



Product Specification

F133PET-T41

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

Title	13.3-inches Touch Display Product Specifications
Model Name	F133PET-T41
Version	2

Customer

Approved by

Date

Notice: This Specification is subject to change without notice.

Approved By	Prepared By
ZOE NIEN	ALLEN FANG
2026-05-20	2026-05-20



REVISION HISTORY

Version	ECN No.	Description of Changes	Date	Prepared
0		Preliminary specification first edition	2023-01-18	Allen Fang
1		Modified Label	2025-12-19	Allen Fang
2		Final specification	2026-05-20	Allen Fang



CONTENTS

1. General Description	4
1.1. Introduction	4
1.2. Features	4
1.3. Application	4
1.4. General Specification	5
2. Absolute Maximum Ratings	6
3. Electrical Specifications	7
3.1. LCD Module	7
3.2. LCD Back-Light Unit	8
3.3. Touch Panel	8
3.4. LCD Input Terminal Pin Assignment	9
3.5. Touch Panel Pin Assignment	10
3.6. Input Data Format	11
3.7. LCD Function Block Diagram	11
4. LCD Interface Timing	12
4.1. LCD Timing Characteristics	12
4.2. LCD Timing diagram	13
4.3. Power On/OFF Sequence	14
5. Optical Characteristics	17
6. Reliability Test Items	21
7. Label	21
8. Mechanical Characteristics	22
9. Engineering Drawing	24



1. General Description

1.1. Introduction

F133PET-T41 is a color active matrix TFT LCD module G133HAN02.0 with projected capacitive multi-touch B133PFU-E05 air bonding.

The display format is intended to support the 16:9 FHD mode (1920(H) x 1080(V)) screen and 16.2M color with white LEDs backlight driving circuit. All input signals are eDP (Embedded Display Port) interface compatible.

1.2. Features

- Wide view angle
- RoHS product

1.3. Application

- TFT LCD monitor
- Industrial application

1.4. General Specification

Parameter	Specification	Unit	Remarks
Active Area Size	13.3	inch	
Display Area	293.472 (H) x 165.078 (V)	mm	
Outline Dimension	330.76 (H) x 214.24 (V) x 6.01 (D)	mm	D:PCAP+LCM
Weight	550	g	(Typ.)
Driver Element	a-Si TFT active matrix	-	
Display Colors	16.2M	Colors	
Number of Pixels	1920 (H) x 1080 (V)	pixels	
Pixel Pitch	0.1529 (H) x 0.1529(W)	Um	
Pixel Arrangement	RGB vertical stripe	-	
Display Mode	Normal Black	-	
Color Gamut	45% of NTSC (Typ.)	-	
LCD Electrical Interface	2 Lane eDP 1.2	-	
Touch Technology	Projected Capacitive Multi-Touch Panel	-	
Touch Method	Finger or exclusive pen	-	
Numbers of Touch	10	Points	
Touch Driver interface	COF/ USB & I2C	-	
Touch Sensor Glass Type	Strengthening Glass	-	
Touch Controller IC	EETI,EXC80W46	-	
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	Remarks
Logic/LCD Drive Voltage	V_{DD}	-0.3	14.0	V	Note 1,2
Input Voltage of Signal	V_{In}	-0.3	4	V	
Operating Temperature	T_{op}	0	+50	°C	Note 4
Operating Humidity	H_{op}	5	95	%RH	
Storage Temperature	T_{st}	-20	+60	°C	
Storage Humidity	H_{st}	5	95	%RH	
Touch DC Supply Voltage	USB_ V_{DD}	-0.3	6.0	V	

Note 1: At T_a (25°C)

Note 2: Permanent damage to the device may occur if exceed maximum values

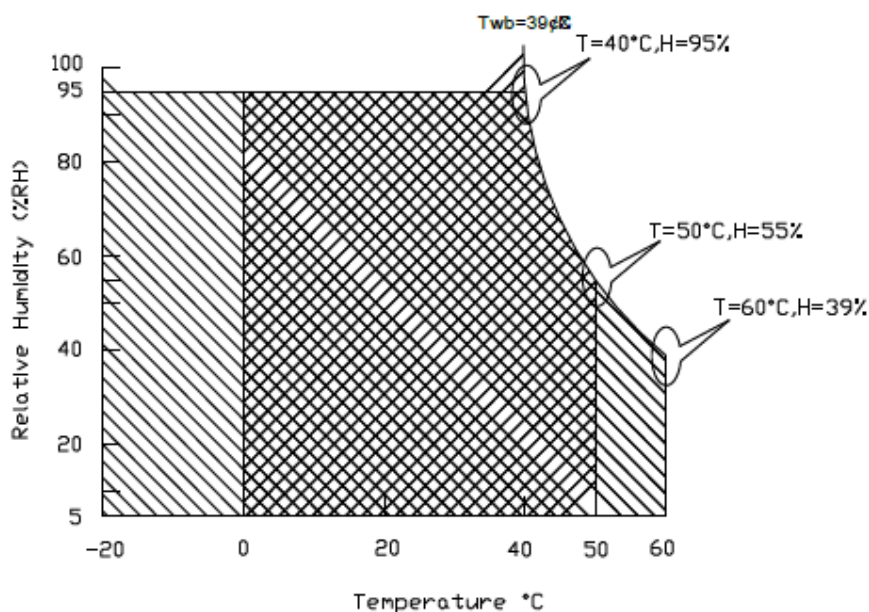
Note 3: LED specification refer to section 3.2

Note 4: For quality performance, please refer to IIS (Incoming Inspection Standard).

