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TFT DISPLAY SPECIFICATION



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司



Winstar Display Co., LTD
華凌光電股份有限公司



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SPECIFICATION

CUSTOMER : _____

MODULE NO.: **WFN0200A2T07ADNN000**

APPROVED BY: (FOR CUSTOMER USE ONLY)	PCB VERSION: _____ DATA: _____
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
ISSUED DATE: 2025/05/05			

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>



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華凌光電股份有限公司

MODLE NO :

RECORDS OF REVISION

DOC. FIRST ISSUE

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2025/05/05		First issue



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1.Module Classification Information

W	F	N	0200	A2	T	07	A	D	N	N	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 : 2.0" 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									
		View angle		6H	12H	2H	3H	9H	O-Film	OD-Film	All View	IPS	VA
		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.Summary

This is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This module is composed of a Transflective type TFT-LCD Panel, driver circuit, back-light unit. The resolution of a 2.0 " TFT-LCD contains 240x320 pixels, and can display up to 65K/262K colors.



3.General Specifications

Item	Dimension	Unit
Size	2.0	inch
Dot Matrix	240 x RGB x 320 (TFT)	dots
Module dimension	35.8 x 52.1 x 2.65	mm
Active area	30.6 x 40.8	mm
Pixel pitch	0.1275 X 0.1275	mm
LCD type	TFT, Normally Black, Transflective	
Viewing Angle	80/80/80/80	
TFT Interface	3/4serial 8/9/16/18bit MCU 3/4SPI+16/18BIT RGB	
Backlight Type	LED ,Normally White	
TFT Controller IC	ST7789 or Equivalent	
With /Without TP	Without TP	
Surface	Glare	

*Color tone slight changed by temperature and driving voltage.

4. Absolute Maximum Ratings

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

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

1. Temp. $\leq 60^{\circ}\text{C}$, 90% RH MAX. Temp. $> 60^{\circ}\text{C}$, Absolute humidity shall be less than 90% RH at 60°C



5. Electrical Characteristics

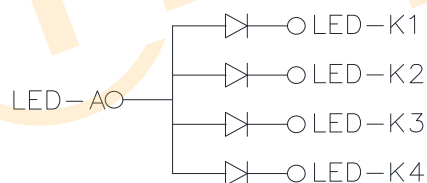
5.1. Operating conditions

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Note
Digital Supply Voltage	VCI	2.5	3.3	3.6	V	
Digital interface supply Voltage	IOVCC	1.65	1.8	3.3	V	
Normal mode Current consumption	IDD	--	6	12	mA	
Level input voltage	VIH	0.7IOVCC		IOVCC	V	
	VIL	GND		0.3IOVCC	V	
Level output voltage	VOH	0.8IOVCC		IOVCC	V	
	VOL	GND		0.2IOVCC	V	

LED driving conditions

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED current	-	60	80	-	mA	-
LED voltage	VLED+	2.8	3.2	3.3	V	Note 1
LED Life Time	-	50,000	-	-	Hr	Note 2,3,4

Note 1 : There are 1 Groups LED



BL CIRCUIT DIAGRAM

Note 2 : $T_a = 25\text{ }^{\circ}\text{C}$

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

6.AC Characteristic

6.1. 8080 Series MCU Parallel Interface Timing Characteristics: 18/16/9/8-bit Bus

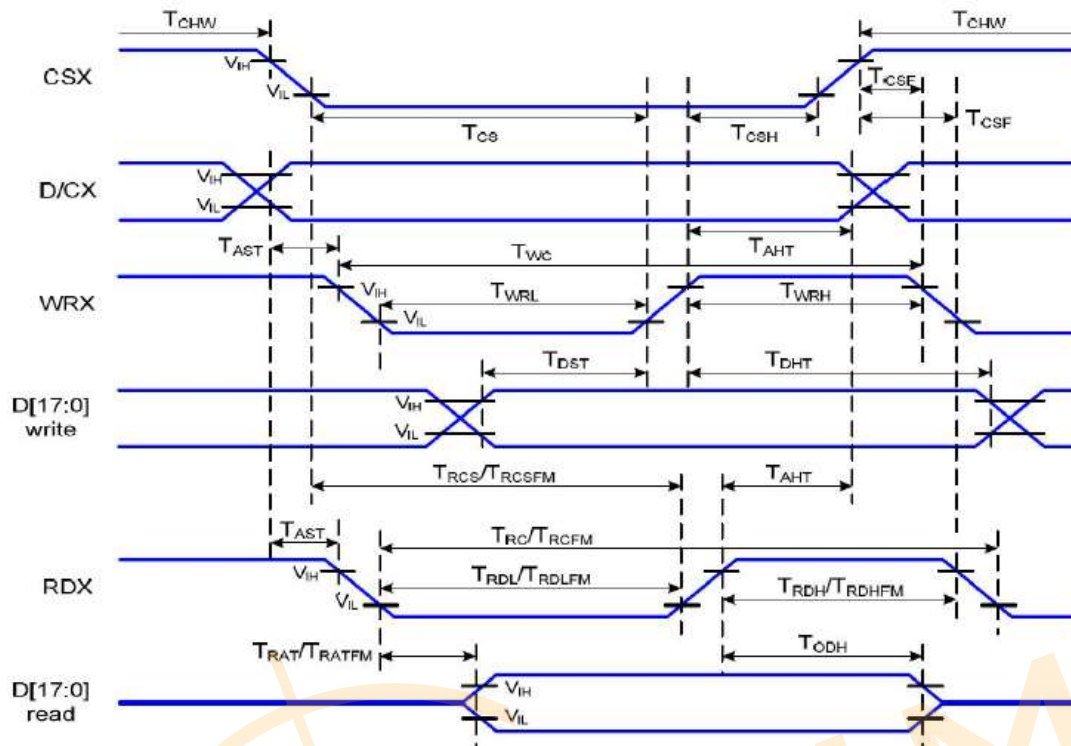


Figure 1 Parallel Interface Timing Characteristics (8080-Series MCU Interface)

