



# PRODUCT SPECIFICATION

PART NUMBER # REV: FLD-104GML60P0FA1#00

DESCRIPTION: 10.4" TFT 1024x768 1000CD Full View LVDS int  
+ Rocktouch Black USB / I2C

- ( ) Preliminary Specification
- (V) Approved Specification

<b>Customer Name:</b>	
<b>Signature:</b>	<b>Date:</b>

<b>PREPARED BY</b>	<b>REVIEWED BY</b>
<i>Mia</i>	<i>David</i>

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## Revision History

Version	Date	Page	Description	Note
V1.0	2021/03/11		1 <sup>st</sup> initial	
V1.1	2021/07/07		Update ME spec	

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# 1. GENERAL DESCRIPTION

## 1.1 Description

10.4" 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 XGA, 1024 x768 screen and 16.2M 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	10.4	Inch
2	Pixel Number	1024 (H) x RGB x 768 (V)	Pixels
3	Outline Dimension	240.6(H) ×190.8 (V) ×12.85 (D)	mm
4	Active Area	210.4 (H) × 157.8 (V)	mm
5	Display Colors	16.2M/262K	--
6	Pixel Arrangement	RGB vertical stripe	--
7	Display Mode	Normally Black / Transmissive	--
8	Electrical Interface	LVDS	
9	Surface Treatment	Anti-Glare	--
10	Brightness	1,000 (Typ.)	cd/m2
11	Viewing Direction	All Direction	--
12	Contrast Ratio	1000 (Typ.)	--
13	Total Power Consumption (Typ)	TBD	--

# 2. ABSOLUTE MAXIMUM RATING

## 2.1 Electrical Absolute Rating

Item	Symbol	Values		Unit	Note
		Min	Max.		
Power supply voltage	V <sub>CC</sub>	-0.3	4	V	
Logic Input Voltage	V <sub>IN</sub>	-0.3	V <sub>CC</sub> +0.3	V	

## 2.2 Environment Absolute Rating

Item	Symbol	Values			Unit	Note
		Min	Typ	Max.		
Operating Temperature	Top	-30		85	°C	Ta=25°C
Storage Temperature	Tstg	-30		85	°C	

TFT surface temperature

## 3. ELECTRICAL CHARACTERISTICS

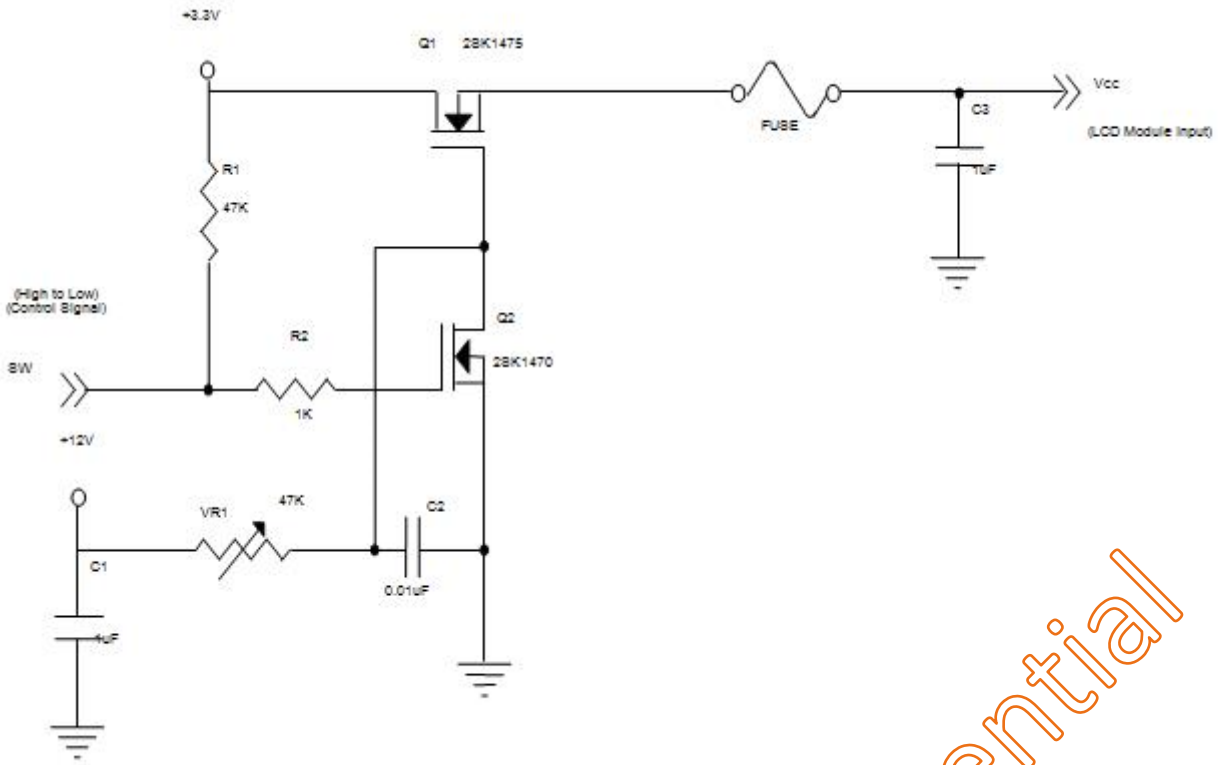
### 3.1 LCM

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	VCC	3.0	3.3	3.6	V	(1)
Power Supply Ripple Voltage	VRP	-	-	100	mV	
Rush Current	IRUSH	-	-	4.0	A	(2)
Power Supply Current	White	-	TBD	TBD	mA	(3)
	Black	-	TBD	TBD	mA	
Power Consumption	PE	---	TBD	TBD	W	
LVDS differential input voltage	V <sub>ID</sub>	100	-	600	mV	-
LVDS common input voltage	V <sub>IC</sub>	1.0	1.2	1.4	V	-
Logic High Input Voltage	V <sub>IH</sub>	2.3	-	VCC	V	
Logic Low Input Voltage	V <sub>IL</sub>	0	-	0.7	V	
LVDS terminating resistor	RT	-	100	-	ohm	

