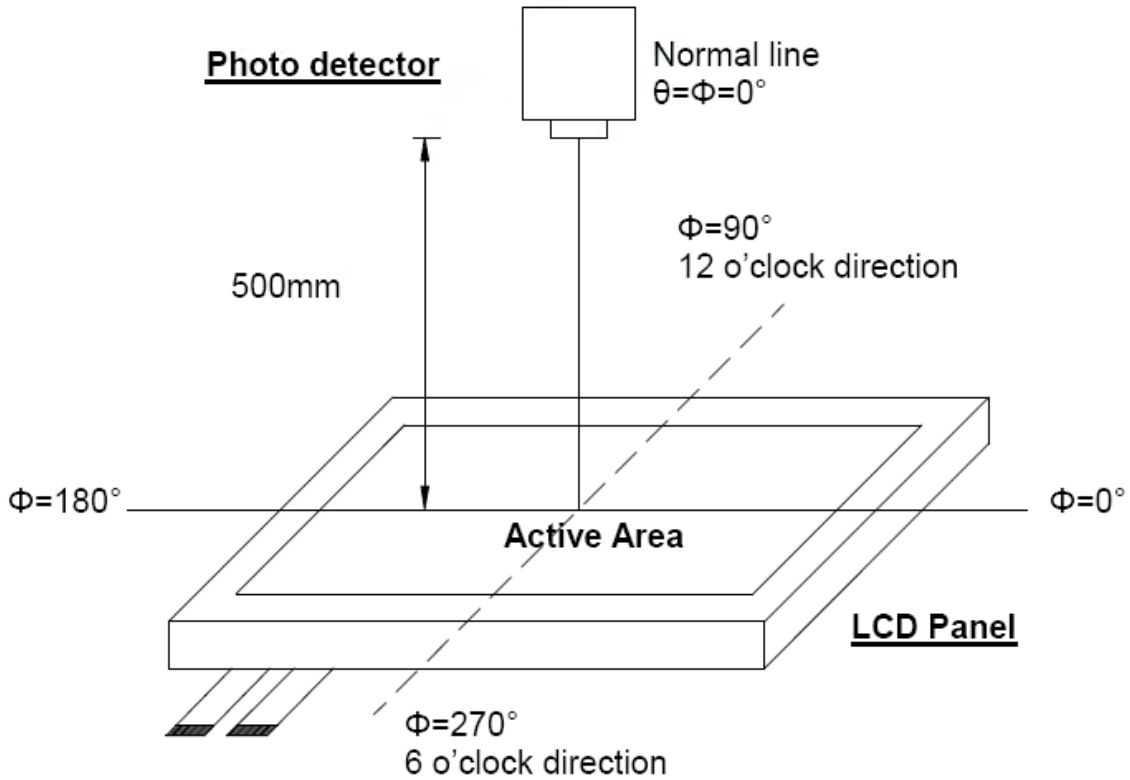
1. VCC = 3.3V, I_L = 338mA (Backlight current), the ambient temperature is 25℃.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range



Note 2 : Definition of optical measurement system.

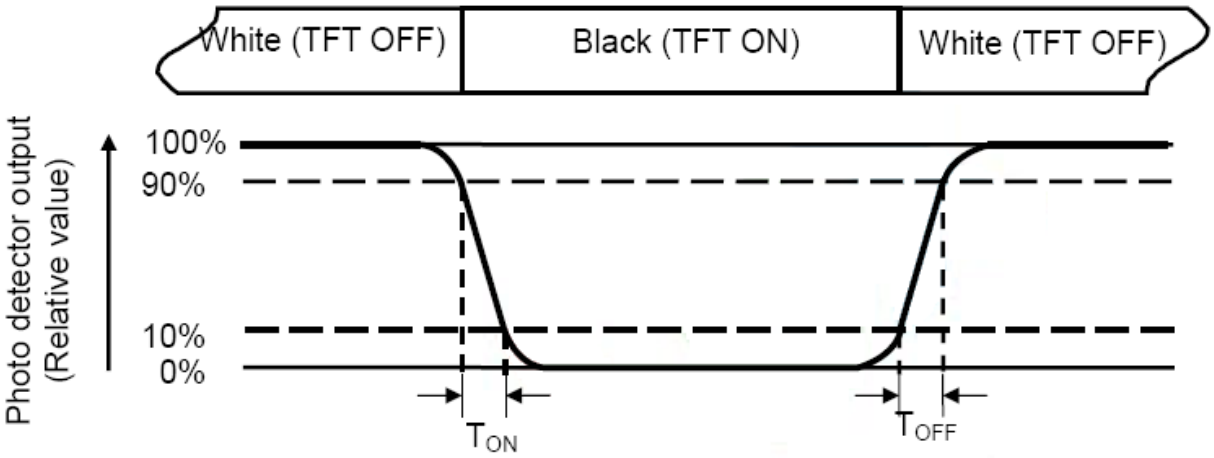
The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view : 1° / Height : 500mm.)



Note 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 (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



Note 4 : Definition of contrast ratio

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

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.

6. INTERFACE

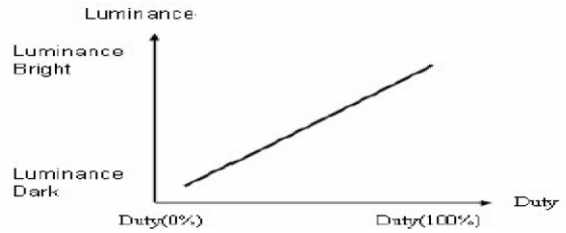
Electrical Interface Connection

CN1(Input signal): CSTAR DS100-430-H23 (equivalent JAE FI-XB30SSRL-HF16)

Pin No.	Symbol	Description	Note
1	GND	Ground	
2	VDD	3.3V Power	
3	VDD	3.3V Power	
4	NC	No connection	
5	ADJ	LED PWM	Note*
6	NC	No connection	
7	NC	No connection	
8	RXIN0-	LVDS Signal - channel0-	
9	RXIN0+	LVDS Signal+ channel0+	
10	GND	Ground	
11	RXIN1-	Data Input channel1-	
12	RXIN1+	Data Input channel1+	
13	GND	Ground	
14	RXIN2-	Data Input channel2-	
15	RXIN2+	Data Input channel2+	
16	GND	Ground	
17	RXCLKIN-	Data Input CLK-	
18	RXCLKIN+	Data Input CLK+	
19	GND	Ground	
20	RXIN3-	Data Input channel3-	
21	RXIN3+	Data Input channel3+	
22	GND	Ground	
23	GND	Ground	
24	VLED	VLED Power +5V	
25	VLED	VLED Power +5V	
26	VLED	VLED Power +5V	

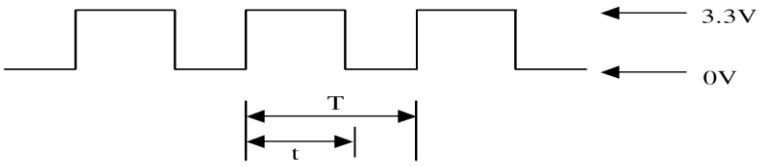
27	SELB	LVDS Interface Select PIN SELB = “0”, 24BIT LVDS SELB = “1”, 18BIT LVDS	Note3
28	U/D	Vertical inversion	Note2
29	L/R	Horizontal inversion	Note2
30	LED_ON	LED Enable Pin：High→Enable	

[Note]
(1) ADJ can adjust brightness to control Pin. Pulse duty the bigger the brighter.



