



Product Specification

F133PET-Z05

- ☐ Draft Specifications
☐ Preliminary Specifications
☒ Final Specifications

Title	13.3-inches Touch Display Product Specifications
Model Name	F133PET-Z05
Version	1

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

Approved By	Prepared By
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2026-05-20	2026-05-20



REVISION HISTORY

Version	ECN No.	Description of Changes	Date	Prepared
0		Preliminary specification first edition	2023-02-04	Allen Fang
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1. GENERAL DESCRIPTION

1.1. INTRODUCTION

F133PET-Z05 is a 13.3" color active matrix TFT LCD module G133HAN01.1 with projected capacitive multi-touch B133PFU-E05 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 driver) with LED backlight driving circuit.

1.2. FEATURES

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

1.3. APPLICATION

- TFT LCD monitor
- Industrial application



2. GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Active Area Size	13.3	inch	
Display Area	293.472 x 165.078 (V)	mm	
Outline Dimension	330.76 (H) x 214.24 (V) x 12.24 (D)	mm	D:PCAP+LCM
Weight	800	g	Typ.
Driver Element	a-Si TFT active matrix	-	
Display Colors	16.7M (RGB 8 bits)	Colors	
Electrical Interface	LVDS	-	
Number of Pixels	1920 (H) x 1080 (V)	pixels	
Pixel Pitch	0.15285(H) x 0.15285(W)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	AHVA, Normal Black	-	
NTSC	90	%	
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	-	

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	+4.0	V
LCD Input Signal Voltage	V _{signal}	-0.3	+4.0	V
LED Input Voltage	LED_V _{DD}	-0.3	+34.0	V
LED Control Signal Voltage	LED_EN,PWM	-0.3	+5.5	V
Operating Temperature	T _{op}	-20	+70	°C
Operating Humidity	H _{op}	10	90	%RH
Storage Temperature	T _{st}	-30	+80	°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.

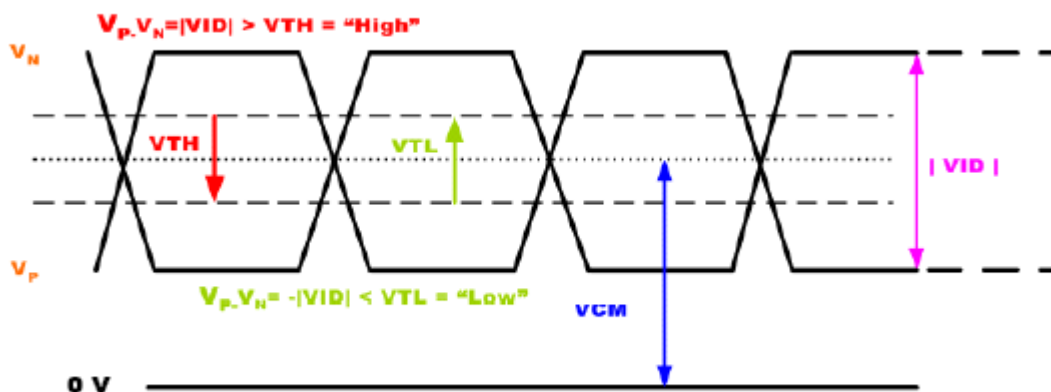
4.1.2. SIGNAL ELECTRICAL CHARACTERISTICS

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

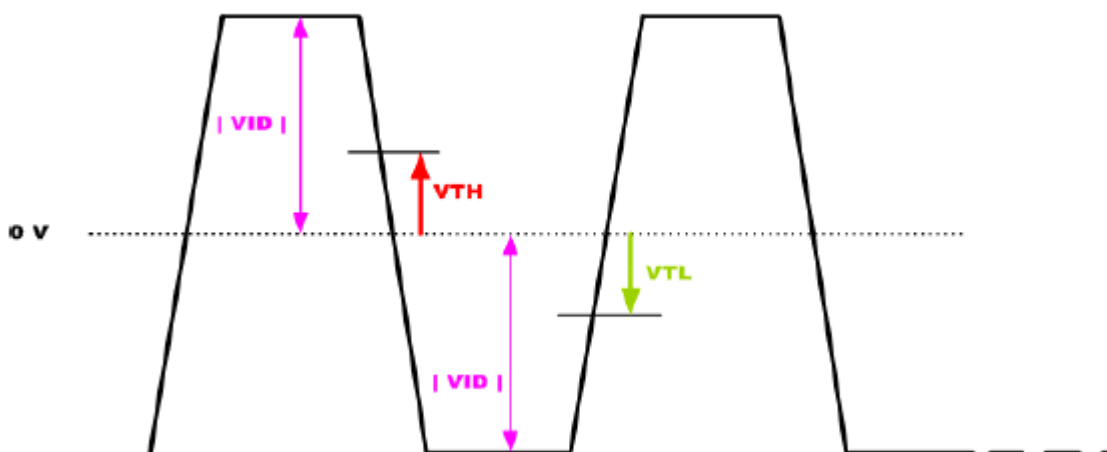
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Differential Input High Threshold	VTH	-	-	100	mV	VCM=1.2V
Differential Input Low Threshold	VTL	-100	-	-	mV	VCM=1.2V
Input Differential Voltage	VID	100	400	600	mV	
Differential Input Common Mode Voltage	VICM	1.125	-	1.375	V	VTH/VTL=±200mV

