

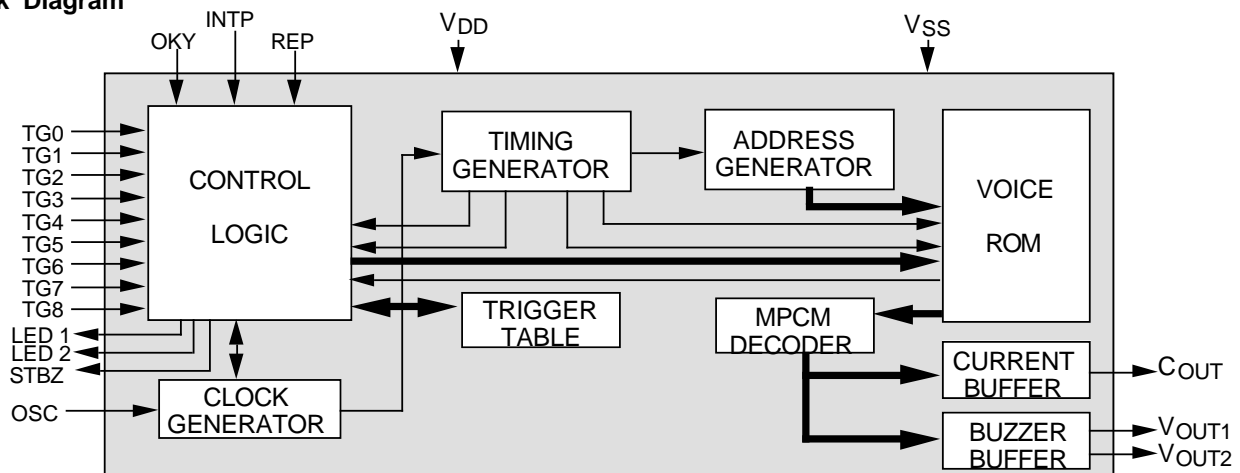
Features

- Single power supply can operate at 2.4V through 6V.
- Current output can drive 8 ohm speaker with a transistor, Vout can drive buzzer directly.
- The voice content is stored up to 6 seconds and can be separated to 9 sections.
- Nine trigger input pins are provided. Each trigger pin can access a phrase instead of simple section. A phrase is composed of one or more than one section(s) and called a section - combination of sections.
- Total section number of all phrases is up to 64.
- Total duration of all sections with mute is up to 24 seconds.
- Interrupt function (INTP) stops the audio output at once.
- Playall function (OKY) plays all 9 phrases one by one by single trigger.
- Sequential function (OKY): one trigger plays next phrase of 9 phrases circularly.
- 2 LED function with 6 or 3 Hz flash is provided to tell the audio status in alternate flash.
- A STOP pulse comes out when audio signal is finished.
- CDS input interface with debounce is provided for 9 trigger pins, OKY pin and INTP pin.
- Extra pad for REPEAT playing.
- Mask option for either real Busy or Ground Busy on BUSY signal.
- Mask option for 10ms, 0.4ms, 10us on debounce time.
- Mask option for either PLAYALL or SEQUENTIAL for one-key function.
- Separate option setting on 9 individual trigger pins and OKY pin for below four masks:
 - a. Mask option for either Level or Edge trigger type.
 - b. Mask option for either Holdable or Unholdable output type.
 - c. Mask option for either BUSY output or STOP pulse on STBZ output.
 - d. Mask option for either Retrigger or Irretrigger .

Description

The MSS0605 is a monolithic CMOS VLSI ASIC that can memorize voice up to 6 seconds using MOSEL qualified coding method (MPCM). It can play 9 phrases instead of 9 simple sections. Most of the necessary circuit are built in like oscillator, ROM, DAC and interface logic. 2 LEDs and separate option setting is provided . Customer voice data will be edited and built in by mask programming during the device fabrication.

