



Product Specification

F150PET-T81

- ☐ Draft Specifications
☒ Preliminary Specifications
☐ Final Specifications

Title	15.0-inches Touch Display Product Specifications
Model Name	F150PET-T81
Version	1

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

Approved By	Prepared By
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2025-12-23	2025-12-23



REVISION HISTORY

Version	ECN No.	Description of Changes	Date	Prepared
0		Draft specification first edition	2023-02-10	Allen Fang
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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
3.1.1. POWER SPECIFICATION	7
3.1.2. SIGNAL ELECTRICAL CHARACTERISTICS	8
3.2. LCD BACKLIGHT UNIT	9
3.2.1. DRIVER CONNECTOR	10
3.2.2. PARAMETER GUIDELINE FOR LED BACKLIGHT	9
3.3. TOUCH CONTROL BOARD	12
3.4. LCD BLOCK DIAGRAM	10
3.5. INPUT TERMINAL PIN ASSIGNMENT	11
3.6. TOUCH CONTROL BOARD PIN ASSIGNMENT	13
4. LCD SIGNAL CHARACTERISTIC	14
4.1. PIXEL FORMAT IMAGE	14
4.1.1. SCANNING DIRECTION	14
4.2. THE LCD INPUT DATA FORMAT	15
4.3. LCD INTERFACE TIMING	16
4.3.1. LCD TIMING CHARACTERISTICS	16
4.3.2. LCD INPUT TIMING DIAGRAM	16
4.4. POWER SEQUENCE FOR LCD	17
5. OPTICAL CHARACTERISTICS	18
6. RELIABILITY TEST ITEMS	21
7. LABEL	22
8. MECHANICAL CHARACTERISTICS	23
9. ENGINEERING DRAWING	25



1. GENERAL DESCRIPTION

1.1. INTRODUCTION

F150PET-T81 is a 15.0" color active matrix TFT LCD module G150XAN02.1 with projected capacitive multi-touch B150PBU-E03 air bonding, with touch driver B000PDU-E03.

The display format is intended to support the XGA mode (1024(H) x 768(V)) screen and 16.7M colors (LVDS RGB 6+FRC). And LED driving circuit for backlight built in PCBA.

1.2. FEATURES

- Wide view angle
- Long life LED backlight (50k hrs)
- Industrial application
- RoHS product

1.3. APPLICATION

- TFT LCD monitor
- Industrial application

1.4. GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Active Area Size	15.0	inch	
Display Area	304.128(H) x 228.096 (V)	mm	
Outline Dimension	326.50 (H) x 253.50 (V) x 11.57(D)	mm	D:PCAP+LCM
Weight	1350	g	Typ.
Driver Element	a-Si TFT active matrix	-	
Display Colors	16,7M	Colors	
Electrical Interface	LVDS	-	
Number of Pixels	1024 (H) x 768 (V)	pixels	
Pixel Pitch	0.297 (H) x 0.297(W)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	AHVA / Normal Black	-	
Color Gamut	60	%	
Touch Technology	Projected Capacitive Multi-Touch Panel	-	
Touch Method	Finger or exclusive pen	-	
Numbers of Touch	10	Points	
Touch Driver	B000PDU-E03: USB	-	
Touch Sensor Glass Type	Strengthening Glass	-	
Touch Controller IC	EETI, EXC80W46	-	
Touch Driver Interface	USB 1.1 Full Speed / I ² C	-	
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
Logic/LCD Drive Voltage	V _{DD}	-0.3	4	V
Converter Input Voltage	V _{LED}	-0.3	14	V
Converter Control Signal Voltage	V _{LED_PWM}	-0.3	5.5	V
Converter Control Signal Voltage	V _{LED_EN}	-0.3	5.5	V
Operating Temperature	T _{op}	-20	+70	°C
Operating Humidity	H _{op}	10	90	%RH
Storage Temperature	T _{st}	-20	+70	°C
Storage Humidity	H _{st}	10	90	%RH
Touch DC Supply Voltage	USB_V _{DD}	-0.3	6.0	V

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

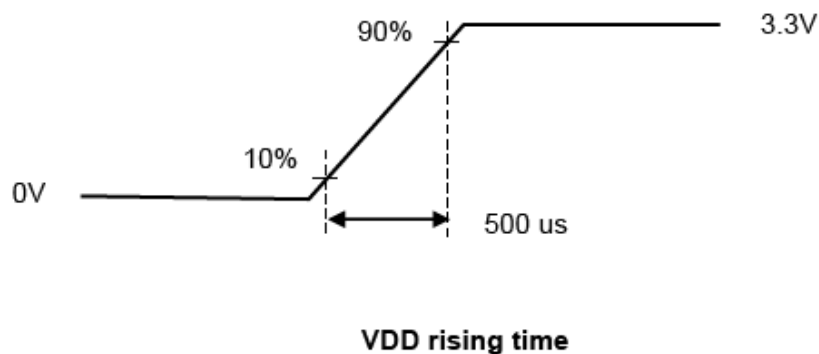
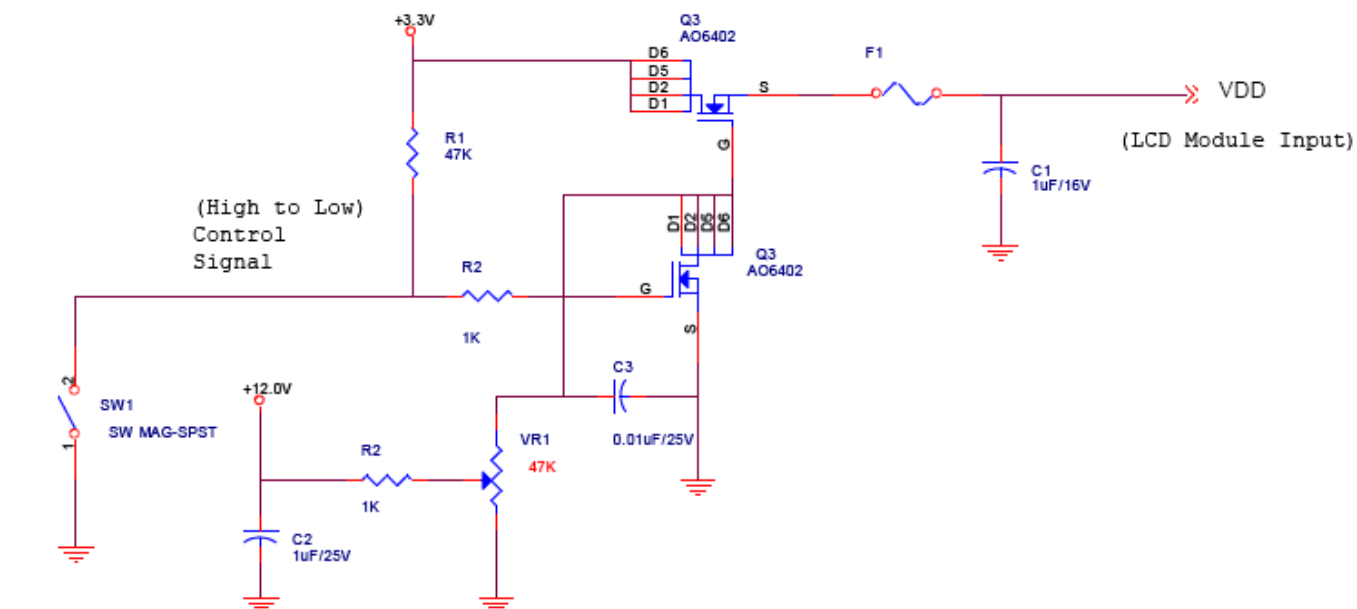
3. ELECTRICAL CHARACTERISTICS

