深圳市海量视界电子科技有限公司

LCD Module Specifiction

Customer:	
Module No.:	**XC018BWV8952ACT**
Customer P/N:	
Date:	
Version:	**V1.0**

Approved by	Checked by	Prepared by

Final Approval by Customer	
Approved by	**Comment**

Table of Contents

1.Record of Revision

Rev.	Issued Date	Description	Editor
1.0	2026-03-26	First release	-

2.General Specifications

Note 1: Viewing direction for best image quality is different from TFT definition. There is a 180°shift.

Note 2: ROHS compliant.

Item	Specification	Unit
LCD size	1.8	inch
Display Mode	Normally Black	--
Resolution	360(RGB)x360	Pixel
Pixel pitch	0.0423*RGB*0.1269	mm
Pixel Arrangement	RGB Vertical Stripe	
Viewing direction	IPS	-
Module outline dimension	52.3(H)*52.3(V)*3.51(D)	mm
LCD AA	45.68x45.68	mm
TP VA	-	mm
Colors	262K	-
Driver IC	ST77916	-
Driver IC RAM Size	-	-
Interface	QSPI/SPI	--
Backlight	White LED	--
Touch IC	-	--
Surface hardness	-	--
Touch structure	-	--
Cover lens	-	--
Color	-	--
Operating Temperature	-20℃~ +70℃	--
Storage Temperature	-30℃~ +80℃	--

3.Pin Assignment

PIN	Symbol	Description	Remark
1	LEDK	LED CATHODE	
2	LEDA	LED ANODE	
3	SDA0	Data signal for DBI Type B mode	
4	SDA1	Data signal for DBI Type B mode	
5	SDA2	Data signal for DBI Type B mode	
6	SDA3	Data signal for DBI Type B mode	
7	CS	Chip select pin of DBI Type B mode. Low active.	
8	RD(SCL)	Read Control pulse H duration	
9	TE	Tearing effect output pin to synchronize MCU to frame writing. This pin is low when it is not activated. If not used, please open it	
10	RESET	This sign allow will reset the device and must be applied to properly initialize the chip. Signal is low active	
11	IOVCC	Power Supply for logic, VDDIO= 1.65V~3.3V.	
12	VDD(3.3V)	Power Supply for Analog, VDD=2.4V~3.3V	
13	GND	Ground	
14	TP_INT	Touch panel interrupt output.If not used, please open it.	
15	TP_SDA	Touch panel I2C data	
16	TP_SCL	Touch panel I2C clock	
17	TP_RESET	Touch panel reset	
18	TP_VCC	Touch panel Power output	

4.Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Remark
Power Voltage	VCI	-0.30	+3.3	V	
	IOVCC	-0.30	+3.3	V	
	TP_VCI	/	/	V	
	TP_IOVCC	/	/	V	
Operating Temperature	Top	-20.0	70.0	℃	
Storage Temperature	T_{st}	-30.0	80.0	℃	
Operating and Storage Humidity	H_{stg}	10%	90%	%(RH)	

5.Electrical Characteristics

5.1Recommended Operating Condition

VCI=3.3V，GND=0V，Ta = 25℃

Item		Symbol	Min.	TYP.	Max.	Unit	Remark
Digital supply Voltage		IOVCC	1.65	1.8	3.3	V	
Analog supply Voltage		VCI	2.4	2.8	3.3	V	
TP Power		TP_VCI	/	/	/	V	
TP Power		TP_IOVCC	/	/	/	V	NOTES
Input Signal Voltage	Low Level	V_{IL}	0	-	0.3 x IOVCC	V	
	High Level	V_{IH}	0.7 x IOVCC	-	IOVCC	V	
Current of digital supply voltage		I_{IOVCC}	-	/	/	Ma	VCI=3.3V, color bar pattern
Current of analog supply voltage		I_{VCI}	-	/	/	Ma	

5.2 Backlight Unit Driving Condition

Item	Symbol	Min.	TYP.	Max.	Unit	Remark
Forward Current	I_F	-	60	-	Ma	(3LED Parallel)
Forward Current Voltage	V_F	5.6	6.2	6.6	V	
Backlight Power Consumption	W_{BL}	330	372	396	mW	
Operating Life Time	--	20000	--	--	hrs	Note 2, Note 3

Note1: The LED driving condition is defined for each module.