Block Diagram



Pad Description

Pad No.	Signal Name	I/O	Function
1	INTP	I	Interrupt input, internal pull low, high active
2	OKY	I	One key function input, internal pull low, high active
3	TG8	I	Trigger 8 input, internal pull low, high active
4	TG7	I	Trigger 7 input, internal pull low, high active
5	TG6	I	Trigger 6 input, internal pull low, high active
6	TG5	I	Trigger 5 input, internal pull low, high active
7	TG4	I	Trigger 4 input, internal pull low, high active
8	TG3	I	Trigger 3 input, internal pull low, high active
9	TG2	I	Trigger 2 input, internal pull low, high active
10	TG1	I	Trigger 1 input, internal pull low, high active
11	TG0	I	Trigger 0 input, internal pull low, high active
12	OSC	I	Oscillator Resistor input
13	V _{DD}	Power	Positive power supply
14	C _{OUT}	O	Audio signal current output (for speaker)
15	V _{OUT1}	O	Audio signal voltage output (for buzzer)
16	V _{OUT2}	O	Audio signal voltage output (for buzzer)
17	LED 1	O	LED signal output , sink current output.
18	LED 2	O	
19	STBZ	O	One shot stop signal output / BUSY signal output
20	V _{SS}	Power	Negative power supply
21	REP	I	High use as repeat
22	NC	NC	No connection

DC Characteristics

Symbol	Parameter		Min.	Typ.	Max.	Unit	Condition
I _{SB}	Supply Current	Stand by	—	0.1	1	μA	V _{DD} = 4.5V, I/O Open
I _{OP}		Operating	—	—	200		
I _{IH}	Input Current TG0~TG8, OKY, INTP, REP		—	10	—	μA	V _{DD} = 4.5V
I _{IL}			—	0	—		
I _{OH}	O/P Current V _{OUT1} , V _{OUT2}	Drive	—	-13	—	mA	V _{DD} = 4.5V, V _{O/P} = 0V
I _{OL}		Sink	—	13	—		V _{DD} = 4.5V, V _{O/P} = 4.5V
I _{CO}	Output Current (C _{OUT})		—	2.5	—	mA	V _{DD} = 3V, V _{O/P} = 0V
			—	3.8	—		V _{DD} = 4.5V, V _{O/P} = 0V
			—	5.0	—		V _{DD} = 6.0V, V _{O/P} = 0V
I _{OL}	Output Current LED1, LED2		—	13	—	mA	V _{DD} = 4.5V, V _{O/P} = 4.5V
I _{OH}	Output Current STOP / BUSY		—	-8	—	mA	V _{DD} = 4.5V, V _{O/P} = 0V
I _{OL}			—	8	—		V _{DD} = 4.5V, V _{O/P} = 4.5V
ΔF/F	Frequency Stability		—	5	—	%	$\frac{F_{osc}(4.5V) - F_{osc}(4V)}{F_{osc}(4.5V)}$
ΔF/F	Fosc Variation		—	10	—	%	V _{DD} = 4.5V, R _{osc} = 1.2MΩ

Absolute Maximum Rating

Symbol	Rating	Unit
$V_{DD} \sim V_{SS}$	-0.5 ~ +7.0	V
V_{IN}	$V_{SS} - 0.3 < V_{IN} < V_{DD} + 0.3$	V
V_{OUT}	$V_{SS} < V_{OUT} < V_{DD}$	V
T (Operating)	-10 ~ +60	°C
T (Storage)	-55 ~ +125	°C

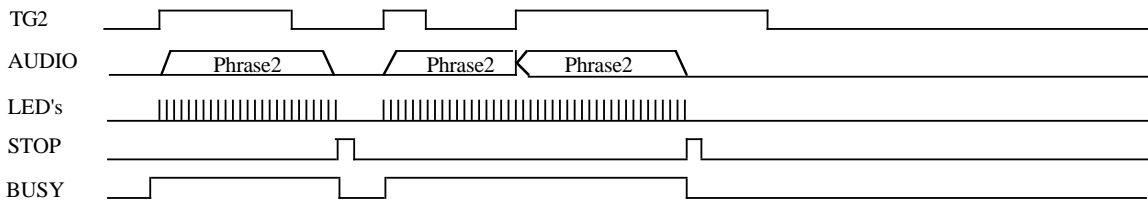
AC Characteristics

Timing		Min.	Typ.	Max.	Unit
T_{STOP}	Stop pulse	20	—	—	ms
T_P	Power rise up time	—	—	1	ms
T_R	Power Ripple width	—	—	1	ms