$V_{DDI}=1.65$ to $3.3V$, $V_{DD}=2.4$ to $3.3V$, $AGND=DGND=0V$, $T_a = -30$ to $70\text{ }^{\circ}C$

Signal	Symbol	Parameter	Min	Max	Unit	Description
D/CX	T_{AST}	Address setup time	0		ns	
	T_{AHT}	Address hold time (Write/Read)	10		ns	
CSX	T_{CHW}	Chip select "H" pulse width	0		ns	
	T_{CS}	Chip select setup time (Write)	15		ns	
	T_{RCS}	Chip select setup time (Read ID)	45		ns	
	T_{RCSFM}	Chip select setup time (Read FM)	355		ns	
	T_{CSF}	Chip select wait time (Write/Read)	10		ns	
	T_{CSH}	Chip select hold time	10		ns	
WRX	T_{WC}	Write cycle	66		ns	
	T_{WRH}	Control pulse "H" duration	15		ns	
	T_{WRL}	Control pulse "L" duration	15		ns	
RDX(ID)	T_{RC}	Read cycle (ID)	160		ns	When read ID data
	T_{RDH}	Control pulse "H" duration (ID)	90		ns	
	T_{RDL}	Control pulse "L" duration (ID)	45		ns	

RDX(FM)	T_{RCFM}	Read cycle (FM)	450		ns	When read from frame memory
	T_{RDHFM}	Control pulse "H" duration(FM)	90		ns	
	T_{RDLFM}	Control pulse "L" duration(FM)	355		ns	
DB[17:0]	T_{DST}	Data setup time	10		ns	For CL=30pF
	T_{DHT}	Data hold time	10		ns	
	T_{RAT}	Read access time (ID)		40	ns	
	T_{RATFM}	Read access time (FM)		340	ns	
	T_{ODH}	Output disable time	20	80	ns	

