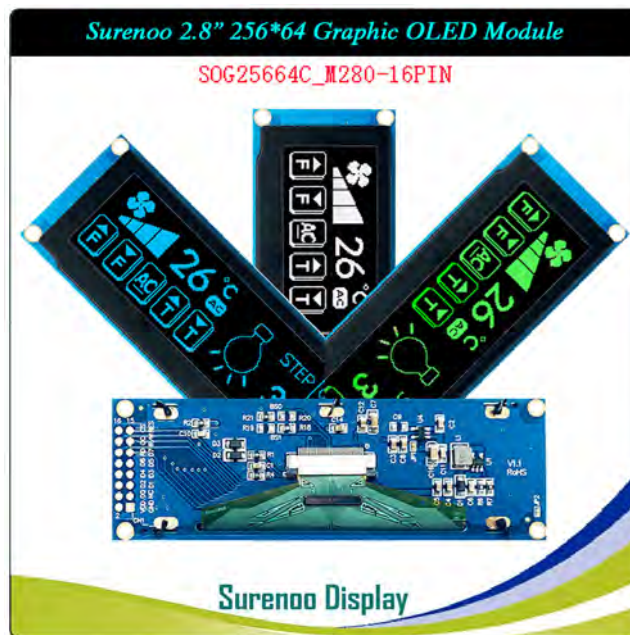


SURENOO GRAPHIC OLED SERIES DISPLAY

Product Specification

Part Name: OEL Display Module
SOG25664C_M280

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Shenzhen Surenoo Technology Co.,Ltd.

