



- ☐ Draft Specifications
☒ Preliminary Specifications
☐ Final Specifications

Title	11.6-inches Touch Display Product Specifications
Model Name	F116PET-T22
Version	1

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

Approved By	Prepared By
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2025-12-17	2025-12-17



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1. GENERAL DESCRIPTION

1.1. INTRODUCTION

F116PET-T22 is an 11.6" color active matrix TFT LCD module G116HAN01.0 with projected capacitive multi-touch B116PFU-E03 air bonding.

The display format is intended to support the 16:9 FHD, 1920(H) x 1080(V) screen and 16.7M colors (RGB 8-bits data driver) with LED backlight driving circuit. All input signals are eDP interface compatible.

1.2. FEATURES

- 16:9 Wide view angle
- FHD, 1920(H) x 1080(V) screen
- RoHS product

1.3. APPLICATION

- Notebook style personal computer

1.4. GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Screen Diagonal	294.09 (11.58W")	mm	
Display Area	256.32 x 144.18 (V)	mm	
Physical Size	287.32 (H) x 191.18(V) x 6.0(D)	mm	D:PCAP+LCM
Weight	430	g	Typ.
Driver Element	a-Si TFT active matrix	-	
Display Colors	16.7M (RGB 8-bits)	Colors	
Electrical Interface	eDP1.2	-	
Number of Pixels	1920 (H) x 1080 (V)	pixels	
Pixel Pitch	0.1335 (H) x 0.1335(W)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	AHVA, Normal Black	-	
Color Gamut	52	%	
Touch Technology	Projected Capacitive Multi-Touch Panel	-	
Touch Method	Finger or exclusive pen	-	
Numbers of Touch	10	Points	
Touch FPC Type	COF	-	
Touch Sensor Glass Type	Strengthening Glass	-	
Touch Controller IC	EETI, EXC80W46	-	
Touch Driver Interface	USB / I2C	-	
Support OS	Windows (Embedded/CE/XP/2000/Vista/7/8/10) / Linux / Android	-	

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	4.0	V
LCD Input Signal Voltage	V_{signal}	-0.3	$V_{DD}+0.3$	V
LED Input Voltage	LED_V_{DD}	-0.3	33	V
Operating Temperature	T_{op}	0	+50	°C
Operating Humidity	H_{op}	10	90	%RH
Storage Temperature	T_{st}	-20	+60	°C
Storage Humidity	H_{st}	10	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.

Operating Temperature : 0°C to +50°C (Front and rear surface)

3.ELECTRICAL CHARACTERISTICS

3.1. LCD MODULE

3.1.1. POWER SPECIFICATION

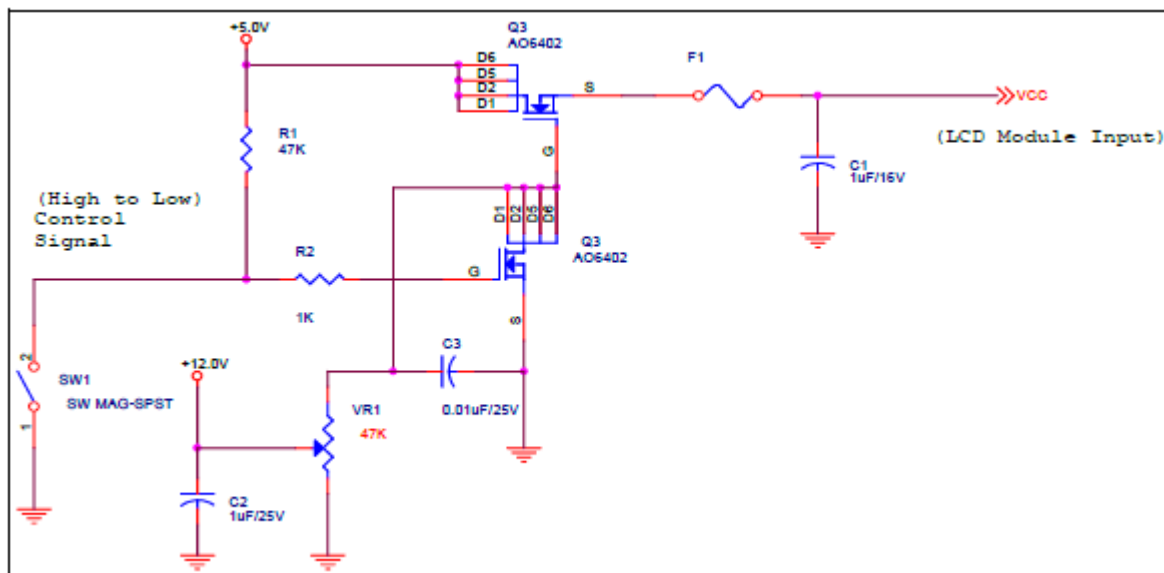
The power Input specifications are shown as follows:

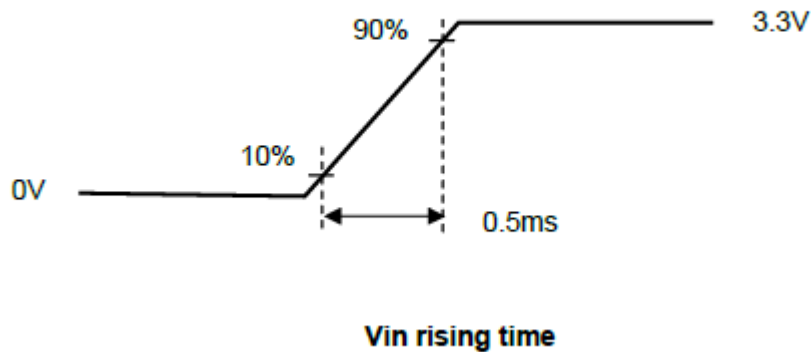
Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Logic/LCD Drive Voltage	VDD	3.0	3.3	3.6	V	
V _{DD} Power	P _{VDD}	-	-	1000	mW	White Pattern (VDD=3.3V at 60Hz)
V _{DD} Current	I _{VDD}	-	-	303	mA	White Pattern (VDD=3.3V at 60Hz)
LCD Inrush Current	I _{rush}	-	-	2000	mA	Note 1
Allowable Logic/LCD Drive Ripple Voltage	VDDrp	-	-	100	mV p-p	White Pattern (VDD=3.3V at 60Hz)

Note 1: Maximum Measurement condition: White pattern at 3.3V driving voltage. ($P_{max}=V_{3.3} \times I_{white}$)