Table 1 8080 Parallel Interface Characteristics

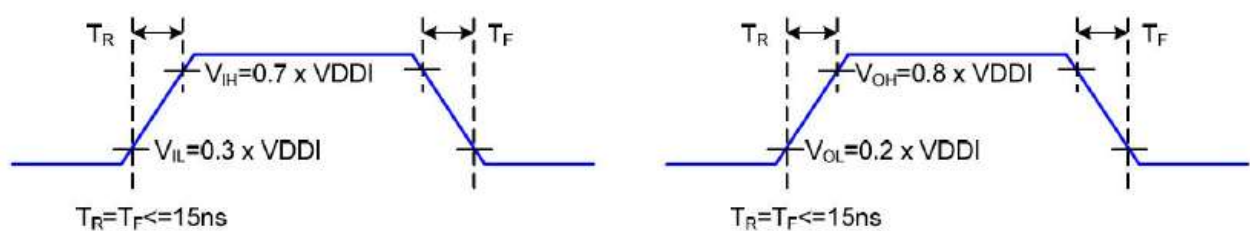


Figure 2 Rising and Falling Timing for I/O Signal

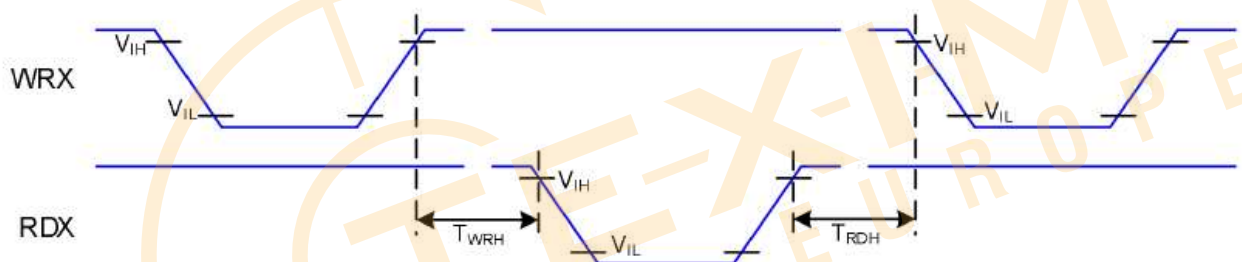


Figure 3 Write-to-Read and Read-to-Write Timing

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

6.2. Display Serial Interface Timing Characteristics (3-line SPI system)

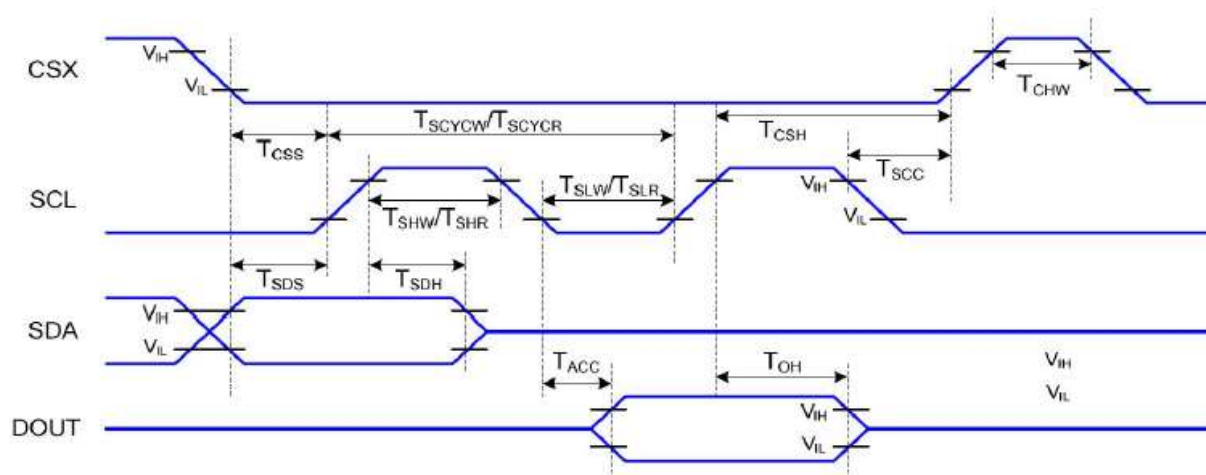


Figure 4 3-line serial Interface Timing Characteristics

$V_{DDI}=1.65$ to $3.3V$, $V_{DD}=2.4$ to $3.3V$, $AGND=DGND=0V$, $T_a = -30$ to $70\text{ }^{\circ}C$

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)	65		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	
DOUT	T_{ACC}	Access time	10	50	ns	For maximum $CL=30pF$
	T_{OH}	Output disable time	15	50	ns	For minimum $CL=8pF$

Table 2 3-line serial Interface Characteristics

Note: The rising time and falling time (T_r , T_f) of input signal are specified at 15 ns or less.
Logic high and low levels are specified as 30% and 70% of V_{DDI} for Input signals.

6.3. Display Serial Interface Timing Characteristics (4-line SPI system)

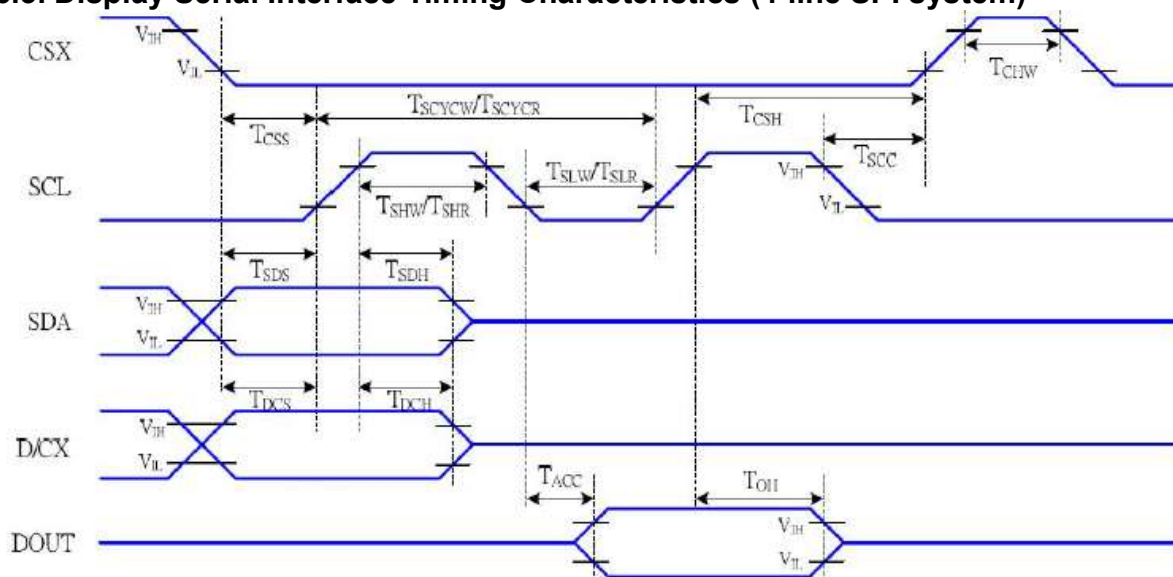


Figure 5 4-line serial Interface Timing Characteristics

VDDI=1.65 to 3.3V, VDD=2.4 to 3.3V, AGND=DGND=0V, Ta= -30 to 70 °C

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)	65		ns	
	T _{chW}	Chip select "H" pulse width	40		ns	
SCL	T _{scycW}	Serial clock cycle (Write)	66		ns	-write command & data ram
	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	-read command & data ram
	T _{shR}	SCL "H" pulse width (Read)	60		ns	
	T _{slR}	SCL "L" pulse width (Read)	60		ns	
D/CX	T _{DCS}	D/CX setup time	10		Ns	
	T _{DCH}	D/CX hold time	10		ns	
SDA	T _{SDS}	Data setup time	10		ns	
(DIN)	T _{SDH}	Data hold time	10		ns	
DOUT	T _{ACC}	Access time	10	50	ns	For maximum CL=30pF For minimum CL=8pF
	T _{OH}	Output disable time	15	50	ns	

Table 3 4-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 specified as 30% and 70% of VDDI for Input signals.