3.1. LCD MODULE

3.1.1. POWER SPECIFICATION

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Logic/LCD Drive Voltage	VDD	3	3.3	3.6	V	±10%
V _{DD} Current	I _{VDD}	-	0.42	0.51	A	All White Pattern (VDD=3.3V at 60Hz)
LCD Inrush Current	I _{rush LCD}	-	-	3	A	Note 1
VDD Power	P _{VDD}	-	1.39	1.68	W	All White Pattern (VDD=3.3V at 60Hz)

Notes 1: Measurement condition



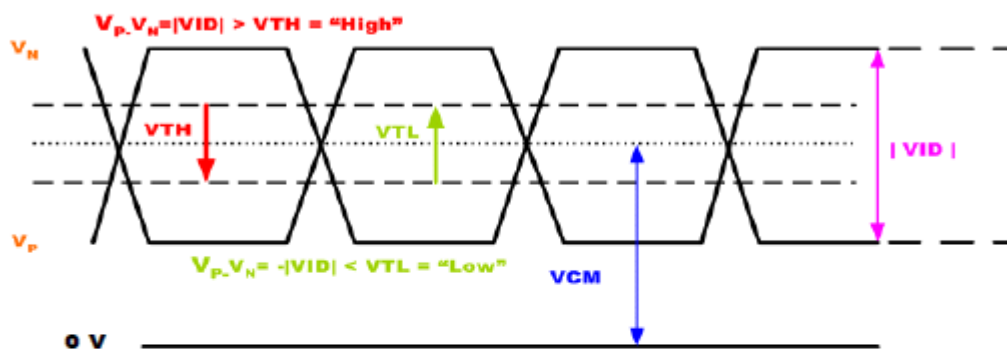
3.1.2. SIGNAL ELECTRICAL CHARACTERISTICS

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Differential Input High Threshold	VTH	-	-	100	mV	VICM=1.2V
Differential Input Low Threshold	VTL	-100	-	-	mV	VICM=1.2V
Input Differential Voltage	VID	100	-	600	mV	
Differential Input Common Mode Voltage	VICM	1.0	1.2	1.5	V	VTH/VTL=±100mV

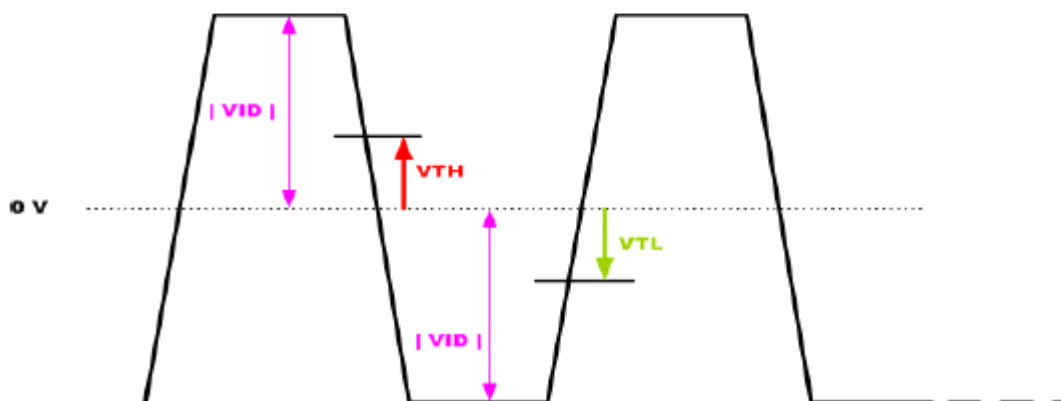
Note: LVDS Signal Waveform

$V_P - V_N = |VID| > V_{TH} = \text{"High"}$
 $V_P - V_N = -|VID| < V_{TL} = \text{"Low"}$

Single-end Signal



Differential Signal



3.2. LCD BACKLIGHT UNIT

3.2.1. PARAMETER GUIDELINE FOR LED BACKLIGHT

Following characteristics are measured under a stable condition using a inverter at 25°C. (Room Temperature):