Typical Measurement Condition: Mosaic Pattern

Note 2: Measure Condition





3.1.2. SIGNAL ELECTRICAL CHARACTERISTICS

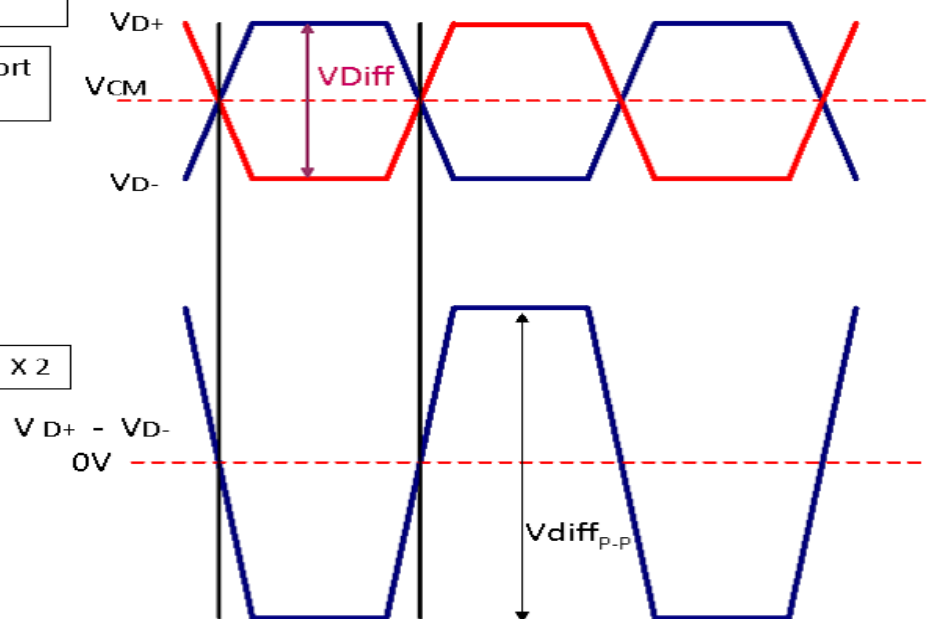
Signal electrical characteristics are as follows:

Display Port main link signal:

Differential pair VD+ , VD-
Which is one Display port
Main link

VCM of Display port
Main link

$$V_{diffP-P} = [(V_{D+}) - (V_{D-})] \times 2$$

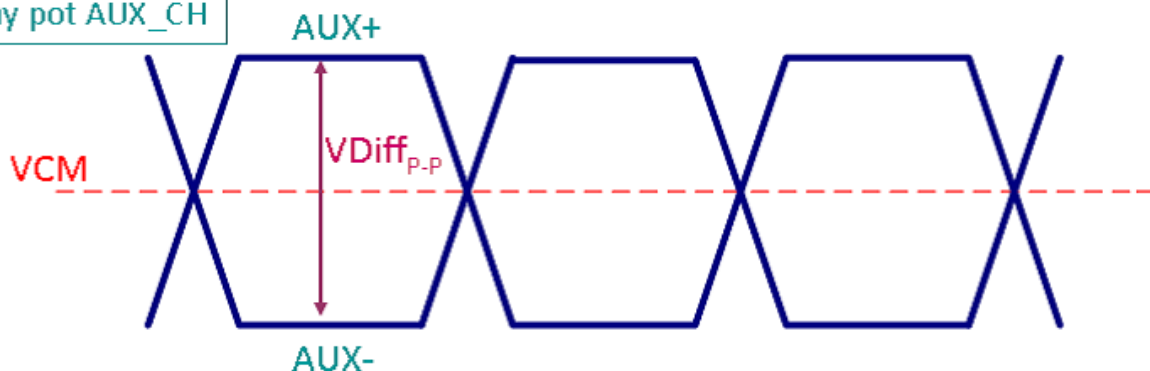


Display port main link					
Item	Symbol	Min.	Typ.	Max.	Unit
RX input DC Common Mode Voltage	VCM		0		V
Peak-to-Peak Voltage at a receiving Device	VDiff _{P-P}	100		1320	mV

Follow as VESA display port standard

Display Port AUX_CH signal:

Differential AUX+ , AUX-
Which is Display port AUX_CH



Display port AUX_CH					
Item	Symbol	Min.	Typ.	Max.	Unit
AUX DC Common Mode Voltage	VCM		0		V
AUX Peak-to-Peak Voltage at a receiving Device	$V_{Diff_{P-P}}$	0.4	0.6	0.8	mV

Follow as VESA display port standard

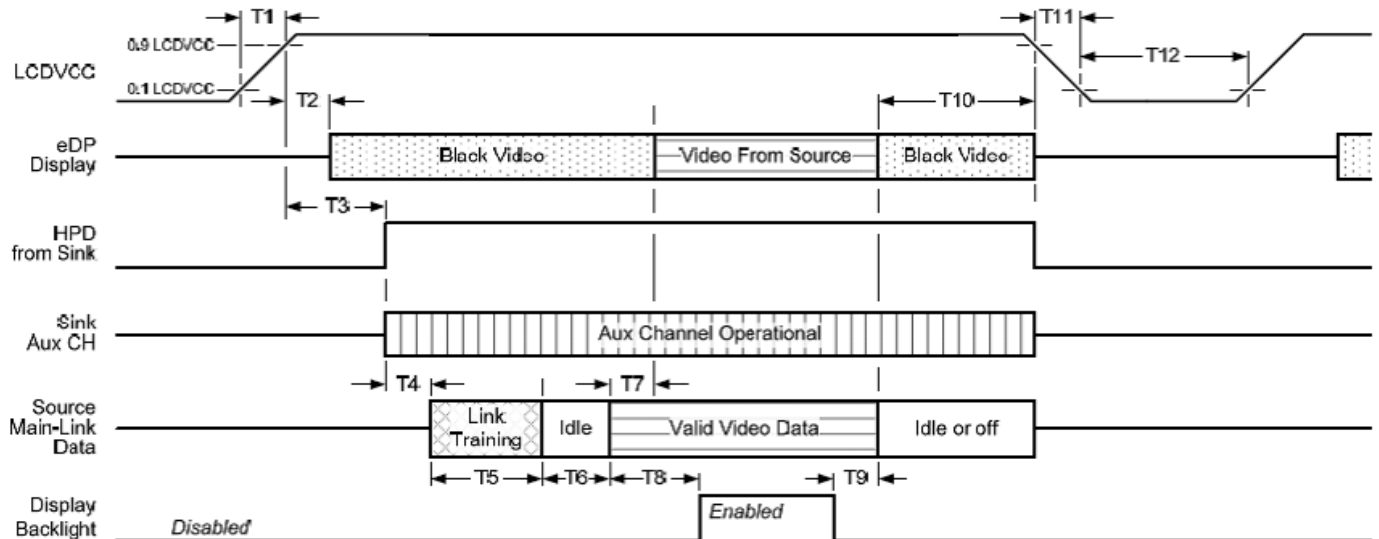
Display Port VHPD signal:

Display port VHPD					
Item	Symbol	Min.	Typ.	Max.	Unit
HPD Voltage	VHPD	2.25	--	3.6	V