6.4. Parallel RGB Interface Timing Characteristics

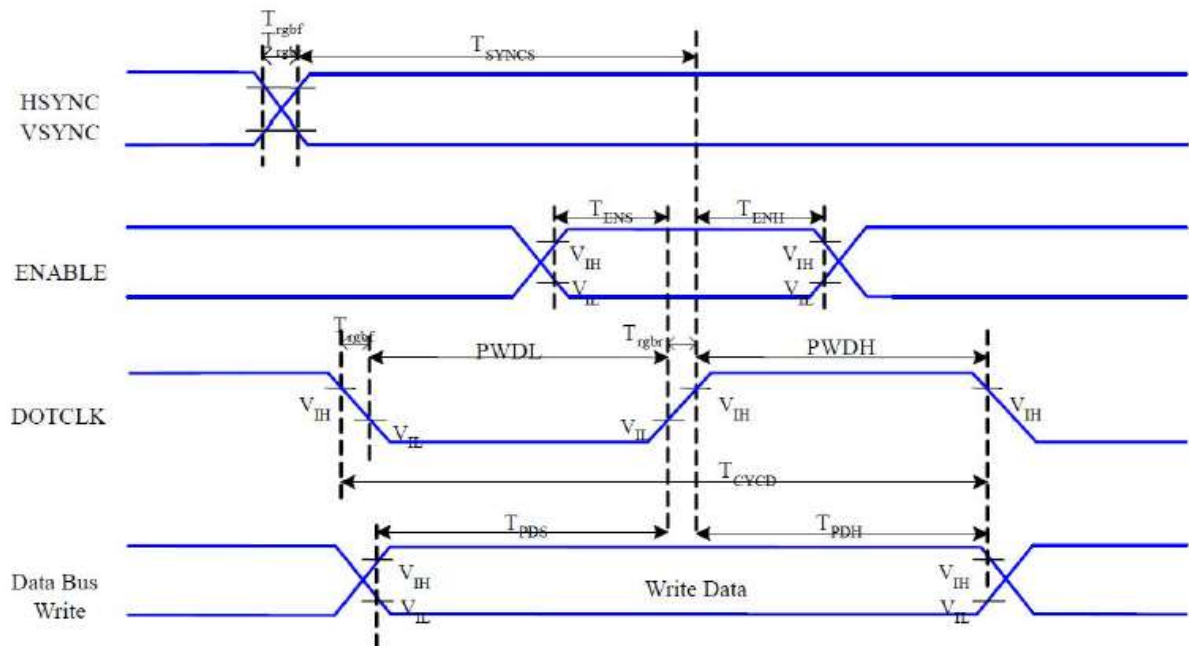


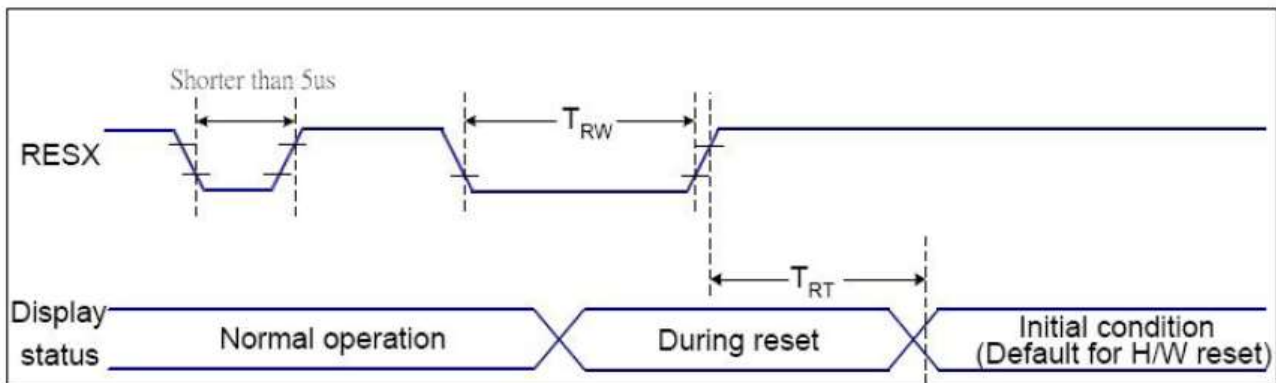
Figure 6 RGB Interface Timing Characteristics

$V_{DDI}=1.65$ to $3.3V$, $V_{DD}=2.4$ to $3.3V$, $AGND=DGND=0V$, $T_a = -30$ to $70\text{ }^{\circ}\text{C}$

Signal	Symbol	Parameter	Min	Max	Unit	Description
HSYNC, VSYNC	T_{SYNCS}	VSYNC, HSYNC Setup Time	30		ns	
ENABLE	T_{ENS}	Enable Setup Time	25		ns	
	T_{ENH}	Enable Hold Time	25		ns	
DOTCLK	P_{WDH}	DOTCLK High-level Pulse Width	60		ns	
	P_{WDL}	DOTCLK Low-level Pulse Width	60		ns	
	T_{CYCD}	DOTCLK Cycle Time	120		ns	
	$T_{rghr} T_{rghf}$	DOTCLK Rise/Fall time		20	ns	
DB	T_{PDS}	PD Data Setup Time	50		ns	
	T_{PDH}	PD Data Hold Time	50		ns	

