
OTP Speech Chip SC5804M

V2.14

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1、Description:

SC5804M is the 32-bit single chip CMOS voice chip, chip internal integration 4M EPPROM and 2 channel speech synthesis, speech synthesis using ADPCM algorithm, the highest sampling rate to 48 KHZ, Each body has 4 I/O pins and PWM output for voice, Through accurate internal oscillation, external Rosc is unnecessary. This any external component is not required, serial mode maximum 1024 voice groups , mobile One Group contain several steps(voice section); Maximum 1536 steps. Maximum 500 seconds Voice at 8khz.Each Step can be define Trigger Mode, Output Status, Voice Section, Mute length, I/O Type & Simple Programming Function. Support two mode trigger IC (Stand Alone, Serial Trigger Mode). Easy use development system is for function selection and voice combination . PC download the ROM code by the OTP_Writer.

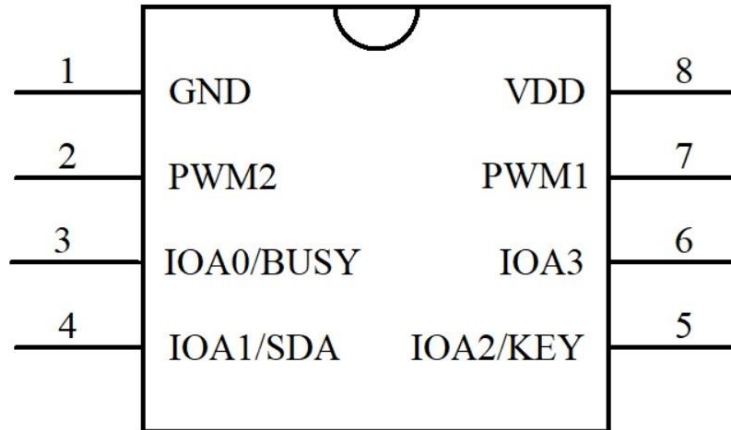
2、Funtions:

- (1) Programmable high quality voice chip.
- (2) Total Voice Duration: 500S (8K Samples).

- (3) PWM output: 8Ω/0.5W
- (4) Internal oscillation.
- (5) Key mode and serial mode, can use MCU/RF/IR send address code control voice Groups to play/stop, circulation, volume orders.
- (6) MAX voice file:1536
- (7) MAX Trigger Groups:1024
- (8) Any IO choose 7 mode to trigger;
- (9) Support play 48KHz under different sampling rate of the audio and music;
- (10) Support the BUSY state output function;
- (11) To support low voltage reset;
- (6) MAX voice file:1536;
- (7) MAX Trigger 1024 Groups;
- (8) Only one input pin can select 7 trigger mode ;
- (9) Play 48Khz under different sampling rate of the audio and music files;
- (10) support the BUSY state output;
- (11) low voltage reset (LVR);
- (12) Operating Voltage: DC 3.0~5.5V;
- (13) SOP8 Package

3、PAD Description:

3.1、PAD Diagram



3.2、PAD Funtions

Pad No	Pad Name	Description
1	GND	Connected to Ground.
2	PWM2	As a PWM PIN , can Directly drive the Speaker
3	IOA0/BUSY	As Key Stand-alone or Output PIN to Voice play busy
4	IOA1/SDA	Serial Mode : is used to control maximum 1024 Voice Groups As Output PIN
5	IOA2/KEY	As Key Stand-alone or Output PIN
6	IOA3	As Key Stand-alone or Output PIN
7	PWM1	As a PWM PIN , can Directly drive the Speaker .
8	VDD	Power Supply PIN , Connected with a 0.1 uF to VSS.