Follow as VESA display port standard

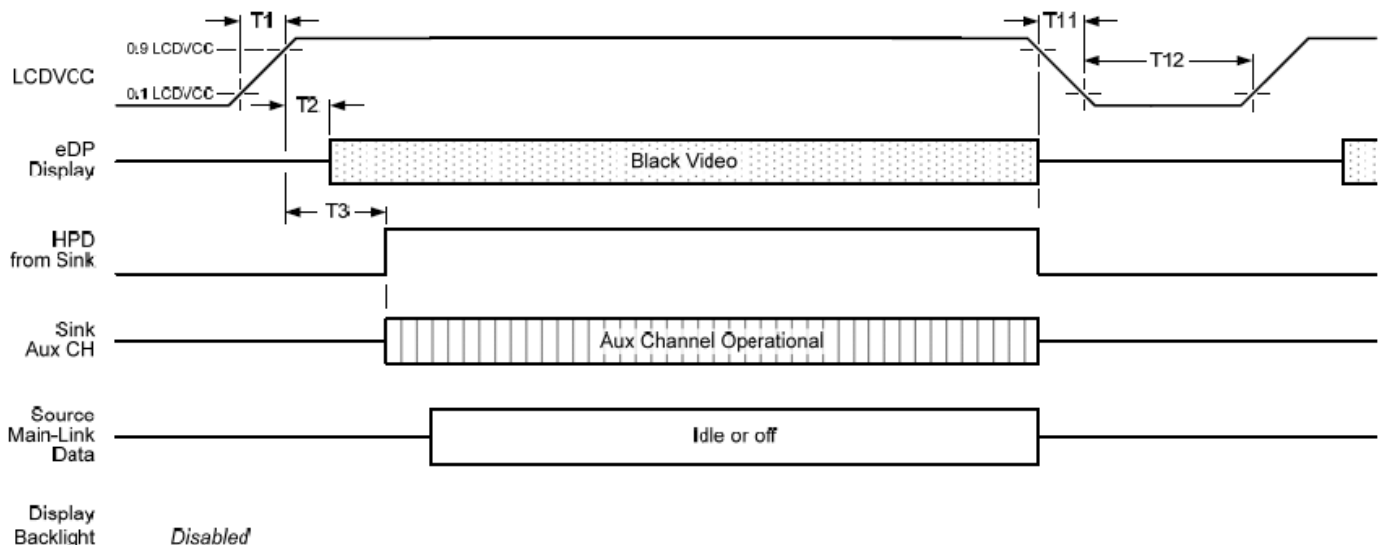
3.1.3. POWER ON/OFF SEQUENCE

Display Port panel power sequence:



Display port interface power up/down sequence, normal system operation

Display Port AUX_CH transaction only:



Display port interface power up/down sequence, AUX_CH transaction only

Display Port panel power sequence timing parameter:

Timing parameter	Description	Reqd. by	Limits			Notes
			Min.	Typ.	Max.	
T1	power rail rise time, 10% to 90%	source	0.5ms		10ms	
T2	delay from LCDVDD to black video generation	sink	0ms		200ms	prevents display noise until valid video data is received from the source
T3	delay from LCDVDD to HPD high	sink	0ms		200ms	sink AUX_CH must be operational upon HPD high.
T4	delay from HPD high to link training initialization	source				allows for source to read link capability and initialize.
T5	link training duration	source				dependant on source link to read training protocol.
T6	link idle	source				Min accounts for required BS-Idle pattern. Max allows for source frame synchronization.
T7	delay from valid video data from source to video on display	sink	0ms		50ms	max allows sink validate video data and timing.
T8	delay from valid video data from source to backlight enable	source				source must assure display video is stable.
T9	delay from backlight disable to end of valid video data	source				source must assure backlight is no longer illuminated.
T10	delay from end of valid video data from source to power off	source	0ms		500ms	
T11	power rail fall time, 90% to 10%	source			10ms	
T12	power off time	source	500ms			

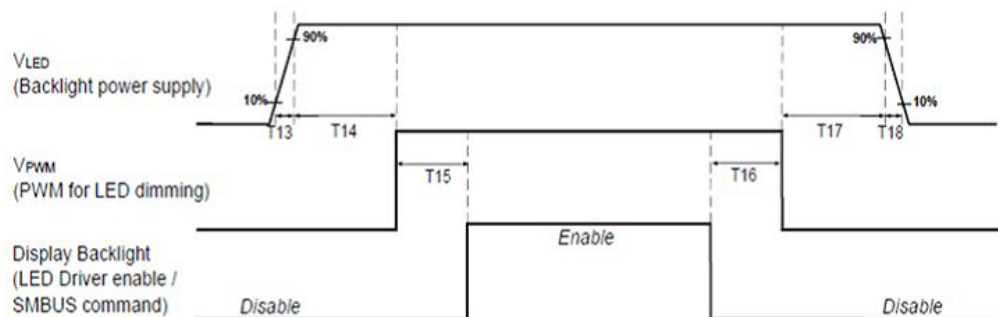
Note 1: The sink must include the ability to generate black video autonomously. The sink must automatically enable black video under the following conditions:

- upon LCDVDD power on (within T2 max)-when the "Novideostream_Flag" (VB-ID Bit 3) is received from the source (at the end of T9).
- when no main link data, or invalid video data, it is received from the source. Black video must be displayed within 64ms (typ.) from the start of either condition. Video data can be deemed invalid based on MSA and timing information, for example.

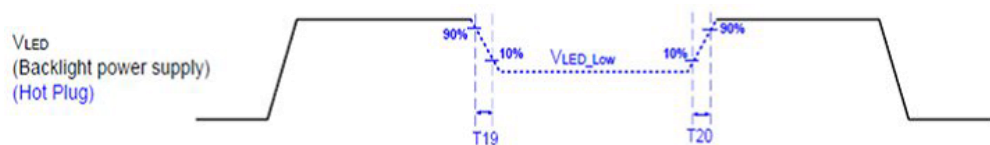
Note 2: The sink may implement the ability to disable the black video function, as described in Note 1, above, for system development and debugging purpose.

Note 3: The sink must support AUX_CH polling by the source immediately following LCDVDD power on without causing damage to the sink device (the source can re-try if the sink is not ready). The sink must be able to respond to an AUX_CH transaction with the time specified within T3 max.

Display Port panel B/L power sequence timing parameter:



Note : When the adapter is hot plugged, the backlight power supply sequence is shown as below.



	Min (ms)	Max (ms)
T13	0.2	10
T14	0	-
T15	0	-
T16	0	-
T17	0	-
T18	0.2	10
T19	1*	-
T20	1*	-

Seamless change: $T19/T20 = 5 \times T_{PWM}^*$

* $T_{PWM} = 1/PWM \text{ Frequency}$

Note 1: If T14, T15, T16, T17 < 10ms, the display garbage may occur. We suggest T14, T15, T16, T17 > 10ms to avoid the display garbage.

Note 2: If T13 or T18 < 0.5ms, the inrush current may cause the damage of fuse. If T13 or T18 < 0.5ms, the inrush current I2t is under typical melt of fuse Spec., there is no mentioned problem.