Timing Diagram

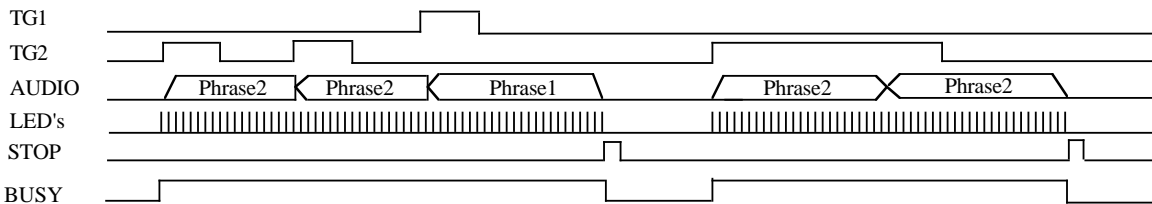
I. Edge/Unholdable/Retrigger Trigger Mask

- a. When trigger is shorter than a whole section output
- b. When trigger is longer than a whole section output



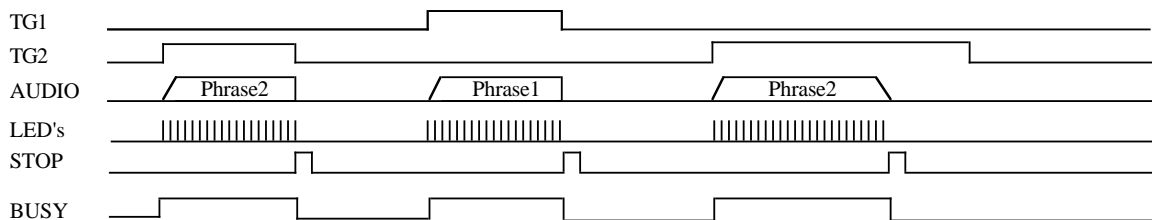
II. Level/Unholdable/Retrigger Trigger Mask

- a. When trigger is shorter than a whole section output
- b. When trigger is longer than a whole section output



III. Edge/Holdable/Retrigger Trigger Mask

- a. When trigger is shorter than a whole section output
- b. When trigger is longer than a whole section output



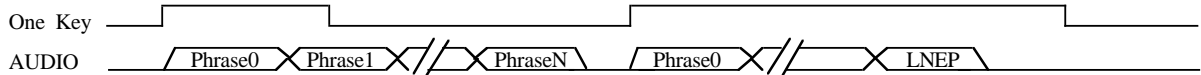
IV. Level/Holdable/Retrigger Trigger Mask

- a. When trigger is shorter than a whole section output b. When trigger is longer than a whole section output

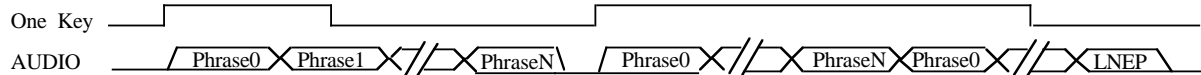


V. One Key Pin Play All Function

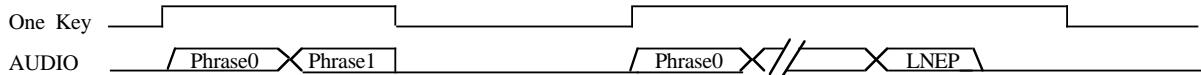
a.EDGE / UNHOLD



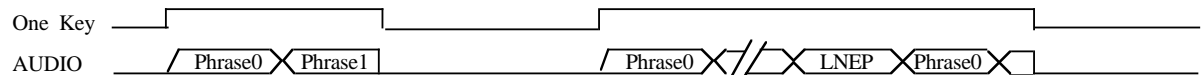
b.LEVEL / UNHOLD



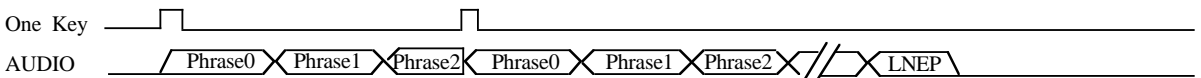
c.EDGE / HOLD



d.LEVEL / HOLD

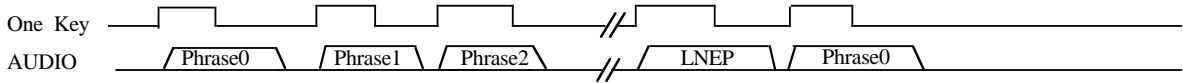


e.RETRIGGER



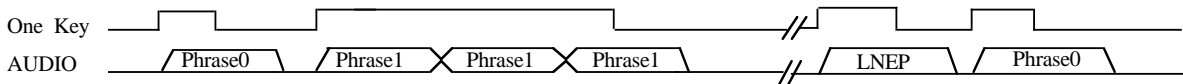
VI. One Key Pin Sequential Play Function