Note: LVDS Signal Waveform

Single-end Signal

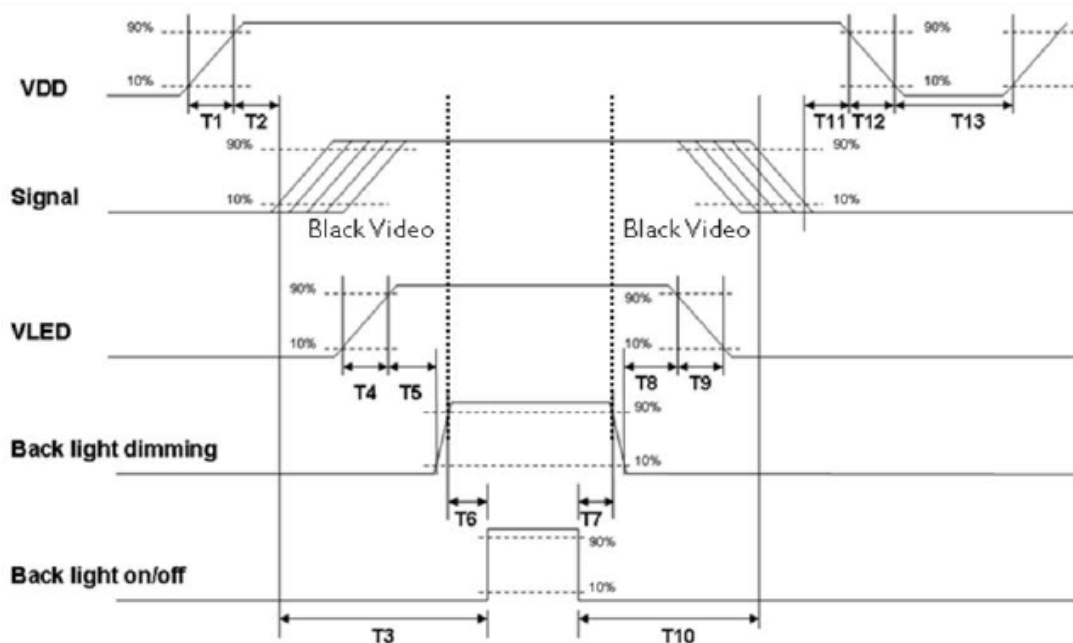


Differential Signal



4.1.3. POWER ON/OFF SEQUENCE

VDD power and backlight 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	---	9	ms
T2	10	---	50	ms
T3	400	---	---	ms
T4	0.5	---	10	ms
T5	10	---	---	ms
T6	10	---	---	ms
T7	10	---	---	ms
T8	10	---	---	ms
T9	0.5	---	10	ms
T10	50	---	---	ms
T11	10	---	---	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. LCD BACKLIGHT UNIT

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
Input Voltage		VLED	10.8	12	13.2	V	Ta=25°C
Input Current		I _{VLED}	-	-	1.25	A	VCC=12V & 100% PWM Duty Ta=25°C
EN Control Level	Backlight on	LED_EN	2	-	5	V	Ta=25°C
	Backlight off		-	-	0.5	V	Ta=25°C
PWM Control level	PWM High	V _{PWM}	2	-	5	V	Ta=25°C
	PWM Low		-	-	0.5	V	Ta=25°C
PWM Control Frequency		F _{PWM}	500	-	10K	Hz	Ta=25°C
PWM Control Duty Ratio		D _{PWM}	5	-	100	%	Ta=25°C
LED Inrush Current		I _{LED} Rush	-	-	2	A	Ta=25°C
LED Power Consumption		P _{LED}	-	-	15	W	Ta=25°C
LED Life Time		LT _{LED}	-	50,000	-	Hrs	Ta=25°C