www.surenoo.com

E-mail: info@surenoo.com

Skype: Surenoo365

Graphic OLED Display Selection Guide

Graphic OLED Module

Graphic OLED Panel

SSD1322

1. Basic Specifications

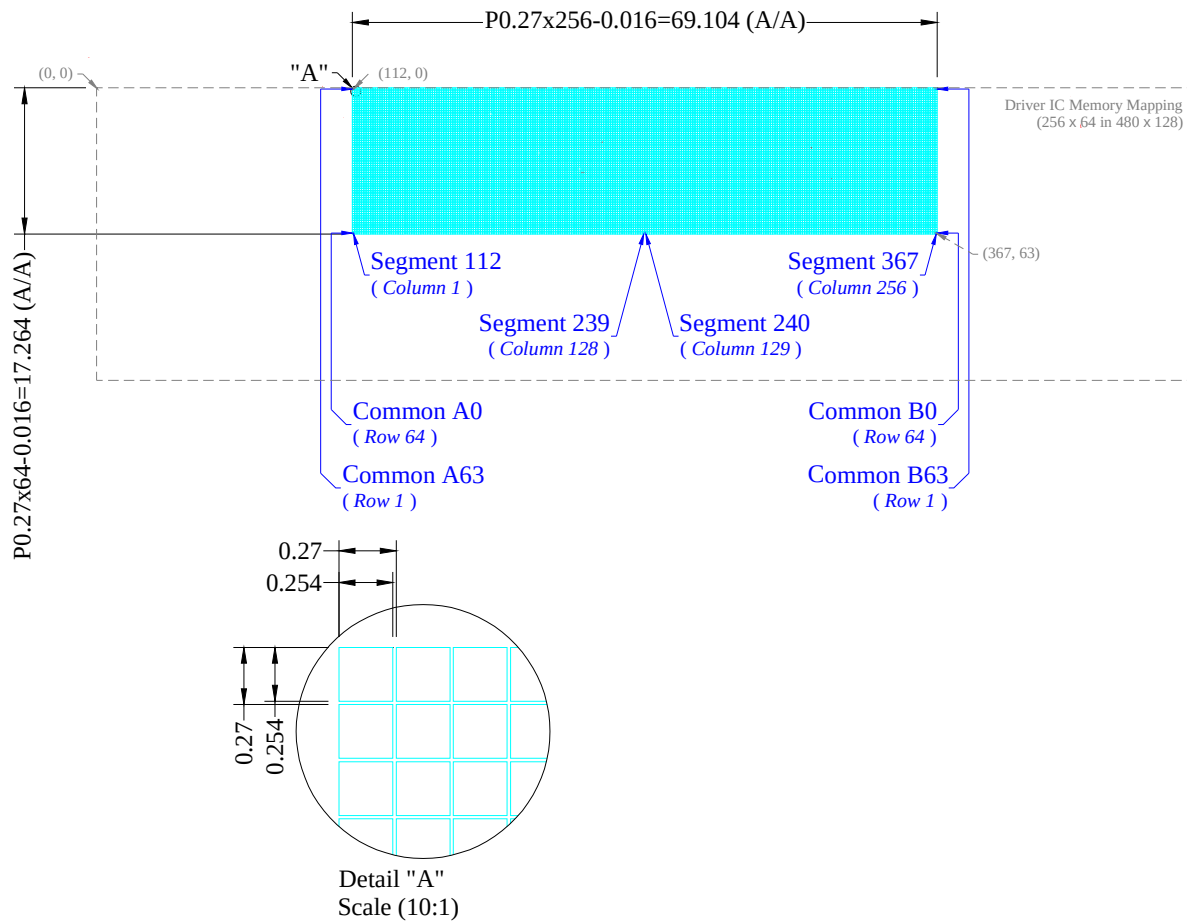
1.1 Display Specifications

- 1) Display Mode: Passive Matrix
- 2) Display Color: Monochrome (Blue)
- 3) Drive Duty: 1/64 Duty

1.2 Mechanical Specifications

- 1) Outline Drawing: According to the annexed outline drawing
- 2) Number of Pixels: 256×64
- 3) PCB Size: $100.00 \times 35.00 \times 4.8$ (mm)
- 4) Active Area: 69.10×17.26 (mm)
- 5) Pixel Pitch: 0.27×0.27 (mm)
- 6) Pixel Size: 0.254×0.254 (mm)

1.3 Active Area / Memory Mapping & Pixel Construction

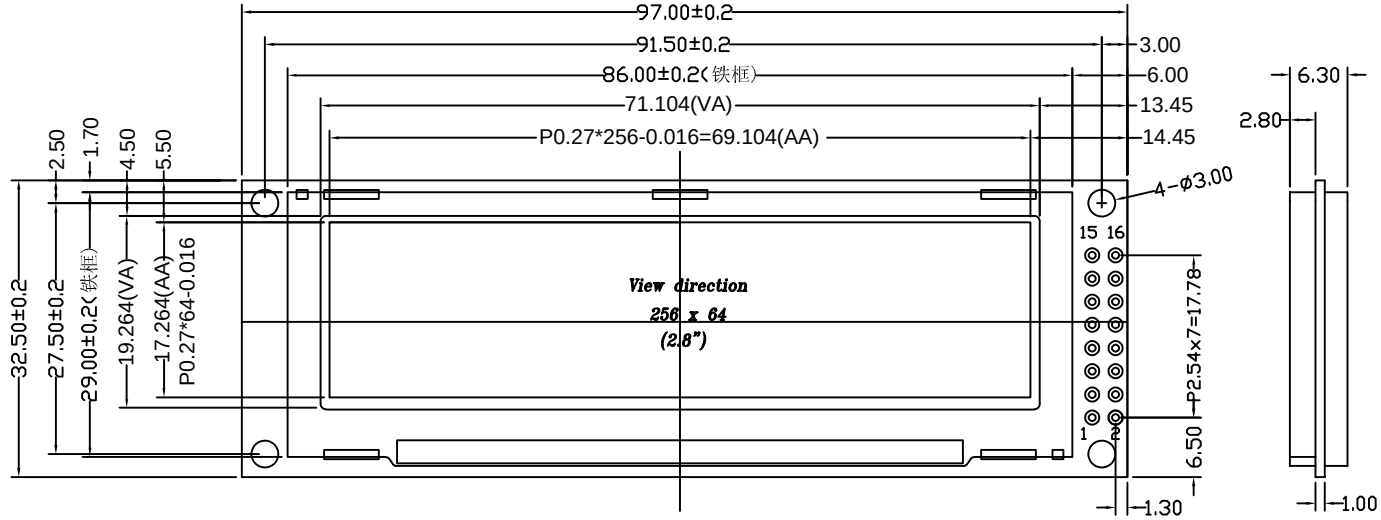




3 EXTERNAL DIMENSIONS

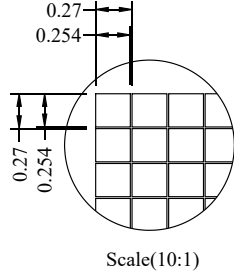
NOTES:

1. DISPLAY TYPE: 2.8" 256*64 OLED Module
2. VIEWING DIRECTION: ALL
3. POLARIZER MODE: TRANSMISSIVE/NORMALLY BLACK
4. DRIVER IC: SSD1322U
5. Resolution: 256x64
6. INTERFACE: 8-bit 68XX/80XX Parallel, 3-/4-wire SPI
7. VOLTAGE: 3.3V
8. OPERATING TEMP: -40°C~70°C



Item	Date	Remark
A	20190425	Original Drawing

Pin Descriptions	
Pin	Symbol
1	GND
2	VCC
3	NC
4	D0(CLK)
5	D1(DIN)
6	D2
7	D3
8	D4
9	D5
10	D6
11	D7
12	E/RD
13	R/W
14	DC
15	RES
16	CS



Customer Approval Signature	SHENZHEN SURENOO TECHNOLOGY CO.,LTD. 深圳市襄诺科技有限公司					Drawing Number	Rev.
	SOG25664C_M280 PM-OLED Display Module Pixel Number: 256x64, Monochrome					Material	
						Soda Lime / Polyimide	
	Unit mm	Title	Drawn	E.E.	Panel / E.	P.M.	Scale
General Roughness Φ		By HBK					Sheet
Tolerance	±0.3	Date	20190425				Size
Angle	±1						1:1 1 of 1 A4

1.5 Pin Definition

Parallel Interface(8080): (R18,R21- Use; R19,R20- No Use)

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3~+5.0V	Power Supply For Logic
3	NC	-	No connect
4~11	D0~D7	H/L	Data Bus
12	RD	H/L	8080: Active LOW Read signal
13	WR	H/L	8080:Active LOW Write signal
14	D/C(RS)	H/L	H: Data L: Command
15	/RST	H/L	Active LOW Reset signal
16	/CS	L	Chip Select

Parallel Interface(6800): (R18,R20- Use; R19,R21- NO Use)

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3~+5.0V	Power Supply For Logic
3	NC	-	No connect
4~11	D0~D7	H/L	Data Bus
12	RD	H/L	6800:Operation enable signal. Falling edge triggered.
13	WR	H/L	6800:Read/Write select signal, R/W=1: Read R/W: =0: Write
14	D/C(RS)	H/L	H: Data L: Command
15	/RST	H/L	Active LOW Reset signal
16	/CS	L	Chip Select

