



Product Specification

F238PET-TA2

- ☒ Draft Specifications
☐ Preliminary Specifications
☐ Final Specifications

Title	23.8-inches Touch Display Product Specifications
Model Name	F238PET-TA2
Version	0

Customer	
Approved by	Date
Notice: This Specification is subject to change without notice.	

Approved By	Prepared By
ZOE NIEN 2026-05-26	ALLEN FANG 2026-05-26



REVISION HISTORY

Version	ECN No.	Description of Changes	Date	Prepared
0		Draft specification first edition	2026-05-26	Allen Fang



CONTENTS

1. GENERAL DESCRIPTION	4
1.1. INTRODUCTION	4
1.2. FEATURES	4
1.3. APPLICATION	4
1.4. GENERAL SPECIFICATIONS	5
2. ABSOLUTE MAXIMUM RATINGS	6
3. ELECTRICAL CHARACTERISTICS	7
3.1. LCD MODULE	7
3.2. LCD BACKLIGHT UNIT	9
3.3. TOUCH CONTROL BOARD	11
3.4. LCD BLOCK DIAGRAM	11
3.5. INPUT TERMINAL PIN ASSIGNMENT	12
3.6. LCD BACKLIGHT UNIT (CONVERTER CONNECTOR PIN)	13
3.7. Touch Control Board Pin Assignment :	14
3.8. LCD COLOR DATA INPUT ASSIGNMENT	16
4. SIGNAL TIMING SPECIFICATION	17
4.1. LCD COLOR INPUT DATA REFERENCE	17
4.2. POWER SEQUENCE FOR LCD	19
5. OPTICAL CHARACTERISTICS	21
5.1. TEST CONDITIONS	21
5.2. OPTICAL SPECIFICATIONS	21
6. RELIABILITY TEST ITEMS	24
7. LABEL	24
8. MECHANICAL CHARACTERISTICS	25
9. ENGINEERING DRAWING	27



1. GENERAL DESCRIPTION

1.1. INTRODUCTION

F238PET-TA2 is a 23.8" color active matrix TFT LCD module G238HCJ-LH1 with projected capacitive multi-touch B238PBU-E04 air bonding, with touch driver ETP-MB-EXC84H5680STAG.

The display format is intended to support the FHD mode (1920(H) x 1080(V)) screen and 2 channel 30 pins LVDS interface, 16.7M colors, with white LEDs backlight built in PCBA.

1.2. FEATURES

- FHD (1920 x 1080 pixels) resolution
- RoHS Compliance

1.3. APPLICATION

- TFT LCD monitor
- Factory application

1.4. GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Active Area Size	23.8	inch	
Display Area	527.04 x 296.46 (V)	mm	
Outline Dimension	544.00 (H) x 322.00 (V) x 23.225 (D)	mm	D:PCAP+LCM
Weight	4020	g	Typ.
Driver Element	a-Si TFT active matrix	-	
Display Colors	16.7M / 262K	Colors	
Number of Pixels	1920 (H) x 1080 (V)	pixels	
Pixel Pitch	0.2745(H) x 0.2745(W)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	Normal Black	-	
Touch Technology	Projected Capacitive Multi-Touch Panel	-	
Touch Method	Finger or exclusive pen	-	
Numbers of Touch	10	Points	
Touch Driver	ETP-MB-EXC84H5680STAG : USB	-	
Touch Sensor Glass Type	Strengthening Glass	-	
Touch Controller IC	EETI, EXC80H84	-	
Touch Driver Interface	USB 2.0	-	
Support OS	Windows (Embedded/CE/XP/2000/Vista/7/8/10) / Linux / Android / MAC / QNX	-	

2. ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	V_{DD}	-0.3	6.0	V	Note 1
Converter Voltage	V_I	-0.3	26.4	V	
Enable Voltage	EN	-0.3	5.5	V	
Dimming Voltage	PWM	-0.3	5.5	V	
Operating Temperature	T_{op}	-20	+70	°C	Note 2
Operating Humidity	H_{op}	10	90	%RH	
Storage Temperature	T_{st}	-30	+80	°C	
Storage Temperature	H_{st}	10	90	%RH	
Touch DC Supply Voltage	USB_ V_{DD}	-0.3	6.0	V	

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.
2. Maximum Wet-Bulb temperature should be 39°C and no condensation.

The relative humidity must not exceed 90% non-condensing at temperatures of 40°C or less. At temperatures greater than 40°C, the wet bulb temperature must not exceed 39°C.

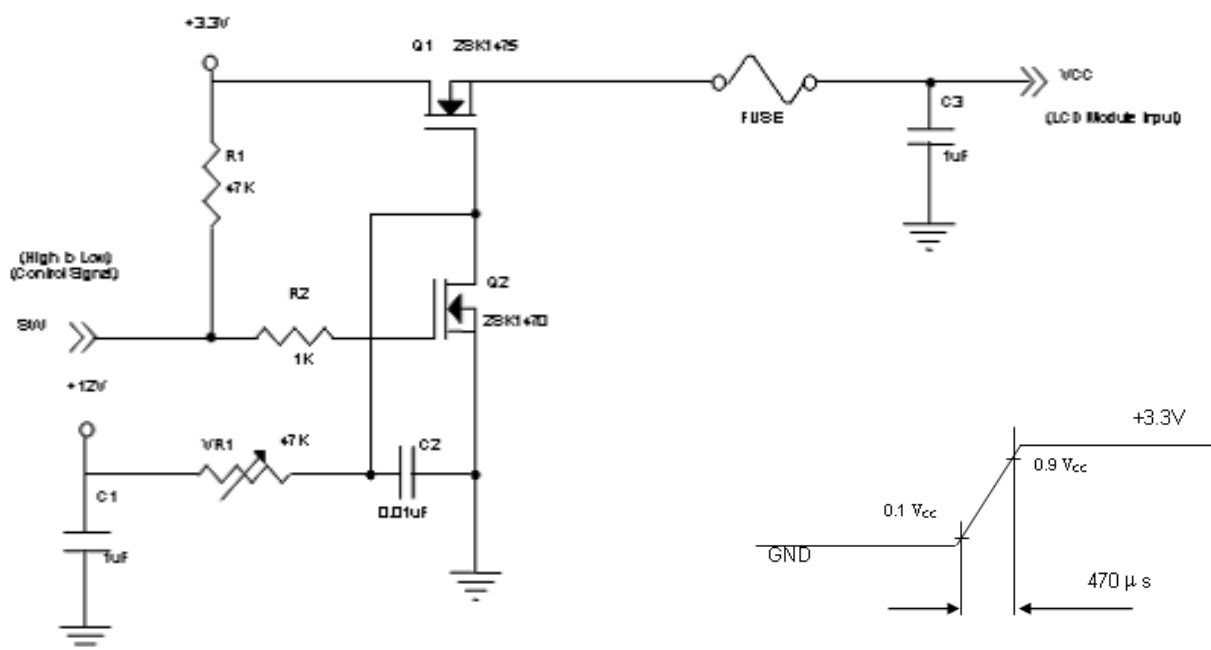
3. ELECTRICAL CHARACTERISTICS

3.1. LCD MODULE

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
Power Supply Input Voltage		V_{CC}	4.5	5.0	5.5	V	1
Power Supply Ripple Voltage		V_{RP}	-	-	400	mVp-p	
Rush Current		I_{RUSH}	-	-	3.0	A	2
Power Supply Input Current	White Pattern	I_{CC}	-	0.99	1.45	A	3
	Black Pattern		-	0.45	0.5	A	
	Vertical Stripe		-	0.74	0.81	A	
LVDS differential input voltage		V_{id}	100	-	600	mV	
LVDS common input voltage		V_{ic}	1.0	1.2	1.4	V	
Logic High Input Voltage		V_{IH}	-	-	100	mV	
Logic Low Input Voltage		V_{IL}	-100	-	-	mV	
LVDS terminating resistor		R_T	-	100	-	ohm	

Note1. The assembly should be always operated within above ranges.

