



- ☒ Draft Specifications
☐ Preliminary Specifications
☐ Final Specifications

Title	21.5-inches Touch Display Product Specifications
Model Name	F215PET-Z18
Version	0

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

Approved By	Prepared By
ZOE NIEN 2026-05-25	ALLEN FANG 2026-05-25



REVISION HISTORY

Version	ECN No.	Description of Changes	Date	Prepared
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1. GENERAL DESCRIPTION

1.1. INTRODUCTION

F215PET-Z18 is a 21.5" wide color VA mode TFT LCD module G215HVN01.3 02 with projected capacitive multi-touch B215PBU-E08 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.

1.2. FEATURES

- FHD (1920 x 1080 pixels) resolution
- High Brightness and Contrast
- LVDS Interface with 2 pixel / clock
- 8-bit color depth, display 16.7M colors
- DE (Data Enable) only
- RoHS / Halogen Free

1.3. APPLICATION

- Desktop Type of PC & Workstation Use
- Slim-Size Display for Stand-alone Monitor
- Display Terminals for Control System
- Monitors for Process Controller

1.4. GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Active Area Size	21.5	inch	
Display Area	476.64 x 268.11(V)	mm	
Outline Dimension	495.60 (H) x 292.20 (V) x 12.16 (D)	mm	D:PCAP+LCM
Weight	2300	g	Typ.
Driver Element	a-Si TFT active matrix	-	
Display Colors	16.7M	Colors	
Number of Pixels	1920 (H) x 1080 (V)	pixels	
Pixel Pitch	0.24825(H) x 0.24825(W)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	VA 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	5.5	V	Note 1
Converter Voltage	V _I	10.8	13.2	V	
Enable Voltage	EN	-0.3	5.5	V	
Dimming Voltage	PWM	-0.3	5.5	V	
Operating Temperature	T _{op}	-10	70	°C	Note 2
Operating Humidity	H _{op}	20	90	%RH	
Storage Temperature	T _{st}	-10	80	°C	
Storage Temperature	H _{st}	20	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.

