IP5306 Register file

1,I2C protocol

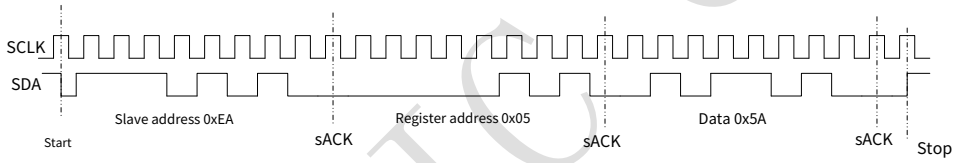
The i2c speed support 400Kbps.Support 8 bit address width and 8bit data width. Transmit and receive MSB first. The default slave address is 0Xea.

I2C acts as slave and is controlled by the master. The SCK line of the I2C interface is driven by the master. The SDA line could be pulled up to VCC by a 2.2Kohm resister and pulled

down by either the master or the slave.A typical WRITE sequence for writing 8bits data to a register is shown in below figure. A start bit is given by the master, followed by the slave address, register address and 8-bit data. After each 8-bit address or data transfer, the IP5306 gives an ACK bit. The master stops writing by sending a stop bit.

All 8 bits data must be written before the register is updated.

Example: Write 8bit data 0x5a to register 0x05, and the slave address is 0Xea



Note:Sack generated by Slave, Mack generated by Master, and Mnack is a NACK generated by Master

Figure1 I2C WRITE

A typical READ sequence is shown in below figure. First the master has to write the slave address, followed by the register address. Then a restart bit and the slave address specify that a READ is generated. The master then clocks out 8 bits at a time to read data.

Example: Read 8bit data 0x5A from register 0x05, and the slave address is 0Xea

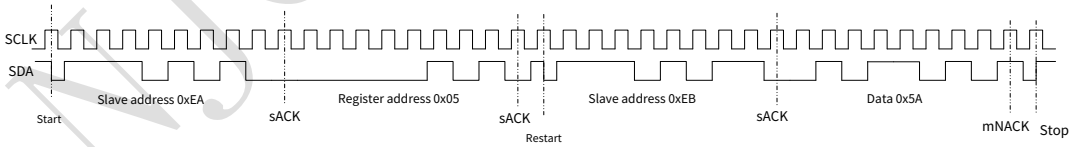
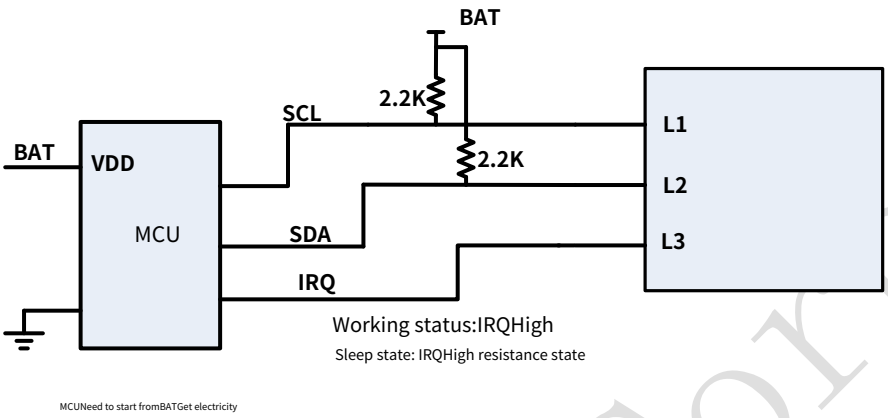


Figure2 I2C Read

2,I2C Application note



I2C Connection diagram

1,IP5306 The standard product is not supported by default I2C, Need to be customized separately I2C Version, please follow IP5306_I2C Models apply for samples and place orders

2, If you want to modify IP5306 When a certain register address=, the value of the corresponding register address= needs to be read out to modify the BIT After bit and OR operation, write the calculated value into this register address =,**Make sure to modify only what needs to be modified bit other bit The value of can not be changed at will**

3,Recommendations:

1) useIRQSignal judgmentIP5306Is it in working mode or standby mode: IRQ=1Hour work,IRQ=0Standby

2) Use register address =0x70ofbit3judgeIP5306Is it charging or discharging:bit3=1When charging,bit3=0Hourly discharge

3) Use register address =0x71ofbit3Determine whether the battery is fully charged:bit3=1Time is full,bit3=0Not full

4) IP5306There is no voltage and current information inside, only external belts can be addedADCofMCUTo manage battery power

4,I2C Communication waveform introduction

I2c master When writing, pass it first 8bit Data, section 9 indivual bit read slave return ack,ack Low means writing is successful, high means writing is unsuccessful.

I2c master When reading, the last one byte Transmission is slave Return data,master return nack(High level), which means the end of reading; if master What returned is ack(Low level), it means that the reading is not over,master Will continue to read. So the ninthbit of ack Signal depends on master Whether the end is a read operation or a write operation: because IP5306 Can only do slave:

If to IP5306 Register address = write data,IP5306 return ack Is low level;

If from IP5306 Read data,IP5306 return nack High level),**(master Must send NACK, Otherwise there will be an exception) on behalf of the end of the reading**

3, Register address

Marked as "Reserved"The register address = bit has a special control function, the original value cannot be changed, otherwise unpredictable results will occur. The operation of register address = must be carried out in accordance with "read --> modify --> write", and only modify what is neededbit, Cannot modify other unused bitValue.