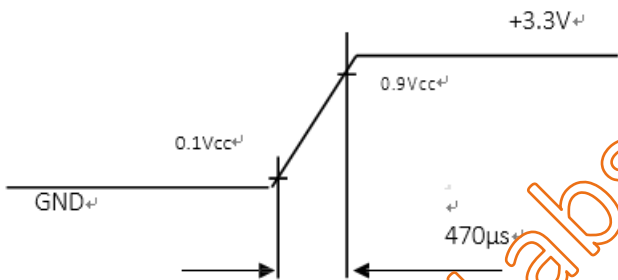
Note (1) The assembly should be always operated within above ranges.

Ta = 25 ± 2 °C

Note (2) Measurement Conditions:



**VCC rising time is 470us**



Note (3) The specified power supply current is under the conditions at  $V_{cc} = 3.3 \text{ V}$ ,  $T_a = 25 \pm 2 \text{ }^\circ\text{C}$ ,  $f_v = 60 \text{ Hz}$ , whereas a power dissipation check pattern below is displayed.

a. White Pattern



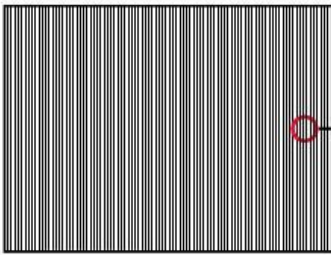
Active Area

b. Black Pattern

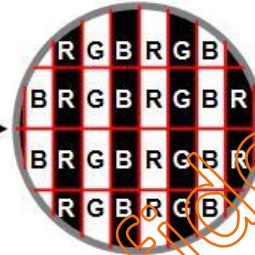


Active Area

c. Vertical Stripe Pattern



Active Area



### 3.2 Backlight Unit

#### LED Backlight Absolute Rating

Item	Symbol	Value			Unit	Note
		Min.	Typ	Max.		
Forward Voltage	Fv	16		18	V	(1)
Forward Current	Fi	0.45		0.45	A	
LED Life Time		70.000	100.000		Hrs	(4)

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for LED light bar Typ. =0.45A

Note (3) Light Bar: 3pcs/s (3 x 6V) x 9 strings

Note (4) The lifetime of LED is estimated data and defined as the time when it continues to operate under the conditions at  $T_a = 25 \pm 2F \text{ } ^\circ\text{C}$  and Duty=100% until the brightness becomes  $\leq 50\%$  of its original value. Operating LED under high temperature environment will reduce lifetime and lead to color shift.

LED light bar connector is connected to Back Light Unit with a cable.

Connector Name / Designation	Lamp Connector / Backlight lamp
Manufacturer	
Type Part Number	A20D/HD2-2P
Mating Type Part Number	S2B-PH-SM4-TB

Light bar cable=25cm

Connector No.	Pin No.	Input	Color	Function
	1	HV	Red	LED V+
	2	LV	Black	LED V-

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## 4. SIGNAL CHARACTERISTICS