Note2: When LCM is operated, the stable forward current should be inputted. And forward voltage is for reference only.

Note3: Optical performance should be evaluated at Ta=25℃ When LED is driven at high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.

Note4: The LED driving condition is defined for each LED module.

6.Timing Characteristics

6.1 QSPI Interface Characteristics

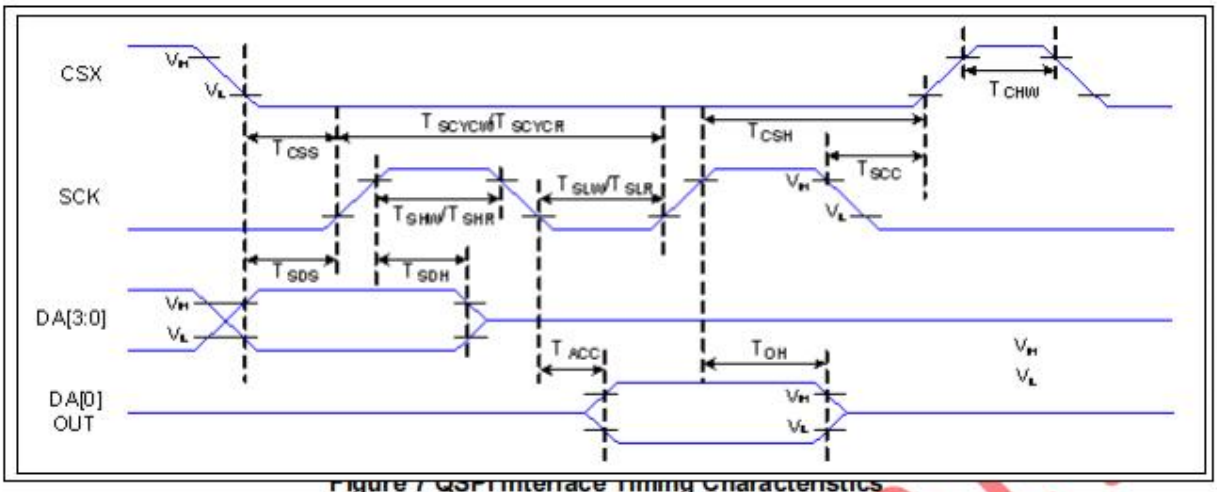


Figure 7 QSPI Interface Timing Characteristics

VDDI=1.65 to 3.3V, VDD=2.65 to 3.3V, GND=RGND=0V, Ta=25℃

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	
			200		ns	*Note1*
SCL	T_{SCYCW}	Serial clock cycle (Write)	16		ns	
	T_{SHW}	SCL "H" pulse width (Write)	7		ns	
	T_{SLW}	SCL "L" pulse width (Write)	7		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	7		ns	
	T_{SDH}	Data hold time	7		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 5 QSPI Interface Characteristics

