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Chefree Technology Corp.

TFT COLOR LCD MODULE

MODEL: CF070HLDLWH-CA2-U

(Complied with RoHS)

7” WVGA
LVDS interface

Version: P02

Customer : _____

Approved By : _____

Date: _____

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CHEFREE		
APPROVAL	**CHECKER**	**PREPARE**
Tim	Mark	Benson

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CONTENTS

1. RECORD OF REVISION 1
2. MECHANICAL SPECIFICATIONS 2
3. OUTLINE DIMENSIONS 3
4. INTERFACE PIN CONNECTION 4
5. BLOCK DIAGRAM 6
6. ABSOLUTE MAXIMUM RATINGS 7
7. ELECTRICAL CHARACTERISTICS 8
8. OPTICAL CHARACTERISTICS 10
9. TOUCH PANEL SPECIFICATIONS 12
10. TIMING SPECIFICATIONS 13
11. RELIABILITY TEST 15
12. PRECAUTIONS FOR USE 16

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1. RECORD OF REVISION

Rev	DATE	PAGE	SUMMARY
P00	2021.07.14	ALL	Preliminary specification was issued
P01	2022.08.04	-	Touch controller IC changed to EXC81W46.
		4	Add R/L and U/D to interface.
P02	2026.04.08	-	1. BIAS power chip changed to new part because EOL Original: ANX6623AAQ Alternative: HA5266DD 2. LED power chip changed to new part because EOL Original: ANX6903AAQ Alternative: RT8510GQW

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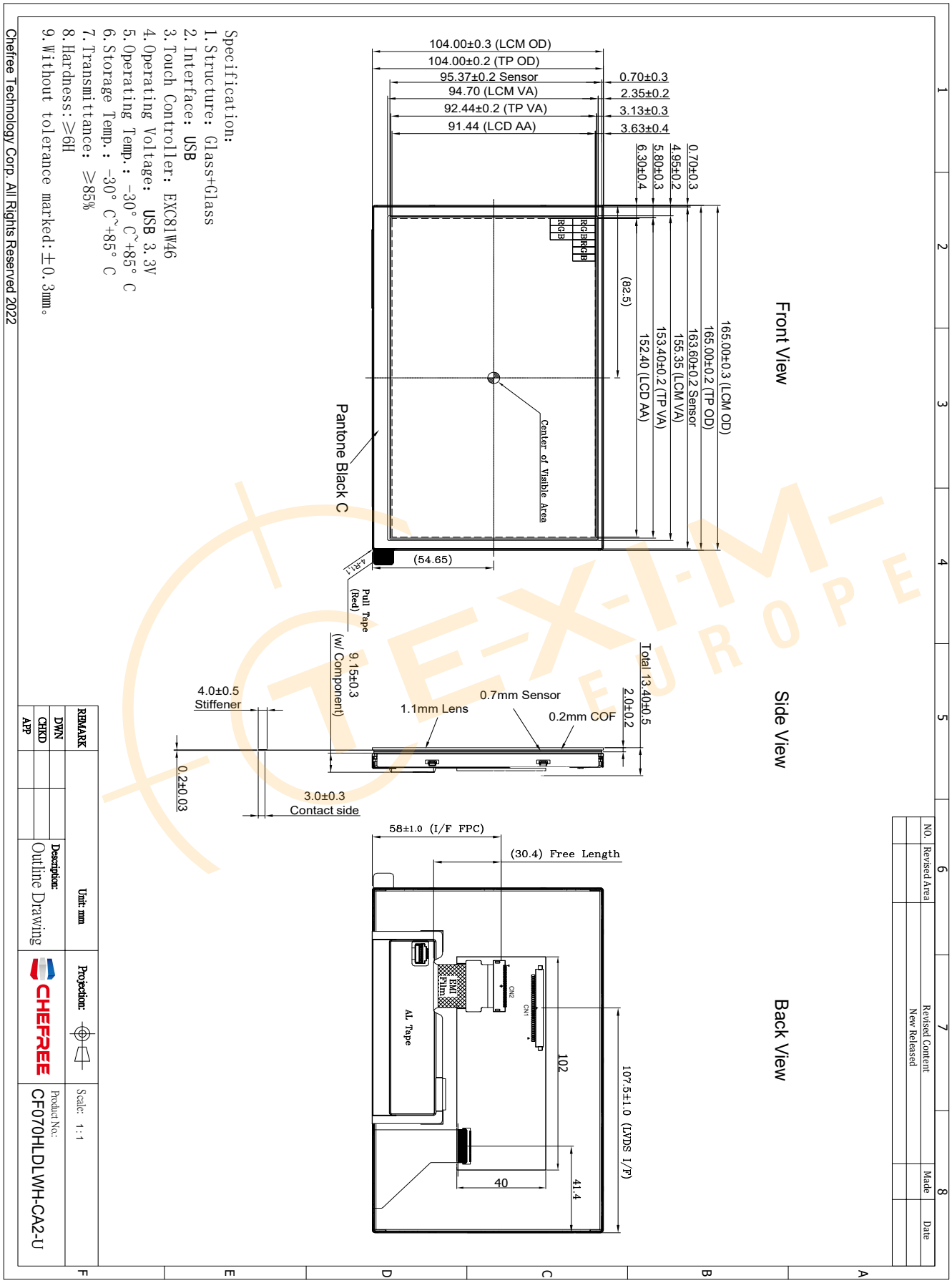
2. MECHANICAL SPECIFICATIONS

