TFT DISPLAY SPECIFICATION

WINSTAR Display Co.,Ltd.
華凌光電股份有限公司

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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WFN0210A2T0YADNA000

APPROVED BY: **(FOR CUSTOMER USE ONLY)**	**PCB VERSION: DATA:**

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
ISSUED DATE: 2025/07/11			

TFT Display Inspection Specification: https://www.winstar.com.tw/technology/download.html
Precaution in use of TFT module: https://www.winstar.com.tw/technology/download/declaration.html

MODLE NO：

RECORDS OF REVISION			DOC. FIRST ISSUE
VERSION	DATE	REVISED PAGE NO.	**SUMMARY**
0	2025/04/25		First issue
A	2025/06/13		Modify Color Chromaticity
B	2025/07/11		Remove Gesture Function

Contents

1.Module Classification Information

W	F	N	0210	A2	T	0Y	A	D	N	A	0	00
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬

①	Brand：WINSTAR DISPLAY CORPORATION					
②	Display Type：F→TFT Type, J→Custom TFT					
③	N: Normal　E：EFD　M：MIP					
④	Display Size：2.1” TFT					
⑤	Model serials no.					
⑥	Backlight Type：	F：	CCFL, White	T：	LED, White	
		S：	LED, High Light White	Z：	Nichia LED, White	
		N：	With out Backlight	A：	Front Light	

⑦ LCD Polarize Type/ Temperature range/ Gray Scale Inversion Direction

Operating Temperature	Normal temperature				Super Wide temperature					
LCD tape	TN		IPS	VA	TN				IPS	VA
View angle	6H	12H			6H	12H	O-Film	OD-Film		
Reflective	AA	-	-	AT	AN	-	-	-	AW	AV
Transflective	0B	0E	-	02	0M	0P	-	-	08	04
Transmissive	0C	0F	0A	0T	0N	0Q	0R	0S	0W	0V

Operating Temperature	Wide temperature									
LCD tape	TN								IPS	VA
View angle	6H	12H	2H	3H	9H	O-Film	OD-Film	All View		
Reflective	AG	AJ	AB	-	-	-	-	05	AY	AX
Transflective	0H	0K	-	0G	0D	0U	-	-	07	03
Transmissive	0I	0L	-	-	-	0Z	0J	-	0Y	0X

⑧	A：	TFT LCD	G：	TFT+ Screw holes
	B：	TFT+ Screw holes+ Control board	H：	TFT+ D/V board
	C：	TFT+ Screw holes + A/D board	I：	TFT+ Screw holes +D/V board
	D：	TFT+ Screw holes + A/D board + Control board	J：	TFT+ Power board
	E：	TFT+ Screw holes + Power board	Z：	TFT+ Power board (Embedded)
	F：	TFT+ Control board		

⑨	A：Analog	B：6-bits parallel	D：Digital	E：eDP
	L：LVDS	M：MIPI	S：SPI	

⑩ Interface:

A：8Bit	B：16Bit	E：eDP	H：HDMI	I：I2C Interface	M：MIPI
N：Without Control board	P：DP	R：RS232	S：SPI	U：USB	

⑪ TS:

A：	CTP + Optical bonding	B：	CTP + USB	C：	CTP
D：	CTP + USB + Optical bonding	E：	RTP + Optical bonding	F：	CG + Optical bonding
H：	CTP + Only G-sensor	J：	CTP + Only G-sensor + USB	L：	CTP+ Hover Touch
N：	Without TS	Q：	in-cell	R：	on-cell
T：	RTP	U：	CG	V：	in-cell + CG
W：	on-cell + CG				

⑫	Version:
⑬	Serial No.: Serial number (00~99)

2.General Specifications

Item	Dimension	Unit
Size	2.1	inch
Dot Matrix	480 x RGB x 480 (TFT)	dots
Module dimension	71.27 x 71.27 x 3.43	mm
Active area	53.28 x 53.28	mm
Pixel pitch	0.111 X 0.111	mm
LCD type	TFT, Normally Black, Transmissive	
Viewing Angle	85/85/85/85	
TFT Interface	3W SPI+RGB18bit	
Backlight Type	LED ,Normally White	
TFT Controller IC	ST7701 or Equivalent	
CTP Driver IC	CST826 or equivalent	
CTP Support Operation	Support single-finger touch	
CTP Interface	I2C	
CTP FW Version	0X10	
CTP Resolution	480 * 480	
With /Without TP	With CTP	
Surface	Glare	

*Color tone slight changed by temperature and driving voltage.

3.Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	℃
Storage Temperature	TST	-30	—	+80	℃

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. ≦ 60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃

4.Electrical Characteristics

4.1. Operating conditions

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Power supply Voltage		VCI	2.6	3.0	3.3	V	
CTP Power supply Voltage		TP_VCI	2.8	3.0	3.3	V	
Input Signal Voltage	Low Level	V_{IL}	0	-	0.3 x VCI	V	
	High Level	V_{IH}	0.7 x VCI	-	VCI	V	
Power supply Voltage		I_{VCI}	-	24	35	mA	VCI=3.3V, color bar pattern
CTP Power supply Current		I_{CTP_VCI}	-	10	20	mA	

LED driving conditions

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED current	-	-	20	25	mA	-
LED voltage	VLED+	-	12.8	14	V	Note 1
LED Life Time	-	30000	-	-	Hr	Note 2,3,4

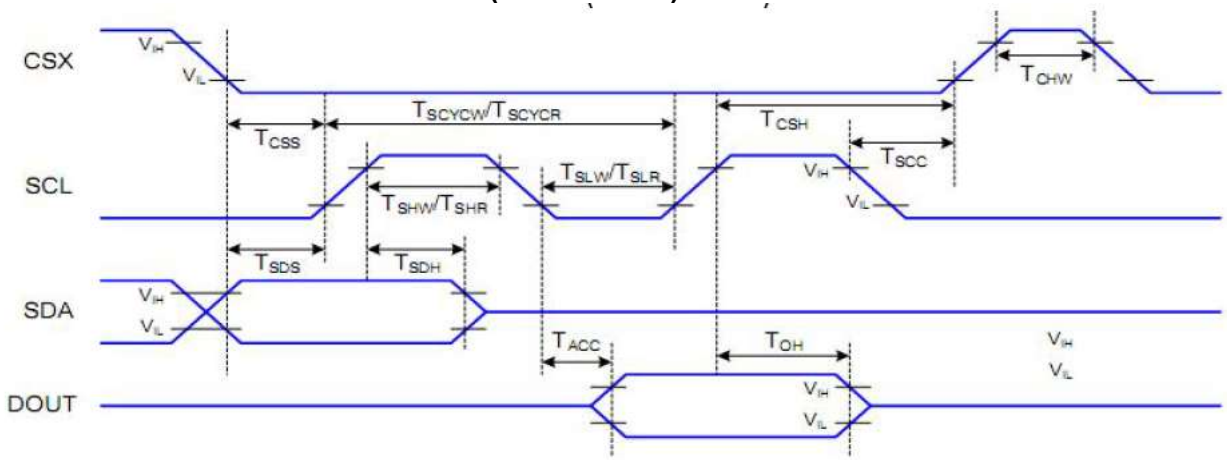
Note 1 : There are 1 Groups LED

Backlight Circuit

Note 2 : Ta = 25 ℃
Note 3 : Brightness to be decreased to 50% of the initial value
Note 4 : The single LED lamp case