Note 5: The packing material of system forbid to involve ammonium component.

Note 6: The reliability test conditions of system do not exceed the verified conditions of TFT module.

Note 7: Be sure the panel test condition do not exceed the component limitation of TFT modules (TN liquid crystal, for example)



3.2. LCD Back-Light Unit

G133HAN02.0

Parameter	Symbol	Values			Unit	Notes
		Min.	Typ.	Max.		
LED Power Supply	V_{LED}	10.0	12.0	13.2	V	Define as Connector interface (Ta=25°C)
LED Enable Input	V_{LED_EN}	High	2.2	-	5.5	
		Low	-	-	0.6	
PWM Logic Input	V_{LED_PWM}	High	2.2	-	5.5	
		Low	-	-	0.6	
PWM Input Frequency	F_{PWM}	200	1K	20K	Hz	
PWM Duty Ratio	Duty	1	-	100	%	
Backlight Power Consumption	P_{LED}	-	-	3.38	W	
LED lifetime	LT_{LED}	30,000	-	-	Hrs	

Note 1: Measured in Panel VLED

Note 2: Recommend system, pull up/down resistor no bigger than 10kohm.

Note 3: If the PWM duty ratio (min) is setting 5% to 1%, the PWM input frequency should be set below 1kHz.

The brightness-duty characteristic might not be able to keep in its linearity if the dimming control is operated in 1% to 5% range.

Note 4: Calculated value for reference $P_{LED} = VF$ (Normal Distribution) * IF (Normal Distribution) / Efficiency

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

3.3. Touch Panel

NO.	Item	Specification
1	Touch Controller IC	EXC80W46
2	Number Of Channel	RX 43× TX 24
3	Number Of Support	10-points Fingers Touch
4	FPC Type / Interface	COF / USB & I2C
5	OS	Android, Linux, Win7, Win8, Win10, XP