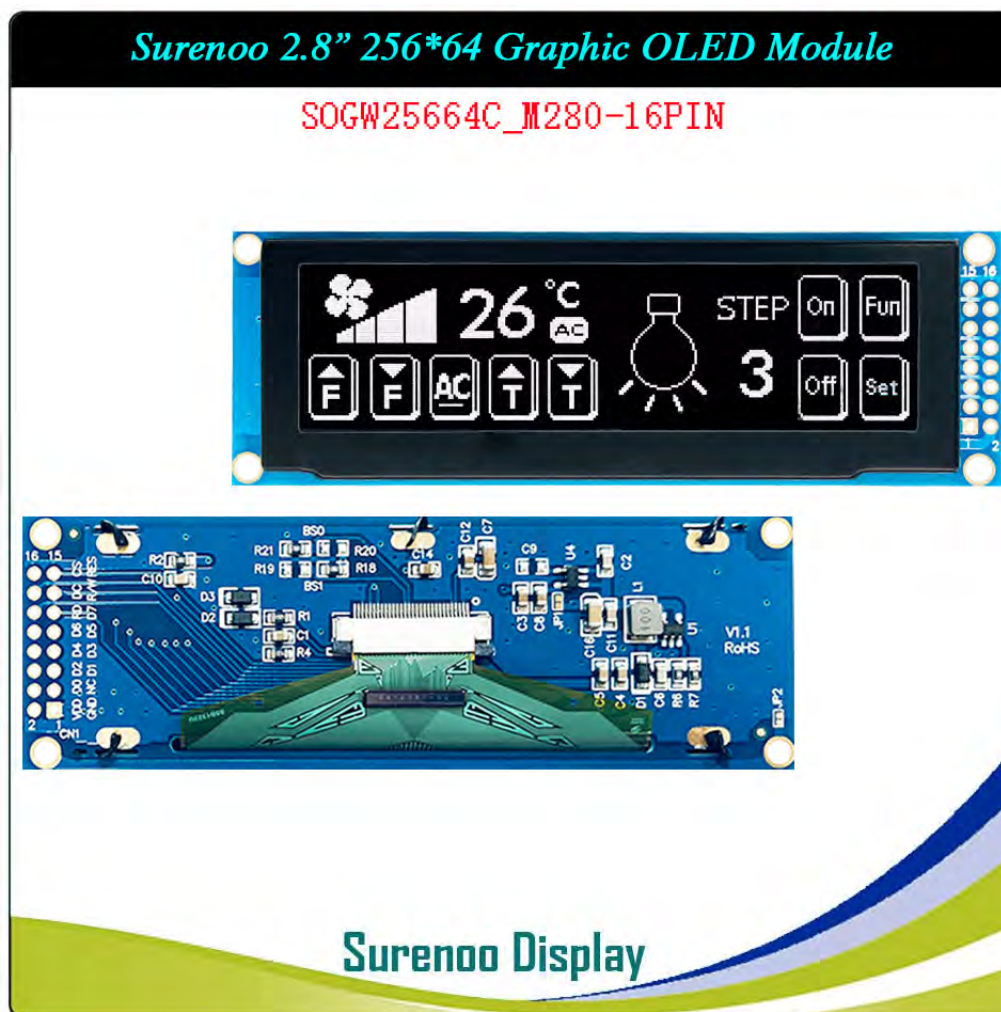
4-SPI: (R19,R21- Use; R18,R20- No Use)

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3~+5.0V	Power Supply For Logic
3	NC	-	No connect
4	SCLK(D0)	H/L	Serial Clock signal
5	SDIN(D1)	H/L	Serial Data input signal
6	NC(D2)	-	No connect
7~11	D3~D7	0V	Power Ground
12	RD	0V	Power Ground
13	WR	0V	Power Ground
14	D/C(RS)	H/L	H: Data L: Command
15	/RST	H/L	Active LOW Reset signal
16	/CS	L	Chip Select

3-SPI : (R19,R20- Use; R18,R21 -No Use)

ITEM	SYMBOL	LEVEL	FUNCTION
1	GND	0V	Power Ground
2	VDD	+3.3~+5.0V	Power Supply For Logic
3	NC	-	No connect
4	SCLK(D0)	H/L	Serial Clock signal
5	SDIN(D1)	H/L	Serial Data input signal
6	NC(D2)	-	No connect
7~11	D3~D7	0V	Power Ground
12	RD	0V	Power Ground
13	WR	0V	Power Ground
14	D/C(RS)	0V	Power Ground
15	/RST	H/L	Active LOW Reset signal
16	/CS	L	Chip Select