6.2 Serial Interface Characteristics (3-line serial):

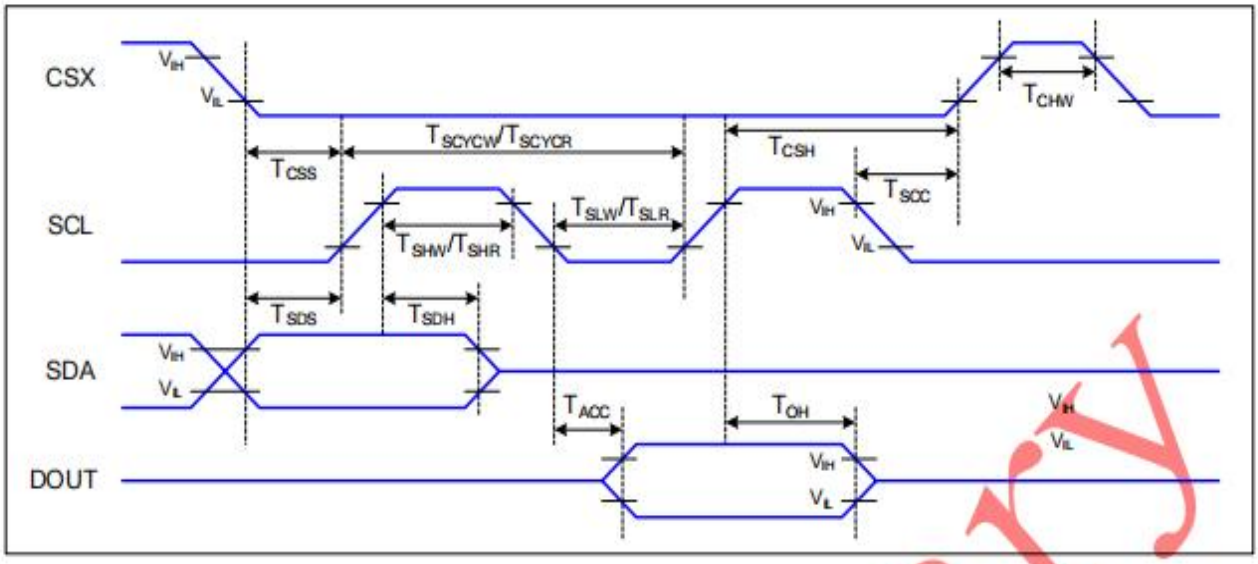


Figure 4 3-line serial Interface Timing Characteristics

VDDI=1.65 to 3.3V, VDD=2.65 to 3.3V, GND=RGND=0V, Ta=25℃

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)	16		ns	
	T_{SHW}	SCL "H" pulse width (Write)	7		ns	
	T_{SLW}	SCL "L" pulse width (Write)	7		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

6.3 Serial Interface Characteristics (4-line serial):

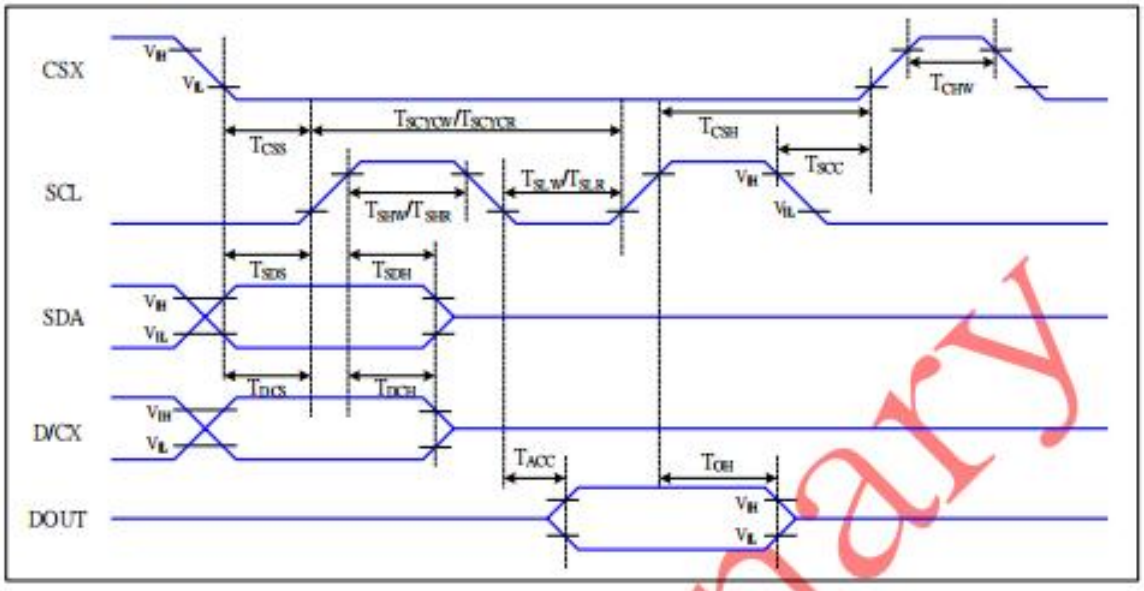


Figure 5 4-line serial Interface Timing Characteristics

VDDI=1.65 to 3.3V, VDD=2.65 to 3.3V, GND=RGND=0V, Ta=25℃

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)	16		ns	-write command & data ram
	T_{SHW}	SCL "H" pulse width (Write)	7		ns	
	T_{SLW}	SCL "L" pulse width (Write)	7		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	7		ns	
	T_{DCH}	D/CX hold time	7		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 3 4-line serial Interface Characteristics

