



Colour TFT Display Modules

Product Specification

Part No. SCF2105300FGC00

21.5" Colour TFT Display

with PCAP Touchscreen

For more information, please visit www.andersdx.com
or email info@andersdx.com

Version 1



Confidential Document

DATA IMAGE CORPORATION

CTP Module Specification

Preliminary

ITEM NO.: SCF2105300FGC00

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Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
	ALEX	PRETTY	DAVID	KEN
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	1	02/JUL/15'		27



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2. RECORD OF REVISION

Rev	Date	Item	Page	Comment	Source
1	02/JUL/15'			Initial Preliminary	ESR0405026

3. LCD GENERAL SPECIFICATIONS

Composition : 21.5 inch HD 1080 resolution display with a projected Capacitive Touch Panel (CTP).
 Interface : LVDS Interface for panel and I²C for the CTP.

Parameter	Specifications	Unit
Screen Size	21.5 (diagonal)	inch
Display Format	1920(H) x (R,G,B) x 1080(V)	dot
Outline Dimension	533.4(W) x 324.86(H) x 14.6(D)	mm
LCD Active Area	476.64(W) x 268.11(H)	mm
CTP Active Area	477.64(H) x 269.11(V)	mm
Dot Pitch	0.24825(H) x 0.24825(V)	mm
Pixel Configuration	RGB vertical stripe	
Surface treatment	Glare	
Display mode	Normally white	
Weight	TBD	g
View Angle direction(Gray inversion)	All	
LCM Part Number	FG210500DSSWNG01	

4. LCD ABSOLUTE MAXIMUM RATINGS

4.1 Absolute Ratings of Environment

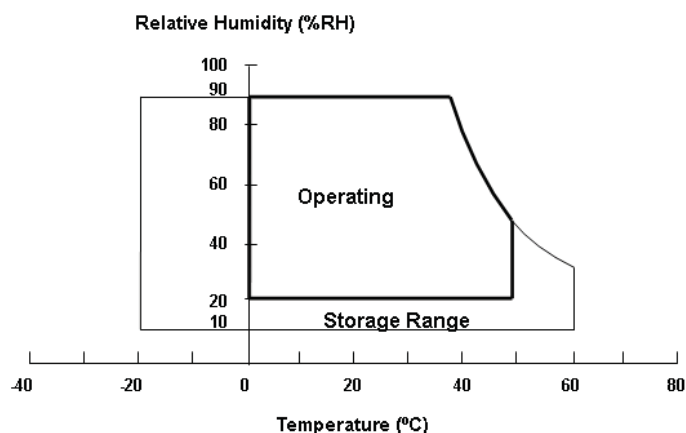
Parameter	Symbol	Min.	Max.	Unit	Remark
Storage temperature	T _{st}	-20	60	°C	Note1
Operating temperature	T _{op}	0	50	°C	Note1,2

Note 1 : (a) 90 %RH Max. (T_a ≤ 40 °C).

(b) Wet-bulb temperature should be 39 °C Max. (T_a > 40 °C).

(c) No condensation.

Note 2 : The temperature of panel surface should be 0°C min. and 65°C max under V_{cc}=5.0V, f_r=60Hz, typical LED string current, 25°C ambient temperature, and no humidity control . Any condition of ambient operating temperature ,the surface of active area should be keeping not higher than 65°C



4.2 Electrical Absolute Ratings

4.2.1 TFT-LCD Module

Parameter	Symbol	Min.	Max.	Unit	Remark
Power Supply Voltage	VCCS	-0.3	+6.0	V	Note1
	VIN	-0.3	+3.6	V	

4.2.2 Backlight Unit

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Forward Current Per Input Pin	IF	-	65	69	mA	Note1, 2 Duty=100%
LED Pulse Forward Current Per Input Pin	IP	-	-	150	mA	Note1, 2 Pulse Width \leq 10msec. and Duty \leq 0%

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 input pin of LED light bar at $T_a=25\pm 2^\circ\text{C}$

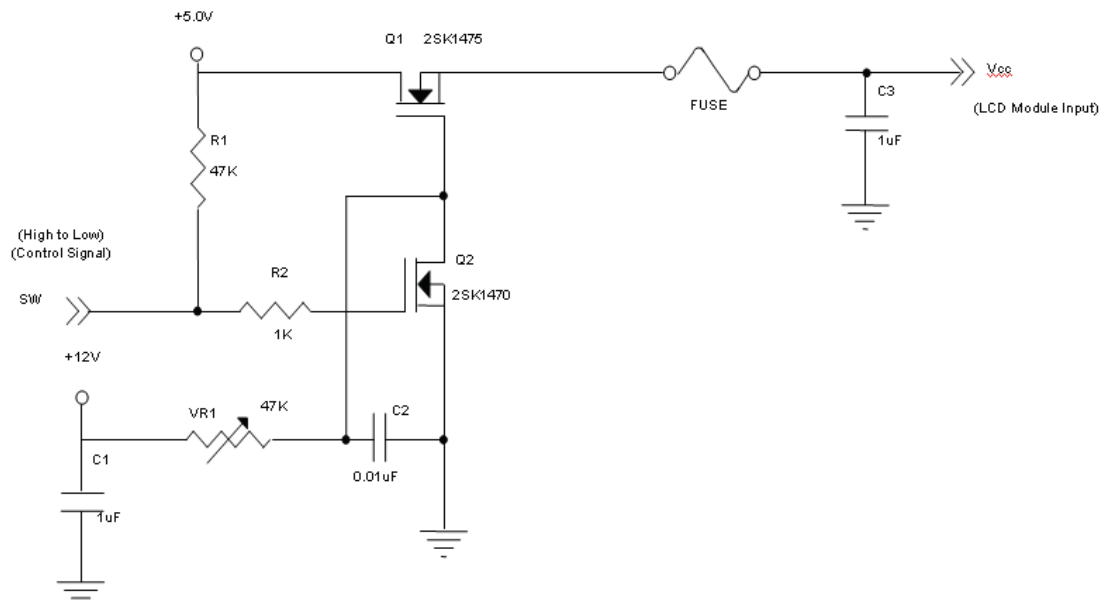
5. LCD ELECTRICAL CHARACTERISTICS

5.1 Operating Conditions

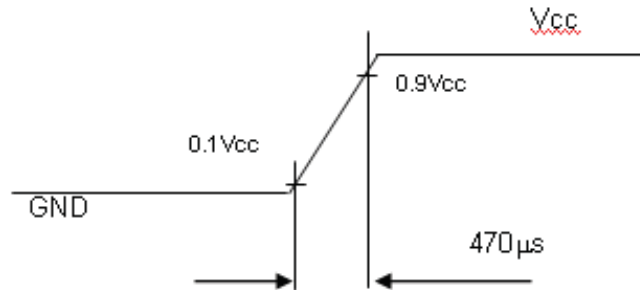
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply Voltage	VCC	4.5	5.0	5.5	V	-
Ripple Voltage	VRP	-	-	300	Mv	-
Rush Current	IRUSH	-	-	3	A	Note2
AC off Rush Current	Ioff_RUSH	-	-	4	A	Note5
Power Supply Current	White	-	0.39	0.45	A	Note3(a)
	Black	-	1.17	1.45	A	Note3(b)
	Vertical Stripe	-	0.75	1.00	A	Note3(c)
Power Consumption	PLCD	-	5.85	7.97	Watt	Note4
LVDS differential input voltage	Vid	100	-	600	Mv	
LVDS common input voltage	vic	0.05	-	2.35	V	

Note 1: The ambient temperature is $T_a = 25 \pm 2^\circ\text{C}$.