5.Timing Chart

5.1. Serial Interface Characteristics (3-line serial):



VDD=2.8, AGND=DGND=0V, Ta=

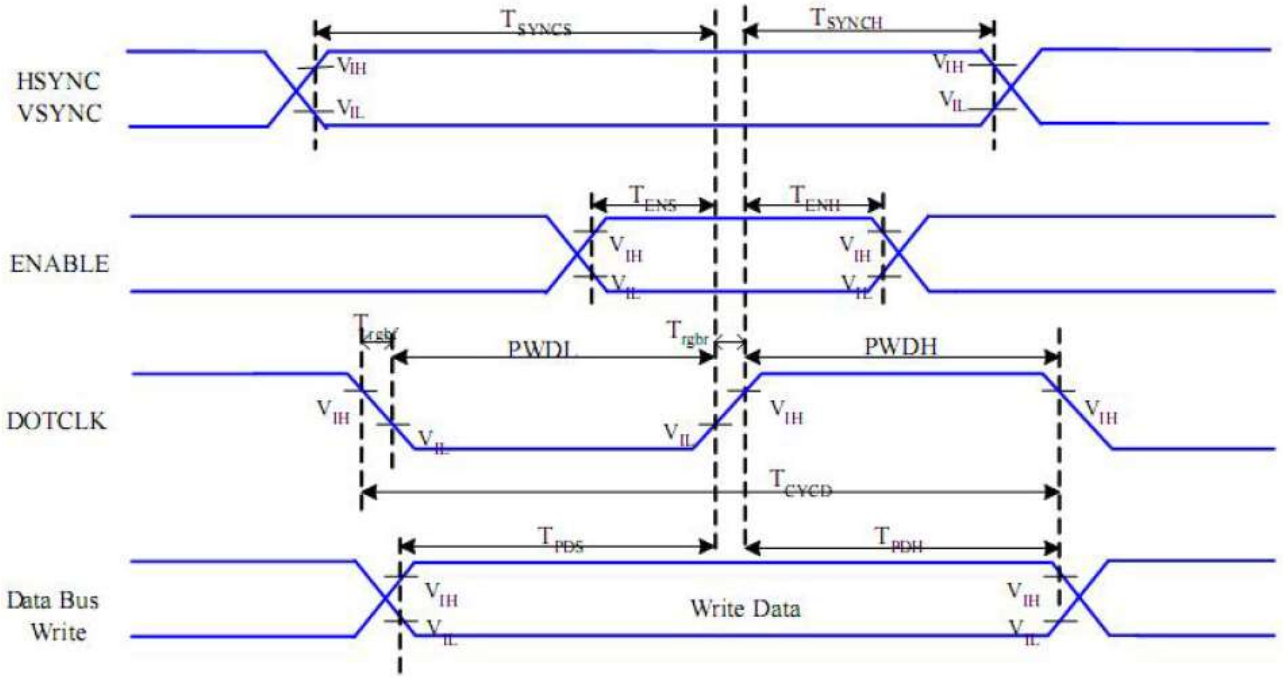
Signal	Symbol	Parameter	Min	Max	Unit	Description
CSX	T_{CSS}	Chip select setup time (write)	15		ns	
	T_{CSH}	Chip select hold time (write)	15		ns	
	T_{CSS}	Chip select setup time (read)	60		ns	
	T_{SCC}	Chip select hold time (read)	60		ns	
	T_{CHW}	Chip select "H" pulse width	40		ns	
SCL	T_{SCYCW}	Serial clock cycle (Write)	66		ns	
	T_{SHW}	SCL "H" pulse width (Write)	15		ns	
	T_{SLW}	SCL "L" pulse width (Write)	15		ns	
	T_{SCYCR}	Serial clock cycle (Read)	150		ns	
	T_{SHR}	SCL "H" pulse width (Read)	60		ns	
	T_{SLR}	SCL "L" pulse width (Read)	60		ns	
SDA (DIN)	T_{SDS}	Data setup time	10		ns	
	T_{SDH}	Data hold time	10		ns	

3-line serial Interface Characteristics

Note : The rising time and falling time (Tr, Tf) of input signal are specified at 15 ns or less. Logic high and low levels are specifie 30% and 70% of VDDI for Input signals.