(2) ADJ Signal=0~3.3V，Operation Frequency：

Dimming Range		
PWM Frequency (F)	Duty Cycle (Min.)	Duty Cycle (Max.)
100Hz < F < 500Hz	5%	100%
500Hz < F < 20KHz	10%	100%



Duty Cycle = t / T *100%

Note2：When L/R=″0″, set right to left scan direction.
When L/R=″1″, set left to right scan direction.
When U/D=″0″, set top to bottom scan direction.
When U/D=″1″, set bottom to top scan direction.

Note3：If LVDS input data is 6 bits, SELB must be set to High;
If LVDS input data is 8 bits, SELB must be set to Low.

7. TIMING CHARACTERISTICS

7-1 Electrical Characteristics

TFT LCD Module

Item	Symbol	Values			UNIT	Note
		Min.	Typ.	Max.		
Supply Voltage	VDD	3.0	3.3	3.6	V	
Input signal voltage	ViH	0.7VDD	--	VDD	V	
	ViL	0	--	0.3VDD	V	
Current of power supply	IDD	--	23	--	mA	**VDD=3.3V**

Switching Characteristics for LVDS Receiver

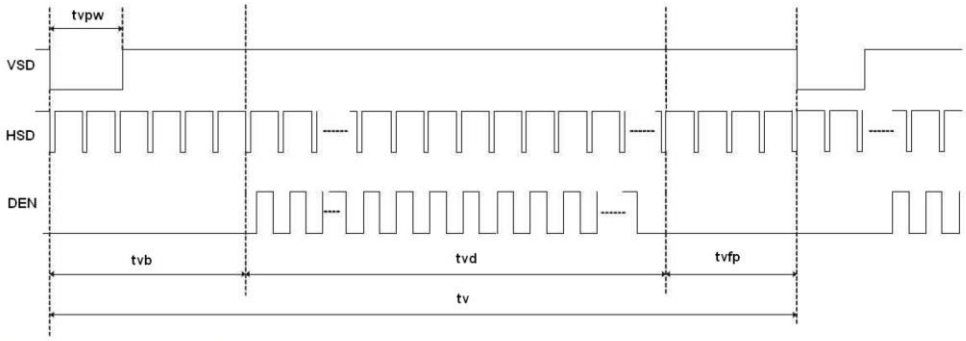
Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	Vth	—	—	100	mV	V_{CM}=1.2V
Differential Input Low Threshold	Vtl	-100	—	—	mV	
Input Current	I_{IN}	-10	—	+10	uA	
Differential input Voltage	$\|V_{ID}\|$	0.1	—	0.6	V	
Common Mode Voltage Offset	V_{CM}	0.7	1.2	1.6	V	

7-3 Timing(DE MODE)

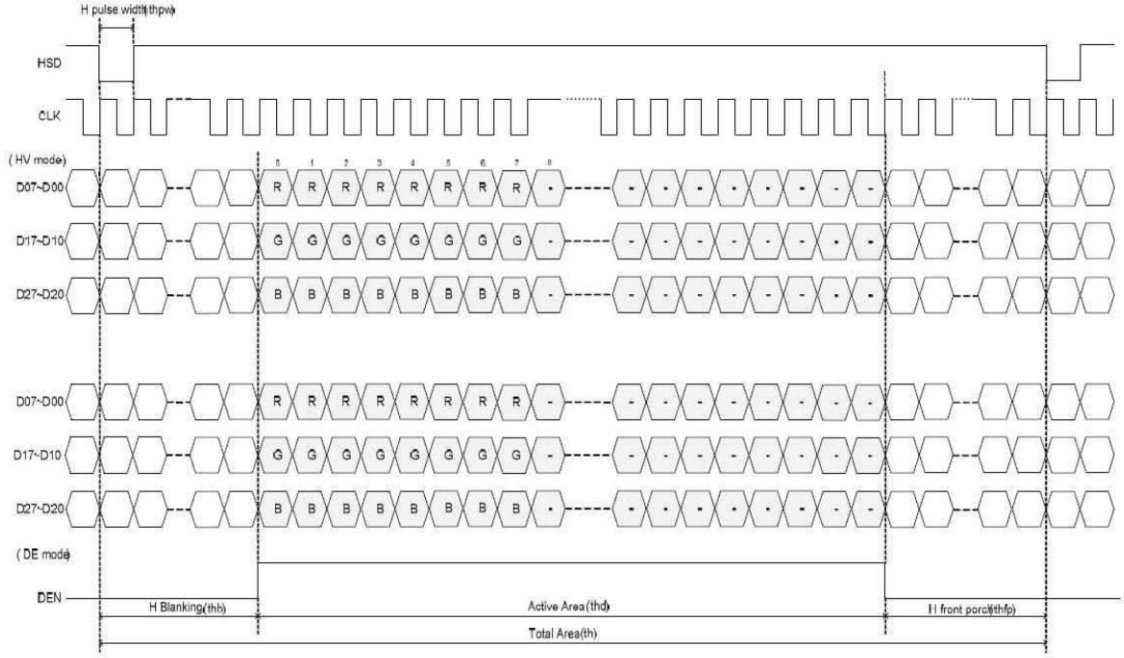
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd		1024		DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

Timing Diagram of Interface Signal (DE mode)

