



GENERAL DESCRIPTION

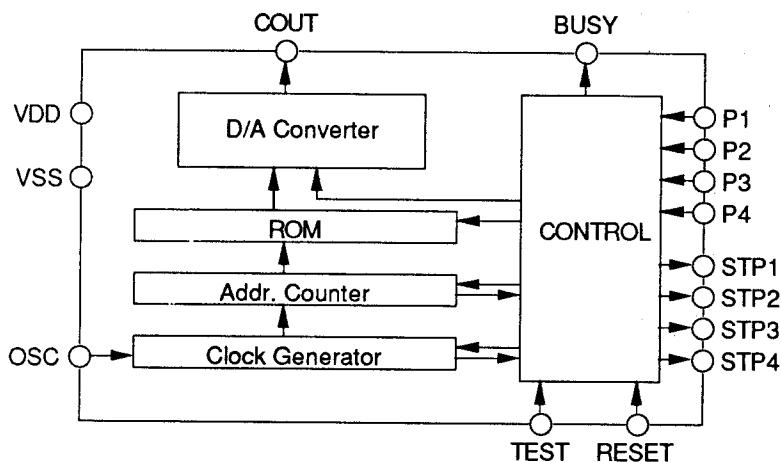
The C5306B is a speech synthesizer product with 6-bit sound quality. As it is a CMOS device, low power consumption is its characteristic. It can store one to four sentences of up to about 6 seconds' sound data at 6KHz sampling frequency. The speech data are mask programmable. Four trigger inputs are provided and can be mask programmed to be edge or level sensitive individually.

This chip is suitable for reproduction of high quality sound with minimum external components.

FEATURES

- Single 3V-4.5V power supply.
- Auto power standby.
- Power on reset.
- Typical 6 seconds of speech capacity.
(At 6KHz sampling frequency)
- 6-bit sound quality.
- Built in oscillator, frequency adjusted by an external resistor.
- Built-in D/A converter with current output.
- Stop pulse output at the end of each sentence, whereas other three stop should keep low.
- BUSY output can drive LED.
- Support Cds input trigger.
- Mask programmable option for :
edge retrigger function
max. 4 sentences
max .16 times of repeat
max. 16 pieces of phrase
max. 16 mutes between phrases whose interval is 5.4 sec in maximum and need not take up ROM space.
2 trigger mode (level / edge trigger) for each sentence
BUSY drives LED blinking or keeps high during play.

BLOCK DIAGRAM



PIN DESCRIPTION

Symbol	Description
VSS	Negative power supply.
VDD	Positive power supply.
COUT	D/A current output .
OSC	For adjusting sampling frequency.
P1~P4	Trigger inputs with built-in pull down resistors.
STP1~STP4	Stop pulse outputs for ending of sentence.
BUSY	Active high during operation.
TEST	Test input (For testing purpose).
RESET	Master reset

ABSOLUTE MAXIMUM RATINGS

Parameter	Limits
Power supply voltage range	-0.3V to +6V
Input voltage range	Vss -0.3V to Vdd +0.3V
Operating temperature range	0 to +70°C
Storage temperature range	-40 to +125°C

DC ELECTRICAL CHARACTERISTICS

Unless otherwise specified, Ta = 25°C, Vdd = 3V, Vss = 0V, Rosc=270K

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage range	Vdd	2.4	-	5	V	-
Standby current	Idd1	-	0.1	1	μA	no load
Operating current	Idd2	-	64	500	μA	no load
Input threshold voltage(P1~P4)	Vth	1.5	1.9	2.5	V	-
Input current(P1~P4)	I _{IH}	-	-	-10	μA	Vin=3V
	I _{IL}	-	-	0.1	μA	Vin=0.4V
Output full range current (COUT)	Ic _{out}	-	3	-	mA	Vc _{out} =0.6V