Note 2: Measurement Conditions:

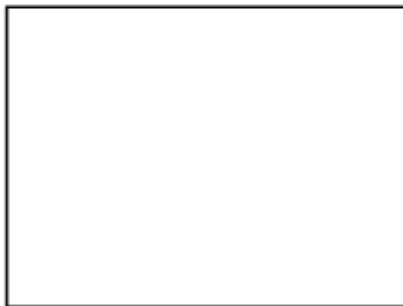


Vcc rising time is 470µs



Note 3: The specified power supply current is under the conditions at $V_{cc} = 5.0\text{ V}$, $T_a = 25 \pm 2\text{ }^\circ\text{C}$, $F_r = 60\text{ Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern



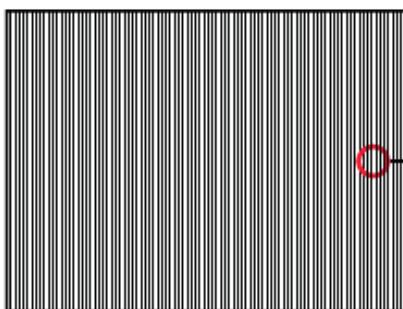
Active Area

b. Black Pattern

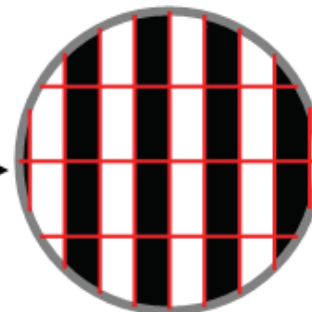


Active Area

c. Vertical Stripe Pattern



Active Area



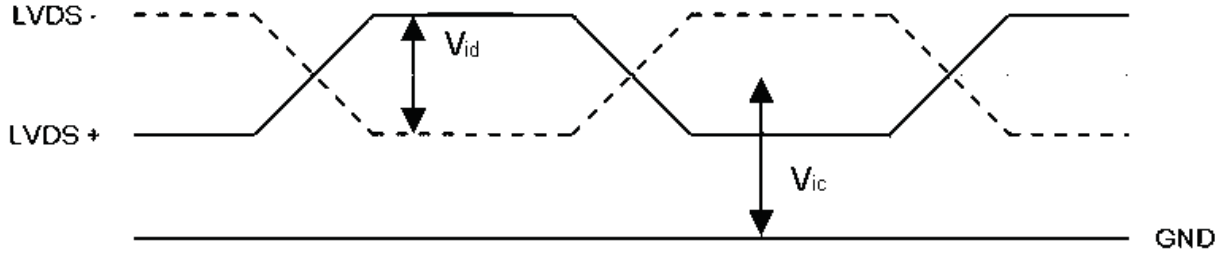
Note 4: The power consumption is specified at the black pattern with the maximum current.

Note 5: The Rush current would be happened when system doesn't follow Power sequence in AC off status.

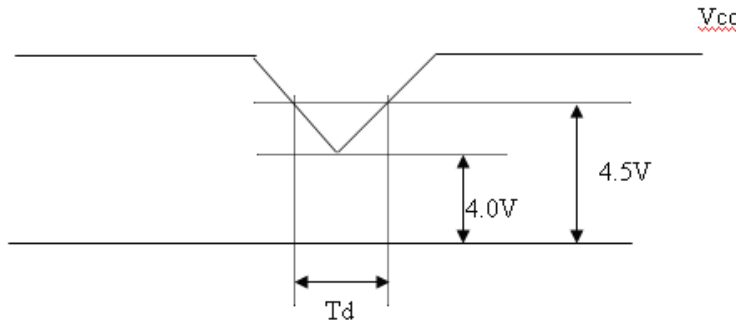
Note 6: VID waveform condition.



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5.2 VCC Dip Condition

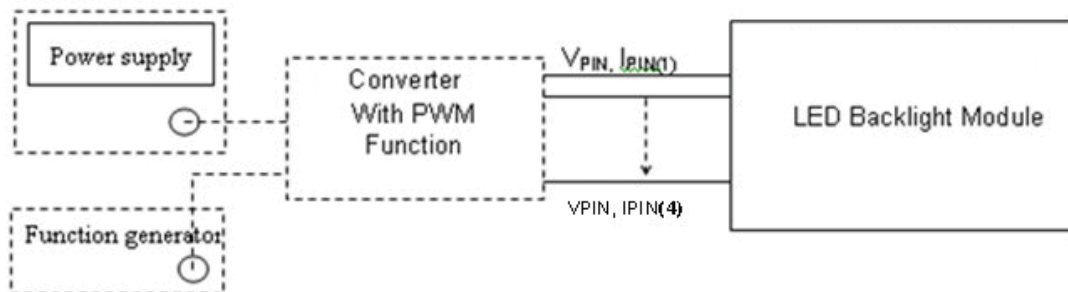


5.3 Backlight Unit

Ta = 25 ± 2 °C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Light Bar Input Voltage Per Input Pin	V _{PIN}	-	34.1	37.4	V	Note1 Duty=100%, I _{PIN} =(65mA)
LED Light Bar Current Per Input Pin	I _{PIN}	-	65	69	mA	Note1,2 Duty=100%
Power Consumption	P _L	-	8.87	10.32	W	Note1 Duty=100%, I _{PIN} =(65mA)
LED Dice Life Time	L _{BL}	40000	-	-	Hrs	Note3

- Note 1 : LED light bar input voltage and current are measured by utilizing a true RMS multimeter as shown below:
- Note 2 : PBL = I_{PIN} × V_{PIN} × (4) input pins ,
- Note 3 : The lifetime of LED is defined as the time when LED packages continue to operate under the conditions at Ta = 25 ± 2 °C and I = (65)mA (per chip) until the brightness becomes ± 50% of its original value.
- Note 4 : The max ΔV_f is 3.3V between each string.



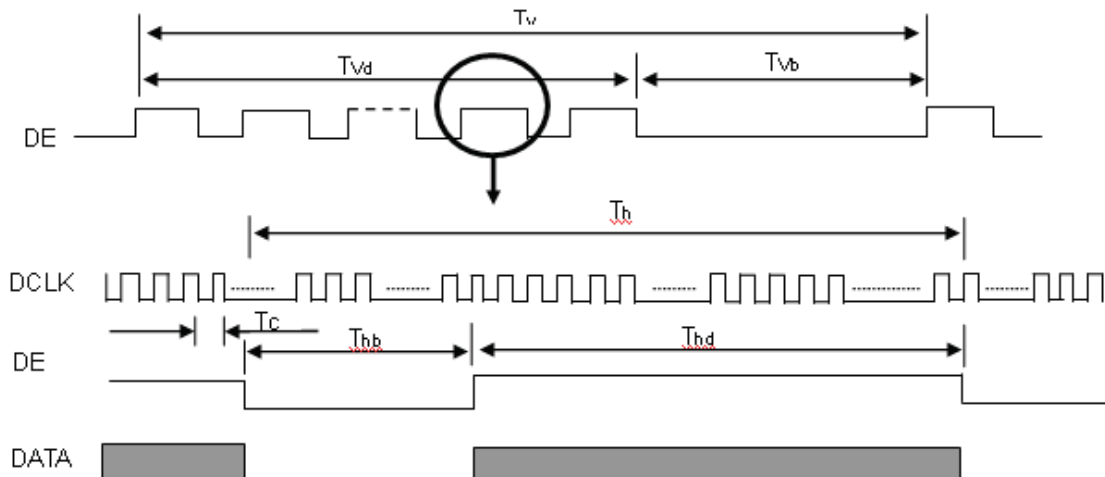
6. LCD INPUT SIGNAL CHARACTERISTICS

6.1 Signal Timing

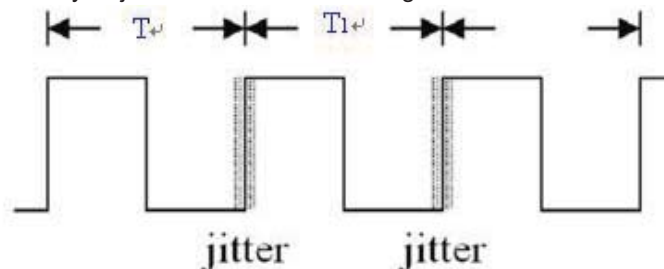
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	Fc	58.54	74.25	97.98	MHZ	
	Period	Tc	-	13.47	-	ns	
	Input cycle to cycle jitter	Trcl	-	-	200	ns	Note1
	Input Clock to data skew	TLVCCS		-	400	ps	Note2
	Spread spectrum Modulation range	Fclkin_mod	Fc*98%	-	Fc*102%	MHZ	Note3
	Spread spectrum Modulation frequency	FSSM		-	200	KHZ	
Vertical Display Term	Frame Rate	Fr	50	60	75	HZ	
	Total	Tv	1115	1125	1136	Th	Tv=Tvd+Tvb
	Active Display	Tvd	1080	1080	1080	Th	
	Blank	Tvb	Tv-Tvd	45	Tv-Tvd	Th	
Horizontal Display Term	Total	Th	1050	1100	1150	Tc	Th=Thd+Thb
	Active Display	Thd	960	960	960	Tc	
	Blank	Thb	Th-Thd	140	Th-Thd	Tc	