3.2. LCD BACKLIGHT UNIT

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
Input Voltage	V_{LED}	5.0 (*Note 4)	12	21.0	V	
Input Current	I_{VLED}	---	152	180	mA	100% Brightness ($V_{LED} = 12V$)
Power Consumption	P_{VLED}	---	---	2.2	W	$T_a=25^{\circ}C$, Note 1
LED Forward Current	I_F	---	19.6	---	mA	$T_a=25^{\circ}C$
LED Enable Input High Level	V_{EN}	2.2	----	5.5	V	
LED Enable Input Low Level		-		0.5	V	
PWM Logic Input High Level	V_{PWM}	2.2	--	5.5	V	
PWM Logic Input Low Level		-		0.5	V	
PWM Input Frequency	$FPWM$	200	1K	10K	Hz	
PW Logic Input Ratio	Duty	1 (*Note 5)		100	%	
LED Life Time	LT_{LED}	15,000	-	-	Hrs	$T_a=25^{\circ}C$, Note 2 $I_F=19mA$

Note:

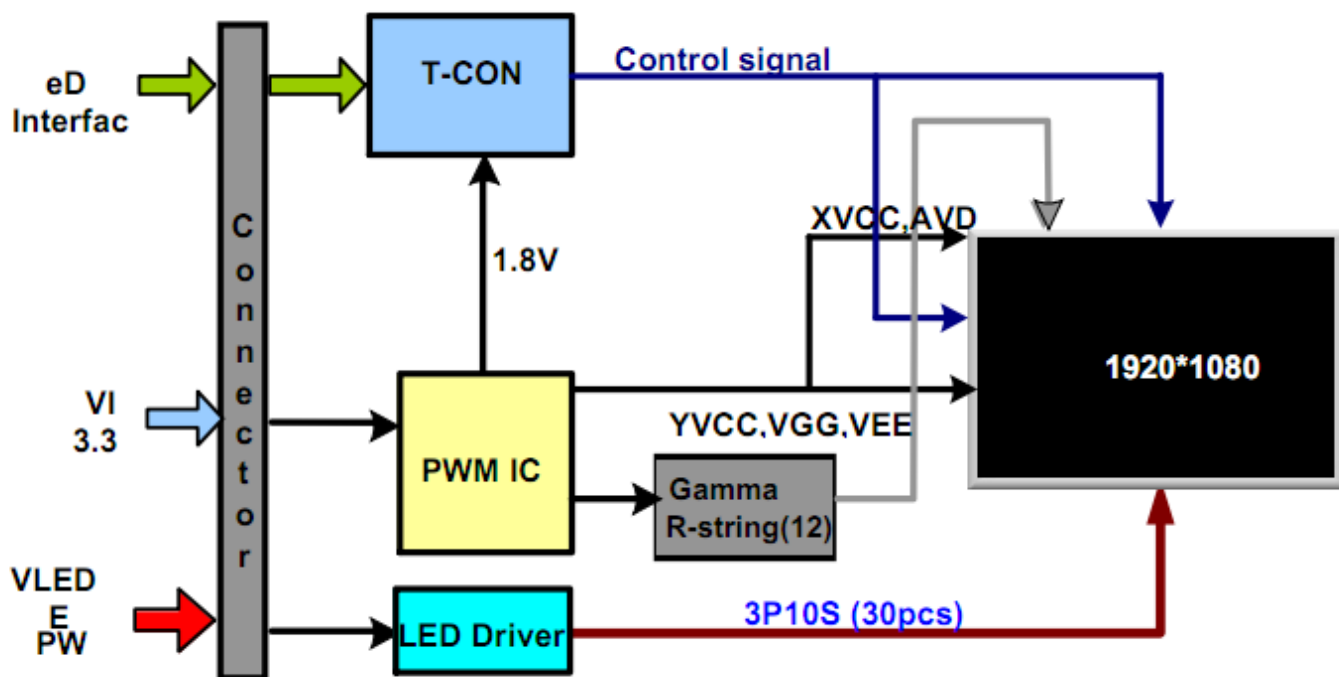
1. Calculator value for reference $P_{LED} = V_F$ (Normal Distribution) * I_F (Normal Distribution) / Efficiency
2. The LED life-time defined as the estimated time to 50% degradation of initial luminous.
3. Recommend system pull up/down resistor no bigger than 10Kohm
4. Measured in panel VIN
5. If the PWM duty ratio (min.) is set in 5% to 1%, the PWM input frequency should be set below 1 KHz.
The brightness-duty characteristic might not be able to keep in it's linearity if the dimming control is operated in 1% to 5% range.

3.3. TOUCH CONTROL

Parameter	Values			Unit
	Min.	Typ.	Max.	
I2C Input Voltage	-	3.3	-	V
USB Input Voltage	-	5	-	V
FPC Type / Interface	COF / USB & I2C			-
Touch Controller IC	EXC80W46			-
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

3.4. LCD BLOCK DIAGRAM

The following diagram shows the function block of the 10.1 inch color TFT/LCD module.