OPERATION

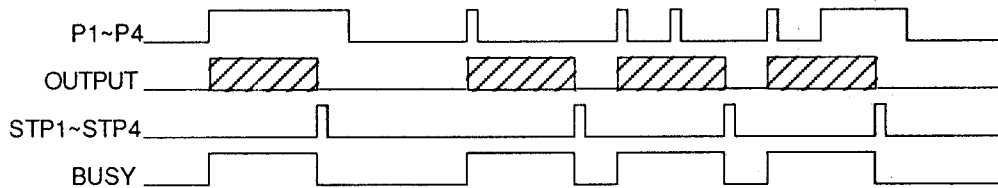
(1) REPEAT TIMES AND PHRASES

The internal ROM can be arbitrarily divided into four sentences and each sentence can be individually mask programmed to play from 1 to 16 times. Maximum 16 pieces of phrase can be shared by the four sentences and one sentence itself to have more voice combinations.

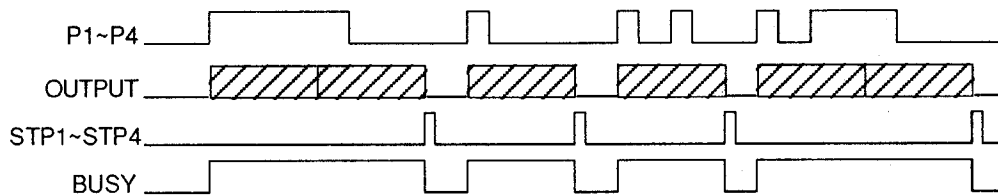
(2) TRIGGER MODES

Each sentence can be mask programmed to be level or edge trigger individually. Each sentence once triggered will not be interrupted until the programmed number of times of play is finished.

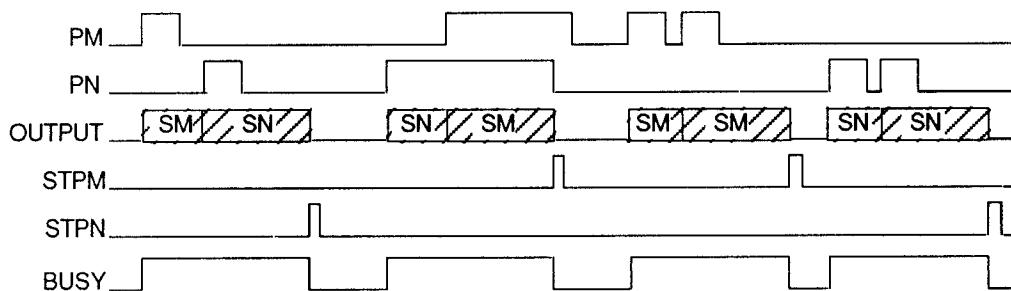
(A) Edge Trigger



(B) Level trigger

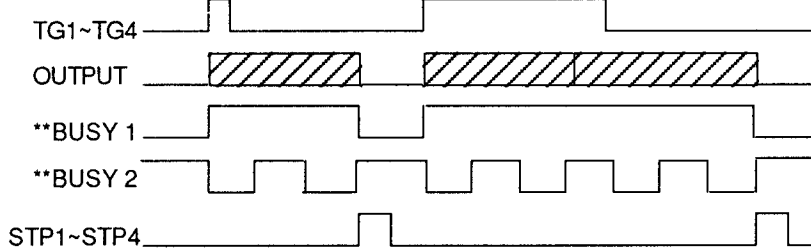


(C) Edge retrigger



(3) BUSY AND STOP

BUSY signal is active during operation and a STOP pulse will release at end of play.



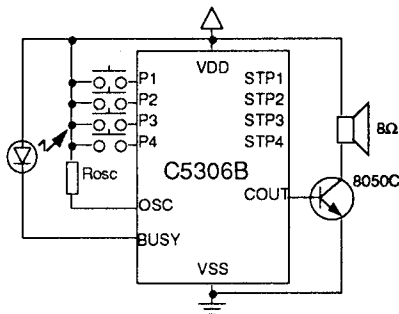
** The output BUSY can be mask programmed to have two options during play:
 Option 1(BUSY 1): BUSY keeps high to indicate the device is operating.
 Option 2(BUSY 2): BUSY outputs pulses to drive LED blinking.