4、DC Electrical Characteristics:

4.1、Maximum Rating

Symbol	Rating	Unit
VDD~GND	-0.5 ~ +6.0	V
Top (operating)	-20 ~ +80	°C
Tst (storage)	-25 ~ +85	°C

4.2、DC Characteristics

Parameter	Symb ol	Min	Typ	Max	Uni t	Condition
VDD	VDD	2.4	3.0	5.5	V	VDD>2.4V, key mode
Standby current	I _{sb}		3	5	uA	VDD=3V, no load
Operating current	I _{op}		2		mA	VDD=3V, no load
			2.4		mA	VDD=4.5V, no load
Output drive current	I _{od}		20		mA	VDD=3V
			20		mA	VDD=4.5V
Input current	I _{os}		-10		mA	VDD=3V
			-20		mA	VDD=4.5V
PWM current	I _{pwm}		60	70	mA	VDD=3V, Load=8Ω
			100	110	mA	VDD=4.5V, Load=8Ω
PWM power	P _O		1.3		W	VDD=4.5V, Load=4Ω
			0.65		W	VDD=4.5V, Load=8Ω

5、Timing Diagram:

5.1、Key Stand-alone Trigger Mode

Only one input pin can select Toggle On/Off function.

1. Trigger Pulse Width < Group Length

Option Setting = Edge / Hold

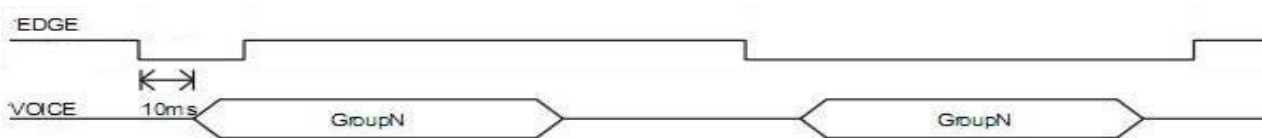


2. Trigger Pulse Width < Group Length

Option Setting = Edge / Unhold



3. Option Setting = Retrigger

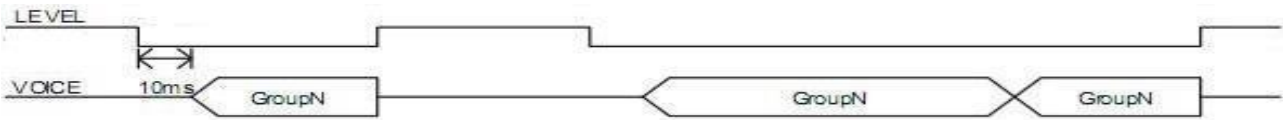


4. Option Setting = Irretrigger



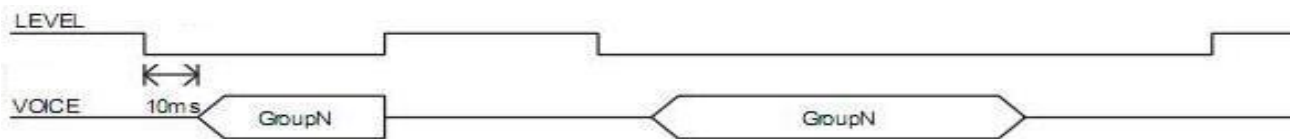
5. Trigger Pulse Width < Group Length

Option Setting = Level / Hold

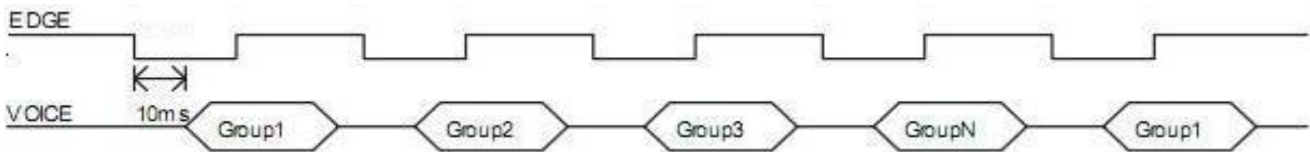


6. Trigger Pulse Width < Group Length

Option Setting = Level / Unhold



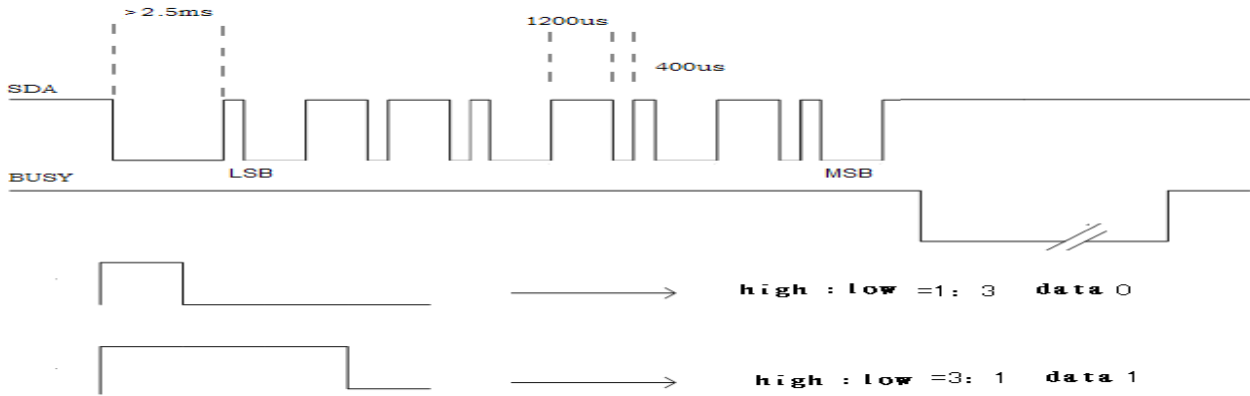
7. DATA= Sequential Trigger & From Group1~Group5



5.2、Serial Mode:

Serial mode is sent commands by the SDA line controlling speech addresses. Commonly used in MCU control. Data sent 8 bit support 255 addresses; Data sent 10 bit support 1024 addresses.

5.2.1 Serial mode diagram:



SDA send 3.5ms–8ms low level After send 3: 1 or 1: 3: high or low level. Timing range is 400us: 1200us to 800us: 2400us. After pull on the SDA $>200\mu s$ next data.

5.3.1、Command and Function (8BIT)

Command	Function
01H	Voice 1 Group.
02H	Voice 2 Group.
XXH	Voice XXX Group.
DFH	Voice 223 Group.
E0H~EFH	16 steps volume control , E0H Vol Min , EFH Vol Max
F2H	Loop Playback, XX Group+F2H
F3H	Exit the loop
FCH	Audio on
FDH	Audio off
FEH	Stop playing

5.3.2、Command and Function (10BIT)

Command	Function
001H	Voice 1 Group.
002H	Voice 2 Group.
XXXH	Voice XXX Group.
3DFH	Voice 223 Group.
3E0H~3EFH	16 steps volume control , 3E0H Vol Min , 3EFH Vol Max
3F2H	Loop Playback, XXX Group+3F2H
3F3H	Exit the loop
3FCH	Audio on
3FDH	Audio off
3FEH	Stop playing

5.4.1、8 BIT Sample program :

```
void SC50X0B_SDA(unsigned char data)
{
    unsigned char i;
    SDA = 0;
    delay_ms(5);
    for(i=0;i < 8;i++)
    {
        SDA = 1;
        if(data & 0x01)
        {
            delay_us(1500);
            SDA = 0;
            delay_us(500);
        }
        else
        {
            delay_us(500);
            SDA = 0;
            delay_us(1500);
        }
        data >>= 1;
    }
    SDA = 1;
    delay_us(500);
}
```