SYS_CTL0

Register address =0X00

Bit(s)	Name	Description	R/W	Reset
7:6		Reserved		10
5		Boost enable 0: disable 1:enable Note:disable Rear IP5306 There is no way to automatically shut down under light load, you need to press the button to send a double-click pulse signal to shut down and enter sleep	RW	1
4		Charger enable 0: disable 1:enable Note: After being fully charged and charging, without unplugging the input Down enable – disable- enable, You can turn on charging again	RW	1
3		Reserved		1
2		Plug-in load automatic power-on function enable 0: disable 1:enable	RW	1
1		BOOST Output normally open function 0: disable 1:enable	RW	1
0		Button shutdown enable 0: disable 1:enable	RW	0

SYS_CTL1

Register address =0X01

Bit(s)	Name	Description	R/W	Reset
7		closure boost Boost control signal selection 1:Press 0: Short press twice	R/W	0
6		switch WLED Flashlight control signal selection 1: Short press twice 0:Press	R/W	0
5		Short press the switch boost 0: disable 1:enable	R/W	0
4:3		reserved		
2		VIN After unplugging, whether to turn on Boost 0: Not open, 1: On	R/W	1
1		reserved	R/W	0
0		Batlow 3.0V Low power shutdown enable 0: disable 1: enable	RW	1

SYS_CTL2

Register address = 0X02

Bit(s)	Name	Description	R/W	Reset
7:5		reserved		
4		KEY long press time setting 0:2s 1:3s	R/W	0
3:2		Light load shutdown time setting 11:64S 10:16S 01:32S 00:8S	R/W	0
1:0		reserved	R/W	0

Charger_CTL0

Register address =0x20

Bit(s)	Name	Description	R/W	Reset
7:2		Reserved		
1:0		Full charge stop setting 11:4.2/4.305/4.35/4.395 10: 4.185/4.29/4.335/4.38 01: 4.17/4.275/4.32/4.365 00: 4.14/4.26/4.305/4.35 Corresponding to 4.2V/4.3V/4.35V/4.4V The charging cut-off voltage is recommended 01 or 00 Gear	RW	10

Charger_CTL1

Register address =0x21

Bit(s)	Name	Description	R/W	Reset
7:6		Battery end stop charging current detection 11: 600mA 10: 500mA 01: 400mA 00: 200mA IP5306 The full charge detection first detects the current and then the battery voltage (0X20bit1:0)	RW	01
5		reserved		0
4:2		Charging under-voltage loop setting (output terminal when charging VOUT Voltage111:4.8 110:4.75 101:4.7 100:4.65 011:4.6 010:4.55 001:4.5 000:4.45	RW	101 F

		Note: When charging IC Will detect output VOUT Voltage to automatically adjust the charging current when VOUT When the voltage is greater than the set value, the maximum current is used to charge, and when the voltage is less than the set value, it will be charged automatically. Automatically reduce the charging current to maintain this voltage; If the customer requires charging and discharging, sampling can be added at the output The load current at the output terminal of the resistance detection while charging and discharging is greater than 100mA The undervoltage ring can be set to the highest value when it is time, and the external load can be charged first		

Charger_CTL1

Register address =0x22

Bit(s)	Name	Description	R/W	Reset
7:4		Reserved		0000
3:2		Battery voltage setting 11:4.4 10:4.35v 01:4.3v 00: 4.2v	RW	00
1:0		Constant voltage charging voltage setting 11: Pressurized 42mV 10: Pressurized 28mV 01: Pressurized 14mV 00: Not pressurized Note:4.30V/4.35V/4.4V It is recommended to pressurize 14mV; 4.2V It is recommended to pressurize 28mV;	RW	01

Register address =0x23

Bit(s)	Name	Description	R/W	Reset
7:6		Reserved		
5		Charging constant current loop selection: 1:VIN end CC Constant current 0:BAT end CC Constant current	RW	1
4:0		Reserved	RW	

CHG_DIG_CTL0

Register address =0x24

Bit(s)	Name	Description	R/W	Reset

7:5		Reserved		
4:0		Charger(VIN End) current setting: I=0.05+b0*0.1+b1*0.2+b2*0.4+b3*0.8+b4*1.6A	RW	

REG_READ0

Register address = 0X70

Bit(s)	Name	Description	R/W	Reset
7:4		Reserved	R	
3	charge_en	Charging enable flag 1: Charging is on 0: Charging off	R	
2:0		Reserved	R	

REG_READ1

Register address = 0X71

Bit(s)	Name	Description	R/W	Reset
7:4		Reserved	R	X
3		Full of flags 0: Still charging 1: Already full	R	X
2:0		Reserved	R	X

REG_READ2

Register address = 0X72

Bit(s)	Name	Description	R/W	Reset
7:3		Reserved	R	X
2		Output light load flag 0: Heavy load 1: Light load	R	X
1:0		Reserved	R	X

REG_READ3

Offset = 0X77

Bit(s)	Name	Description	R/W	Reset
7:3				
2	KEY Button double click sign	for 1, Indicating that a double-click has occurred Write 1 Cleared	R/W	0
1	KEY Button long press sign	for 1, Indicating that a long key press has occurred Write 1 Cleared	R/W	0
0	KEY Button short press sign	for 1, Indicating that a short press of the button has occurred Write 1 Cleared	R/W	0

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