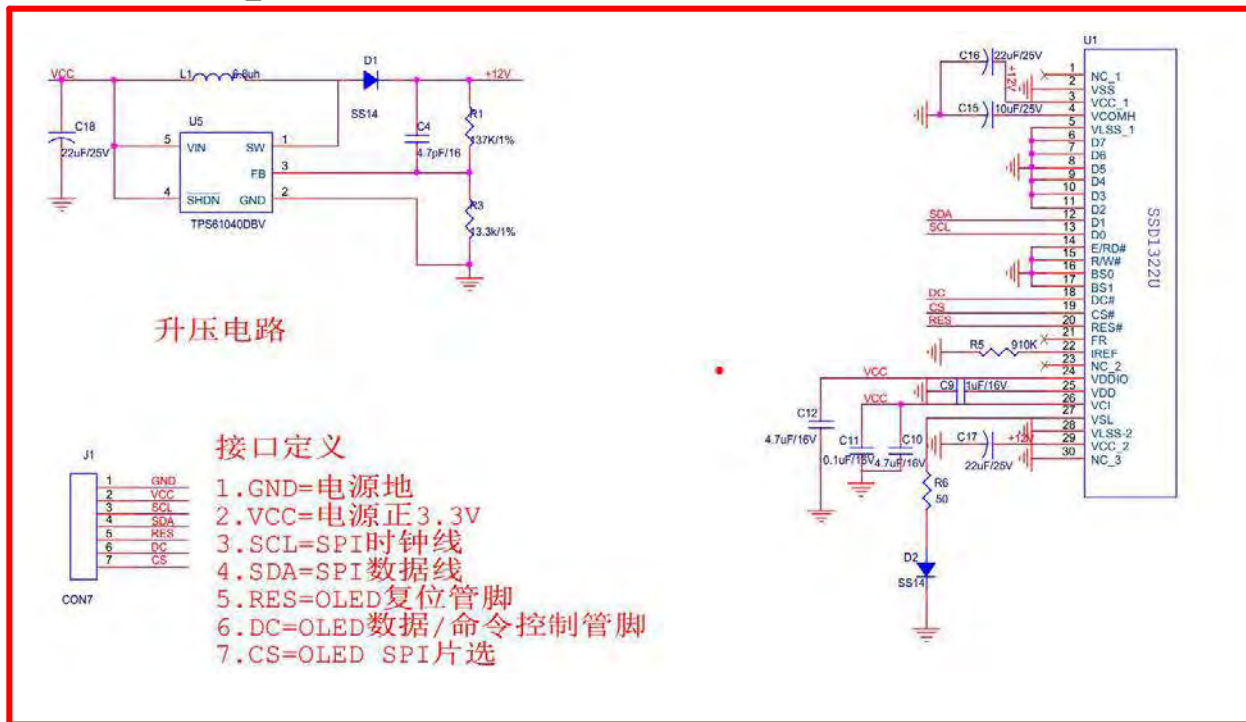
1.6 Product Picture





1.7 Schematic Diagram

Model: SOG25664C_M280



2. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Supply Voltage for Operation	V_{CI}	-0.3	4	V	1, 2
Supply Voltage for Logic	V_{DD}	-0.5	2.75	V	1, 2
Supply Voltage for I/O Pins	V_{DDIO}	-0.5	V_{CI}	V	1, 2
Supply Voltage for Display	V_{CC}	-0.5	16	V	1, 2
Operating Current for V_{CC}	I_{CC}	-	60	mA	1, 2
Operating Temperature	T_{OP}	-40	85	°C	3
Storage Temperature	T_{STG}	-40	90	°C	3
Life Time (80 cd/m ²)		10,000	-	hour	4
Life Time (60 cd/m ²)		20,000	-	hour	4

Note 1: All the above voltages are on the basis of " $V_{SS} = 0V$ ".

Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur. Also, for normal operations, it is desirable to use this module under the conditions according to Section 3. "Optics & Electrical Characteristics". If this module is used beyond these conditions, malfunctioning of the module can occur and the reliability of the module may deteriorate.

Note 3: The defined temperature ranges do not include the polarizer. The maximum withstood temperature of the polarizer should be 80°C.

Note 4: $V_{CC} = 12.0V$, $T_a = 25^{\circ}C$, 50% Checkerboard.

Software configuration follows Section 4.5 Initialization.

End of lifetime is specified as 50% of initial brightness reached. The average operating lifetime at room temperature is estimated by the accelerated operation at high temperature conditions.

