Product Specification

PART NUMBER # REV: FLD-070DMLG2PU002#00

DESCRIPTION: TFT 7”w, 800(H)*480(V), LVDS,
Full View 500CD Assembled with Black Pcap USB

Customer Name:	
Signature:	**Date:**

PREPARED BY	**REVIEWED BY**
Sulley Yan	*David*

Revision History

Version	Date	Page	Description	Note
V1.0	2024/05/09		1st initial	

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1. GENERAL DESCRIPTION

1.1 Description

7 inch is a Color Active Matrix Liquid Crystal Display Module composed of a TFT LCD panel and LED backlight system. The screen format is intended to support the 800 x 480 screen.

1.2 Product Summary

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

No.	Item	Specification	Unit
1	Display Size	7”W	Inch
2	Pixel Number	800 (H) x 3(RGB)x 480 (V)	Pixels
3	Outline Dimension	180.40(H)×140.40(V)×14(D)	mm
4	Active Area	152.40 (H) x 91.44 (V)	mm
5	Pixel Pitch	0.1905(H) x 0.1905(V)	mm
6	Display Colors	8bit RGB	
7	Pixel Arrangement	RGB vertical stripe	-
8	Display Mode	Normally Black	-
9	Electrical Interface	LVDS	-
10	Surface Treatment	Glare	-
11	Brightness	500 (Typ.)	cd/m^2
12	Contrast Ratio	1000 (Typ.)	-
13	Power Supply Voltage	3.3V for LCD – 12V for Backlight	
14	Power Consumption	Backlight System: 2.16W (Typ.) Total: 2.66W (Typ.)	W

2. ABSOLUTE MAXIMUM RATING

2.1 Electrical Absolute Rating

Item	Symbol	Values			Unit	Note
		Min	Typ	Max		
Power Supply Voltage	V_{CC}	-0.3	-	4.5	V	GND=0

2.2 Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min	Typ	Max.		
Operating Temperature	Top	-30	-	+85	°C	
Storage Temperature	Tstg	-30	-	+85	°C	

Note (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

Note (2) Before cosmetic and function test, the product must have enough recovery time, at least 24 hours at room temperature.

Note (3) In the standard conditions, there is no function failure issue occurred. All the cosmetic specification is judged before reliability test.

Note (4) Ta =25±2°C

Note (5) Test Condition: LED current

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD Module

Item	Symbol	Values			Unit	Note
		Min	Typ	Max		
Power supply voltage	V_{CC}	3.0	3.3	3.6	V	GND=0
Power Current	I_{VCC}	-	150	200	mA	V_{CC}=3.3V
Input signal voltage	V_{IH}	0.7V_{CC}	-	V_{CC}	V	
	V_{IL}	GND	-	0.3V_{CC}	V	

3.2 Backlight Characteristics

Parameter guideline for LED driving is under stable conditions at 25℃ (Room Temperature):

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Backlight Forward Voltage	VLED	9.0	12.0	15.0	V	
Backlight Current	IL	-	180	-	mA	
PWM Signal Voltage_High	VPWM	1.6	-	-	V	
PWM Signal Voltage_Low		-	-	0.8	V	
PWM Duty Cycle		1	-	100	%	
PWM Frequency Dimming	DIM	100	-	8K	Hz	
BL Enable High Threshold	VBL_ENH	1.6	-	-	V	
BL Enable Low Threshold	VBL_ENL	0	-	0.8	V	
LED life time	Hr	50,000	-	-	Hrs	