Interface	Symbol	Condition	Min.	Typ.	Max.	Unit
I2C	V_{DD}	-	-	3.3	-	V
USB				5		

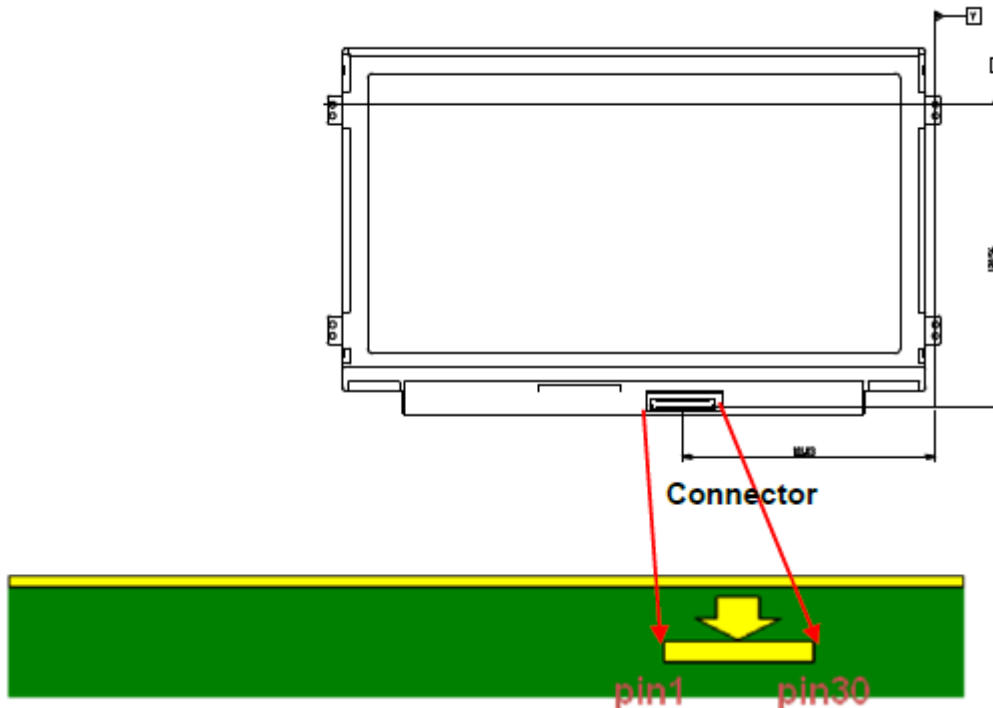
3.4. LCD Input Terminal Pin Assignment

Pin	Symbol	Description
1	NC	Reserved for LCD supplier
2	GND	Ground
3	Lane1_N	Complement Signal Link Lane 1
4	Lane1_P	True Signal Link Lane 1
5	GND	Ground
6	Lane0_N	Complement Signal Link Lane 0
7	Lane0_P	True Signal Link Lane 0
8	GND	Ground
9	AUX_CH_P	True Signal Auxiliary Channel
10	AUX_CH_N	Complement Signal Auxiliary Channel
11	GND	Ground
12	VDD	LCD Logic Power: 3.3V
13	VDD	LCD Logic Power: 3.3V
14	NC	LCD Panel Self Test Enable (Optional)
15	GND	Ground
16	GND	Ground
17	HPD	HPD Signal Pin
18	BL_GND	LED Backlight ground
19	BL_GND	LED Backlight ground
20	BL_GND	LED Backlight ground
21	BL_GND	LED Backlight ground
22	VLED_EN	LED Backlight control on/off control
23	VLED_PWM	System PWM signal input for dimming
24	NC	Reserved for LCD supplier
25	NC	Reserved for LCD supplier
26	VLED	LED Backlight Power
27	VLED	LED Backlight Power
28	VLED	LED Backlight Power
29	VLED	LED Backlight Power
30	NC	Reserved for LCD supplier

LCD connector: IPEX 20765-030E-11A (0.5mm pitch)

Mating Housing/Part Number: IPEX or compatible

Note1. Pin number start from the right side as the following figure.



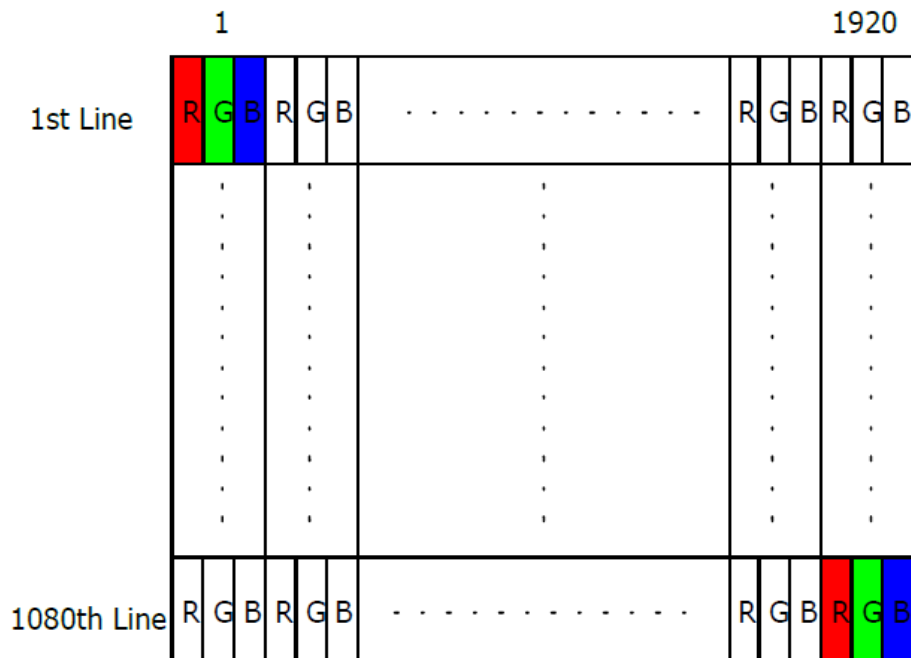
Note2. Input signals shall be low or High-impedance state when VDD is off. Internal circuit of eDP inputs are as following.