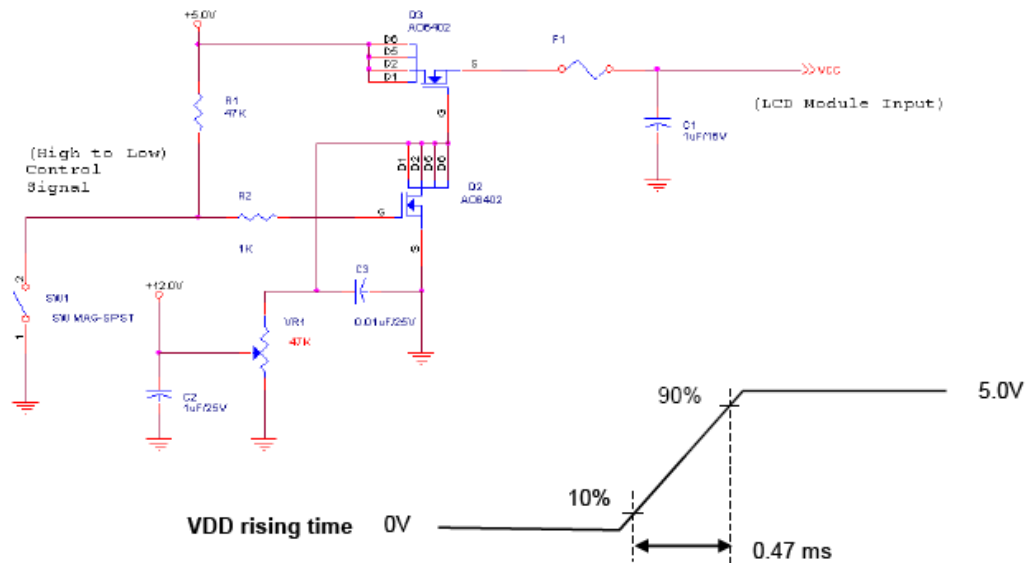
3.ELECTRICAL CHARACTERISTICS

3.1. LCD MODULE

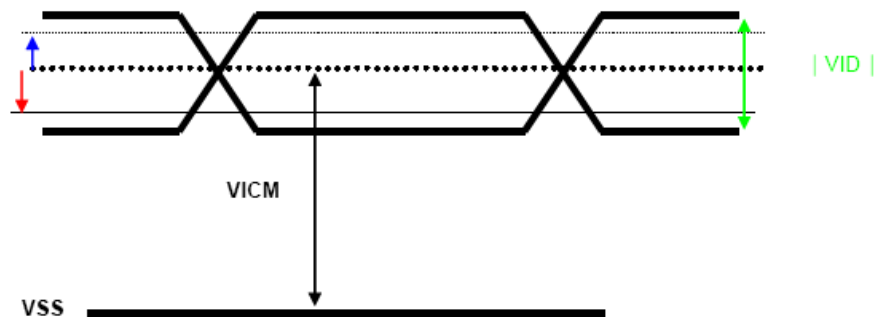
Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
Power Supply Voltage	V_{DD}	4.5	5.0	5.5	V	+/-10%
Power Supply Current	I_{DD}	-	0.7	0.8	A	VDD=5.0V, All White pattern at 60Hz
			0.81	0.89	A	VDD=5.0V, All White pattern at 75Hz
Power Consumption	P_{DD}	-	3.5	4.47	W	VDD=5.0V, All White pattern at 60Hz
		-	4.05	4.9	W	VDD=5.0V, All White pattern at 75Hz
In-Rush Current	I_{RUSH}	-	-	3.0	A	1
Permissible Input Ripple Voltage	V_{DDrp}	-	-	500	mV	$V_{DD}=5.0V$
High Level Differential Input Threshold Voltage	V_{TH}	-	-	100	mV	$V_{ICM}=1.2V$ 2
Low Level Differential Input Threshold Voltage	V_{TL}	-100	-	-	mV	$V_{ICM}=1.2V$ 2
Differential input voltage	$ V_{ID} $	100	-	600	mV	2
Differential input common mode voltage	V_{ICM}	1.0	1.2	1.5	V	$V_{TH}-V_{TL}=200mV(max)$ 2
LED Input Voltage	LED	-	56		V	
LED Supply Current	IF		50		mA	$T_a=25^{\circ}C$
LED Power Consumption	PLED		22.4		W	
LED Lifetime	LL	50,000	-	-	Hrs	

Note1. Measurement conditions:

The duration of rising time of power input is 470us.



Note2. LVDS Signal Waveform



Note3. Ta means ambient temperature of TFT-LCD module.

Note4. If the module is driven by high current or at high ambient temperature & humidity condition, the operating life will be reduced.

Note5. LED light bar structure: (2 light bar x 4 strings x 20pcs / string = 160pcs LED)

Note6. Definition of the life time: Brightness becomes to 50% of its original value. The minimum life time of LED unit is on the condition of IF = 50 mA and 25°C (Room Temperature)

3.2. LCM BLU DRIVER

(Darwin P/N : 55.21G0W.DE0 DARFON Model : V351-405)

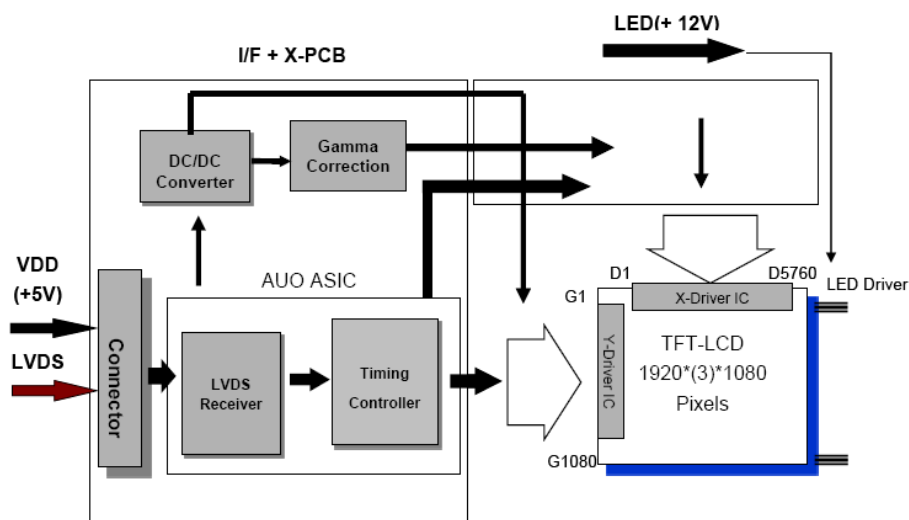
Item	Symbol	Min.	Typ.	Max.	Unit	Note
Driving Type		☐ Analog ☒ PWM 180 Hz				
Input voltage	V _{in}	10.8	12	13.2	V[dc]	
Input current	I _{in}	-	2.08	-	A[dc]	
Power consumption	P _{BL}		24.9		Watt	
Test conditions	Environment	T=25±3°C H=65±20%				
	Method	See attachment " test detail-1 (a)"				

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	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



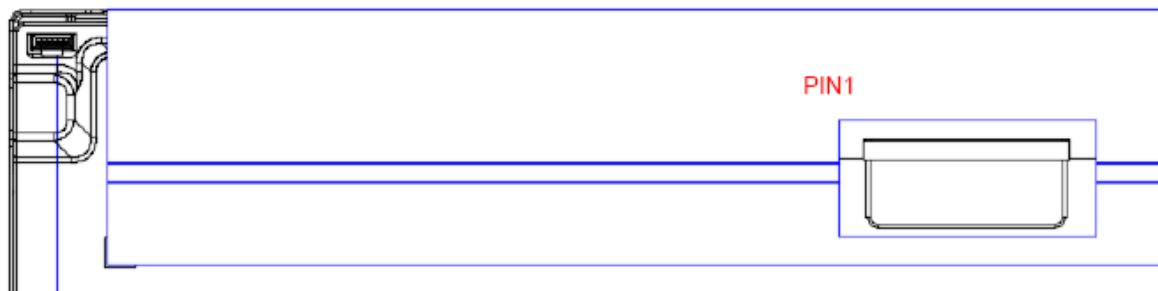
3.5. LCD INPUT TERMINAL PIN ASSIGNMENT

The module be using a pair of LVDS receiver **SN75LVDS82 / SN75LVDS83** (Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. Transmitter shall be SN75LVDS83 (negative edge sampling) or compatible. The first LVDS port (RxOxxx) transmits odd pixels while the second LVDS port (RxExxx) transmits even pixels