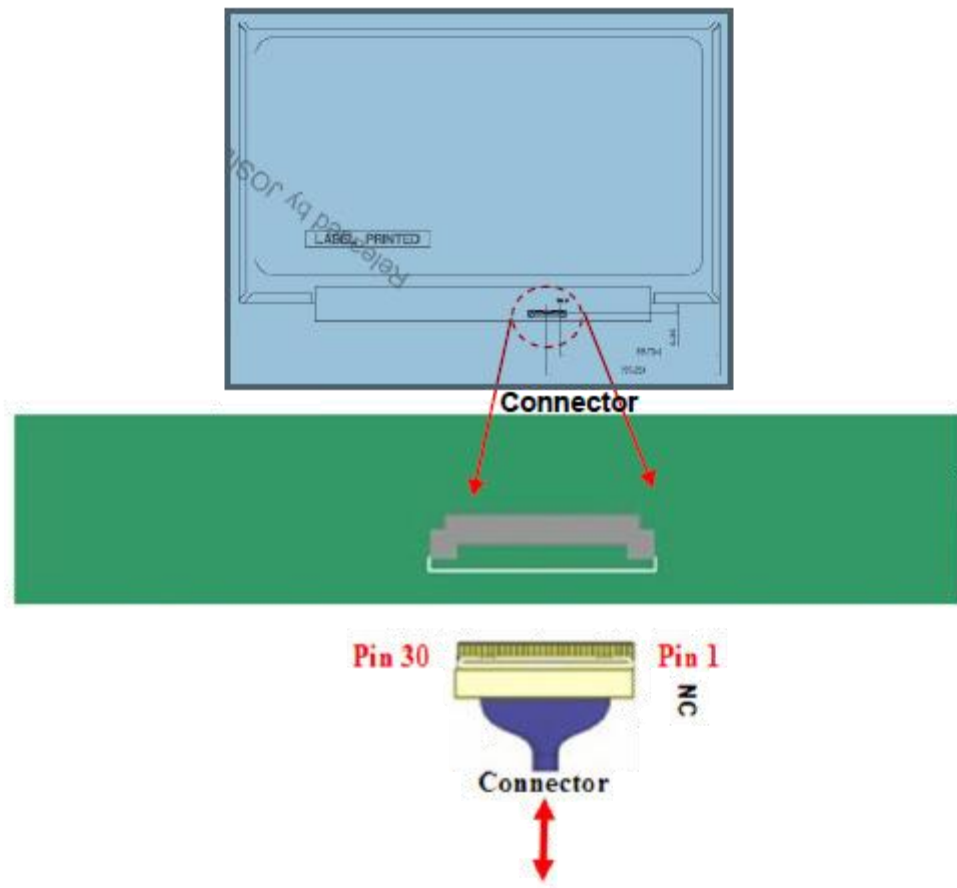
3.5. INPUT TERMINAL PIN ASSIGNMENT

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

Pin	Symbol	Description
1	NC	No connection
2	H_GND	High Speed Ground
3	Lane 1_N	Comp Signal Link Lane 1
4	Lane 1_P	True Signal Link Lane 1
5	H_GND	High Speed Ground
6	Lane 0_N	Comp Signal Link Lane 0
7	Lane 0_P	True Signal Link Lane 0
8	H_GND	High Speed Ground
9	AUX_CH_P	True Signal Auxiliary Ch.
10	AUX_CH_N	Comp Signal Auxiliary Ch.
11	H_GND	High Speed Ground
12	VDD	LCD Logic and driver power
13	VDD	LCD Logic and driver power
14	AGING	LCD Panel Self Test
15	LCD GND	LCD Logic and driver Ground
16	LCD GND	LCD Logic and driver Ground
17	HPD	HPD Signal pin
18	BL_GND	Backlight Ground
19	BL_GND	Backlight Ground
20	BL_GND	Backlight Ground
21	BL_GND	Backlight Ground
22	LED_EN	Backlight On/Off
23	LED_PWM	System PWM signal Input
24	NC-Reserved	Reserved for LCD manufacture's use(EDID_CLK)
25	NC-Reserved	Reserved for LCD manufacture's use(EDID_DATA)
26	VLED	Backlight power
27	VLED	Backlight power
28	VLED	Backlight power
29	VLED	Backlight power
30	NC	No connection

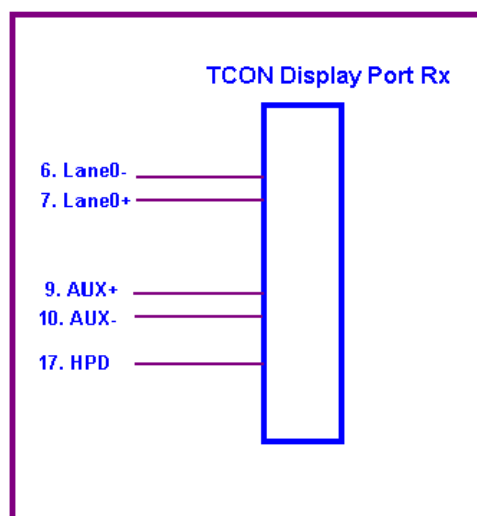
Note1. LCD connector: JAE, STM MSAK24025P30M or compatible

Note2. Mating Housing: IPEX 20455-030T-11 or compatible



Note3: Start from right side.

Note4: Input signals shall be low or High-impedance state when VDD is off. Internal circuit of **eDP inputs** are as following.



3.6. TOUCH CONTROL PIN ASSIGNMENT

J1 : I2C

Brand: Centenary Materials

Part number: SM06B-SRSS-TB or equivalence

J2 : USB

Brand: JST

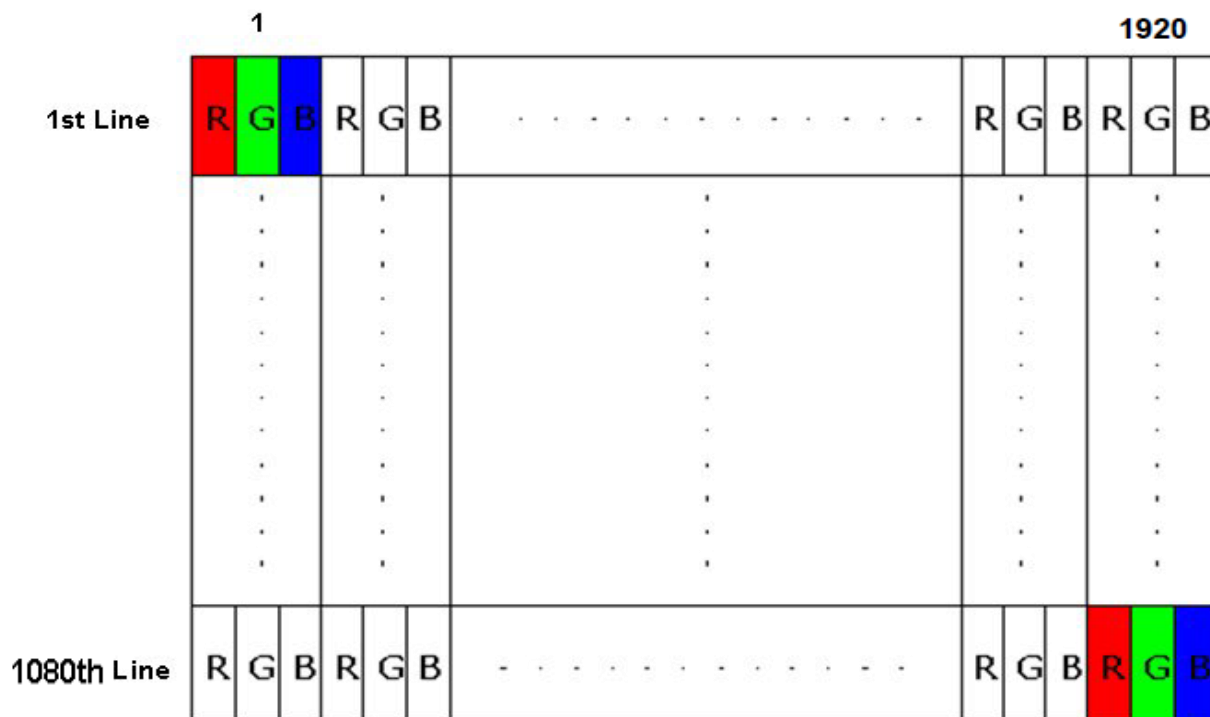
Part number: SM05B-SRSS-TB or equivalence

J1 I2C	Pin Definition	J2 USB	Pin Definition
1	RST	1	GND
2	VDD (3.3 V)	2	VDD (5V)
3	GND	3	GND
4	INT	4	D+
5	SDA	5	D-
6	SCL		

