



Specification

TFT-LCD module

Module(型号):	ZSX128-H18183
Customer (客户) :	
Customer P/N (客户型号) :	

Approved by (批准) :	
Qualified (合格) :	Unqualified (不合格) :

PREPARED	CHECKED	APPROVED



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1. General Description

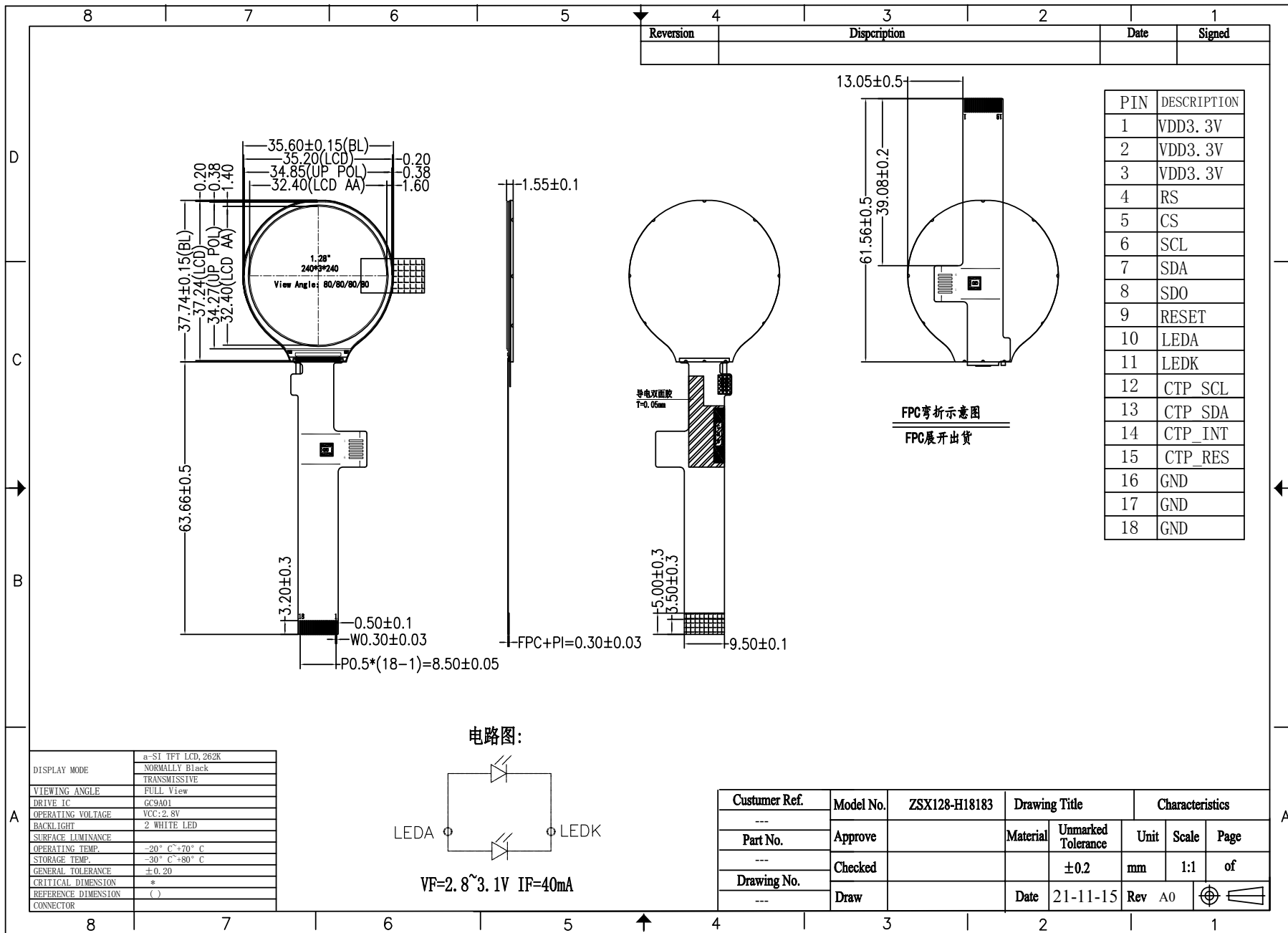
ZSX128-H18183 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This TFT LCD has a 1.28 inch diameter measured active display area with 240 horizontal by 240 vertical pixel resolution.