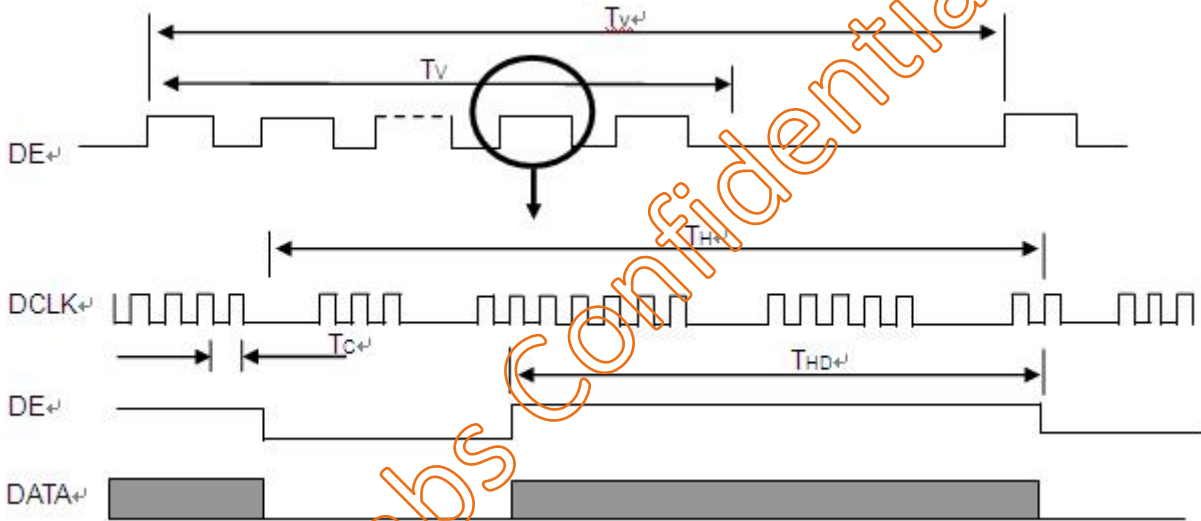
### 4.1 Interface Timing

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	F <sub>c</sub>	57.6	65	74.5	MHz	-
	Period	T <sub>c</sub>	13.4	15.4	17.4	ns	
	Input cycle to cycle jitter	T <sub>rcl</sub>	---	---	200	ns	(a)
	Input Clock to data skew	TLVCCS	-0.02*T <sub>c</sub>	---	0.02*T <sub>c</sub>	ps	(b)
	Spread spectrum modulation range	F <sub>clk<sub>in</sub>_mod</sub>	---	---	102*F <sub>c</sub>	MHz	(c)
	Spread spectrum modulation frequency	F <sub>SSM</sub>	---	---	200	KHz	
	High Time	T <sub>ch</sub>	---	4/7	---	T <sub>ch</sub>	
	Low Time	T <sub>cl</sub>	---	3/7	---	T <sub>ch</sub>	
Vertical Display Term	Frame Rate	F <sub>r</sub>	---	60	---	Hz	T <sub>v</sub> =T <sub>vd</sub> +T <sub>vb</sub>
	Total	T <sub>v</sub>	774	806	848	Th	-
	Active Display	T <sub>vd</sub>	768	768	768	Th	-
	Blank	T <sub>vb</sub>	6	38	80	Th	-
Horizontal Display Term	Total	T <sub>h</sub>	1240	1344	1464	T <sub>c</sub>	T <sub>h</sub> =T <sub>hd</sub> +T <sub>hb</sub>
	Active Display	T <sub>hd</sub>	1024	1024	1024	T <sub>c</sub>	-
	Blank	T <sub>hb</sub>	216	320	440	T <sub>c</sub>	-

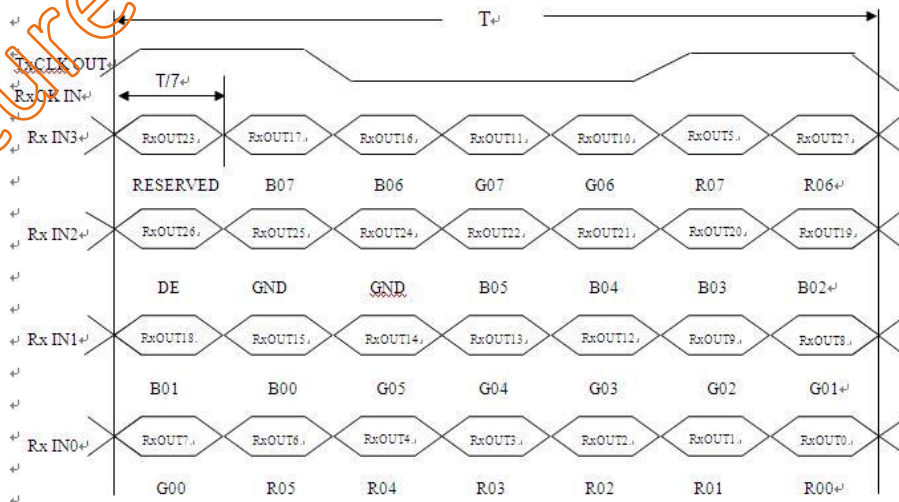
Note (1) Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormally.

Note (2) The T<sub>v</sub>(T<sub>vd</sub>+T<sub>vb</sub>) must be integer, otherwise, the module would operate abnormally.

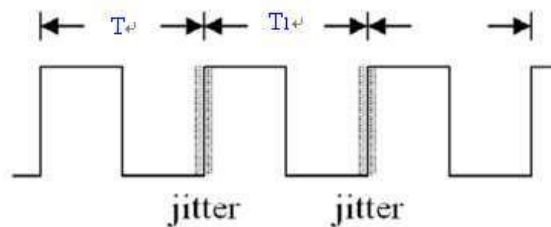
### INPUT SIGNAL TIMING DIAGRAM



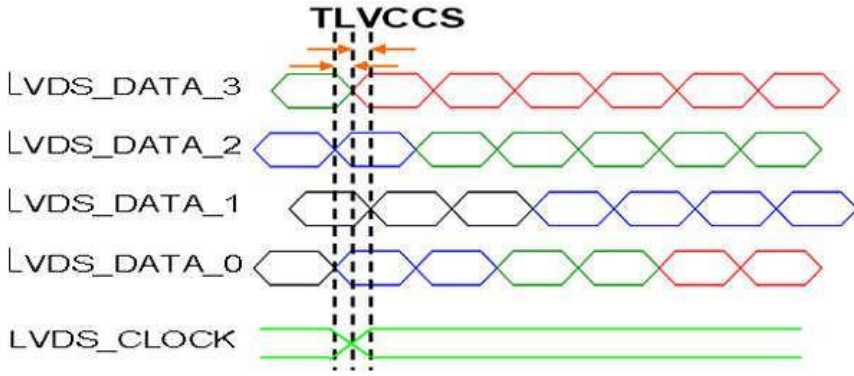
### TIMING DIAGRAM of LVDS



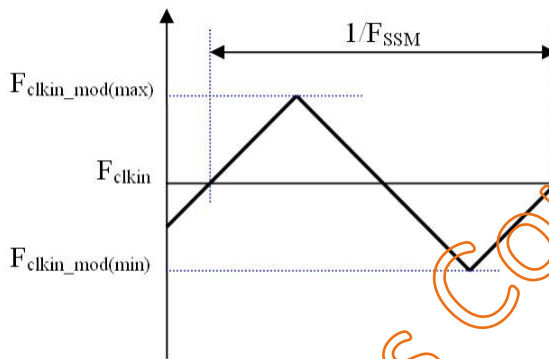
Note (a) The input clock cycle-to-cycle jitter is defined as below figures.  $Trcl = |T1 - Tl|$



Note (b) Input Clock to data skew is defined as below figures.



