

OTP Speech Chip SC8021B

1、Description

SC8021B are single-chip voice synthesizing CMOS IC. They are embedded EPROM architecture, and OTP (One Time Programmable) Speech chip, Each body has one input and two I/O pins. Through accurate internal oscillation, external R_{osc} is unnecessary. There is only one PWM output for voice. Thus any external component is not required. Maximum 128 voice groups. Serial trigger mode maximum 127 voice groups, mobile One Group contain several steps (voice section); Maximum 1536 steps for all the Groups. Maximum 21 seconds Voice. Each Step can be define Trigger Mode, Output Status, Voice Section, Mute length, I/O Type & Simple Programming Function. Support three 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).MAX voice file : 1536

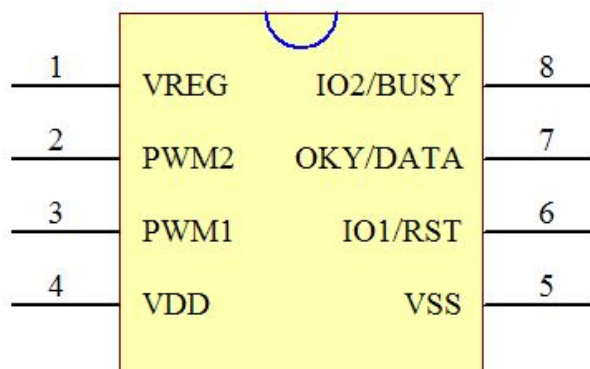
(2).MAX Trigger Groups : 128

- (3).MAX Step : 768
- (4).Operating Voltage range: 1.8V ~ 6.5V
- (5).Total Voice Duration : 21S (6K Samples)
- (6).I/O pin : 3
- (7).Voice output : PWM
- (8).Sequential Key : OKY1 -> 128 Groups. IO1-> 1 Group. IO1-> 1 Group
- (9).Debounce time : 50 us or 10 ms
- (10)Step can change Trigger I/O Type, Trigger Mode & Output Status.
- (11).DIP8/SOP8 Package.
- (12).Three Mode Trigger IC :
- (13).Key Stand-alone Trigger Mode :
 - A. Edge/Level
 - B. Hold/Unhold
 - C. Retrigger/Irretrigger
- (14).Serial Trigger Mode :

Combinations of OKY1 to trigger maximum 127 Voice Group.
- (15).Output status (for each Output pin):
 - A. Stand by Status. (High/Low Status)

- B. Busy Low Active.
- C. Busy High Active.
- D. LED Flash at 6 Hz.
- E. LED Flash at 3 Hz.
- F. LED Flash at 1.5 Hz.
- G. PWM for LED Dimming Control.

3、PAD Description:



Pad No	Pad Name	Description
1	VREG	Power Supply PIN ,Connected with a 0.1 uF to VSS.
2	PWM2	As a PWM PIN , can Directly drive the Speaker
3	PWM1	As a PWM PIN , can Directly drive the Speaker .
4	VDD	Power Supply PIN , Connected with a 0.1 uF to VSS.
5	VSS	Connected to Ground.
6	I01/RST	Key Stand-alone Trigger Mode : is used trigger Only One Group Serial Trigger Mode :is used to trigger reset Voice Group
7	OKY/DATA	Key Stand-alone Trigger Mode : Tis used to trigger the maximum 128 Voice. Serial Trigger Mode : is used to trigger the maximum 127 Voice Group
8	I02/BUSY	Key Stand-alone Trigger Mode : is used trigger Only One Group. As Output PIN , Output the BUSY or Flash Signal.