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	No connection (for AUO test only. Do not connect)	
26	NC	No connection (for AUO test only. Do not connect)	
27	NC	No connection (for AUO test only. Do not connect)	
28	V _{CC}	+5.0V power supply	
29	V _{CC}	+5.0V power supply	
30	V _{CC}	+5.0V power supply	

Note1: Start from right side



Note2. Input signals of clock shall be the same timing.

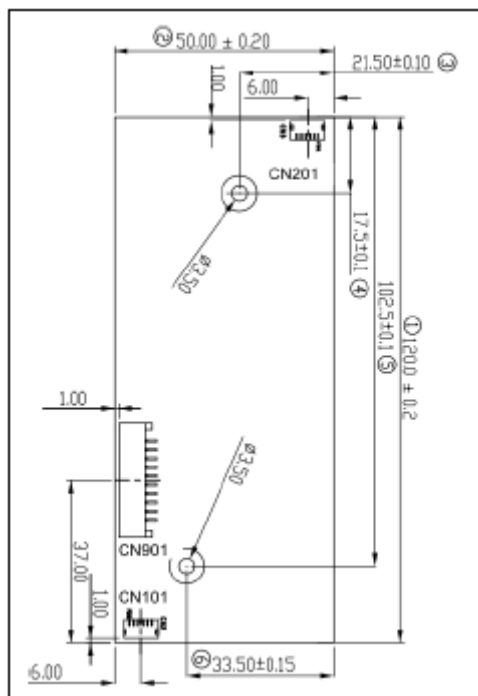
Note3. Please follow TV VESA Pin Assignment

Connector Name / Designation	Interface Connector / Interface card
Manufacturer	JAE or compatible
Type Part Number	JAE (FI-XB30SRL-HF11) or equivalent
Mating Housing Part Number	JAE (FI-X30HL) or compatible

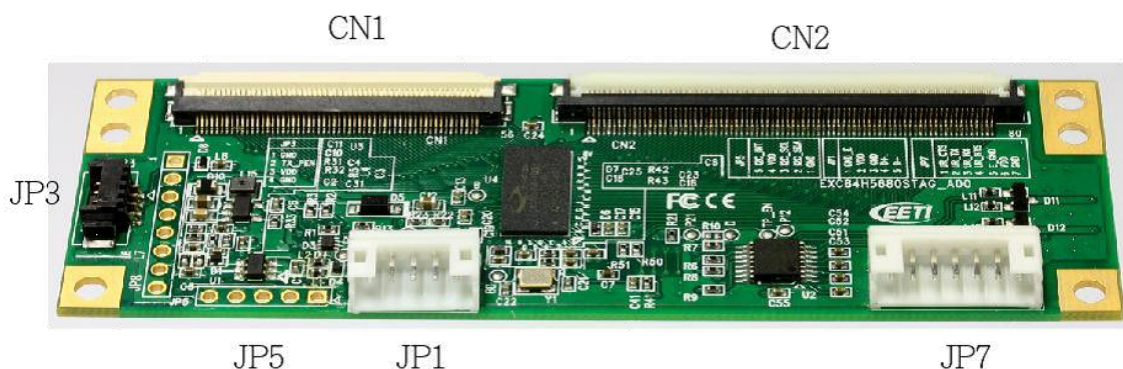
3.6. LCD BACKLIGHT UNIT (LED LIGHT BAR DRIVER PIN ASSIGNMENT)

TYPE: CI0110M1HR0-NH(CVILUX) or compatible

Pin No.	Signal Name	Feature
1	VCC	Supply Voltage 12V
2	VCC	Supply Voltage 12V
3	VCC	Supply Voltage 12V
4	VCC	Supply Voltage 12V
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	BLON	BL ON/OFF
10	E_PWM	External PWM Control (HW mode)