(1)	Number of Dots	800(R.G.B) x 480
(2)	Module Size(mm)	165(H) x 104.07(V) x 13.45 (D)
(3)	Active Area(mm)	152.4(H) x 91.44(V)
(4)	Pixel Pitch(mm)	0.1905(H) x 0.1905(V)
(5)	LCD Model	TFT, Transmissive, Normally Black
(6)	Backlight Color	White, LED
(7)	Viewing Direction	All
(8)	Electrical Interface	LVDS Interface
(9)	Color Configuration	R.G.B Vertical Stripe
(10)	Touch Panel Mode	Built – in EETI 81W46 Controller
(11)	Module Weight(g)	253g±5%

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3. OUTLINE DIMENSIONS



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4. INTERFACE PIN CONNECTION

4.1 TFT LCM PANEL PIN DEFINE

CN1 Connector：STM MSBK2407P30 RF:HB or Equivalent

PIN No.	Symbol	I/O	Description	Remark
1	GND	P	Ground	
2	GND	P	Ground	
3	EN	I	Enable Control for Backlight	
4	PWM	I	Brightness Control for Backlight	
5	VLED	P	Power Supply for LED Backlight (12V)	
6	VLED	P	Power Supply for LED Backlight (12V)	
7	VDD	P	Power Supply for Digital Circuit (3.3V)	
8	R/L	I	Left or Right display control	Note 1
9	U/D	I	UP or Down display control	Note 1
10	GND	P	Ground	
11	RxIN0-	I	Negative LVDS Differential Data Input	
12	RxIN0+	I	Positive LVDS Differential Data Input	
13	GND	P	Ground	
14	RxIN1-	I	Negative LVDS Differential Data Input	
15	RxIN1+	I	Positive LVDS Differential Data Input	
16	GND	P	Ground	
17	RxIN2-	I	Negative LVDS Differential Data Input	
18	RxIN2+	I	Positive LVDS Differential Data Input	
19	GND	P	Ground	
20	RxCLK-	I	Negative LVDS Differential Clock Input	
21	RxCLK+	I	Positive LVDS Differential Clock Input	
22	GND	P	Ground	
23	RxIN3-	I	Negative LVDS Differential Data Input	
24	RxIN3+	I	Positive LVDS Differential Data Input	
25	NC	-	No connection	
26	NC	-	No connection	
27	VCC	P	Power Supply for PCAP(5V)	
28	D-	I	Data-	
29	D+	I	Data+	
30	GND	P	Ground	