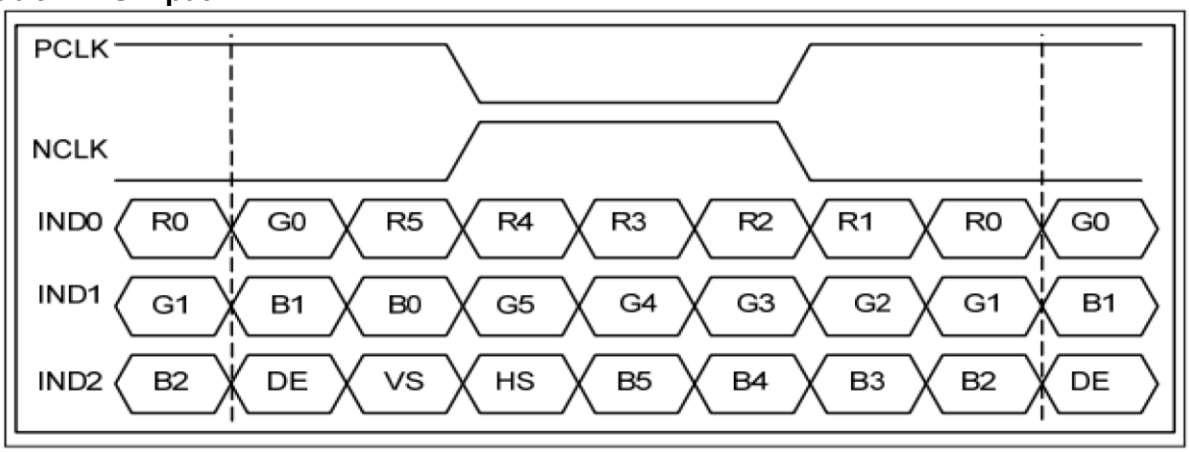
(1) Vertical input timing



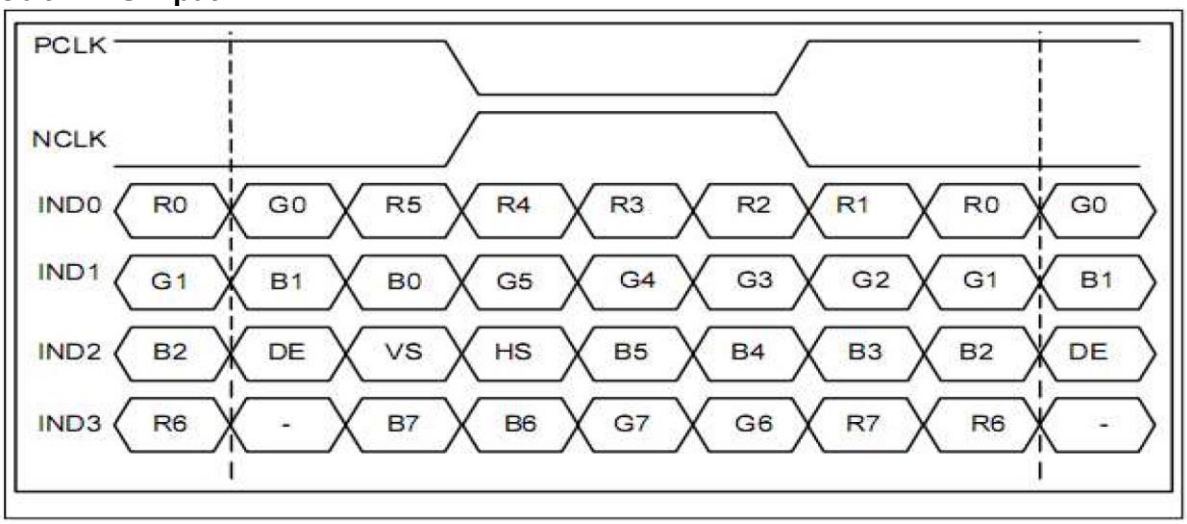
(2) Horizontal Vertical input timing



6bit LVDS input



8bit LVDS input



8. Touch Panel

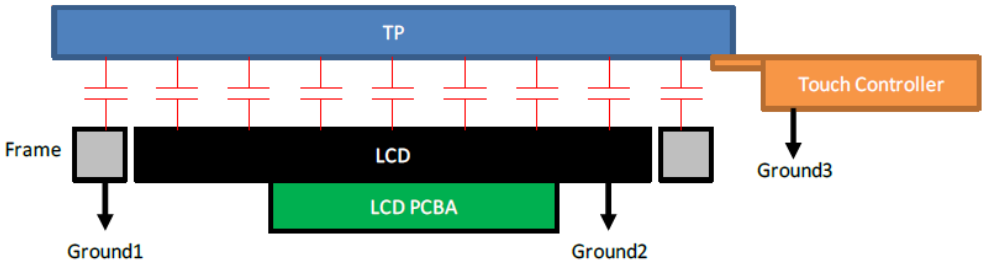
8.1 Basic Characteristic

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. 80 points/sec
Control IC	**EETI EXC3132 +EX5440**
Conductive Susceptibility	10V

8.2 Interface

CN6		
Pin No.	**Symbol**	**Function**
1	VCC	USB POWER 5V
2	D+	USB Data+
3	D-	USB Data-
4	Reserve	Not Connect
5	DGND	USB POWER GND
6	DGND	USB POWER GND

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

8. RELIABILITY TEST CONDITIONS

Test Item	Test Conditions	Note
High Temperature Operation	70±3°C ,Dry t=240 hrs	
Low Temperature Operation	-20±3°C, Dry t=240 hrs	
High Temperature Storage	80±3°C , Dry t=240 hrs	1,2
Low Temperature Storage	-30±3°C ,Dry t=240 hrs	1,2
Thermal Shock Test	-20°C ~ 25°C ~ 70°C 30 m in. 5 min. 30 min. (1 cycle) Total 100 cycle(Dry)	1,2
Storage Humidity Test	60 °C, Humidity 90%, 240 hrs	1,2

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

Note(2) The module should be inspired after 1 hour storage in normal conditions (15~35℃, 45~65%RH).

Note(3) The module shouldn't be tested over one condition, and all the tests are independent.

Note(4) All reliability tests should be done without the protective film.

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 initial value.

9. USE PRECAUTIONS

9-1 Handling precautions

(1) The polarizing plate may break easily so be careful when handling it. Do not touch, press or rub it with a hard-material tool like tweezers.

(2) Do not touch the polarizing plate surface with bare hands so as not to make it dirty. If the surface or other related part of the polarizing plate is dirty, soak a soft cotton cloth or chamois leather in benzine and wipe off with it. Do not use chemical liquids such as acetone, toluene and isopropyl alcohol. Failure to do so may bring chemical reaction phenomena and deteriorations.

(3) Remove any spit or water immediately. If it is left for hours, the suffered part may deform or decolorize.

(1) If the LCD element breaks and any LC stuff leaks, do not suck or lick it. Also if LC stuff is stuck on your skin or clothing, wash thoroughly with soap and water immediately.

9-2 Installing precautions

(1) The PCB has many ICs that may be damaged easily by static electricity. To prevent breaking by static electricity from the human body and clothing, earth the human body properly using the high resistance and discharge static electricity during the operation. In this case, however, the resistance value should be approx. 1MΩ and the resistance should be placed near the human body rather than the ground surface. When the indoor space is dry, static electricity may occur easily so be careful. We recommend the indoor space should be kept with humidity of 60% or more. When a soldering iron or other similar tool is used for assembly, be sure to earth it.

(2) When installing the module and ICs, do not bend or twist them. Failure to do so may crack LC element and cause circuit failure.

(3) To protect LC element, especially polarizing plate, use a transparent protective plate (e.g., acrylic plate, glass etc) for the product case.