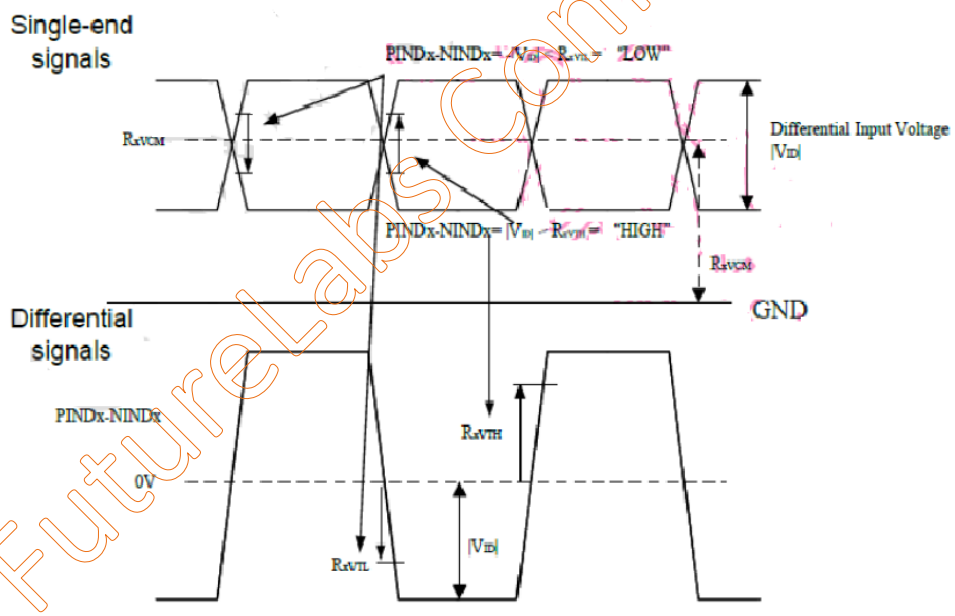
Note (1) Be sure to apply the power voltage as the power sequence spec.

Note (2) DGND=AGND=0V.

Note (3) Below 1% PWM brightness is at 0.

3.3 DC Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Note
Differential Input high Threshold voltage	RxvTH	-	-	0.2	V	RXVCM=1.2V
Differential Input Low Threshold voltage	RxvTL	-0.2	-	-	V	
Input voltage range(signaled-end)	RxVN	0.3	-	VDD-1.2	V	
Differential Input common Mode voltage	RxvcM	0.8	1.2	VDD-1.2-$\|V_{ID}\|/2$	V	
Differential Input voltage	$\|V_{ID}\|$	0.2	-	1	V	R_{XVCM}=1.2V
Differential Input Leakage Current	RVxliz	-10	-	+10	uA	
LVDS Digital Operating Current	IddIvds	-	TBD	TBD	mA	Fclk=61MHz,VDD=3.3V
LVDS Digital Stand-by Current	Istlvdds	-	TBD	TBD	uA	Clock & all functions are stopped