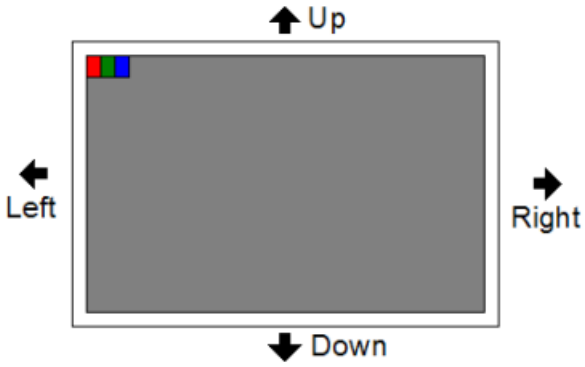
Note：‘P’ stand for Power, ‘ I ‘ stand for Input

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Note 1：L/R and U/D control function

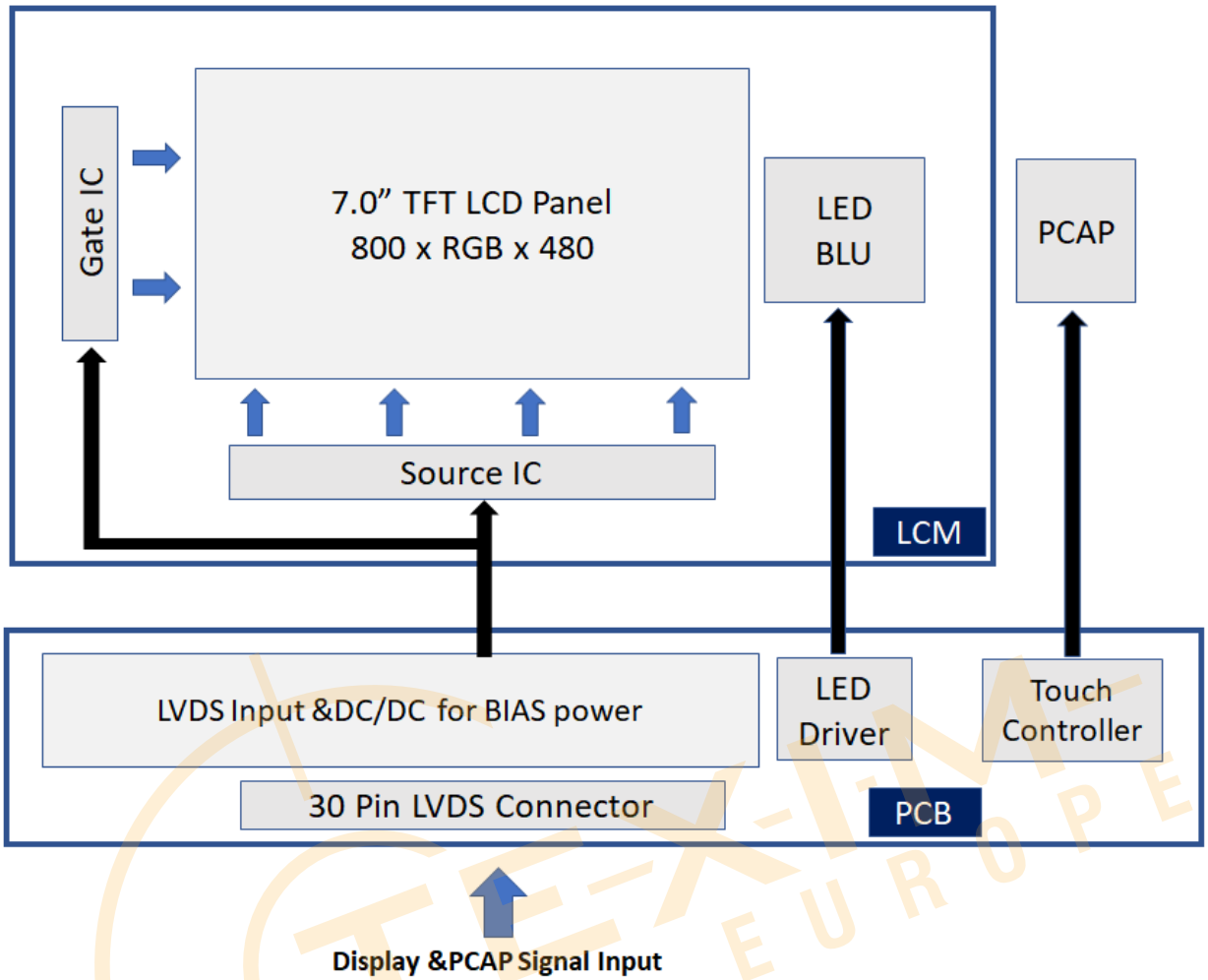
L/R	U/D	Data shifting
H	H	Left→Right, Up→Down (Default)
L	H	Right→Left, Up→Down
L	L	Right→Left, Down→Up
H	L	Left→Right, Down→Up