3. Optics & Electrical Characteristics

3.1 Optics Characteristics

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Brightness	L_{br}	Note 5	60	80	-	cd/m ²
C.I.E.	(x) (y)	C.I.E. 1931	0.12 0.22	0.16 0.26	0.20 0.30	
Dark Room Contrast	CR		-	>10,000:1	-	
Viewing Angle			-	Free	-	degree

* Optical measurement taken at $V_{CI} = 2.8V$, $V_{CC} = 12.0V$.
Software configuration follows Section 4.4 Initialization.

3.2 DC Characteristics

Characteristics	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage for Operation	V_{CI}		2.4	2.8	3.5	V
Supply Voltage for Logic	V_{DD}		2.4	2.5	2.6	V
Supply Voltage for I/O Pins	V		1.65	1.8	V_{CI}	
Supply Voltage for Display	V_{CC}	Note 5	11.5	12	12.5	
High Level Input	V		$0.8 \times V_{DDIO}$	-	V_{DDIO}	V
Low Level Input	V_{IL}		0	-	$0.2 \times V_{DDIO}$	V
High Level Output	V_{OH}	$I_{out} = 100\mu A$	$0.9 \times V_{DDIO}$	-	V_{DDIO}	V
Low Level Output	V_{OL}	$I_{out} = 100\mu A$	0	-	$0.1 \times V_{DDIO}$	V
Operating Current for V_{CI}	I_{CI}		-	180	300	μA
Operating Current for V_{CC} Sleep Mode Current for V_{CI}	I_{CC} $I_{CI, SLEEP}$	Note 6		17.8	22.3	mA
		Note 7	-	28.1	35.1	mA
		Note 8	-	47.7	59.7	mA
Sleep Mode Current for V_{CC}	$I_{CC, SLEEP}$		-	20	100	μA
Sleep Mode Current for V_{CC}	$I_{CC, SLEEP}$		-	2	10	μA

Note 5: Brightness (L_{br}) and Supply Voltage for Display (V_{CC}) are subject to the change of the panel characteristics and the customer's request.

Note 6: $V_{CI} = 2.8V$, $V_{CC} = 12.0V$, 30% Display Area Turn on.

Note 7: $V_{CI} = 2.8V$, $V_{CC} = 12.0V$, 50% Display Area Turn on.

Note 8: $V_{CI} = 2.8V$, $V_{CC} = 12.0V$, 100% Display Area Turn on.

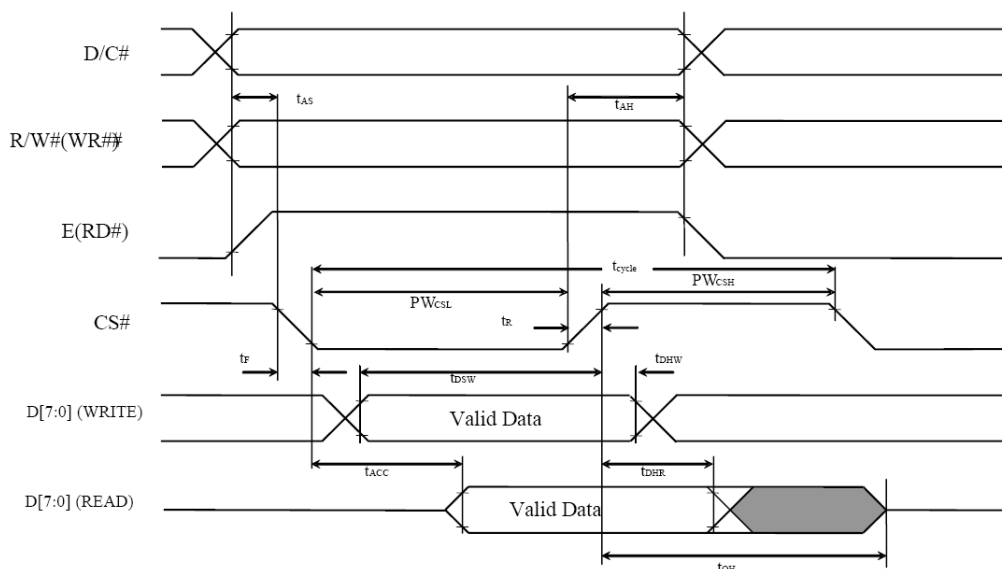
* Software configuration follows Section 4.4 Initialization.