5.2. RGB Interface Characteristics :

1. TFT-LCD Input Clock and Data timing Diagram

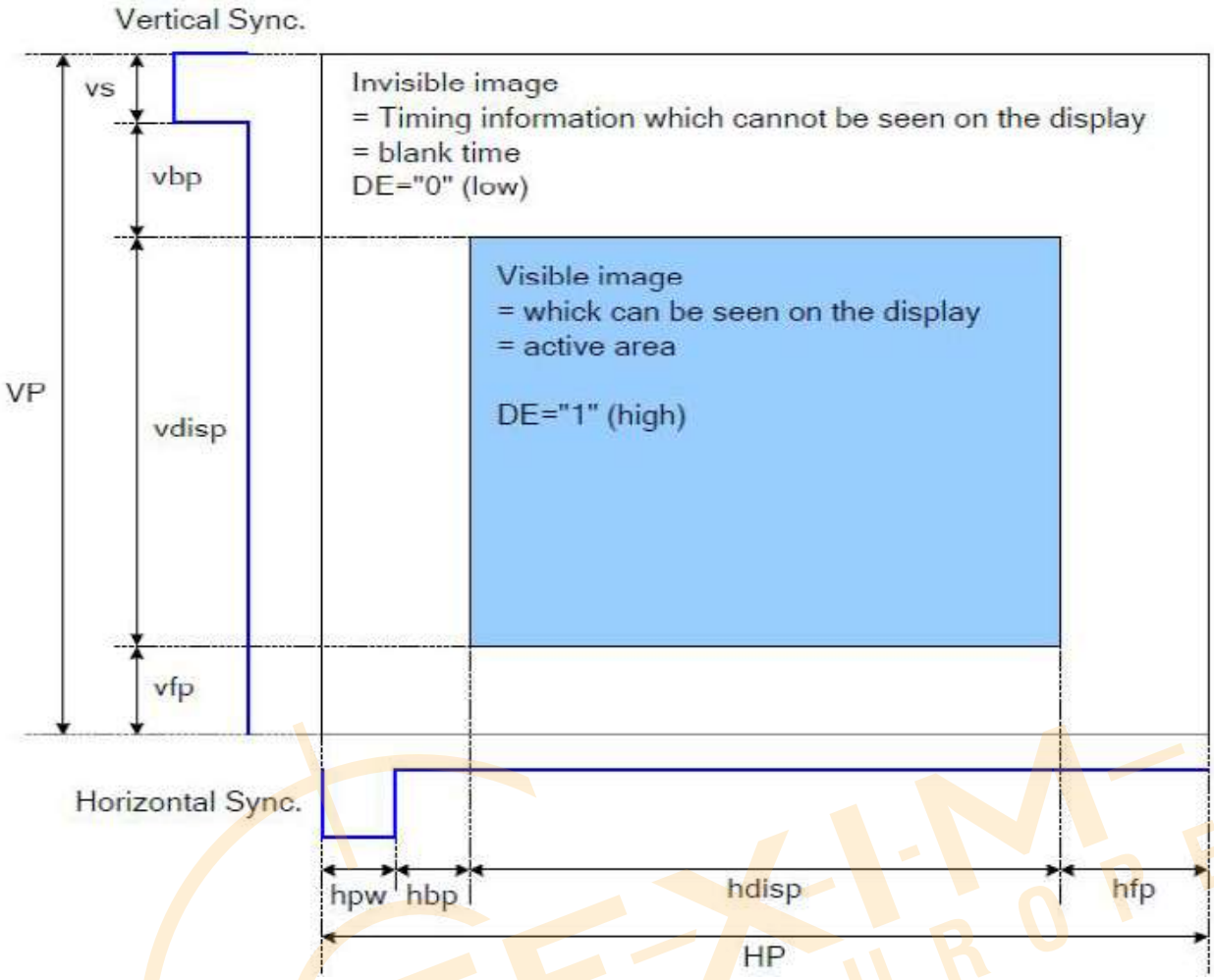


VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
HSYNC, VSYNC	T_{SYNCS}	VSYNC, HSYNC Setup Time	5	-	ns	
ENABLE	T_{ENS}	Enable Setup Time	5	-	ns	
	T_{ENH}	Enable Hold Time	5	-	ns	
DOTCLK	PWDH	DOTCLK High-level Pulse Width	15	-	ns	
	PWDL	DOTCLK Low-level Pulse Width	15	-	ns	
	T_{CYCD}	DOTCLK Cycle Time	33	-	ns	
	Trghr, Trghf	DOTCLK Rise/Fall time	-	15	ns	
DB	T_{PDS}	PD Data Setup Time	5	-	ns	
	T_{PDH}	PD Data Hold Time	5	-	ns	

18Bits RGB Interface Timing Characteristics

2. Recommended Timing Setting of TCON



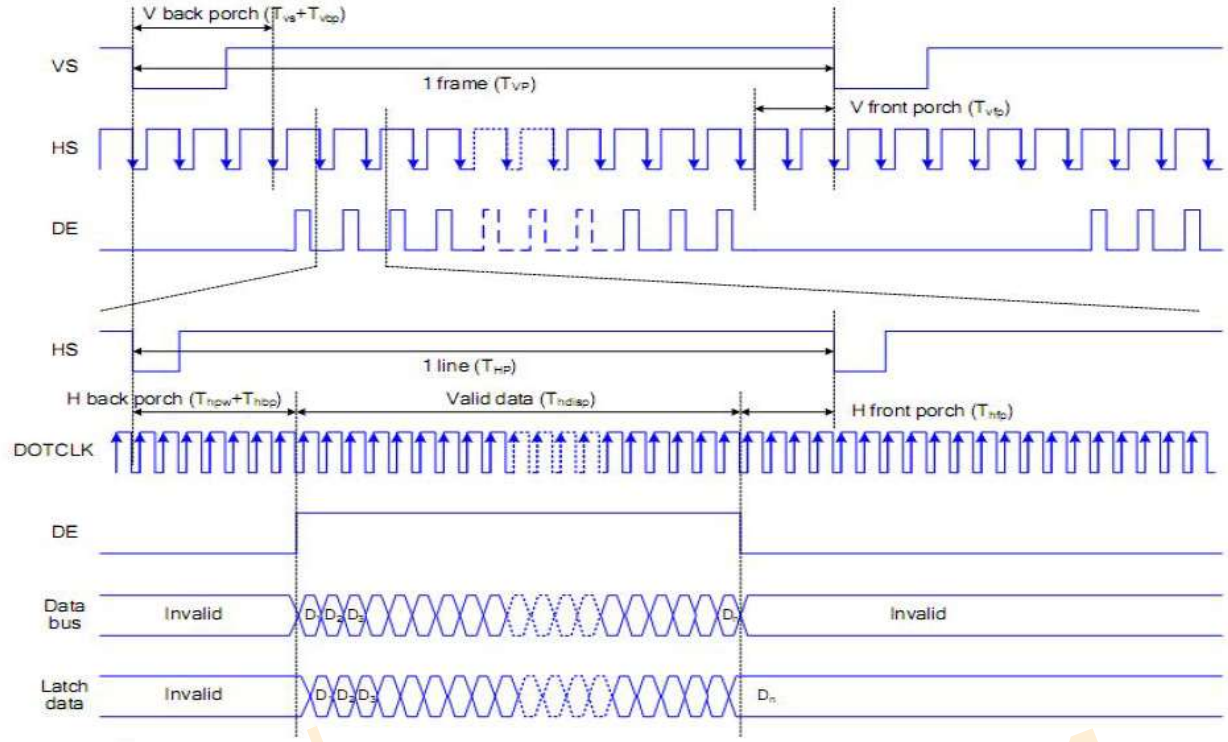
2.1 TCON (Embedded in Source IC) Input Timing (DCLK, HS, VS, DE)

VCC=2.8V, GND=0V, Ta=25℃

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK	Fclk	10	17	30	MHz	
	tclk	33	58.8	100	ns	
HSD	hdisp	480	480	480	tclk	
	hpw	2	25	255	tclk	
	hbp	2	30	255	tclk	
	hfp	2	4	--	tclk	
VSD	vdisp	480	480	480	th	
	vs	2	8	254	th	
	vbp	2	20	254	th	
	vfp	2	15	--	th	

