



- ☒ Draft Specifications
- ☐ Preliminary Specifications
- ☐ Final Specifications

Title	19.0-inches Touch Display Product Specifications
Model Name	F190PET-T33
Version	0

Customer

Approved by

Date

Notice: This Specification is subject to change without notice.

Approved By	Prepared By
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2026-06-29	2026-06-29



REVISION HISTORY

Version	ECN No.	Description of Changes	Date	Prepared
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CONTENTS

1. GENERAL DESCRIPTION	4
1.1. INTRODUCTION	4
1.2. FEATURES	4
1.3. APPLICATION	4
2. GENERAL SPECIFICATIONS	5
3. ABSOLUTE MAXIMUM RATINGS	6
4. ELECTRICAL CHARACTERISTICS	7
4.1. LCD MODULE	7
4.1.1. POWER SPECIFICATION	7
4.1.2. LVDS DC ELECTRICAL CHARACTERISTICS	8
4.1.3. LCD BACKLIGHT UNIT	9
4.1.4. LCD BLOCK DIAGRAM	10
4.1.5. LCD INPUT TERMINAL PIN ASSIGNMENT : LVDS Connector	11
4.1.6. LED BACKLIGHT UNIT : Driver Connector	13
4.1.7. LCD SIGNAL CHARACTERISTIC	14
4.1.8. THE LCD INPUT DATA FORMAT	15
4.1.9. LCD INTERFACE TIMING	15
4.2. TOUCH PANEL	18
4.2.1. TOUCH PIN ASSIGNMENT	18
4.3. TOUCH DRIVER	18
5. OPTICAL CHARACTERISTICS	20
6. RELIABILITY TEST ITEMS	23
7. LABEL	23
8. MECHANICAL CHARACTERISTICS	24
9. ENGINEERING DRAWING	26



1. GENERAL DESCRIPTION

1.1. INTRODUCTION

F190PET-T33 is a 19.0" color active matrix TFT-LCD module G190EAN01.3 11 with projective capacitive multi-touch B190PBU-E02 air bonding, with touch driver ETP-MB-EXC84H4254STAG.

The display format is intended to support the SXGA (1280 (H) x 1024 (V)) screen and 16.7M colors (RGB 8-bits). All input signals are 2-channel LVDS interface. With white LEDs backlight built in PCBA.

1.2. FEATURES

- SXGA (1280 x 1024 pixels) resolution
- LVDS Interface with 2 pixel / clock
- 8-bit color depth, display 16.7M colors
- DE (Data Enable) only
- RoHS / Halogen Free

1.3. APPLICATION

- TFT LCD monitor
- Industrial application



2. GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Active Area Size	19"	inch	
Display Area	376.32 x 301.06 (V)	mm	
Outline Dimension	396.00 (H) x 324.00 (V) x 19.14 (D)	mm	D:PCAP+LCM
Weight	2550	g	Typ.
Driver Element	a-Si TFT active matrix	-	
Display Colors	16.7M (RGB 8-bit)	Colors	
Electrical Interface	LVDS	-	
Number of Pixels	1280(H) x 1024 (V)	pixels	
Pixel Pitch	0.294(H) x 0.294(W)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	AHVA, Normal Black	-	
NTSC	72	%	
Touch Technology	Projected Capacitive Multi-Touch Panel	-	
Touch Method	Finger or exclusive pen	-	
Numbers of Touch	10	Points	
Touch Driver	ETP-MB-EXC84H4254STAG : 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	-	



3.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	+5.5	V
LED Input Voltage	LED_V _{DD}	-0.3	+14	V
LED Control Signal Voltage	LED_EN,PWM	-0.3	+5.5	V
Operating Temperature	T _{op}	-15	+70	°C
Operating Humidity	H _{op}	20	80	%RH
Storage Temperature	T _{st}	-20	+70	°C
Storage Humidity	H _{st}	20	90	%RH
Touch DC Supply Voltage	I2C	-0.3	3.6	V
Touch DC Supply Voltage	USB	-0.3	6.0	V

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

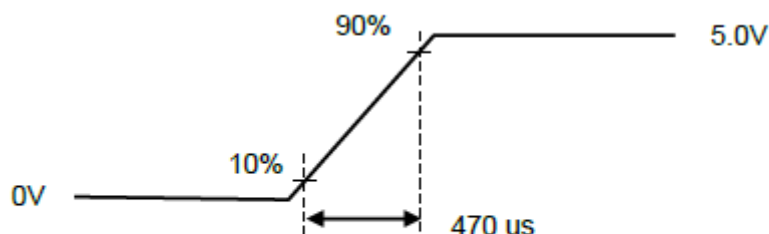
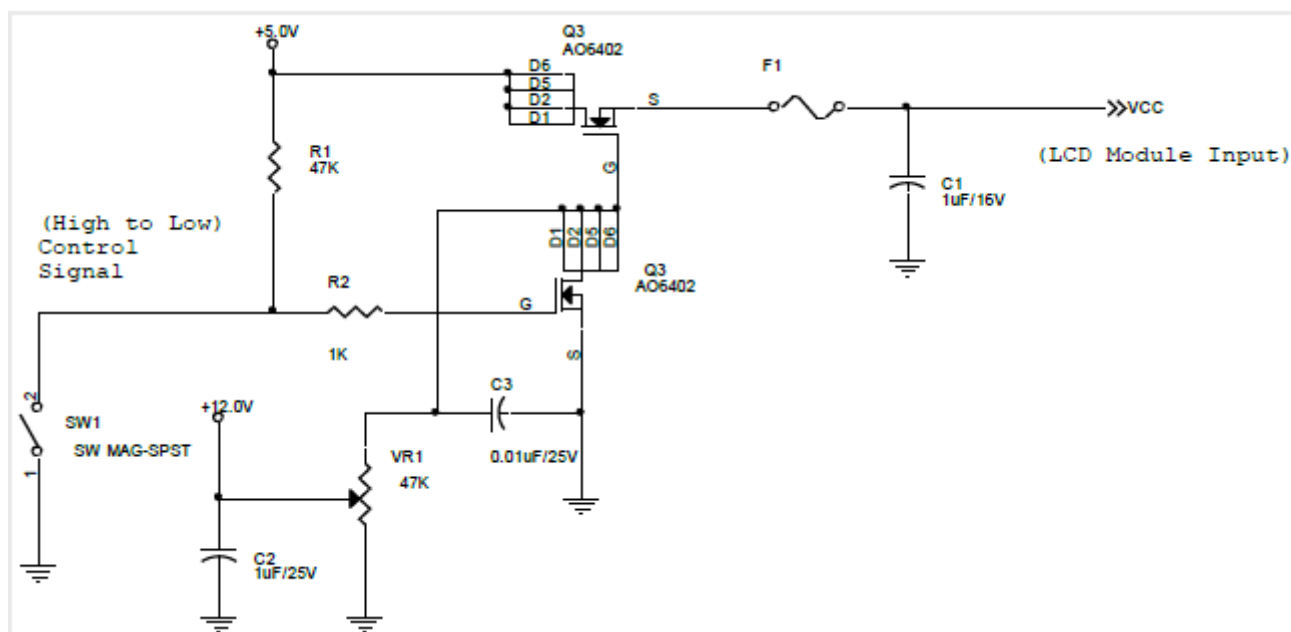
4.ELECTRICAL CHARACTERISTICS