Note : Because this module is operated by DE only mode, Hsync and Vsync input signals are ignored

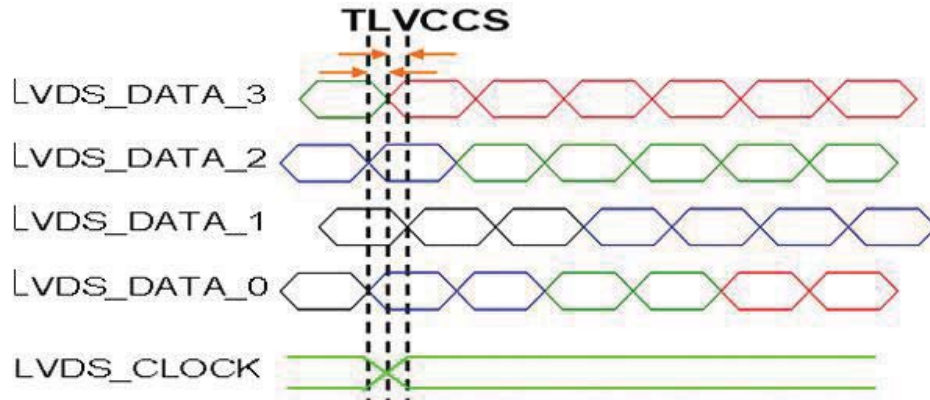
INPUT SIGNAL TIMING DIAGRAM



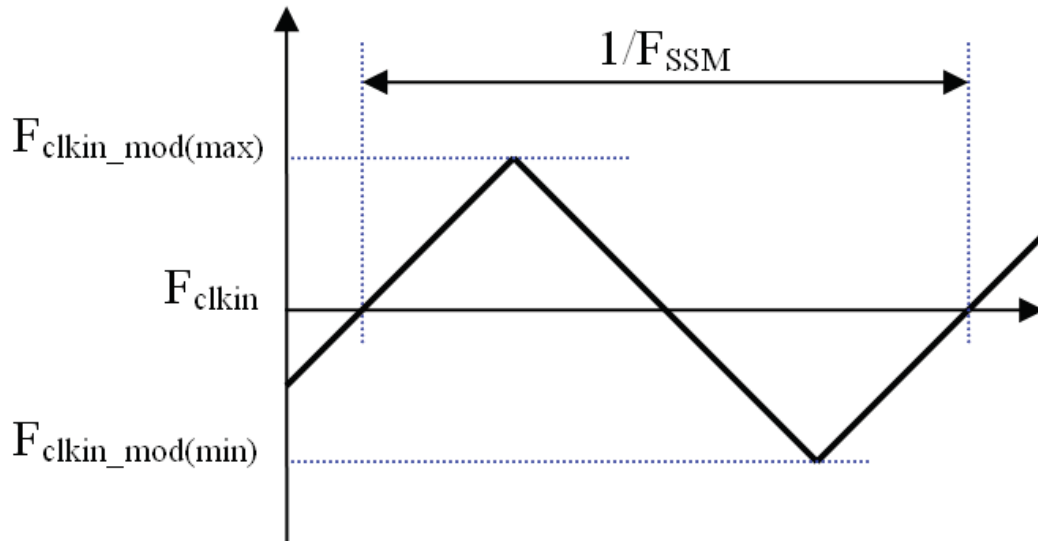
Note 1 : The input clock cycle-to-cycle jitter is defined as below figures. $Trcl = |T_1 - T_1|$



Note 2 : Input Clock to data skew is defined as below figures.



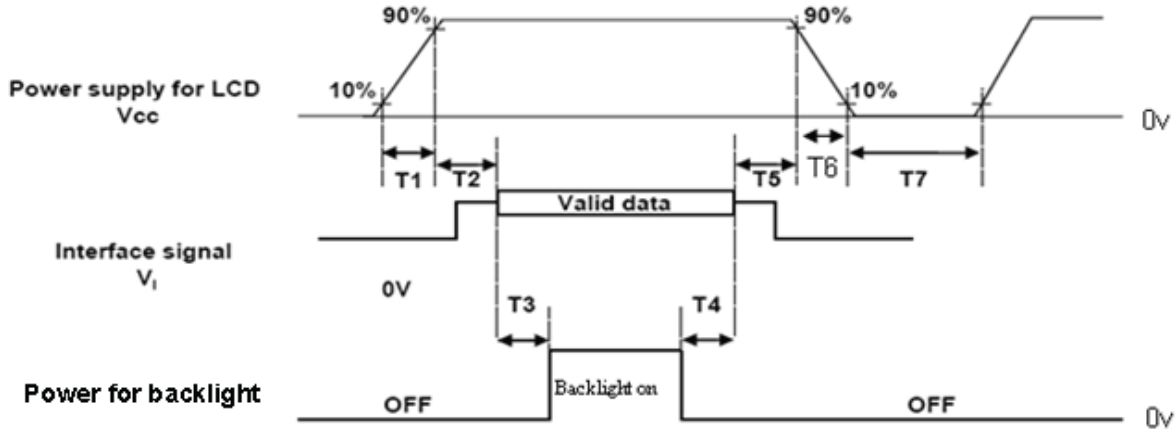
Note 3 : The SSCG (Spread spectrum clock generator) is defined as below figures.



Note 4 The DCLK range at last line of V-blanking should be set in 0 to Hdisplay/2

6.2 Power On/Off Sequence

The power sequence specifications are shown as the following table and diagram.



Parameters	Min.	Typ.	Max.	Units
T1	0.5	-	10	ms
T2	0	-	50	
T3	450	-	-	
T4	90	-	-	
T5	0	-	50	
T6	5	-	150	
T7	500	-	-	

Note 1 : The supply voltage of the external system for the module input should be the same as the definition of V_{cc}.

Note 2 : When the backlight turns on before the LCD operation of the LCD turns off, the display may momentarily become abnormal screen.

Note 3 : In case of V_{CC} = off level, please keep the level of input signals on the low or keep a high impedance.

Note 4 : T₄ should be measured after the module has been fully discharged between power off and on period.

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

Note 6 : DI won't take any responsibility for the products which are damaged by the customers not following the Power Sequence.

Note 7 : There might be slight electronic noise when LCD is turned off (even backlight unit is also off). To avoid this symptom, we suggest "V_{cc} falling timing" to follow "t₆ spec".