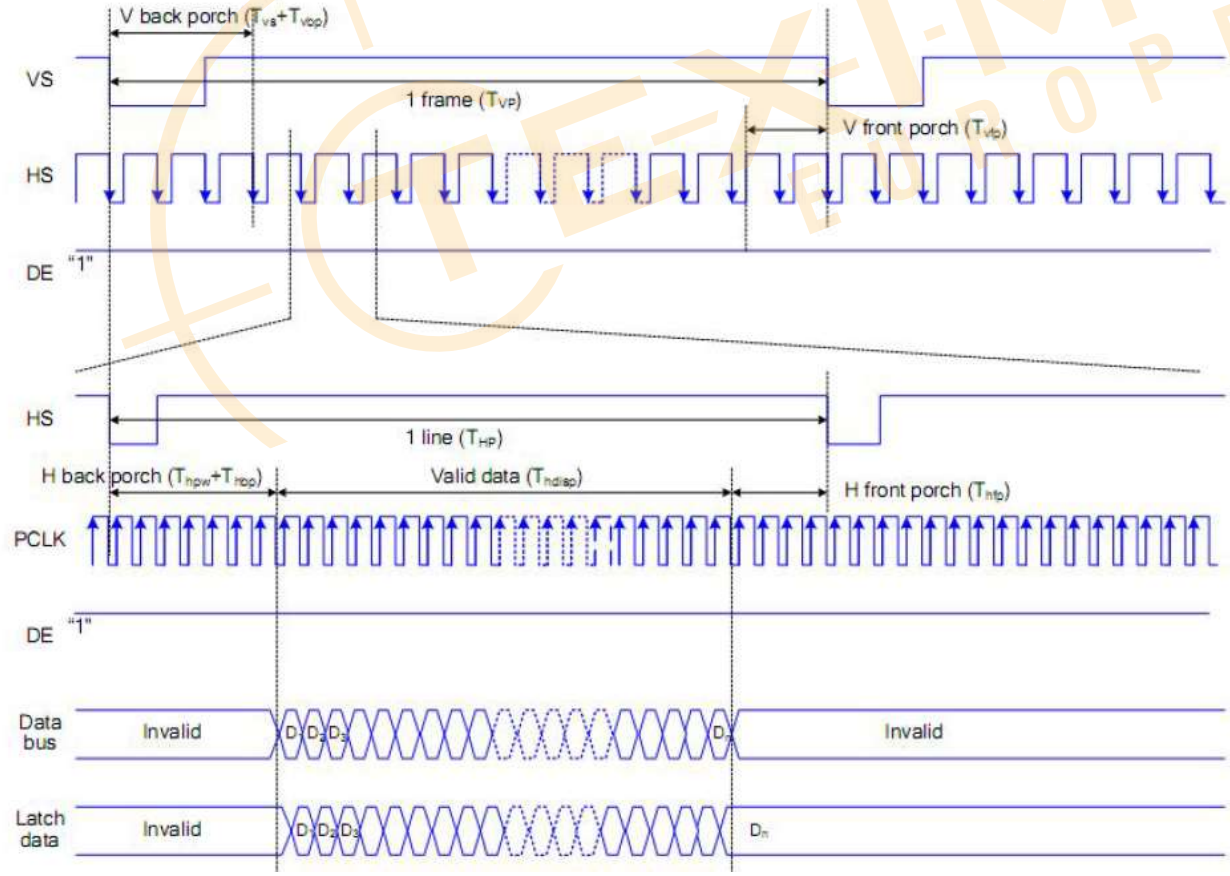
Note: For reference only, it needs to be adjusted according to the actual display effect

2.2 The timing chart of RGB interface DE mode is shown as follows

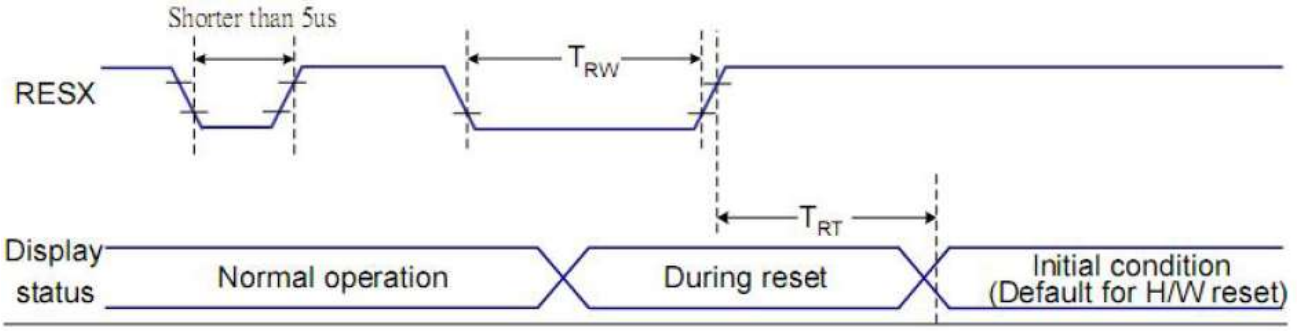


Note: The setting of front porch and back porch in host must match that in IC as this mode.

2.3 The timing chart of RGB interface HV mode is shown as follows.



5.3. Reset input timing



VDD=2.8, AGND=DGND=0V, Ta=25

Related Pins	Symbol	Parameter	MIN	MAX	Unit
RESX	TRW	Reset pulse duration	10	-	us
	TRT	Reset cancel	-	5 (Note 1, 5)	ms
				120(Note 1, 6, 7)	ms