4、DC Electrical Characteristics:

4.1、Maximum Rating

Symbol	Rating	Unit
VDD~GND	-0.5 ~ +7.0	V
Top (operating)	-0 ~ +70	°C
Tst (storage)	55 ~ +150	°C

4.2、DC Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
VDD	VDD	1.8	3.0	6.5	V	
I _{sb}	Standby current, VDD=3V/4.5V		1		uA	VDD=3V/4.5V, no load
I _{op}	Operating current DD=3V		1		mA	VDD=3V, no load
	Operating current DD=3V		1.1		mA	VDD=4.5V, no load
I _{ih}	Input current (1M ohms pull-low)		10		uA	VDD=3V
			25			VDD=4.5V
I _{ih}	Input current (300k ohms pull-low)		30		uA	VDD=3V
			85			VDD=4.5V
I _{od}	Output drive current		-7		mA	VDD=3V, Voh=1.0V
			-11			VDD=4.5V, Voh=2.2V
I _{os}	Output sink current		22		mA	VDD=3V, Voh=1.5V
			33			VDD=4.5V, Voh=1.5V
I _{oh}	PWM1, PWM2 output current		-65		mA	VDD=3V, Voh=1.5V
I _{oi}			65			VDD=3V, Voi=1.5V

5、Play Rate:

1	2	3	4	5	6	7	8
24kHz	20 kHz	17.1 kHz	15.0 kHz	13.3kHz	12.0 kHz	10.9 kHz	10.0 kHz
9	10	11	12	13	14	15	16
9.2kHz	8.6 kHz	8.0 kHz	7.5 kHz	7.1 kHz	6.3 kHz	6.0 kHz	5.5 kHz

6、Timing Diagram :