Note:

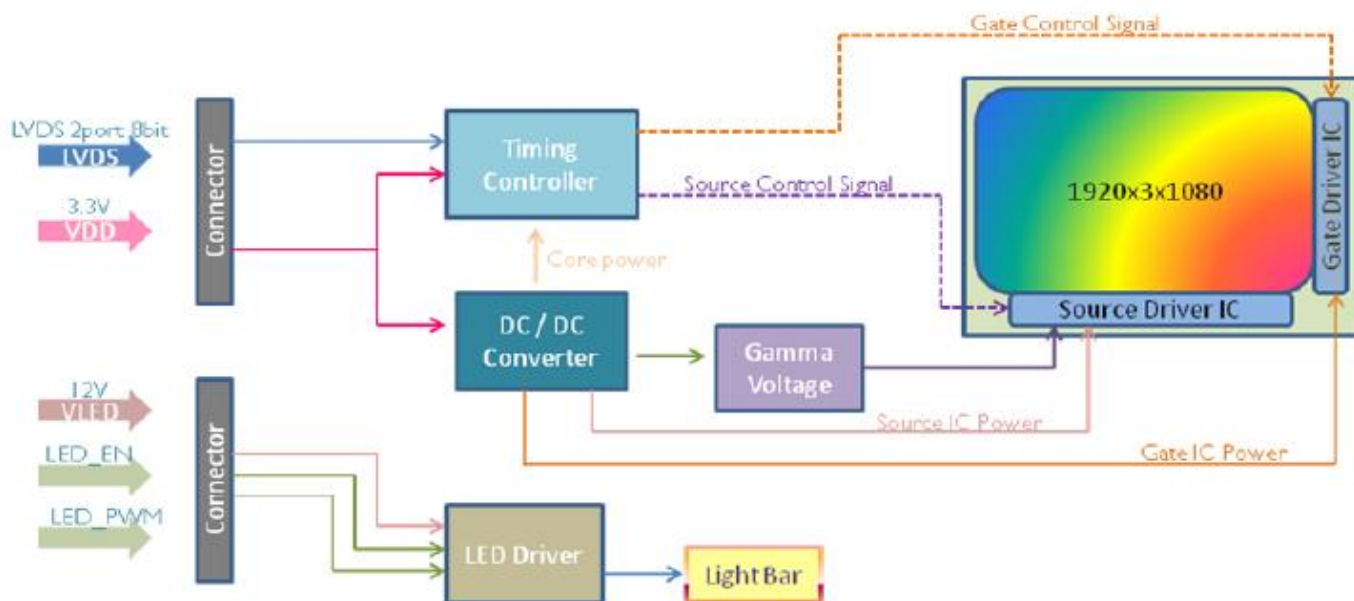
1. Ta, means ambient temperature of TFT-LCD module.
2. Calculator value for reference P_{LED} = V_F (Normal Distribution) * I_F (Normal Distribution) / Efficiency
3. The LED life-time defined as the estimated time to 50% degradation of initial luminous.
4. Maximum LED Input Current Measurement Condition: VLED at 12V driving voltage

4.3. TOUCH CONTROL

Parameter	Values			Unit
	Min.	Typ.	Max.	
I2C Input Voltage	-	3.3	-	V
USB Input Voltage	-	5	-	V
FPC Type / Interface	COF / USB & I ² C			-
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

4.4. LCD BLOCK DIAGRAM

The following diagram shows the function block of the 13.3 inch color TFT/LCD module.



4.5. INPUT TERMINAL PIN ASSIGNMENT

4.5.1. TFT LCD MODULE CONNECTOR (CN1)

Pin	Symbol	Description	Note
1	RX00-	Negative transmission data of Odd pixel 0	
2	RX00+	Positive transmission data of Odd pixel 0	
3	RX01-	Negative transmission data of Odd pixel 1	
4	RX01+	Positive transmission data of Odd pixel 1	
5	RX02-	Negative transmission data of Odd pixel 2	
6	RX02+	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	RX03-	Negative transmission data of Odd pixel 3	
11	RX03+	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	AGBSEN(NC)	For AUO internal use (NC)	
26	VDD	Power +3.3V	
27	VDD	Power +3.3V	
28	SCL (NC)	For AUO internal use (NC)	
29	SDA (NC)	For AUO internal use (NC)	
30	GND	Ground	

Note1. LCD connector: Hirose DF19K-30P-1H (54) or compatible

Note2. User's connector Part No.: Hirose DF19G-30S-1C (05), DF19A-2830SCFA (41) or compatible

Note3. Input Signals should be in low status when VDD is off.