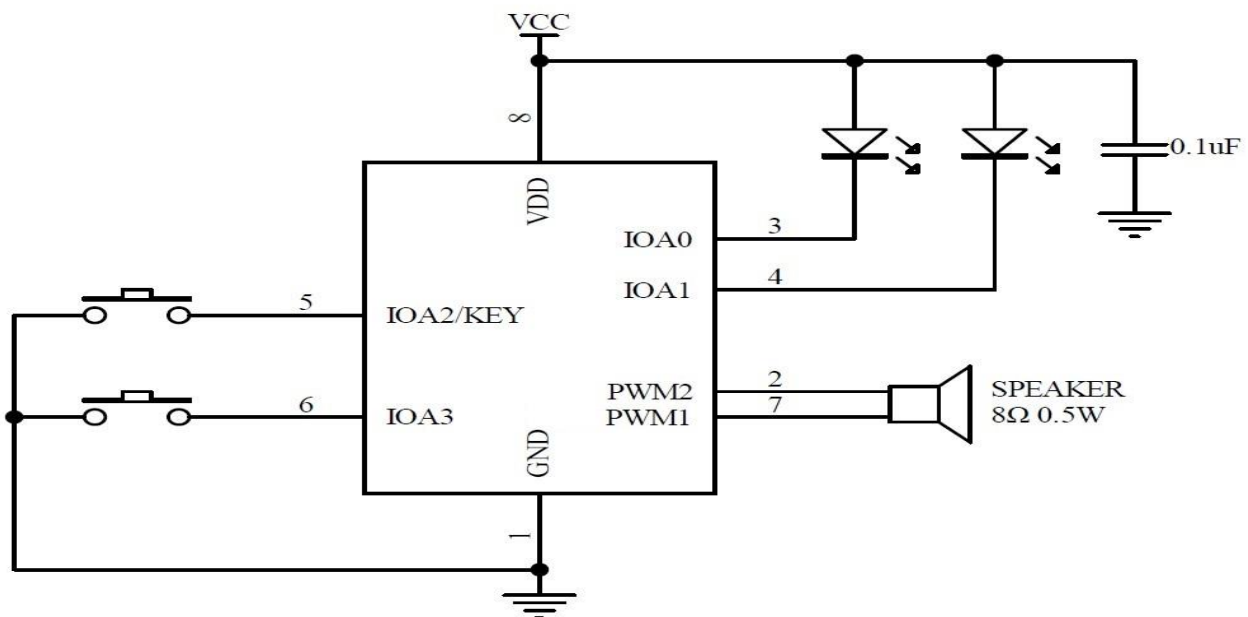
5.4.2、10 BIT Sample program:

```

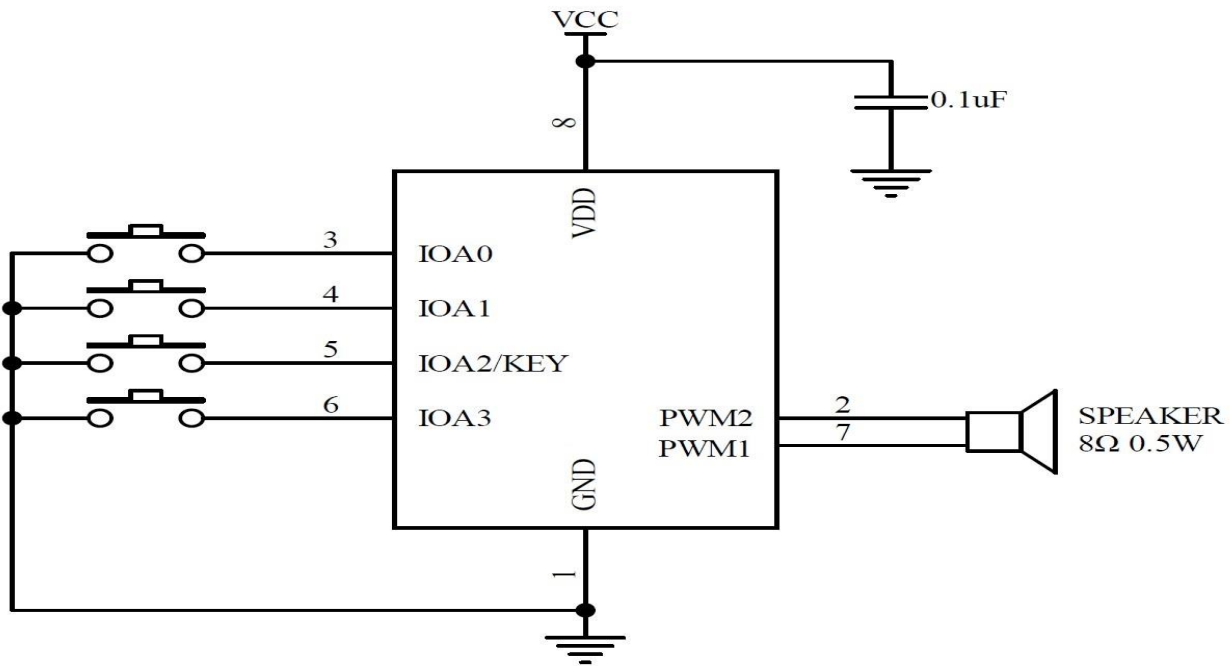
void SC50X0B_SDA(unsigned int data)
{
    unsigned char i;
    SDA = 0;
    delay_ms(5);
    for(i=0;i < 10;i++)
    {
        SDA = 1;
        if(data & 0x0001)
        {
            delay_us(1500);
            SDA = 0;
            delay_us(500);
        }
        else
        {
            delay_us(500);
            SDA = 0;
            delay_us(1500);
        }
        data >>= 1;
    }
    SDA = 1;
    delay_us(500); }
    
```

