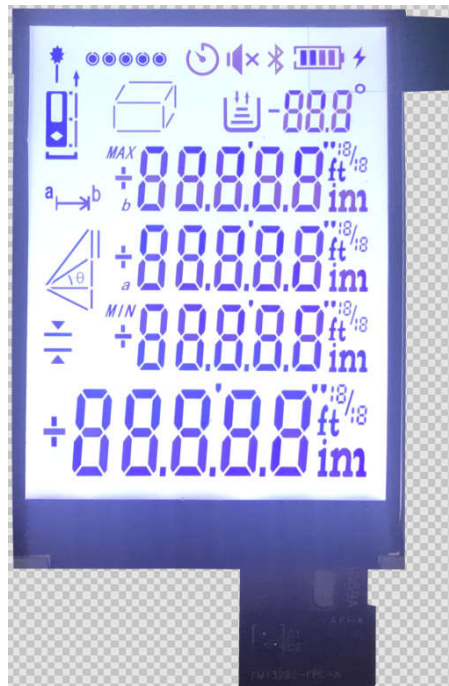


FM13292 液晶显示屏使用手册



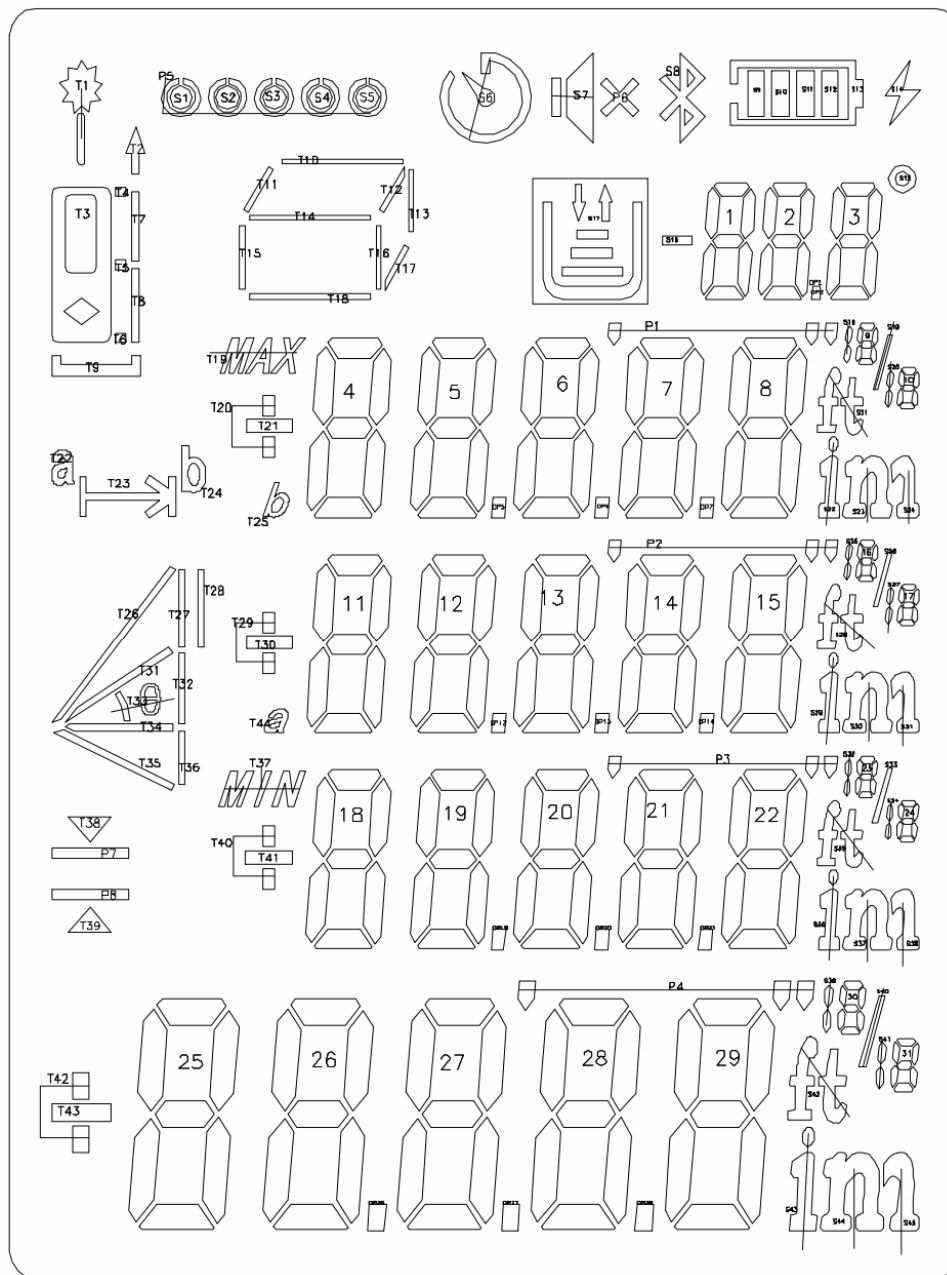
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2. 逻辑图:



	SEG0	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	SEG7	SEG8	SEG9	SEG10	SEG11	SEG12	SEG13	SEG14	SEG15	SEG16	SEG17	SEG18	SEG19	SEG20	SEG21	SEG22	SEG23	SEG24
COM0	S5	S4	S3	S2	S1	P5	T1	T2	T4	T3	T9	T22	T42	25E	25D	26D	DP26	27D	DP27	28D	DP28	29E	29D	S45	30E
COM1	---	---	---	---	---	1A	2A	2B	3A	S15	T37	T35	T41	S33	18A	19A	19B	20A	20B	P3	21A	22F	22A	S35	S32
COM2	---	---	---	---	---	T10	T11	T7	T5	T6	T19	T23	T43	25G	25C	26E	26C	27E	27C	28E	28C	29G	29C	S44	30G
COM3	---	---	---	---	---	1B	2F	2G	3F	3B	T29	T34	T40	18F	18B	19F	19G	20F	20G	21F	21B	22G	22B	S36	23F
COM4	---	---	---	---	---	S6	T12	T14	T15	T8	T21	T24	T39	25F	25B	26F	26G	27F	27G	28F	28G	29F	29B	S43	30F
COM5	---	---	---	---	---	1C	2E	2C	3E	3C	T30	T33	T38	18G	18C	19E	19C	20E	20C	21G	21C	22E	22C	S37	23G
COM6	---	---	---	---	---	S17	T13	T17	T16	T18	T20	T26	P8	---	25A	26A	26B	27A	27B	28A	28B	P4	29A	S42	S39
COM7	---	---	---	---	---	1D	2D	DP2	3D	3C	T25	T31	P7	18E	18D	19D	DP19	20D	DP20	21E	21D	DP21	22D	S38	23E

	SEG25	SEG26	SEG27	SEG28	SEG29	SEG30	SEG31	SEG32	SEG33	SEG34	SEG35	SEG36	SEG37	SEG38	SEG39	SEG40	SEG41	SEG42	SEG43	SEG44	SEG45	SEG46	SEG47	SEG48	SEG49
COM0	30D	S40	31E	31D	---	S19	4A	5A	5B	6A	6B	P1	7A	8F	8A	S21	S18	9A	---	S20	10A	---	---	---	---
COM1	23A	---	S34	24A	T36	T44	11D	12D	DP12	13D	DP13	14D	DP14	15E	15D	S31	16E	16D	S26	S27	17D	1F	S14	S10	S9
COM2	30C	---	31G	31C	---	4F	4B	5F	5G	6F	6C	7F	7B	8G	8B	S22	9F	9B	---	10F	10B	---	---	---	---
COM3	23B	---	24F	24B	T32	11E	11C	12E	12C	13E	13C	14E	14C	15G	15C	S30	16G	16C	---	17E	17C	1G	S13	S11	S12
COM4	30B	---	31F	31B	---	4G	4C	5E	5C	6E	6C	7G	7C	8E	8C	S23	9G	9C	---	10G	10C	---	---	---	---
COM5	23C	---	24G	24C	T28	11G	11B	12F	12G	13F	13G	14F	14G	15F	15B	S29	16F	16B	---	17G	17B	1E	S8	---	---
COM6	30A	---	S41	31A	---	4E	4D	5D	DP5	6D	DP6	7E	7D	DP7	8D	S24	9E	9D	---	10E	10D	S7	---	---	---
COM7	23D	---	24E	24D	T27	11F	11A	12A	12B	13A	13B	14A	14B	P2	15A	S28	S25	16A	---	17F	17A	S16	P6	---	---

四. 引脚特性:

引脚号	引脚名称	级 别	引 脚 功 能 描 述
1	BLK-	0V	背光负极
2	BLA+	3.0V	背光正极
3	SCLK	H/L	串行接口锁存端
4	SDA	H/L	串行接口数据端
5	CS	H/L	片选信号
6	RST	H/L	复位, 低有效
7	VDD	3.3V	电源正
8	VSS	0V	电源地

