

Product Specification

PART NUMBER # REV: FLD-070QMMG0PCCA1#00

DESCRIPTION: TFT 7" W 800x1280 8bit MIPI 550CD DSA with Rocktouch Pcap

Transparent USB – I2C

() Preliminary Specification

(V) Approved Specification

Customer Name:	
Signature:	Date:

PREPARED BY	REVIEWED BY
<i>Sarah</i>	<i>David</i>

Revision History

Version	Date	Page	Description	Note
V1.0	2021/10/27		First Edition	

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1. GENERAL DESCRIPTION

1.1 Description

7" w 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 800x1280 screen and 16.7 M colors.

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 1280 (V)	Pixels
3	Outline Dimension	110.15(H)x163.62(V)x7.3(D)	mm
4	Active Area	94.2 (H) x 150.72 (V)	mm
5	Pixel Pitch	0.11775(H) x0.11775(V)	mm
6	Display Colors	16.7M colors	
7	Pixel Arrangement	RGB vertical stripe	--
8	Display Mode	IPS , Normally Black	--
9	Back-light	Single LED (Side-Light type)	
11	Surface Treatment	None	--
12	IC	ILI9881C	
13	Power Consumption	B/ L System	1.5(Max.)
			W

2. ABSOLUTE MAXIMUM RATING

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Power supply voltage	VDDIN	-0.3	-	3.6	V	GND=0
Logic Signal Input Level	VCC	-0.3	-	VDDIN+0.3	V	

2.1.2 Back Light Unit

Item	Symbol	Values			Unit	Note
		Min	Typ	Max		
Current of Backlight Unit	IBL	--	80	--	mA	
Voltage of Backlight Unit	VBL	--	15	16.5	V	

Note:

Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is loaded.

2.2 Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
Operating Temperature	Topa	-20		+70	°C	
Storage Temperature	Tstg	-30		+80	°C	

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD Module

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power Supply Voltage	VDDIN	3.0	3.3	3.6	V	
Power Supply Current	IVDDIN	-	35.0	59.0	mA	
Input signal voltage	VIH	0.7*VDD	-	VDD	V	
	VIL	0	-	0.3*VDD	V	

3.2 Back Light Unit

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED current	IL	-	80	-	mA	(2)
LED Voltage	V _F	-	15	16.5	V	
Operating LED life time	Hr	50000	-	-	Hour	(1)(2)

Note (1) LED life time (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25±3°C, typical IL value indicated in the above table until the brightness becomes less than 50%.

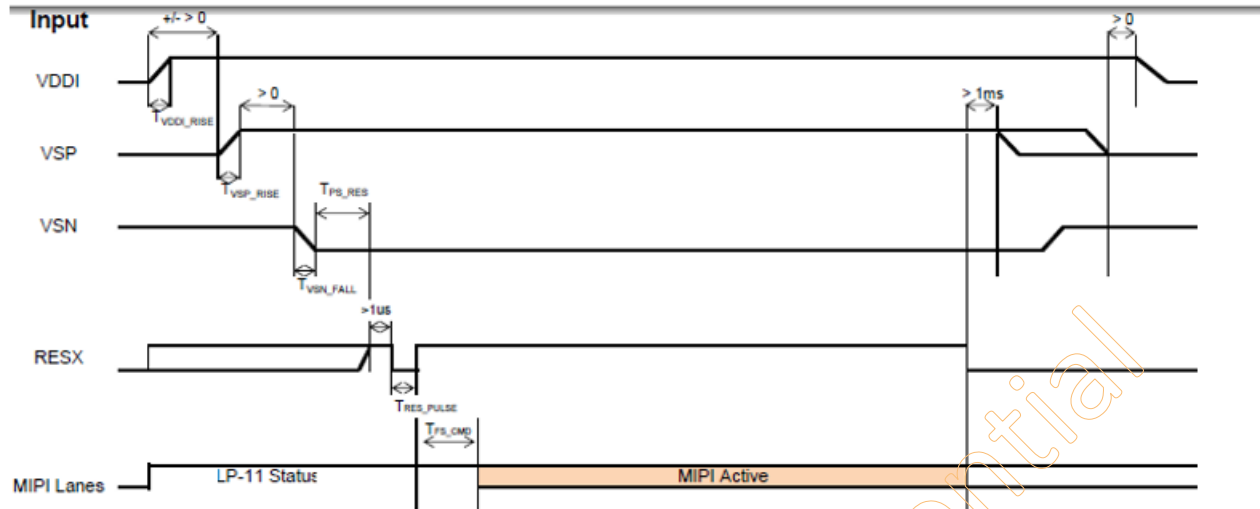
Note (2) The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IL=80mA. The LED lifetime could be decreased if operating IL is larger than 80mA. The constant current driving method is suggested.