6.1、Key Stand-alone Trigger Mode

Only one input pin can select Toggle On/Off function (1st

Trigg nput priority is OKY1 > IO1 > IO2

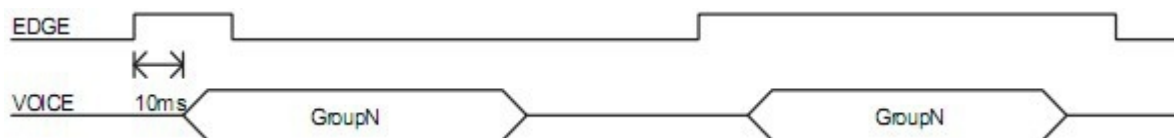
1. Trigger Pulse Width < Group Length

Option Setting =Edge / Hold

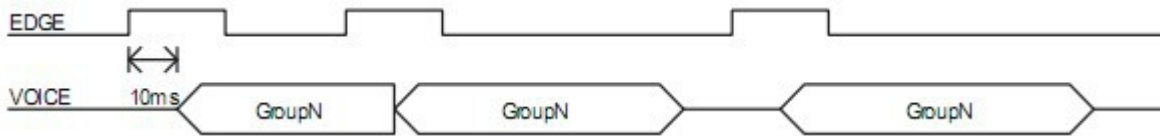


2. Trigger Pulse Width < Group Length

Option Setting = Edge / Unhold



3. Option Setting = Retrigger

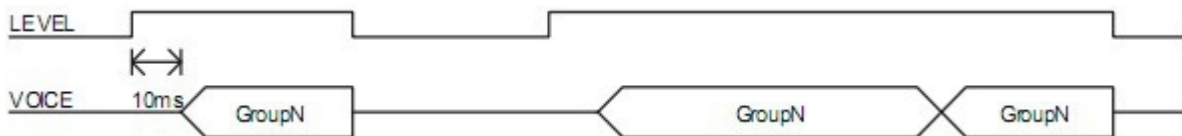


4. Option Setting = Irretrigger



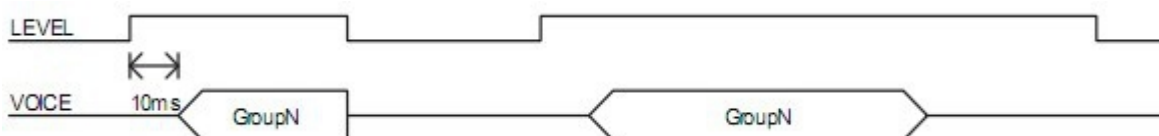