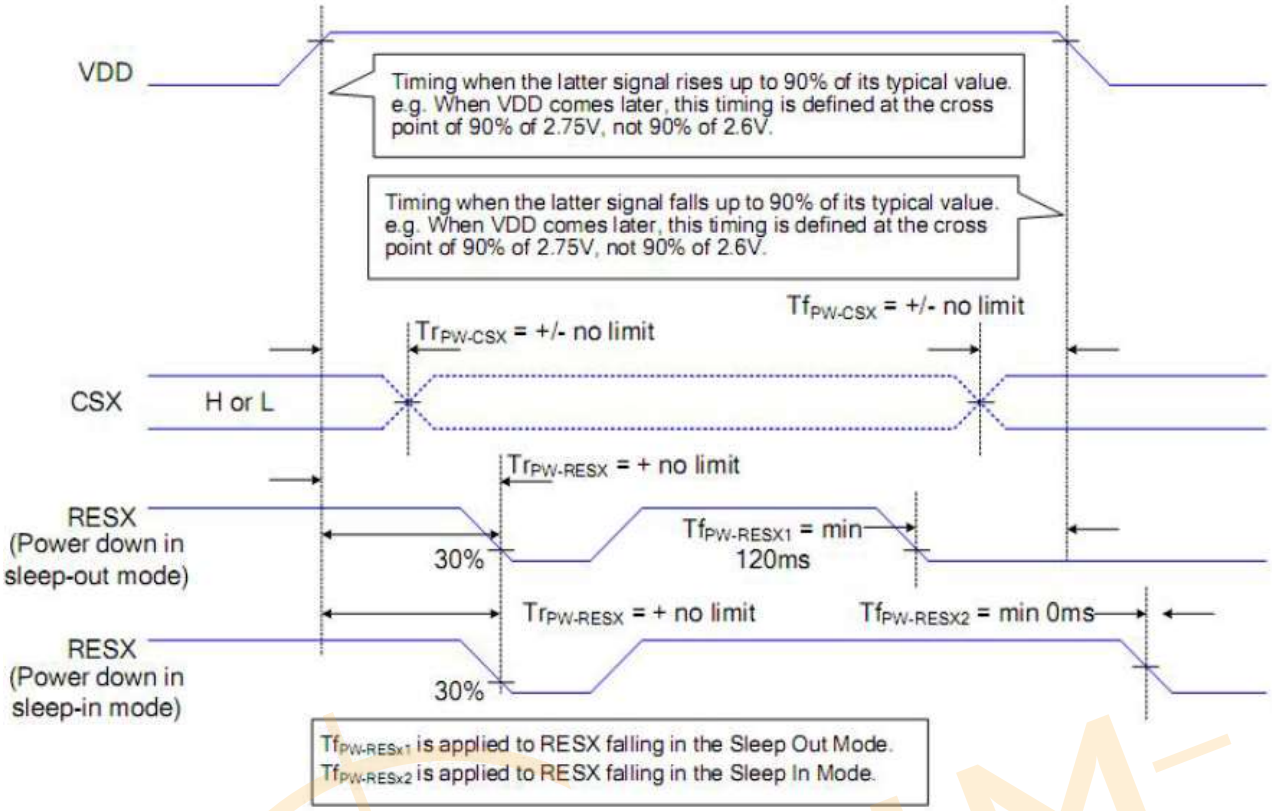
Notes:

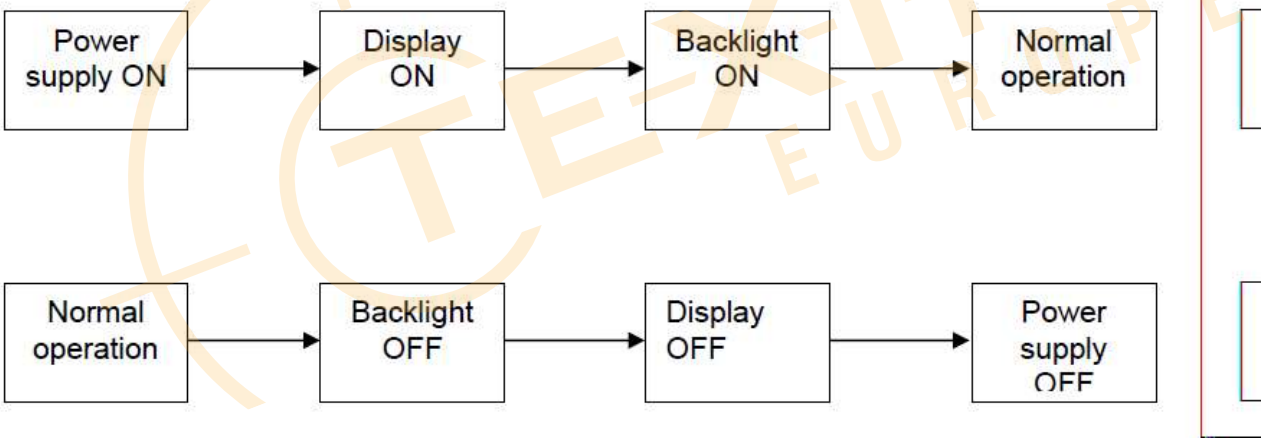
1. The reset cancel includes also required time for loading ID bytes, VCOM setting and other settings from NVM (or similar device) to registers. This loading is done every time when there is HW reset cancel time (tRT) within 5 ms after a rising edge of RESX.
2. Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below:

RESX Pulse	Action
Shorter than 5us	Reset Rejected
Longer than 9us	Reset
Between 5us and 9us	Reset starts

3. During the Resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode.) and then return to Default condition for Hardware Reset.
4. When Reset applied during Sleep In Mode.
5. When Reset applied during Sleep Out Mode.
6. It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

5.4. Power On/Off Sequence (VCI=VDD)





6.Optical Characteristics

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr+ Tf	θ=0°、Φ=0°	-	30	35	.ms	Note 3
Contrast ratio		CR	At optimized viewing angle	800	1000	-	-	Note 4
Color Chromaticity	White	Wx	θ=0°、Φ=0	0.253	0.303	0.353	-	Note 2,5,6
		Wy		0.282	0.332	0.382	-	
Viewing angle (Gray Scale Inversion Direction)	Hor.	ΘR	CR≧10	80	85	-	Deg.	Note 1
		ΘL		80	85	-		
	Ver.	ΦT		80	85	-		
		ΦB		80	85	-		
Brightness		-	-	360	430	-	cd/m²	Center of display
Uniformity		(U)	-	75	-	-	%	Note 5