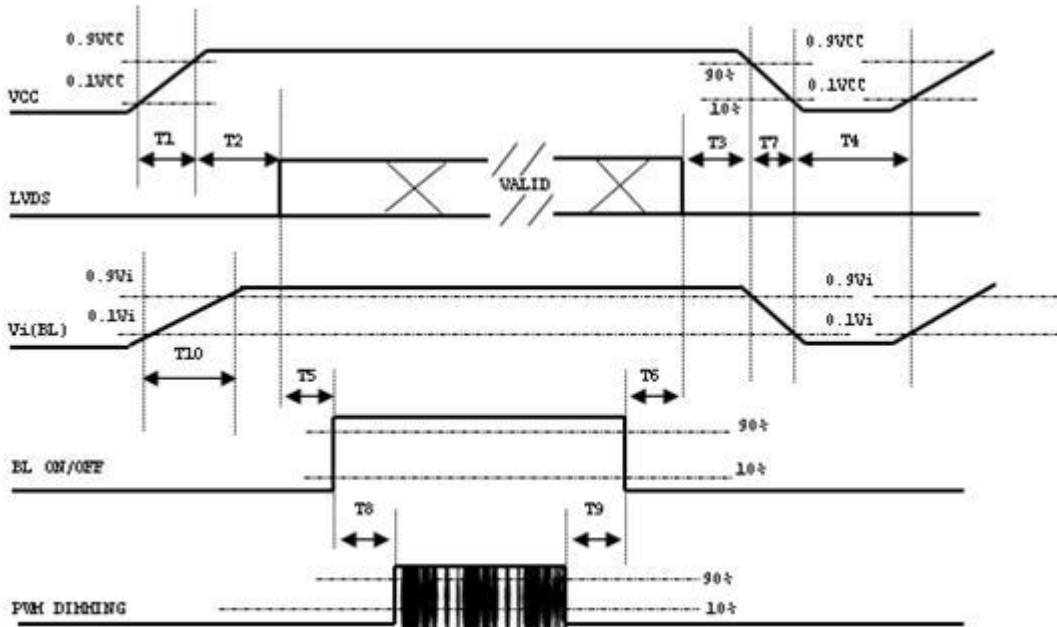
Note (c) The SSCG (Spread spectrum clock generator) is defined as below figures.



#### 4.2 Power ON/OFF Sequence

To prevent a latch-up or DC operation of LCD assembly, the power on/off sequence should be as the diagram below.

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Note (1) Please avoid floating state of interface signal at invalid period.

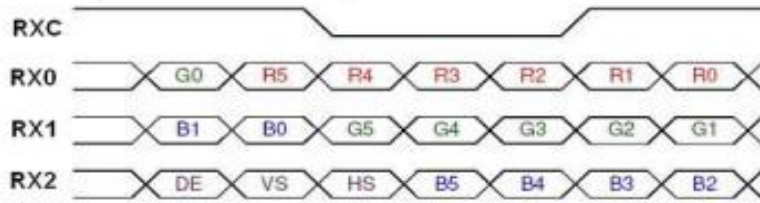
Note (2) When the interface signal is invalid, be sure to pull down the power supply of LCD VCC to 0V.

Note (3) The Backlight converter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight converter power must be turned off before the power supply for the logic and the interface signal is invalid.

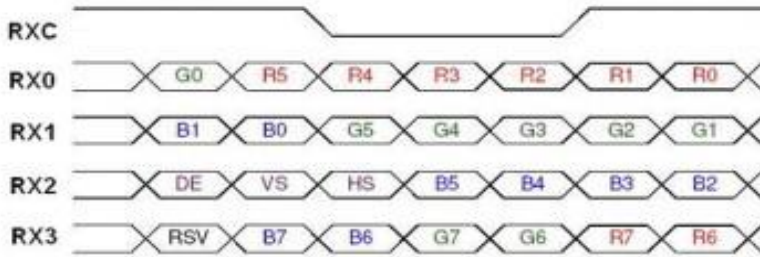
Parameter	Value			Units
	Min	Typ	Max	
T1	0.5	---	10	ms
T2	0	---	50	ms
T3	0	---	50	ms
T4	500	---	---	ms
T5	450	---	---	ms
T6	200	---	---	ms
T7	10	---	100	ms
T8	10	---	---	ms
T9	10	---	---	ms
T10	20	---	50	ms

### 4.3 The Input Data Format

#### SEL 6/8 = "High" for 6 bits LVDS Input



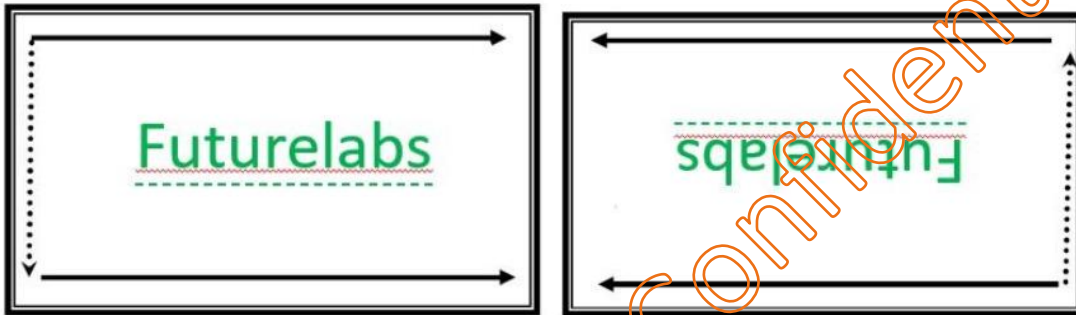
#### SEL 6/8 = "Low" or "NC" for 8 bits LVDS Input



Note (1) R/G/B data 7: MSB, R/G/B data 0: LSB

Note (2) Please follow PSWG

Note (3) Output Signals from any system shall be low or Hi-Z state when VCC is off.