Note4. NC means "No Connection".

4.5.2. TFT LCD MODULE BACKLIGHT CONNECTOR (CN2)

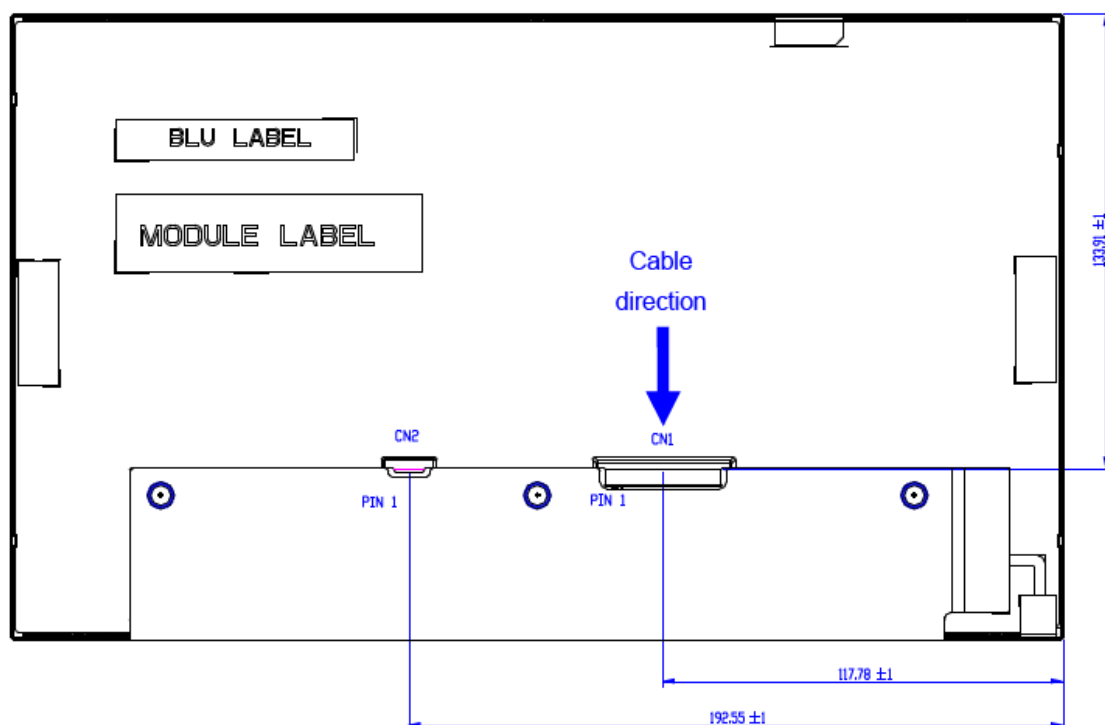
Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

Pin#	Symbol	Signal Name
1	LED_EN	LED enable pin
2	LED_PWM	System PWM single input
3	NC	No Connect
4	VLED	+12V
5	VLED	+12V
6	NC	No Connect
7	GND	Ground
8	GND	Ground

Note1. LCD connector: Hirose DF19K-8P-1H (54) or compatible

Note2. User's connector Part No.: Hirose DF19G-8S-1C (05), DF19A-2830SCFA (41) or compatible

Note3. NC means "No Connection".