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

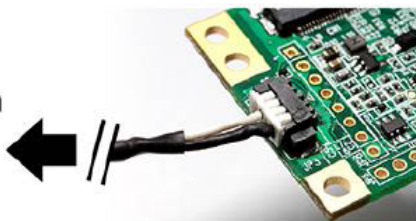
JP7 RS232 connector

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

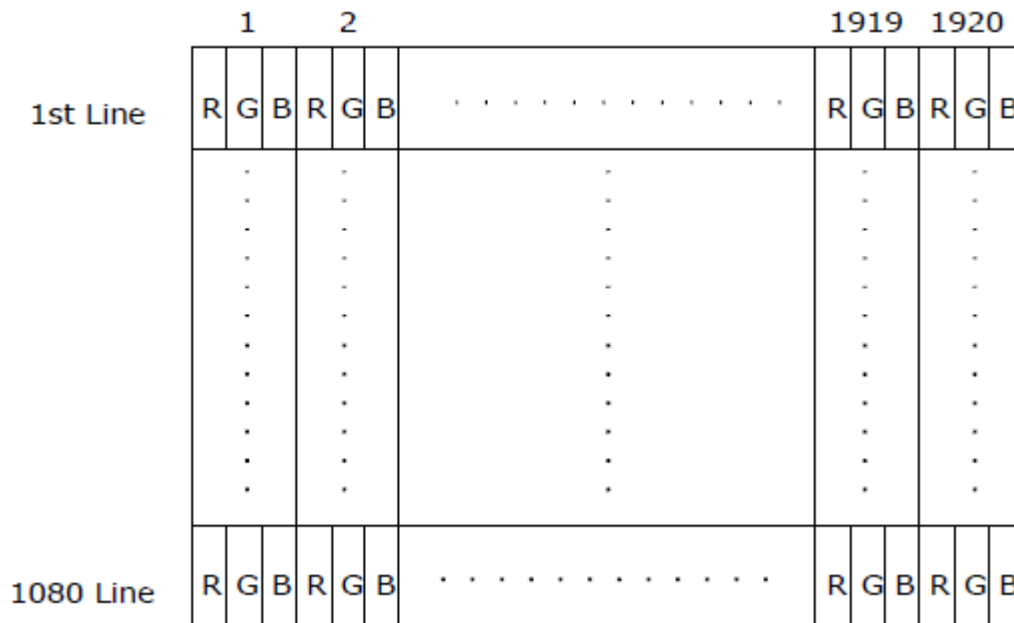
Brand: JST

Part number: SM05B-SRSS-TB or equivalence

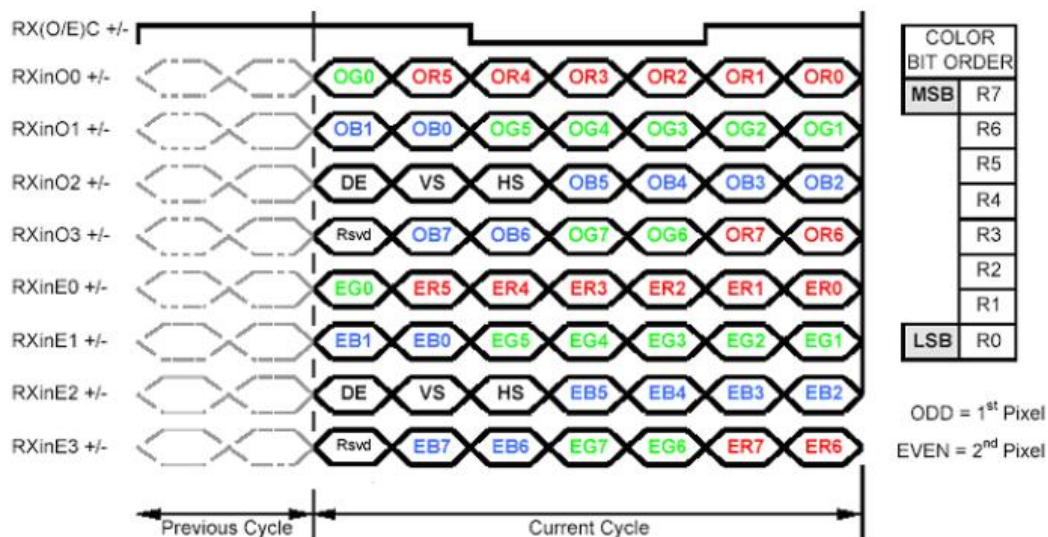
4. SIGNAL TIMING SPECIFICATION

4.1. PIXEL FORMAT IMAGE

Following figure shows the relationship of the signals and LCD pixel format.



4.2. THE INPUT DATA FORMAT



Note1. 8-bits signal input.