3.3 AC Characteristics

3.3.1 68XX-Series MPU Parallel Interface Timing Characteristics:

Symbol	Description	Min	Max	Unit
t_{cycle}	Clock Cycle Time	300	-	ns
t_{AS}	Address Setup Time	10	-	ns
t_{AH}	Address Hold Time	0	-	ns
t_{DSW}	Write Data Setup Time	40	-	ns
t_{DHW}	Write Data Hold Time	7	-	ns
t_{DHR}	Read Data Hold Time	20	-	ns
t_{OH}	Output Disable Time	-	70	ns
t_{ACC}	Access Time	-	140	ns
PW_{CSL}	Chip Select Low Pulse Width (Read)	120	-	ns
	Chip Select Low Pulse Width (Write)	60		
PW_{CSH}	Chip Select High Pulse Width (Read)	60	-	ns
	Chip Select High Pulse Width (Write)	60		
t_{R}	Rise Time	-	15	ns
t_{F}	Fall Time	-	15	ns

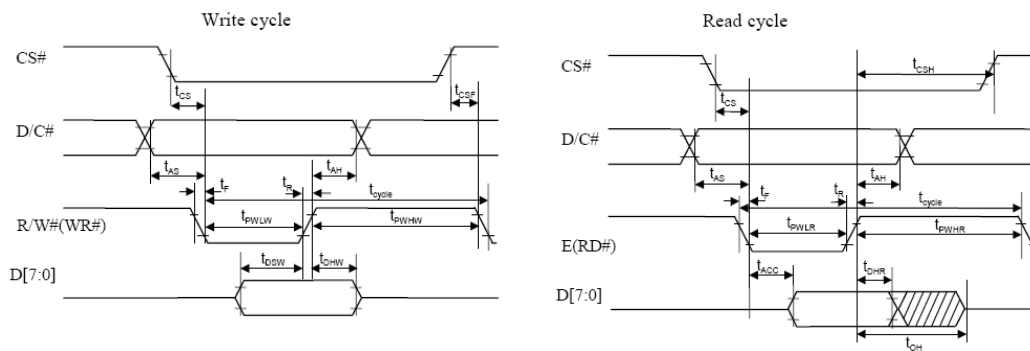
* ($V_{\text{DD}} - V_{\text{SS}} = 2.4\text{V to } 2.6\text{V}$, $V_{\text{DDIO}} = 1.6\text{V}$, $V_{\text{CI}} = 2.8\text{V}$, $T = 25^\circ\text{C}$)



3.3.2 80XX-Series MPU Parallel Interface Timing Characteristics:

Symbol	Description	Min	Max	Unit
t_{cycle}	Clock Cycle Time	300	-	ns
t_{AS}	Address Setup Time	10	-	ns
t_{AH}	Address Hold Time	0	-	ns
t_{DSW}	Write Data Setup Time	40	-	ns
t_{DHW}	Write Data Hold Time	7	-	ns
t_{DHR}	Read Data Hold Time	20	-	ns
t_{OH}	Output Disable Time	-	70	ns
t_{ACC}	Access Time	-	140	ns
t_{PWLRL}	Read Low Time	150	-	ns
t_{PWLW}	Write Low Time	60	-	ns
t_{PWHRL}	Read High Time	60	-	ns
t_{PWHW}	Write High Time	60	-	ns
t_{CS}	Chip Select Setup Time	0	-	ns
t_{CSH}	Chip Select Hold Time to Read Signal	0	-	ns
t_{CSF}	Chip Select Hold Time	20	-	ns
t_{R}	Rise Time	-	15	ns
t_{F}	Fall Time	-	15	ns