6.3 LVDS Input Signal Specifications

6.3.1 LVDS Data Mapping Table

LVDS Channel O0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	OG0	OR5	OR4	OR3	OR2	OR1	OR0
LVDS Channel O1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	OB1	OB0	OG5	OG4	OG3	OG2	OG1
LVDS Channel O2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	OB5	OB4	OB3	OB2
LVDS Channel O3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	OB7	OB60	OG7	OG6	OR7	OR6
LVDS Channel E0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	EG0	ER5	ER4	ER3	ER2	ER1	ER0
LVDS Channel E1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	EB1	EB0	EG5	EG4	EG3	EG2	EG1
LVDS Channel E2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	EB5	EB4	EB3	EB2
LVDS Channel E3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	EB7	EB6	EG7	EG6	ER7	ER6

6.3.2 Color Data Input Assignment

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	0	1	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	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
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	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	1	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	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
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	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	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	1	0	
	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
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	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	
	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	1		

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

7. LCD PIN CONNECTIONS

7.1 TFT-LCD

Pin No	Symbol	Function	Remark
1	RX00-	Negative LVDS differential data input. Channel O0 (odd)	
2	RX00+	Positive LVDS differential data input. Channel O0 (odd)	
3	RX01-	Negative LVDS differential data input. Channel O1 (odd)	
4	RX01+	Positive LVDS differential data input. Channel O1 (odd)	
5	RX02-	Negative LVDS differential data input. Channel O2 (odd)	
6	RX02+	Positive LVDS differential data input. Channel O2 (odd)	
7	GND	Ground	
8	RXOC-	Negative LVDS differential clock input. (odd)	
9	RXOC+	Positive LVDS differential clock input. (odd)	
10	RX03-	Negative LVDS differential data input. Channel O3(odd)	
11	RX03+	Positive LVDS differential data input. Channel O3 (odd)	
12	RXE0-	Negative LVDS differential data input. Channel E0 (even)	
13	RXE0+	Positive LVDS differential data input. Channel E0 (even)	
14	GND	Ground	
15	RXE1-	Negative LVDS differential data input. Channel E1 (even)	
16	RXE1+	Positive LVDS differential data input. Channel E1 (even)	
17	GND	Ground	
18	RXE2-	Negative LVDS differential data input. Channel E2 (even)	
19	RXE2+	Positive LVDS differential data input. Channel E2 (even)	
20	RXEC-	Negative LVDS differential clock input. (even)	
21	RXEC+	Positive LVDS differential clock input. (even)	
22	RXE3-	Negative LVDS differential data input. Channel E3 (even)	
23	RXE3+	Positive LVDS differential data input. Channel E3 (even)	
24	GND	Ground	
25	NC	For LCD internal use only, Do not connect	
26	NC		
27	NC		
28	Vcc	+5.0V power supply	
29	Vcc		
30	Vcc		

Note 1 : Connector Part No.:
Fullconn WF13-422-3033 or P-Two 187098-30091 or Foxconn GS23302-0311R-7H or equivalent

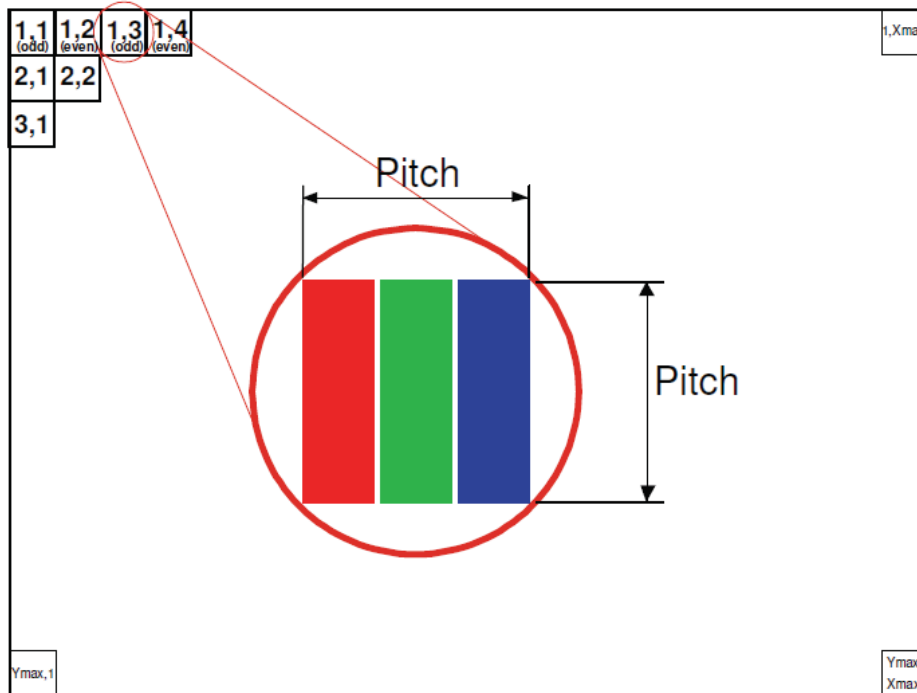
Note 2 : User's connector Part No:
Mating Wire Cable Connector Part No.: FI-X30H(JAE) or FI-X30HL(JAE)
Mating FFC Cable Connector Part No.: 217007-013001 (P-TWO) or JF05X030-1 (JAE).

Note 3 : The first pixel is odd.



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Note 4 : Input signal of even and odd clock should be the same timing.



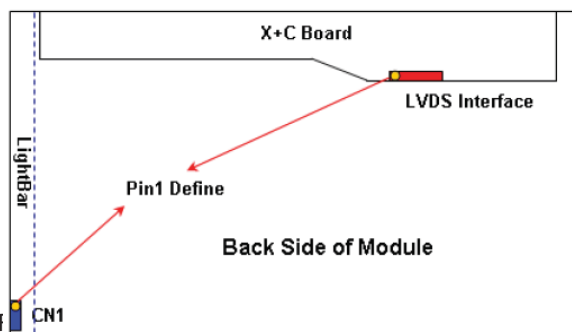
7.2 LIGHTBAR Connector Pin Assignment

CN1

Pin No	Symbol
1	Cathode of LED string
2	Cathode of LED string
3	VLED
4	VLED
5	Cathode of LED string
6	Cathode of LED string

Note 1 : Connector(wire type):FCN(WM13-406-063N) or Entery(3707K-Q06N-08L) or CviLux(CI1406M1HRK-NH) or equivalent.

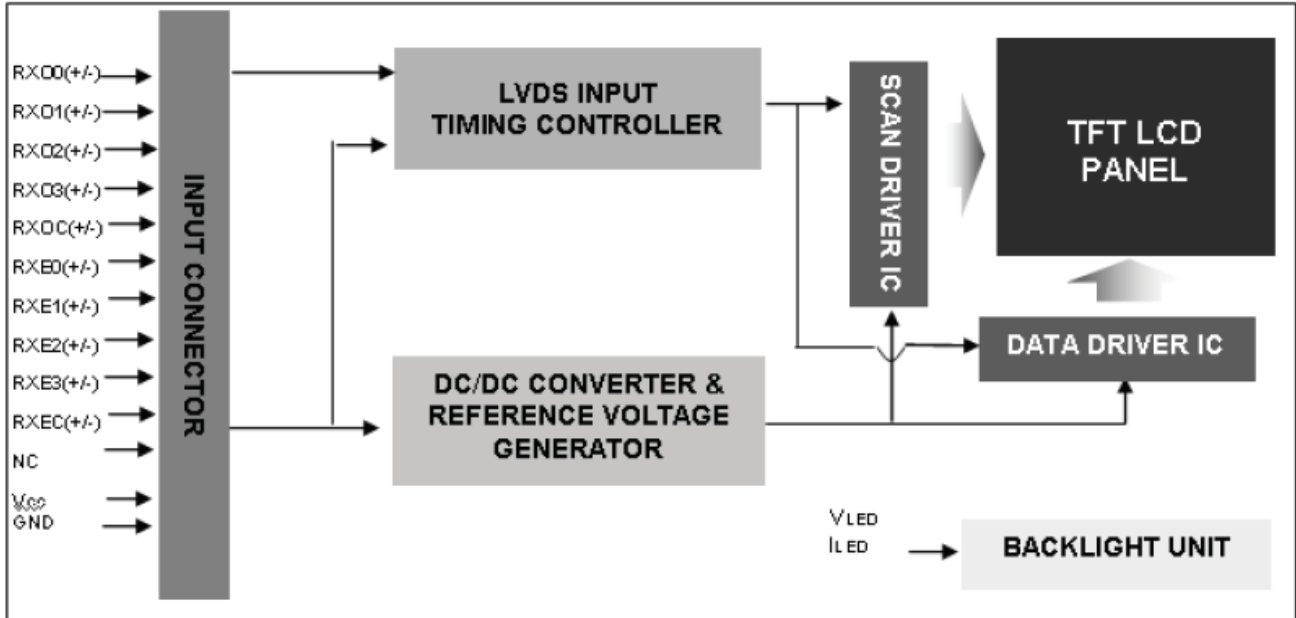
Note 2 : User's mating connector part No.: FCN(WF1300106-B) or Entery(H112K-P06N-01B or M001-E11N-00R) or CviLux(CI1406SL000-NH) and hook width must be less than 4.5mm.