4. LCD SIGNAL CHARACTERISTIC

4.1. PIXEL FORMAT IMAGE

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



4.2. LCD INTERFACE TIMING

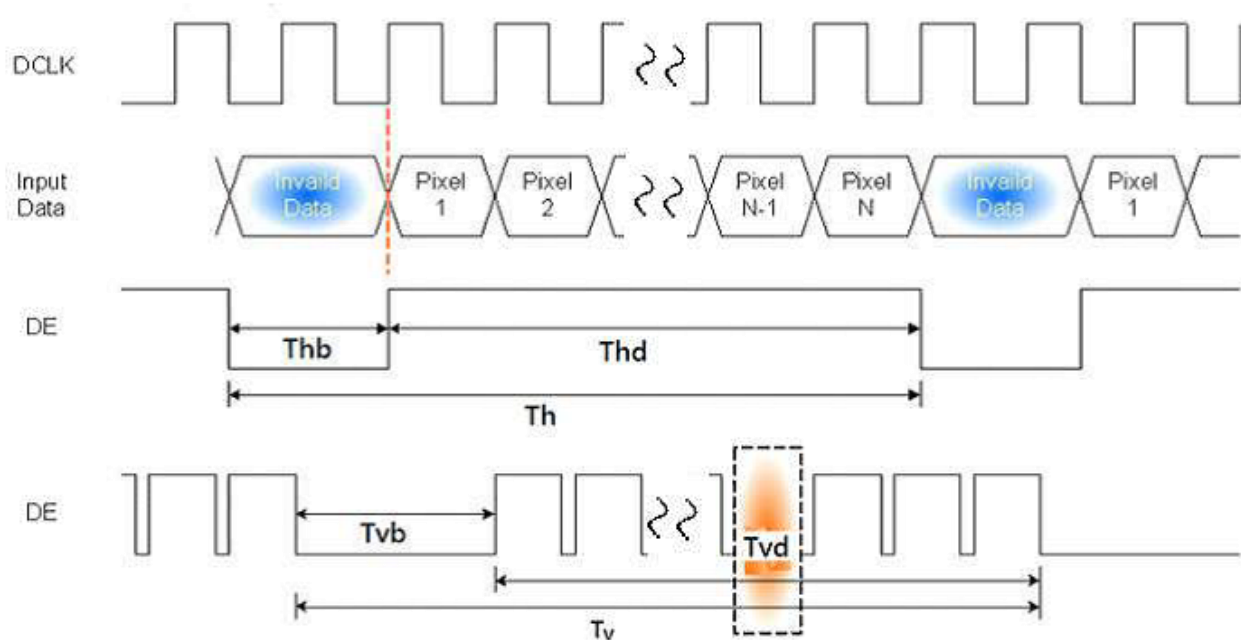
4.2.1. LCD TIMING CHARACTERISTICS

Signal		Symbol	Min.	Typ.	Max.	Unit
Clock Frequency		T _{dclk}	--	138.5	--	MHz
Vertical Section	Period	T _V	1084	1111	1080+A	T _{Line}
	Active	T _{VD}	1080			
	Blanking	T _{VB}	4	30	A	
Horizontal Section	Period	T _H	2050	2080	1920+B	T _{dclk}
	Active	T _{HD}	1920			
	Blanking	T _{HB}	130	160	B	
Frame Rate		F	--	60	--	Hz

Note: DE mode.

Note2: The maximum clock frequency = $(1920+B) \times (1080+A) \times 60 < 149.1 \text{ MHz}$

4.2.2. LCD INPUT TIMING DIAGRAM

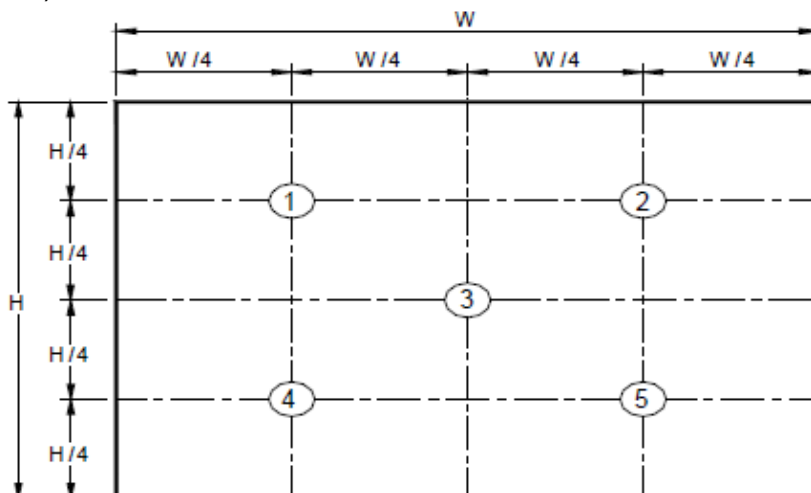


5. OPTICAL CHARACTERISTICS

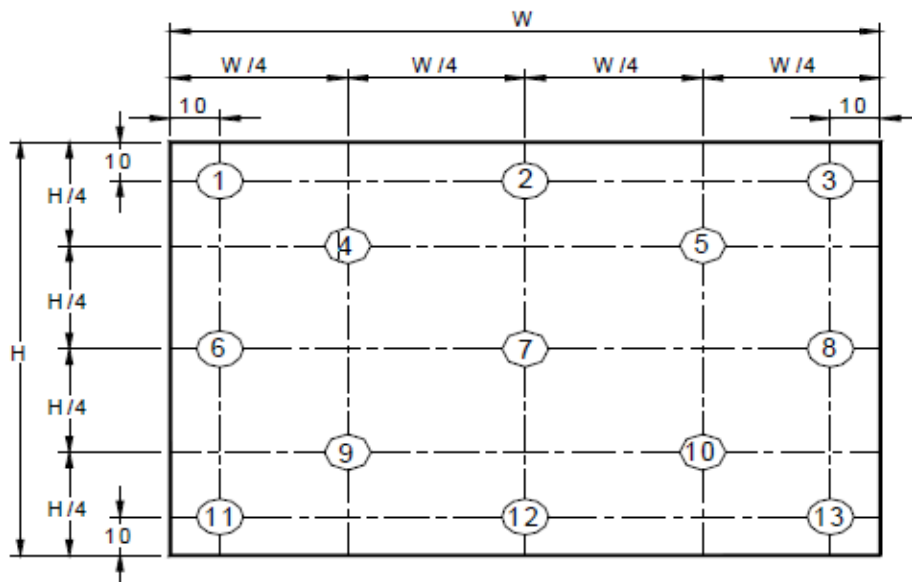
The optical characteristics are measured under stable conditions at 25°C (Room Temperature):