a.EDGE / UNHOLD

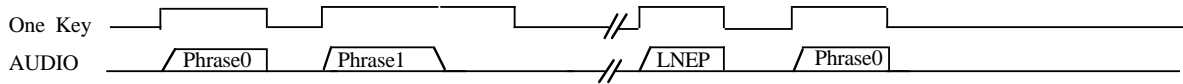


LNEP = The last Non-Empty Phrase

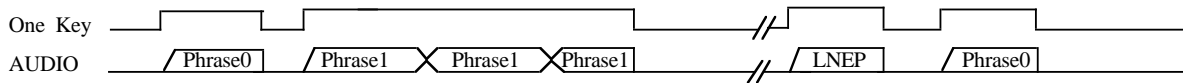
b.LEVEL / UNHOLD



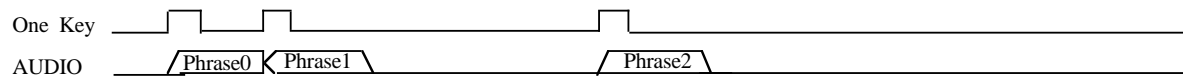
c.EDGE / HOLD



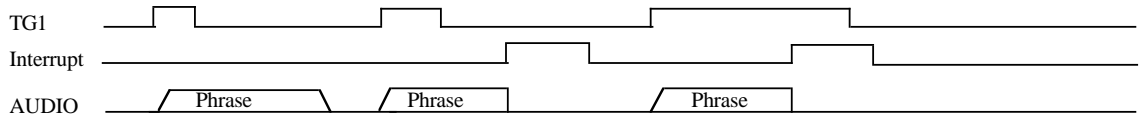
d.LEVEL / HOLD



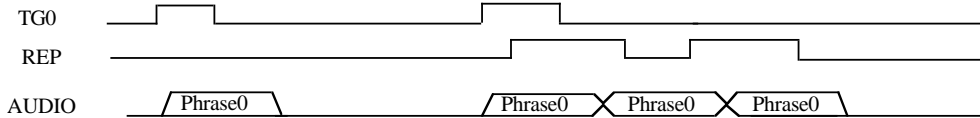
e.RETRIGGER