4.6. TOUCH CONTROL PIN ASSIGNMENT

J1 : I2C

Brand: Centenary Materials

Part number: SM06B-SRSS-TB or equivalence

J2 : USB

Brand: JST

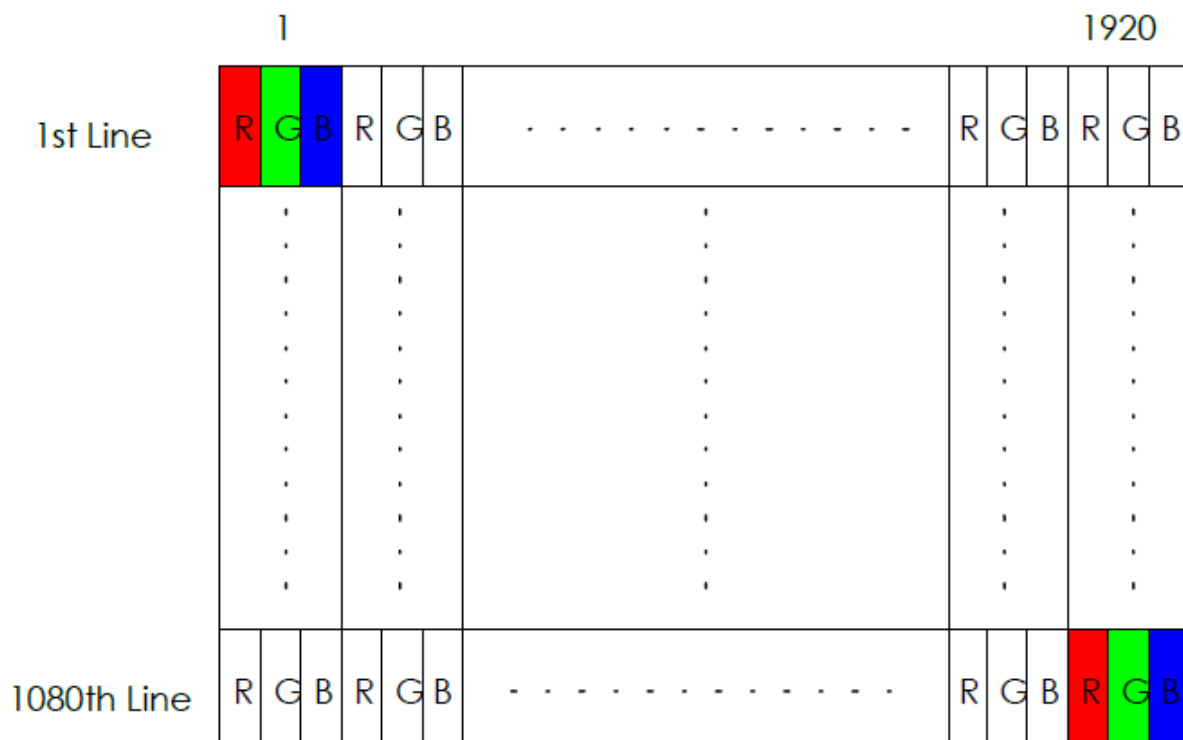
Part number: SM05B-SRSS-TB or equivalence

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		

5.LCD SIGNAL CHARACTERISTIC

5.1. PIXEL FORMAT IMAGE

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



5.2. LCD INTERFACE TIMING

5.2.1. LCD TIMING CHARACTERISTICS

Basically, interface timings should match the 1920x1080/ 60Hz manufacturing guide line timing.

Signal		Symbol	Min.	Typ.	Max.	Unit
Frame Rate		F	60	60	60	Hz
Clock Frequency		1/T _{Clock}	69.22	70.57	73.9	MHz
Horizontal Section	Period	T _H	1045	1054	1090	T _{Clock}
	Active	T _{HD}	960			
	Blanking	T _{HB}	85	94	130	
Vertical Section	Period	T _V	1104	1116	1130	T _{Line}
	Active	T _{VD}	1080			
	Blanking	T _{VB}	24	36	50	