3.5. Touch Panel Pin Assignment

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

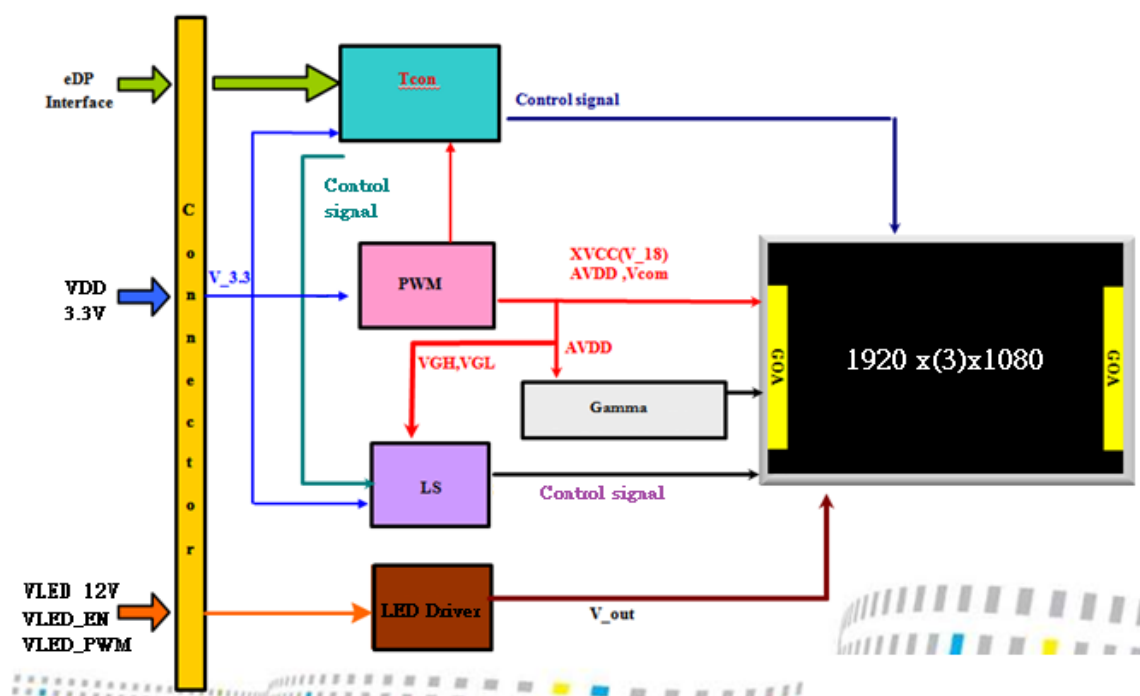
3.6. Input Data Format

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



3.7. LCD Function Block Diagram

Schematic Block Diagram



4. LCD Interface Timing

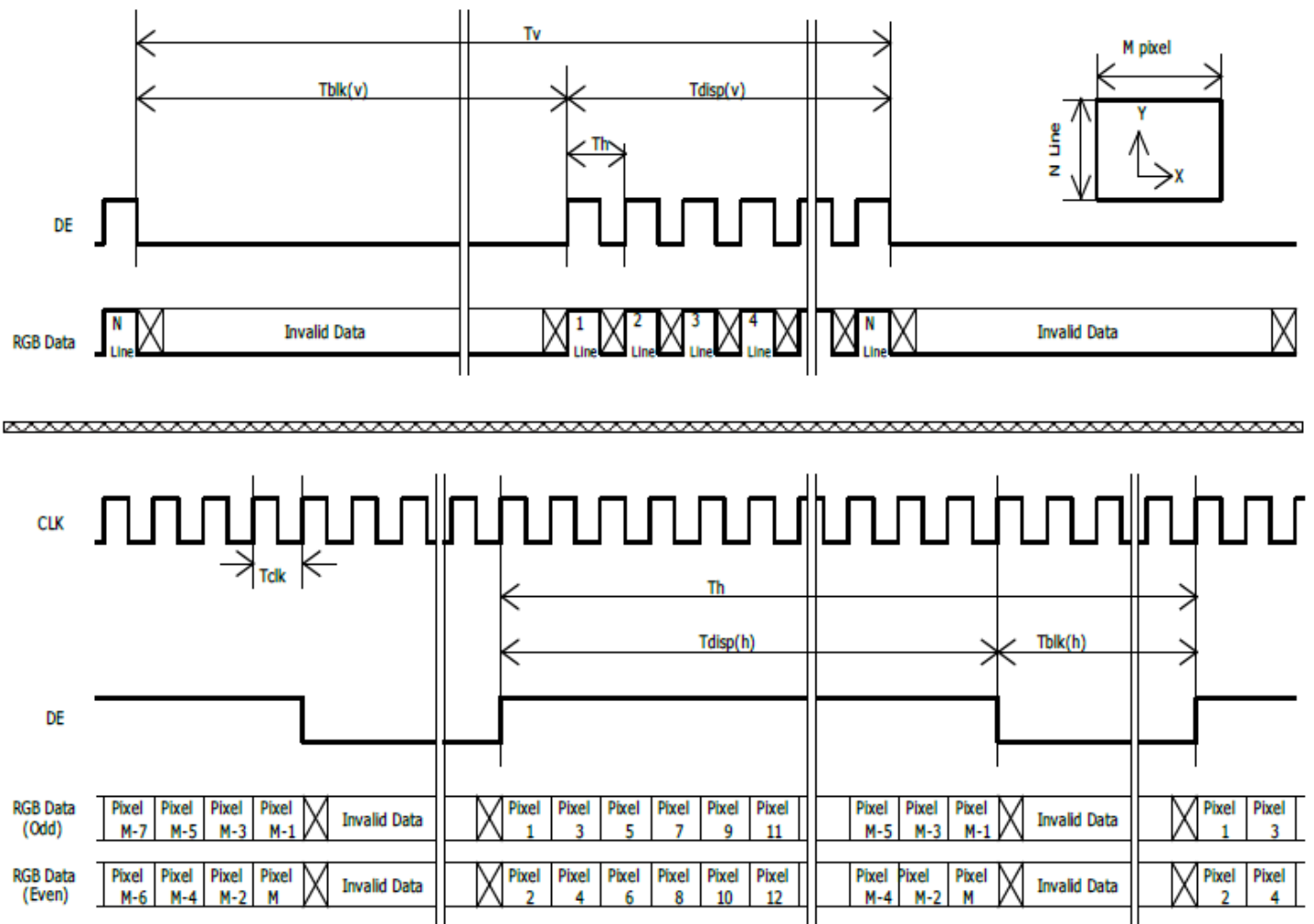
4.1. LCD Timing Characteristics

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

Parameter		Symbol	Min.	Typ.	Max.	Unit
Frame Rate		-	-	60	-	Hz
Clock frequency		1/T _{Clock}	68	70.5	75.9	MHz
Vertical Section	Period	T _V	1100	1116	1150	T _{LINE}
	Active	T _{VD}	1080			
	Blanking	T _{VB}	20	36	70	
Horizontal Section	Period	T _H	1030	1052	1100	T _{CLOCK}
	Active	T _{HD}	960			
	Blanking	T _{HB}	70	92	140	