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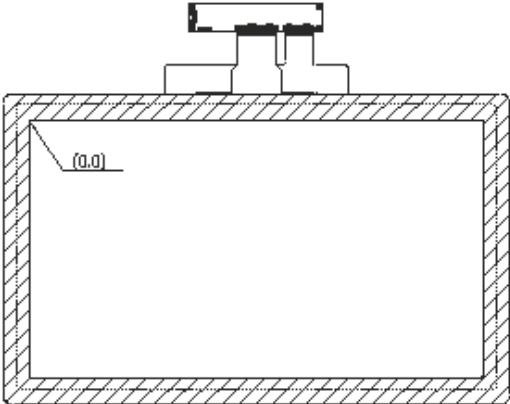
8. LCD BLOCK DIAGRAM



9. CTP SPECIFICATIONS

9.1 CTP General Specifications

Composition: It's 21.5 inch Capacitive Touch Panel (CTP).

Item	Specification	Unit
Type	Transparent type projected capacitive touch panel	
Input mode	Human's finger	
Multi touch	2	Point
Interface	USB	
(X,Y) Position		

9.2 Absolute Maximum Rating

Symbol	Description	Min	Typ.	Max	Unit	Notes
VCC	Supply voltage	-0.5	-	6	V	
VIO	Input I/O pin voltage	GND-0.3	-	VCC+0.3	V	

9.3 Electrical Characteristic

Symbol	Description	Min	Typ.	Max	Unit	Notes
VCC	Supply voltage	4.75	5	5.25	V	USB 5V

9.4 Pin Connections

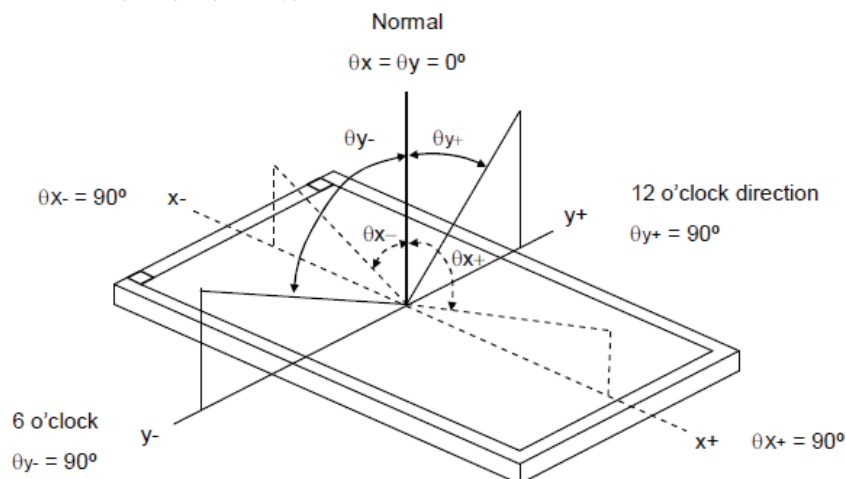
Pin Number	Pin Name	Description
1	G	Ground
2	V	Power Supply Voltage, USB 5V
3	G	Ground
4	D+	USB data+
5	D-	USB data -

10. OPTICAL CHARACTERISTIC

Parameter	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	VCC	5	V
Input Signal	According to typical value in "5. ELECTRICAL CHARACTERISTICS"		
LED Light Bar Input Current Per Input Pin	IPIN	65 ± 1.95	mADC
PWM Duty Ratio	D	100	%

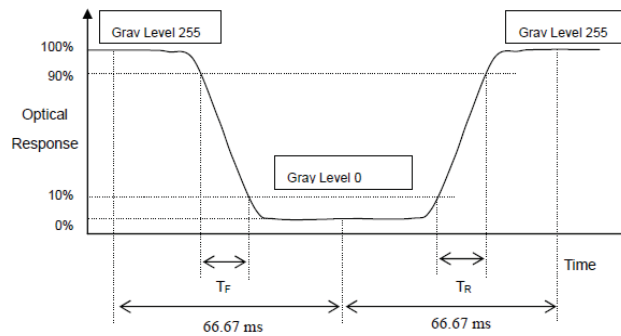
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks	
Viewing Angle	Horizontal	$\Theta_x^- + \Theta_x^+$	(CR≥10)	150	170	-	deg	Note 1,5
	Vertical	$\Theta_y^- + \Theta_y^+$		140	160	-		
	Horizontal	$\Theta_x^- + \Theta_x^+$	(CR≥5)	160	178	-		
	Vertical	$\Theta_y^- + \Theta_y^+$		150	170	-		
Contrast Ratio	CR	$\theta_x = \theta_y = 0^\circ$	700	1000	-	-	Note 2,5	
Response time	Tr		-	1.5	2.5	ms	Note 3	
	Tf		-	3.5	5.5			
Uniformity	B-uni		75	-	-	%	Note 5,6	
Brightness	L		170	210	-	cd/m ²	Note 4,5	
Chromaticity		Center $\theta_x = \theta_y = 0^\circ$	Typ. -0.03	0.635	Typ. +0.03	-	Note 1,5	
				0.352				
				0.321				
				0.633				
				0.151				
				0.052				
				0.313				
				0.329				

Note 1 : Definition of Viewing Angle (Θ_x , Θ_y) :



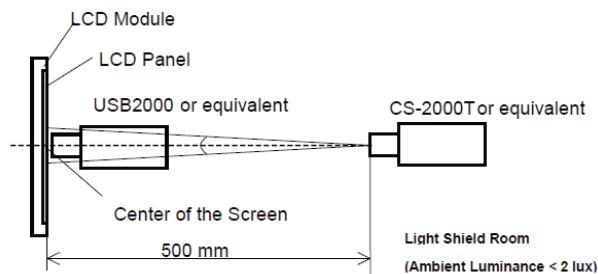
Note 2 : Definition of Contrast Ratio (CR) :
 The contrast ratio can be calculated by the following expression :
 $CR = L_{255} / L_0$
 L255: Luminance of gray level 255
 L 0: Luminance of gray level 0
 $CR = CR (5)$
 CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note 6.

Note 3 : Definition of Response Time (T_R , T_F) :

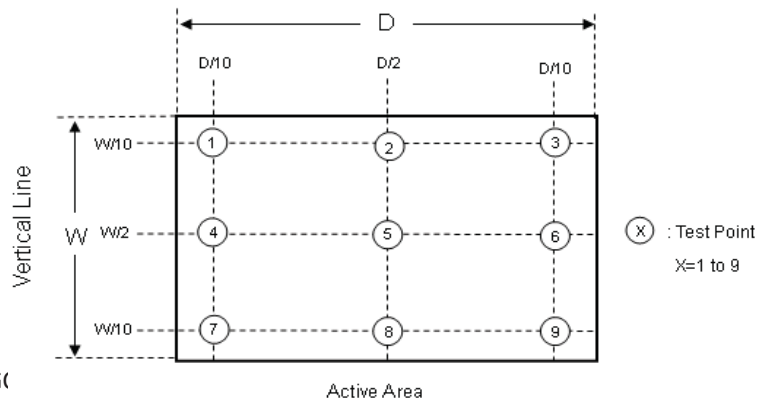


Note 4 : Definition of Center Point Luminance of White (L_{CP}) :
 Measure the luminance of gray level 255 at center point
 $L_{CP} = L(5)$
 L (x) is corresponding to the luminance of the point X at Figure in Note 6.