Note 1: The above is as optimized setting

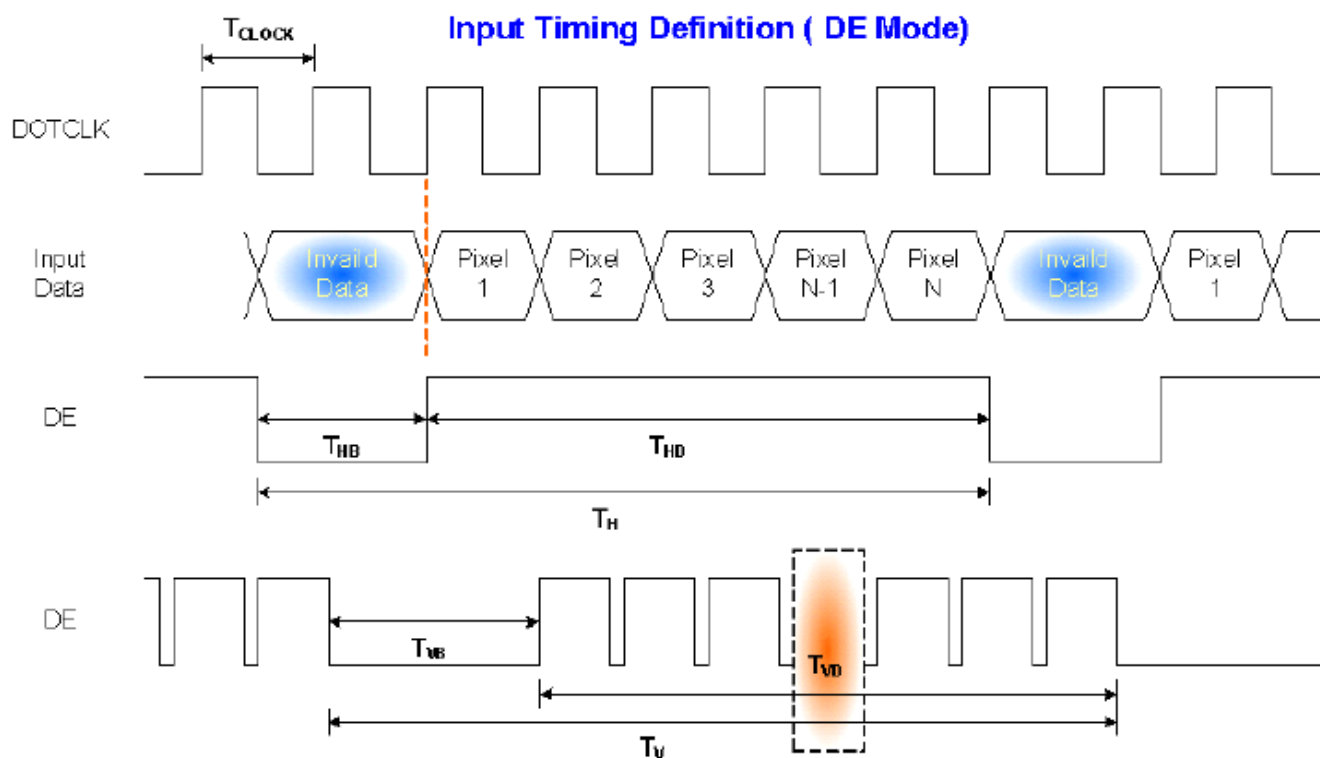
Note 2: Horizontal related parameters must be constant without variation. (H_Sync_Width, H_Front_Porch and H_Back_Porch must be constant on each scan line).

Note 3: On vertical blank area, H_Sync_Width and H_Total must be same as on the V_Active area.

Note 4: Vertical related parameters must be constant without variation. (V_Sync_Width, V_Front_Porch and V_Back_Porch must be constant on each video field).

Note 5: The DE timings also must be constant without variation. (H/V timing requirements are as same as previous. Blank timing must also be constant.)

5.2.2. LCD INPUT TIMING DIAGRAM



5.2.3. LCD INPUT DATA FORMAT

Interface	Type	Data
LVDS	JEIDA	8 bit

JEIDA / NS Mapping Format (Using JEIDA)

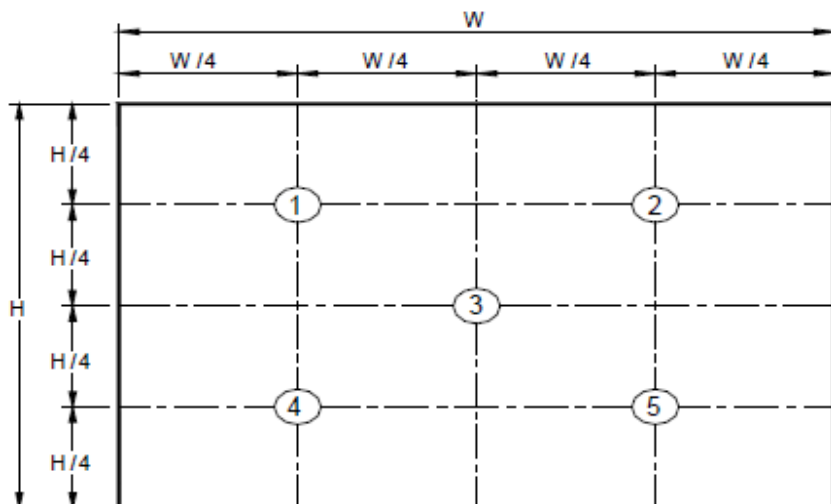
RXIN1D0 N/P	J:RA6=G2	J:RA5=R7	J:RA4=R6	J:RA3=R5	J:RA2=R4	J:RA1=R3	J:RA0=R2
RXIN2D0 N/P	N:RA6=G0	N:RA5=R5	N:RA4=R4	N:RA3=R3	N:RA2=R2	N:RA1=R1	N:RA0=R0
RXIN1D1 N/P	J:RB6=B3	J:RB5=B2	J:RB4=G7	J:RB3=G6	J:RB2=G5	J:RB1=G4	J:RB0=G3
RXIN2D1 N/P	N:RB6=B1	N:RB5=B0	N:RB4=G5	N:RB3=G4	N:RB2=G3	N:RB1=G2	N:RB0=G1
RXIN1D2 N/P	J:RC6=DE	J:RC5=VS	J:RC4=HS	J:RC3=B7	J:RC2=B6	J:RC1=B5	J:RC0=B4
RXIN2D2 N/P	N:RC6=DE	N:RC5=VS	N:RC4=HS	N:RC3=B5	N:RC2=B4	N:RC1=B3	N:RC0=B2
RXIN1D3 N/P	J:RD6=X	J:RD5=B1	J:RD4=B0	J:RD3=G1	J:RD2=G0	J:RD1=R1	J:RD0=R0
RXIN2D3 N/P	N:RD6=X	N:RD5=B7	N:RD4=B6	N:RD3=G7	N:RD2=G6	N:RD1=R7	N:RD0=R6