## 5. INTERFACE PIN DESCRIPTION

### 5.1 LCM Connector PIN Assignment

LVDS

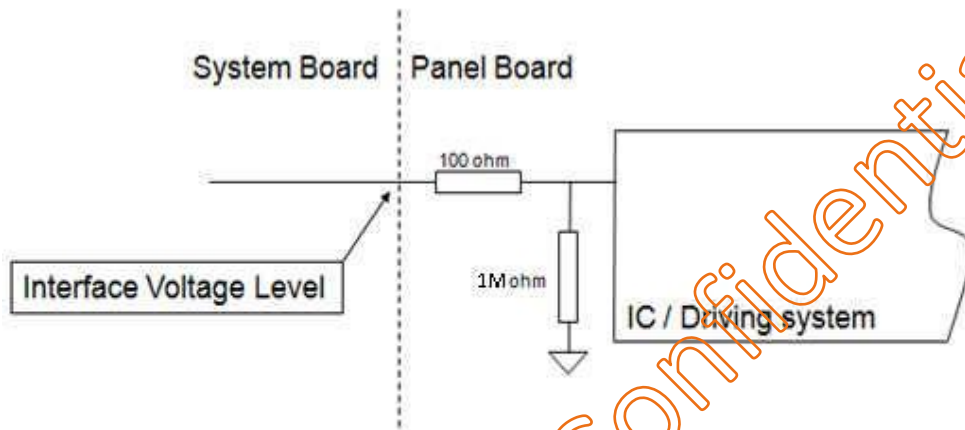
CN1 Connector Pin Assignment

Pin No.	Symbol	Description	Note
1	VCC	Power supply: +3.3V	-
2	VCC	Power supply: +3.3V	-
3	VCC	Power supply: +3.3V	-
4	GND	Ground	-
5	GND	Ground	-
6	GND	Ground	-
7	RPMI	Reverse Panel Function (Display Rotation)	( 2 )
8	NC	No Connection	( 2 )
9	NC	No Connection	( 2 )
10	NC	No Connection	( 2 )
11	SEL6/8	LVDS 6/8 bit select function control, Low or NC 8 bit Input Mode High 6bit Input Mode	( 2 )
12	GND	Ground	-
13	NC	No Connection	( 2 )
14	GND	Ground	-
15	RX0-	Negative transmission data of pixel 0	-
16	RX0+	Positive transmission data of pixel 0	-
17	GND	Ground	-
18	RX1-	Negative transmission data of pixel 1	-
19	RX1+	Positive transmission data of pixel 1	-
20	GND	Ground	-
21	RX2-	Negative transmission data of pixel 2	-
22	RX2+	Positive transmission data of pixel 2	-
23	GND	Ground	-
24	RXCLK-	Negative of clock	-
25	RXCLK+	Positive of clock	-
26	GND	Ground	-
27	RX3-	Negative transmission data of pixel 3	-
28	RX3+	Positive transmission data of pixel 3	-
29	GND	Ground	-
30	NC	No Connection	( 2 )

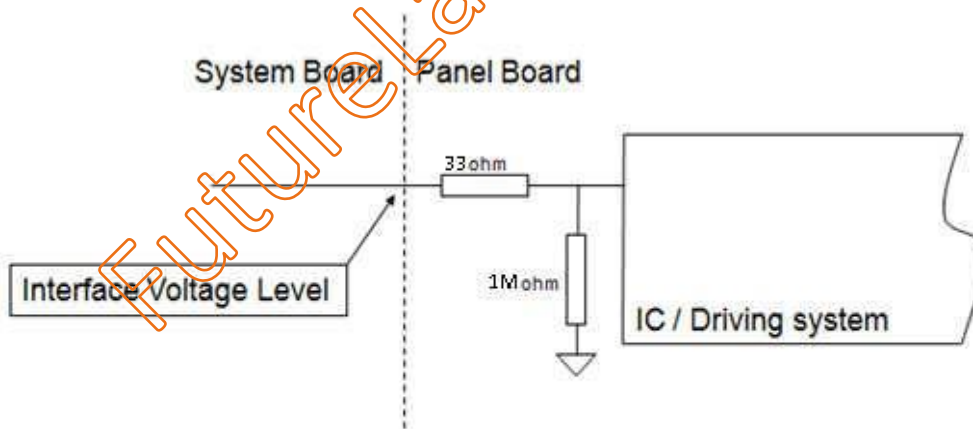
Note (1) Connector Part No.: STM, MSCK2407P30.D or compatible connector

Note (2) "Low" stands for 0V. "High" stands for 3.3V. "NC" stands for "No Connected".

RPFI pin:



SEL6/8 pin:



## 5.2 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 6-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color.

Color		Data Signal																	
		Red						Green						Blue					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale Of Green	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	
Gray Scale Of Blue	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Blue(61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	
	Blue(62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	
	Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	

Note (1) 0: Low Level Voltage, 1: High Level Voltage

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color versus data input.