Note2. Measurement Condition :



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 Hz, whereas a power dissipation check pattern below is displayed.

a. White Pattern



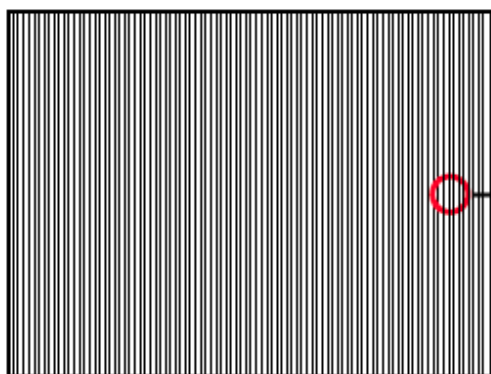
Active Area

b. Black Pattern

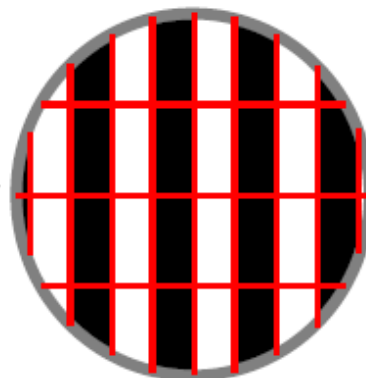


Active Area

c. Vertical Stripe Pattern



Active Area

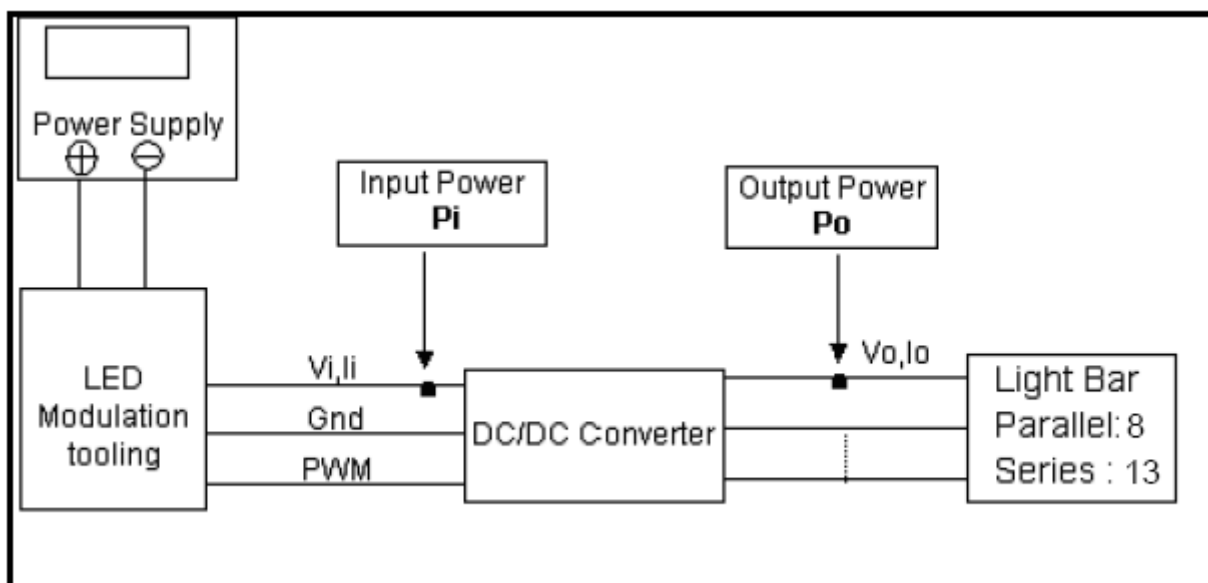


3.2. LCD BACKLIGHT UNIT

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
Converter Input Voltage		V_i	21.6	24	26.4	V	(Duty 100%)
Converter Input Ripple Current		V_{iRP}	-	-	500	mV	
Converter Input Current		I_i	-	1.25	1.5	A _{DC}	@ $V_i=24V$ (Duty 100%)
Converter Inrush Current		I_{iRUSH}	-	-	3.0	A	@ V_i rising time =20ms ($V_i=24V$)
Input Power Consumption		P_{BL}	-	30	36	W	@ $V_i=24V$ (Duty 100%)
EN Control Level	Backlight on	ENLED	2.5	3.3	5.0	V	
	Backlight off	(BLON)	0	-	0.3	V	
PWM Control level	PWM High	Dimming	2.5	3.3	5.0	V	
	PWM Low	(E_PWM)	0	-	0.15	V	
PWM Noise Range		V_{Noise}	-	-	0.1	V	
PWM Control Frequency		f_{PWM}	100	200	1000	Hz	2, Suggestion@200Hz
PWM Control Duty Ratio		-	5	-	100	%	2, @100Hz< f_{PWM} <500Hz
			10	-	100	%	2, @500Hz≤ f_{PWM} <1kHz
LED Life Time		LT_{LED}	50,000	-	-	Hrs	3

Notes:

1. LED current is measured by utilizing a high frequency current meter as shown below:



2. At 100 ~499 Hz PWM control frequency, duty ratio range is restricted from 5% to 100%.

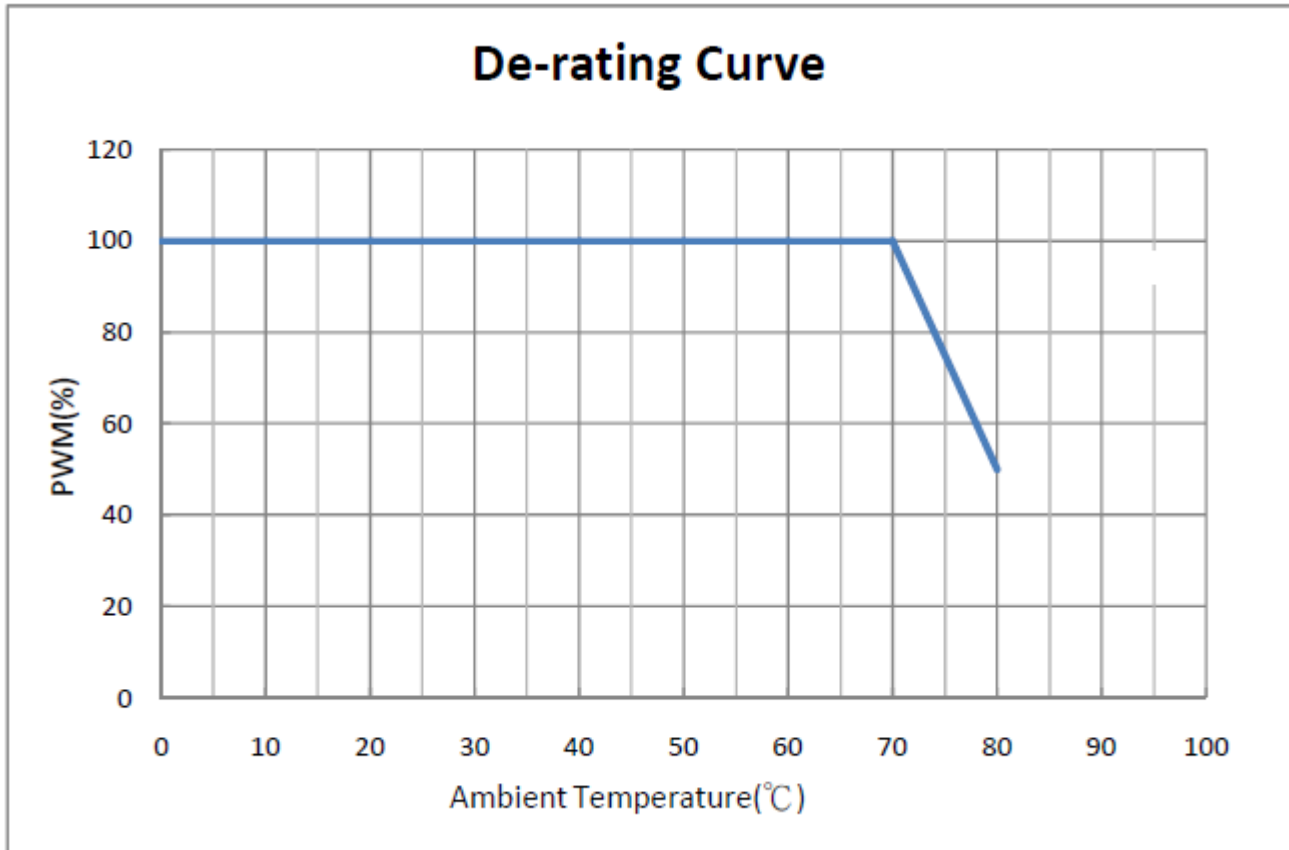
At 500 ~1k Hz PWM control frequency, duty ratio range is restricted from 10% to 100%.

If PWM control frequency is applied in the range from 1K Hz above. The “non-linear” phenomenon on the Backlight Unit may be found. It's a suggestion that PWM control frequency should be less than 1K Hz.

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

4. De-rating Curve

De-rating the BLU from 70°C and 50% PWM at 80°C to avoid damaging the module.

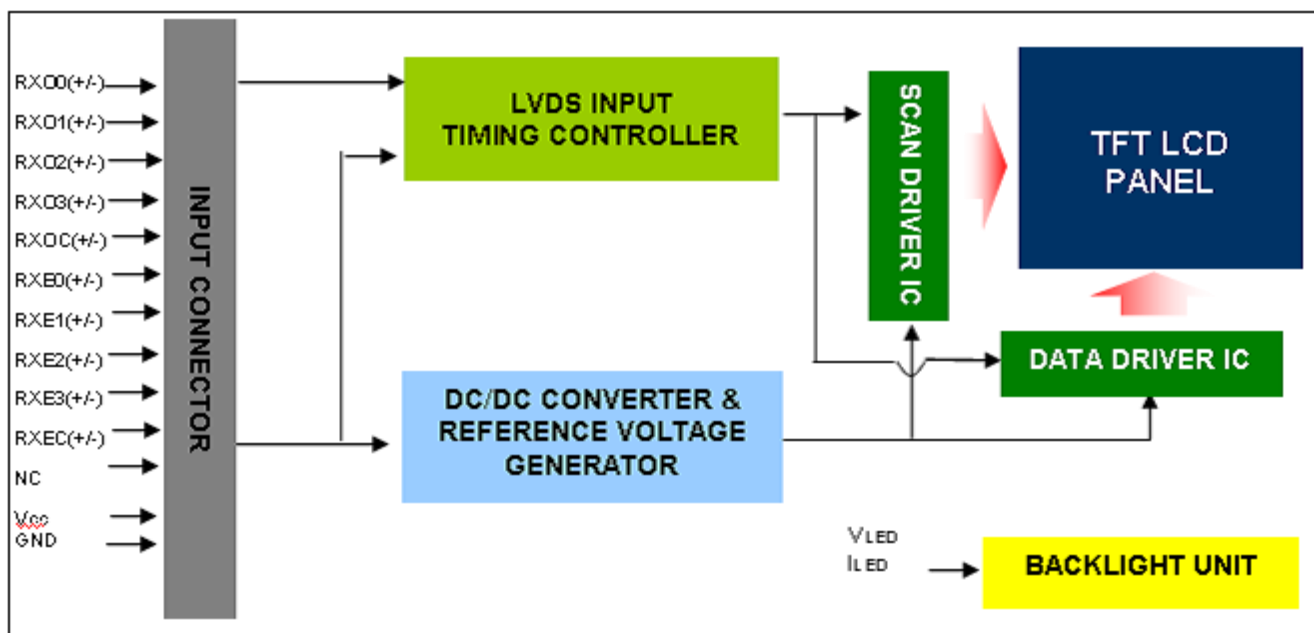


3.3. TOUCH CONTROL BOARD

ETP-MB-EXC84H5680STAG

Parameter	Values			Unit	Notes
	Min.	Typ.	Max.		
Input Voltage	3.5	5	5.5	V	
Interface	USB:2.0			-	
Max Resolution	16384 x 16384 resolution			-	
Channels of panel	Max. TX: 48 Rx:80 channels			mm	Including shielding pin
Linearity	Line drawing accuracy: 1pt +/- 1 mm offset /10 mm Touch (point) accuracy: 1pt +/- 1mm			mm	
Power consumption (mA)	Active Mode: <90 mA Idle Mode: depends on firmware			mA	
Report rate (points/sec)	≥100			Hz	
Response time	Average <25			ms	

3.4. LCD BLOCK DIAGRAM



3.5. INPUT TERMINAL PIN ASSIGNMENT

Pin	Symbol	Description	Note
1	RXO0-	Negative LVDS differential data input Channel O0 (odd)	
2	RXO0+	Positive LVDS differential data input Channel O0 (odd)	
3	RXO1-	Negative LVDS differential data input Channel O1 (odd)	
4	RXO1+	Positive LVDS differential data input Channel O1 (odd)	
5	RXO2-	Negative LVDS differential data input Channel O2 (odd)	
6	RXO2+	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	RXO3-	Negative LVDS differential data input Channel O3 (odd)	
11	RXO3+	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	For LCD internal use only	
27	NC	For LCD internal use only	
28	V _{CC}	+5.0V power supply	
29	V _{CC}	+5.0V power supply	
30	V _{CC}	+5.0V power supply	

Note1. LCD connector:

Taiwan Screen Optonics Co., Ltd

TEL: 886-2-82275490 FAX: 886-2-32347264

6F. No.87, Lide St. Jhong-he Dist.,

New Taipei City 235, Taiwan



FCN WF13-422-3033

P-TWO 187098-30091 or equivalent

Note2. User's connector

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).

Note3. The first pixel is odd.

Note4. Input signal of even and odd clock should be the same timing.