4. Timing Chart

4.1 Timing Table

Item	Symbol	Min.	Type	Max.	Unit.	Remark
Clock Frequency	fclk	80.5	82.5	84.5	MHz	Frame rate=60Hz
Horizontal display area	thd	800			DCLK	
Horizontal Back Porch	HBP	-	100	-	DCLK	
Horizontal Pulse Width	HS	-	33	-	DCLK	
Horizontal Front Porch	HFP	-	100	-	DCLK	
HS Blanking	thb	-	233	-	DCLK	
HS period time	th	-	1033	-	DCLK	
Vertical display area	tvd	1280			H	
Vertical Back Porch	VBP	-	30	-	H	
Vertical Pulse Width	VS	-	2	-	H	
Vertical Front Porch	HFP	-	20	-	H	
VS Blanking	thb	-	52	-	H	
VS period time	tv	-	1332	-	H	

4.2 Power On/Off Sequence



Symbol	Characteristics	Min.	Typ.	Max.	Units
T_{VDDI_RISE}	VDDI Rise time	10	-	-	us
T_{VSP_RISE}	VSP Rise time	130	-	-	us
T_{VSN_FALL}	VSN Fall time	200	-	-	us
T_{PS_RES}	VDDI/VSP on to Reset high	5	-	-	ms
T_{RES_PULSE}	Reset low pulse time	10	-	-	us
T_{FS_CMD}	Reset to first command	10	-	-	ms

5. INTERFACE PIN DESCRIPTION

5.1 LCM Connector PIN Assignment

The electronics interface connector : FH33J-40S-0.5H (10) (HIROSE), 40pin,pitch = 0.5mm or Equivalent.

Terminal No.	Symbol	I/O	Functions
1	NC	–	NC
2	VDDIN	P	Power input 3.3 Voltage
3	VDDIN	P	Power input 3.3 Voltage
4	GND	P	Power Ground
5	RST	I	Globel reset signal,low active
6	NC	-	No connection
7	GND	P	Power Ground
8	MIPI_ON	I	MIPI DSI differential data pair
9	MIPI_OP	I	MIPI DSI differential data pair
10	GND	P	Power Ground
11	MIPI_1N	I	MIPI DSI differential data pair
12	MIPI_1P	I	MIPI DSI differential data pair
13	GND	P	Power Ground
14	MIPI_CKN	I	MIPI DSI differential CLK pair
15	MIPI_CKP	I	MIPI DSI differential CLK pair
16	GND	P	Power Ground
17	MIPI_2N	I	MIPI DSI differential data pair
18	MIPI_2P	I	MIPI DSI differential data pair
19	GND	P	Power Ground
20	MIPI_3N	I	MIPI DSI differential data pair
21	MIPI_3P	I	MIPI DSI differential data pair
22	GND	P	Power Ground
23	NC	-	No connection
24	NC	-	No connection
25	GND	P	Power Ground