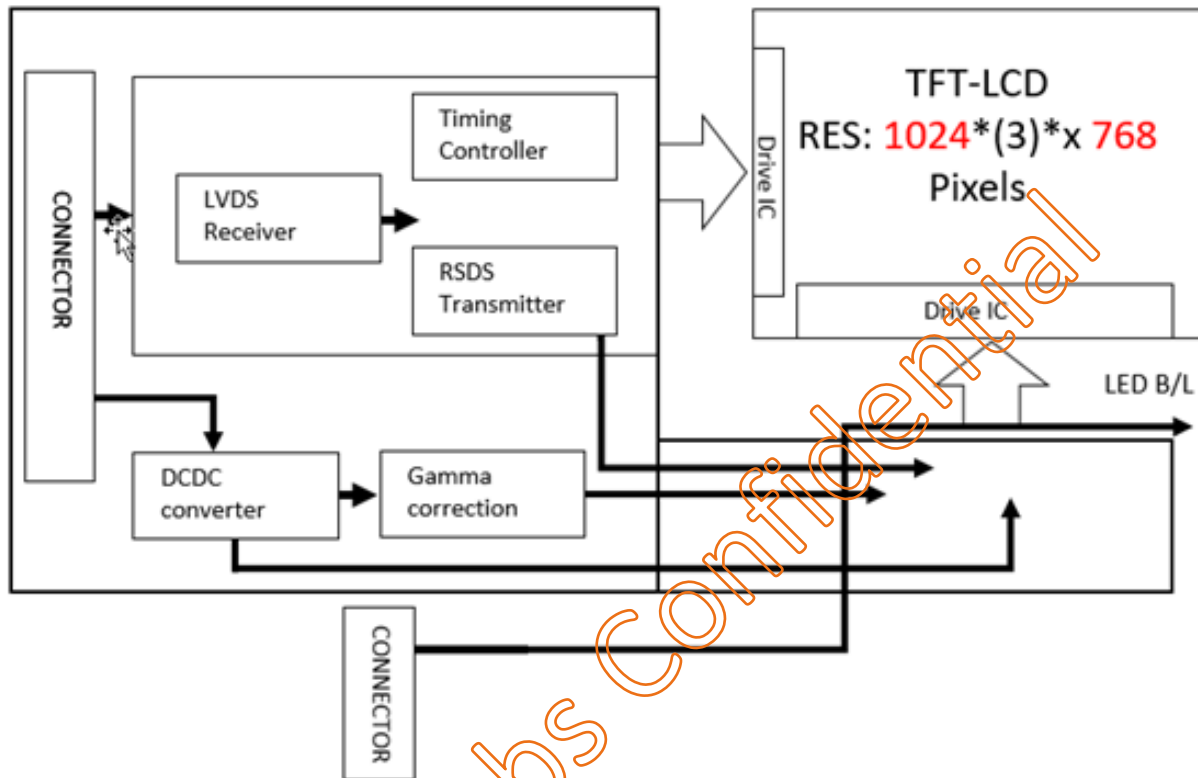


Color		Data Signal																							
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(1)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red(255)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale Of Green	Green(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	Green(253)	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
	Green(255)	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
Gray Scale Of Blue	Blue(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	

Note (1) 0: Low Level Voltage, 1: High Level Voltage

## 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.

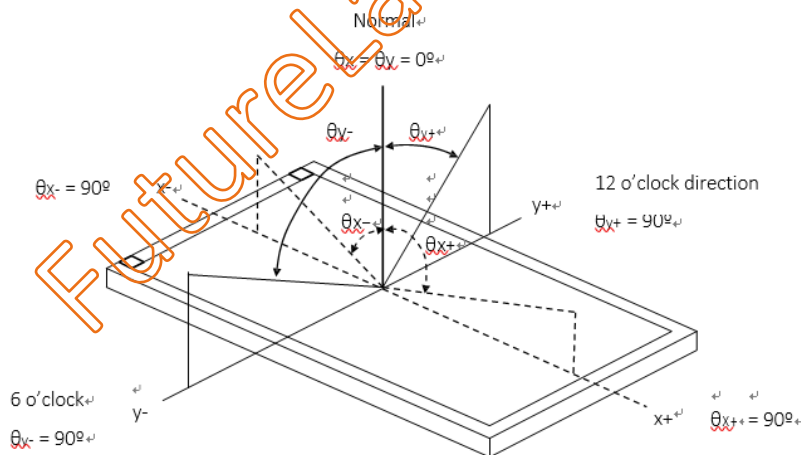
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Contrast Ratio	CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing angle at normal direction	700	1000		-	(2)	
Response Time	TR		-	14	19	ms	(3)	
	TF		-	11	16	ms		
Center Luminance of White	LC		900	1000	-	cd/m <sup>2</sup>	(4)	
White Variation	$\delta W$		-	1.25	1.4	-	(7)	
Chromaticity	Red		Rx	Typ.	0.652	Typ.	-	(6)
			Ry		0.338		-	
	Green	Gx	0.326		-			
		Gy	0.608		-			
	Blue	Bx	0.150		-			
		By	0.053		+0.05		-	
	White	Wx	0.313		-			
Wy		0.329	-					
Viewing Angle	Horizontal	$\theta_{x+}$	80	88	-	Deg.	(1)	
		$\theta_{x-}$	80	88	-			
	Vertical	$\theta_{y+}$	80	88	-			
		$\theta_{y-}$	80	88	-			

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.