6.4 8080 Series MCU Parallel Interface Characteristics: 8-bit Bus

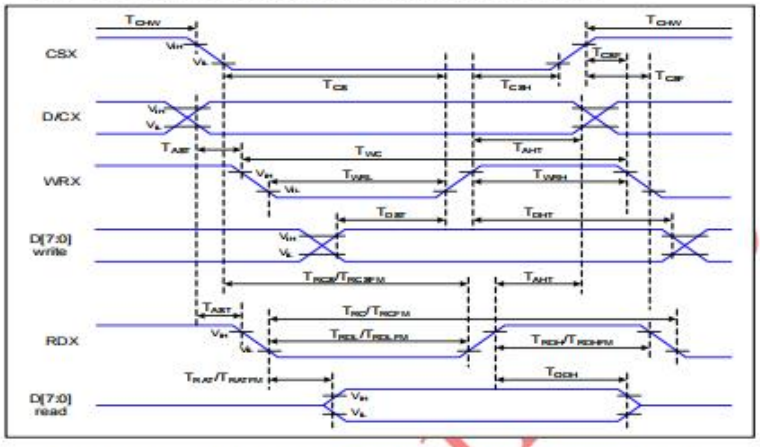


Figure 1 Parallel Interface Timing Characteristics (8080-Series MCU Interface)

VDDI=1.65 to 3.3V, VDD=2.65 to 3.3V, GND=RGND=0V, Ta=25℃

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		30		ns	
	T_{WRH}	Control pulse "H" duration		14		ns	
	T_{WRL}	Control pulse "L" duration		14		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	
D[7:0]	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