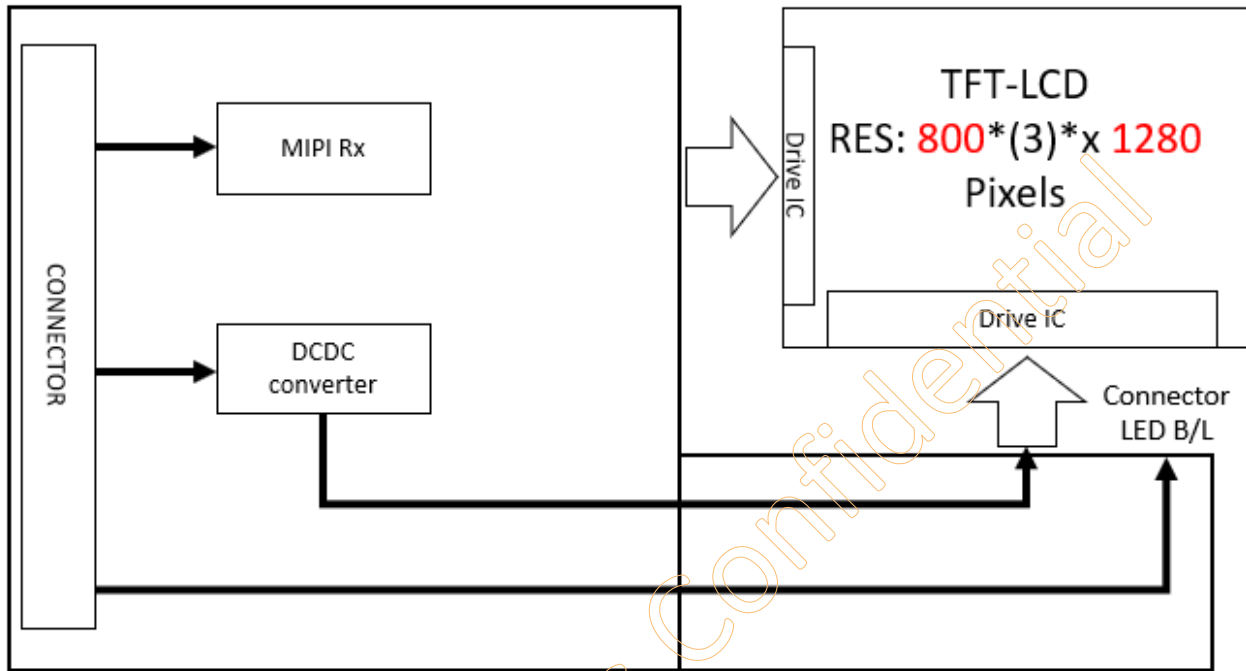
26	NC	-	No connection
27	PWMO/NC	-	PWM control signal for BL driver (No connection)
28	NC	-	No connection
29	VCL/NC	-	Output voltage pin (No connection)
30	GND	P	Power Ground
31	LED-	P	Power for LED backlight negative
32	LED-	P	Power for LED backlight negative
33	NC	-	No connection
34	NC	-	No connection
35	NC	-	NC
36	NC	-	No connection
37	NC	-	No connection
38	NC	-	NC
39	VLED+	P	Power for LED backlight anode
40	VLED+	P	Power for LED backlight anode

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

Note (2): DGND=AGND=0V

6. BLOCK DIAGRAM

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



7. TFT OPTICAL CHARACTERISTIC

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

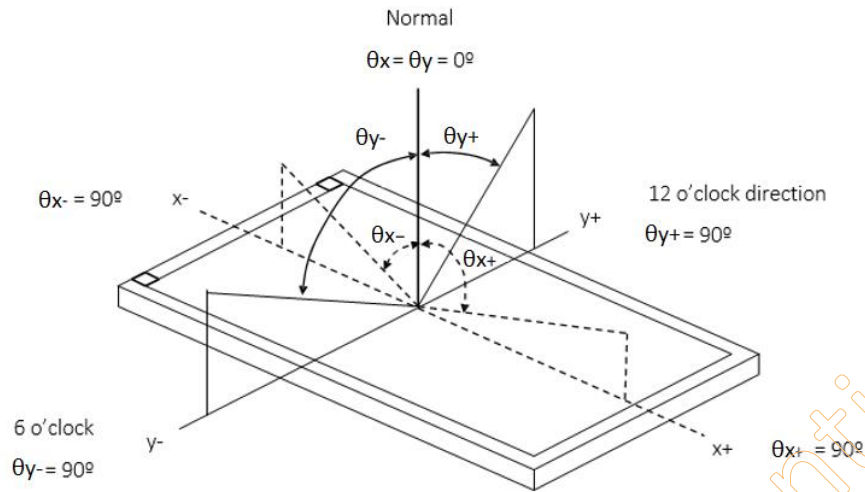
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing angle at normal direction	600	800		-	(2), (5)
Response Time		T_{R+TF}		-	30	35	ms	(3)
Center Luminance of White		L_c		500	550	-	cd/m ²	(4), (5)
Brightness Uniformity		BUNI		-	80	-	-	(5), (6)
Chromaticity	Red	R _x	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing angle at normal direction	Typ. -0.05	TBD	Typ. +0.05	-	(1), (5)
		R _y					-	
	Green	G _x					-	
		G _y					-	
	Blue	B _x					-	
		B _y					-	
	White	W _x					0.31	
		W _y					0.32	
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