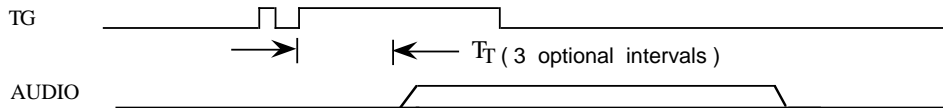
VII. Interrupt Pin Function



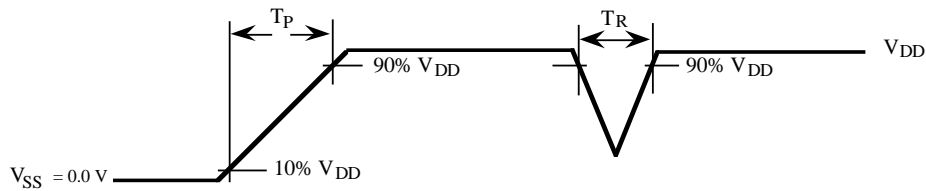
VIII. Repeat function



IX. DEBOUNCE TIME

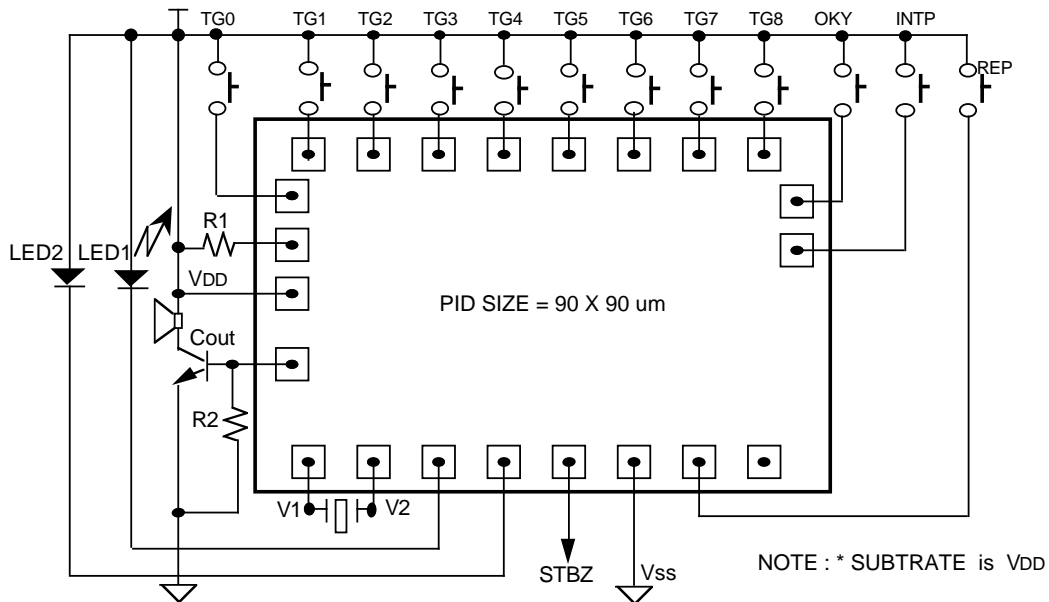


X. Acceptable Power On Signal & Ripple

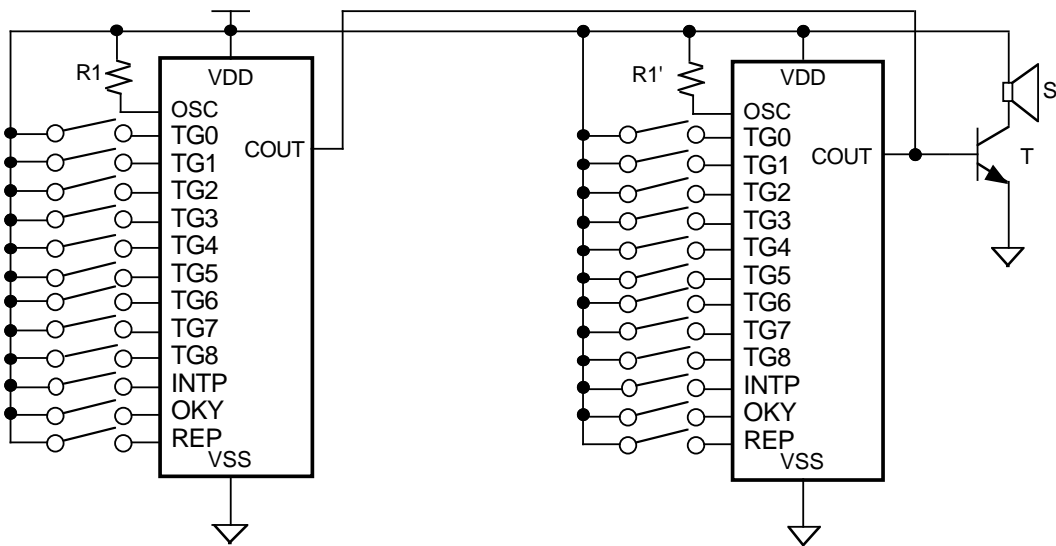
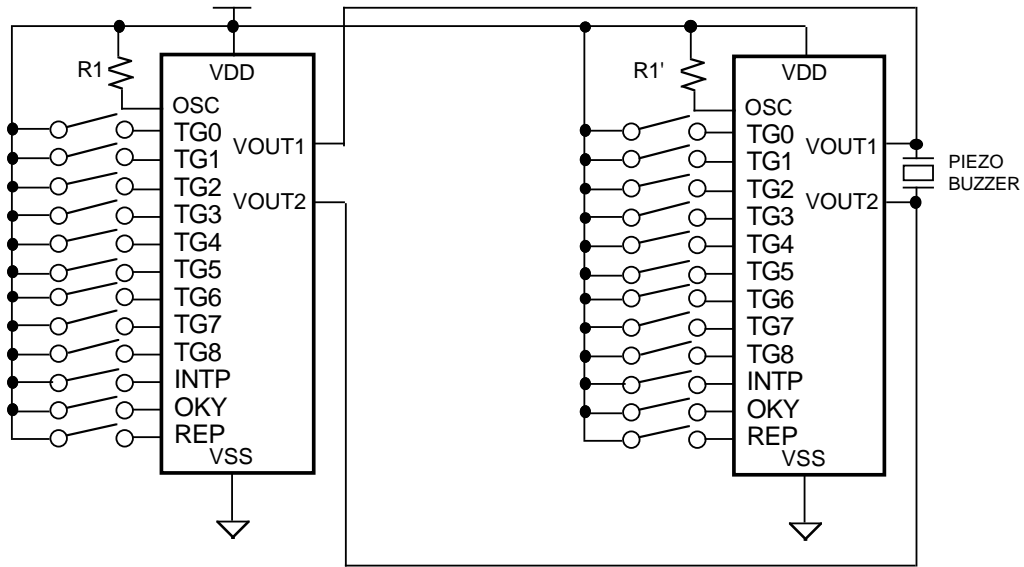