4.1.LCD MODULE

4.1.1.POWER SPECIFICATION

Parameter	Symbol	Min.	Typ.	Max.	Units	Remark
Logic/LCD Drive Voltage	VDD	4.5	5.0	5.5	V	+/-10%
Input Current	IDD	-	0.67	0.8	mA	All White Pattern (VDD=5.0V, at 60Hz)
VDD Power	PDD	-	3.35	4.0	W	All White Pattern (VDD=5.0V, at 60Hz)
Inrush Current	IRush	-	2.7	3.4	A	Note 1
Allowable Logic/LCD Drive Ripple Voltage	VDDrp	-	-	300	mV P-P	With pane loading

Note1: Measurement condition:



VDD rising time

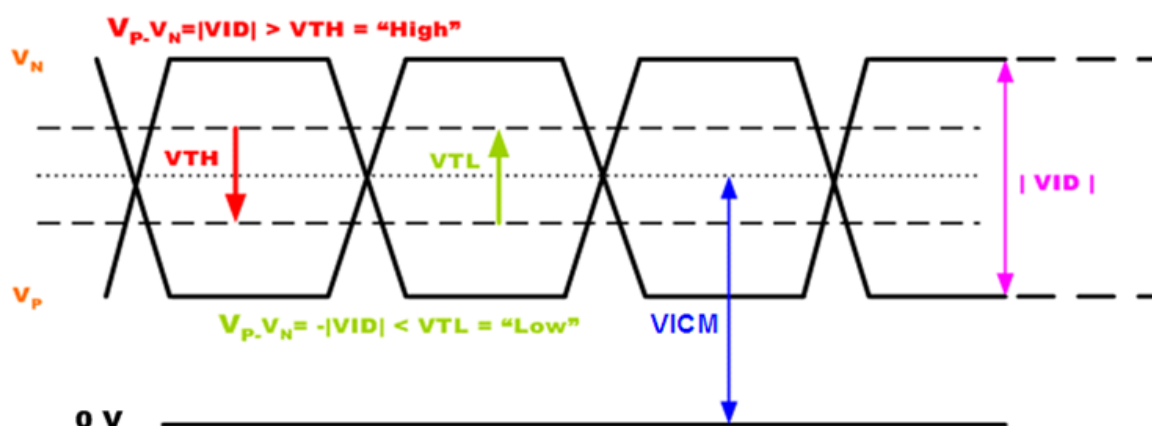
4.1.2. LVDS DC ELECTRICAL CHARACTERISTICS

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Differential Input High Threshold	V _{TH}	-	-	+100	mV	V _{CM} =1.2V, Note
Differential Input Low Threshold	V _{TL}	-100	-	-	mV	V _{CM} =1.2V, Note
Input Differential Voltage	V _{ID}	100	400	600	mV	Note
Differential Input Common Mode Voltage	V _{ICM}	+1.0	+1.2	+1.5	V	V _{TH} /V _{TL} =+/-100mV, Note

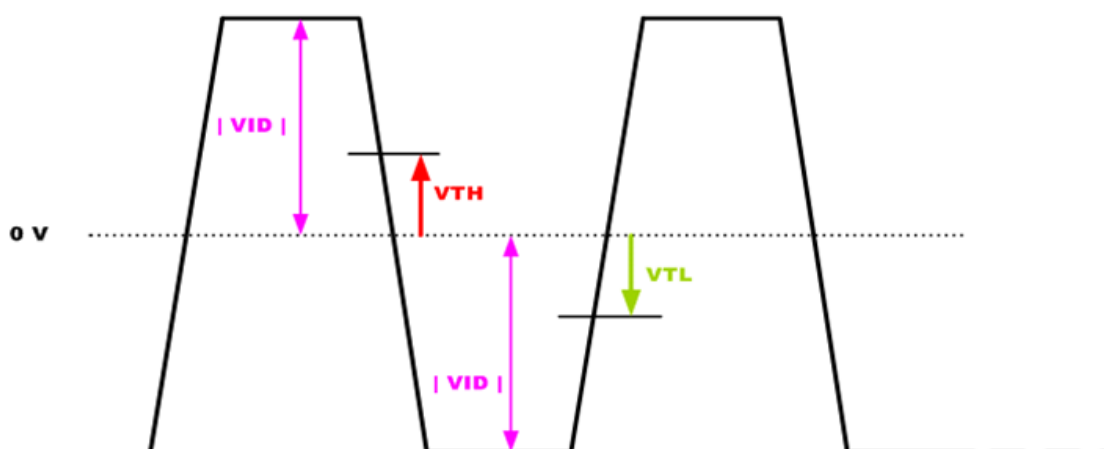
Input signals shall be low or Hi-Z state when VDD is off.

Note: LVDS signal waveform

Single-end Signal



Differential Signal



4.1.3. LCD BACKLIGHT UNIT

4.1.3.1. BACKLIGHT INPUT SIGNAL CHARACTERISTICS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Input Voltage	V _{LED}	10.8	12	13.2	V	
Inrush Current	Inrush	-	-	5	A	
On Control Voltage	V _{LED on/off}	2.5	-	5.5	V	Back light ON/OFF
Off Control Voltage		-	-	0.7	V	
PWM Dimming Frequency	E _{PWM}	200	-	20K	Hz	
High Voltage		2.5	-	5.5	V	
Low Voltage		-	-	0.7	V	
Dimming Duty 200~5K		5		100	%	
Dimming Duty 5K~5K		15		100	%	
Backlight Power Consumption	P _{LED}	-	11	11.6	W	LED only
LED Life-Time	LT _{LED}	50000	-	-	Hour	LED only

Note 1: Ta means ambient temperature of TFT-LCD module.

Note 2: If this module is driven at high ambient temperature & humidity condition. The operating life will be reduced.