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
Input Voltage		V _{LED}	10.8	12	13.2	V	
Input Current		I _{VLED}	-	0.90	0.98	A	100% PWM Duty
Power Consumption		P _{VLED}	-	10.74	11.78	W	100% PWM Duty
Inrush Current		I _{rush}	-	-	2	A	
EN Control Level	Backlight on	V _{LED_EN}	2.5	3.3	5.5	V	
	Backlight off				0.5	V	
PWM Control level	PWM High	V _{PWM}	2.5	3.3	5.5	V	
	PWM Low				0.5	V	
PWM Control Duty Ratio		D _{PWM}	5	-	100	%	200Hz~5KHz
			15	-	100	%	5KHz~10KHz
PWM Control Frequency		F _{PWM}	200	-	10K	Hz	
LED Forward Current		I _F	-	66	-	mA	Ta=25°C
LED Life Time		LT _{LED}	50,000	-	-	Hrs	I _F =66mA, Ta=25°C

Note:

1. Ta, means ambient temperature of TFT-LCD module.
2. If G150XAN02.1 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.
3. Definition of life time: LED brightness becomes 50% of its original value. The minimum life time of LED unit is defined at the condition of I_F= 66 mA and 25±2 °C (Room temperature).

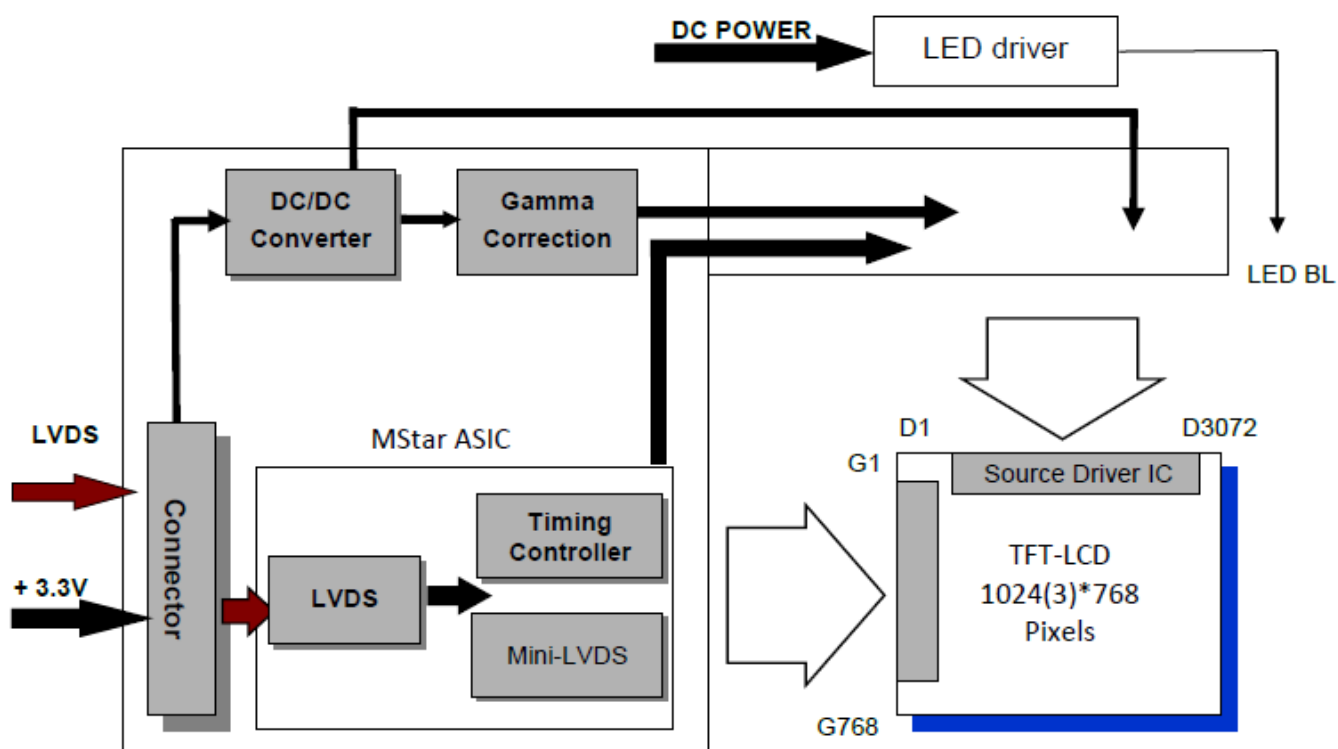
3.2.2. DRIVER CONNECTOR

Connector Model Number: **ENTERY, 3808K-F05N-12R** or compatible

Mating Model Number: **ENTERY, H208K-P05N-02B** or compatible

Pin No.	Symbol	Description
1	V _{CC}	LED Power 12V
2	GND	Ground
3	Enable	LED On/Off
4	Dimming	PWM Dimming
5	NC	No Connection

3.3. LCD BLOCK DIAGRAM



3.4. INPUT TERMINAL PIN ASSIGNMENT

LVDS is a differential signal technology for LCD interface and a high-speed data transfer device.