(4) RESET:

Reset goes high will disable oscillator to stop the voice immediately.

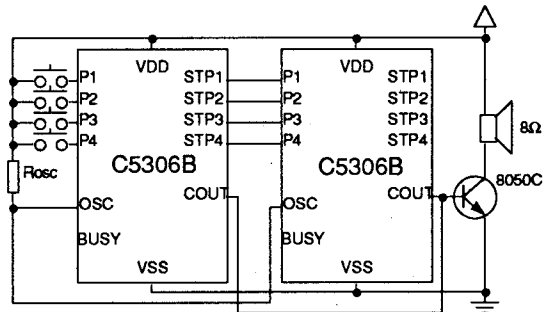
APPLICATION ENVIRONMENT

(1) BASIC APPLICATIONS



D/A converter loudspeaker output with BUSY driving LED blinking

(2) CASCADE APPLICATIONS

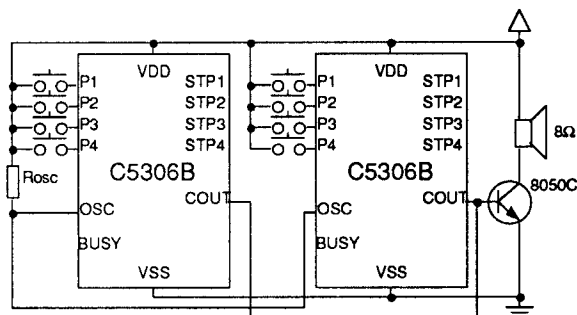


Cascade application with loudspeaker output.

Rosc : The value of Rosc for different sampling frequency is suggested as below(as reference)

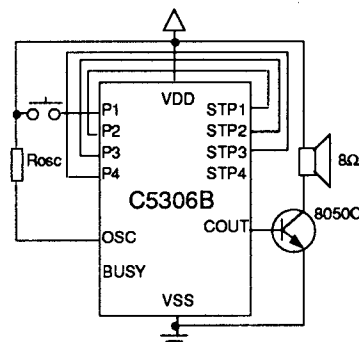
VDD	Sampling frequency	Rosc
3V	6KHZ	270K
3V	9KHZ	170K
4.5V	6KHZ	300K
4.5V	9KHZ	190K

(3) PARALLEL APPLICATIONS



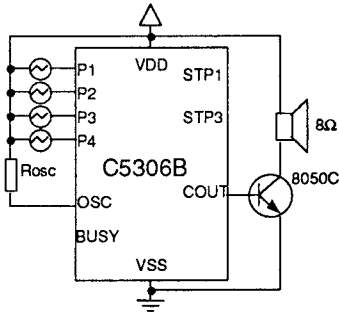
Parallel application with loudspeaker output.