Table 4 18/16 Bits RGB Interface Timing Characteristics

6.5. Reset Timing Characteristics



VDDI=1.65 to 3.3V, VDD=2.4 to 3.3Vr AGND=DGND=OVr Ta=-30 ~ 70 C

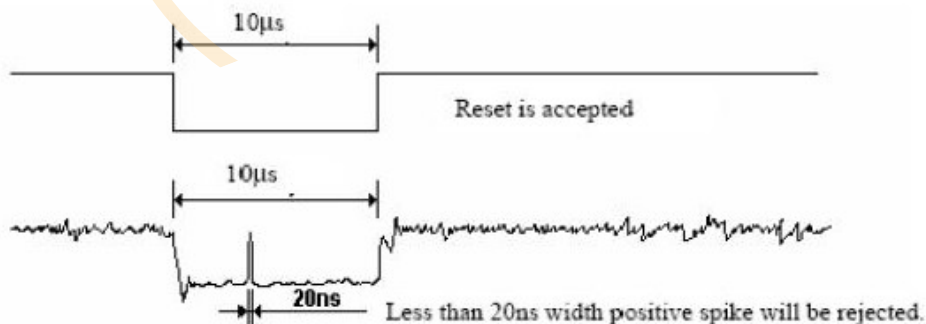
Related Pins	Symbol	Parameter	MIN	MAX	Unit
RESX	TRW	Reset pulse duration	10	-	us
	TRT	Reset can cel	-	5 (Note 1, 5)	ms
				120 (Note 1,6, 7)	ms

Notes:

1. The reset cancel includes also required time for loading ID bytes, VC(JM setting and other settings from NVM (or similar device) to registers. This loading <s done every time "hen there is HW reset cancel time (t_{PT}) 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. Spike Rejection also applies during a valid reset pulse as shown below:



5. When Reset applied during Sleep In Mode.
6. When Reset applied during Sleep Out Mode.
7. It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

7.Optical Characteristics

(Transflective)

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time		Tr+ Tf	$\theta=0^{\circ}$ 、 $\Phi=0^{\circ}$	-	25	50	.ms	Note 3
Contrast ratio		CR	At optimized viewing angle	200	250	-	-	Note 4
Color Chromaticity	White	Wx	$\theta=0^{\circ}$ 、 $\Phi=0$	0.2293	0.2693	0.3093	-	Note 2,5,6
		Wy		0.2521	0.2921	0.3321	-	
Viewing angle	Hor.	ΘR	$CR\geq 10$	60	80	-	Deg.	Note 1
		ΘL		60	80	-		
	Ver.	ΦT		60	80	-		
		ΦB		60	80	-		
Brightness		-	-	200	260	-	cd/m ²	Center of display
Uniformity		(U)	-	80	-	-	%	Note 5

(Reflective)

Item		Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Contrast ratio		CR	At optimized viewing angle	-	5	-	-	Note 4
Viewing angle	Hor.	θ_R	$CR > 2$	-	45	-	Deg.	Note 1
		θ_L		-	45	-		
	Ver.	ϕ_T		-	45	-		
		ϕ_B		-	45	-		

Ta=25±2°C,

Note 1: Definition of viewing angle range

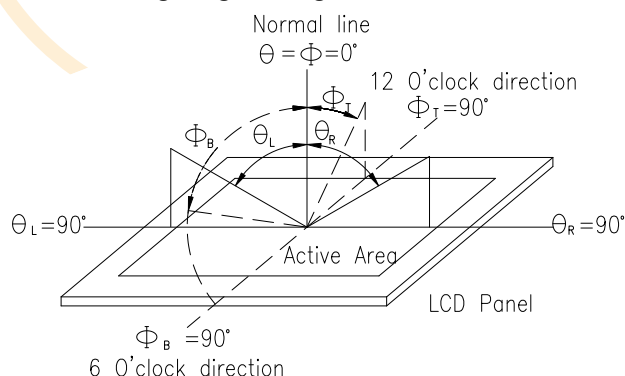


Fig. 7.1. Definition of viewing angle

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-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

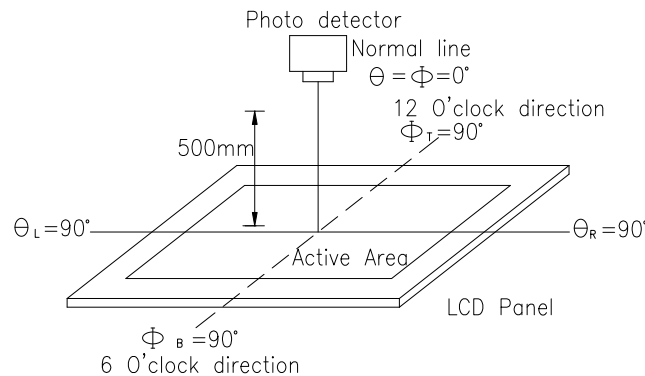
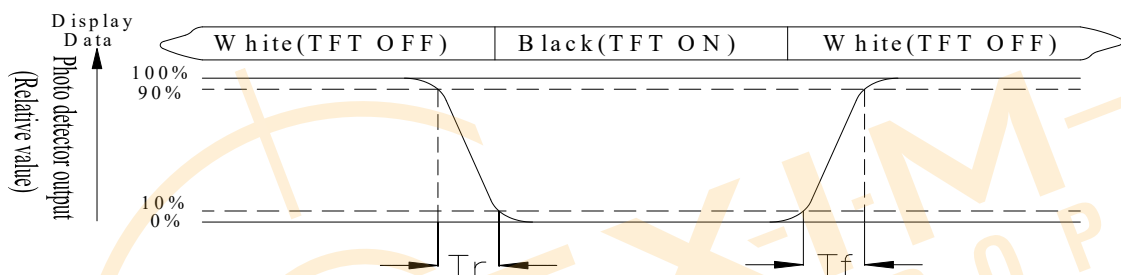


Fig. 7.2. Optical measurement system setup

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, T_r , is the time between photo detector output intensity changed from 90% to 10%. And fall time, T_f , 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.