5. Trigger Pulse Width < Group Le

Option Setting = Level / Hold

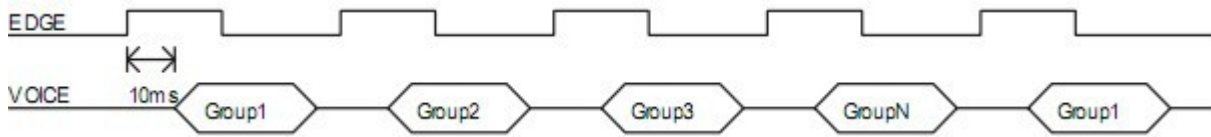


6. Trigger Pulse Width < Group Length

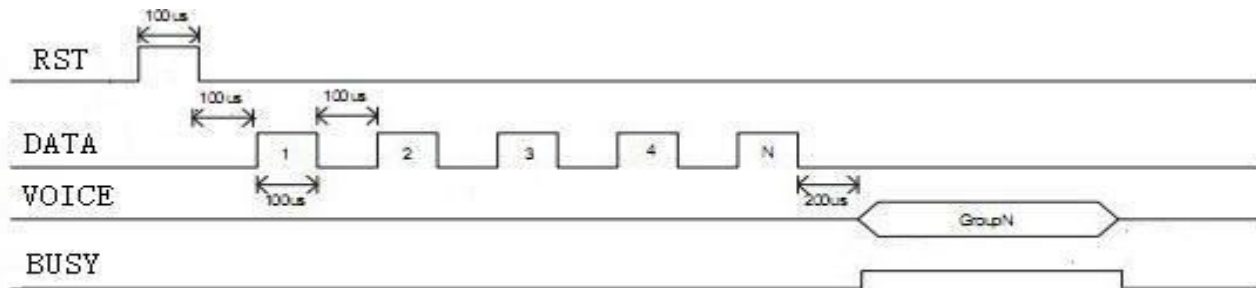
Option Setting = Level / Unhold



7. DATA= Sequential Trigger & From Group1~Group5



6.2、Serial Mode Timing

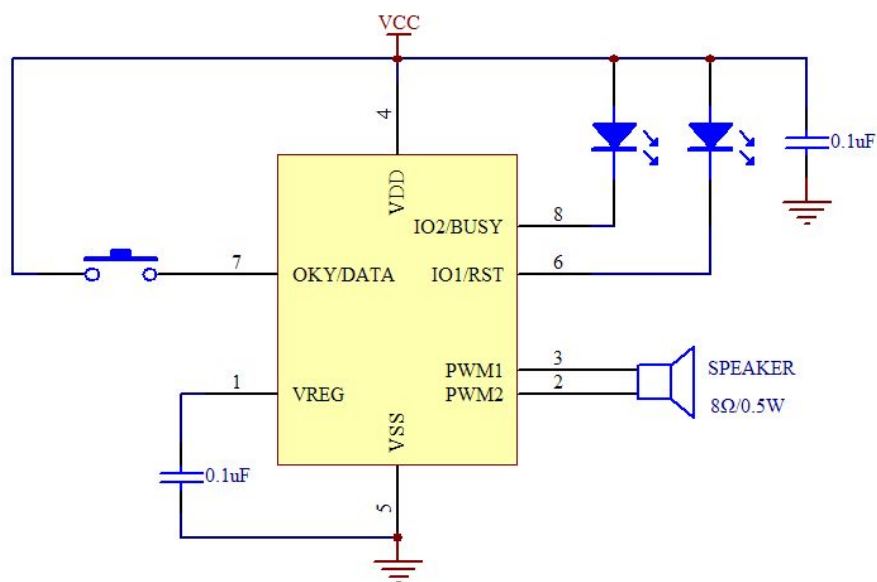


DATA=Edge/Unhol Trigger>50us

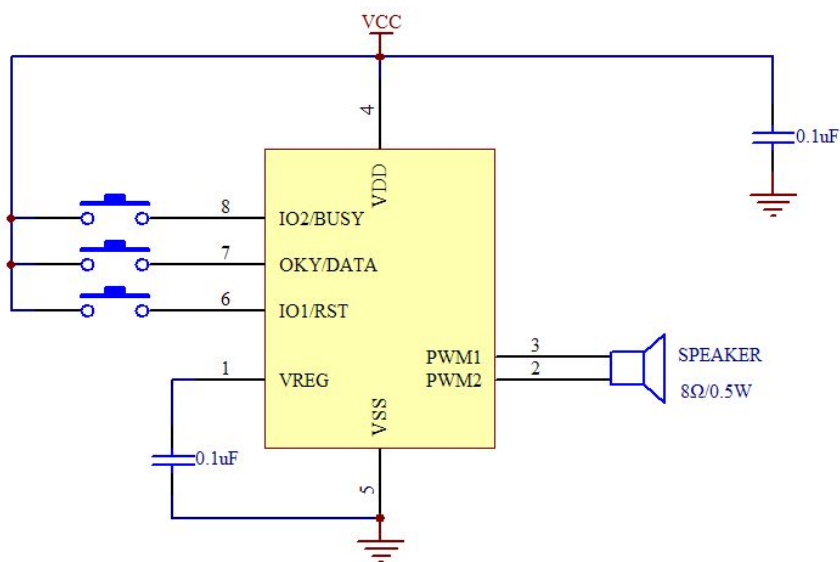
RST=Reset PIN .

7、Application Circuit:

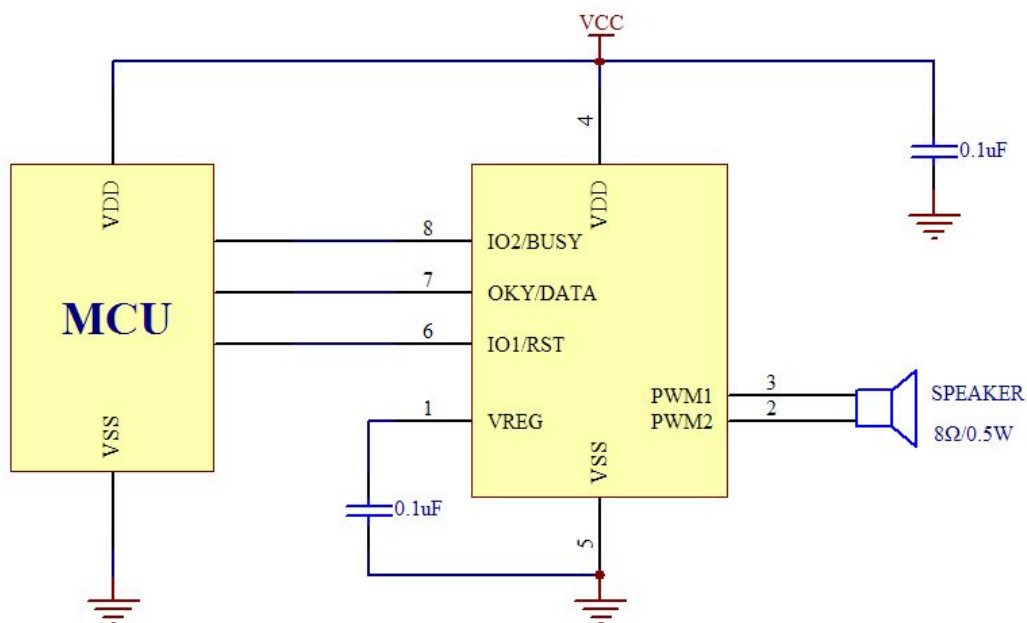
7.1、Stand-alone Mode(一)