Ta=25±2℃,

Note 1: Definition of viewing angle range

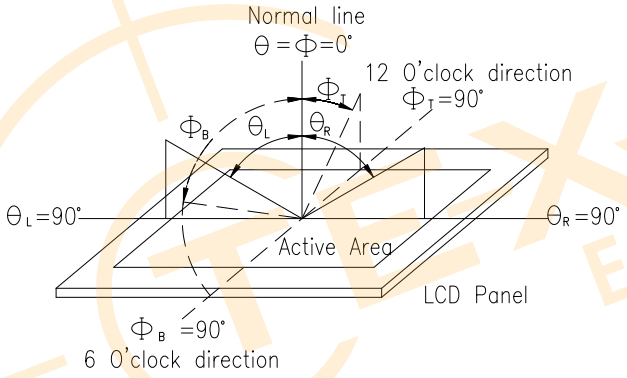


Fig. 6.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

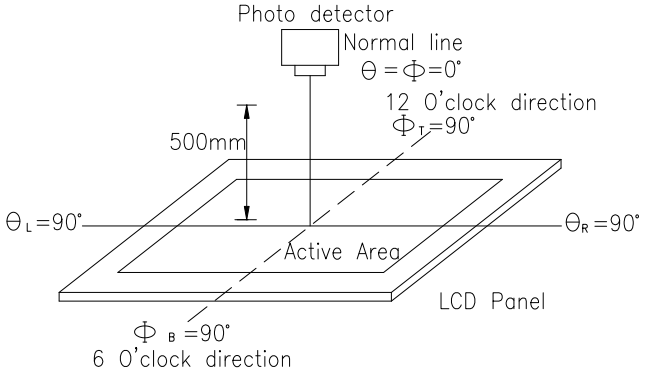
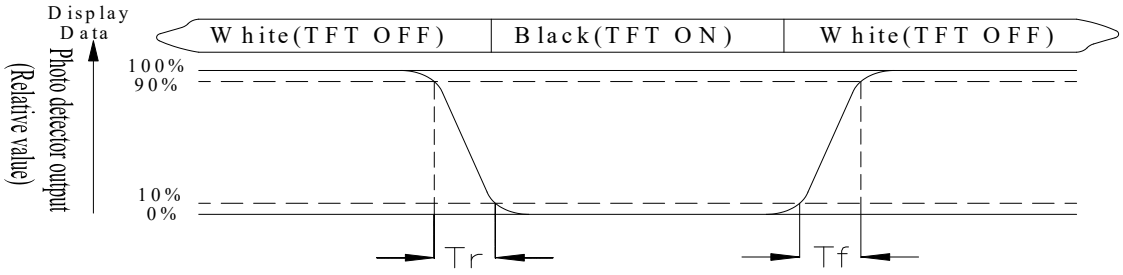


Fig. 6.2. Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time, Tr, is the time between photo detector output intensity changed from 90%to 10%. And fall time, Tf, is the time between photo detector output intensity changed from 10%to 90%



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (reference the picture in below). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/Lmax x100%

L = Active area length

W = Active area width

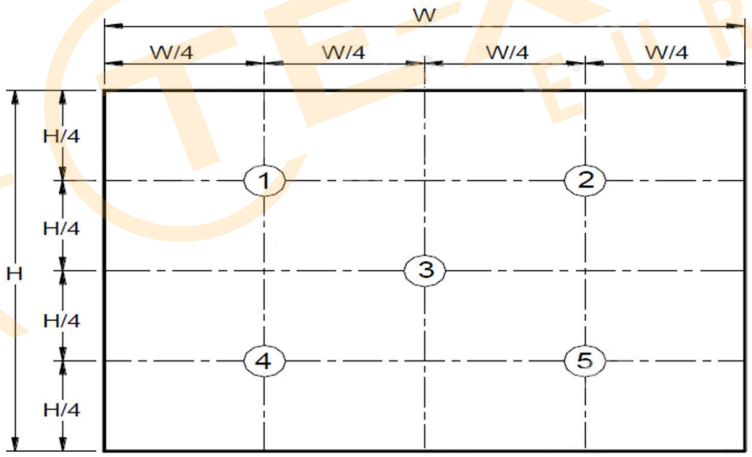


Fig6.3. Definition of uniformity

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

7.Interface

7.1. LCM PIN Definition

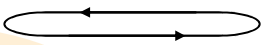
Match connector: XF2M-4015-1A（OMRON）or equivalent.

PIN No	Symbol	I/O	Description	Remark
1	VLED+	P	LED ANODE	
2	VLED-	P	LED CATHODE	
3	VLED-	P	LED CATHODE	
4	GND	P	Ground	
5	VCI	P	Power supply (VCI=VDD=VCC=VDDI)	
6	RESET	I	Reset Signal ,Active Low (RESX)	
7	NC	-	No connect.	
8	NC	-	No connect.	
9	SDA	I	SPI Data signal (In: DIN, Out: DOUT)	
10	SCK	I	SPI Clock signal (SCL)	
11	CS	I	SPI Chip select signal (CSX)	
12	PCLK	I	RGB dot clock signal (DOTCLK)	
13	DE	I	RGB data enable signal (ENABLE)	
14	VSYNC	I	RGB frame synchronizing signal (VS)	
15	HSYNC	I	RGB line synchronizing signal (HS)	
16~33	DB0~DB17	I	RGB data signal: DB0:BLUE LSB--DB5:BLUE MSB; DB6:GREEN LSB--DB11:GREEN,MSB; DB12:RED LSB--DB17:RED MSB.	
34	GND	P	Ground	
35	TP_INT	-	Touch Interrupt	
36	TP_SDA	-	Touch IIC Data signal	
37	TP_SCL	-	Touch IIC Clock signal	
38	TP_RESET	-	Touch Reset Signal	
39	TP_VCI	-	Touch Power supply	
40	GND	P	Ground	