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5. BLOCK DIAGRAM



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6. ABSOLUTE MAXIMUM RATINGS

6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VDD	-0.3	4.5	V	
Backlight Supply Voltage	VLED	-	24	V	
Power Voltage For CTP	/	/	/	V	

Note：The absolute maximum rating values of this product not allowed to be Exceeded at any times. Should be module be used with any of absolute maximum ratings exceeded. The characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(℃)	(-30)	(85)	(-30)	(85)	Note 1,2
Humidity(% RH)	10~90		10~90		-

Note 1 : The response time will become lower when operated at low temperature.
Note 2 : Background color changes slightly depending on ambient temperature.

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7. ELECTRICAL CHARACTERISTICS

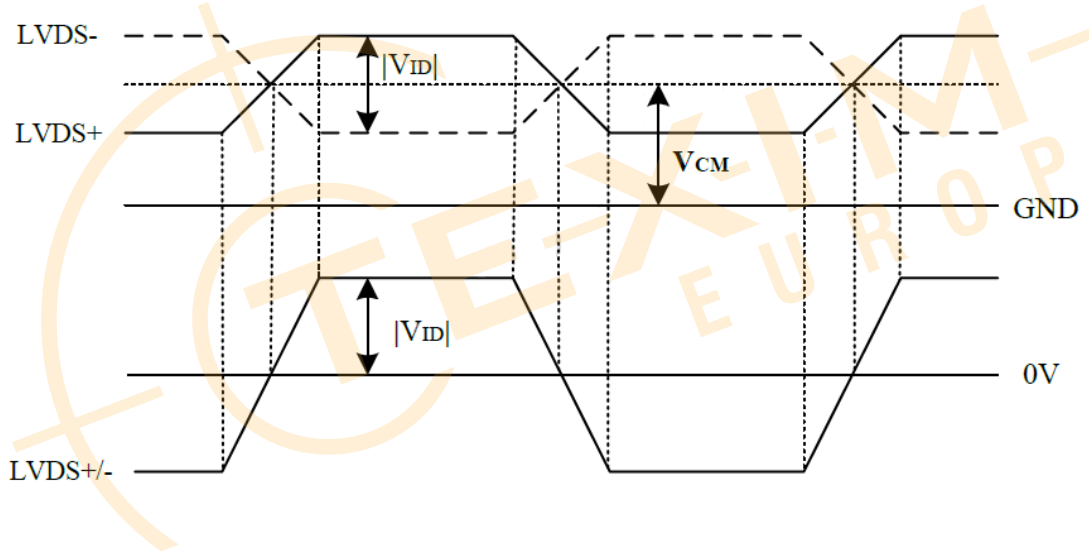
7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For LCD	VDD	3.0	3.3	3.6	V	
	IDD	-	200	-	mA	Note1
Differential Input Threshold	VTH	100	-	-	mV	Note2
	VTL	-	-	-100	mV	
Magnitude Differential Input	$\|V_{ID}\|$	0.2		0.6	mV	
Common Mode Voltage	V_{CM}	1.0	1.2	1.4	V	