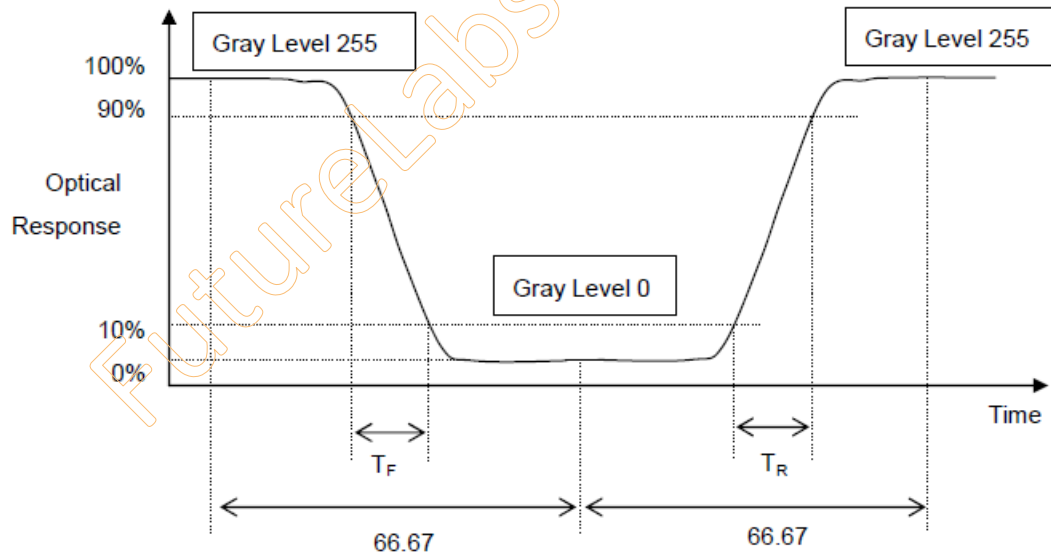


Note 2: Definition of Contrast Ratio (CR)

Measure the viewing angle of $\Theta = 0$ 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:

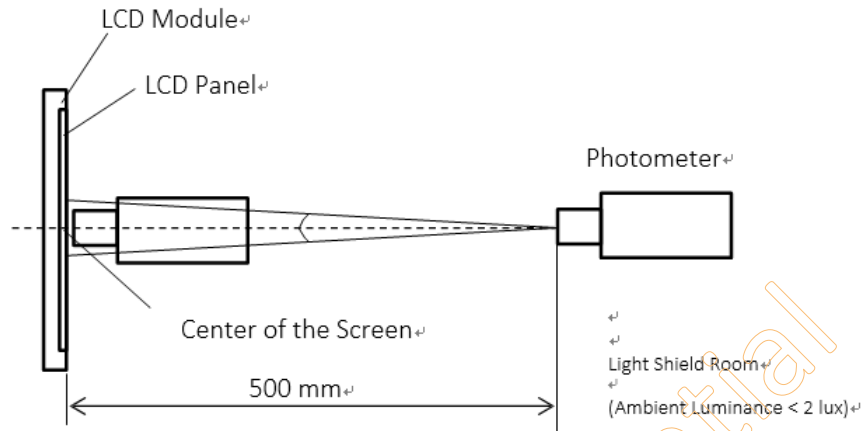
The response time is set initially by defining the "Rising Time (T_R)" and the "Falling Time (T_F)" respectively. Please refer the figure to the followings:



Note 4: Definition of Brightness (L)

Measure the center area of the panel and the viewing angle of the $\theta_x = \theta_y = 0^\circ$