6. OPTICAL CHARACTERISTICS

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

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Central Luminance		L _{WH}		320	400	--	Cd/m ²	1, 3 ,4
Viewing Angle	Horizontal	θ _r	CR=10	75	89	--	degree	3
		θ _l		75	89	--		
	Vertical	θ _u		75	89	--		
		θ _d		75	89	--		
Uniformity		δ _{W5p}	5 points	75	80	--	%	1, 2, 3
Contrast Ratio		CR		600	800	--		3, 5
Response Time		T _R +T _F		--	25	35	ms	3, 6
Color Coordinates	Red	R _x	θX=0°, θY=0° Grayscale Maximum	0.625	0.675	0.725		3
		R _y		0.266	0.316	0.366		
	Green	G _x		0.235	0.285	0.335		
		G _y		0.605	0.655	0.705		
	Blue	B _x		0.103	0.153	0.203		
		B _y		0.000	0.036	0.086		
	White	W _x		0.263	0.313	0.363		
		W _y		0.279	0.329	0.379		
NTSC				--	90	--	%	

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

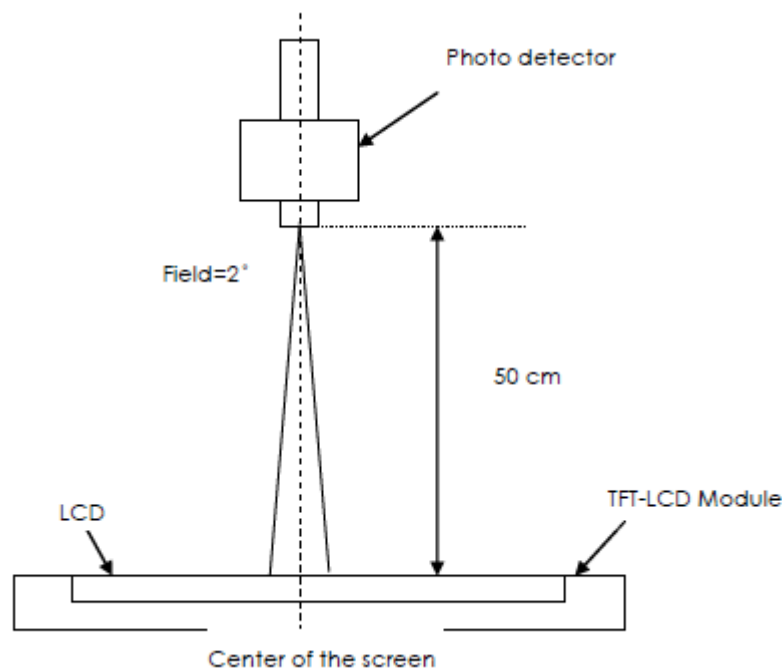


Note 2: The luminance uniformity of 5 points is defined by dividing the minimum luminance values by the maximum test point luminance

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

Note 3: 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.



Note 4: 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).