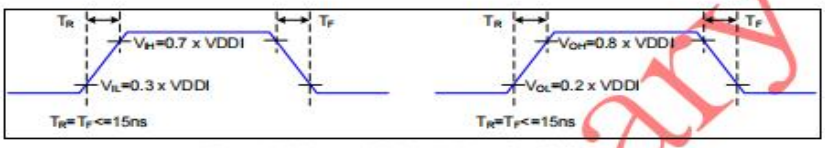


Figure 2 Rising and Falling Timing for I/O Signal

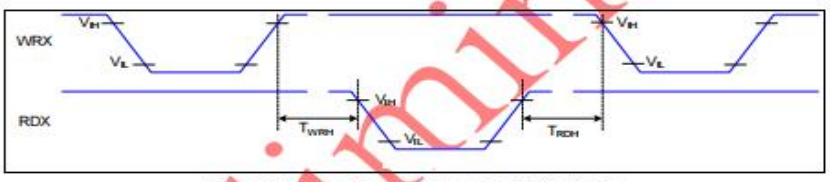
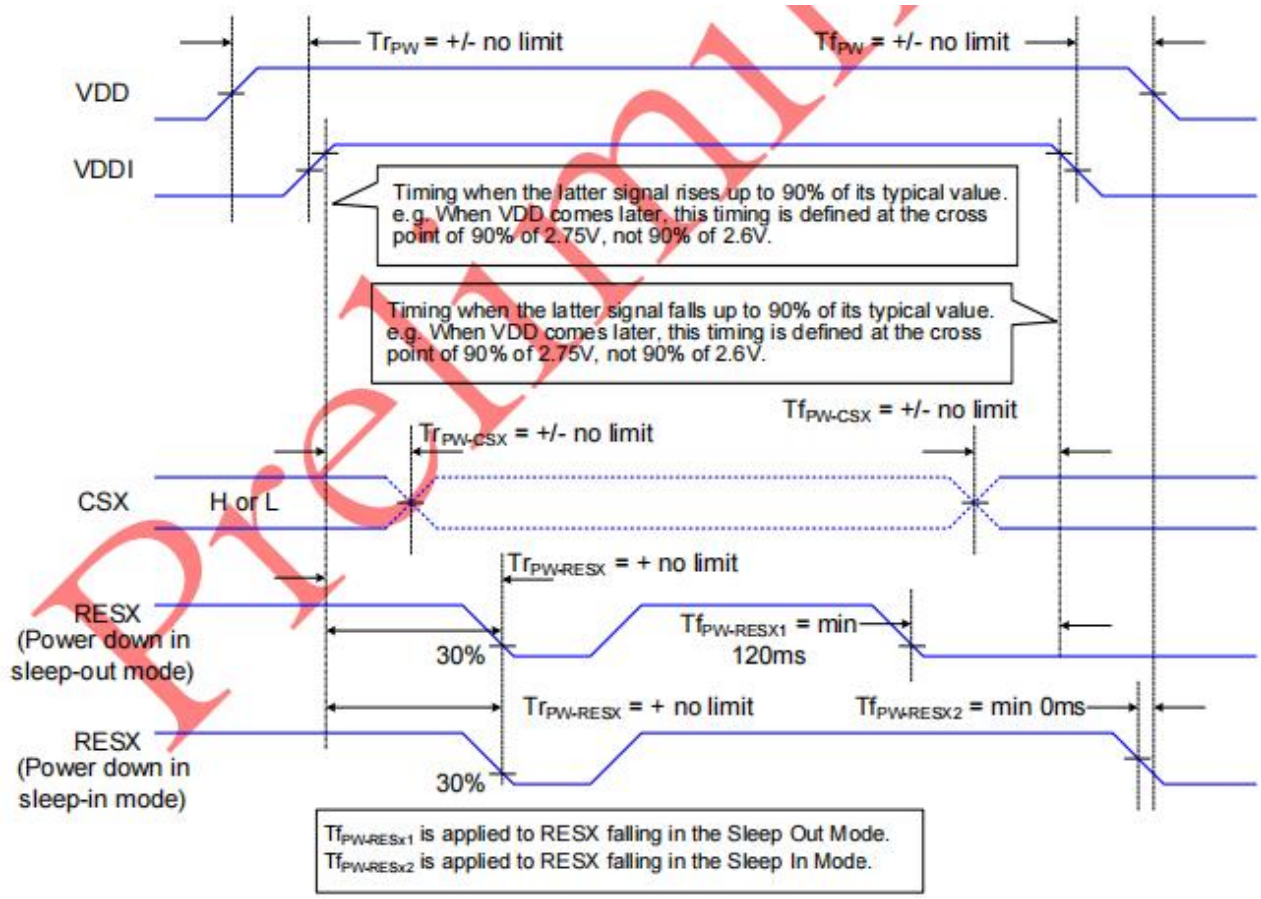
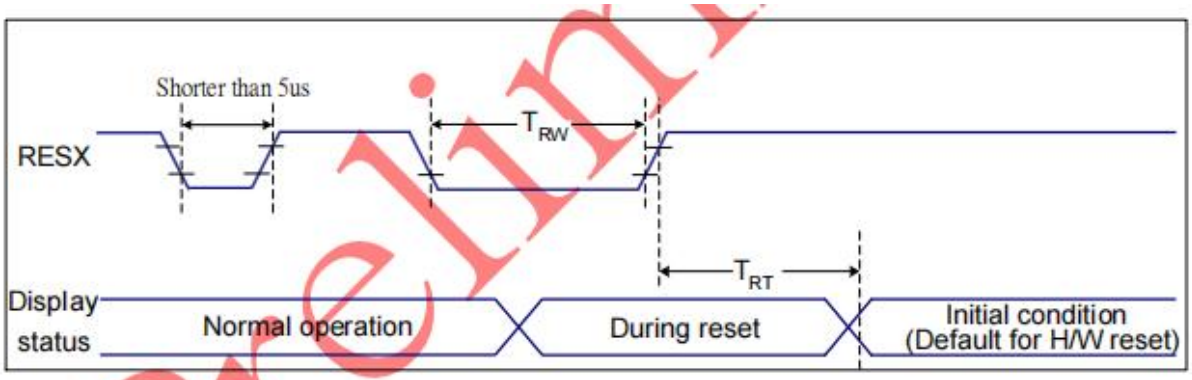