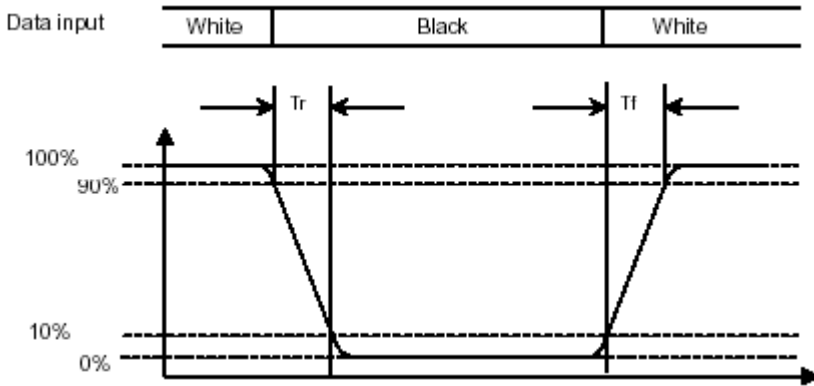


### Note 2: Definition of Contrast Ratio (CR)

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. The response time interval is between 10% and 90% of amplitudes, please refer the figure to the followings:



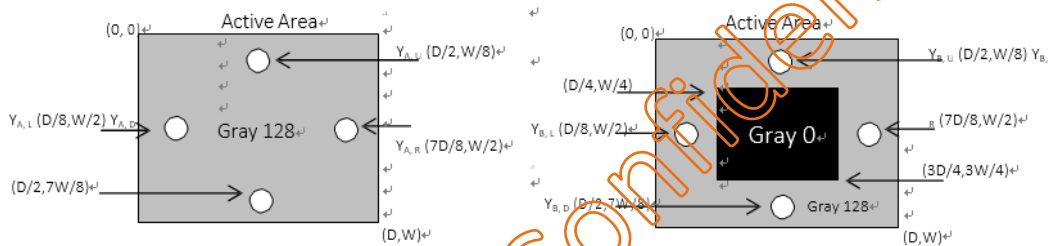
Note 4: Definition of Brightness (L)

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

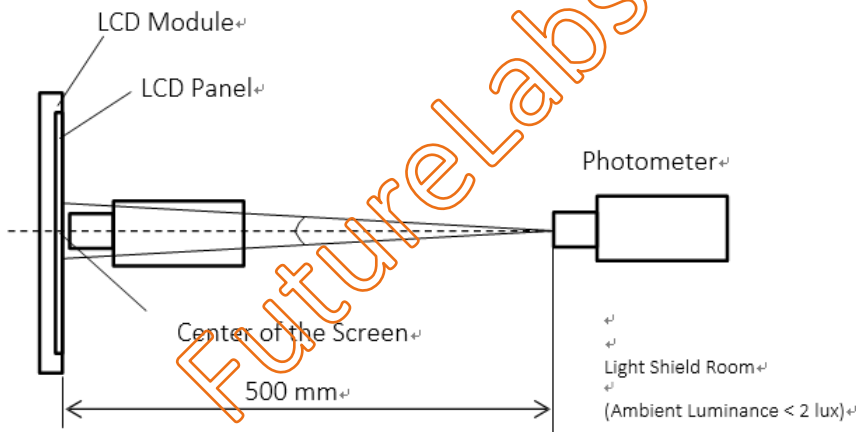
Note 5: Definition of Cross Talk  $CT = |Y_B - Y_A| / Y_A \times 100$  (%) Where:

$Y_A$  = Luminance of measured location without gray level 0 pattern ( $cd/m^2$ )

$Y_B$  = Luminance of measured location with gray level 0 pattern ( $cd/m^2$ )



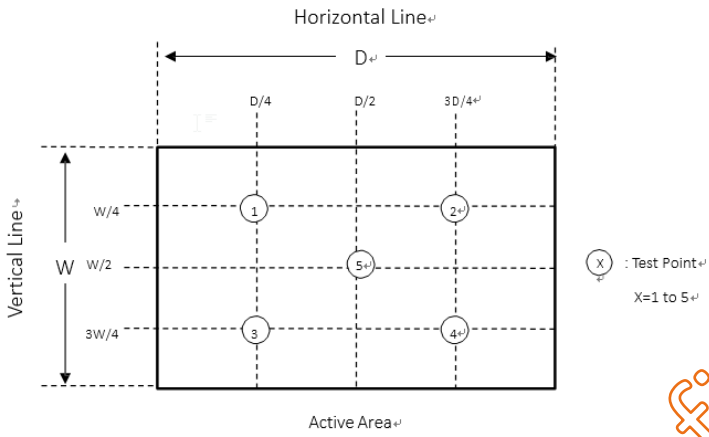
Note 6: The method of optical measurement:



Note 7: Definition of White Variation ( $\delta W$ ):

Measure the luminance of gray level 255 at 5 points

$$\delta W = \text{Maximum } [L(1), L(2), L(3), L(4), L(5)] / \text{Minimum } [L(1), L(2), L(3), L(4), L(5)]$$



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## B. Touch Screen specification

### 1. Environmental Specification

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

### 2. Mechanical Specification

Specification	Value
Operating Life (Finger input)	10 <sup>7</sup> 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