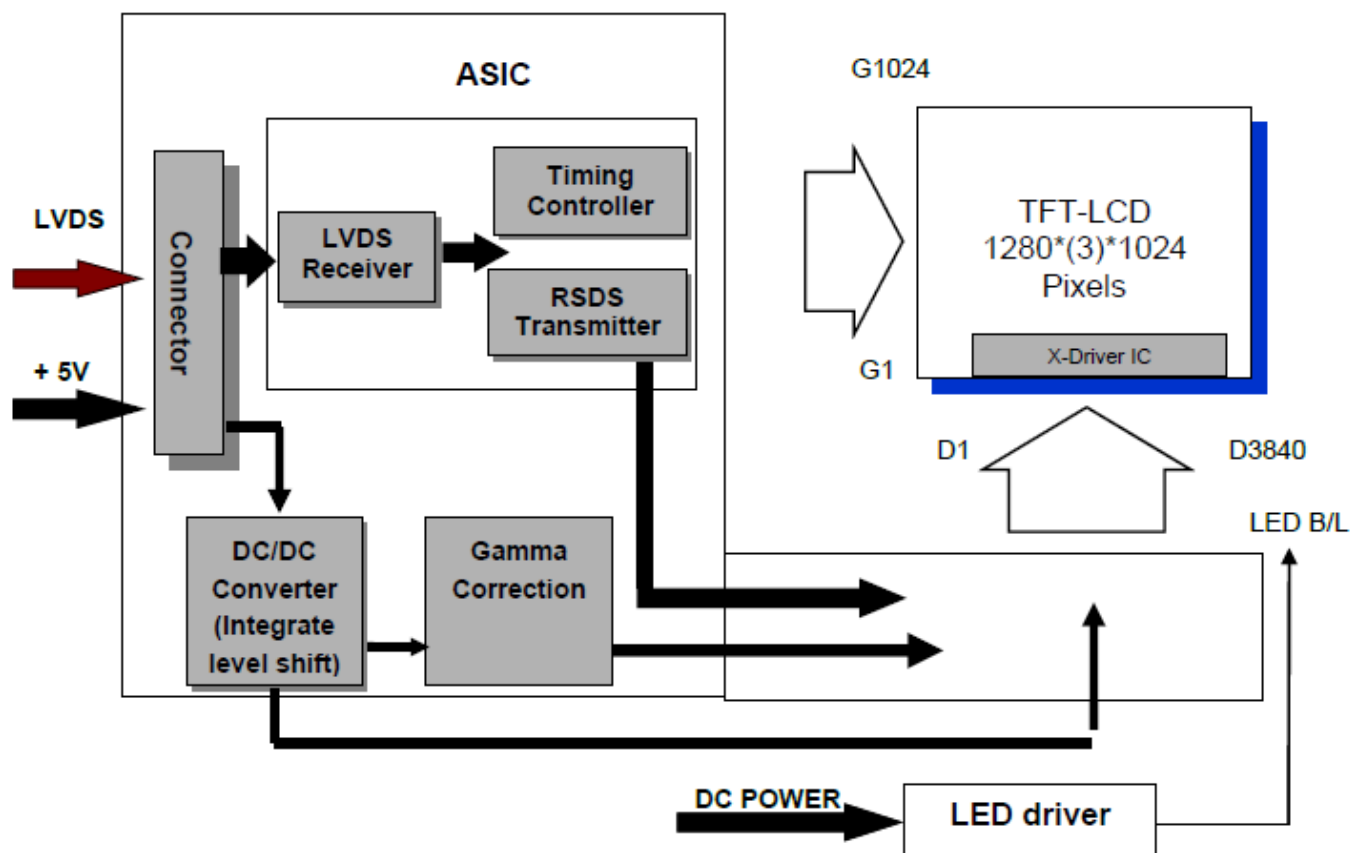
Note 3: Operating life means brightness goes down to 50% initial brightness. Min. operating life time is estimated data.

Note 4: Calculator value for reference

$$P_{LED} = V_F (\text{Normal Distribution}) * I_F (\text{Normal Distribution}) / \text{Efficiency}$$

Note 5: The LED life-time define as the estimated time to 50% degradation of initial luminous.

4.1.4. LCD BLOCK DIAGRAM



I/F PCB Interface:

AL230F-A0G1D-P

Mating Type:

FI-X30HL (Locked Type)

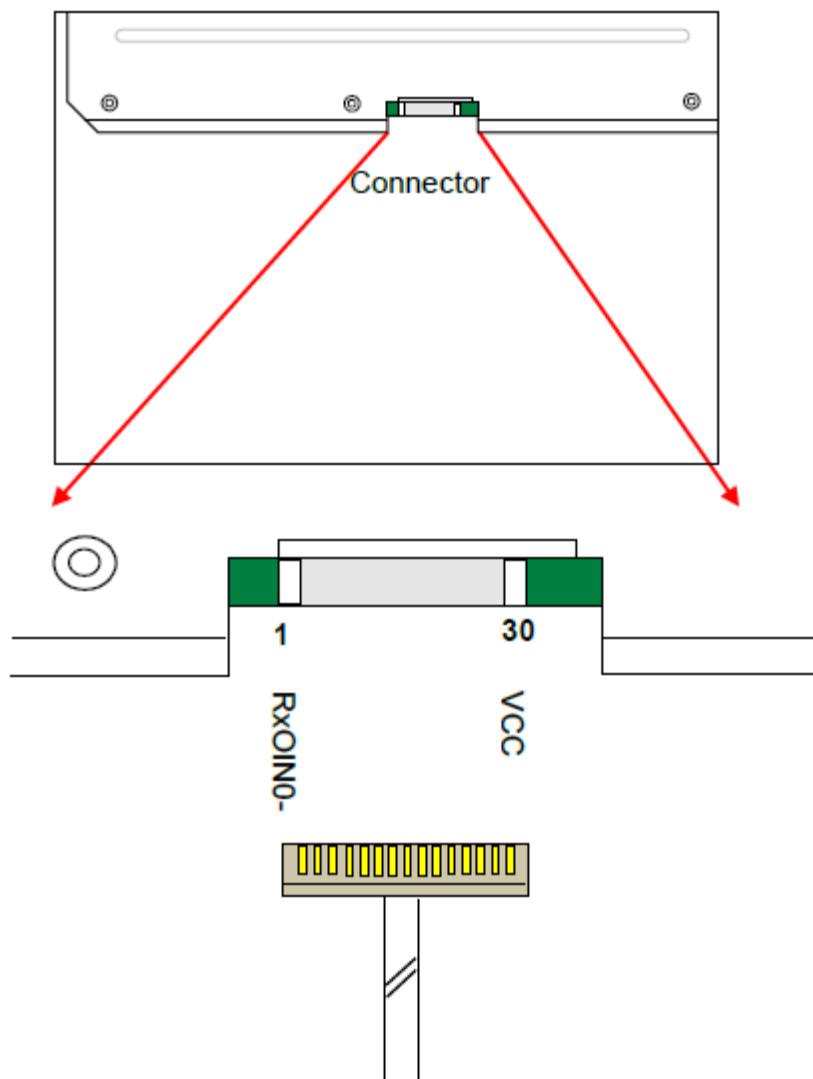
FI-X30H (Unlocked Type)