(4) Do not use an adhesive like a both-side adhesive tape to make LCD surface (polarizing plate) and product case stick together. Failure to do so may cause the polarizing plate to peel off

9-3 Storage precautions

(1) Avoid a high temperature and humidity area. Keep the temperature between 0°C and 35°C and also the humidity under 60%.

(2) Choose the dark spaces where the product is not exposed to direct sunlight or fluorescent light.

(3) Store the products as they are put in the boxes provided from us or in the same conditions as we recommend.

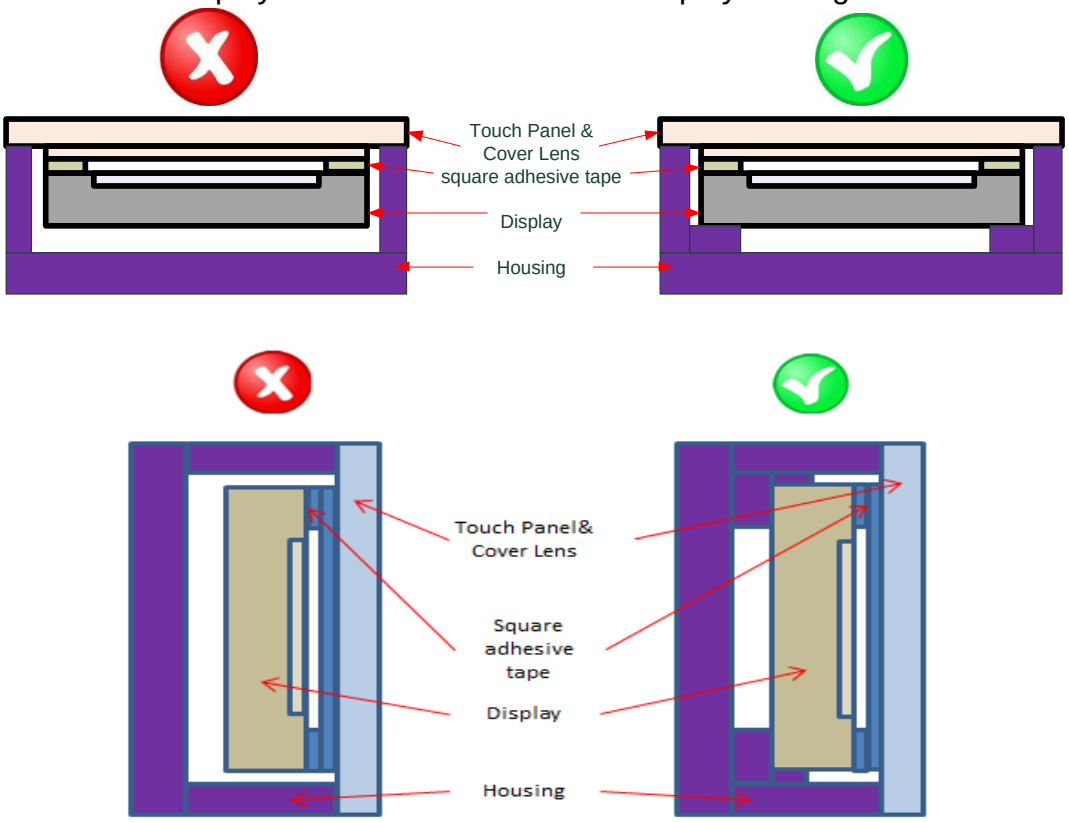
9-4 Operating precautions

(1) Do not boost the applied drive voltage abnormally. Failure to do so may break ICs. When applying power voltage, check the electrical features beforehand and be careful. Always turn off the power to the LC module controller before removing or inserting the LC module input connector. If the input connector is removed or inserted while the power is turned on, the LC module internal circuit may break.
(2) The display response may be late if the operating temperature is under the normal standard, and the display may be out of order if it is above the normal standard. But this is not a failure; this will be restored if it is within the normal standard.
(3) The LCD contrast varies depending on the visual angle, ambient temperature, power voltage etc. Obtain the optimum contrast by adjusting the LC dive voltage.
(4) When carrying out the test, do not take the module out of the low-temperature space suddenly. Failure to do so will cause the module condensing, leading to malfunctions.
(5) Make certain that each signal noise level is within the standard (L level: 0.2Vdd or less and H level: 0.8Vdd or more) even if the module has functioned properly. If it is beyond the standard, the module may often malfunction. In addition, always connect the module when making noise level measurements.
(6) The CMOS ICs are incorporated in the module and the pull-up and pull-down function is not adopted for the input so avoid putting the input signal open while the power is ON.
(7) The characteristic of the semiconductor element changes when it is exposed to light emissions, therefore ICs on the LCD may malfunction if they receive light emissions. To prevent these malfunctions, design and assemble ICs so that they are shielded from light emissions.
(8) Crosstalk occurs because of characteristics of the LCD. In general, crosstalk occurs when the regularized display is maintained. Also, crosstalk is affected by the LC drive voltage. Design the contents of the display, considering crosstalk.

9-5 Mechanism

(1) Please mount LCD module by using mounting holes arranged in four corners tightly.

(2) 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.