Note2. L: NS alike, H: Thine alike

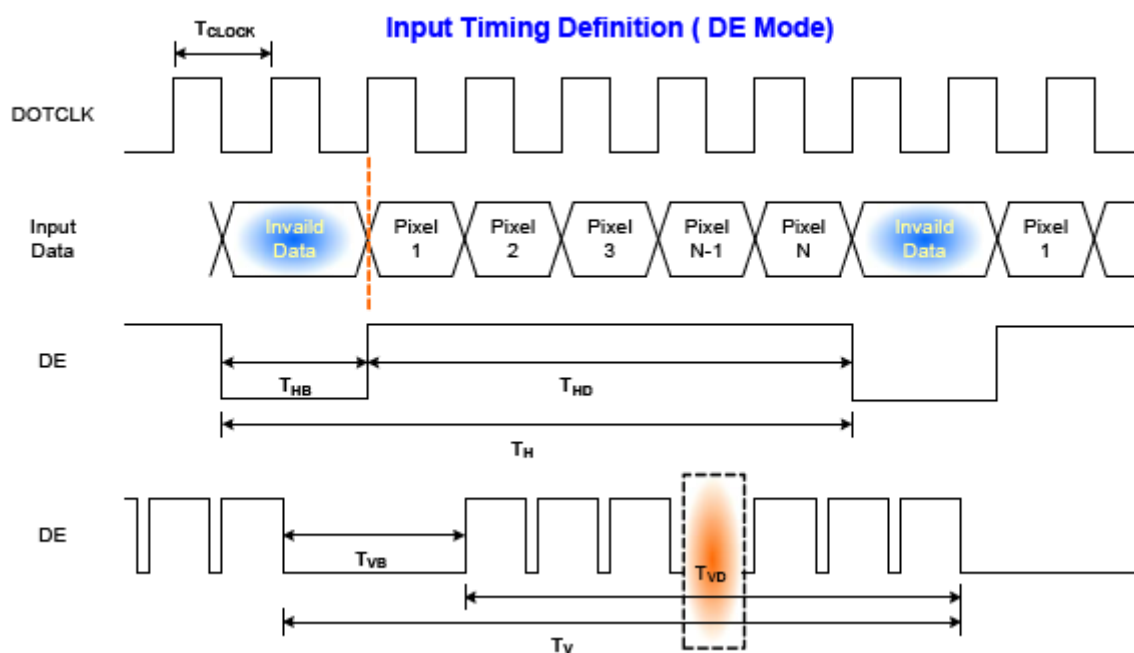
4.3. LCD COLOR INPUT DATA REFERENCE

Signal	Item	Symbol	Min.	Typ.	Max.	Unit
Clock	Frequency	T_{Clock}	40	72	83	MHz
Frame Rate	Frequency	F	50	60	75	Hz
V-section	Total	T_v	1092	1130	1653	T_h
	Active	T_V	1080	1080	1080	T_h
	Blanking	T_{VB}	12	50	573	T_h
H-section	Total	T_H	1004	1050	1100	T_c
	Active	T_{HD}	960	960	960	T_c
	Blanking	T_{HB}	44	90	140	T_c

Note1. DE mode only

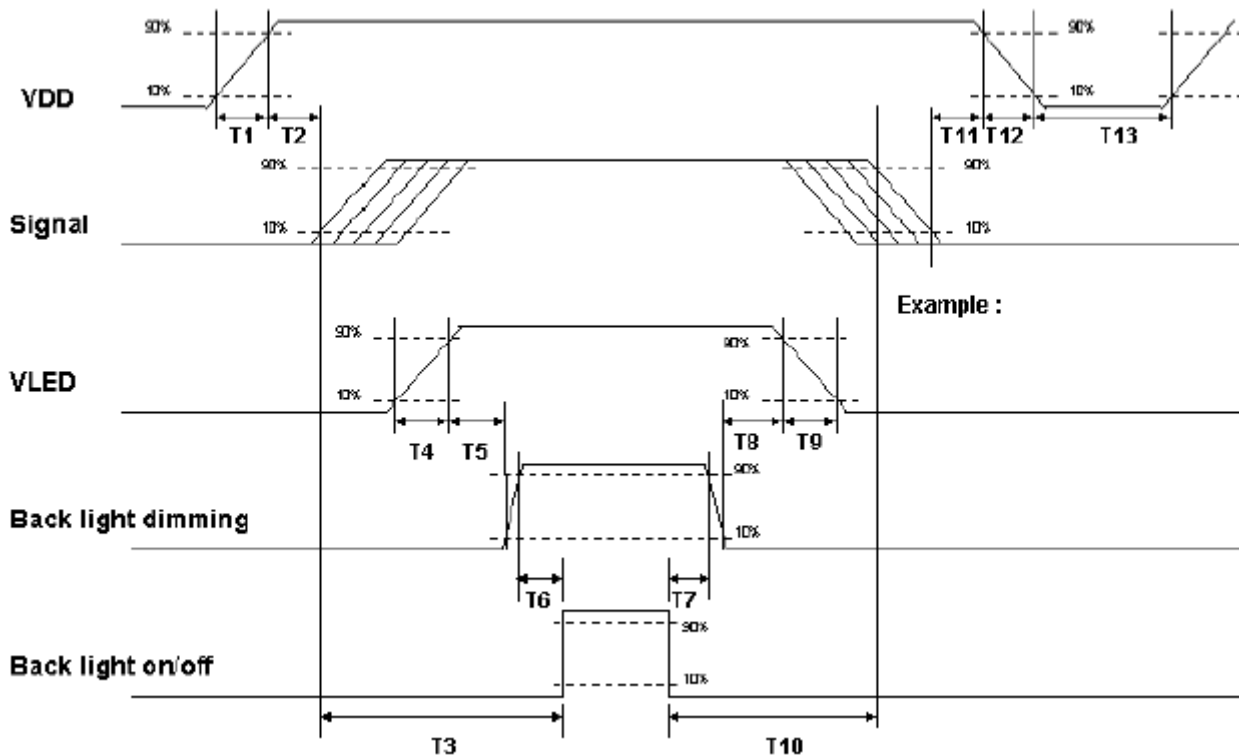
Note2. Typical value refer to VESA STANDARD

4.4. LCD INPUT TIMING DIAGRAM



4.5. POWER SEQUENCE FOR LCD

VDD power and LED on/off sequence are as follows. 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	Value			Units
	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	--	--	10	[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.