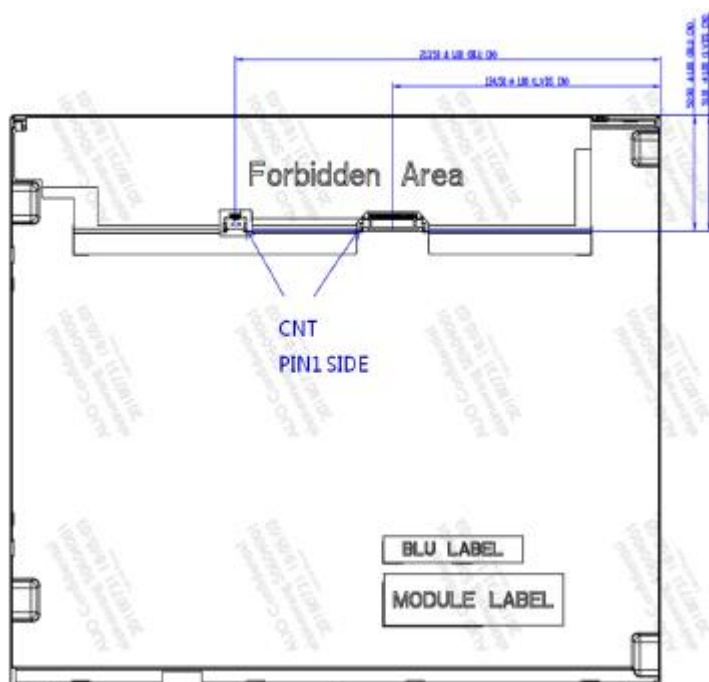
Pin	Symbol	Description
1	VDD	Power supply: +3V
2	VDD	Power supply: +3V
3	NC	No Connect
4	NC	No Connect
5	RX0-	Negative transmission data input (R0-R5,G0)
6	RX0+	Positive transmission data input (R0-R5,G0)
7	GND	Ground
8	RX1-	Negative transmission data input (G1-G5,B0-B1)
9	RX1+	Positive transmission data input(G1-G5,B0-B1)
10	GND	Ground
11	RX2-	Negative transmission data input (B2-B5,HS,VS,DE)
12	RX2+	Positive transmission data input (B2-B5,HS,VS,DE)
13	GND	Ground
14	RXCLK-	Negative transmission clock input
15	RXCLK+	Positive transmission clock input
16	GND	Ground
17	RX3-	Negative transmission data input (R6-R7,G6-G7,B6-B7)
18	RX3+	Positive transmission data input (R6-R7,G6-G7,B6-B7)
19	GND	Ground
20	GND	Ground

Note1. LCD connector: **STM MSB240420HD** or compatible

Note2. User's connector Part No.: **STM P240420** or compatible

Note3. Input Signals should be in low status when V_{DD} is off.

Note4. High Stands for "3.3V", Low stands for "0V", NC stands for "No Connection".



3.5.TOUCH CONTROL BOARD

B000PDU-E03

Parameter	Values			Unit	Notes
	Min.	Typ.	Max.		
Input Voltage	3.5	5	5.5	V	
Interface	USB:1.1 Full Speed / I ² C			-	
Max Resolution	4096*4096			-	
Precision	≤2.5			mm	
Two points separate distance	≥15 (pitch of finger center)			mm	
Touch point	1~10 points			-	
Power consumption (mA)	Active Mode: About 50mA			mA	
Report rate (points/sec)	≥120			Hz	
Response time	15			ms	

3.6. TOUCH CONTROL BOARD PIN ASSIGNMENT

JP1 : USB

Brand: JST

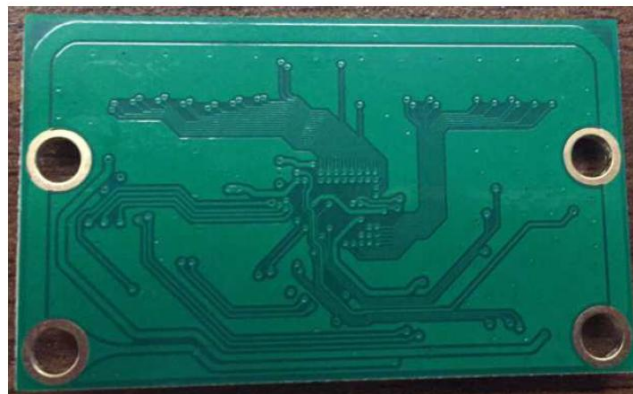
Part number: SM05B-SRSS-TB or equivalence

JP2 : I2C

Brand: Centenary Materials

Part number: ZIF-FPC-1.0mm-SMT-6P-Bottom flap or equivalence

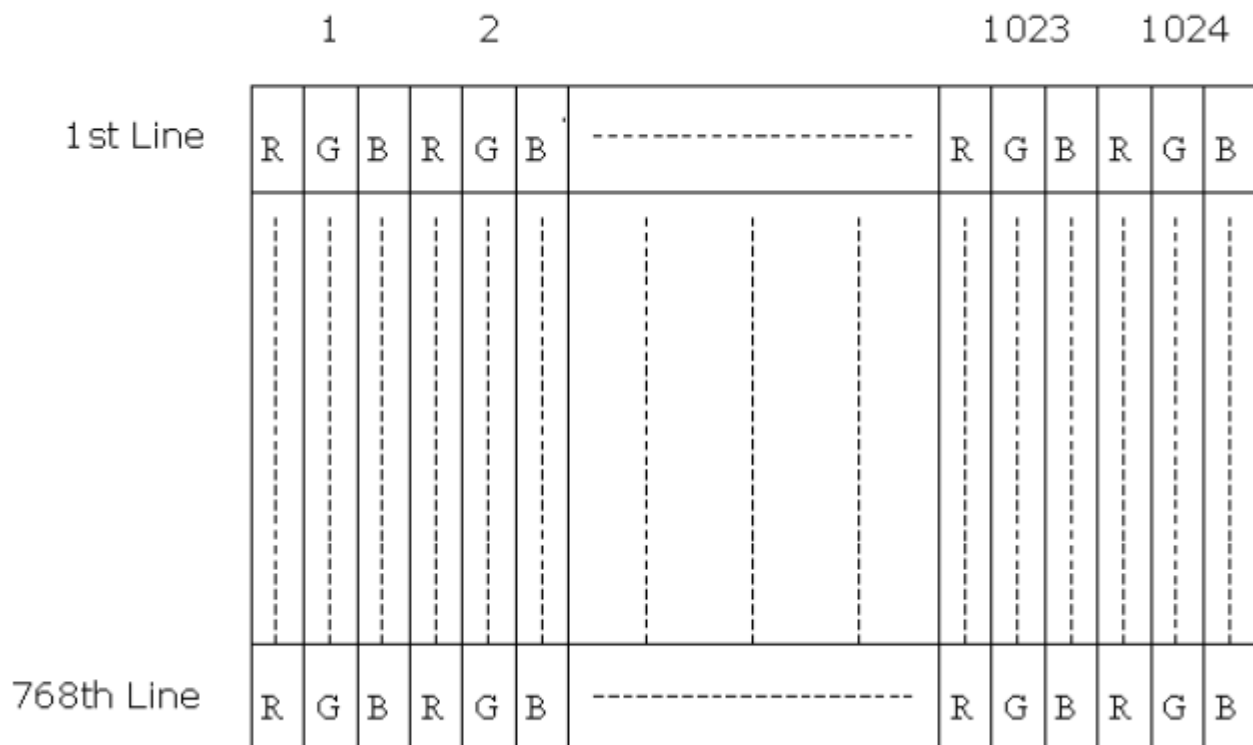
FCON1				JP1 USB		JP2 I ² C	
Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	Shielding(TX0)	33	GND	1	5V	1	RST
2~29	TX1-TX28	34	Shielding(RX0)	2	D-	2	INT
30	NC	35~78	RX1-RX44	3	D+	3	SCL
31	Shielding(TX29)	79	NC	4	GND	4	SDA
32	GND	80	Shielding(RX45)	5	GND	5	3.3V
						6	GND