Note 5 : Measurement Setup :
 The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note 6 : Definition of White Variation (δW) :
 Measure the luminance of gray level 255 at 9 points
 $\delta W_{9p} = \{ \text{Minimum } [L(1) \sim L(9)] / \text{Maximum } [L(1) \sim L(9)] \} * 100\%$
 Horizontal Line



SCF2105300FG(

Active Area

11. APPEARANCE SPECIFICATION

11.2 Inspection condition

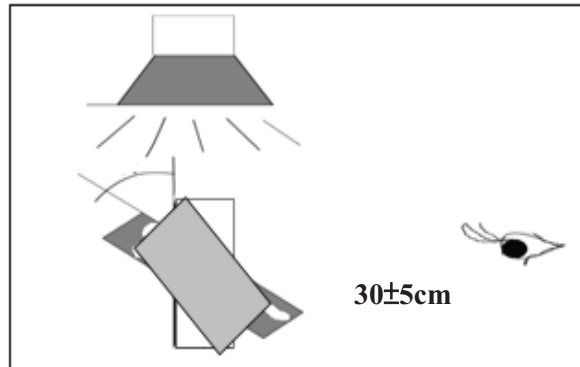
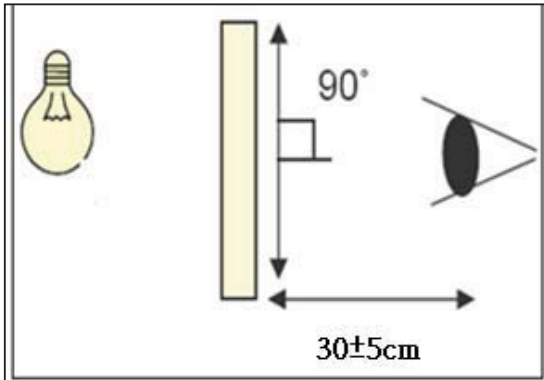
11.2.1 Inspection conditions

11.2.2 Inspection Distance : 30 ± 5 cm

11.2.3.1 View Angle :

(1) Inspection that light pervious to the product: $90 \pm 15^\circ$

(2) Inspection that light reflects on the product: $90 \pm 15^\circ$




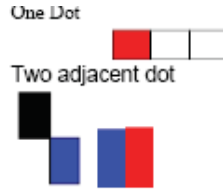
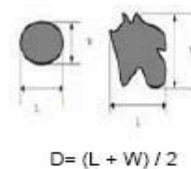
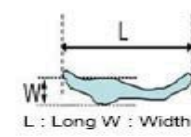
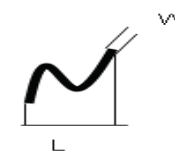
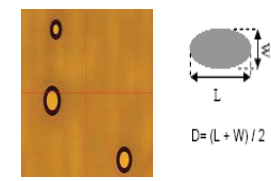
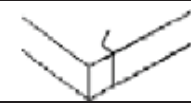
11.3 Environment conditions:

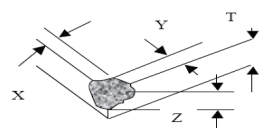
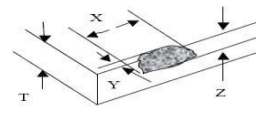
Ambient Temperature :	$25 \pm 5^\circ\text{C}$
Ambient Humidity :	30~75%RH
Ambient Illumination	300~500 lux

11.4 Inspection Parameters

Appearance inspection standard (D: diameter, L: length; W: width, Z: height, T: glass thickness)

Inspection item	Inspection standard	Description
No image	Prohibited	
Image abnormal	Prohibited	
Bright line	Prohibited	
Thin line	It is acceptable that the defect can not be seen with 2% ND filter.	
Mura	It is acceptable that the defect can not be seen with 2% ND filter.	

Dot	Item	Acceptable Visible area	Total	
	Bright dot	3		
	Dark dot	5		
	Bright adjacent dots	1	1	
	Dark adjacent dots	2	2	
	Adjacent dots with a bright dot and a dark dot	2	2	
Foreign material in dot shape	SPEC (unit: mm)		Acceptable	
	$D \leq 0.5$		Ignored	
	$0.5 < D \leq 0.8$, distance > 5		$n \leq 5$	
	$D > 0.8$		0	
Foreign material in line shape	SPEC		Acceptable	
	$W \leq 0.05$ and $L \leq 10$		Ignored	
	$0.05 < W \leq 0.1$, $L \leq 10$, distance > 5		$n \leq 5$	
	$W > 0.1$ or $L > 10$		0	
Contamination	It is acceptable if the dirt can be wiped.			
Scratch	SPEC		Acceptable	
	$W \leq 0.05$ and $L \leq 10$		Ignored	
	$0.05 < W \leq 0.08$, $L \leq 10$, distance > 5		$n \leq 5$	
	$0.08 < W \leq 0.1$, $L \leq 10$, distance > 5		$n \leq 3$	
	$W > 0.1$ or $L > 10$		0	
Bubble	SPEC (unit: mm)		Acceptable	
	$D \leq 0.3$		Ignored	
	Non visible area		Ignored	
	$0.3 < D \leq 0.5$, distance > 5		$n \leq 5$	
	$D > 0.5$		0	
Polarizer flaw or leak out resin	Defect is defined as the active area.			
Cover & Sensor Crack	Prohibited			

Cover angle missing	SPEC (unit: mm)	Acceptable	
	Side/Bottom	Ignored	
	It is prohibited if the defect appears on the front.	0	
Cover edge break	SPEC (unit: mm)	Acceptable	
	$X \leq 3.0, Y \leq 3.0, Z \leq T$	Ignored	
	$X > 3.0, Y > 3.0, Z > T$	0	
Inspection item	SPEC		Description
Ink	SPEC (unit: mm)	Acceptable	
	word unclear, inverted, mistake, break line	0	
Bubble under protection film	SPEC (unit: mm)	Acceptable	
	NA		
Function	Prohibited		

11.5 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

Sampling type: normal inspection, single sampling

Sampling table: MIL-STD-105E

Inspection level: Level II

Class of defects	Definition		
	Major	AQL 0.65	It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
Minor	AQL 1.5	It is a defect that will not result in functioning problem with deviation classified.	

12. QUALITY ASSURANCE

12.1 Test Condition

12.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25 ± 5°C
 Humidity : 65 ± 5%

12.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

12.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

12.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

12.1.5 Test Method

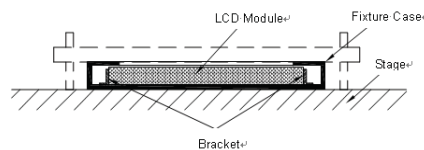
Reliability Test Item & Level		Test Level	Remark
No.	Test Item		
1	High Temperature Storage Test	Ta=60°C,240hrs	IEC68-2-2
2	Low Temperature Storage Test	Ta=-20°C,240hrs	IEC68-2-1
3	High Temperature Operation Test	Ta=50°C,240hrs	IEC68-2-2
4	Low Temperature Operation Test	Ta=0°C,240hrs	IEC68-2-1
5	Thermal Cycling Test (No operation)	-20°C, 0.5hour→25°C/5 min →60°C, 0.5hour; 100cycles	IEC68-2-14
6	High Temperature and High Humidity Operation Test	T=50°C,80% RH,240hrs	IEC68-2-3
7	ESD TEST	Location: LCM/TP surface Condition:150pf 330Ω Contact +/- 8kV Air +/-12kV Criteria: Class C	IEC-61000-4-2
8	Vibration Test (No operation)	1.5G / 10-300 Hz, Sine wave, 30 min/cycle, 1cycle for each X, Y, Z	IEC60068-2-32
9	Shock Test (non-operating)	Acceleration: 50 G Wave: Half-sine Active time: 11ms Direction: one time for each Axis (X, Y, Z)	IEC68-2-6

Note 1 : Criteria : Normal display image with no obvious non-uniformity and no line defect.

Note 2 : Evaluation should be tested after storage at room temperature for more than two hours.