6、Application Circuit:

6.1、Stand-alone Mode (PWM)

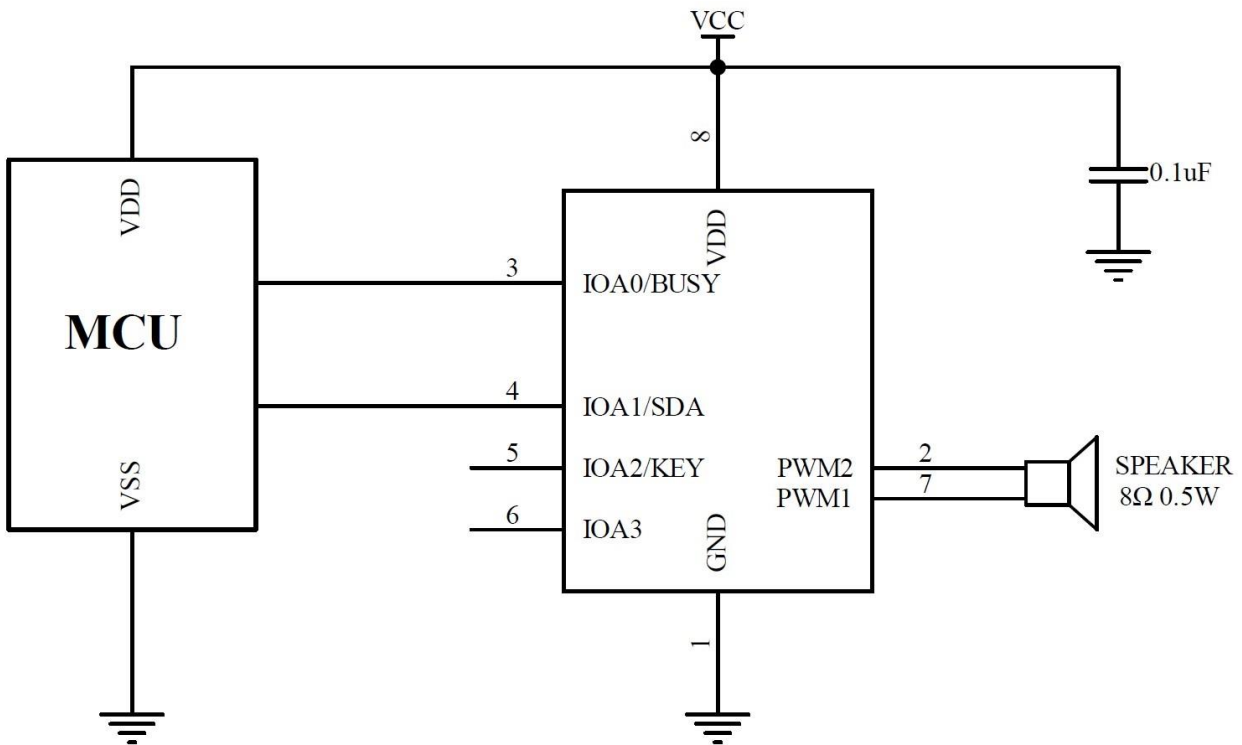


图(一)



图(二)

6.2、Serial PWM Mode (PWM) :



7、 Design Attention:

7.1、 Choice model Attention: Audio files, the power voltage, the control mode and the output mode has set program written in the factory, when using cannot be changed. The following is to set up internal LDO scope of supply:

MODE	power voltage
KEY	2.4V-5.5V
Serial	3.0V-5.5V

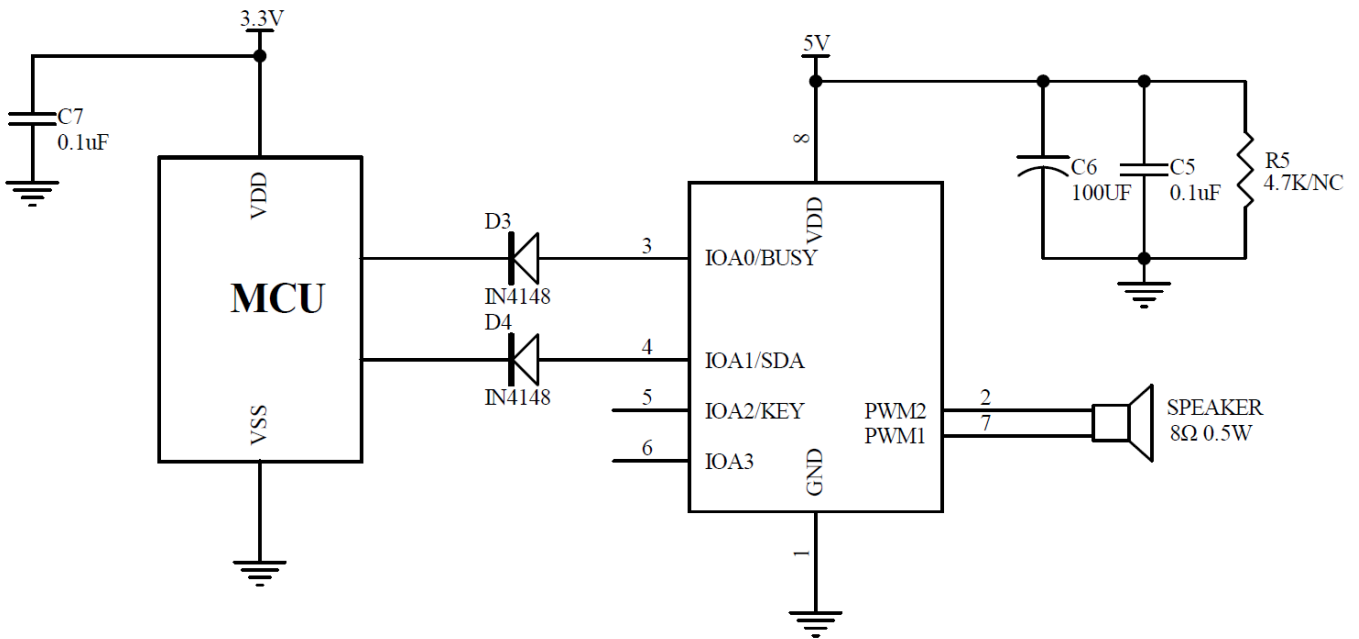
7.2、 Anti-interference circuit reference:

1. power voltage the current >300 ma. the power supply voltage is not phase line string IN4148 isolation diodes do. BUSY signal the resistance can be set to a IO port input to external add a pulldown resistor.

2. Power feet plus 100 uF and 0.1 uF capacitance and 4.7 K resistor. And voltage is not more than 5V.

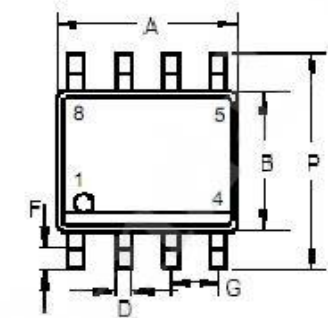
3. PCB layout, C5, C6 capacitance as far as possible close to the IC power supply, ground walk as far as possible, less through hole.

4. Hardware debugging, grounding line first, then connect power, through IC feet by 5PIN key if there is a sound.



8、Package Information

1. SOP8 (150mil)



	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.183	-	0.202	4.65	-	5.13
B	0.144	-	0.163	3.66	-	4.14
C	0.068	-	0.074	1.35	-	1.88
D	0.010	-	0.020	0.25	-	0.51
F	0.015	-	0.035	0.38	-	0.89
G	0.050 BSC			1.27 BSC		
J	0.007	-	0.010	0.19	-	0.25
K	0.005	-	0.010	0.13	-	0.25
L	0.189	-	0.205	4.80	-	5.21
M	-	-	8°	-	-	8°
P	0.228	-	0.244	5.79	-	6.20