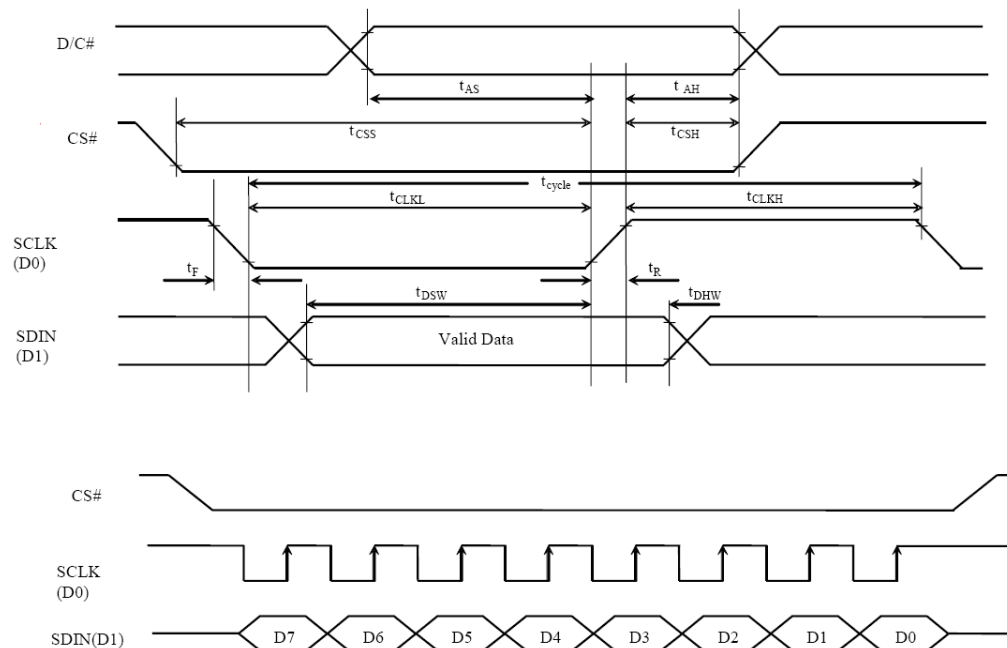
* ($V_{\text{DD}} - V_{\text{SS}} = 2.4\text{V}$ to 2.6V , $V_{\text{DDIO}} = 1.6\text{V}$, $V_{\text{CI}} = 2.8\text{V}$, $T_a = 25^\circ\text{C}$)



3.3.3 Serial Interface Timing Characteristics: (4-wire Serial)

Symbol	Description	Min	Max	Unit
t_{cycle}	Clock Cycle Time	100	-	ns
t_{AS}	Address Setup Time	15	-	ns
t_{AH}	Address Hold Time	15	-	ns
t_{CSS}	Chip Select Setup Time	20	-	ns
t_{CSH}	Chip Select Hold Time	10	-	ns
t_{DSW}	Write Data Setup Time	15	-	ns
t_{DHW}	Write Data Hold Time	15	-	ns
t_{CLKL}	Clock Low Time	20	-	ns
t_{CLKH}	Clock High Time	20	-	ns
t_{R}	Rise Time	-	15	ns
t_{F}	Fall Time	-	15	ns

* ($V_{\text{DD}} - V_{\text{SS}} = 2.4\text{V to } 2.6\text{V}$, $V_{\text{DDIO}} = 1.6\text{V}$, $V_{\text{CI}} = 2.8\text{V}$, $T_a = 25^\circ\text{C}$)



3.3.4 Serial Interface Timing Characteristics: (3-wire Serial)

Symbol	Description	Min	Max	Unit
t_{cycle}	Clock Cycle Time	100	-	ns
t_{CSS}	Chip Select Setup Time	20	-	ns
t_{CSH}	Chip Select Hold Time	10	-	ns
t_{DSW}	Write Data Setup Time	15	-	ns
t_{DHW}	Write Data Hold Time	15	-	ns
t_{CLKL}	Clock Low Time	20	-	ns
t_{CLKH}	Clock High Time	20	-	ns
t_{R}	Rise Time	-	15	ns
t_{F}	Fall Time	-	15	ns

* ($V_{\text{DD}} - V_{\text{SS}} = 2.4\text{V to } 2.6\text{V}$, $V_{\text{DDIO}} = 1.6\text{V}$, $V_{\text{CI}} = 2.8\text{V}$, $T_{\text{a}} = 25^{\circ}\text{C}$)