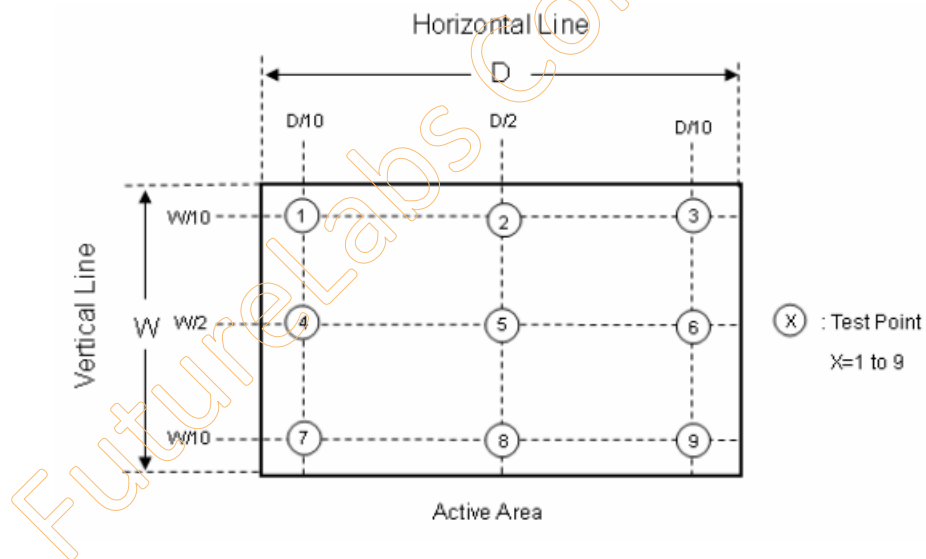
Note 5: The method of optical measurement:



Note 6: Definition of White Variation (δW):

Measure the luminance of gray level 255 at 5 points

$$\delta W = \text{Maximum [L (1), L (2), L (3), L (4) \sim L (9)]} / \text{Minimum [L (1), L (2), L (3), L (4) \sim L (9)]}$$



8. Touch Screen specification

8.1 Environmental Specification

Specification	Value
Operating Temperature	-20°C ~ 70°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	>86% Min. (JIS K-7105) with glass
Surface hardness	Depending by the Cover Lens Material Customer choose
FPC Peeling Force	5N Max

8.3 Combo Type Controller

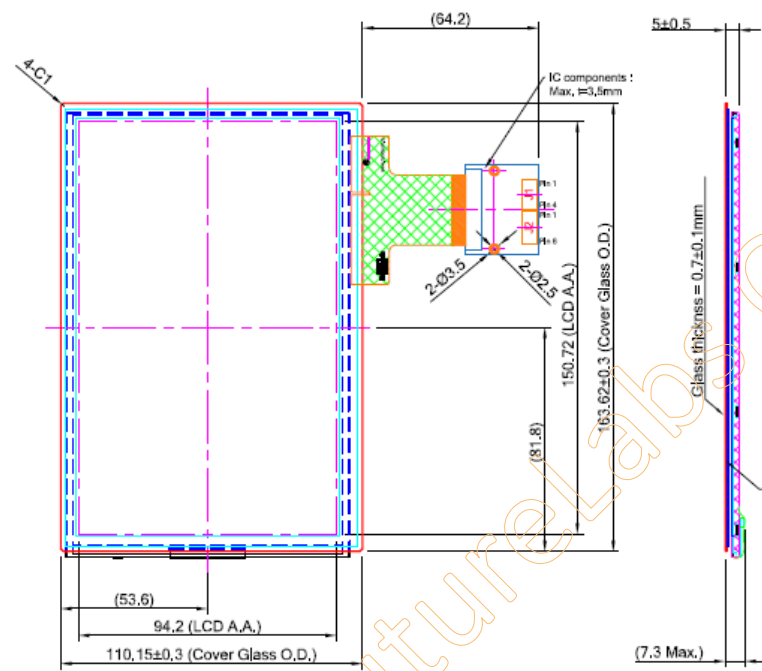
Parameters	Features
Circuit Board Dimension	Refer to drawings
Channels of Panel	Based on Sensor Design
Input Voltage	USB : 5V Typ. I2C : 5V/3.3V(3.2V Min.)
Linearity(Note 1)	Single Line drawing accuracy : Up to 1pt +/- 1mm offset /10mm
	Single Touch (point) accuracy : Up to 1pt +/- 1mm
Interface	USB: 2.0 Full Speed I2C: 100K/400K Hz
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 < 25 ms