4.1.5. LCD INPUT TERMINAL PIN ASSIGNMENT : LVDS Connector

Pin	Symbol	Description	Note
1	RXO0-	Negative transmission data of Odd pixel 0	
2	RXO0+	Positive transmission data of Odd pixel 0	
3	RXO1-	Negative transmission data of Odd pixel 1	
4	RXO1+	Positive transmission data of Odd pixel 1	
5	RXO2-	Negative transmission data of Odd pixel 2	
6	RXO2+	Positive transmission data of Odd pixel 2	
7	GND	Ground	
8	RXOCLK-	Negative of clock Odd pixel	
9	RXOCLK+	Positive of clock Odd pixel	
10	RXO3-	Negative transmission data of Odd pixel 3	
11	RXO3+	Positive transmission data of Odd pixel 3	
12	RXE0-	Negative transmission data of Even pixel 0	
13	RXE0+	Positive transmission data of Even pixel 0	
14	GND	Ground	
15	RXE1-	Negative transmission data of Even pixel 1	
16	RXE1+	Positive transmission data of Even pixel 1	
17	GND	Ground	
18	RXE2-	Negative transmission data of Even pixel 2	
19	RXE2+	Positive transmission data of Even pixel 2	
20	RXECLK-	Negative of clock Even pixel	
21	RXECLK+	Positive of clock Even pixel	
22	RXE3-	Negative transmission data of Even pixel 3	
23	RXE3+	Positive transmission data of Even pixel 3	
24	GND	Ground	
25	GND	Ground	
26	GND	NC	
27	GND	Ground	
28	POWER	Power +5V	
29	POWER	Power +5V	
30	POWER	Power +5V	

Connector Name / Description	Signal Connector
Manufacturer	P-TWO
Connector Model Number	AL230F-A0G1D-P
Adaptable Plug	FI-X30HL or Compatible FI-X30H or Compatible (Unlocked Type)

Note 1: Start from left side



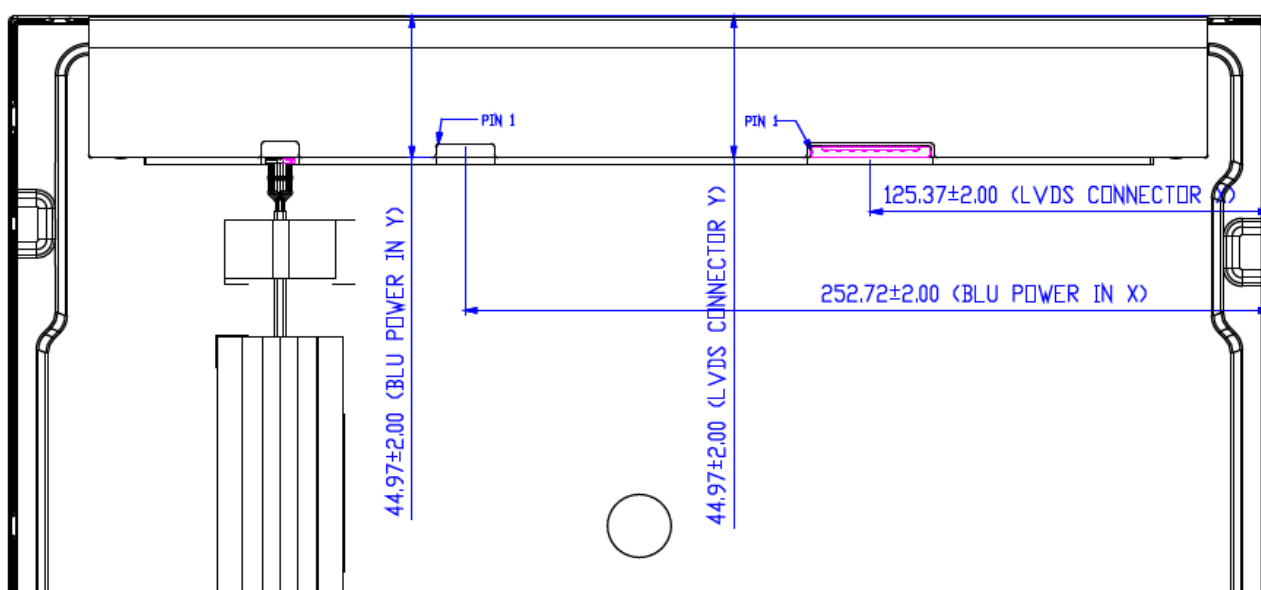
Note 2: Input signals of odd and even clock shall be the same timing.

Note 3: Please follow VESA

4.1.6. LED BACKLIGHT UNIT : Driver Connector

Pin No.	Symbol	Description
1	VCC	+12V
2	VCC	+12V
3	VCC	+12V
4	NC	NC
5	GND	GND
6	GND	GND
7	GND	GND
8	Enable	5V-ON / 0V-OFF
9	Dimming	PWM Dimming 10% ~ 100%

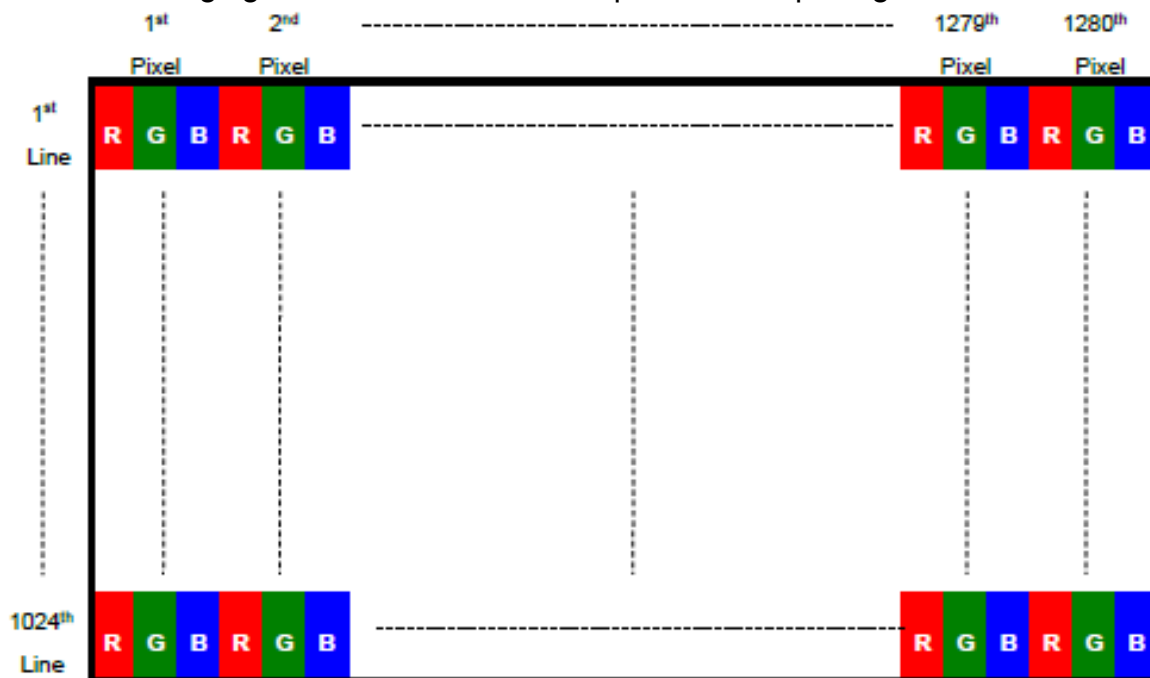
Connector Name / Description	Signal Connector
Manufacturer	STM
Connector Model Number	MS24019RHD or compatible
Adaptable Plug	P24019 or compatible