$$\text{Luminance Uniformity (U)} = L_{\min}/L_{\max} \times 100\%$$

L = Active area length

W = Active area width

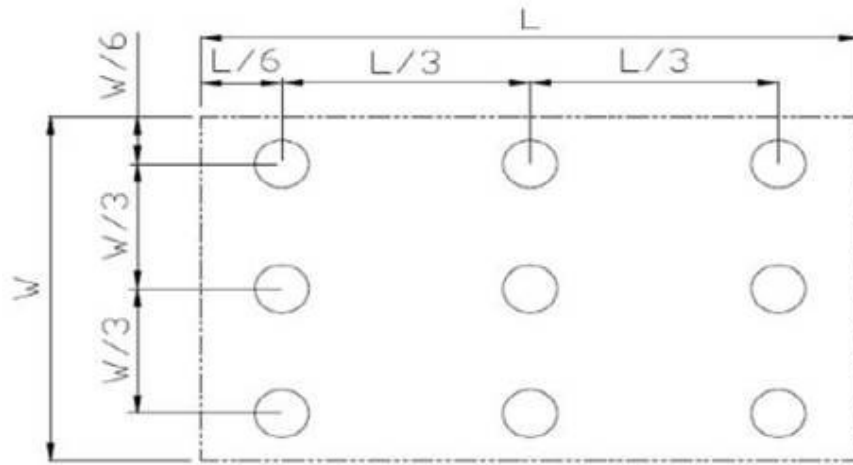


Fig7.3. Definition of uniformity

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.



8.Interface

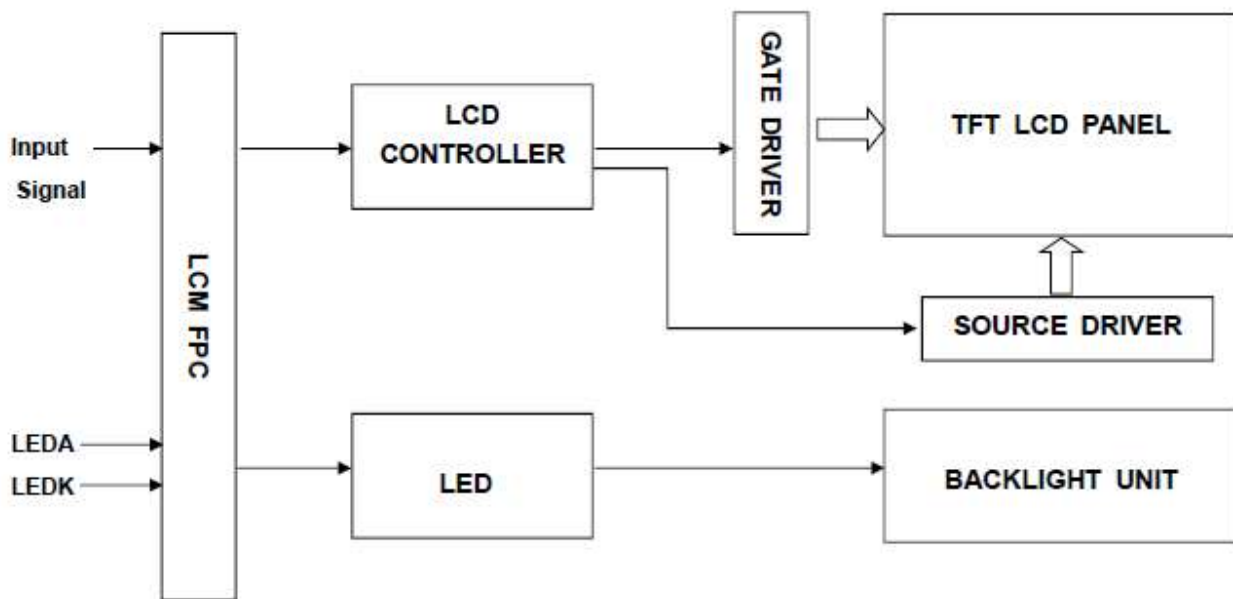
8.1. LCM PIN Definition

Pin No	Symbol	Description	I/O
1	GND	Ground.	P
2	VCI	Supply voltage (3.3V).	P
3	IOVCC	Supply voltage (1.65-3.3V).	P
4	IM2	MPU Parallel interface bus and serial interface select If use RGB Interface must select serial interface. Fix this pin at IOVCC and GND.	I
5	IM1		
6	IM0		
7	RESET	This signal will reset the device and must be applied to properly initialize the chip.	I
8	CS	Chip select input pin ("Low" enable). fix this pin at GND when not in use.	I
9	DC(SPI-SCL)	-Display data/command selection pin in parallel interface. -This pin is used to be serial interface clock. DC='1': display data or parameter. DC='0': command data. -If not used, please fix this pin at GND.	I
10	WR(SPI-RS)	-Write enable in MCU parallel interface. Display data/command selection pin in 4-line serial interface. Second Data lane in 2 data lane serial interface. -If not used, please fix this pin at GND.	I
11	RD	Serves as a read signal and MCU read data at the rising edge. fix this pin at IOVCC or GND when not in use.	I
12	VSYNC	Frame synchronizing signal for RGB interface operation. fix this pin at GND when not in use.	I
13	HSYNC	Line synchronizing signal for RGB interface operation. fix this pin at GND when not in use.	I
14	ENABLE	Data enable signal for RGB interface operation. fix this pin at GND when not in use.	I
15	DOTCLK	Dot clock signal for RGB interface operation. Fix this pin at GND when not in use.	I
16	SDA	Serial input signal. The data is latched on the rising edge of the SCL signal. fix this pin at GND when not in use.	I