Note 1 : Test Condition: VDD=3.3V ; Test Pattern: Black.
Note 2 : VTH and VTL is defined in RxIN0+/-、RxIN1+/-、RxIN2+/-、 RxIN3+/-、RxCLK+/- signal voltage level.

Voltage Definitions



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7.2 BACKLIGHT UNITS

Ta=25℃

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
LED Driving Voltage	VLED	-	12	-	V	
LED Driving Current	ILED	-	(0.5)	-	A	
Power Consumption	-		(6)		W	
LED Life Time	-	20000	-	-	Hrs	

Note 1: The LED life time define as the estimated time to 50% degradation of initial luminous.

7.3 CTP ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For PCAP	VCC	/	5.0	/	V	

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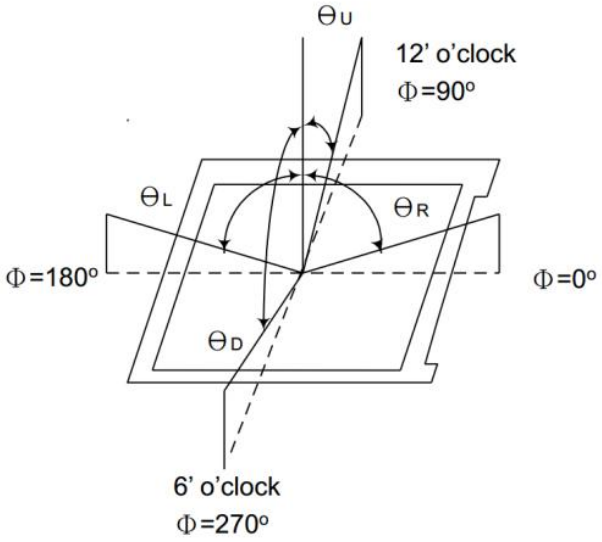
8. OPTICAL CHARACTERISTICS

8.1 Optical specification

Ta=25℃

ITEM		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio		CR	Viewing Normal Angle Θ=0	-	1000	-	-	Note 1,2
Response Time (TR+TF)		@25℃		-	30	40	ms	Note 1,3
		@-30℃			800		ms	
Color Chromaticity (CIE1931)	White	Wx		-0.04	0.291	+0.04		Note 1,4
		Wy			0.312			
	Red	Rx			0.643			
		Ry			0.330			
	Green	Gx			0.291			
		Gy			0.610			
	Blue	Bx			0.149			
		By			0.058			
Viewing Angle	Hor.	θ_L	CR>10	80	85	-	Deg.	
		θ_R		80	85	-		
	Ver.	θ_U		80	85	-		
		θ_D		80	85	-		
	Hor.	θ_L	CR>110	65				
		θ_R		65				
	Ver.	θ_U		65				
		θ_D		65				
Luminance(Center)		Y_L		-	900	-	cd/m²	Note 1,4
Luminance Uniformity		BUNI		75	80	-	%	Note 5