4.1.7. LCD SIGNAL CHARACTERISTIC

4.1.7.1. PIXEL FORMAT IMAGE

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



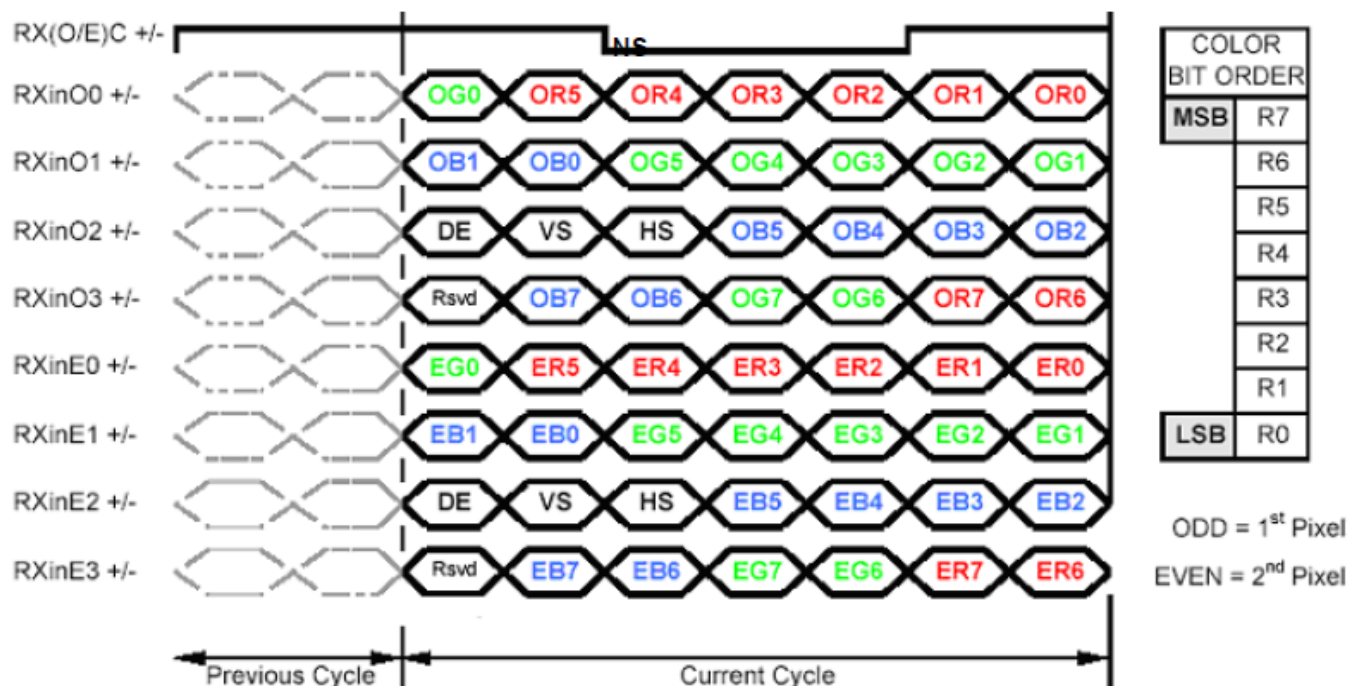
4.1.7.2. SCANNING DIRECTION

The following figures show the image seen from the front view. The arrow indicates the direction of scan.



Fig. 1 Normal scan

4.1.8. THE LCD INPUT DATA FORMAT



Note1: Normally, DE, VS, HS on EVEN channel are not used.

Note2: Please follow PSWG.