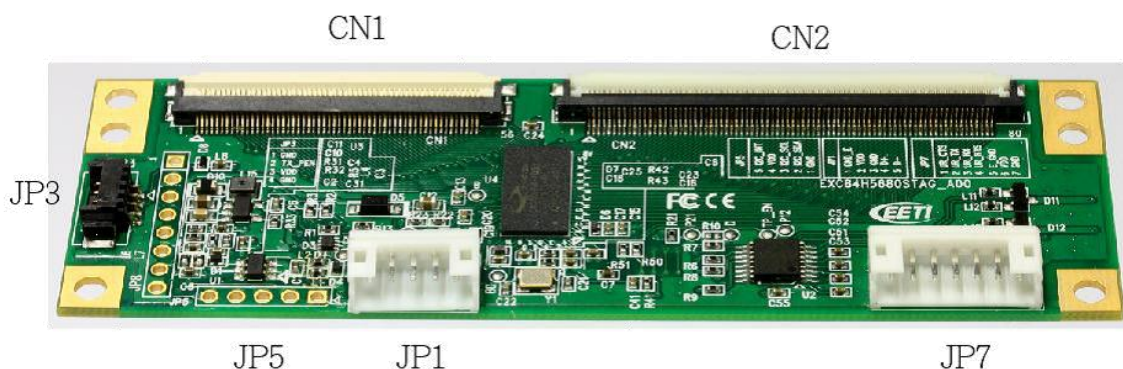
3.6. LCD BACKLIGHT UNIT (CONVERTER CONNECTOR PIN)

Pin	Symbol	Description	Remark
1	V _i	Converter Input Voltage	24V
2	V _i	Converter Input Voltage	24V
3	V _i	Converter Input Voltage	24V
4	V _i	Converter Input Voltage	24V
5	V _i	Converter Input Voltage	24V
6	V _{GND}	Converter Ground	Ground
7	V _{GND}	Converter Ground	Ground
8	V _{GND}	Converter Ground	Ground
9	V _{GND}	Converter Ground	Ground
10	V _{GND}	Converter Ground	Ground
11	NC	No Connect	No Connect
12	EN	Enable pin	BL ON/OFF (ON: DC 3.3V, OFF: 0V)
13	NC	No Connect	No Connect
14	E_PWM	PWM Dimming	External PWM Control (H: DC 5V, L:0V)

Note1. Connector Part No.: CviLux: **CI0114M1HR0-LA-NH** or FCN: **JH2-D4-143N** or equivalent.

Note2. User's connector Part No.: CviLux **CI0114S0000** or equivalent.

3.7. Touch Control Board Pin Assignment :



FPC Pin Description

CN1					
PN		PN		PN	
1	NC	21	TX34	41	TX14
2	NC	22	TX33	42	TX13
3	NC	23	TX32	43	TX12
4	NC	24	TX31	44	TX11
5	NC	25	TX30	45	TX10
6	NC	26	TX29	46	TX9
7	NC	27	TX28	47	TX8
8	NC	28	TX27	48	TX7
9	TX_S1	29	TX26	49	TX6
10	TX45	30	TX25	50	TX5
11	TX44	31	TX24	51	TX4
12	TX43	32	TX23	52	TX3
13	TX42	33	TX22	53	TX2
14	TX41	34	TX21	54	TX1
15	TX40	35	TX20	55	TX0
16	TX39	36	TX19	56	TX_S0
17	TX38	37	TX18		
18	TX37	38	TX17		
19	TX36	39	TX16		
20	TX35	40	TX15		

CN2							
PN		PN		PN		PN	
1	RX_S1	21	RX58	41	RX38	61	RX18
2	RX77	22	RX57	42	RX37	62	RX17
3	RX76	23	RX56	43	RX36	63	RX16
4	RX75	24	RX55	44	RX35	64	RX15
5	RX74	25	RX54	45	RX34	65	RX14
6	RX73	26	RX53	46	RX33	66	RX13
7	RX72	27	RX52	47	RX32	67	RX12
8	RX71	28	RX51	48	RX31	68	RX11
9	RX70	29	RX50	49	RX30	69	RX10
10	RX69	30	RX49	50	RX29	70	RX9
11	RX68	31	RX48	51	RX28	71	RX8
12	RX67	32	RX47	52	RX27	72	RX7
13	RX66	33	RX46	53	RX26	73	RX6
14	RX65	34	RX45	54	RX25	74	RX5
15	RX64	35	RX44	55	RX24	75	RX4
16	RX63	36	RX43	56	RX23	76	RX3
17	RX62	37	RX42	57	RX22	77	RX2
18	RX61	38	RX41	58	RX21	78	RX1
19	RX60	39	RX40	59	RX20	79	RX0
20	RX59	40	RX39	60	RX19	80	RX_S0

Connector Pin Configuration

JP1 USB connector

JP1	
1	GND_E
2	VDD
3	GND
4	D +
5	D -

JP5 I2C connector

JP5	
1	GND
2	I2C_SDA
3	I2C_SCL
4	VDD
5	I2C_INT

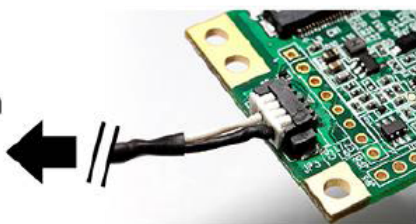
JP7 RS232 connector

JP7	
1	UR_CTS
2	UR_TX
3	UR_RX
4	UR_RTS
5	GND_E
6	VDD
7	GND

JP3 Tethered active stylus connector

JP3	
1	GND_D
2	TX_PEN
3	VDD
4	GND_D

eGalaxPen
Type E
Type T



*JP3 connector is reserved for EETI tethered active stylus :

Type E : Entry-type active stylus

Type T : Tethered USB active stylus

JP1 : USB

Brand: JST

Part number: SM05B-SRSS-TB or equivalence

3.8. LCD 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 a reference for 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	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	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	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	0
	Red (254)	1	1	1	1	1	1	0	0	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	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	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	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	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	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	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	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	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	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	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	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue (253)	0	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	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	0	1	1	1	1	1	1	1	1

Note1. 0: Low Level Voltage, 1: High Level Voltage

4. SIGNAL TIMING SPECIFICATION

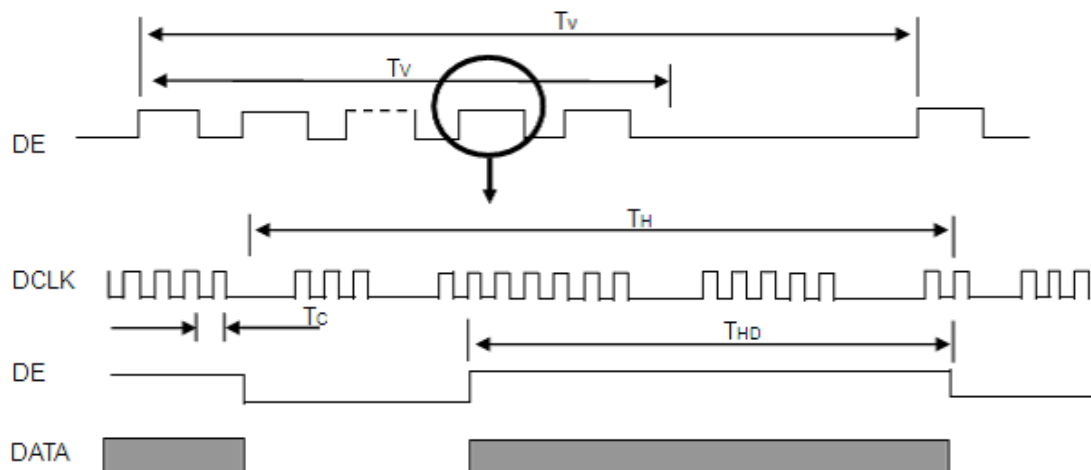
4.1. LCD COLOR INPUT DATA REFERENCE

The signal input timing specification as shown as the following table and timing diagram.