I：Input, O：Output, P：Power/Ground

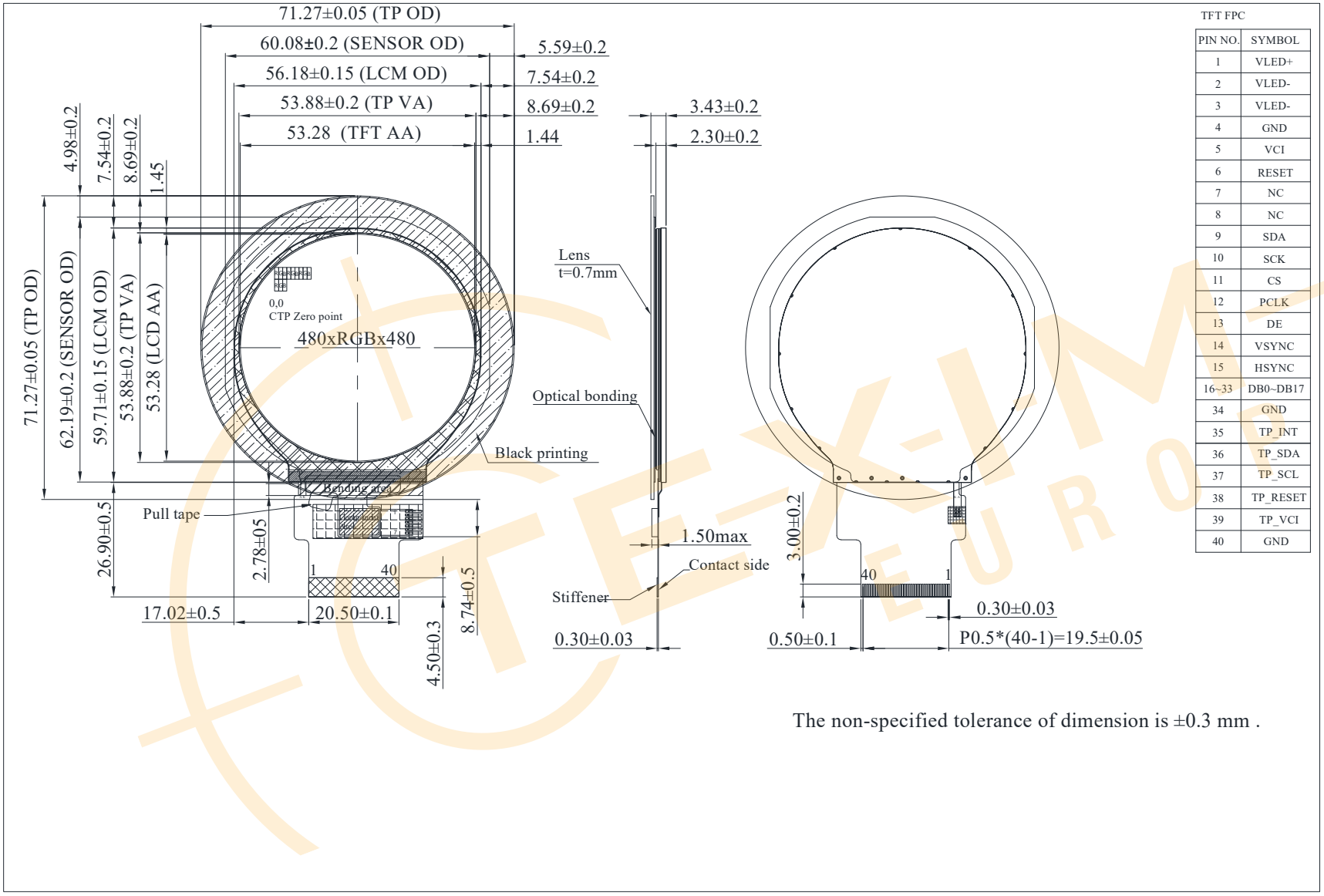
8.Reliability

Content of Reliability Test (Wide temperature, -20℃~70℃)

Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Note**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80℃ 240hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30℃ 240hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70℃ 240hrs	2
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20℃ 240hrs	1,2
High Temperature/ Humidity storage	The module should be allowed to stand at 60℃,90%RH max	60℃,90%RH 240hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of storage -30℃ 25℃ 70℃  30min 5min 30min 1 cycle	-30℃/70℃ 10 cycles	2
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±4KV(contact), ±4KV(air), RS=330Ω CS=150pF 5 times	4

Note1: No dew condensation to be observed.
Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.
Note3: The packing have to including into the vibration testing.
Note4: Endurance test applying the electric stress to the finished product housing

9.Contour Drawing



TFT FPC

PIN NO.	SYMBOL
1	VLED+
2	VLED-
3	VLED-
4	GND
5	VCI
6	RESET
7	NC
8	NC
9	SDA
10	SCK
11	CS
12	PCLK
13	DE
14	VSYNC
15	HSYNC
16~33	DB0~DB17
34	GND
35	TP_INT
36	TP_SDA
37	TP_SCL
38	TP_RESET
39	TP_VCI
40	GND

The non-specified tolerance of dimension is ±0.3 mm .

10.Initial Code For Reference

```
void ST7701_Initial_code(void)
{
    SPI_WrCmd(0xFF);
    SPI_WriteData(0x77);
    SPI_WriteData(0x01);
    SPI_WriteData(0x00);
    SPI_WriteData(0x00);
    SPI_WriteData(0x10);

    SPI_WrCmd(0xC0);
    SPI_WriteData(0x3B);
    SPI_WriteData(0x00);

    SPI_WrCmd(0xC1);
    SPI_WriteData(0x0B);
    SPI_WriteData(0x02);

    SPI_WrCmd(0xC2);
    SPI_WriteData(0x00);
    SPI_WriteData(0x02);


    SPI_WrCmd(0xCC);
    SPI_WriteData(0x10);

    SPI_WrCmd(0xCD);
    SPI_WriteData(0x08);

    SPI_WrCmd(0xB0);
    SPI_WriteData(0x00);
    SPI_WriteData(0x1D);
    SPI_WriteData(0x29);
```

```
SPI_WriteData(0x12);
SPI_WriteData(0x17);
SPI_WriteData(0x0B);
SPI_WriteData(0x18);
SPI_WriteData(0x09);
SPI_WriteData(0x08);
SPI_WriteData(0x2A);
SPI_WriteData(0x06);
SPI_WriteData(0x14);
SPI_WriteData(0x11);
SPI_WriteData(0x19);
SPI_WriteData(0x1C);
SPI_WriteData(0x18);

SPI_WrCmd(0xB1);
SPI_WriteData(0x00);
SPI_WriteData(0x1D);
SPI_WriteData(0x29);
SPI_WriteData(0x12);
SPI_WriteData(0x16);
SPI_WriteData(0x0A);
SPI_WriteData(0x18);
SPI_WriteData(0x08);
SPI_WriteData(0x09);
SPI_WriteData(0x2A);
SPI_WriteData(0x07);
SPI_WriteData(0x13);
SPI_WriteData(0x12);
SPI_WriteData(0x19);
SPI_WriteData(0x1D);
SPI_WriteData(0x18);

SPI_WrCmd(0xFF);
SPI_WriteData(0x77);
```

```
SPI_WriteData(0x01);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x11);

SPI_WrCmd(0xB0);
SPI_WriteData(0x5D);

SPI_WrCmd(0xB1);
SPI_WriteData(0x43);

SPI_WrCmd(0xB2);
SPI_WriteData(0x81);

SPI_WrCmd(0xB3);
SPI_WriteData(0x80);

SPI_WrCmd(0xB5);
SPI_WriteData(0x43);

SPI_WrCmd(0xB7);
SPI_WriteData(0x85);

SPI_WrCmd(0xB8);
SPI_WriteData(0x20);

SPI_WrCmd(0xC1);
SPI_WriteData(0x78);

SPI_WrCmd(0xC2);
SPI_WriteData(0x78);

SPI_WrCmd(0xD0);
SPI_WriteData(0x88);
```

```
SPI_WrCmd(0xE0);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x02);

SPI_WrCmd(0xE1);
SPI_WriteData(0x03);
SPI_WriteData(0xA0);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x04);
SPI_WriteData(0xA0);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x20);
SPI_WriteData(0x20);

SPI_WrCmd(0xE2);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);

SPI_WrCmd(0xE3);
```

```
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x11);
SPI_WriteData(0x00);

SPI_WrCmd(0xE4);
SPI_WriteData(0x22);
SPI_WriteData(0x00);

SPI_WrCmd(0xE5);
SPI_WriteData(0x05);
SPI_WriteData(0xEC);
SPI_WriteData(0xA0);
SPI_WriteData(0xA0);
SPI_WriteData(0x07);
SPI_WriteData(0xEE);
SPI_WriteData(0xA0);
SPI_WriteData(0xA0);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);

SPI_WrCmd(0xE6);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x11);
SPI_WriteData(0x00);

SPI_WrCmd(0xE7);
```

```
SPI_WriteData(0x22);
SPI_WriteData(0x00);

SPI_WrCmd(0xE8);
SPI_WriteData(0x06);
SPI_WriteData(0xED);
SPI_WriteData(0xA0);
SPI_WriteData(0xA0);
SPI_WriteData(0x08);
SPI_WriteData(0xEF);
SPI_WriteData(0xA0);
SPI_WriteData(0xA0);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);

SPI_WrCmd(0xEB);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x40);
SPI_WriteData(0x40);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x00);

SPI_WrCmd(0xED);
SPI_WriteData(0xFF);
SPI_WriteData(0xFF);
SPI_WriteData(0xFF);
```

```
SPI_WriteData(0xAB);
SPI_WriteData(0x0A);
SPI_WriteData(0xBF);
SPI_WriteData(0x45);
SPI_WriteData(0xFF);
SPI_WriteData(0xFF);
SPI_WriteData(0x54);
SPI_WriteData(0xFB);
SPI_WriteData(0xA0);
SPI_WriteData(0xBA);
SPI_WriteData(0xFF);
SPI_WriteData(0xFF);
SPI_WriteData(0xFF);

SPI_WrCmd(0xEF);
SPI_WriteData(0x10);
SPI_WriteData(0x0D);
SPI_WriteData(0x04);
SPI_WriteData(0x08);
SPI_WriteData(0x3F);
SPI_WriteData(0x1F);

SPI_WrCmd(0xFF);
SPI_WriteData(0x77);
SPI_WriteData(0x01);
SPI_WriteData(0x00);
SPI_WriteData(0x00);
SPI_WriteData(0x13);

SPI_WrCmd(0xEF);
SPI_WriteData(0x08);

SPI_WrCmd(0xFF);
SPI_WriteData(0x77);
```

```
    SPI_WriteData(0x01);
    SPI_WriteData(0x00);
    SPI_WriteData(0x00);
    SPI_WriteData(0x00);

    SPI_WrCmd(0x11);
    delay(120);

    SPI_WrCmd(0x29);

    SPI_WrCmd(0x36);
    SPI_WriteData(0x10);

    SPI_WrCmd(0x3A);
    SPI_WriteData(0x60);

    delay(20);

}
```