Note3: 8-bit in

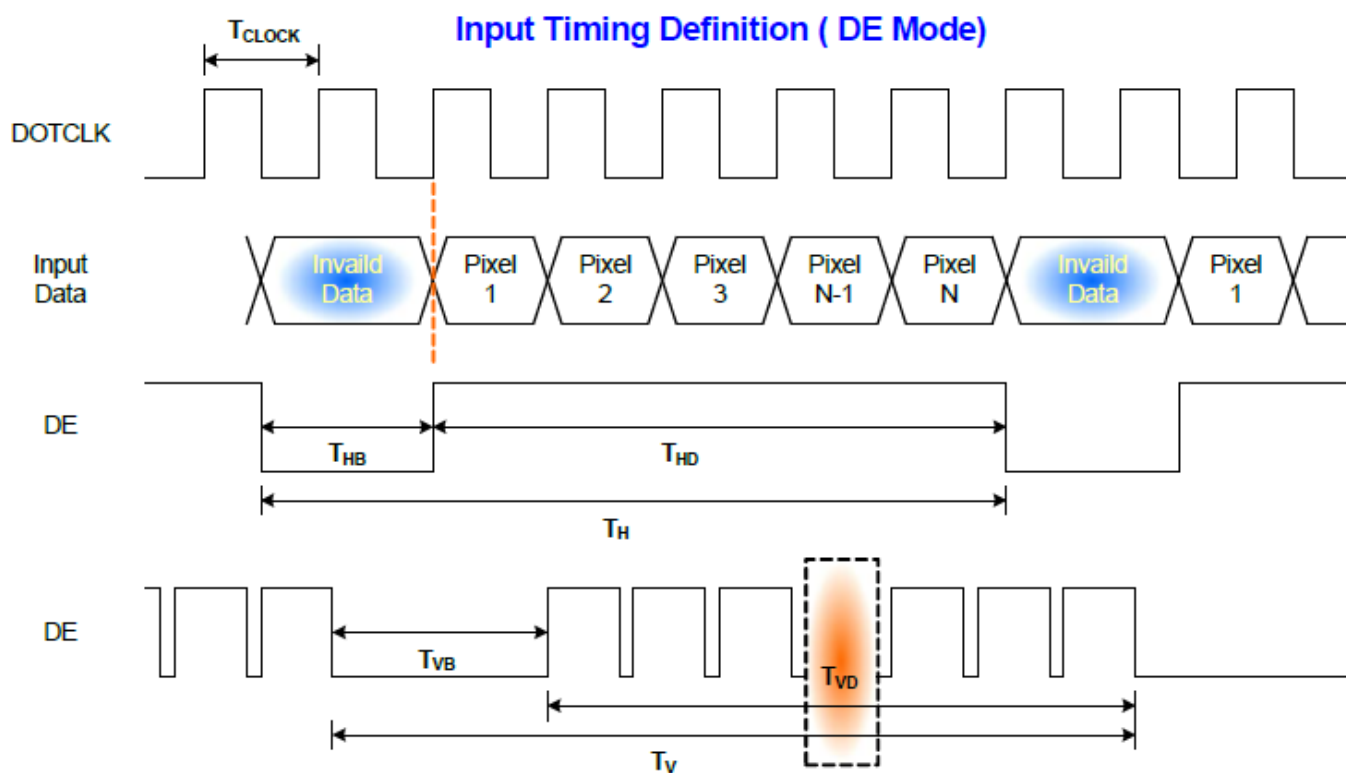
4.1.9. LCD INTERFACE TIMING

4.1.9.1. LCD TIMING CHARACTERISTICS

Signal		Symbol	Min.	Typ.	Max.	Unit
Clock Frequency		1/T _{Clock}	45	54	67.5	MHz
Vertical Section	Period	T _V	1032	1066	1150	T _{Line}
	Active	T _{VD}	1024			
	Blanking	T _{VB}	8	42	126	
Horizontal Section	Period	T _H	780	844	2047	T _{dclk}
	Active	T _{HD}	640			
	Blanking	T _{HB}	140	204	231	
Frame Rate		F	50	60	75	Hz

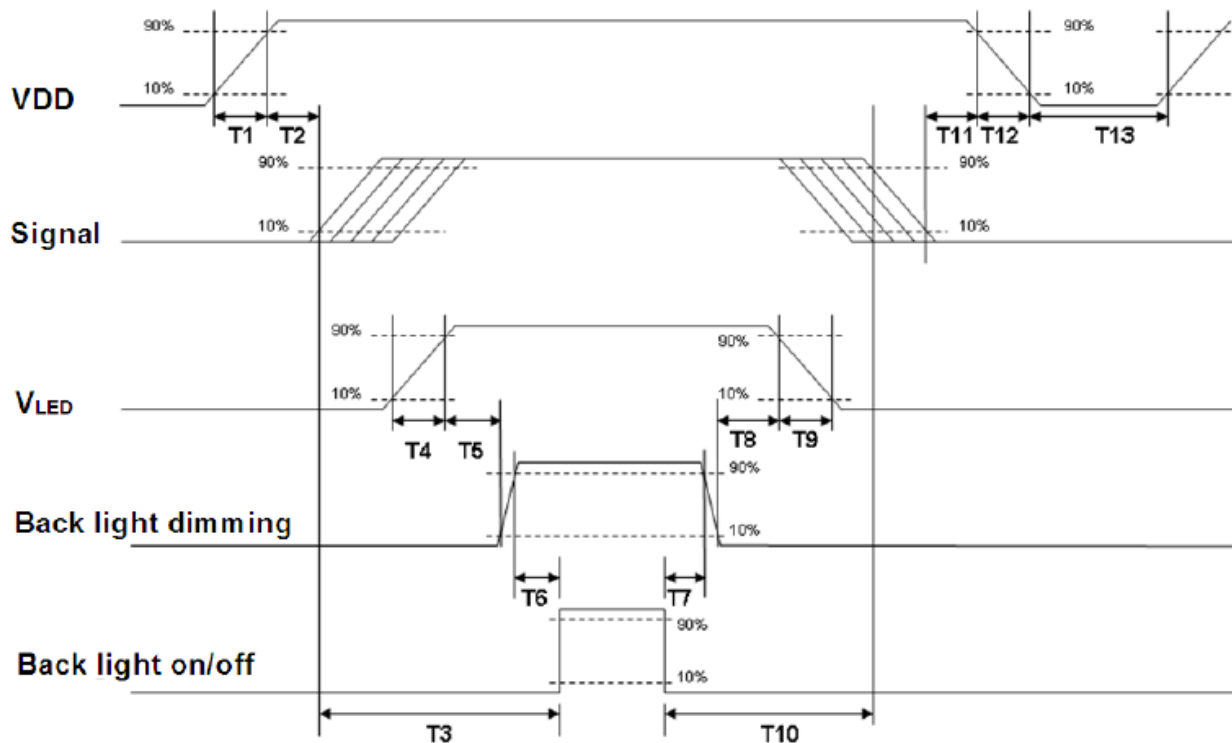
Note1: DE mode only

4.1.9.2. LCD INPUT TIMING DIAGRAM



4.1.9.3. POWER SEQUENCE FOR LCD

VDD power and lamp 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.