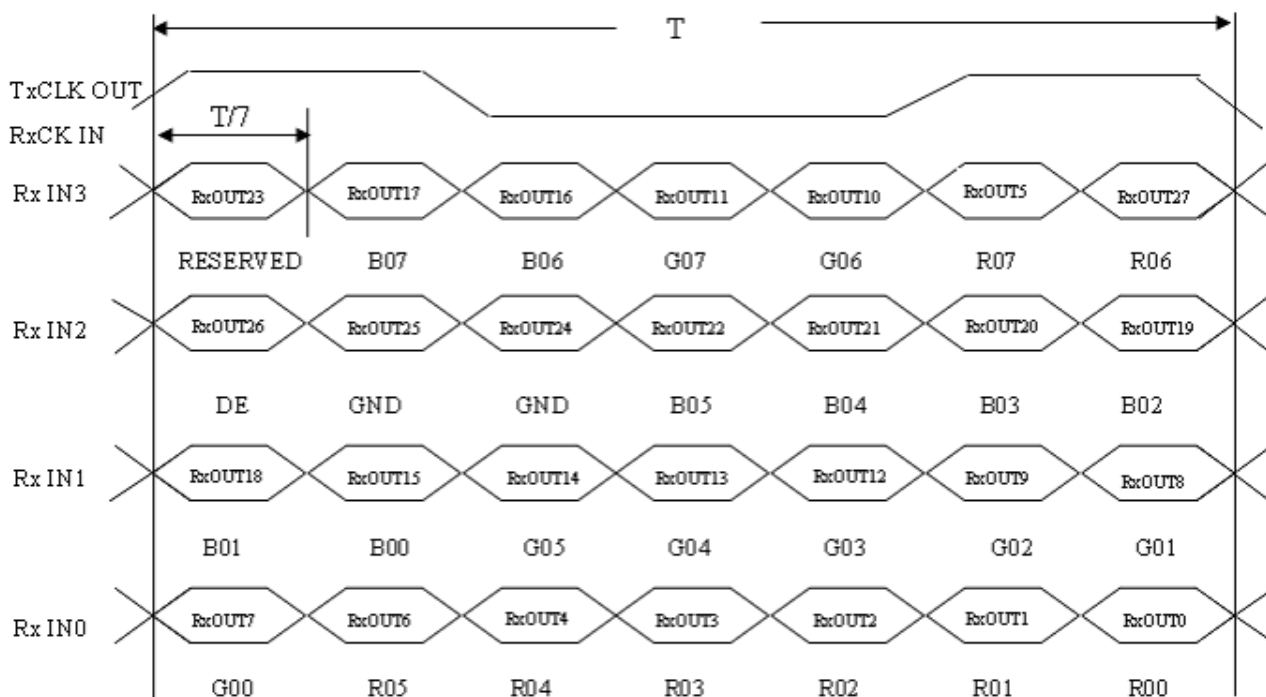
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	F_C	58.54	74.25	97.98	MHz	
	Period	T_C	-	13.47	-	ns	
	Input cycle to cycle jitter	T_{rcl}	$-0.02 \cdot T_C$	-	$0.02 \cdot T_C$	ns	a
	Input Clock to data skew	TLVCCS	$-0.02 \cdot T_C$	-	$0.02 \cdot T_C$	ps	b
	Spread spectrum modulation range	F_{clkin_mod}	$0.97 \cdot F_C$	-	$1.03 \cdot F_C$	MHz	c
	Spread spectrum modulation frequency	F_{SSM}	-	-	100	KHz	
Vertical Display Term	Frame Rate	F_r	50	60	75	Hz	$T_v = T_{vd} + T_{vb}$
	Total	T_v	1110	1125	1220	T_h	
	Active Display	T_{vd}	1080	1080	1080	T_h	
	Blank	T_{vb}	$T_v - T_{vd}$	45	$T_v - T_{vd}$	T_h	
Horizontal Display Term	Total	T_h	1050	1100	1150	T_c	$T_h = T_{hd} + T_{hb}$
	Active Display	T_{hd}	960	960	960	T_c	
	Blank	T_{hb}	$T_h - T_{hd}$	140	$T_h - T_{hd}$	T_c	

Notes :

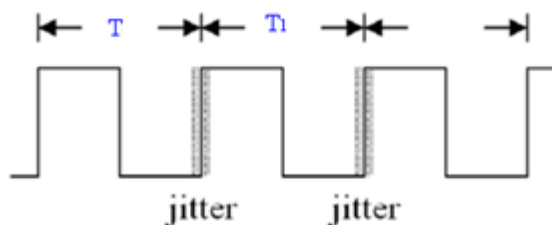
- (1) Because this module is operated by DE only mode, Hsync and Vsync input signals should be set to low logic level or ground. Otherwise, this module would operate abnormal.
- (2) The T_v ($T_{vd} + T_{vb}$) must be integer, otherwise, the module would operate abnormally.



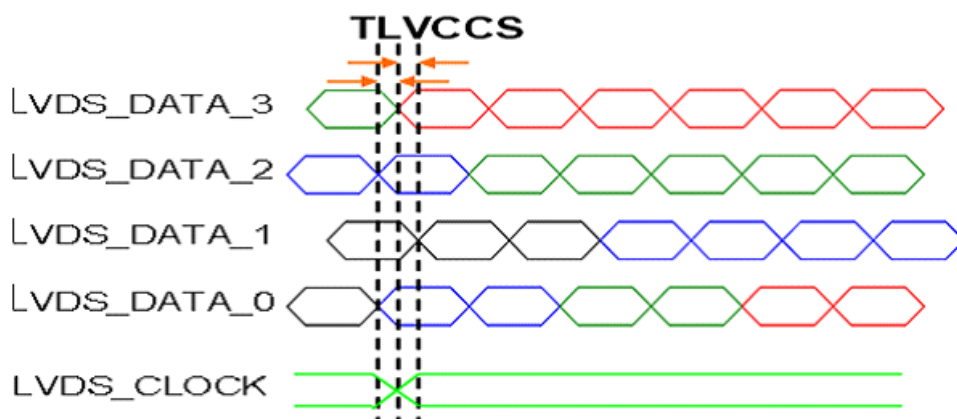
TIMING DIAGRAM of LVDS



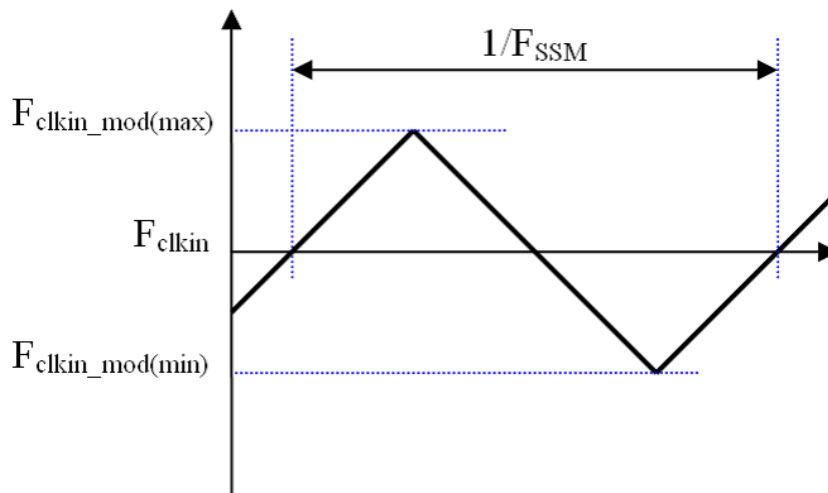
(a) The input clock cycle-to-cycle jitter is defined as below figures. $Trcl = |T1 - T1|$