Note (1)Definition of Viewing Angle：



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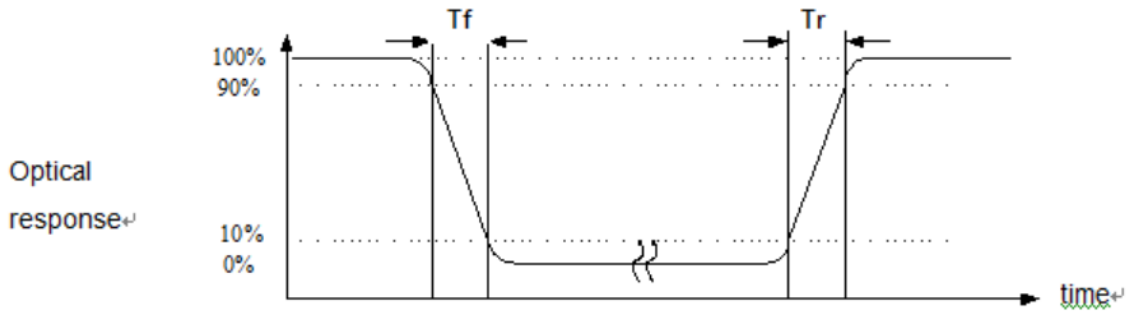
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Note(2) Definition of Contrast Ratio (CR)：

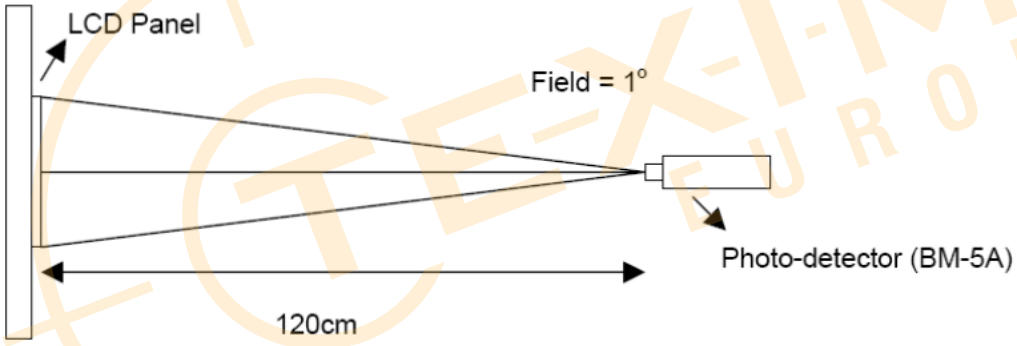
Measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

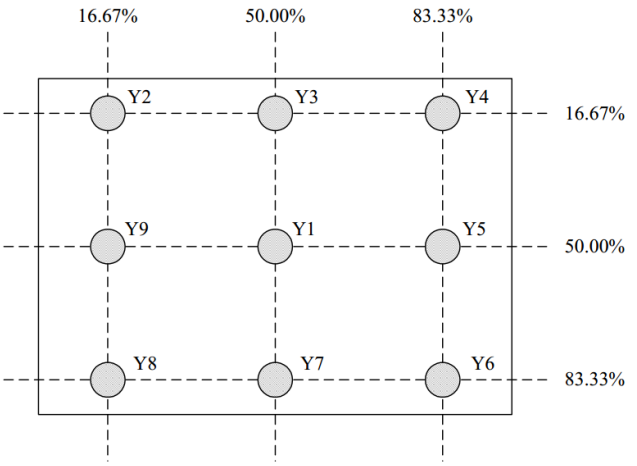
Note(3) Definition of Response Time ：Sum of T_R and T_F



Note(4) Definition of optical measurement setup：



Note (5) Definition of brightness uniformity：



$$\text{Luminance uniformity} = \frac{\text{(Min Luminance of 9 points)}}{\text{(Max Luminance of 9 points)}} \times 100\%$$

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9. TOUCH PANEL SPECIFICATIONS