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
White Luminance I _{LED} =19mA		L _{WH}	5 points average	255	300	--	Cd/m ²	1, 4, 5
Viewing Angle	Horizontal	θ _r	CR=10	85	89	--	degree	4, 9
		θ _l		85	89	--		
	Vertical	θ _u		85	89	--		
		θ _d		85	89	--		
Uniformity		δ _{W5p}	5 points	--	80	--	%	1, 3, 4
Uniformity		δ _{W13p}	13 points	70	--	--	%	2, 3, 4
Contrast Ratio		CR		--	800	--		4, 6
Cross talk		%		--	--	4		4, 7
Response Time		T _R +T _F		--	25	35	ms	4, 8
Color Coordinates	Red	R _x	CIE 1931	0.562	0.592	0.622		4
		R _y		0.307	0.337	0.367		
	Green	G _x		0.301	0.331	0.361		
		G _y		0.578	0.608	0.638		
	Blue	B _x		0.130	0.160	0.190		
		B _y		0.094	0.124	0.154		
	White	W _x		0.283	0.313	0.343		
		W _y		0.299	0.329	0.359		
NTSC		%		--	52	--		

Note 1: 5 points' position (Ref: Active area)



Note 2: 13 points' position (Ref: Active area)



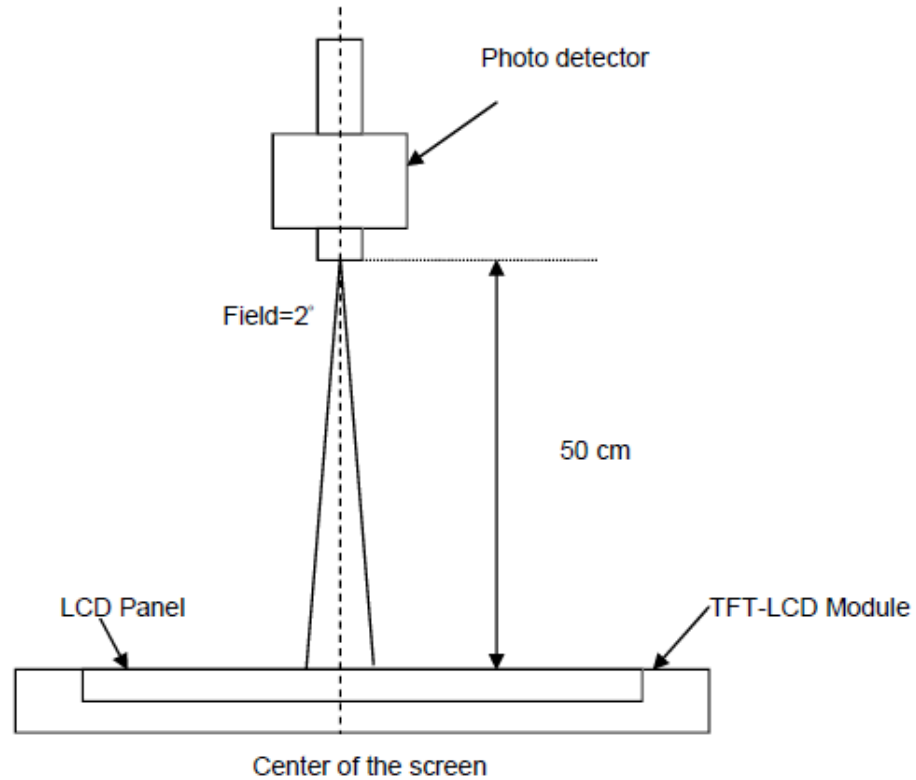
Note 3: The luminance uniformity of 5 or 13 points is defined by dividing the minimum luminance values by the maximum test point luminance

$$\delta_{w5} = \frac{\text{Minimum Brightness of five points}}{\text{Maximum Brightness of five points}}$$

$$\delta_{w13} = \frac{\text{Minimum Brightness of thirteen points}}{\text{Maximum Brightness of thirteen points}}$$

Note 4: Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room, and it should be measured in the center of screen.



Note5: Definition of Average Luminance of White (YL):

Measure the luminance of gray level 63 at 5 points , $YL = [L(1) + L(2) + L(3) + L(4) + L(5)] / 5$

L (x) is corresponding to the luminance of the point X at Figure in Note (1).

Note6: Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

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

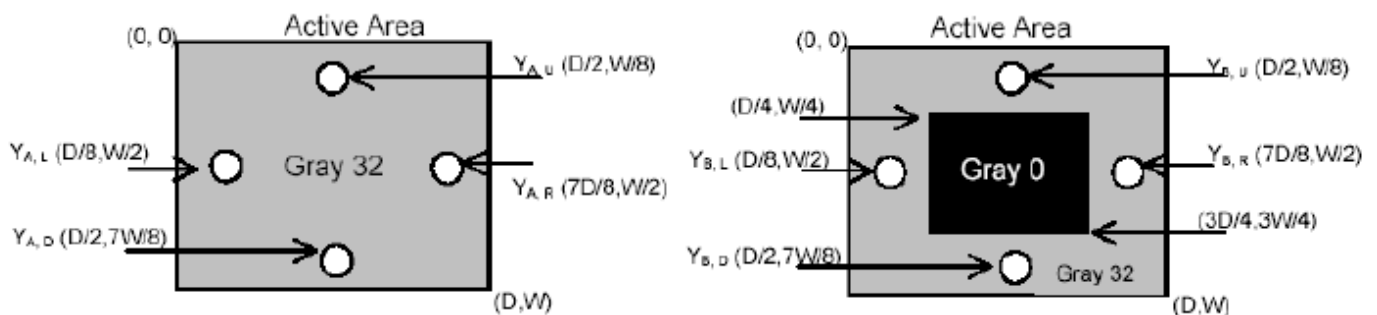
Note7: Definition of Cross Talk (CT)

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

Where

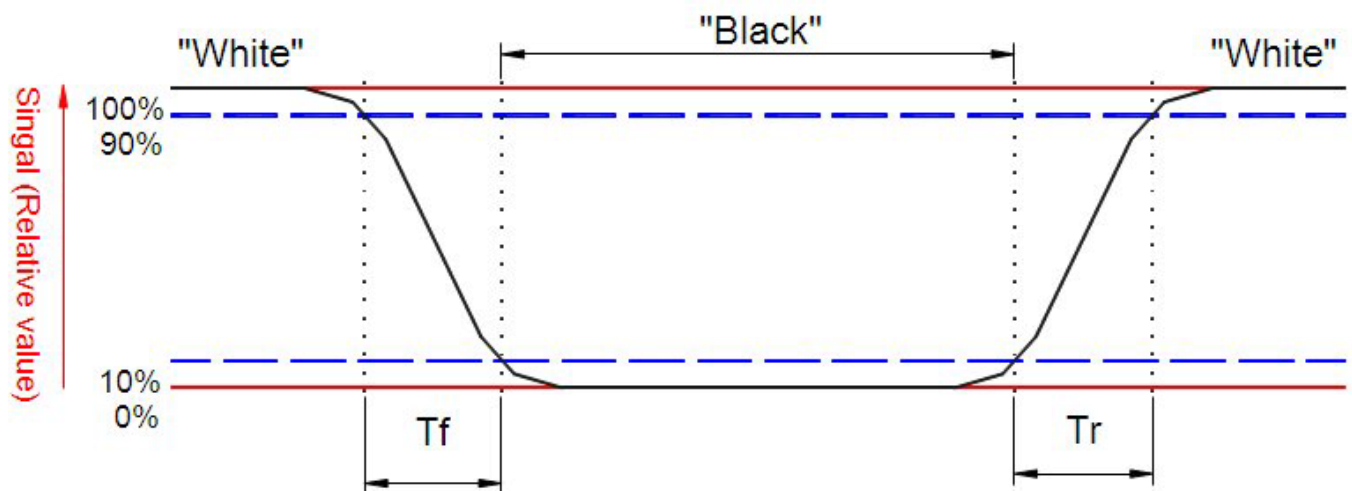
Y_A = Luminance of measured location without gray level 0 pattern (cd/m²)