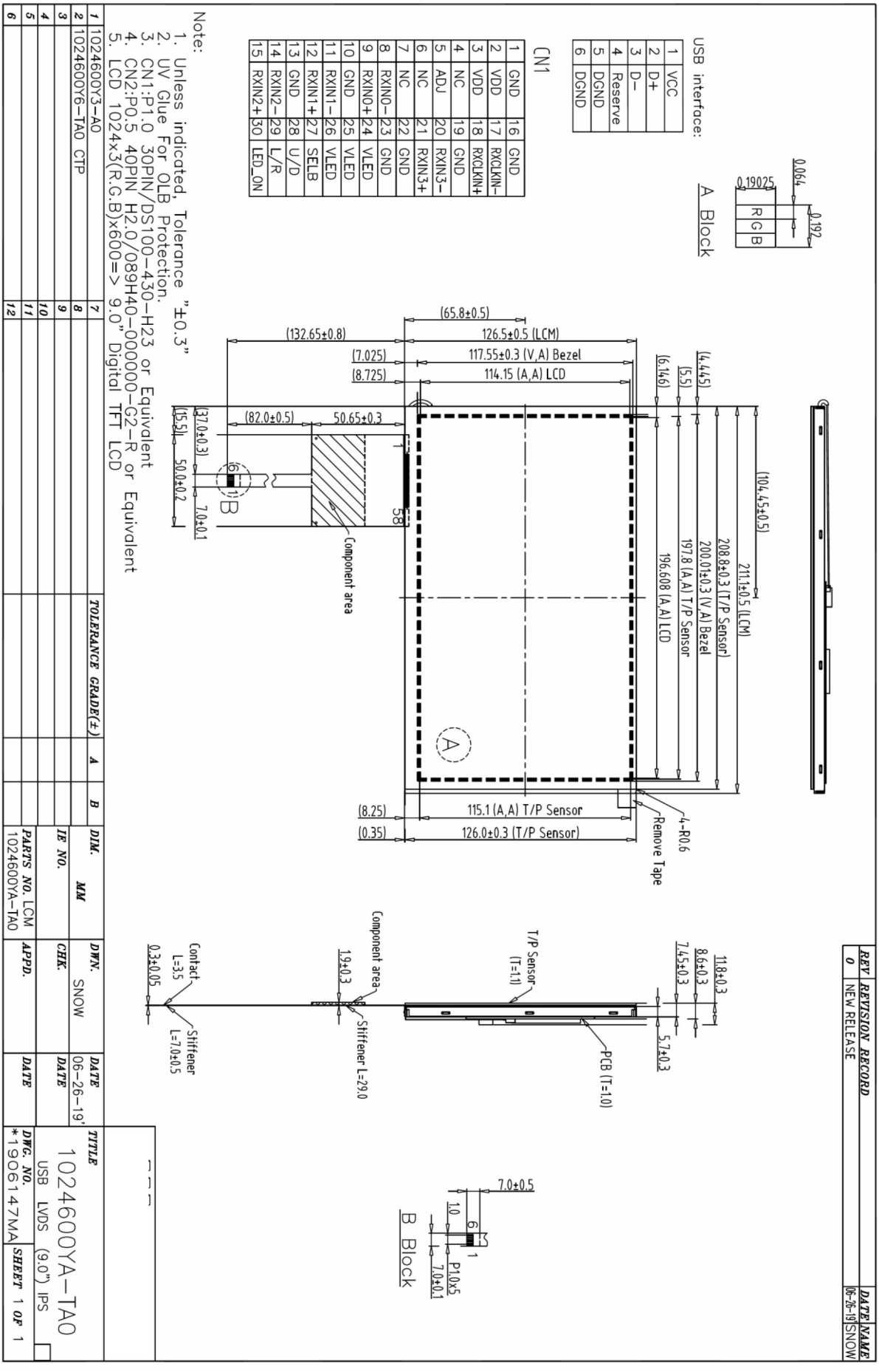
9-6 Other

(1) Do not disassemble or take the LC module into pieces. The LC modules once disassembled or taken into pieces are not the guarantee articles.

(2) 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.

(3) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

10. OUTLINE DIMENSION



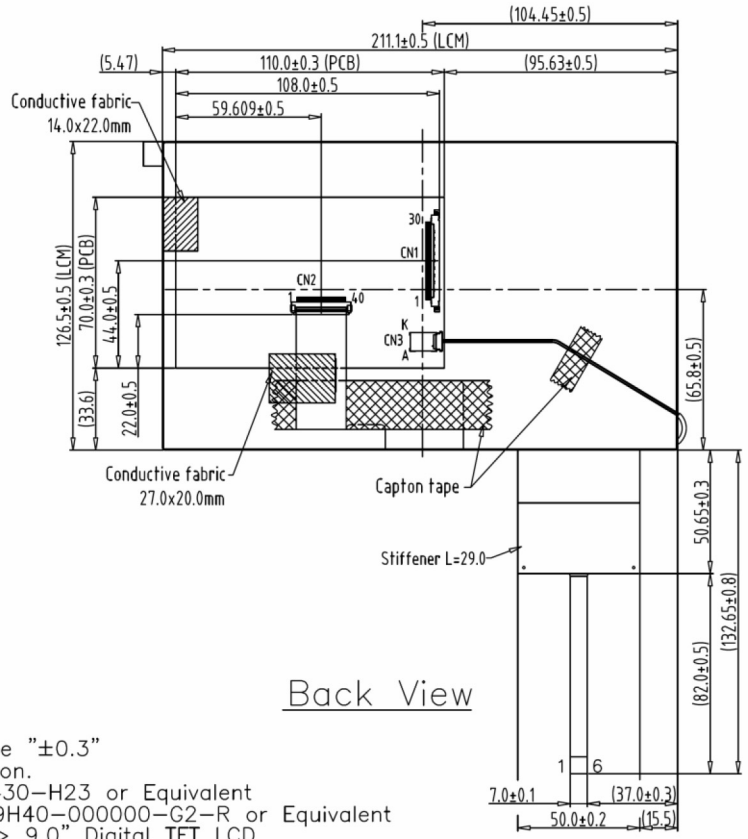
REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	06-26-19'	SNOW

USB interface:

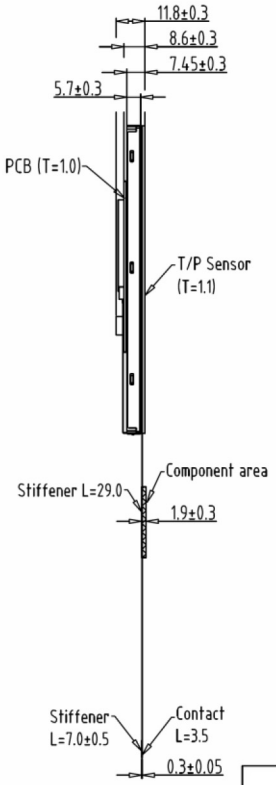
1	VCC
2	D+
3	D−
4	Reserve
5	DGND
6	DGND

CN1

1	GND	16	GND
2	VDD	17	RXCLKIN−
3	VDD	18	RXCLKIN+
4	NC	19	GND
5	ADJ	20	RXIN3−
6	NC	21	RXIN3+
7	NC	22	GND
8	RXIN0−	23	GND
9	RXIN0+	24	VLED
10	GND	25	VLED
11	RXIN1−	26	VLED
12	RXIN1+	27	SELB
13	GND	28	U/D
14	RXIN2−	29	L/R
15	RXIN2+	30	LED_ON



Back View



Note:
1. Unless indicated, Tolerance "±0.3"
2. UV Glue For OLB Protection.
3. CN1:P1.0 30PIN/DS100−430−H23 or Equivalent
4. CN2:P0.5 40PIN H2.0/089H40−000000−G2−R or Equivalent
5. LCD 1024x3(R.G.B)x600=> 9.0" Digital TFT LCD

1	1024600Y3−A0	7		TOLERANCE GRADE(±)	A	B	DIM. MM	DWN. SNOW	DATE 06−26−19'	TITLE 1024600YA−TA0
2	1024600Y6−TA0 CTP	8								USB LVDS (9.0") IPS
3		9					IE NO.	CHK.	DATE	
4		10								
5		11					PARTS NO. LCM−1 1024600YA−TA0	APPD.	DATE	DWG. NO. *1906148MA SHEET 1 OF 1
6		12								