17-34	DB0-DB17	18-bit parallel bi-directional data bus for MCU system and RGB interface mode . Fix to GND level when not in use	I/O
35	SDO	SPI interface output pin. -The data is output on the falling edge of the SCL signal. -If not used, let this pin open.	O
36	LEDA	Anode pin of backlight	P
37	LEDK1	Cathode pin OF backlight	P
38	LEDK2	Cathode pin OF backlight	P
39	LEDK3	Cathode pin OF backlight	P
40	LEDK4	Cathode pin OF backlight	P
41	XR(NC)	Touch panel Right Glass Terminal	A/D
42	YU(NC)	Touch panel Top Film Terminal	A/D
43	XL(NC)	Touch panel LEFT Glass Terminal	A/D
44	YD(NC)	Touch panel Bottom Film Terminal	A/D
45	GND	Ground.	P



9. Block Diagram



10. Reliability

Content of Reliability Test (Super Wide temperature, -20°C~70°C)

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°C 96hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C 96hrs	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°C 96hrs	2
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 96hrs	1,2
High Temperature/ Humidity Operation	The module should be allowed to stand at 60°C,90%RH max	60°C,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of storage -10°C 25°C 60°C  30min 5min 30min 1 cycle	-10°C/60°C 20 cycles	2
Vibration test	Endurance test applying the vibration during transportation and using.	Frequency range:10~55Hz, Stroke:1.5mm Sweep:10Hz~55Hz ~10Hz 2 hours for each direction of X.Y.Z. (6 hours for total) (Package condition).	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±6KV(contact), ±8KV(air), RS=330Ω CS=150pF 5 times	4

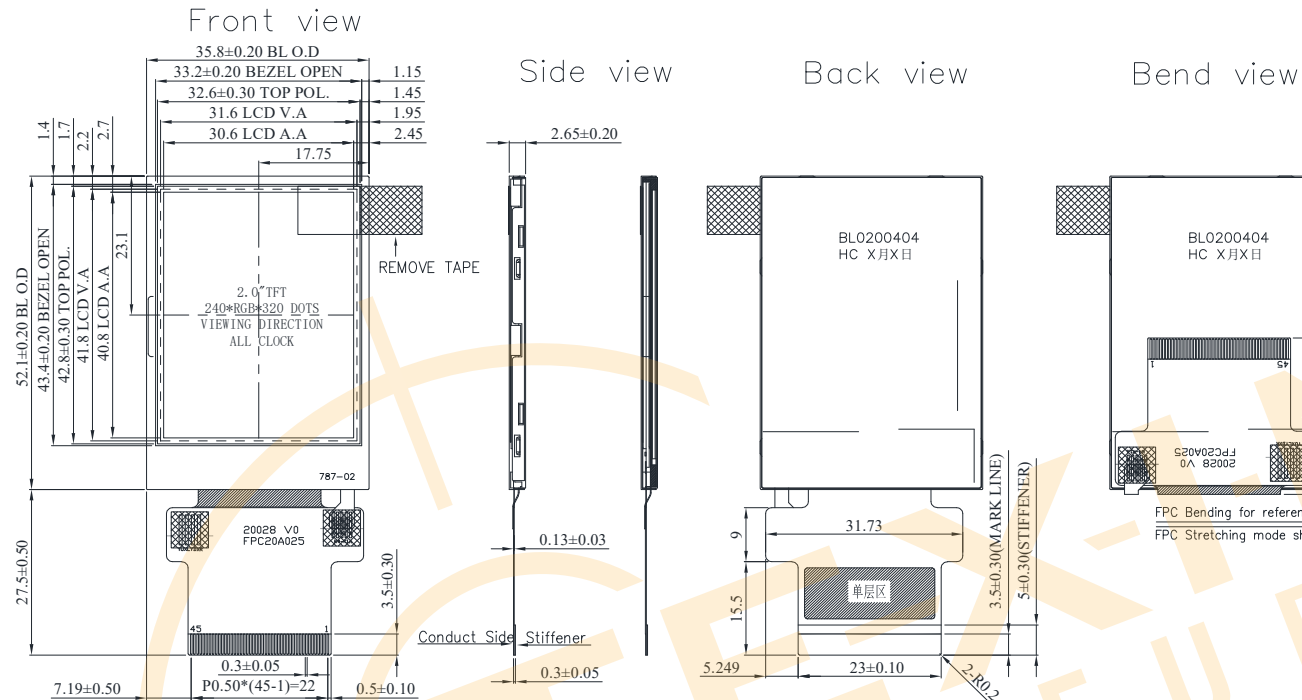
Note1: No dew condensation to be observed.