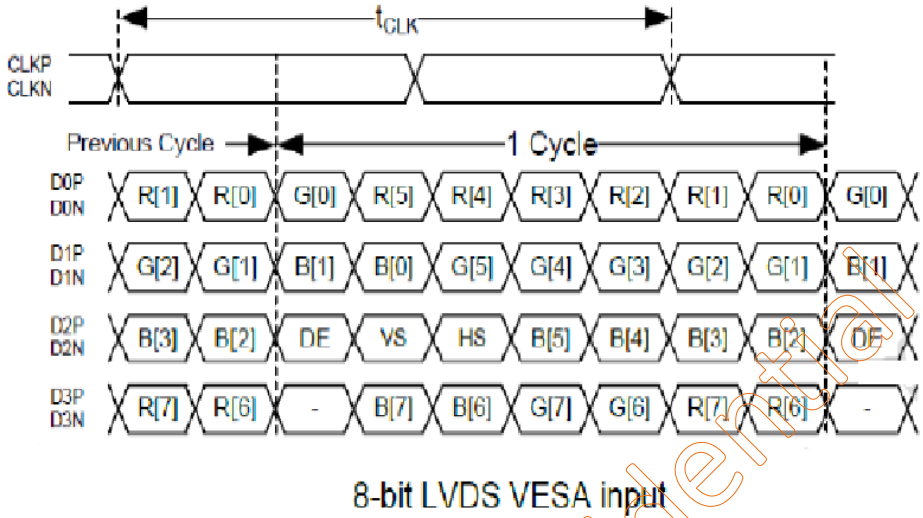


4. Signal Characteristic

4.1Timing Chart

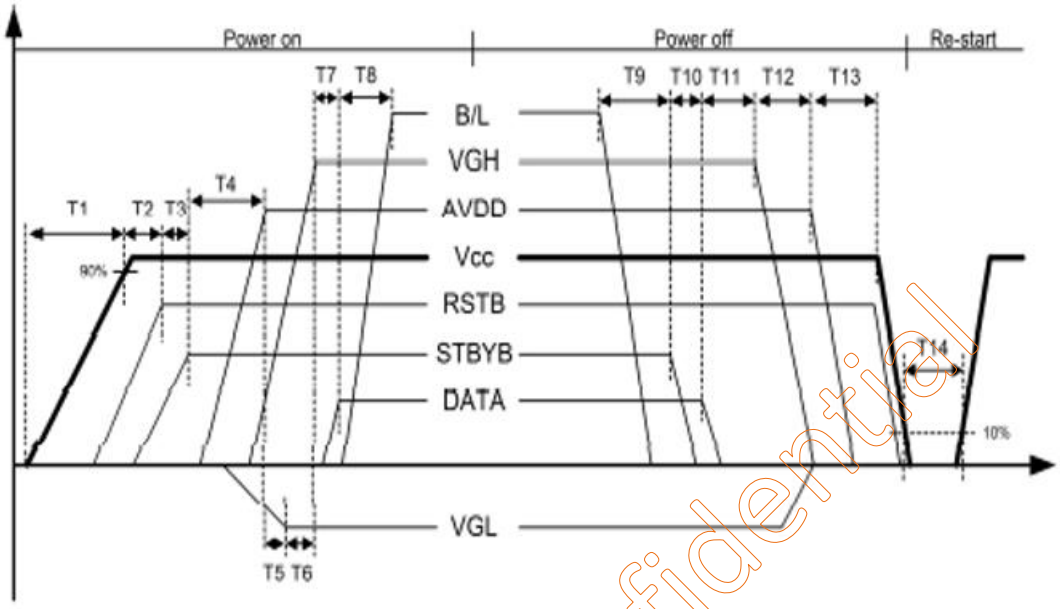
Item	Symbol	Min	Typ	Max	Unit	Note
DCLK cycle time	Tcph	20		220	ns	
DCLK pulse duty	Tcwh	35	50	65	%	
VSD setup time	Tvst	8			ns	
VSD hold time	Tvhd	8			ns	
HSD setup time	Thst	8			ns	
HSD hold time	Thhd	8			ns	
Data setup time	Tdsu	8			ns	
Data hold time	Tdhd	8			ns	
DE setup time	Tesu	8			ns	
DE hold time	Tehd	8			ns	
DCLK frequency	fclk	28	30	32	MHz	
Horizontal display area	thd		800		Tcph	
HSD period time	th	889	902	915	Tcph	
HSD pulse width	thpw	5	10	15	Tcph	
HSD back porch	thb		32		Tcph	
HSD front porch	thfp	52	60	68	Tcph	
Vertical display area	Tvd		480		th	
VSD period time	Tv	546	555	564	th	
VSD pulse width	Tvpw	6	10	14	th	
VSD back porch	Tvb		5		th	
VSD front porch	tvfp	50	60	65	th	

4.2 LVDS INPUT DATA FORMAT



8-bit LVDS VESA input

4.3 Power On/Off Sequence



Item	Min	Typ	Max	Unit
T1	-	-	20	ms
T2	1	-	-	ms
T3	1	-	-	ms
T4	50	-	-	ms
T5	32	-	-	ms
T6	16	-	-	ms
T7	16	-	-	ms
T8	32	-	-	ms
T9	32	-	-	ms
T10	32	-	-	ms
T11	50	-	-	ms
T12	16	-	-	ms
T13	32	-	-	ms
T14	1000	-	-	ms