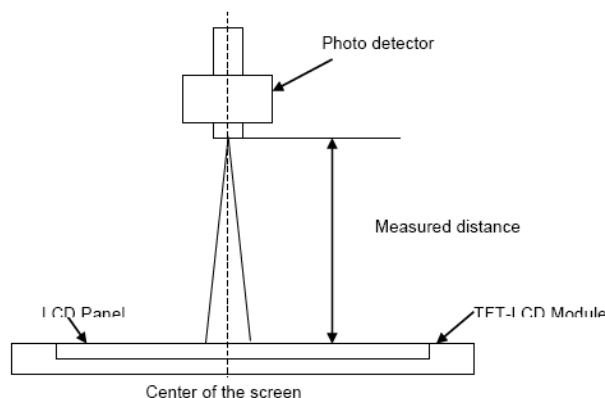
5. OPTICAL CHARACTERISTICS

[VDD = 5.0V, Frame rate = 60Hz, Clock = 74MHz, I_{BL}= 240mA, Ta =25±2 °C]

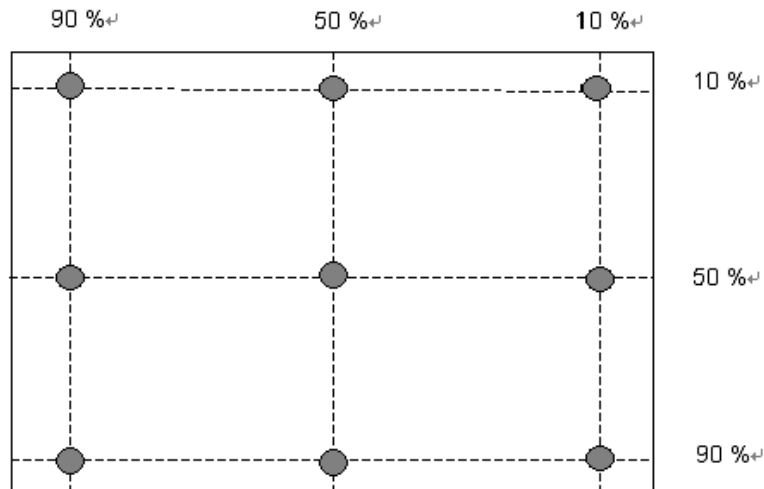
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Luminance of White		Y _W	Center point	800	1000	-	Cd/m ²	1
Luminance uniformity		ΔY	9 points	75	80	-	%	2, 3
Contrast Ratio		CR	Normal Direction	3000	5000	-		4
Response Time		T _R	Raising		20	25	ms	5
		T _F	Falling		5	10		
		T _R +T _F	Raising + Falling		25	35		
Viewing Angle	Horizontal	θ _r	CR=10	75	89		degree	6
		θ _l		75	89			
	Vertical	θ _u		75	89			
		θ _d		75	89			
Color Coordinates	Red	R _x		0.589	0.639	0.689	-	5
		R _y		0.284	0.334	0.384		
	Green	G _x		0.270	0.320	0.370		
		G _y		0.568	0.618	0.668		
	Blue	B _x		0.103	0.153	0.203		
		B _y		0.012	0.062	0.112		
	White	W _x		0.263	0.313	0.363		
		W _y		0.279	0.329	0.379		
Crosstalk (in 60Hz)						1.5	%	7
Flicker						-20	dB	8

Note 1: Measurement method

Before measuring, the LCD module should be turn on 30 minutes at room temperature. In order to stabilize the luminance, the measurement should be executed after Backlight for 30 minutes in a stable, windless and dark room.