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



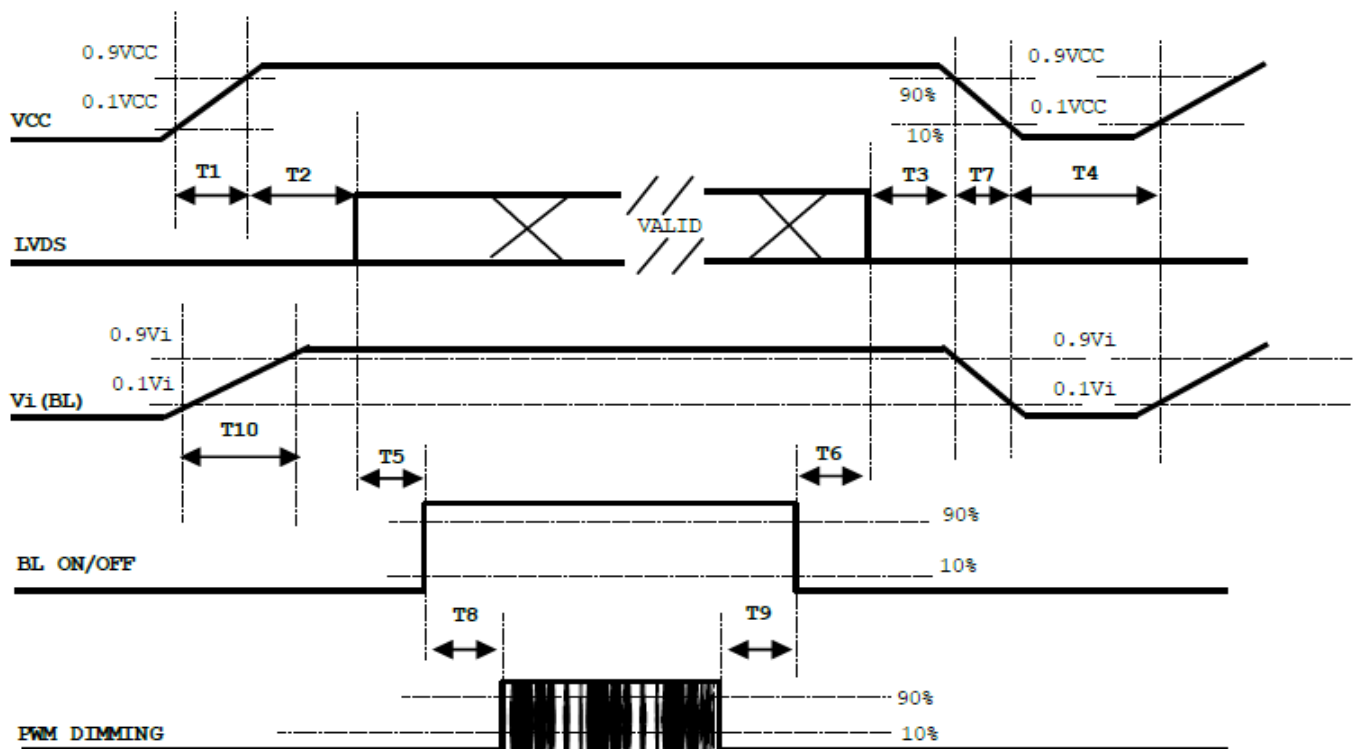
(c) The SSCG (Spread spectrum clock generator) is defined as below figures.



4.2. POWER SEQUENCE FOR LCD

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

Power ON/OFF sequence



Parameter	Values	Unit
-----------	--------	------

	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

Note:

- (1) The supply voltage of the external system for the module input should be the same as the definition of V_{CC} .
- (2) When the backlight turns on before the LCD operation of the LCD turns off, the display may momentarily become abnormal screen.
- (3) In case of V_{CC} = off level, please keep the level of input signals on the low or keep a high impedance.
- (4) T4 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.
- (6) INX won't take any responsibility for the products which are damaged by the customers not following the Power Sequence.
- (7) There might be slight electronic noise when LCD is turned off (even backlight unit is also off). To avoid this symptom, we suggest "Vcc falling timing" to follow "T7 spec".

5. OPTICAL CHARACTERISTICS

5.1. TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	According to typical value and tolerance in “ELECTRICAL CHARACTERISTICS”		
Input Signal			
PWM Duty Ratio	D	100	%

5.2. OPTICAL SPECIFICATIONS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Coordinates	Red	R _x	θX=0°, θY=0° Grayscale Maximum	0.602	0.652	0.702	-	1, 5
		R _y		0.288	0.338	0.388		
	Green	G _x		0.268	0.318	0.368		
		G _y		0.566	0.616	0.666		
	Blue	B _x		0.098	0.148	0.198		
		B _y		0.005	0.055	0.105		
	White	W _x		0.263	0.313	0.363		
		W _y		0.279	0.329	0.379		
Center Luminance of White		L _C	750	1000	--	Cd/m ²	4, 5	
Contrast Ratio		CR	700	1000	--		2, 5	
Response Time		T _R	θ _X =0°, θ _Y =0°	--	14	19	ms	3
		T _F		--	11	16	ms	
White Variation		δ _W	θ _X =0°, θ _Y =0°	70	75	-	%	5, 6
Viewing Angle	Horizontal	θ _r	CR≥10	85	89	--	degree	1, 5
		θ _l		85	89	--		
	Vertical	θ _u		85	89	--		
		θ _d		85	89	--		

The relative measurement methods of optical characteristics are shown here and all items are measured at the center point of screen except white variation. The following items should be measured under the test conditions described in above and stable environment shown in Note (5).