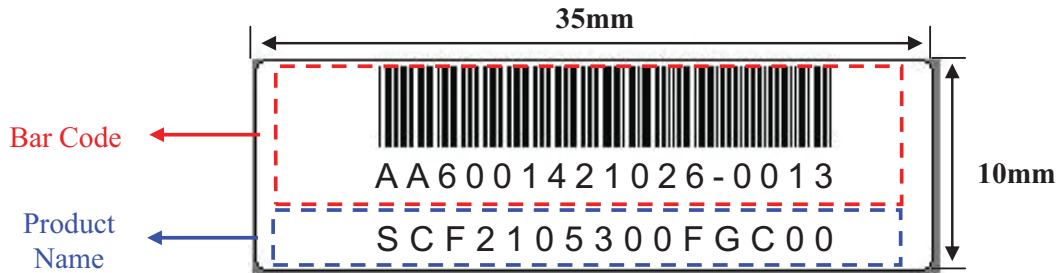
Note 3 : At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.

The fixing condition is shown as below:



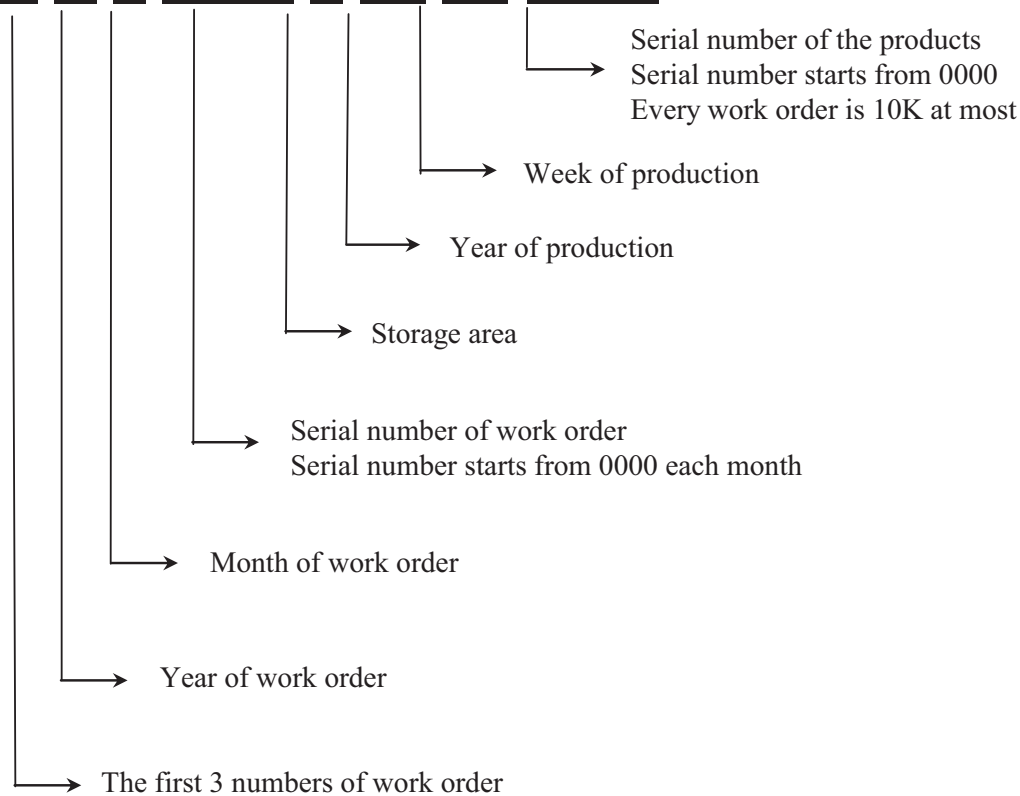
13. PRODUCT LABEL DEFINE

Product Label style:



BarCode Define:

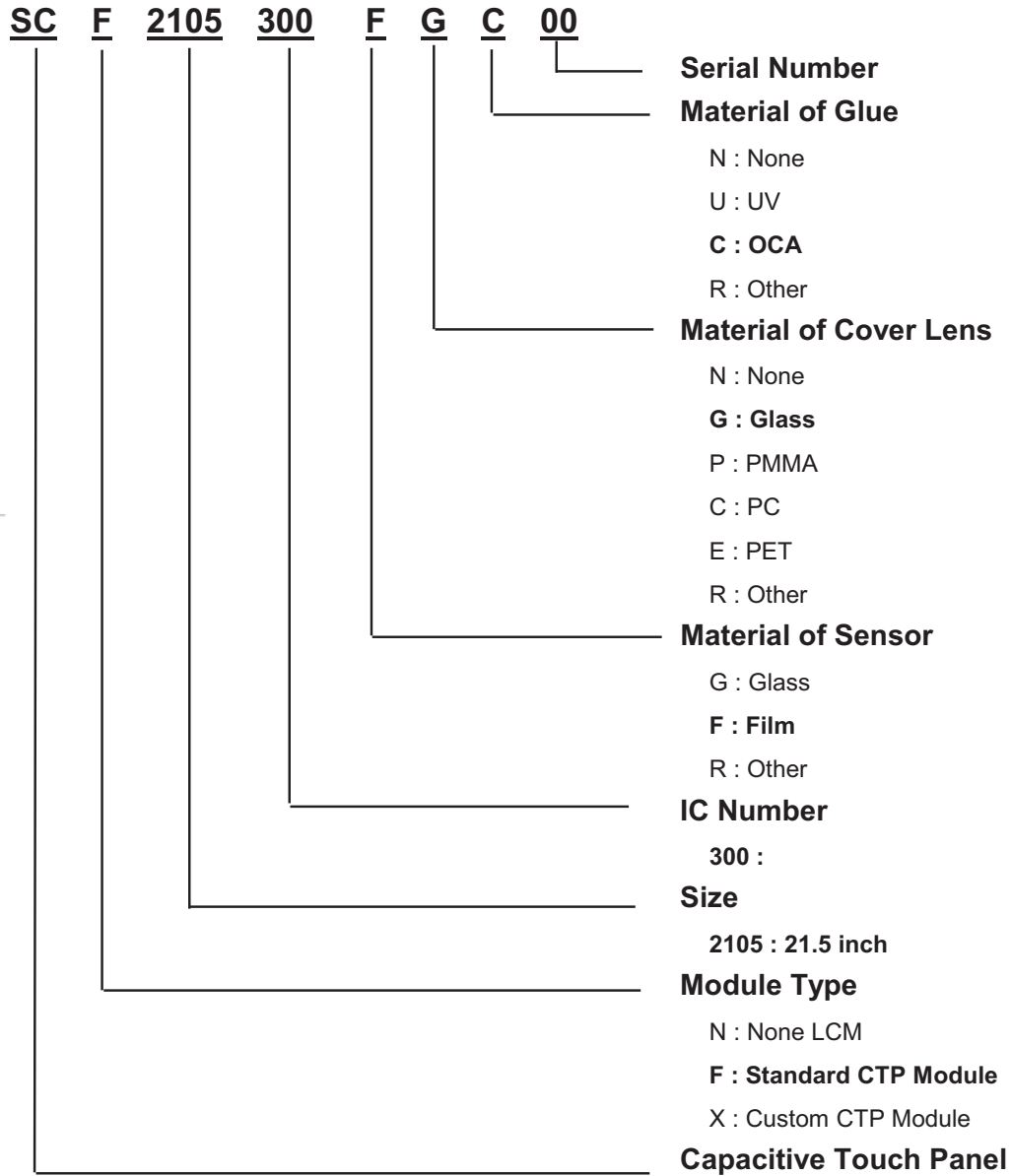
AA6001421026-0013





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Product Name Define:





Confidential Document

14. PRECAUTIONS IN USE LCM

1. ASSEMBLY PRECAUTIONS

- (1) Since Touch Panel is consist of glass, please be careful your hands to be injured during handing. You must wear gloves during handing.
- (2) Do not touch, push or rub the exposed touch panel, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
- (3) Do not stack the touch panels together. Do not put heavy objects on touch panel.
- (4) Please do not take a CTP to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
- (5) Please excessive force or strain to the panel or tail is prohibited, Do not lift touch panel by cable (FPC).
- (6) Use clean sacks or glove to prevent fingerprints and/or stains left on the panel. Extra attention and carefulness should be taken while handling the glass edge.
- (7) Please pay attention for the matters stated below at mounting design of touch panel enclosure.
Enclosure support to fix touch panel must be out of active area.(do not design enclosure presses the active area to protect from miss put)

2. OPERATING PRECAUTIONS

- (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
- (2) Please do not change variable resistance settings in CTP. They are adjusted to the most suitable value. If they are changed, it might happen CTP does not satisfy the characteristics specification
- (3) Be careful for condensation at sudden temperature change. Condensation makes damage to sensor or electrical contacted parts.
- (4) CTP has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (5) Touch the panel with your finger or stylus only to assure normal operation. Any sharp edged or hard objects are prohibited.
- (6) Operate the panel in a steady environment. Abrupt variation on temperature and humidity may cause malfunction of the panel.