4. LCD SIGNAL CHARACTERISTIC

4.1. PIXEL FORMAT IMAGE

Following figure shows the relationship between input signal and LCD pixel format.

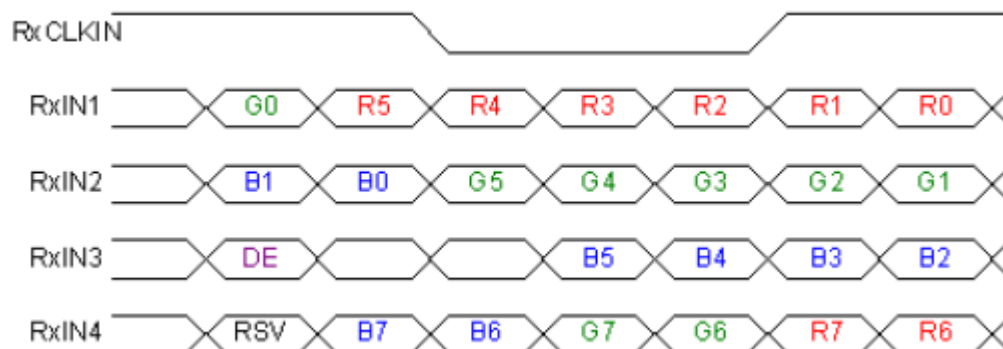


4.1.1. SCANNING DIRECTION

The following figure shows the image seen from the front view. The arrow indicates the direction of scan.



4.2. THE LCD INPUT DATA FORMAT



Note1: Please follow PSWG.

Note2: R/G/B data 7: MSB, R/G/B data 0: LSB

Signal Name	Description	Remark
R7 R6 R5 R4 R3 R2 R1 R0	Red Data 7 Red Data 6 Red Data 5 Red Data 4 Red Data 3 Red Data 2 Red Data 1 Red Data 0	Red-pixel Data For 8Bits LVDS input MSB: R7 ; LSB: R0
G7 G6 G5 G4 G3 G2 G1 G0	Green Data 7 Green Data 6 Green Data 5 Green Data 4 Green Data 3 Green Data 2 Green Data 1 Green Data 0	Green-pixel Data For 8Bits LVDS input MSB: G7 ; LSB: G0
B7 B6 B5 B4 B3 B2 B1 B0	Blue Data 7 Blue Data 6 Blue Data 5 Blue Data 4 Blue Data 3 Blue Data 2 Blue Data 1 Blue Data 0	Blue-pixel Data For 8Bits LVDS input MSB: B7 ; LSB: B0
RxCLKIN	LVDS Data Clock	
DE	Data Enable Signal	When the signal is high, the pixel data shall be valid to be displayed.

Note: Output signals from any system shall be low or Hi-Z state when VDD is off.