Note 1: The above is as optimized setting

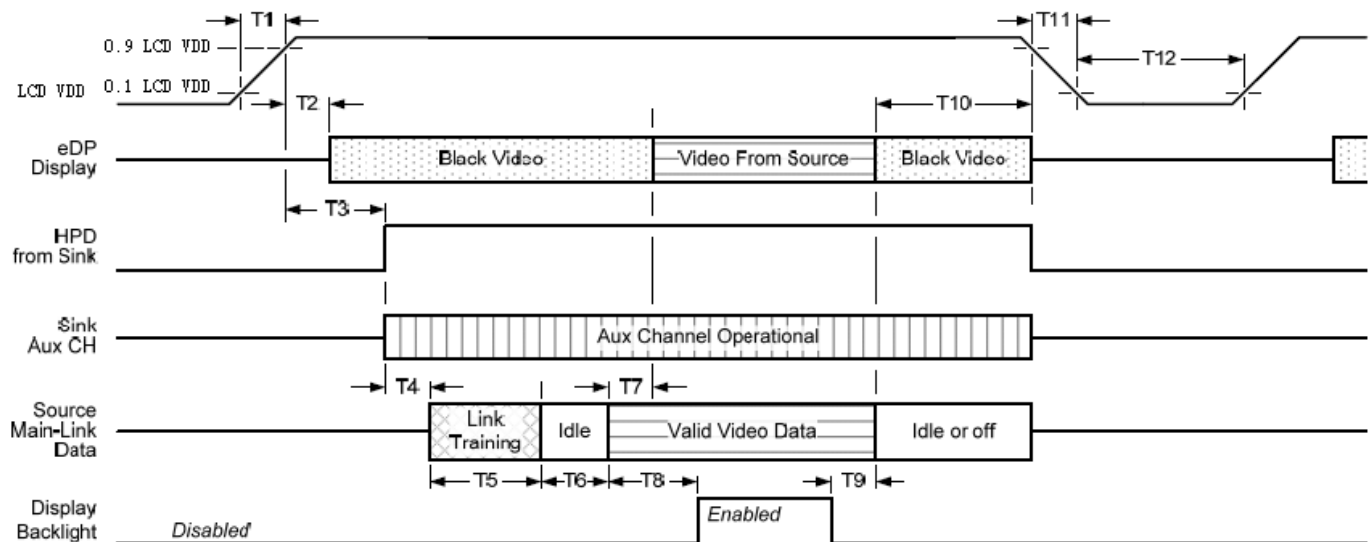
4.2. LCD Timing diagram



4.3. Power On/OFF Sequence

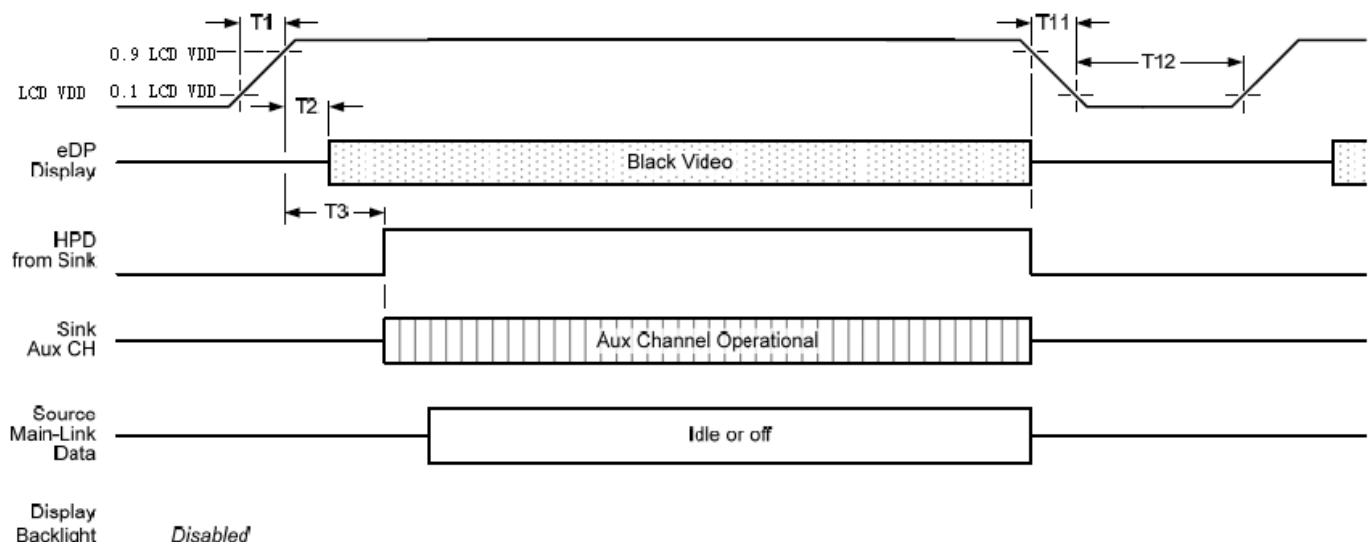
Power on/off sequence is as follows. Interface signals and LED on/off sequence are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off

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			

Note1: The sink must include the ability to generate black video autonomously. The sink must automatically enable black video under the following conditions:

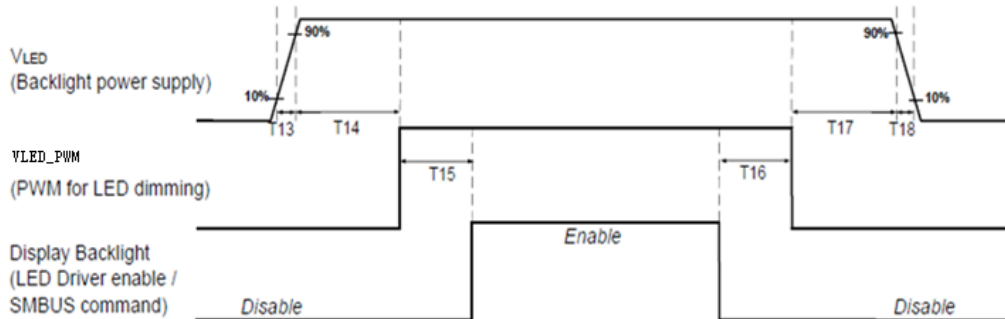
- upon LCD VDD power on (within T2 max)-when the "Novideostream_Flag" (VB-ID Bit 3) is received from the source (at the end of T9).