4.2.TOUCH PANEL

4.2.1. TOUCH PIN ASSIGNMENT

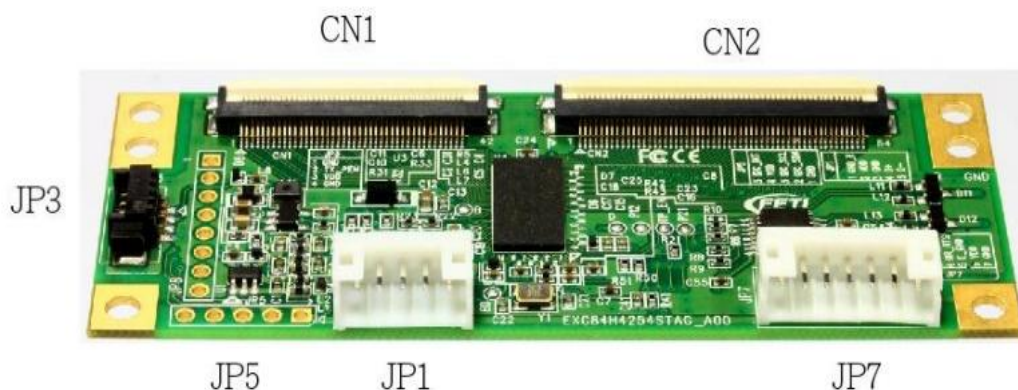
CN1						CN2					
PIN	SYMBOLS	PIN	SYMBOLS	PIN	SYMBOLS	PIN	SYMBOLS	PIN	SYMBOLS	PIN	SYMBOLS
1	TX_S2	21	TX20	41	TX0	1	RX_S1	21	RX32	41	RX12
2	TX39	22	TX19	42	TX_S0	2	RX51	22	RX31	42	RX11
3	TX38	23	TX18			3	RX50	23	RX30	43	RX10
4	TX37	24	TX17			4	RX49	24	RX29	44	RX9
5	TX36	25	TX16			5	RX48	25	RX28	45	RX8
6	TX35	26	TX15			6	RX47	26	RX27	46	RX7
7	TX34	27	TX14			7	RX46	27	RX26	47	RX6
8	TX33	28	TX13			8	RX45	28	RX25	48	RX5
9	TX32	29	TX12			9	RX44	29	RX24	49	RX4
10	TX31	30	TX11			10	RX43	30	RX23	50	RX3
11	TX30	31	TX10			11	RX42	31	RX22	51	RX2
12	TX29	32	TX9			12	RX41	32	RX21	52	RX1
13	TX28	33	TX8			13	RX40	33	RX20	53	RX0
14	TX27	34	TX7			14	RX39	34	RX19	54	RX_50
15	TX26	35	TX6			15	RX38	35	RX18		
16	TX25	36	TX5			16	RX37	36	RX17		
17	TX24	37	TX4			17	RX36	37	RX16		
18	TX23	38	TX3			18	RX35	38	RX15		
19	TX22	39	TX2			19	RX34	39	RX14		
20	TX21	40	TX1			20	RX33	40	RX13		

4.3.TOUCH DRIVER

Control Board : ETP-MB-EXC84H4254STAG

No.	Item	Specification
1	Touch Controller IC	EXC80H84
2	Number Of Support	10 Fingers Touch
3	FPC Type / Interface	USB / RS232

Interface	Symbol	Condition	Min.	Typ.	Max.	Unit
JP1/JP7	VDD	DC	3.5	5	5.5	V



Connector Pin Configuration

JP1 USB connector

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

JP5 I2C connector

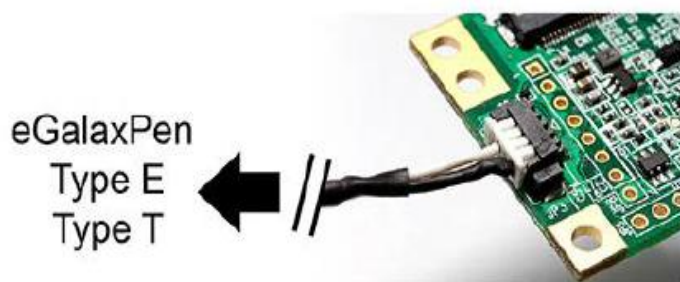
JP5	
1	GND
2	I2C_SDA
3	I2C_SCL
4	VDD
5	I2C_INT

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



*JP3 connector is reserved for EETI tethered active stylus:

Type E: Entry-type active stylus

Type T: Tethered USB active stylus

5.OPTICAL CHARACTERISTICS

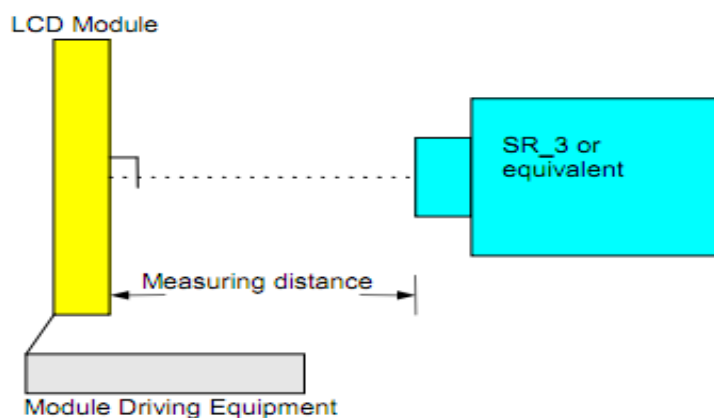
The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
White Luminance		L _{WH}	I _{LED} =60mA (Center point)	280	350	--	Cd/m ²	1
Uniformity		δ _{W9p}	9 points	75	80	--	%	2, 3
Contrast Ratio		CR		700	1000	--	-	4
Response Time		T _R		--	13	18	ms	5
		T _F		--	12	17		
		T _R +T _F		--	25	35		
Viewing Angle	Horizontal	θ _r	CR=10	85	89	--	degree	3
		θ _l		85	89	--		
	Vertical	θ _u		85	89	--		
		θ _d		85	89	--		
Color Coordinates	Red	R _x	CIE 1931	(0.621)	(0.651)	(0.681)	-	
		R _y		(0.313)	(0.343)	(0.373)		
	Green	G _x		(0.272)	(0.302)	(0.332)		
		G _y		(0.581)	(0.611)	(0.641)		
	Blue	B _x		(0.125)	(0.155)	(0.185)		
		B _y		(0.045)	(0.075)	(0.105)		
	White	W _x		0.263	0.313	0.363		
		W _y		0.279	0.329	0.379		
Color Gamut				--	72	--	%	