Auxiliary

AMPIRE HDMI Board

REV.D

Intelligent Display Solutions, Unit 2, Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire, RG19 4EW
Telephone : +44 (0)1635 294600 Fax : +44 (0)1635 869200 Email: info@i-lcd.com
www.i-lcd.com A division of Intelligent Group Solutions Ltd

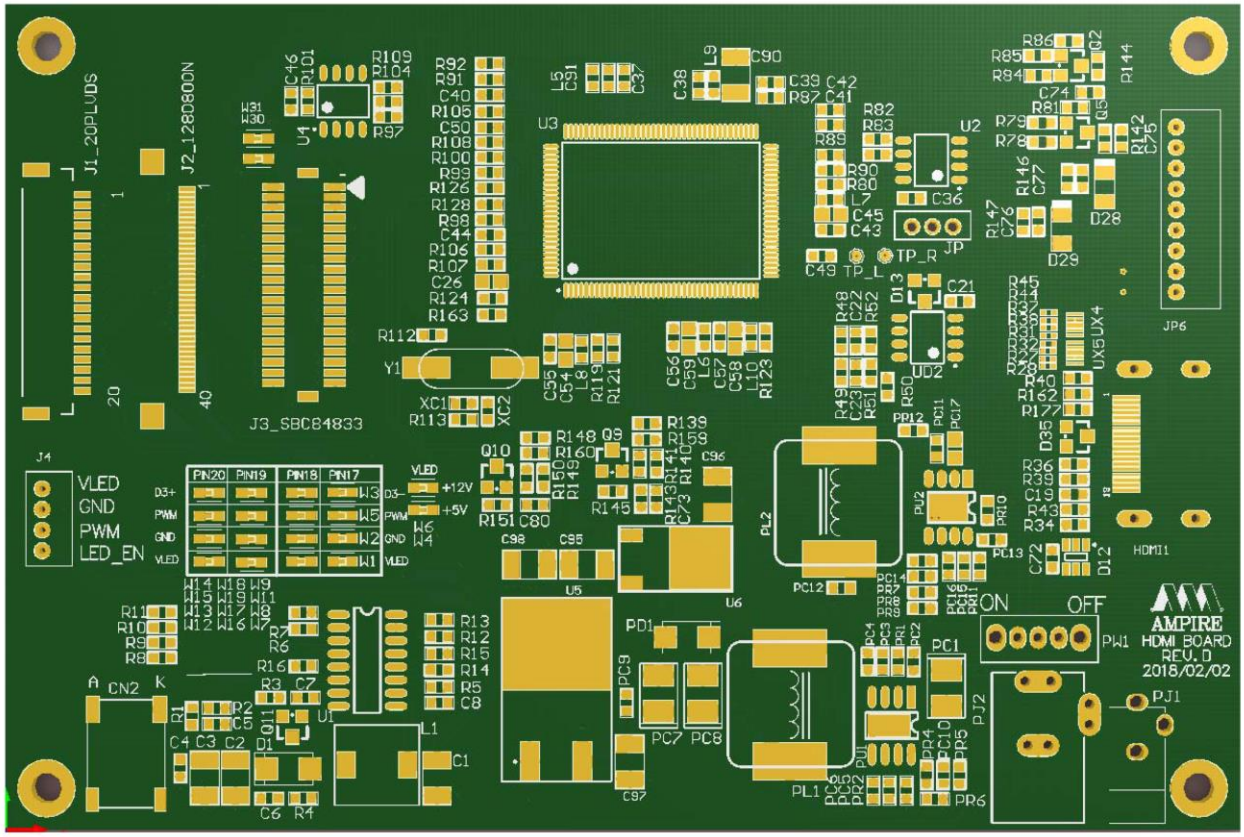
RECORD OF REVISION

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.



Intelligent Display Solutions, Unit 2, Berkshire Business Centre, Berkshire Drive, Thatcham, Berkshire, RG19 4EW
Telephone : +44 (0)1635 294600 Fax : +44 (0)1635 869200 Email: info@i-lcd.com
www.i-lcd.com A division of Intelligent Group Solutions Ltd

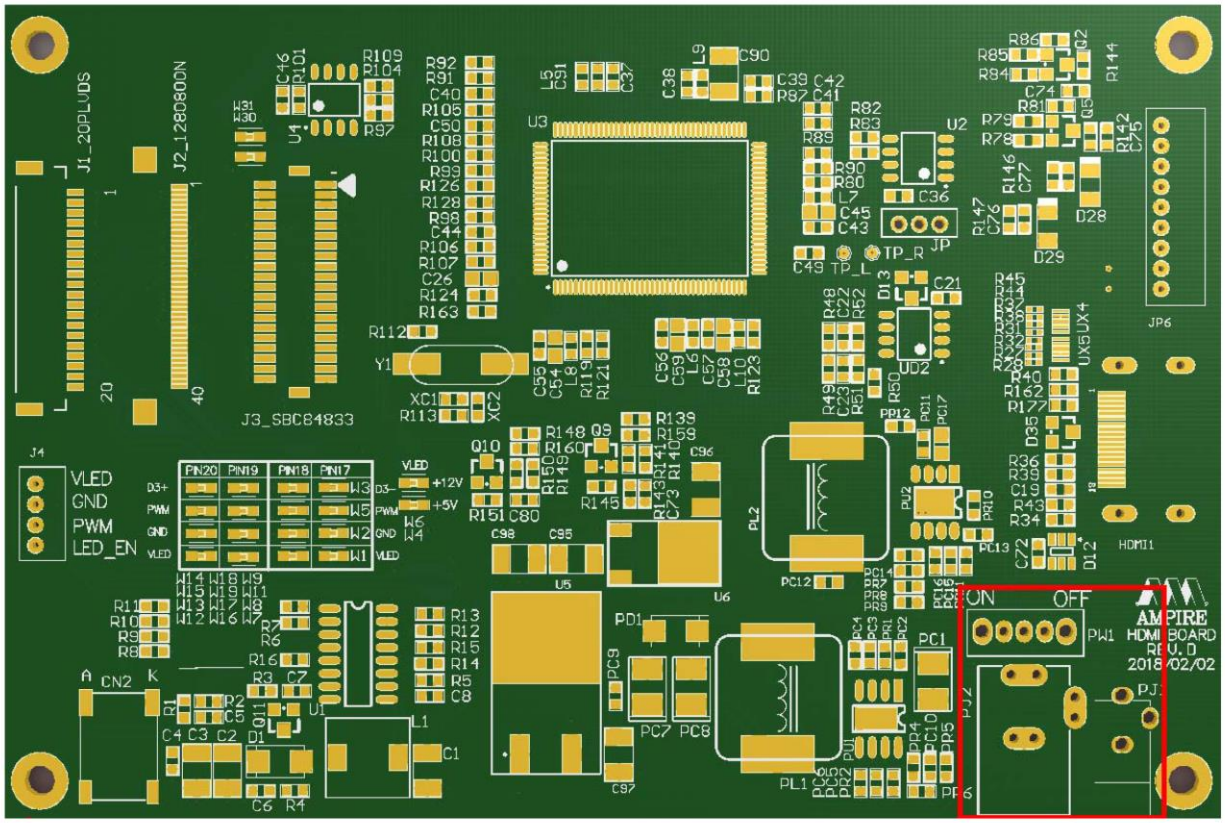
2. Support input video format :