- when no main link data, or invalid video data, 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.

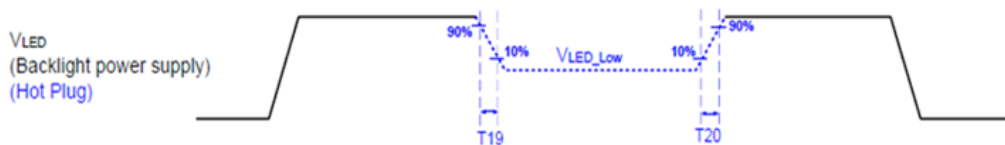
Note 2: The sink may implement the ability to disable the black video function, as described in Note 1, above, for system development and debugging purpose.

Note 3: The sink must support AUX_CH polling by the source immediately following LCD VDD 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.

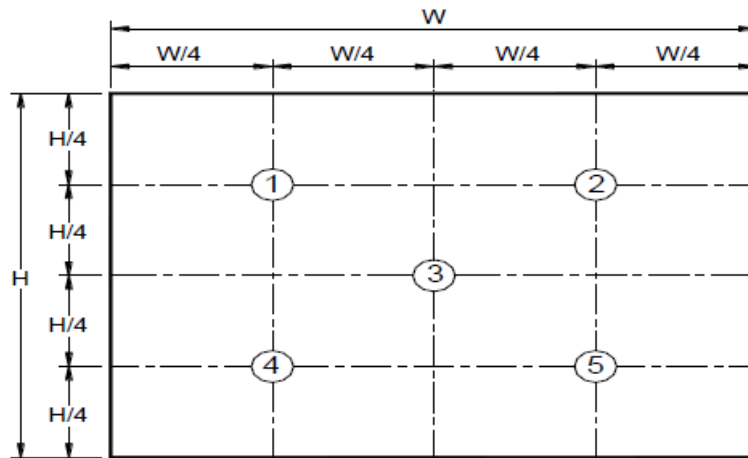
Note 2 : If T13 or T18<0.5ms , the inrush current may cause the damage of fuse. If T13 or T18<0.5ms , the inrush current I2t is under typical melt of fuse Spec. , there is no mentioned problem.