Note 2: Definition of 9 points position



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

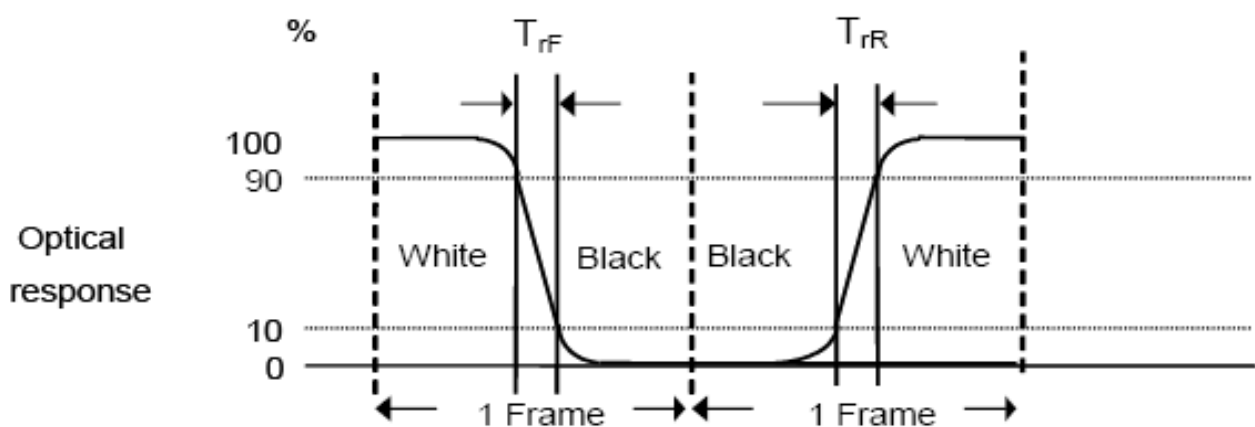
$$\delta_{w9} = \frac{\text{Minimum Brightness of 9 points}}{\text{Maximum Brightness of 9 points}}$$

Note 4: Definition of contrast ratio (CR)

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

Note 5: Definition of response time:

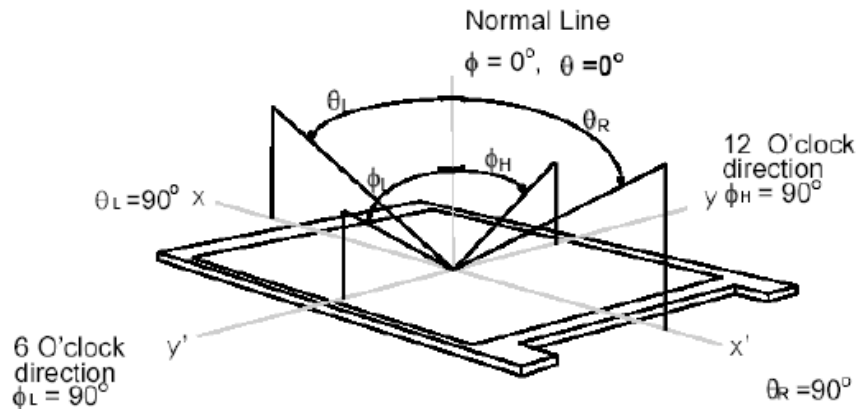
The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full white" (rising time, T_{rF}) and from "Full white" to "Full Black" (falling time, T_{rR}), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.



Note 6: 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 viewing 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.



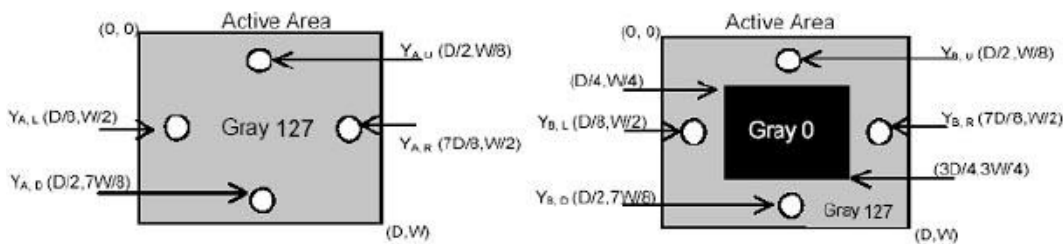
Note 7: Crosstalk is defined as below

$$CT = |Y_B - Y_A| / Y_A \times 100 (\%)$$

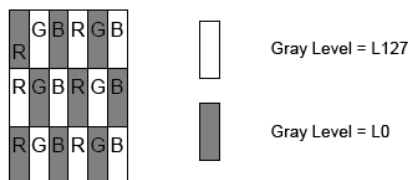
Where

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

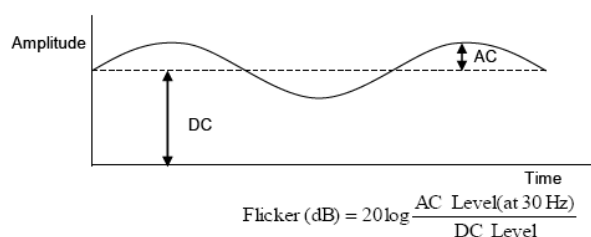
Y_B = Luminance of measured location with gray level 0 pattern (cd/m²)



Note 8: Flicker test pattern : Subchecker Pattern



Method: Record dB value with TRD-100



6. RELIABILITY TEST ITEMS

Test Item		Condition
1	High temperature storage test	80°C, 240hrs
2	Low temperature storage test	-10°C, 240hrs
3	Temperature Humidity Bias test	50°C, 80%RH, 240hrs
4	High temperature operation test	70°C, 240hrs
5	Low temperature operation test	-10°C, 240hrs
6	Thermal Cycle storage test	-10°C(30min)~60°C(30min), 10cycles