4.3. LCD INTERFACE TIMING

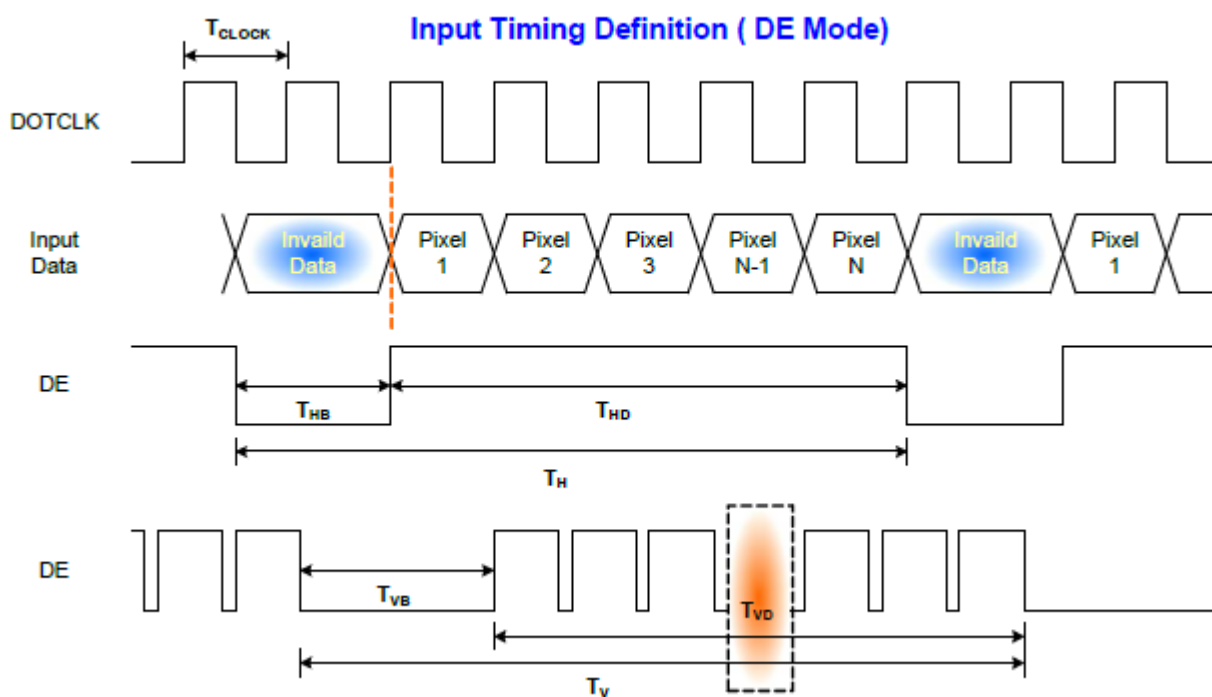
4.3.1. LCD TIMING CHARACTERISTICS

Signal		Symbol	Min.	Typ.	Max.	Unit
Clock Frequency		$1/T_{\text{dclk}}$	63	65	67	MHz
Vertical Section	Period	T_V	804	806	808	T_{Line}
	Active	T_{VD}	768	768	768	
	Blanking	T_{VB}	36	38	40	
Horizontal Section	Period	T_H	1328	1344	1360	T_{dclk}
	Active	T_{HD}	1024	1024	1024	
	Blanking	T_{HB}	304	320	336	
Frame Rate		F	59	60	61	Hz

Note: Support DE mode only.

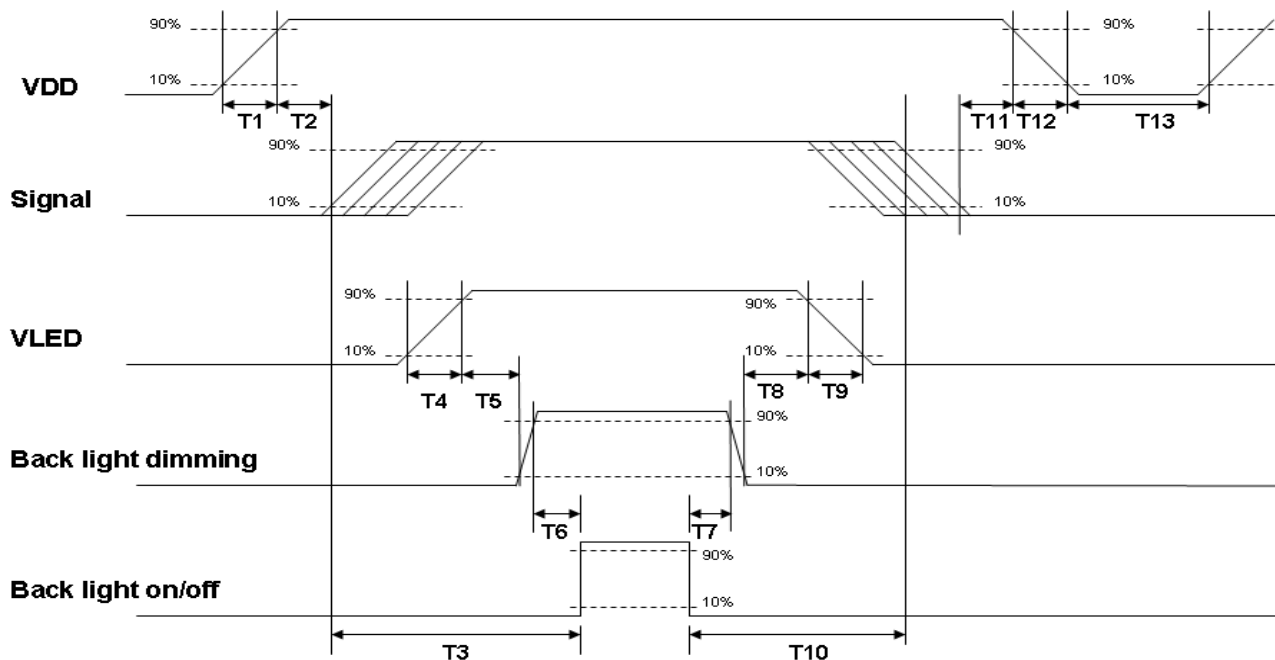
Note: Typical value that refer to VESA Standard.

4.3.2. LCD INPUT TIMING DIAGRAM



4.3. POWER SEQUENCE FOR LCD

VDD power and lamp on/off sequence is as below. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Power ON/OFF sequence timing

Parameter	Values			Unit
	Min.	Typ.	Max.	
T1	0.5	---	10	ms
T2	30	40	50	ms
T3	200	---	---	ms
T4	0.5	---	10	ms
T5	10	---	---	ms
T6	10	---	---	ms
T7	0	---	---	ms
T8	10	---	---	ms
T9	---	---	10	ms
T10	110	---	---	ms
T11	0	16	50	ms
T12	---	---	200	ms
T13	1000	---	---	ms

The above on/off sequence should be applied to avoid abnormal function in the display. Please make sure to turn off the power when you plug the cable into the input connector or pull the cable out of the connector.