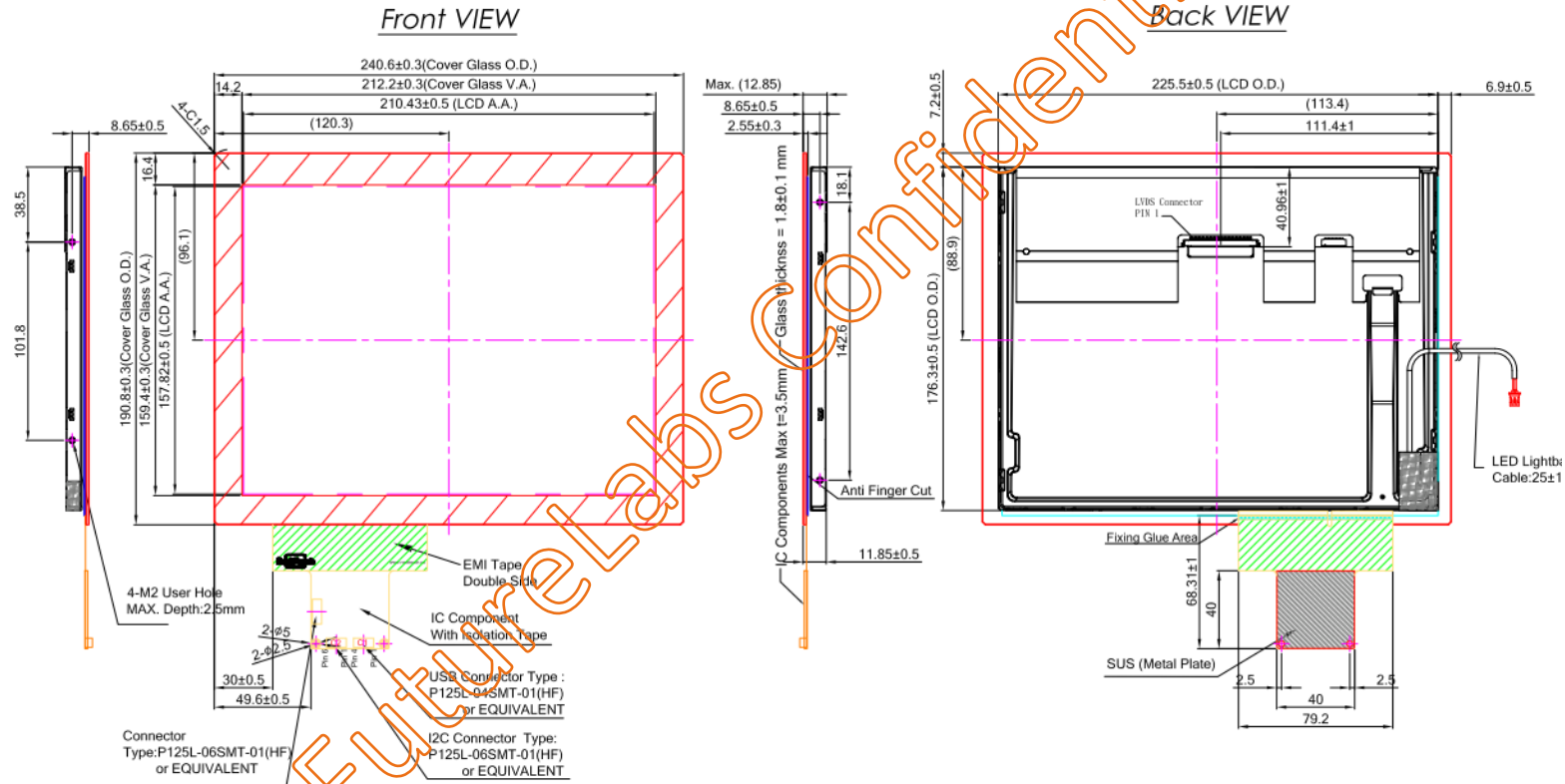
### 3. COMBO Type Controller USB / I2C

Parameters	Features
Circuit Board Dimension	Refer to drawings
Channels of Panel	Based on Sensor Design
Input Voltage	3.5V~5.5V Typical 5V for USB - 5V/3,3V (Min 3,2V) I2C
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 I2C:100K/400K Hz
Resolution	16384×16384 resolution
Power consumption(mA)	Active Mode: <110mA
	Idle Mode : <55mA
	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 other paramet

# 8. DIMENSION AND DRAWING



- Note:
1. Tolerance: ±0.5mm
  2. Touch Finger input only or special conductive pen
  3. Touch Surface Hardness: 6H (C.S.)
  4. Touch Transmittance: >85% (JIS-K7105)
  5. Touch Surface 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. Touch 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 P/N : FLC-104GML6000SA3#00
  11. Touch P/N : RTPC104-0001-C#00
  12. Assembly Solution : DSA

C1: Pin Define for USB 4 pin		C2: Pin Define for I2C 6 pin	
Pin 01	GND	Pin 01	GND
Pin 02	D-	Pin 02	SDA
Pin 03	D+	Pin 03	SCL
Pin 04	VDD	Pin 04	VDD(5V)
		Pin 05	INT
		Pin 06	RST

CNI Pin Define					
PIN	SYMBOL	PIN	SYMBOL	PIN	SYMBOL
1	VCC	11	SEL6/8	21	RX2-
2	VCC	12	GND	22	RX2+
3	VCC	13	NC	23	GND
4	GND	14	GND	24	RXCLK-
5	GND	15	RX0-	25	RXCLK+
6	GND	16	RX0+	26	GND
7	RPFI	17	GND	27	RX3-
8	NC	18	RX1-	28	RX3+
9	NC	19	RX1+	29	GND
10	NC	20	GND	30	NC

Customer Approval	Part Number # REV	FLD-104GML60P0FA1	#00
Date	Rev. No	Date	Revision
Designer	01	20210708	Matt
Name	Change touch panel		
Signature	Date	Design By	Date
			Check By
			Approved By

## 9. 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.

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