5. INTERFACE PIN DESCRIPTION

5.1 LCM Connector PIN Assignment

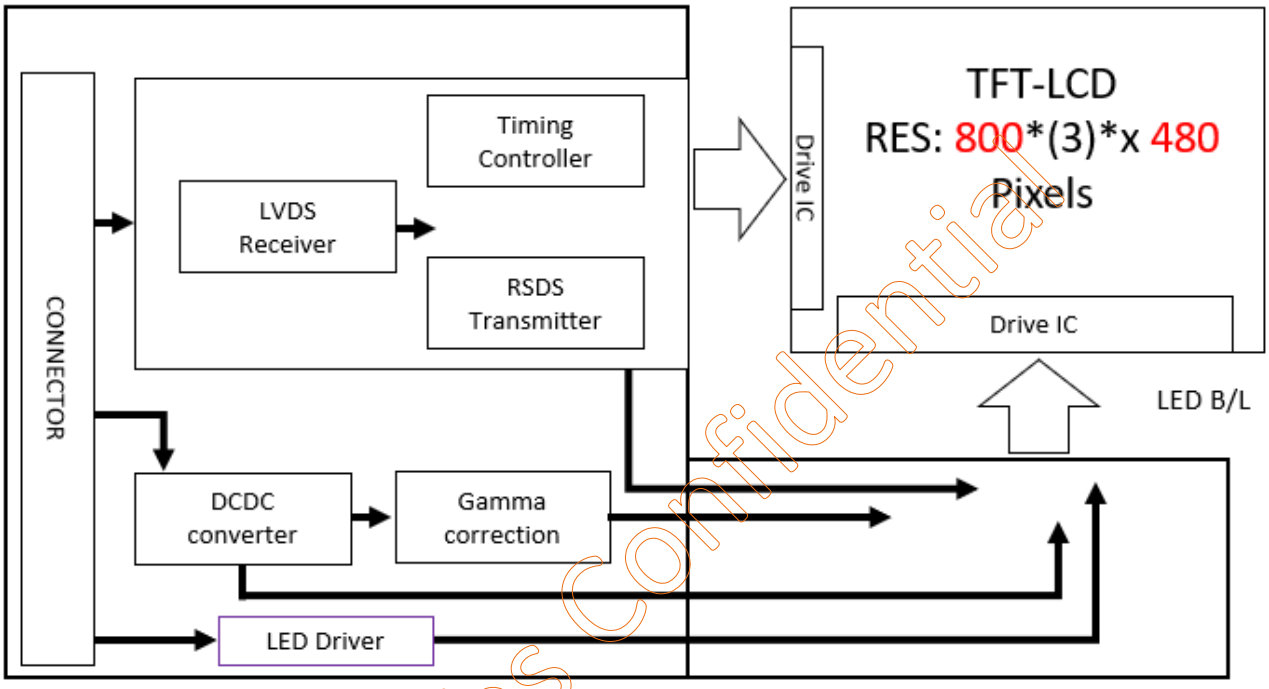
The electronics interface connector is F1-X30SSLA-HF(JAE) 30pin,pitch=1.0mm or equivalent.

Pin No.	Symbol	I/O	Description
1	VCC_3,3V	P	Power Voltage for digital circuit 3.3V
2	VCC_3,3V	P	Power Voltage for digital circuit 3.3V
3	NC	--	No Connection
4	RX0-	I	-LVDS differential data input
5	RX0+	I	+LVDS differential data input
6	RX1-	I	-LVDS differential data input
7	RX1+	I	+LVDS differential data input
8	RX2-	I	-LVDS differential data input
9	RX2+	I	+LVDS differential data input
10	GND	P	Ground
11	RXCLK-	I	-LVDS differential clock input
12	RXCLK+	I	+LVDS differential clock input
13	RX3-	I	-LVDS differential data input
14	RX3+	I	+LVDS differential data input
15	GND	P	Ground
16	V/H	I	Horizontal scan control signal ; H:Left to Right, Up to Down; L: Right to Left, Down to Up
17	NC	--	No connection
18	NC	--	No connection
19	NC	--	No connection
20	NC	--	No connection
21	NC	--	No connection
22	GND	P	Ground
23	NC	--	No connection
24	NC	--	No connection
25	NC	--	No connection
26	NC	--	No connection
27	VLED	P	Backlight Driver Power Supply 12V
28	VLED	P	Backlight Driver Power Supply 12V
29	ENABLE	I	Backlight Driver Enable signal
30	PWM	I	Backlight Brightness Control signal

Note : I : Signal Input ; O : Signal Output ; P : Power Supply

6. BLOCK DIAGRAM

The following diagram shows the functional block of the TFT module:



7. OPTICAL CHARACTERISTIC

The optical characteristics are measured under stable conditions at room temperature 25 °C.