Figure 3 Write-to-Read and Read-to-Write Timing

6.5 Power On /OFF Timing



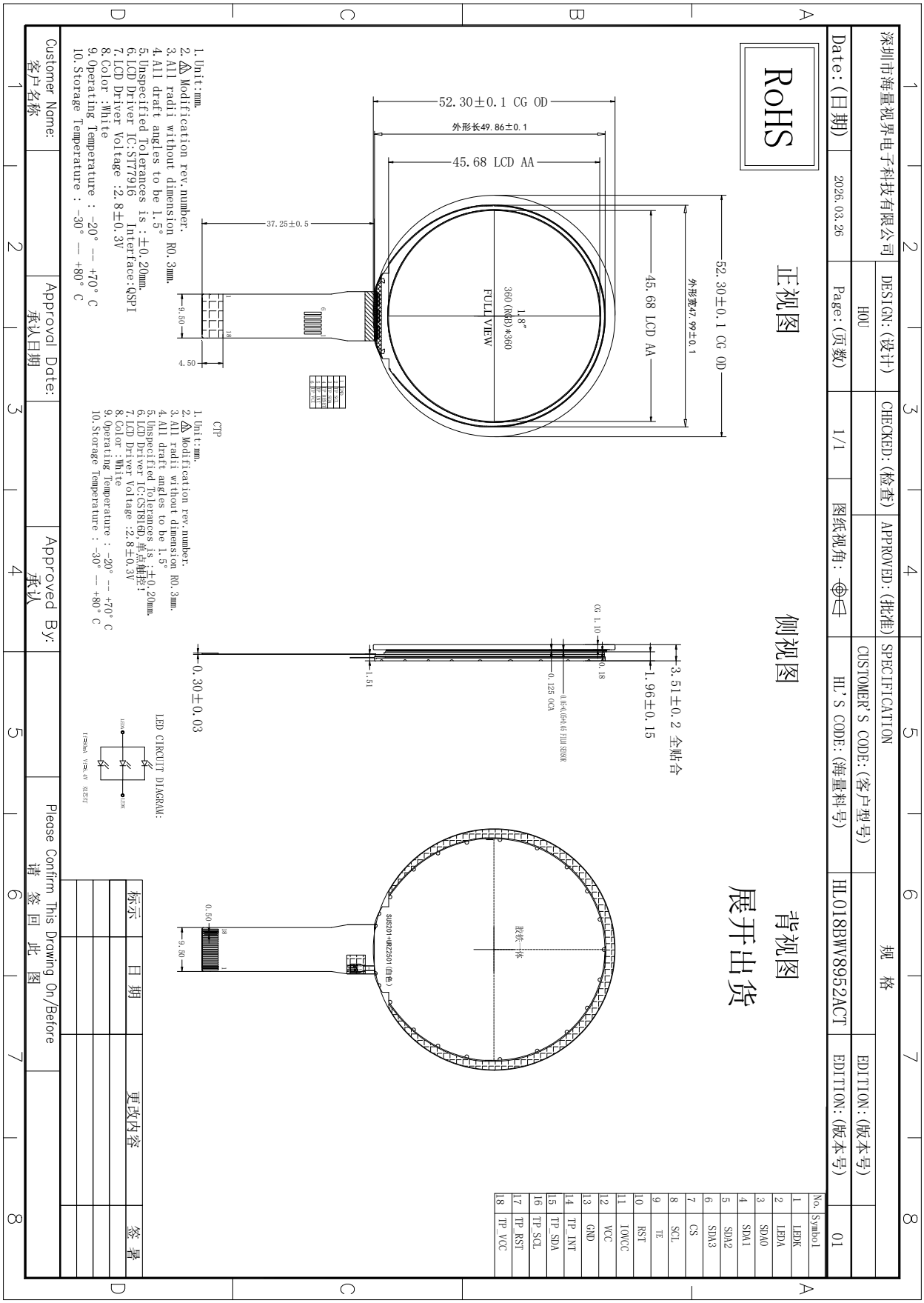
6.6 Reset Timing



VDDI=1.8V, VDD=2.8V, GND=RGND=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