2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Pixel Pitch	0.135(H)x0.135(V)
Input Data	SPI
Viewing Direction	Full View
Driver IC	GC9A01

3. Mechanical Specification

Item	Contents	Unit
LCM Module size	35.6*37.74*1.55	mm
LCM+CTP Module size	47.6*47.6*3.08	mm
Pixel Pitch	0.135(H)x0.135(V)	---
Display Area	Φ 32.4	mm





5. Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit
Supply voltage(Logic)	VCC	-0.3	3.6	V
Operating temperature	TOPR	-20	70	°C
Storage temperature	TSTR	-30	80	°C

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Power Voltage		VCC	2.5	2.8	3.3	V	---
Input Voltage	L level	VIL	---	12	---	V	---
	H level	VIH	---	-11.2	---	V	
LCD Drive Power current		ILCD	---	40	---	mA	---



7. Module Function Description

7-1. Pin Description

LCM接口定义:

1	VDD3.3V	Power supply
2	VDD3.3V	Power supply
3	VDD3.3V	Power supply
4	RS	Register selection signal
5	CS	Chip select input PIN
6	SCL	This PIN is used to be serial interface clock
7	SDA	SPI interface input pin
8	SDO	SPI interface output pin
9	RESET	Reset Signal ,Active Low
10	LEDA	LED ANODE
11	LEDK	LED CATHODE
12	CTP-SCL	Touch IIC Clock signal
13	CTP-SDA	Touch IIC Data
14	CTP-INT	Touch Interrupt
15	CTP-RES	Touch Reset Signal
16	GND	Ground
17	GND	Ground
18	GND	Ground

TP接口定义:

1	TP-SCL	Touch IIC Clock signal
2	TP-SDA	Touch IIC Data
3	TP-INT	Touch Interrupt
4	TP-RESRT	Touch Reset Signal
5	TP-VCC	Touch Power supply
6	GND	Ground



7-2. Timing Characteristics

7.2 Display Parallel 18/16/9/8-bit Interface Timing Characteristics(8080- I)

Figure90.

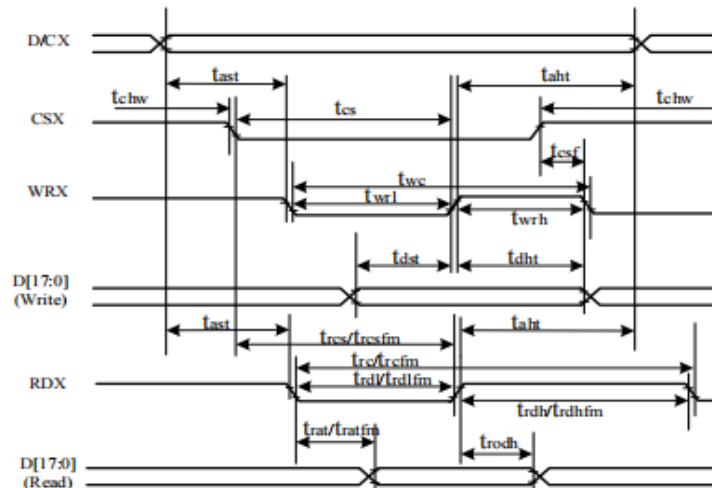


Table45.

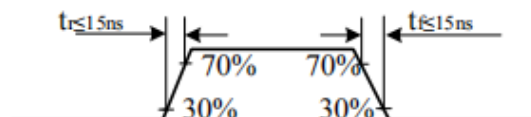
Signal	Symbol	Parameter	min	max	Unit	Description
DCX	tast	Address setup time	0	-	ns	
	taht	Address hold time(Write/Read)	0	-	ns	
CSX	tchwh	CSX "H" pulse width	0	-	ns	
	tcs	Chip Select setup time(Write)	15	-	ns	
	trcs	Chip Select setup time(Read ID)	45	-	ns	
	trcsfm	Chip Select setup time(Read FM)	355	-	ns	
	tcsf	Chip Select Wait time (Write/Read)	10	-	ns	
WRX	twc	Write Cycle	66	-	ns	
	twrh	Write Control pulse H duration	15	-	ns	
	twrl	Write Control pulse L duration	15	-	ns	
RDX(FM)	trcfm	Read Cycle (FM)	380	-	ns	
	trdhfm	Read Control H duration(FM)	180	-	ns	
	trdlfm	Read Control L duration(FM)	200	-	ns	
RDX(ID)	trc	Read Cycle (ID)	160	-	ns	
	trdh	Read Control H pulse duration	90	-	ns	
	trdl	Read Control L pulse duration	70	-	ns	
D[17:0], D[15:0],	tdst	Write data setup time	10	-	ns	For maximum CL=30pF
	tdht	Write data hold time	10	-	ns	