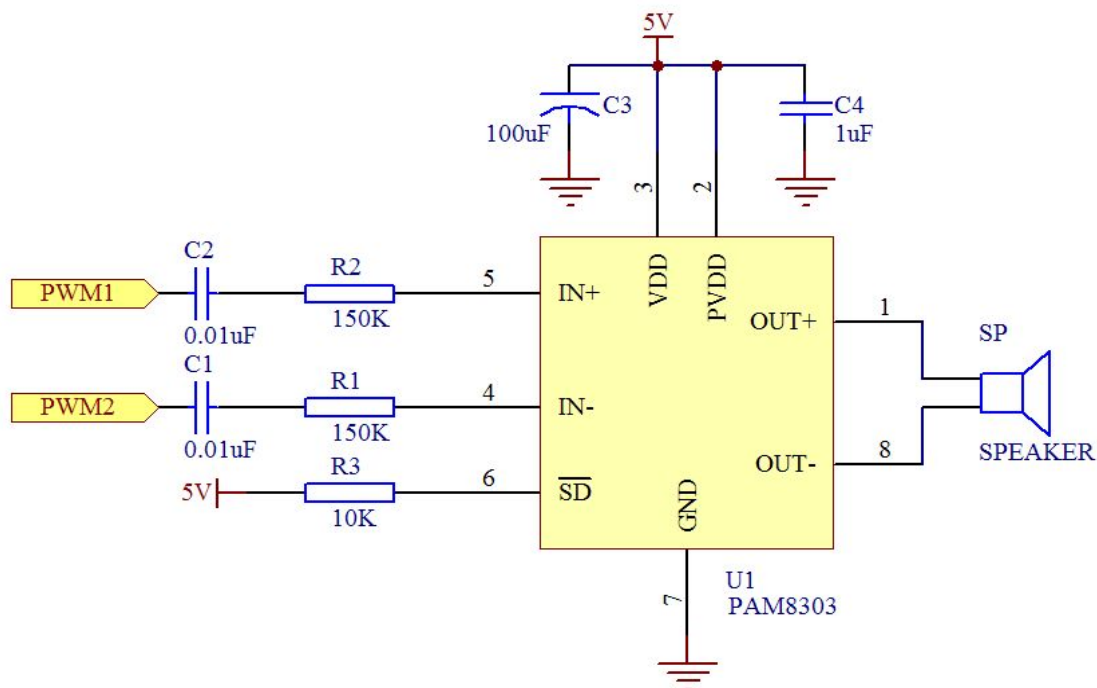
7.2、Stand-alone Mode(二)



7.3、Serial Mode

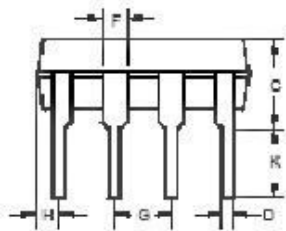
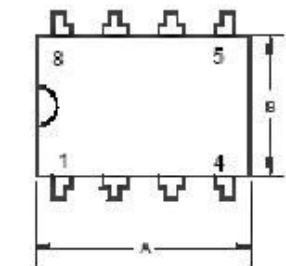


7.4、PWM amplifier Mode



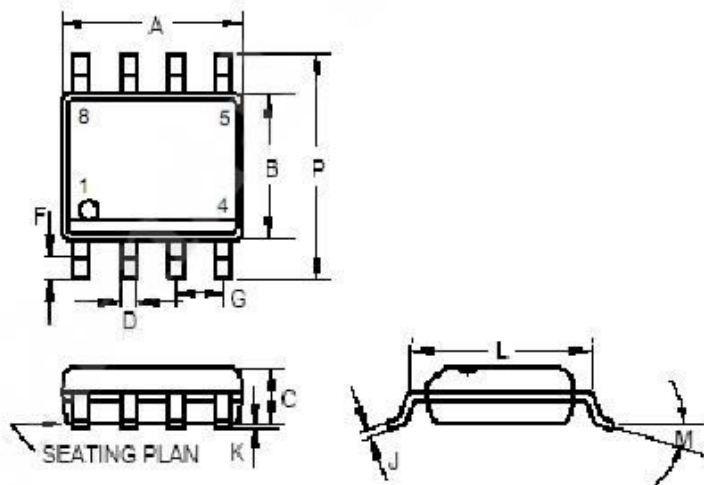
8、Package Information

1. DIP8 (300mil)



	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.355	0.365	0.400	9.02	9.27	10.16
B	0.240	0.250	0.280	6.10	6.35	7.11
C	-	-	0.210	-	-	5.33
D	-	0.018	-	-	0.46	-
F	-	0.060	-	-	1.52	-
G	-	0.100	-	-	2.54	-
H	0.050	-	0.090	1.27	-	2.29
J	0.008	-	0.015	0.20	-	0.38
K	0.115	0.130	0.150	2.92	3.30	3.81
L	0.300 BSC.			7.62 BSC.		
M	-	7°	15°	-	7°	15°

2. 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