7.Mechanical Drawing



8.Optical Characteristics

Item		Symbol	Condition	Min.	TYP.	Max.	Unit	Remark
View Angles		θT	CR≧10	80	85	-	Degree	Note 2
		θB		80	85	-		
		θL		80	85	-		
		θR		80	85	-		
Contrast Ratio		CR	θ=0°	800	1200	-		Note1 Note3
Response Time		T_{ON}	25℃		30	35	ms	Note1 Note4
		T_{OFF}						
Chromaticity	White	x	Backlight is on	-	-	-		Note1 Note5
		y		-	-	-		
Uniformity		U		80	85	-	%	Note1 Note6
NTSC				60	65	-	%	Note 5
Luminance		L		-	400	-	CD/m^2	Note1 Note7

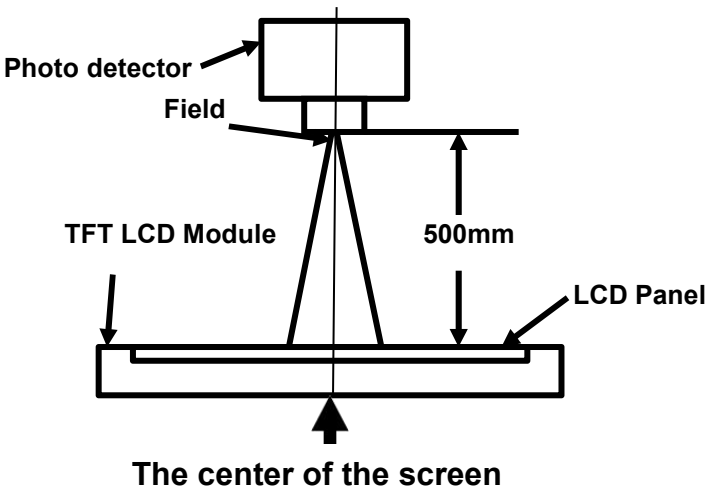
Test Conditions:

1.IF= 60 Ma, VF=6.4 V and the ambient temperature is 25±2℃.humidity is 65±7%

2.The test systems refer to Note 1 and Note 2.

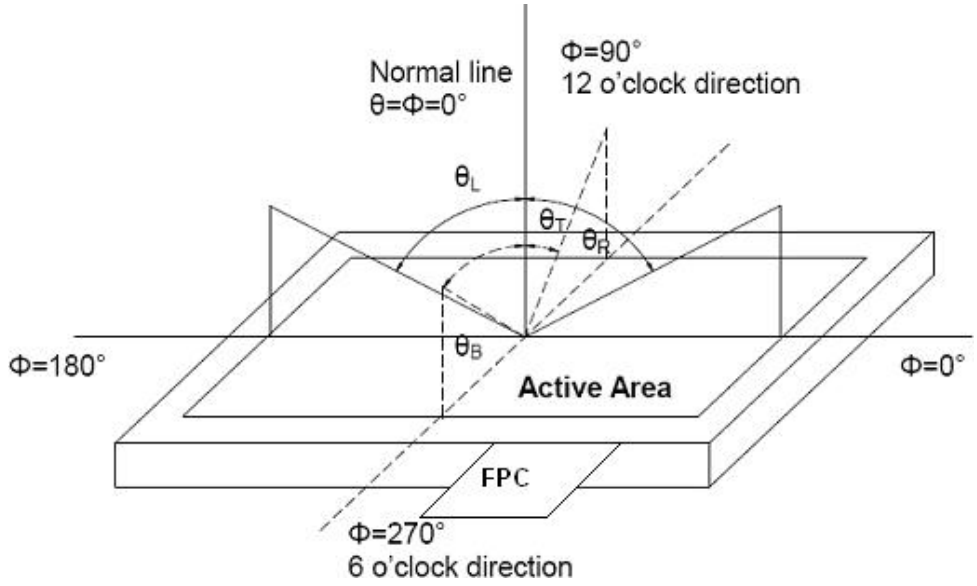
Note 1: Definition of optical measurement system.

Properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system.

Viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80)。

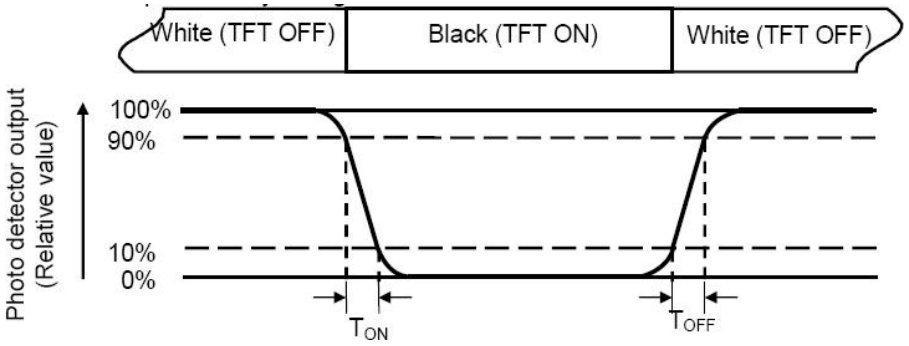


Note 3: Definition of contrast ratio

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

Note 4: 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_{ON}) is the time between photo detector output intensity changed from 90%



to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.

Note 5: Definition of color chromaticity (CIE1931)

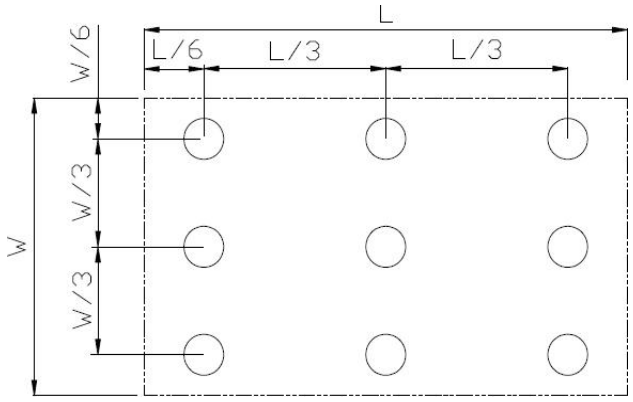
Color coordinates measured at center point of LCD.

Note 6: Definition of luminance uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Luminance min / Luminance max

L-------Active area length W----- Active area width



Luminance max: The measured Maximum luminance of all measurement position. Luminance min: The measured Minimum luminance of all measurement position.

Note 7: Definition of luminance:

Measure the luminance of white state at center point

9.Environmental / Reliability Test

No.	Items	Condition	Inspection after test
1	High Temperature Storage	T = 80℃ for 96 hr	Inspection after 4 hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD 2.Seal leak; 3.Non-display; 4.missing segments; 5.Glass crack; 6.Current IDD is twice higher than initial value.
2	Low Temperature Storage	T = -30℃ for 96 hr	
3	High Temperature Operating	T = 70℃ for 96 hr	
4	Low Temperature Operating	T = -20℃ for 96 hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 60℃/90% for 96 hr (But no condensation dew)	
6	Thermal Shock	-20~25~70℃×10cycles (30min.) (5min.) (30min.)	
7	ESD	Voltage:±2KV R: 330Ω C: 150pF Air discharge, 10time	

Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of samples

10.Precautions for Use of LCD Modules Handling Precautions

10.1Handling Precautions

10.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

10.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4 The Polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this Polarizer carefully.

10.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the Polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

10.1.6 Do not attempt to disassemble the LCD Module.

10.1.7 If the logic circuit power is off, do not apply the input signals.

10.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1 Be sure to ground the body when handling the LCD Modules.
Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.2 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.3 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2 Storage Precautions

10.2.1When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

10.2.2The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is: Temperature : 0℃ ～ 40℃ Relatively humidity: ≤80%

10.2.3The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.