9.1 Type :

9.2 STRUCTURE :

9.2.1 Thickness：2.0±0.2mm

9.2.1 Thickness ：2.0mm (Cover 1.1t / Sensor 0.7t / COF 0.2)

9.3 IC MODEL :

9.3.1 IC manufacture : EETI

9.3.2 IC part number : EXC81W46

9.3.3 Interface：USB

9.4 ELECTRICAL CHARACTERISTICS :

9.4.1 Operating Voltage : +5V

9.5 MECHANICAL CHARACTERISTICS :

9.5.1 Surface hardness：6H

9.6 OPTICAL CHARACTERISTICS :

9.6.1 Transparency：≧ 85%

9.6.2 Haze:TBD

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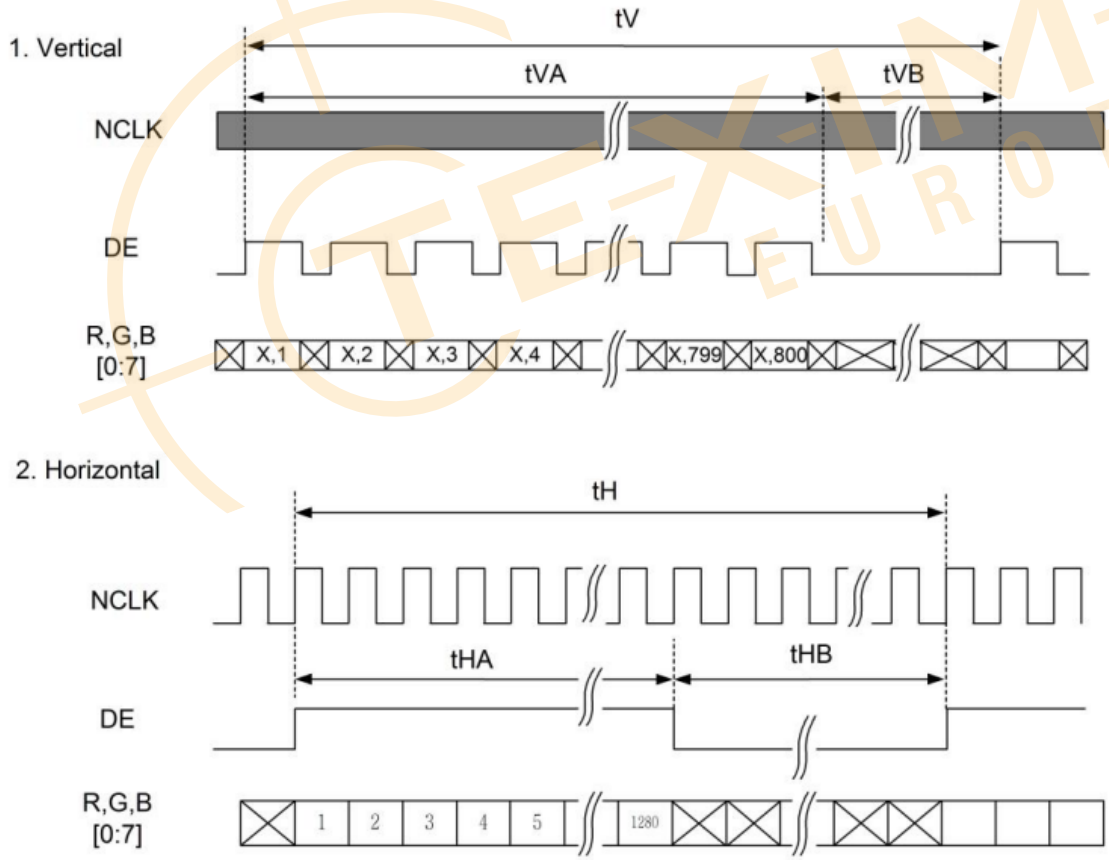
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10. TIMING SPECIFICATIONS

10.1 Interface Timing

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
DCLK frequency	fDCK	28	30	32	MHz	
Horizontal Display Time	tHA		800		Clock	
Horizontal Total Time	tH	890	902	915	Clock	
Horizontal Blanking Time	tHB	90	102	115	Clock	THB=THBP+THFP
Vertical Display Time	tVA		480		Line	
Vertical Total Time	tV	546	555	564	Line	
Vertical Blanking Time	tVB	66	75	84	Line	TVB=TVBP+TVFP
Frame rate	--	54	60	66	Hz	