5. Optical Characteristics

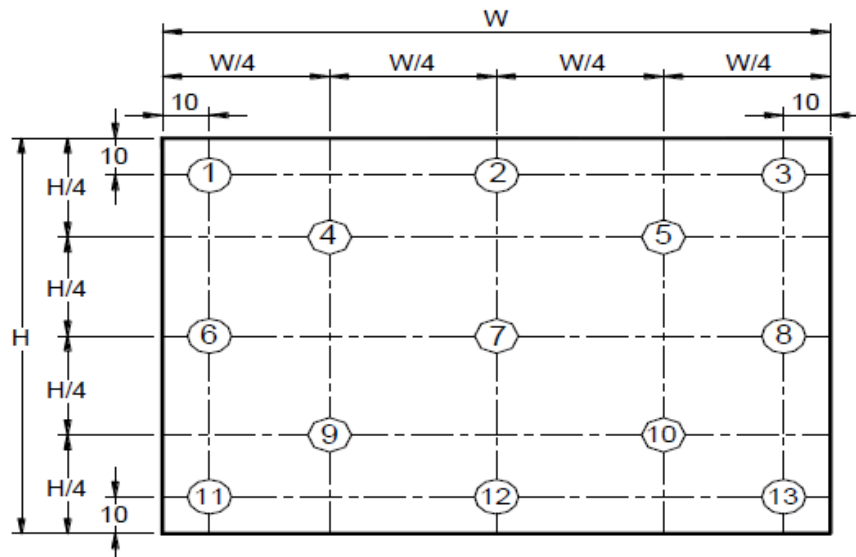
The optical characteristics are measured under stable conditions at 25°C (Room Temperature) :

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
White Luminance, ILED=20mA	Base Panel Only	L _{WH}	320	400	-	Cd/m²	1,4,5
Viewing Angle	Horizontal CR = 10	θ _r	80	89	--	Degree	4, 9
		θ _l	80	89	--		
	Vertical CR = 10	θ _u	80	89	--		
		θ _d	80	89	--		
Luminance Uniformity	5 Points	δ _{5P}	-	-	1.25		1,3,4
	13 Points	δ _{13P}	-	-	1.6		2,3,4
Contrast Ratio		CR	600	800	-		4,6
Response Time (Rising + Falling)		T _{RT}	-	27	-	ms	
Cross talk		%	-	-	1.5		4,7
Color Coordinates	Red	R _x	0.545	0.575	0.605	-	4
		R _y	0.305	0.335	0.365	-	
	Green	G _x	0.310	0.340	0.370	-	
		G _y	0.550	0.580	0.610	-	
	Blue	B _x	0.130	0.160	0.190	-	
		B _y	0.085	0.115	0.145	-	
	White	W _x	0.283	0.313	0.343	-	
		W _y	0.299	0.329	0.359	-	
NTSC			-	45	-	%	4

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



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



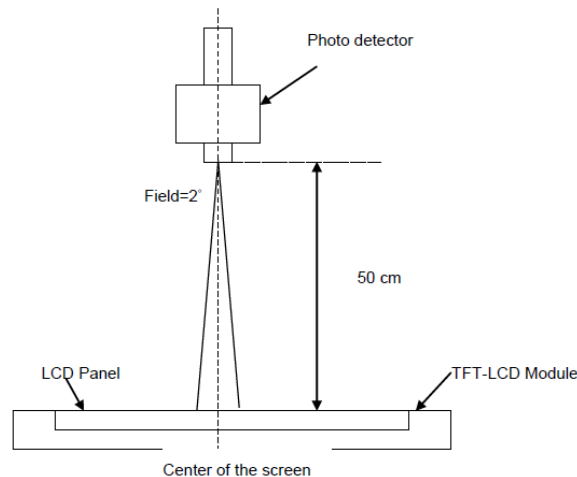
Note 3: The luminance uniformity of 5 or 13 points is defined by dividing the maximum luminance values by the minimum test point luminance

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

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

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.



Note 5 : 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 6 : Definition of contrast ratio: Contrast ratio is calculated with the following formula.

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

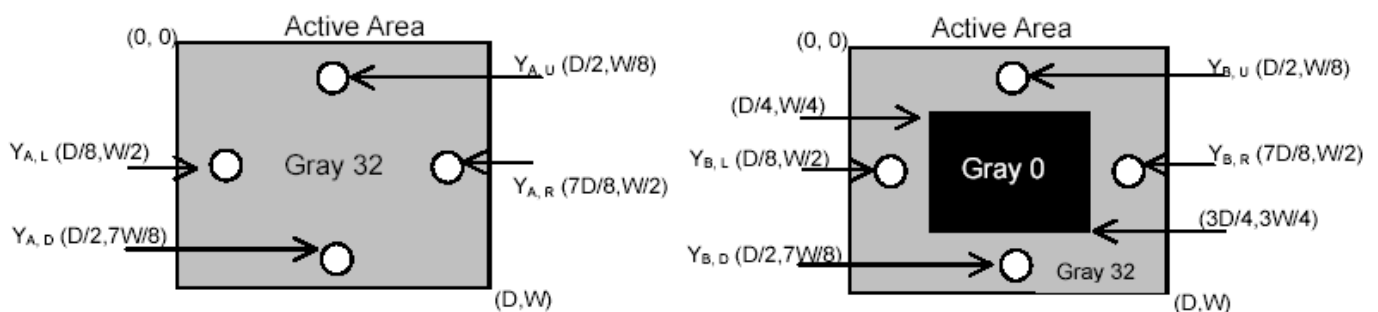
Note 7 : Definition of Cross Talk (CT)