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



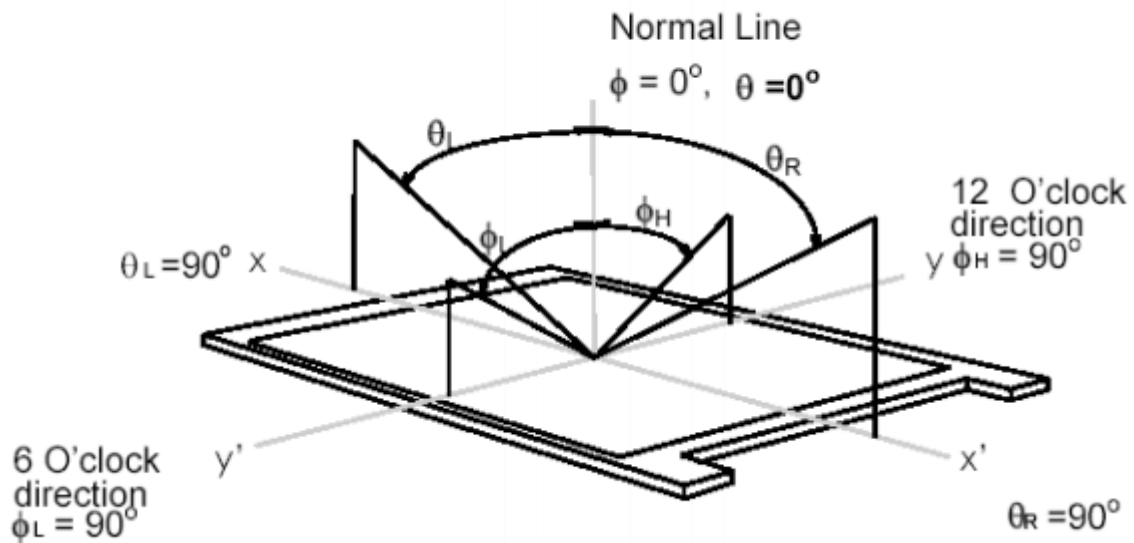
Note8: Definition of response time:

The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (rising time) and from "White" to "Black" (falling time), respectively. The response time interval between the 10% and 90% of amplitudes. Refer to figure as below.



Note9: 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 storage test	60°C, 90% 240hrs
2	Low temperature storage test	-20°C, 240hrs
3	Temperature Humidity Bias test	40°C, 90%, 240hrs
4	High temperature operation test	50°C, Dry, 240hrs
5	Low temperature operation test	0°C, 240hrs
6	Thermal Cycle storage test	-20°C(30min)~60°C(30min), 10cycles

7. LABEL

Model NO. F116PET-T22

條碼

L=32mm

SN 3A Z 20 2 21 0 XXX1

code 1,2 Production location

code 3 Production version

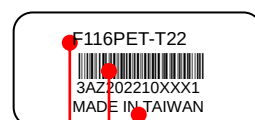
code 4,5 Production year

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)

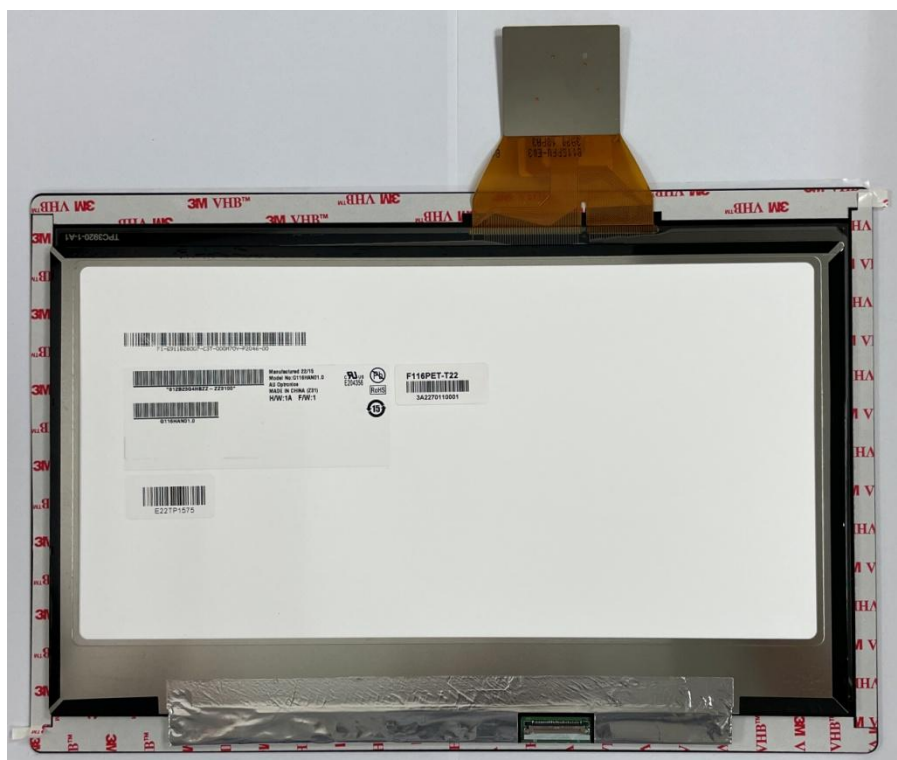
8. MECHANICAL CHARACTERISTICS

Item		Dimension	Unit	Note
Outline Dimension	Horizontal	287.32	mm	PCAP : B116PFU-E03
	Vertical	191.18	mm	
	Depth	2.00	mm	
	Horizontal	268.00	mm	LCD : G116HAN01.0 with PCBA
	Vertical	168.50	mm	
	Depth	2.90	mm	
Weight		430	g	F116PET-T22
Item		Specification		Remarks
PCAP Viewing Area		257.32 mm x 145.18 mm		
PCAP Sensor Area		270.00 mm x 161.00 mm		
PCAP FPC Length		56.05 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