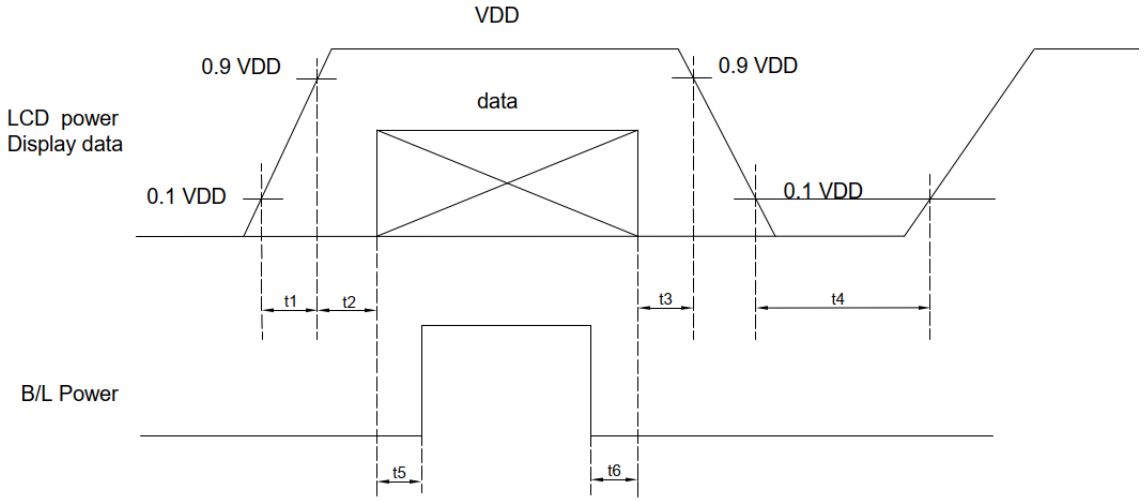
10.2 Timing Diagram of Interface Signal



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10.3 Power Sequence



ITEM	MIN.	MAX.	NOTE
t1	0.5	20	
t2	0	50	
t3	0	50	
t4	200	-	
t5	200	-	
t6	0	-	

UNIT: ms

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11. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	Ta= 85℃	240Hours	1,2,3,4
2	Low Temperature Storage	Ta= -30℃	240Hours	1,2,3,4
3	High Temperature Humidity Storage	65℃,90%RH	240Hours	1,2,3,4
4	High Temperature Operation	Ts= 85℃	240Hours	1,2,3,4
5	Low Temperature Operation	Ta= -30℃	240Hours	1,2,3,4,5
6	Temperature Cycle	-30℃~85℃	100 CYCLES	1,2,3

In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 1：Ta is the ambient temperature of samples.

Note 2：Ts is the temperature of panel's surface.

Note 3：Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

Note 4：Start with cold temperature and end with high temperature.

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12. PRECAUTIONS FOR USE

12.1 SAFETY

(1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
(2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
(3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

12.2 STORAGE CONDITIONS

(1) Store the panel or module in a dark place where the temperature is 23±5°C and the humidity is below 50±20%RH.
(2) Store in anti-static electricity container.
(3) Store in clean environment, free from dust, active gas, and solvent.
(4) Do not place the module near organics solvents or corrosive gases.
(5) Do not crush, shake, or jolt the module.

12.3 HANDLING PRECAUTIONS

(1) Avoid static electricity which can damage the CMOS LSI.
(2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
(3) Do not give external shock.
(4) Do not apply excessive force on the surface.
(5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
(6) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
(7) Do not operate it above the absolute maximum rating.
(8) Do not remove the panel or frame from the module.
(9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
(10) Wipe off water droplets or oil immediately . If you leave the droplets for a long time, staining and discoloration may occur.
(11) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

12.4 WARRANTY

(1) Acceptance inspection period. The period is within one month after the arrival of contracted commodity at the buyer's factory site.
(2) Applicable warrant period. The period is within 12 months since the date of shipping out under normal using and storage conditions.

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