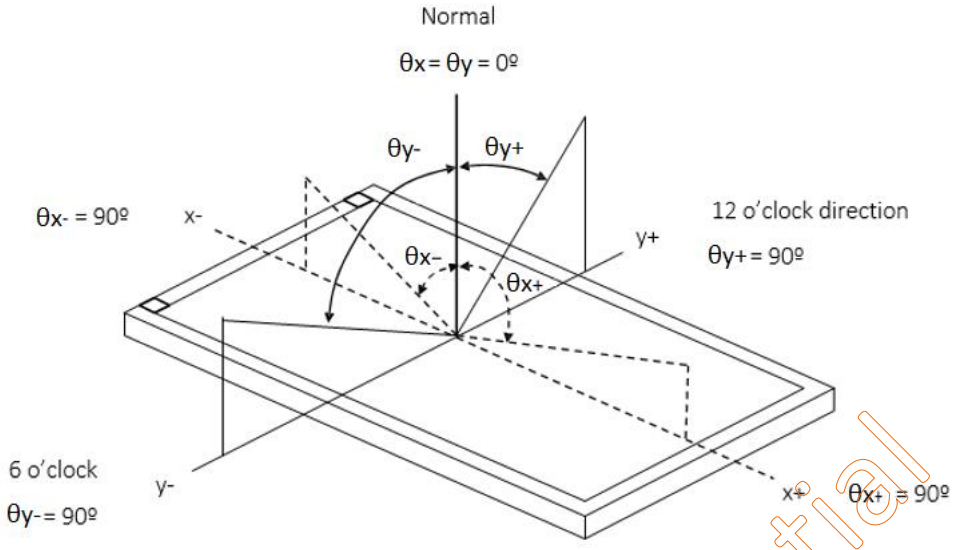
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	θ_X=0°	700	1000	-	-	(2)(5)
Response Time		T_{R+} T_F	25°C	-	30	40	ms	(3)
Center Luminance of White		LC	θ_X=0°, θ_Y =0° Viewing angle at normal direction	400	500	-	cd/m^2	(4)(5)
Brightness uniformity				-	75	-	%	(5)(6)
Chromaticity	Red	Rx		Typ. -0.05	0.655	Typ. +0.05	-	(1) (5)
		Ry			0.318		-	
	Green	Gx			0.261		-	
		Gy			0.576		-	
	Blue	Bx			0.140		-	
		By			0.082		-	
	White	Wx			0.296		-	
		Wy			0.333		-	
Viewing Angle	Horizontal	θ_X+	CR≥10	-	85	-	Deg.	(1)(5)
		θ_X-		-	85	-		
	Vertical	θ_Y+		-	85	-		
		θ_Y-		-	85	-		

The following optical specifications shall be measured in a darkroom or equivalent state (ambient luminance <2 lux, and at room temperature).

The room temperature is 25°C±2°C.

Note 1: Definition of Viewing Angle

Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or the vertical clock direction with respect to the optical axis which is normal to the LCD surface