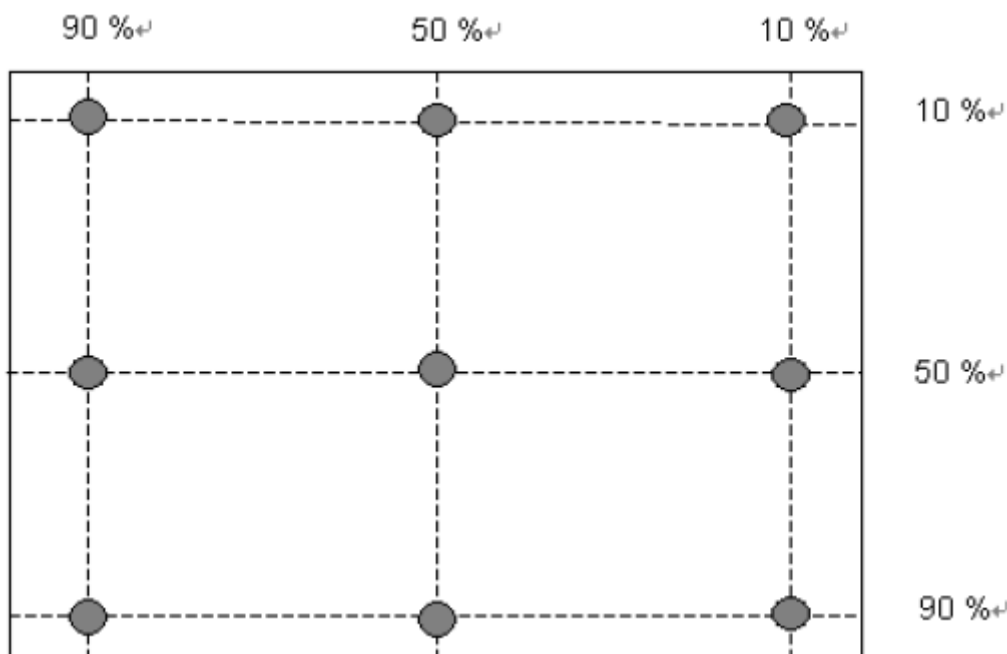
Note 1: Measurement method

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



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

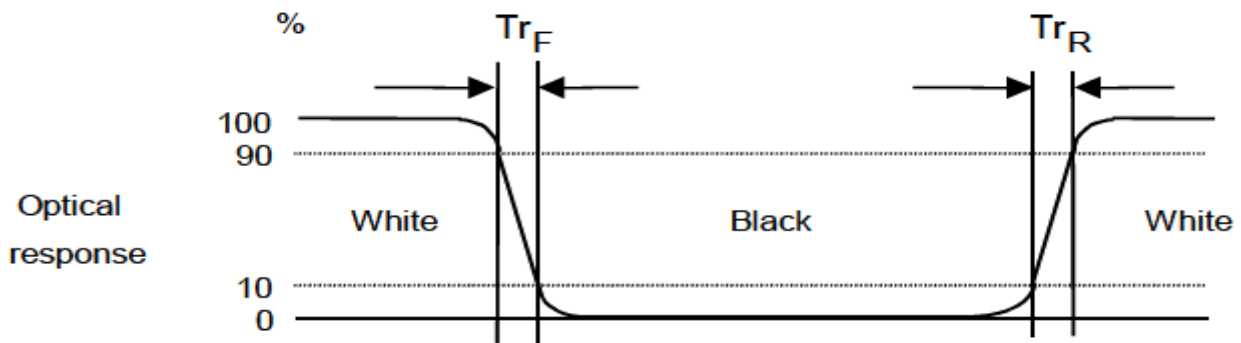
$$\text{Uniformity} = \frac{\text{Minimum Brightness of nine points}}{\text{Maximum Brightness of nine points}}$$

Note 4: Definition of contrast ratio (CR).

$$\text{Contrast ratio (CR)} = \frac{\text{Minimum Brightness of nine points}}{\text{Maximum Brightness of nine points}}$$

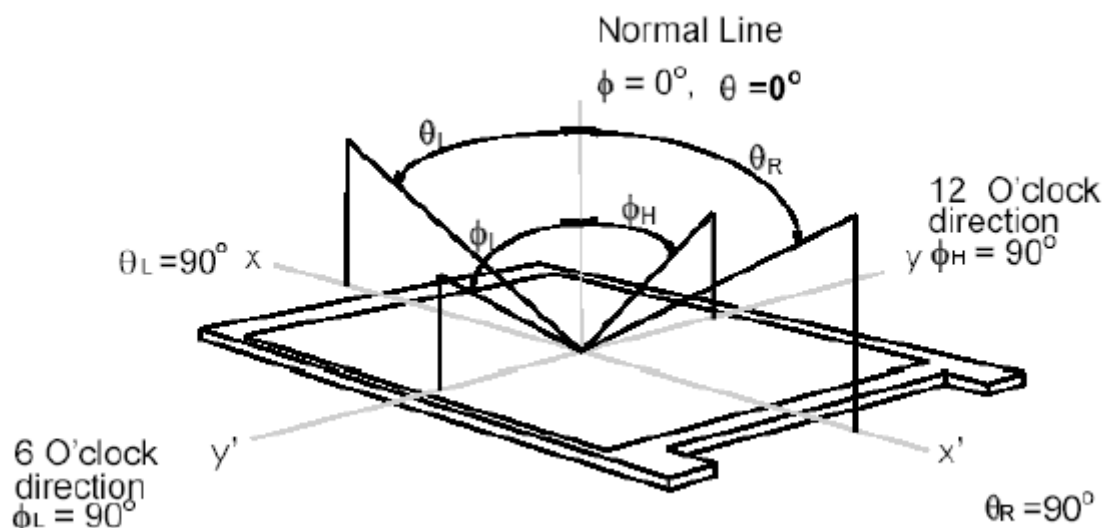
Note 5: Definition of response time.

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



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: $90^\circ(\theta)$ horizontal left and right, and $90^\circ(\Phi)$ 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 view angle.



6.RELIABILITY TEST ITEMS

Test Item		Condition
1	High temperature storage test	70°C, 240hrs
2	Low temperature storage test	-20°C, 240hrs
3	High temperature/Humidity Bias test	50°C, 80%RH, 240hrs
	High temperature operation test	70°C, 240hrs
4	Low temperature operation test	-15°C, 240hrs
5	Thermal Cycle storage test	-20°C(30min)~60°C(30min), 10cycles

7.LABEL

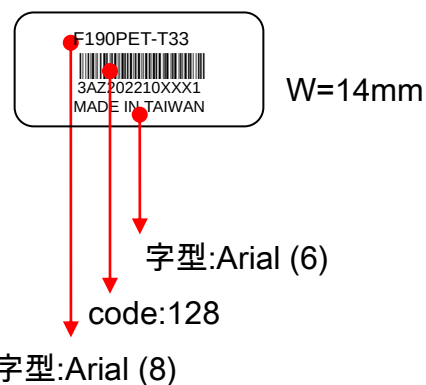
Model NO. F190PET-T33

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





8.MECHANICAL CHARACTERISTICS

Item		Dimension	Unit	Note
Outline Dimension	Horizontal	395.70	mm	PCAP : B190PBU-E02
	Vertical	323.70	mm	
	Depth	2.75	mm	
	Horizontal	396.00	mm	LCD : G190EAN01.3 11
	Vertical	324.00	mm	
	Depth	15.29	mm	
Weight		2550	g	F190PET-T33
Item		Specification		Remarks
PCAP Sensor Area		394.70 mm x 322.70 mm		
PCAP Active Area		379.40 mm x 304.10 mm		
PCAP FPC Length		96.65 mm		
PCAP Input method		Finger or exclusive pen		
PCAP Light Transmission		90% $\pm$ 3%		
PCAP Operation force		$\leq$ 10g		Finger Input
PCAP Hardness of surface		$\geq$ 7H		Pressure 500gf test
PCAP Surface Treatment		Haze < 4%		BYK Gardner, ASTM D1003



Front View

(TBD)

Product Specification

F190PET-T33

Back View

(TBD)

9.ENGINEERING DRAWING