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

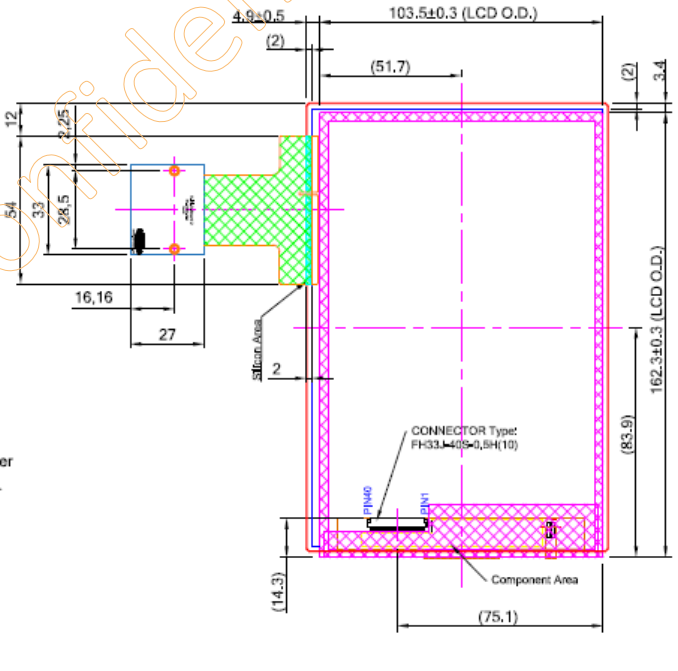
Note (2): Report rate will vary by channel number, cover thickness, number of fingers and another parameter.

9. DIMENSION AND DRAWING

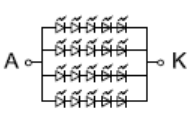
Front VIEW



Back VIEW



Backlighting circuit :



Note:

1. Tolerance: ±0.3mm
2. Touch finger Input or special conductive pen
3. Touch Surface Hardness; 6H (CS Glass)
4. Touch Transmittance; >85% (JIS-K7105)
5. Touch Surfaces Treatment: None
6. Distance between LCD and touch panel need to be minimum 1.0mm otherwise touch maybe will not work correctly
7. If customer put a front cover all around need use at least 2mm thick gasket between touch and metal frame
8. USB max ripple acceptable is 50mV, In other case touch will not work correctly
9. Referring to the Integration guide to avoid any Integration noise Issue
10. LCD modal ; FLC-070QMMG000SA1#00
11. Touch modal : RTPC070W-0019-C#00
12. Assembly Solution : DSA

JSPin Define for USB 4 pin	
Pin 01	GND
Pin 02	D-
Pin 03	D+
Pin 04	VDD(DV)

J2Pin Define for I2C 4 pin	
Pin 01	GND
Pin 02	SDA
Pin 03	SCL
Pin 04	Reserved (not use)
Pin 05	INT
Pin 06	RST

LCD Pin Define					
PIN	SYMBOL	PIN	SYMBOL	PIN	SYMBOL
1	NC	11	MIP-TN	21	MIP-3P
2	VDD	12	MIP-TP	22	GND
3	VDD	13	GND	23	NC
4	GND	14	MIP-CKN	24	NC
5	Reset	15	MIP-CKP	25	GND
6	NC	16	GND	26	NC
7	GND	17	MIP-2N	27	PWM0
8	MIP-ON	18	MIP-2P	28	NC
9	MIP-OP	19	GND	29	VCL
10	GND	20	MIP-3N	30	GND
				40	VLED+

Customer Approval		Part Number #Rev		FLD-070QMMG0PCCA1 #00	
Date	Dep. Ver	Date	Person	Date	Description
Company	Ver	2019/02	Map	Map	Modify PC LOGO and name
Name					
Signature	Date	Design By	Date	Check By	Date
	2019/02	Map			

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 $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and the humidity is below 60% RH.