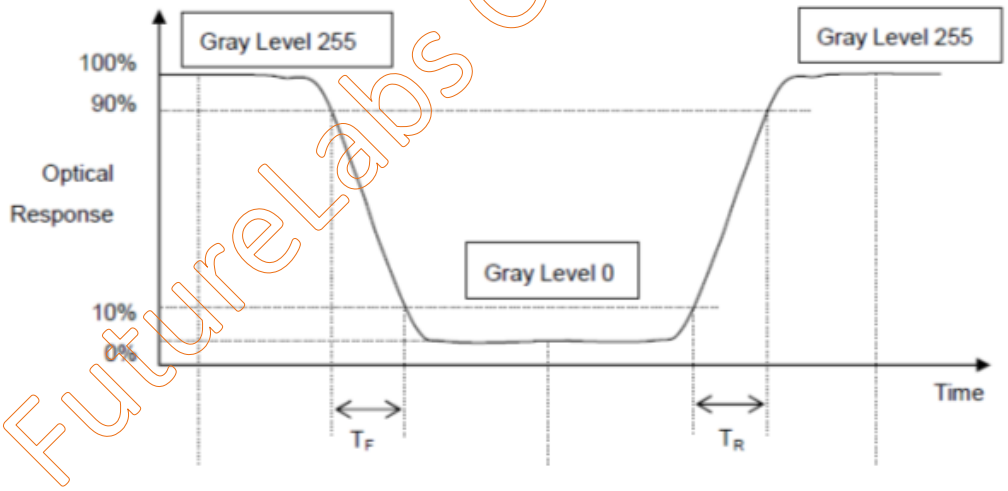


Note 2: Definition of Contrast Ratio (CR)

Measure the viewing angle of Θ= 0 and at the center of the LCD surface. Luminance with all pixels in white state divide by Luminance with all pixels in Black state

Note 3: Definition of Response Time:

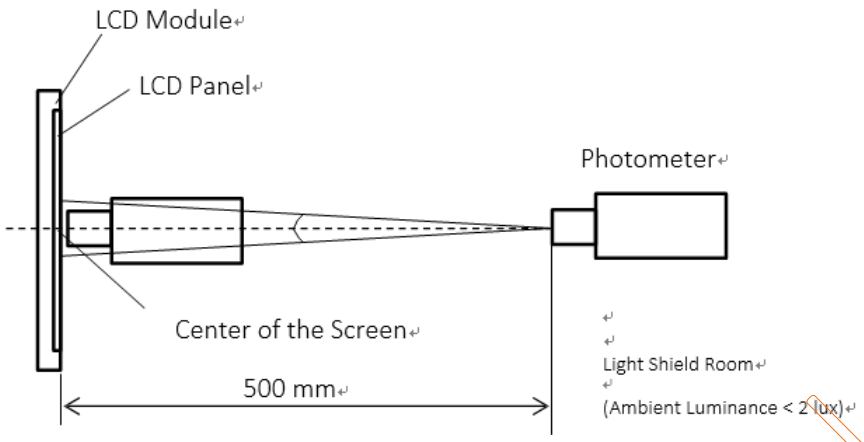
The response time is set initially by defining the "Rising Time (TR)" and the "Falling Time (TF)" respectively. Please refer the figure to the followings:



Note 4: Definition of Brightness (L)

Measure the center area of the panel and the viewing angle of the θx=θy =0°

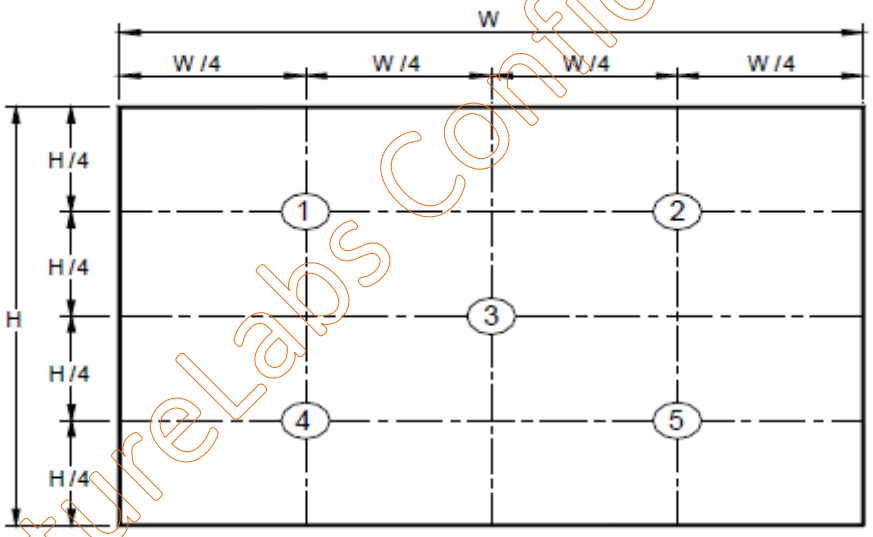
Note 5: The method of optical measurement:



Note 6: Definition of White Variation (δW):

Measure the luminance of gray level 255 at 5 points

δW = (Maximum [L (1), L (2), L (3), L (4)~ L (5)] / Minimum [L (1), L (2), L (3), L (4)~ L (5)]) x 100%



8. Touch Screen specification

8.1 Environmental Specification

Specification	Value
Operating Temperature	-30°C ~ 80°C
Storage Temperature	-40°C ~ 80°C
Operating Humidity	20% ~ 90%RH
Storage Humidity	10% ~ 90%RH

8.2 Mechanical Specification

Specification	Value
Operating Life (Finger input)	10^7 times
Light Transmittance	>85% Min. (JIS K-7105) with glass
Surface hardness	7H
FPC Peeling Force	5N Max

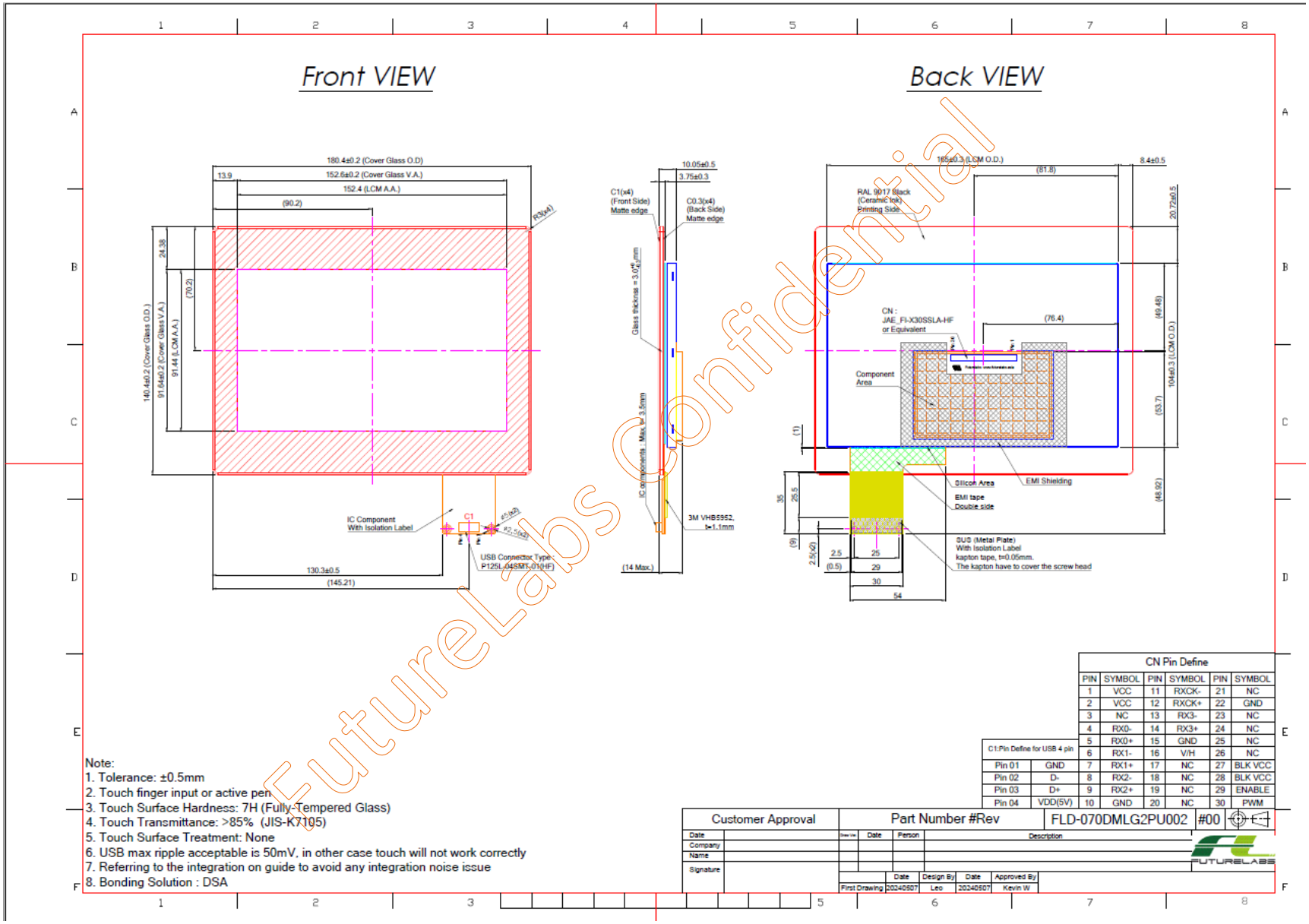
8.3 USB Type Controller

Parameters	Features
Circuit Board Dimension	Refer to drawings
Channels of Panel	Based on Sensor Design
Input Voltage	USB: 5VTyp.
Linearity (Note 1)	Single Line drawing accuracy : Up to 1pt +/- 1mm offset /10mm
	Single Touch (point) accuracy : Up to 1pt +/- 1mm
Interface	USB: 2.0(Below) Full Speed
Resolution	16384×16384 resolution
Power consumption(mA)	Active Mode: <40mA
	Idle Mode : <30mA
	Sleep Mode :<10mA
	(Operation Mode : Active Mode only)
Report rate(points/sec) Note(2)	>100 Hz
Response time	Average < 25ms

Note (1): Depending by Sensor design and other parameters, Refer to Windows 8 Logo regulation if need to follow min spec

Note (2): Report rate will vary by channel number, cover thickness, number of fingers and other parameter.

9. DIMENSION AND DRAWING



CN Pin Define					
PIN	SYMBOL	PIN	SYMBOL	PIN	SYMBOL
1	VCC	11	RXCK-	21	NC
2	VCC	12	RXCK+	22	GND
3	NC	13	RX3-	23	NC
4	RX0-	14	RX3+	24	NC
5	RX0+	15	GND	25	NC