五. 电气特性:

1. 限定参数:

项 目	名称	值	单 位	备 注
Operating Voltage	VDD	+3.0 to +3.3	V	*1
Supply Voltage	VEE	VDD-3.3toVDD-3.0	V	*2

项 目	名称	值	单 位	备 注
Operating Temperature	T _{OPR}	-10 to +60	°C	
Storage Temperature	T _{STG}	-20 to +70	°C	

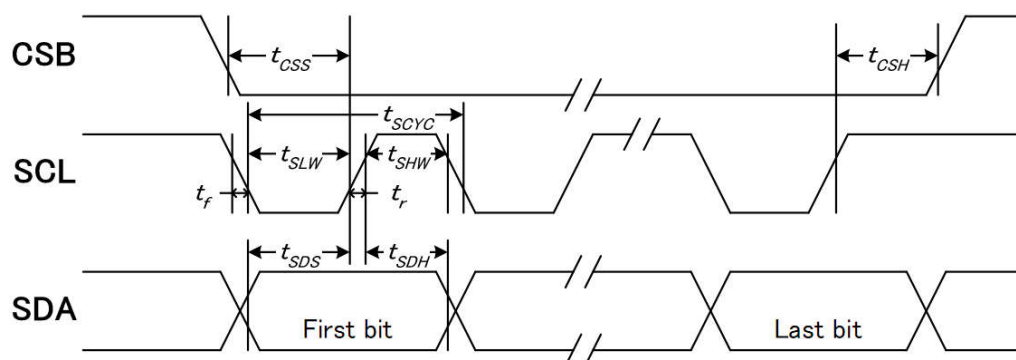
*1. Based on VSS=0V

*2. Applies to V_{LCD}2. 直流特性: (VDD=+3.3V, VSS=0V, V_{LCD}=5.0V, T_a=-20~+70°C)

项 目	名称	测试条件	Min	Typ	Max	单 位	备 注
Input High Voltage	V _{IH}	-	2.4	-	VDD	V	*1
Input Low Voltage	V _{IL}	-	0	-	0.6	V	*1
Output High Voltage	V _{OH}	I _{OH} =-500uA	2.4	-	-	V	*2
Output Low Voltage	V _{OL}	I _{OL} =0.5mA		-	0.6	V	*2
Input Leakage Current	I _{LKG}	V _{IN} =VSS~VDD	-1.0	-	1.0	uA	*3
Three-state(OF) input Current	I _{TSL}	V _{IN} =VSS~VDD	-3.3	-	3.3	uA	*4
Operating Current	I _{DD1}	During Display	-	-	0.5	mA	*5
	I _{DD2}	During Access			1	mA	*5

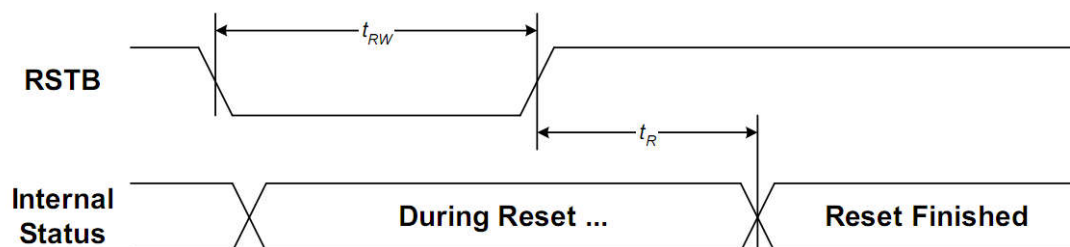
六. 时序特性及地址映射表:

3-Line SPI 时序图:



(VDD1 = 3.3V, Ta = 25°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period	SCL	tSCYC		50	—	ns
SCL "H" pulse width		tSHW		25	—	
SCL "L" pulse width		tSLW		25	—	
Data setup time	SDA	tSDS		20	—	
Data hold time		tSDH		10	—	
CSB-SCL time	CSB	tCSS		20	—	
CSB-SCL time		tCSH		40	—	



(VDD1 = 3.3V, Ta = 25°C)

Item	Symbol	Condition	Min.	Max.	Unit
Reset time	tR		—	1.0	us
Reset "L" pulse width	tRW		1.0	—	

七. 指令列表:

INSTRUCTION	A0	R/W (RWR)	COMMAND BYTE								DESCRIPTION
			D7	D6	D5	D4	D3	D2	D1	D0	
(1) Display ON/OFF	0	0	1	0	1	0	1	1	1	D	D=1, display ON D=0, display OFF
(2) Set Start Line	0	0	0	1	S5	S4	S3	S2	S1	S0	Set display start line
(3) Set Page Address	0	0	1	0	1	1	Y3	Y2	Y1	Y0	Set page address
(4) Set Column Address	0	0	0	0	0	1	X7	X6	X5	X4	Set column address (MSB)
	0	0	0	0	0	0	X3	X2	X1	X0	Set column address (LSB)
(5) Read Status	0	1	0	MX	D	RST	0	0	0	0	Read IC Status
(6) Write Data	1	0	D7	D6	D5	D4	D3	D2	D1	D0	Write display data to RAM
(7) Read Data	1	1	D7	D6	D5	D4	D3	D2	D1	D0	Read display data from RAM
(8) SEG Direction	0	0	1	0	1	0	0	0	0	MX	Set scan direction of SEG MX=1, reverse direction MX=0, normal direction
(9) Inverse Display	0	0	1	0	1	0	0	1	1	INV	INV=1, inverse display INV=0, normal display
(10) All Pixel ON	0	0	1	0	1	0	0	1	0	AP	AP=1, set all pixel ON AP=0, normal display
(11) Bias Select	0	0	1	0	1	0	0	0	1	BS	Select bias setting 0=1/9; 1=1/7 (at 1/65 duty)
(12) Read-modify-Write	0	0	1	1	1	0	0	0	0	0	Column address increment: Read:+0, Write:+1
(13) END	0	0	1	1	1	0	1	1	1	0	Exit Read-modify-Write mode
(14) RESET	0	0	1	1	1	0	0	0	1	0	Software reset
(15) COM Direction	0	0	1	1	0	0	MY	-	-	-	Set output direction of COM MY=1, reverse direction MY=0, normal direction
(16) Power Control	0	0	0	0	1	0	1	VB	VR	VF	Control built-in power circuit ON/OFF
(17) Regulation Ratio	0	0	0	0	1	0	0	RR2	RR1	RR0	Select regulation resistor ratio
(18) Set EV	0	0	1	0	0	0	0	0	0	1	Double command!! Set electronic volume (EV) level
	0	0	0	0	EV5	EV4	EV3	EV2	EV1	EV0	
(19) Set Booster	0	0	1	1	1	1	1	1	0	0	Double command!! Set booster level: BL=0: 4X BL=1: 5X
	0	0	0	0	0	0	0	0	0	BL	
(20) Power Save	0	0	Compound Command								Display OFF + All Pixel ON
(21) NOP	0	0	1	1	1	0	0	0	1	1	No operation
(22) Set N-Line	0	0	1	0	0	0	0	1	0	1	Set N-Line inversion
	0	0	0	0	0	NL4	NL3	NL2	NL1	NL0	
(23) Release N-Line	0	0	1	0	0	0	0	1	0	0	Exit N-Line inversion
(24) SPI Read Status	0	1	1	1	1	1	1	1	0	0	SPI read status command
	0	1	0	MX	D	RST	ID3	ID2	ID1	ID0	
(25) SPI Read DDRAM	0	1	1	1	1	1	1	1	0	1	SPI read DDRAM command
	1	1	D7	D6	D5	D4	D3	D2	D1	D0	

EXTENSION COMMAND SET											
Extension Command Set	0	0	1	1	1	1	1	1	1	Mode	Mode=1: Enter extension command table Mode=0: Exit extension command table
(1) High Power Mode ON	0	0	0	1	1	0	1	0	1	1	Enter high power mode
(2) High Power Mode OFF	0	0	0	1	1	0	0	1	0	0	Exit high power mode
(3) Display Setting Mode	0	0	0	1	1	1	-	-	DSM	0	Complex command DSM=1: Enter display setting DSM=0: Exit display setting When DSM=1, Set duty(DT[3:0]), bias(BA[2:0]), frame rate(FR[2:0])
	0	0	1	1	0	1	DT3	DT2	DT1	DT0	
	0	0	1	0	0	1	0	BA2	BA1	BA0	
	0	0	1	0	0	1	1	FR2	FR1	FR0	

Note: 1. Symbol "-" means this bit can be "H" or "L".

2. Do not use instructions not listed in these tables.