3. ELECTROSTATIC DISCHARGE CONTROL

- (1) The operator should be grounded whenever he/she comes into contact with the CTP. Never touch any of the conductive parts such the copper leads on the FPC and the interface terminals with any parts of the human body.

- (2) The CTP should be kept in antistatic bags or other containers resistant to static for storage.
- (3) Only properly grounded soldering irons should be used.
- (4) If an electric screwdriver is used, it should be well grounded and shielded from commentator sparks.
- (5) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended
- (6) Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.

2. STORAGE PRECAUTIONS

- (1) When you store touch panel for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
- (2) Please do not leave touch panel in the environment of high humidity and high temperature such as 60°C 90%RH
- (3) Please do not leave touch panel in the environment of low temperature; below -20°C.

3. OTHERS

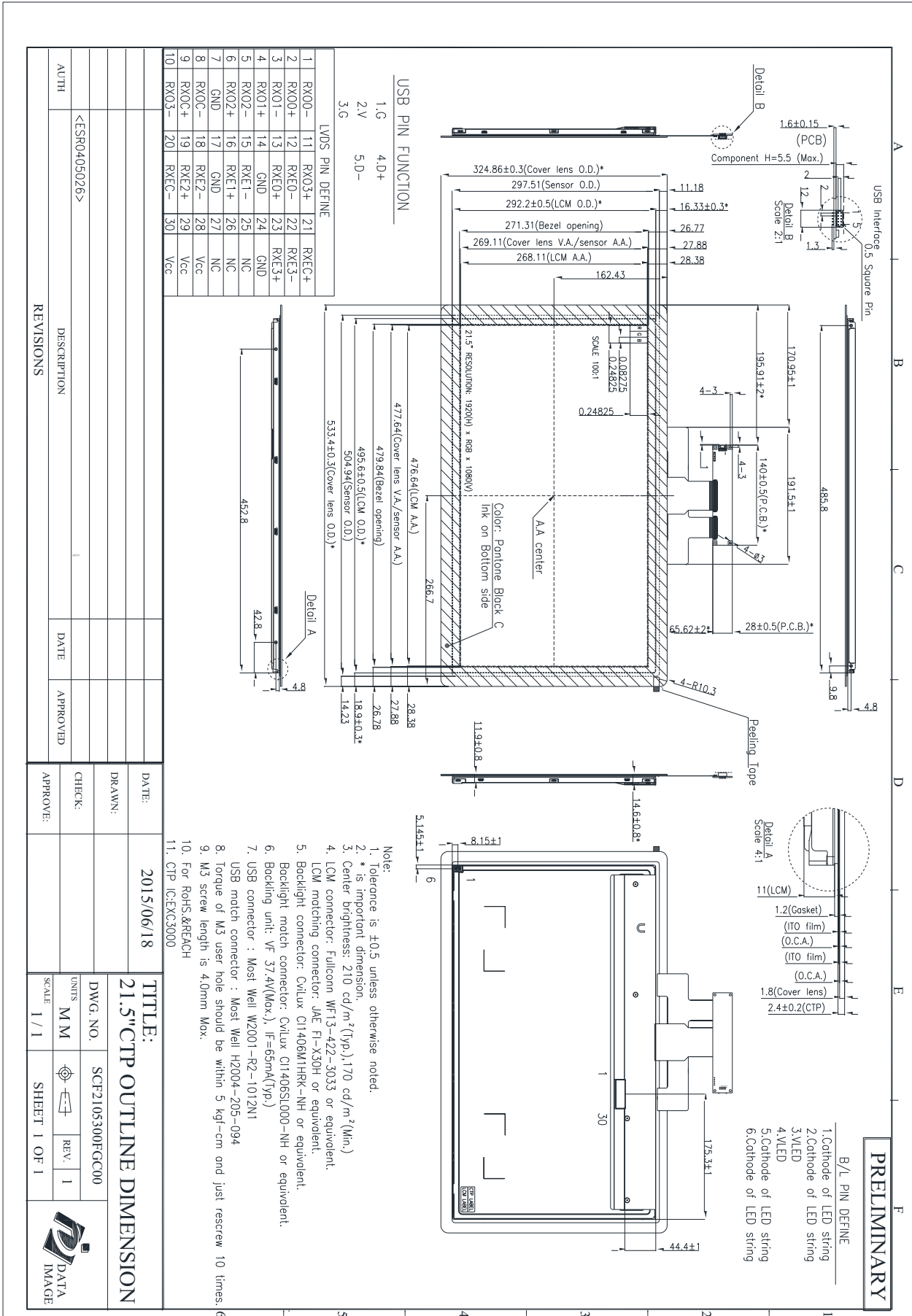
For the packaging box, please pay attention to the followings:

- a. Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
- b. Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
- c. Packing box and inner case for CTP are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

4. LIMITED WARRANTY

Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its CTP which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not responsible for any subsequent or consequential events.

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15. OUTLINE DRAWING



USB PIN FUNCTION

1.G	4.D+
2.V	5.D-
3.G	

LVDS PIN DEFINE

1	RX00-	11	RX03+	21	RXEC+
2	RX00+	12	RXE0-	22	RXE3-
3	RX01-	13	RXE0+	23	RXE3+
4	RX01+	14	GND	24	GND
5	RX02-	15	RXE1-	25	NC
6	RX02+	16	RXE1+	26	NC
7	GND	17	GND	27	NC
8	RX0C-	18	RXE2-	28	Vcc
9	RX0C+	19	RXE2+	29	Vcc
10	RX03-	20	RXEC-	30	Vcc

REVISIONS

NO.	DESCRIPTION	DATE	APPROVED
1	<ESR0405026>		

DATE:	2015/06/18
DRAWN:	
CHECK:	
APPROVE:	

TITLE: 21.5"CTP OUTLINE DIMENSION

DWG. NO.	SCF2105300FGC00
UNITS	MM
SCALE	1/1
REV.	1
SHEET	1 OF 1

DATA IMAGE

- Note:
1. Tolerance is ±0.5 unless otherwise noted.
 2. * is important dimension.
 3. Center brightness: 210 cd/m²(Typ.), 170 cd/m²(Min.)
 4. LCM connector: Fulicom WF13-422-3033 or equivalent.
 5. LCM matching connector: Cvilux C11406M1HRK-NH or equivalent.
 6. Backlight connector: Cvilux C11406S1L000-NH or equivalent.
 7. USB connector: Most Well W2001-R2-1012N1
 8. Torque of M3 user hole should be within 5 kgf-cm and just rescrew 10 times.
 9. M3 screw length is 4.0mm Max.
 10. For RoHS.&REACH
 11. CTP IC:EXC3000

- B/L PIN DEFINE
- 1.Cathode of LED string
 - 2.Cathode of LED string
 - 3.VLED
 - 4.VLED
 - 5.Cathode of LED string
 - 6.Cathode of LED string

PRELIMINARY

16. PACKAGE INFORMATION

T.B.D.