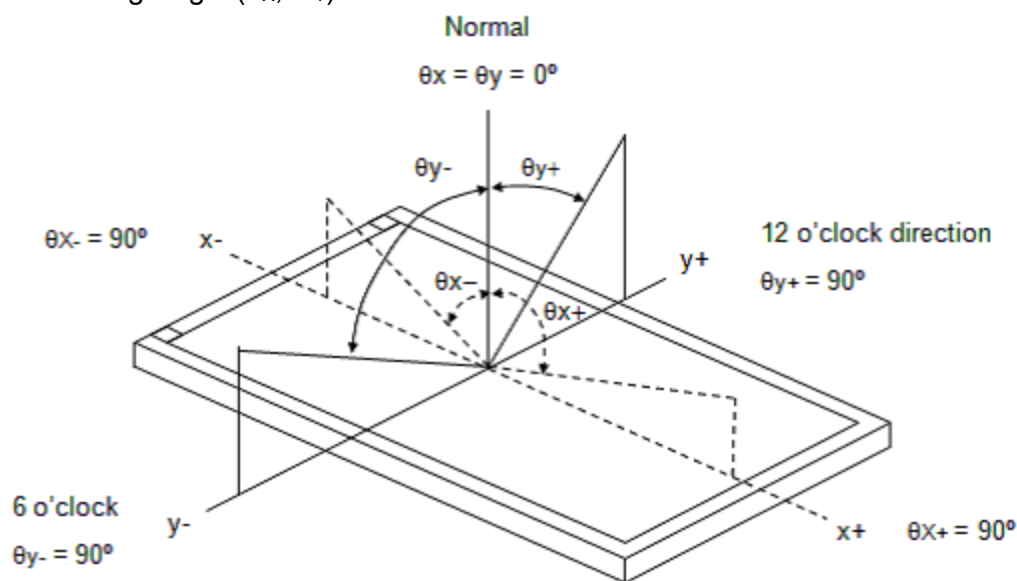
Definition :

Grayscale Maximum: Grayscale 255 (10 bits: grayscale 1023; 8 bits: grayscale 255; 6 bits: grayscale 63)

White: Luminance of Grayscale Maximum (All R, G, B)

Black: Luminance of grayscale 0 (All R, G, B)

Note 1: Definition of Viewing Angle (θ_x , θ_y):

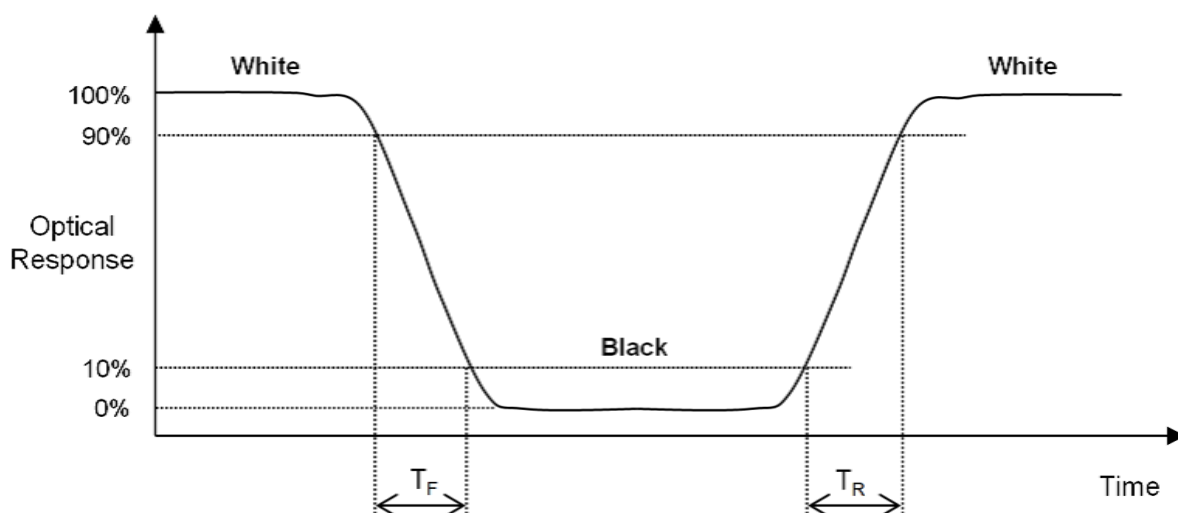


Note 2: Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression at center point.

Contrast Ratio (CR) = White / Black Note

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

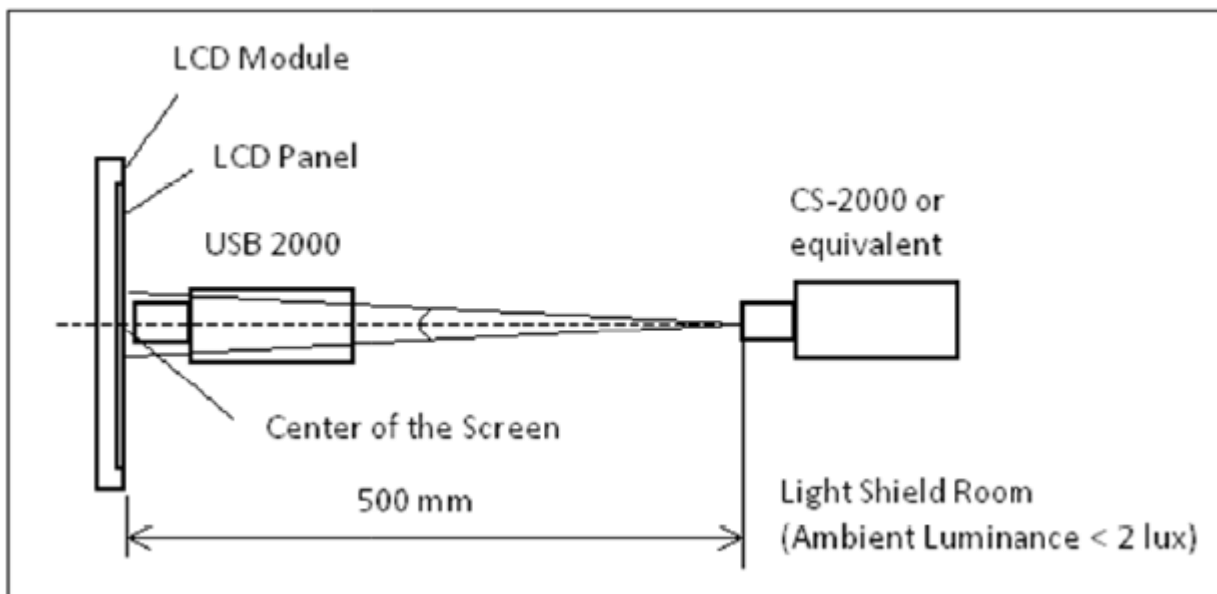


Note 4: Definition of Luminance of White (LC):

Measure the luminance of White at center point.

Note 5: Measurement Setup:

The LCD module should be stabilized at given temperature to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 40 minutes in a windless room. The measurement placement of module should be in accordance with module drawing.

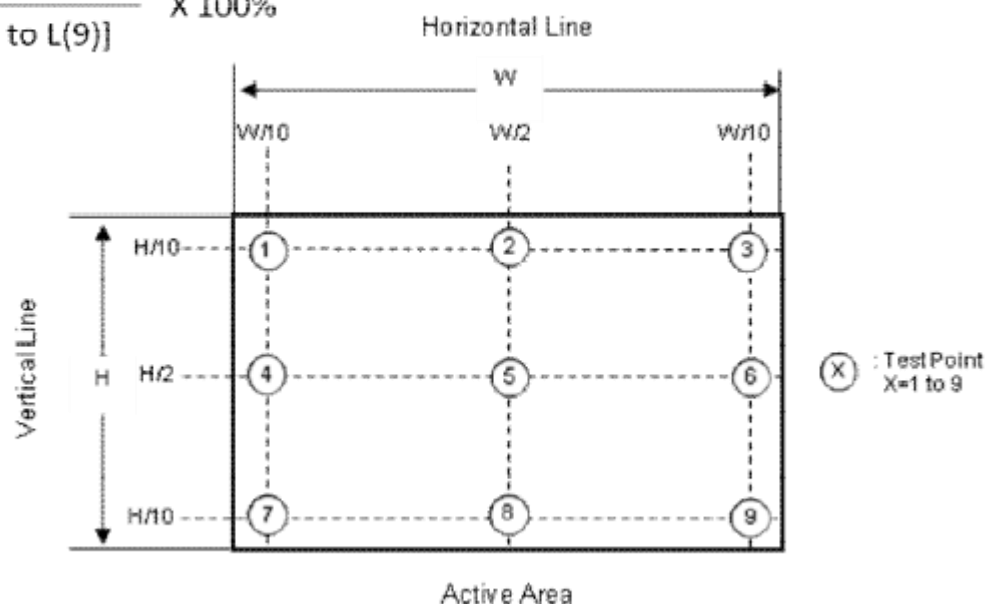


Note 6: Definition of White Variation (δW):

Measure the luminance of White at 9 points.