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

Where

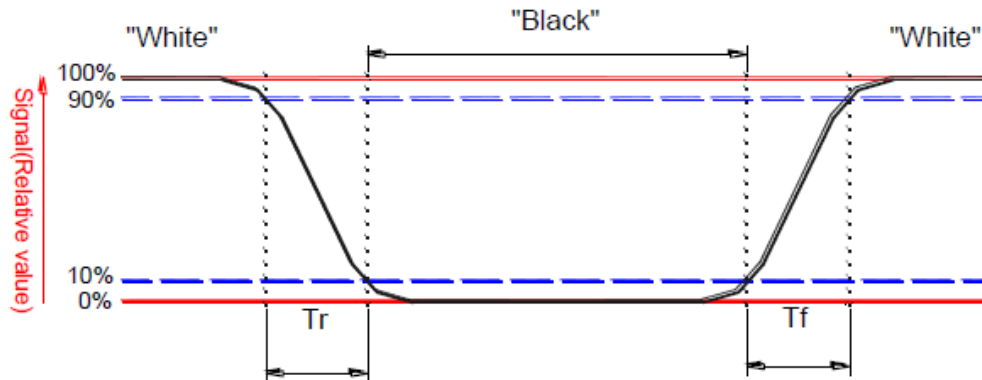
Y_A = Luminance of measured location without gray level 0 pattern (cd/m²)

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



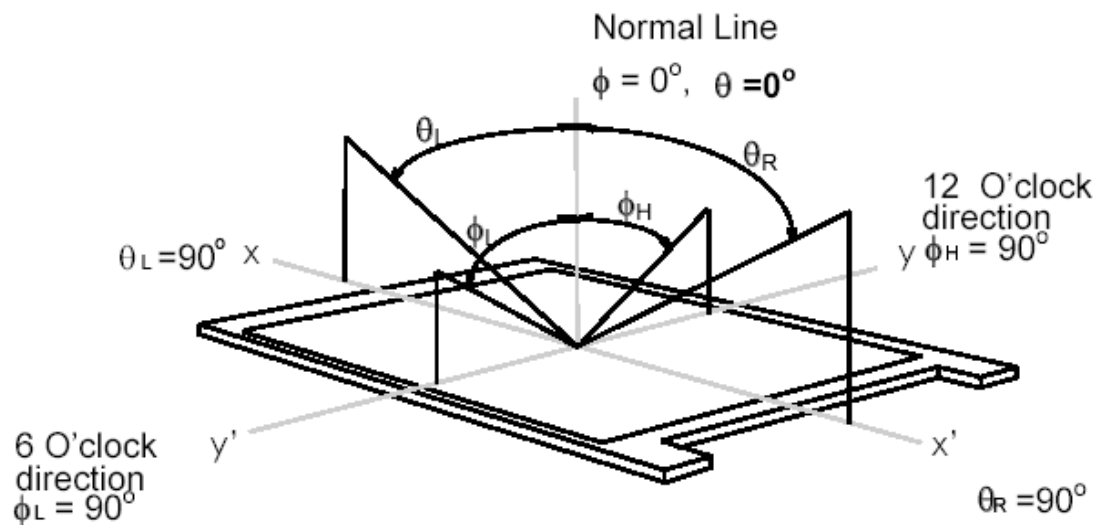
Note 8: Definition of response time:

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



Note 9: 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 follows; 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 about its center to develop the desired measurement viewing angle.



6. Reliability Test Items

Test Item		Condition
1	Temperature Humidity Bias	Ta=40°C, 90% 240hrs
2	High Temperature Operation test	Ta=50°C, Dry, 240hrs
3	Low Temperature Operation test	Ta=0°C, 240hrs
4	High Temperature Storage test	Ta=60°C, 240hrs
5	Low Temperature Storage test	Ta=-20°C, 240hrs
6	Thermal Shock test	Ta=-20°C(30min)~60°C(30min),10 cycles

7. Label

Model NO. **F133PET-T41**

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	330.76	mm	PCAP : B133PFU-E05
	Vertical	214.24	mm	
	Depth	2.00	mm	
	Horizontal	306.29	mm	LCD : G133HAN02.0
	Vertical	177.80	mm	
	Depth	2.91	mm	
Weight		550	g	F133PET-T41
Item		Specification		Remarks
PCAP Viewing Area		294.36 mm x 165.94 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



9. Engineering Drawing