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

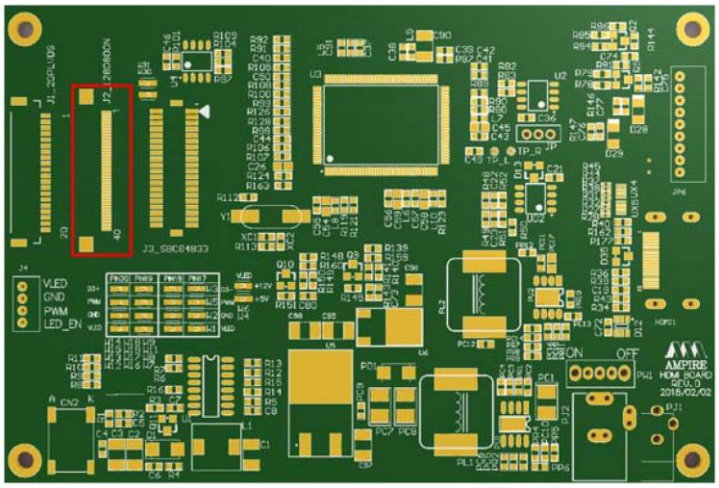
3.1 POWER CONNECTOR (PJ1、PJ2)

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



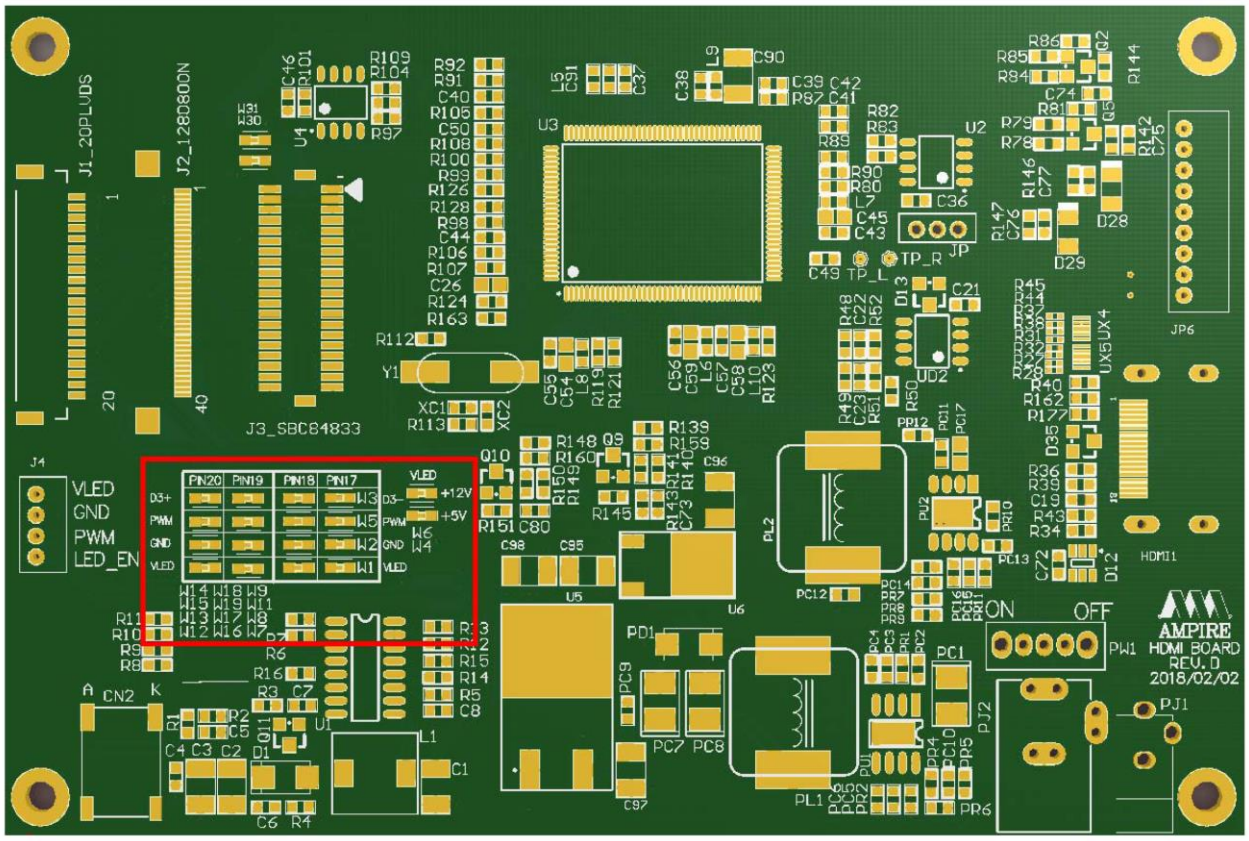
3.2 J2_40PIN LVDS

Pin #	Signal 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. (Keep NC or GND if not use.)	
36-40	NC	Not Connect	