Application Circuit

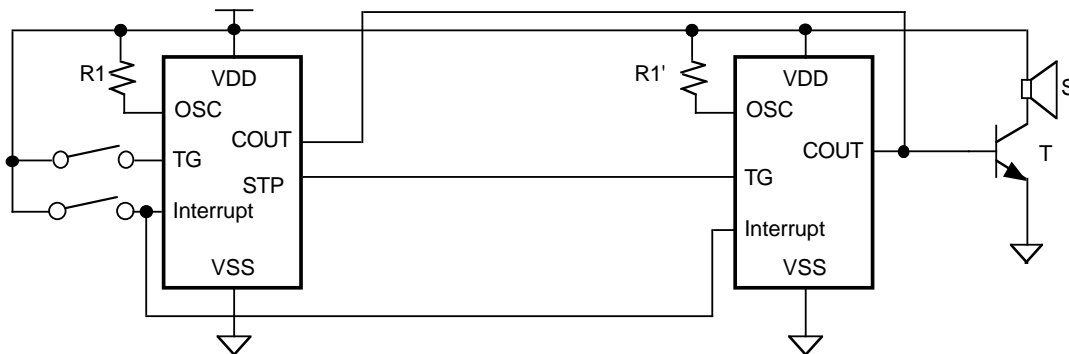
1. Typical Application



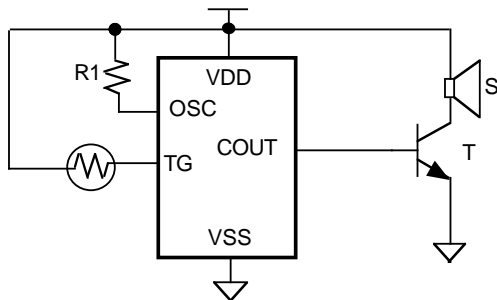
2. Parallel Application



3. Cascade Application

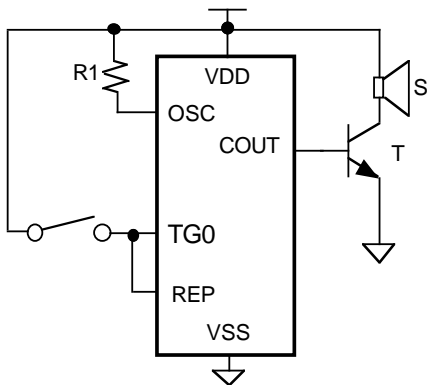


4. CDS Application



5. Edge Mode Change To Level Mode for TG0

(The pin "REP" connects to VDD)



- Note: 1. $R1 = 1.2 \text{ M}\Omega$, $T(\text{transistor}) = \beta > 130$, $R2 = 470 \Omega$, $S(\text{speaker}) = 1/4 \text{ w, } 8 \Omega$; all typical.
 2. $R2=470\Omega$ (typical) to bypass extra current into base to get rid of waveform saturation on collector .
 3. Piezo buzzer resonant frequency being around 1K Hz is recommended.
 4. Input switch could be replaced by CDS.
 5.COUT,VOUT1,VOUT2 are tristate during stand by state.