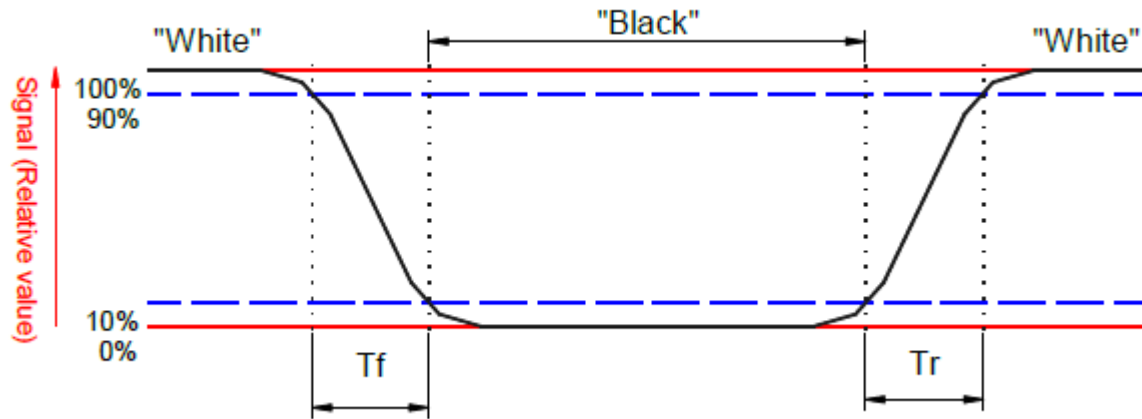
Note 5: Definition of contrast ratio (CR)

Contrast ratio is calculated with the following formula.

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

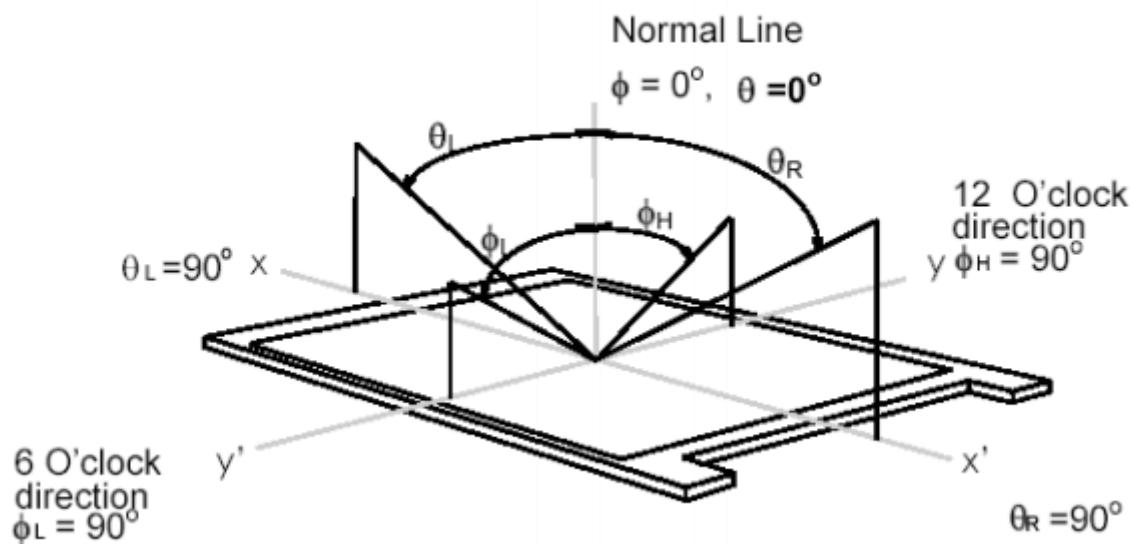
Note 6: Definition of Response Time (T_R , T_F)

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.



Note 7: 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.



7. 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	40°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)~70°C(30min), 10cycles

8. LABEL

Model NO. F133PET-Z05

條碼

SN 3A Z 20 2 21 0 XXX1

L=32mm



W=14mm

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

字型:Arial (6)

code:128

字型:Arial (8)

9. MECHANICAL CHARACTERISTICS

Item		Dimension	Unit	Note
Outline Dimension	Horizontal	330.76	mm	PCAP : B133PFU-E05
	Vertical	214.24	mm	
	Depth (min.)	2.00	mm	
	Horizontal	278.00	mm	LCD : G133HAN01.1
	Vertical	184.00	mm	
	Depth (min.)	9.29	mm	
Weight		800	g	F133PET-Z05
Item		Specification		Remarks
PCAP Viewing Area		294.76 mm x 166.24 mm		
PCAP Sensor Area		307.75 mm x 183.00 mm		
PCAP FPC Length		56.31 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



10. ENGINEERING DRAWING