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

11. Contour Drawing



IM2	IM1	IM0	Interface type	DB Pin in use
0	0	0	DBI Tyb_ 8-bit interface	DB7-DB0
0	0	1	DBI Tyb_ 16-bit interface	DB15-DB0
0	1	0	DBI Tyb_ 9-bit interface	DB8-DB0
0	1	1	DBI Tyb_ 18-bit interface	DB17-DB0
1	0	1	3-Wire 9 BIT data serial interface	SDA SCL CS
1	1	0	4-Wire 8 BIT data serial interface	SDA SCL CS RS

NOTE:

1. If not use PIN, fix to the GND, IOVCC or NC.
2. If use RGB mode must select serial interface.

NO.	Pin Name
1	GND
2	VCI
3	IOVCC
4	IM2
5	IM1
6	IM0
7	RESET
8	CS
9	DC(SPI-SCL)
10	WR(SPI-RS)
11	RD
12	VSYNC
13	HSYNC
14	ENABLE
15	DOTCLK
16	SDA
17	DB0
18	DB01
19	DB02
20	DB03
21	DB04
22	DB05
23	DB06
24	DB07
25	DB08
26	DB09
27	DB10
28	DB11
29	DB12
30	DB13
31	DB14
32	DB15
33	DB16
34	DB17
35	SDO
36	LEDA
37	LEDK1
38	LEDK2
39	LEDK3
40	LEDK4
41	XR(NC)
42	YU(NC)
43	XL(NC)
44	YD(NC)
45	GND

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



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) : | ☐ 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 , _____ |

>> **Go to page 2** <<



Winstar **Module Number :** _____

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5 、 Electronic Characteristics of Module :

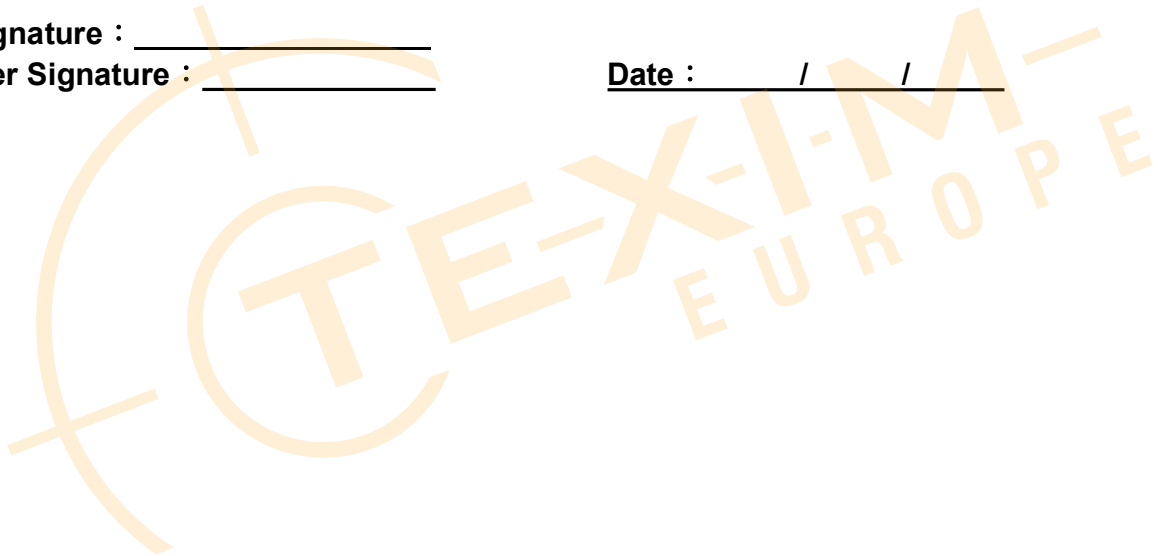
- | | | |
|------------------------------|-------------------------------|-------------------------------------|
| 1. Input Voltage : | ☐ Pass | ☐ NG , _____ |
| 2. Supply Current : | ☐ Pass | ☐ NG , _____ |
| 3. Driving Voltage for LCD : | ☐ Pass | ☐ NG , _____ |
| 4. Contrast for LCD : | ☐ Pass | ☐ 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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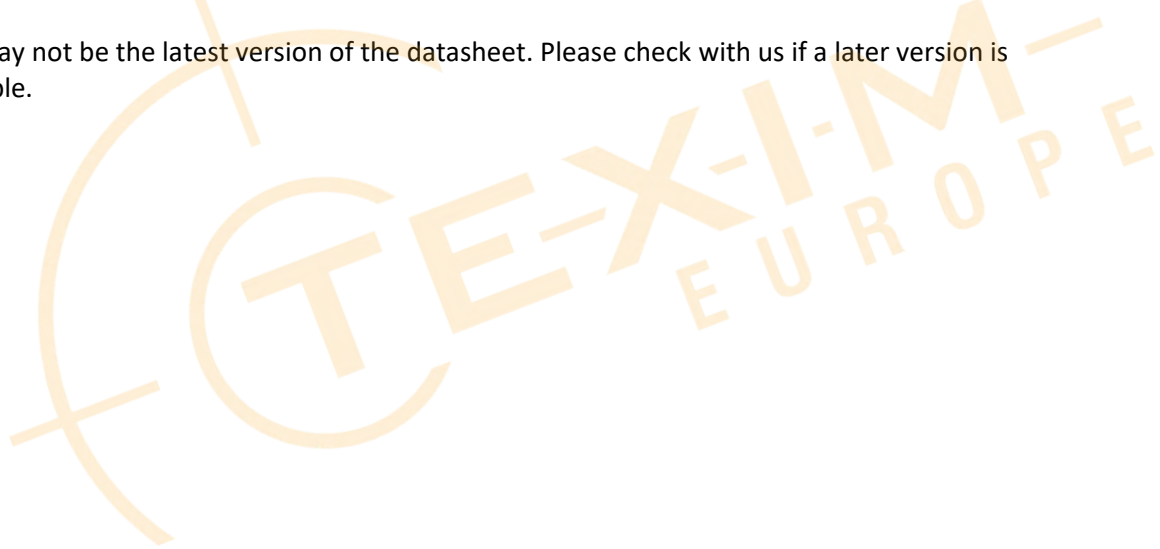
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