Luminance of White: $L(X)$, where X is from 1 to 9.

$$\delta W = \frac{\text{Minimum [} L(1) \text{ to } L(9) \text{]}}{\text{Maximum [} L(1) \text{ to } L(9) \text{]}} \times 100\%$$



6. RELIABILITY TEST ITEMS

Test Item		Condition
1	High temperature Storage test	80°C, 240hrs
2	Low temperature storage test	-30°C, 240hrs
3	High temperature and humidity test	60°C, 90%RH, 240hrs
4	High temperature operation test	70°C, 240hrs
5	Low temperature operation test	-20°C, 240hrs
6	Thermal Cycle storage test	-20°C(30min)~60°C(30min), 10cycles

7. LABEL

Model NO. F238PET-TA2

條碼

SN 3A Z 20 2 21 0 XXX1

code 1,2 Production location
code 3 Production version
code 4,5 Production year
code 6 Production month
code 7,8 Production day
code 9 Production code
code 10,11,12,13 Serial number

L=32mm



W=14mm

字型:Arial (6)

code:128

字型:Arial (8)

8. MECHANICAL CHARACTERISTICS

Item		Dimension	Unit	Note
Outline Dimension	Horizontal	544.00	mm	PCAP : B238PBU-E04
	Vertical	322.00	mm	
	Depth	2.70	mm	
	Horizontal	543.00	mm	LCD : G238HCJ-LH1
	Vertical	317.40	mm	
	Depth	19.425	mm	
	Horizontal	100.00	mm	Touch Driver : ETP-MB-EXC84H5680STAG
	Vertical	33.00	mm	
	Depth	7.20	mm	
Weight		4020	g	F238PET-TA2
Item		Specification		Remarks
PCAP Sensor Area		543.00 mm x 321.00 mm		
PCAP Active Area		530.80 mm x 300.20 mm		
PCAP FPC Length		119.50 mm		
PCAP Input method		Finger or exclusive pen		
PCAP Light Transmission		90 ± 3 %		BYK Gardner , 550nm , ASTM D1003
PCAP Operation force		≤ 10g		Finger Input
PCAP Hardness of surface		≥ 7H		ASTM D3363, pressure 750g/45°
PCAP Surface Treatment		Haze < 4 %		BYK Gardner , ASTM D1003



Product Specification

F238PET-TA2

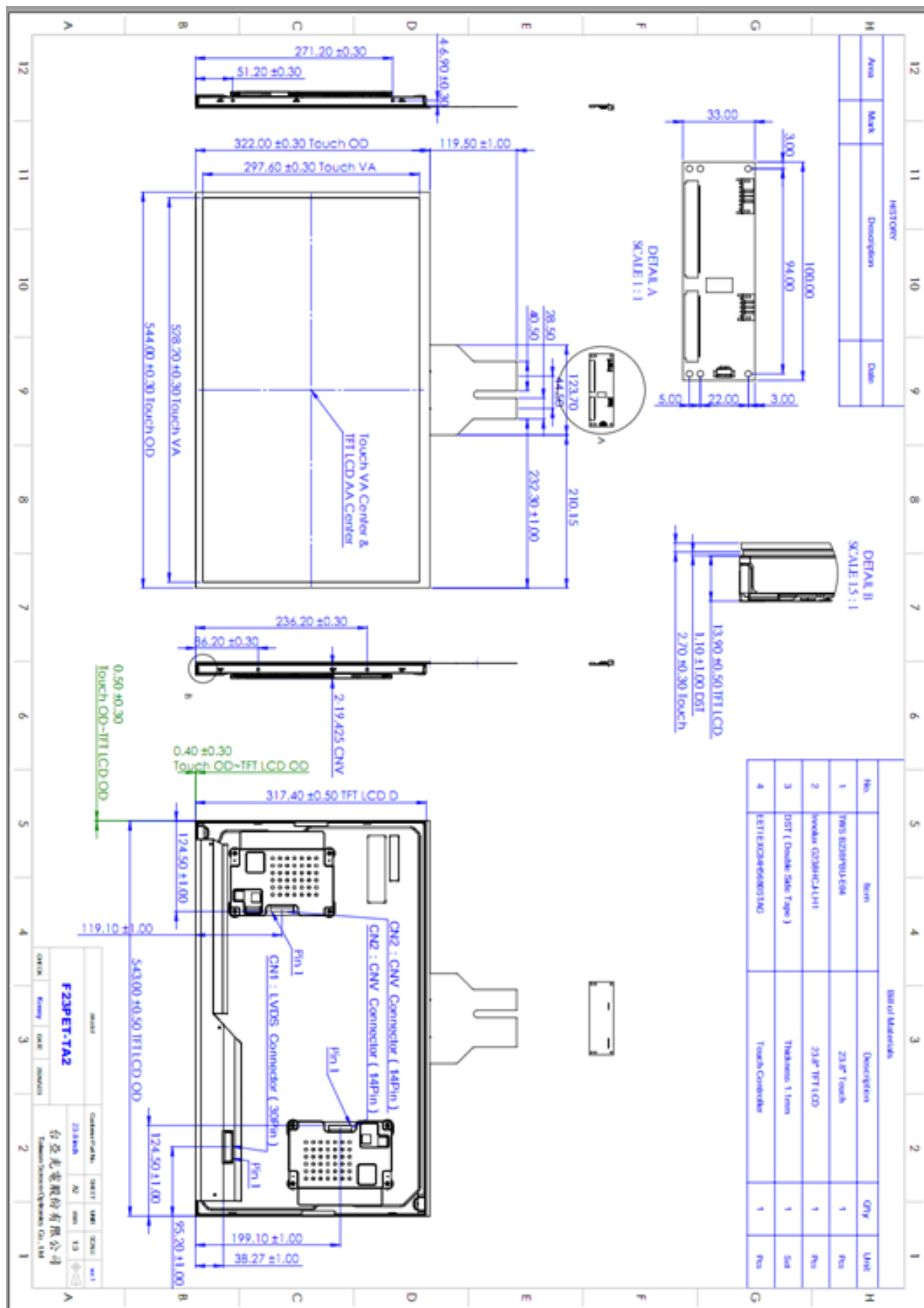
Front View

TBD

Back View

TBD

9. ENGINEERING DRAWING





F238PET-TA2



6F. No.87, Lide St. Jhong-he Dist.,
New Taipei City 235, Taiwan