5. OPTICAL CHARACTERISTICS

The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
White Luminance		L _{WH}		640	800	--	Cd/m ²	1
Uniformity		δ _{W9}	9 points	75	80	--	%	1, 2, 3
Contrast Ratio		CR		800	1000	--		4
Cross talk				--	--	1.5	%	5
Response Time		T _R	Rising	--			ms	6
		T _F	Falling	--			ms	
		T _R +T _F	Rising + Falling	--	25	30	ms	
Viewing Angle	Horizontal	θ _r	CR=10	80	89	--	degree	7
		θ _l		80	89	--	degree	
	Vertical	θ _u		80	89	--	degree	
		θ _d		80	89	--	degree	
Color Coordinates (CIE 1931)	Red	R _x		0.569	0.619	0.669		
		R _y		0.302	0.352	0.402		
	Green	G _x		0.279	0.329	0.379		
		G _y		0.559	0.609	0.659		
	Blue	B _x		0.100	0.150	0.200		
		B _y		0.068	0.118	0.168		
	White	W _x		0.263	0.313	0.363		
		W _y		0.279	0.329	0.379		
Color Gamut				--	60	--	%	

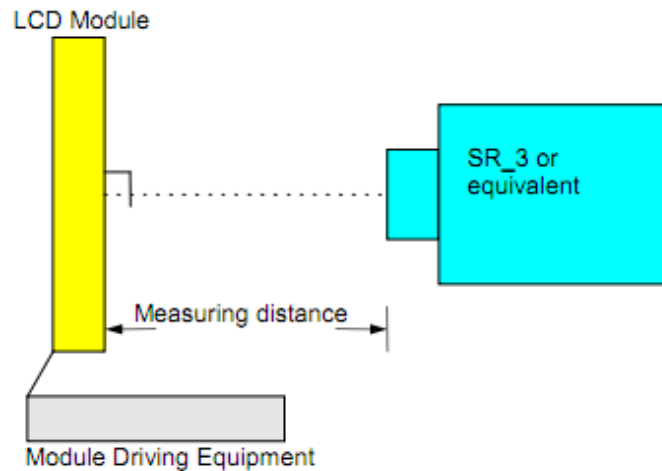
Note 1: Measurement method

Equipment Pattern Generator, Power Supply, Digital Voltmeter, Luminance meter (SR_3 or equivalent)

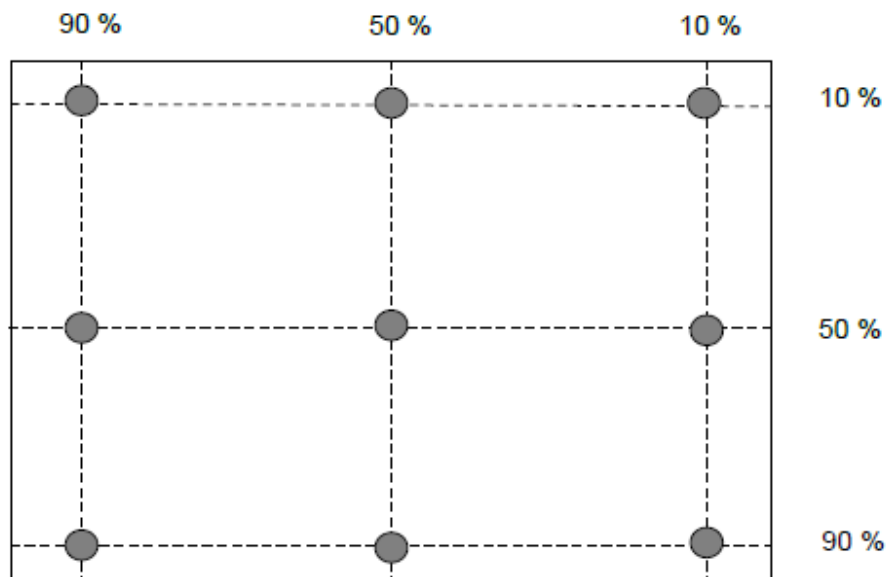
Aperture 1° with 50cm viewing distance

Test Point Center

Environment < 1 lux



Note 2: Definition of 9 points position (Display active area: 304.128 (H) x 228.096 (V))



Note 3: The luminance uniformity of 9 points is defined by dividing the minimum luminance values by the maximum test point luminance

$$\delta_{w9} = \frac{\text{Minimum Brightness of nine points}}{\text{Maximum Brightness of nine points}}$$

Note 4: Definition of contrast ratio (CR)

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

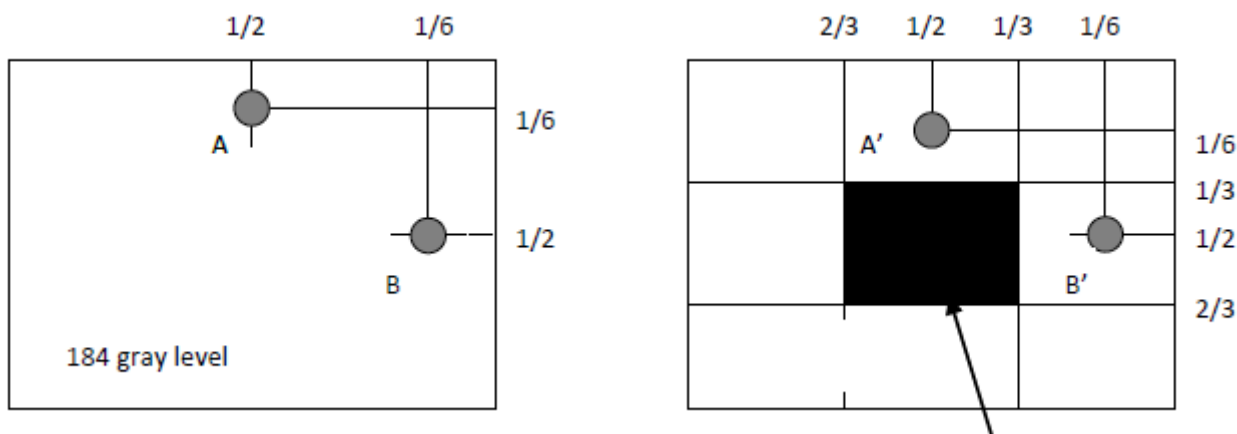
Note5: Definition of cross talk (CT)