D[8:0], D[7:0]	trat	Read access time	-	40	ns	For minimum CL=8pF
	tratfm	Read access time	-	340	ns	
	trod	Read output disable time	20	80	ns	

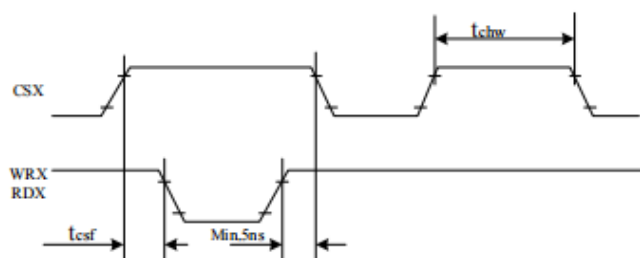
Note: $T_a = -30$ to $70\text{ }^{\circ}\text{C}$, $IOVCC=1.65\text{ V}$ to 3.3 V , $VCI=2.5\text{ V}$ to 3.3 V , $VSS=0\text{ V}$

Figure91.



CSX timings :

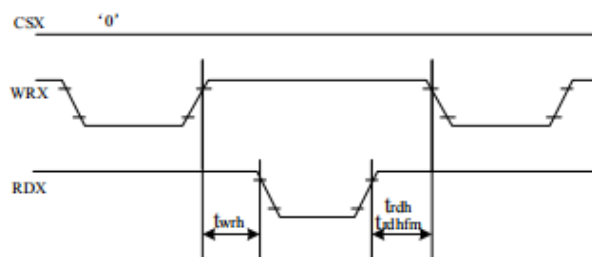
Figure92.



Note: Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.

Write to read or read to write timings:

Figure92.



Note: Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.



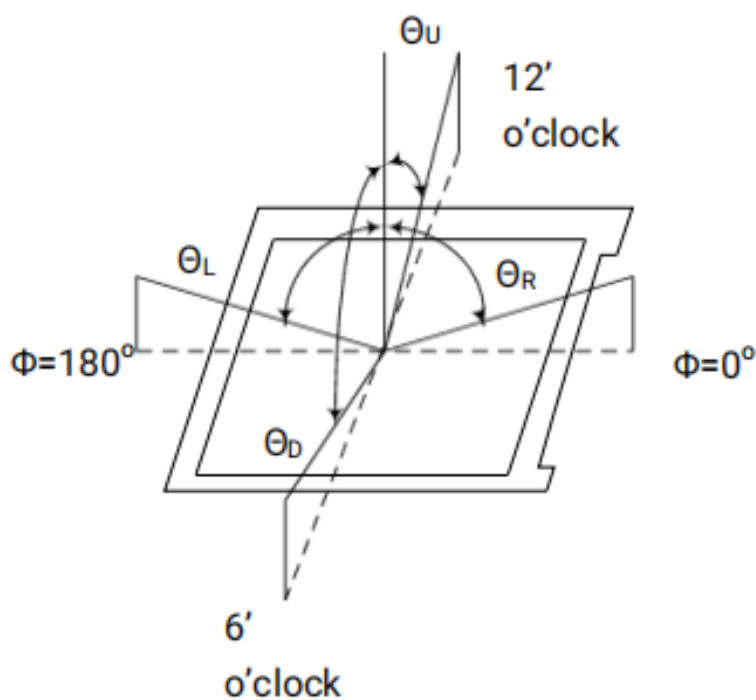
8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (with Polarizer)		T (%)	Θ=0 Normal viewing angle	4.4	4.9	—	%	Measuring with normal polarizer, Reference Only Base on Vop=5.0V
Transmittance (without Polarizer)		T (%)		13.5	15.0	—	%	
Contrast Ratio		CR		900	1100	—	—	(1)(2)
Response Time		T _R +T _F		—	30	35	msec	(1)(3)
Color Gamut	(%)			55	60	—	%	C-light
Color Chromaticity (CIE1931)	White	W _x		-0.02	0.320	+0.02	—	(1)(4) CF glass C-light
		W _y			0.344		—	
	Red	R _x			0.644		—	
		R _y			0.332		—	
	Green	G _x			0.323		—	
		G _y	0.565		—			
	Blue	B _x	0.134		—			
		B _y	0.124		—			
Viewing Angle	Hor.	Θ _L	CR>10	80	85	—	—	(1)(4) Measuring with normal polarizer, Reference Only
		Θ _R		80	85	—		
	Ver.	Θ _U		80	85	—		
		Θ _D		80	85	—		
Optima View Direction		Free						(5)



- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

Note (1) Definition of Viewing Angle:

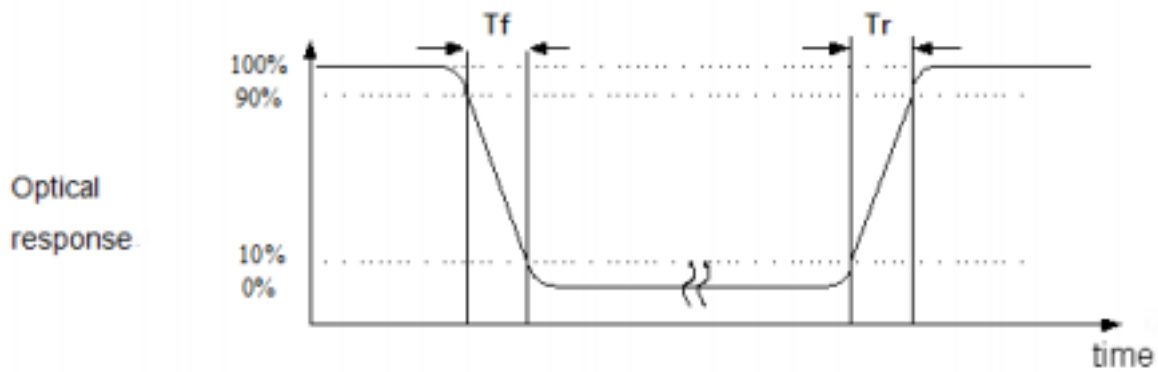


Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

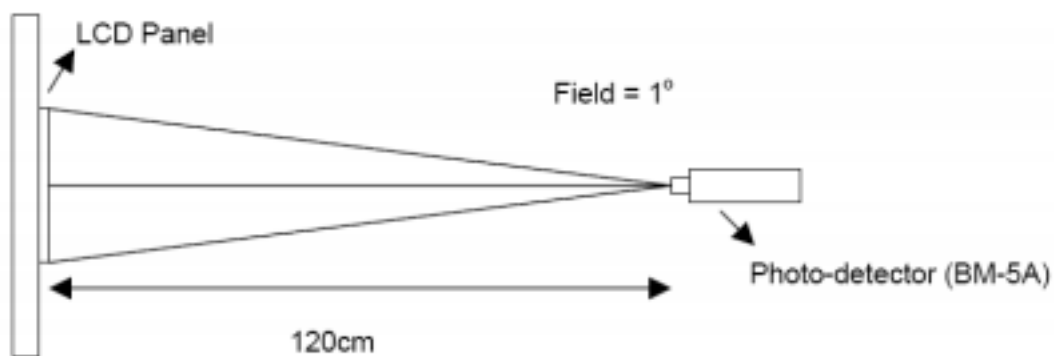
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$



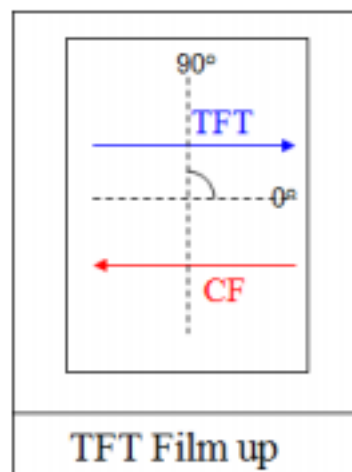
Note (3) Definition of Response Time : Sum of T_R and T_F



Note (4) Definition of optical measurement setup



Note (5) Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.)





9. Reliability

No.	Item	Conditions	Remark
1	High Temperature Storage	Ta=+80°C, 72 hrs	-
2	Low Temperature Storage	Ta=-30°C, 72 hrs	
3	High Temperature Operation	Ta=+70°C, 72 hrs	-
4	Low Temperature Operation	Ta=-20°C, 72 hrs	-

Note: (1) All tests above are practiced at module type.

(2) There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.