7. LABEL

Model NO. F215PET-Z18

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	496.60	mm	PCAP : B215PBU-E08
	Vertical	291.20	mm	
	Depth (min.)	2.70	mm	
	Horizontal	495.60	mm	LCD : G215HVN01.3 02
	Vertical	292.20	mm	
	Depth (min.)	8.36	mm	
	Horizontal	100.00	mm	Touch Driver : ETP-MB-EXC84H5680STAG
	Vertical	33.00	mm	
	Depth (min.)	7.20	mm	
Weight		2440	g	F215PET-T24
Item		Specification		Remarks
PCAP Viewing Area		476.64 mm x 268.11 mm		
PCAP Active Area		481.20 mm x 272.70 mm		
PCAP FPC Length		96.70 mm		
PCAP Input method		Finger or exclusive pen		
PCAP Light Transmission		90 ± 3 %		
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

F215PET-Z18

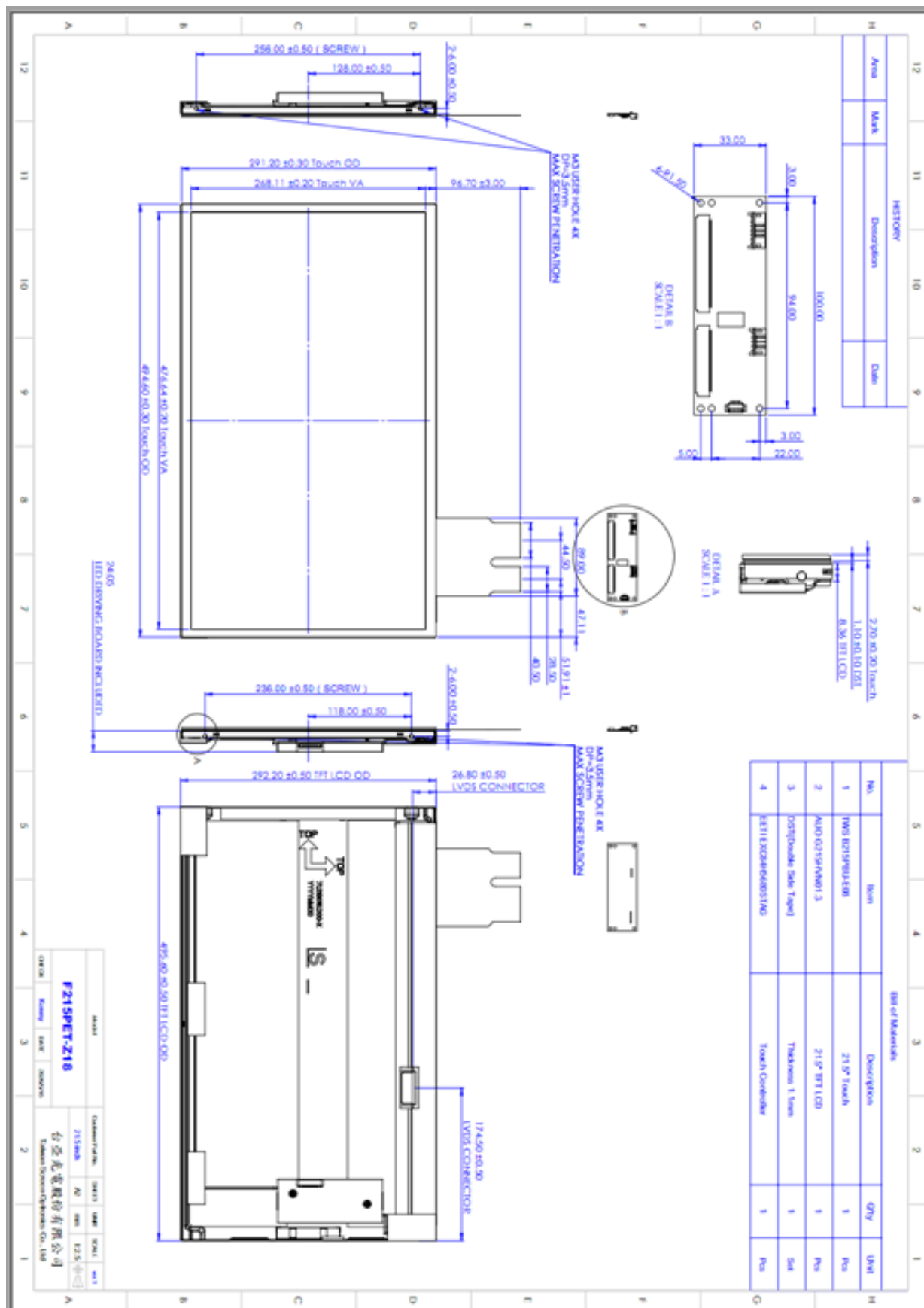
Front View

TBD

Back View

TBD

9. ENGINEERING DRAWING



Touch Driving Board :