6	RX1-	16	V/H	26	NC
7	RX1+	17	NC	27	BLK VCC
8	RX2-	18	NC	28	BLK VCC
9	RX2+	19	NC	29	ENABLE
10	GND	20	NC	30	PWM

C1:Pin Define for USB 4 pin	
Pin 01	GND
Pin 02	D-
Pin 03	D+
Pin 04	VDD(5V)

10. PRECAUTION AND PRODUCT HANDLING

- Do not apply the external force such as bending or twisting to the LCD panel and backlight during assembly.
- Do not insert and plug out the input connector while the LCD panel is operating.
- Do not take apart the panel or frame from LCD module assembly or insert anything into the backlight unit.
- Do not keep the same pattern in a long period of time, it may cause image sticking on LCD panel. Can use shuffle content periodically if fixed pattern is displayed on the screen.
- Do not touch the display area with bare hands, this will stain the display area.
- Pay attention to handle lead wire of backlight, that is not tugged in connect with LED driver.
- Do not change variable resistance settings in LCD panel, it may cause not satisfy of LCD characteristics specification.
- The surface of LCD panel's polarizer is very soft and easily scratched, please use a very soft dry cloth without chemicals for cleaning.
- To avoid the static electricity to damage the CMOS LSI, the operator should be grounded when in contact with the LCD panel, and also to all electrical equipment.
- Need to follow the correct power frequency when LCD panel is connecting and operating, this can avoid damage to CMOS LSI during latch-up.
- Need to store the LCD panel indoor without the exposure of sunlight where the temperature is 25°C ± 5°C and the humidity is below 60% RH.