$$CT = |YB - YA| / YA \times 100 (\%)$$

Where

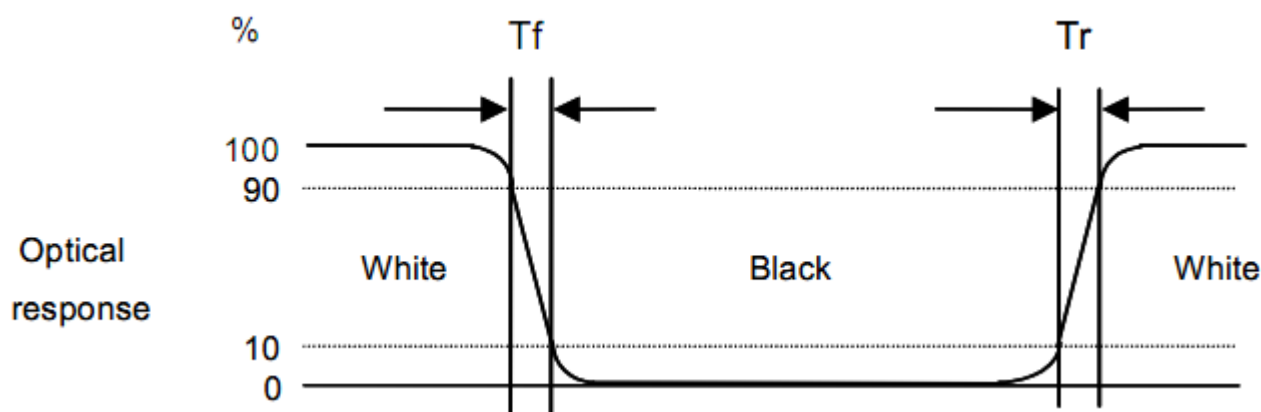
YA=Luminance of measured location without gray level 0 pattern (cd/m²)

YB=Luminance of measured location with gray level 0 pattern (cd/m²)



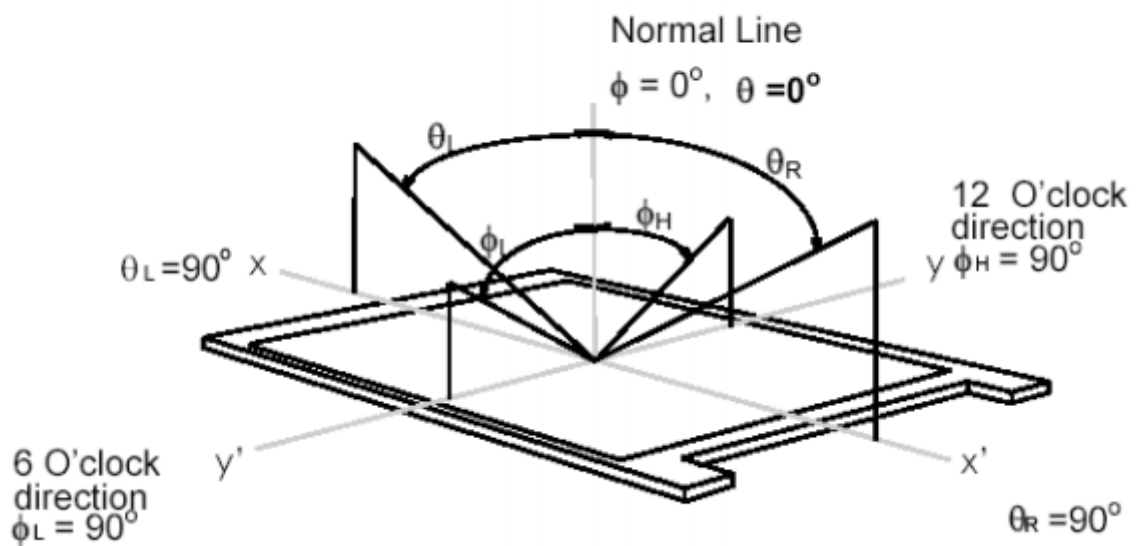
Note6: Definition of Response Time (T_R , T_F)

The output signals of photo detector are measured when the input signals are changed from “White” to “Black” (falling time) and from “Black” to “White” (rising time), respectively. The response time interval is between 10% and 90% of amplitudes. Please refer to the figure as below.



Note7: Definition of viewing angle

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal view angles). The 180° viewing angle range is broken down as below: 90° (θ) horizontal left and right, and 90° (ϕ) vertical high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated to its center to develop the desired measurement viewing angle.



6. RELIABILITY TEST ITEMS

Test Item		Condition
1	High temperature/Humidity Bias	50°C, 80% 240hrs
2	High temperature storage test	70°C, 240hrs
3	Low temperature storage test	-20°C, 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



Product Specification

F150PET-T81

7. LABEL

Model NO. F150PET-T81

條碼

L=32mm

SN 3A Z 20 2 21 0 XXX1

code 1,2 Production location

code 3 Production version

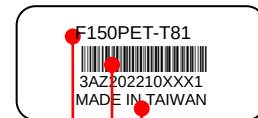
code 4,5 Production year

code 6 Production month

code 7,8 Production day

code 9 Production code

code 10,11,12,13 Serial number



W=14mm

字型:Arial (6)

code:128

字型:Arial (8)

8. MECHANICAL CHARACTERISTICS

Item		Dimension	Unit	Note
Outline Dimension	Horizontal	326.50	mm	PCAP : B150PBU-E01
	Vertical	253.50	mm	
	Depth	2.40	mm	
	Horizontal	326.50	mm	LCD : G150XAN02.1
	Vertical	253.50	mm	
	Depth	8.50	mm	
	Horizontal	50.00	mm	Touch Driver : B000PDU-E03
	Vertical	30.00	mm	
	Depth	1.60	mm	
Weight		1350	g	F150PET-T81
Item		Specification		Remarks
PCAP Viewing Area		305.13 mm x 229.10 mm		
PCAP Sensor Area		325.50 mm x 252.50 mm		
PCAP FPC Length		110.00 mm		
PCAP Input method		Finger or exclusive pen		
PCAP Light Transmission		≥85%		
PCAP Operation force		≤10g		Finger Input
PCAP Hardness of surface		≥6H		Pressure 500gf test
PCAP Surface Treatment		Clear Type		

Front View



Back View



9. ENGINEERING DRAWING