(4) CONSECUTIVE APPLICATION



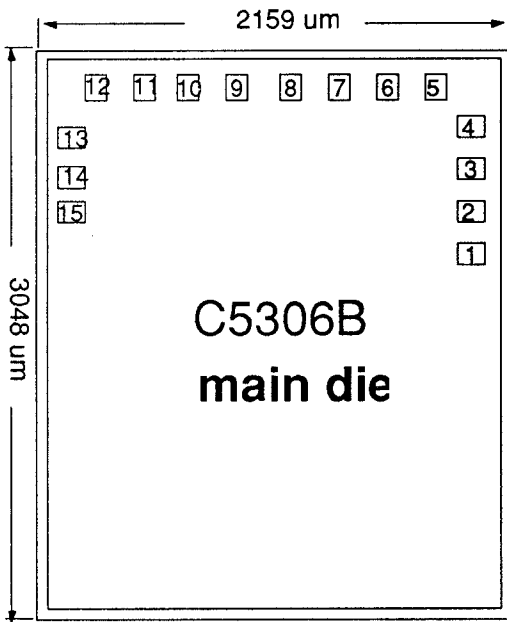
Four sentences consecutively play

(5) Cds INPUT TRIGGER APPLICATIONS



Support Cds input trigger

PAD ASSIGNMENT



1.	VDD	(808.6, 192.5)
2.	OSC	(808.6, 372.5)
3.	TEST	(808.6, 630.9)
4.	BUSY	(808.6, 860.7)
5.	STP1	(610.1, 972.6)
6.	TG1	(380.3, 972.6)
7.	TG2	(121.9, 972.6)
8.	STP2	(-107.9, 972.6)
9.	STP3	(-347.0, 972.6)
10.	TG3	(-576.8, 972.6)
11.	TG4	(-835.2, 972.6)
12.	STP4	(-914.8, 782.4)
13.	COU	(-914.8, 547.6)
14.	RESET	(-914.8, 367.6)
15.	VSS	(-914.8, 182.6)

C5306B Sound Option List

Option ID	Sampling Frequency	Sentence	Content	Play	Remark
C5306B-01	12.0KHz	1	Bird sound	1	Mute = 0.67 Level-trigger
		2	Bird sound	1	Mute = 0.67 Edge-trigger
C5306B-02	18.0KHz	1	Bird sound	4	Mute = 0.1, 1.0, 0.5 & 0.1 second Level-trigger
		2	Bird sound	4	Mute = 0.1, 1.0, 0.5 & 0.1 second Edge-trigger
		3	Bird sound	4	Mute = 0.1, 1.0, 0.5 & 0.1 second Level-trigger
		4	Bird sound	4	Mute = 0.1, 1.0, 0.5 & 0.1 second Edge-trigger
C5306B-03	12.0KHz				
		4	Bird sound	3	Mute = 0.5, 1.0 & 0.1 second Edge-trigger
C5306B-04	6.0KHz	1	Angel 1 (Music 1)	1	Mute = 0.3 second Edge-trigger
		2	Angel 2 (Music 2)	1	Mute = 0.3 second Edge-trigger
C5306B-05	12.0KHz	1	Dog bark.	5	Mute = 0.5 second Edge-trigger
		2	Dog drinking.	1	Mute = 0.5 second Level-trigger
		3	Dog hum.	3	Mute = 0.5 second Edge-trigger
C5306B-06	7.5KHz	1	Hi, Don't leave it (Mandarin & English)	1	Mute = 0.5 second Level-trigger
		2	Hi, Don't leave it (Mandarin & English)	4	Mute = 0.5 second Edge-trigger
		3	Hi, Don't leave it (Mandarin & English)	3	Mute = 0.5 second Edge-trigger
		4	Hi, Don't leave it (Mandarin & English)	2	Mute = 0.5 second Edge-trigger
C5306B-07	7.5KHz	1	Thank you for coming (Mandarin)	1	Mute = 0.5 second Edge-trigger
		2	Thank you for coming (Cantonese)	1	Mute = 0.5 second Edge-trigger
		3	Please come again (Japanese)	1	Mute = 0.5 second Edge-trigger
		4	Thank you very much (English)	1	Mute = 0.5 second Edge-trigger

C5306B Sound Option List

Option ID	Sampling Frequency	Sentence	Content	Play	Remark
C5306B-08	7.5KHz	1	Horse running sound	1	Mute = 0.068 second, Level-trigger
		2	Horse running sound	1	Mute = 0.034 second, Level-trigger
C5306B-09	6.0KHz	1	Sorry! All lines are busy now. Please dial later.	1	Mute = 1 second, Level-trigger
		2	All lines are busy now. Please dial later.	1	Mute = 1 second, Level-trigger
		3	Hello! Please dial the extension number.	1	Mute = 1 second, Level-trigger
		4	Hello! Please dial the extension number. You may dial "zero" for checking the phone number you want.	1	Mute = 0.6 second, Level-trigger
C5306B-11	18.0KHz	1	To save this planet.	1	No Mute, Edge-trigger

Mar 8, 2001