winstar **LCM Sample Estimate Feedback Sheet**

Module Number： _____ **Page: 1**

1、Panel Specification：

1.	Panel Type：	□ Pass	□ NG , _____
2.	View Direction：	□ Pass	□ NG , _____
3.	Numbers of Dots：	□ Pass	□ NG , _____
4.	View Area：	□ Pass	□ NG , _____
5.	Active Area：	□ Pass	□ NG , _____
6.	Operating Temperature：	□ Pass	□ NG , _____
7.	Storage Temperature：	□ Pass	□ NG , _____
8.	Others： _____		

2、Mechanical

1.	PCB Size：	□ Pass	□ NG , _____
2.	Frame Size：	□ Pass	□ NG , _____
3.	Material of Frame：	□ Pass	□ NG , _____
4.	Connector Position：	□ Pass	□ NG , _____
5.	Fix Hole Position：	□ Pass	□ NG , _____
6.	Backlight Position：	□ Pass	□ NG , _____
7.	Thickness of PCB：	□ Pass	□ NG , _____
8.	Height of Frame to PCB：	□ Pass	□ NG , _____
9.	Height of Module：	□ Pass	□ NG , _____
10.	Others：	□ Pass	□ NG , _____

3、Relative Hole Size：

1.	Pitch of Connector：	□ Pass	□ NG , _____
2.	Hole size of Connector：	□ Pass	□ NG , _____
3.	Mounting Hole size：	□ Pass	□ NG , _____
4.	Mounting Hole Type：	□ Pass	□ NG , _____
5.	Others：	□ Pass	□ NG , _____

4、Backlight Specification：

1.	B/L Type：	□ Pass	□ NG , _____
2.	B/L Color：	□ Pass	□ NG , _____
3.	B/L Driving Voltage (Reference for LED Type)：	□ Pass	□ NG , _____
4.	B/L Driving Current：	□ Pass	□ NG , _____
5.	Brightness of B/L：	□ Pass	□ NG , _____
6.	B/L Solder Method：	□ Pass	□ NG , _____
7.	Others：	□ Pass	□ NG , _____

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5、Electronic Characteristics of Module：

1.	Input Voltage：	□ Pass	□ NG ,_____
2.	Supply Current：	□ Pass	□ NG ,_____
3.	Driving Voltage for LCD：	□ Pass	□ NG ,_____
4.	Contrast for LCD：	□ Pass	□ NG ,_____
5.	B/L Driving Method：	□ Pass	□ NG ,_____
6.	Negative Voltage Output：	□ Pass	□ NG ,_____
7.	Interface Function：	□ Pass	□ NG ,_____
8.	LCD Uniformity：	□ Pass	□ NG ,_____
9.	ESD test：	□ Pass	□ NG ,_____
10.	Others：	□ Pass	□ NG ,_____

6、Summary：

Sales signature：_____

Customer Signature：_____ **Date：** ____/____/____

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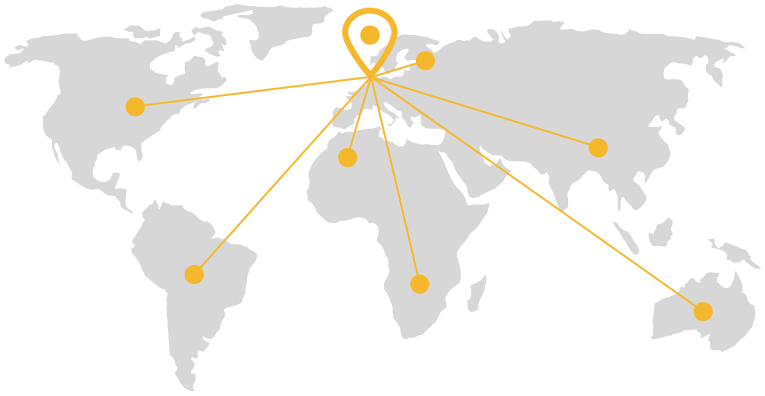

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