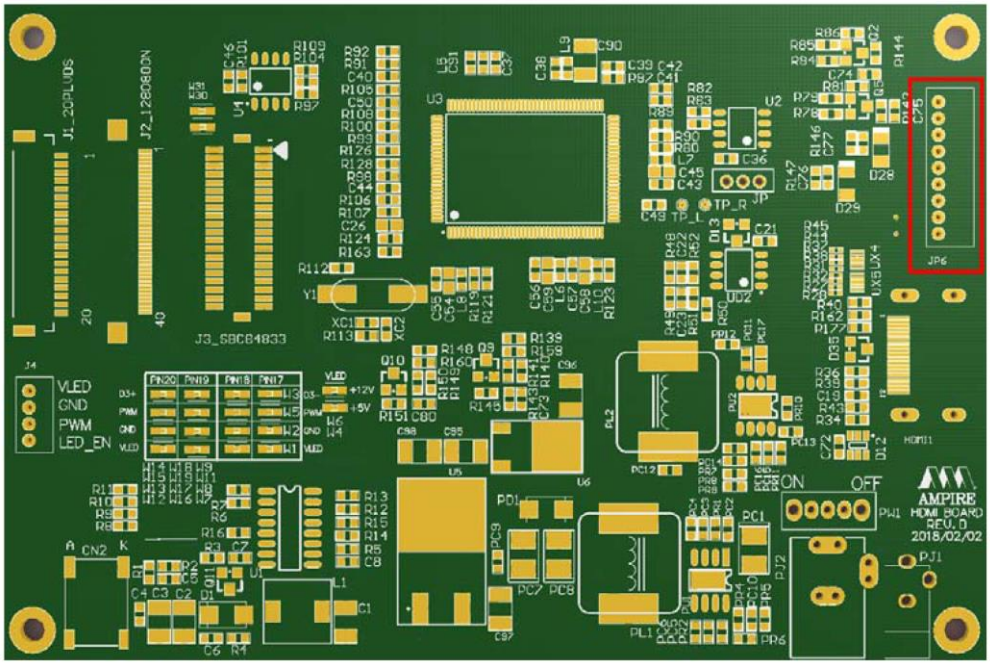
JUMP FOR PIN17,18,19 and VLED

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



3.3 JP6 Keypad connector for HDMI Board

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

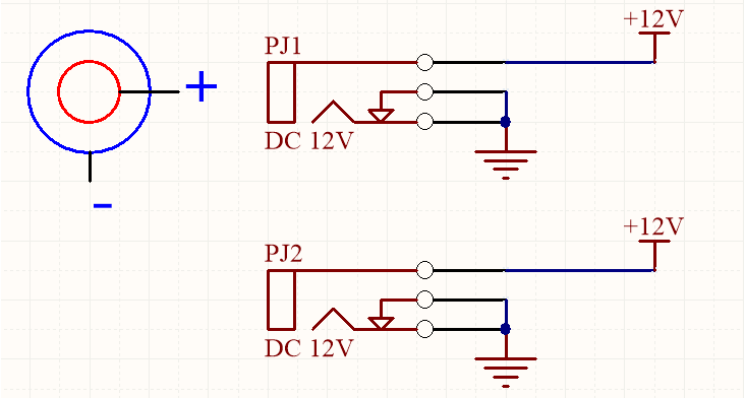


4. INTERFACE PIN CONNECTION

INTERFACE (HDMI Interface Board)

- **PJ1 & PJ2 Power Supply Power Jack:**

  Inner terminal is positive. Outer terminal is GND



- **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+		

5. RELIABILITY TEST CONDITIONS

Test Item	Test Conditions	Note
High Temperature Operation	70±3°C ,Dry t=240 hrs	
Low Temperature Operation	-20±3°C, Dry t=240 hrs	
High Temperature Storage	80±3°C , Dry t=240 hrs	1,2
Low Temperature Storage	-30±3°C ,Dry t=240 hrs	1,2
Thermal Shock Test	-20°C ~ 25°C ~ 70°C 30 m in. 5 min. 30 min. (1 cycle) Total 100 cycle(Dry)	1,2
Storage Humidity Test	60 °C, Humidity 90%, 240 hrs	1,2
Vibration Test (Packing)	Sweep frequency : 10 ~ 55 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis	2

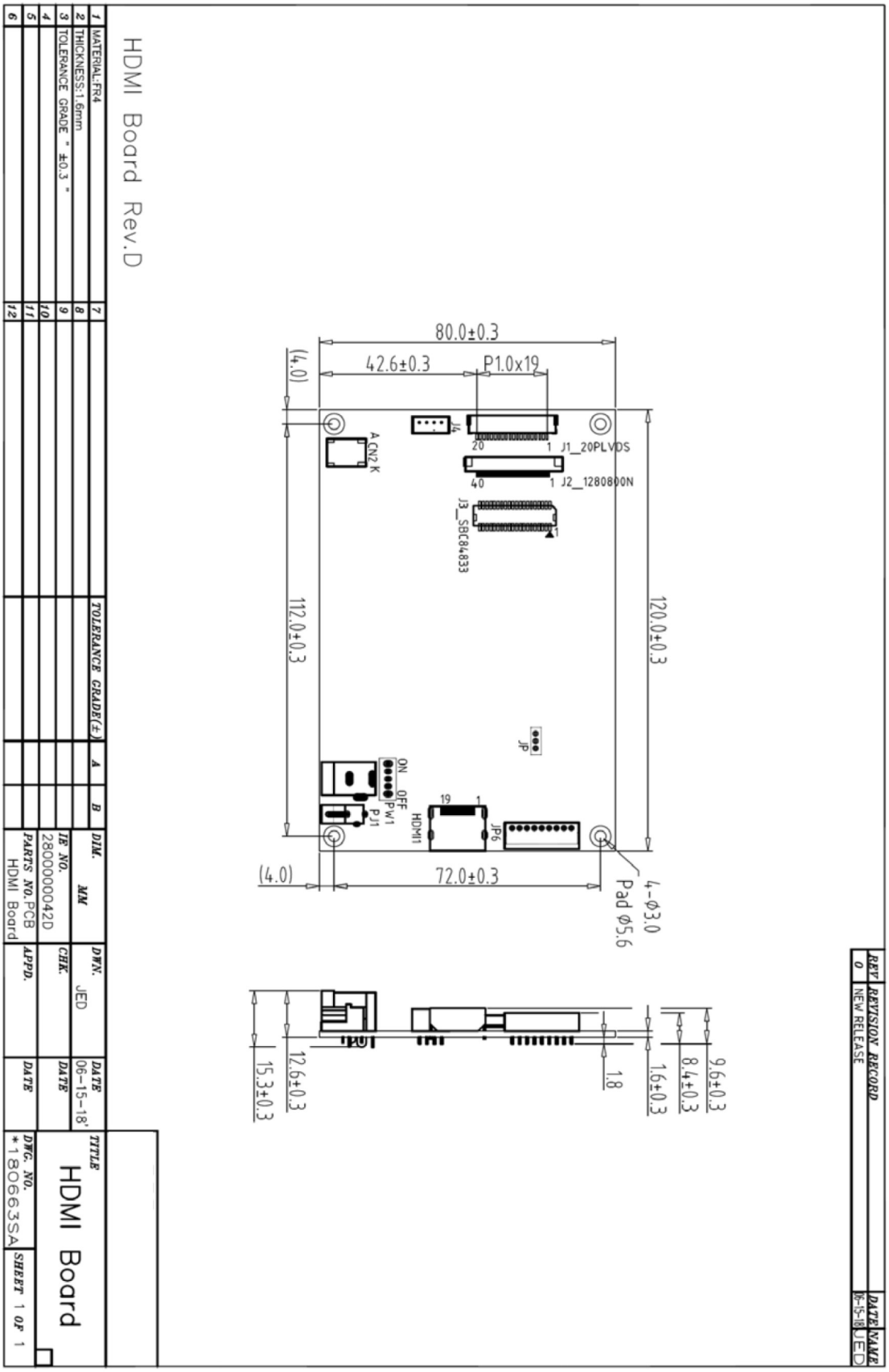
Note 1 : Condensation of water is not permitted on the module.

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

Definitions of life end point :

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.

6. Outline Dimension



7. Photo