

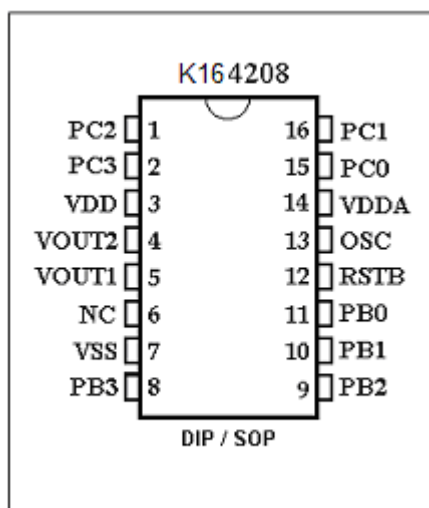


## Single Button Trigger (SBT) with BUSY and /BUSY Output

### FEATURES

- One key SBT sequential trigger
- Up to 64 voice groups
- Any combination of the trigger options:  
    Level/Edge; Hold/Un-hold; Retrigger/Non-retrigger
- DAC through VOUT2\_COUT pin
- PWM through VOUT1 and VOUT2
- BUSY and /BUSY signal output
- Support 8-bit PCM, 5-bit uLaw and 4-bit ADPCM compression

### PIN CONFIGURATIONS



### PIN DESCRIPTIONS

Pin Names	Description
VOUT1	PWM output to drive speaker directly
VOUT2_COUT	PWM output or COUT DAC output select by programmable option
OSC	Oscillator input
VSS	Power Ground
VDD	Positive Power Supply
VDDA	Positive Power Supply
RSTB	Reset pin, Low active
PB0	SBT Input trigger pins with 1M Ohm internal pull-down
PB1	BUSY signal output
PB2	/BUSY output, active LOW during voice playback
PB3, PC0~3	Un-used, should be left open

Pins for EPROM programming are: VDD, VDDA, VSS, PB0, PB1, OSC, VOUT2 and RSTB



## Ramp-up-down enable or disable

When COUT is used for playback, Ramp-up-down would be enabled. This function eliminates the 'POP' noise at the beginning and end of voice playback.

When VOUT1 and VOUT2 are used to drive speaker directly, the Ramp-up-down operation are disabled.

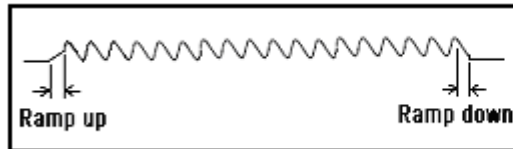


Fig. 1 Ramp-up-down Enable

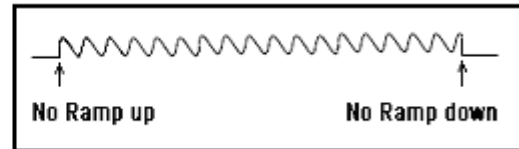


Fig. 2 Ramp-up-down Disable

## Trigger Options

User selectable options that affect each individual group are called Group Options. They are:

- Edge or Level trigger
- Unholdable or Holdable trigger
- Re-triggerable or non-retriggerable

Fig. 3 to Fig. 4 show the voice playback with different combination of triggering mode and the relationship between outputs and voice playback.

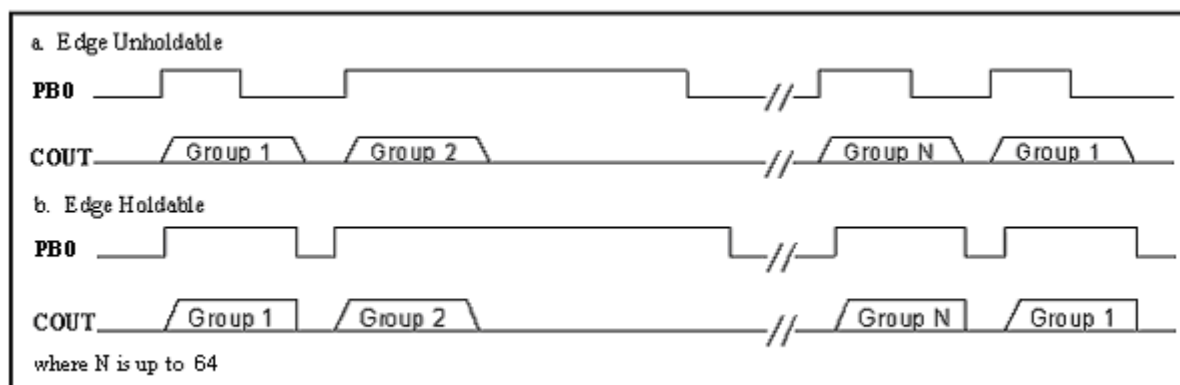


Fig. 3 SBT sequential trigger with Edge Holdable and Unholdable

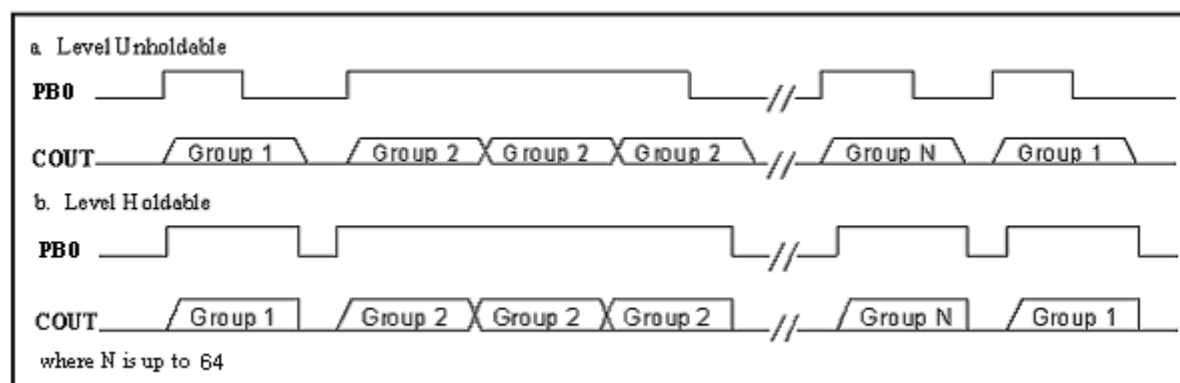
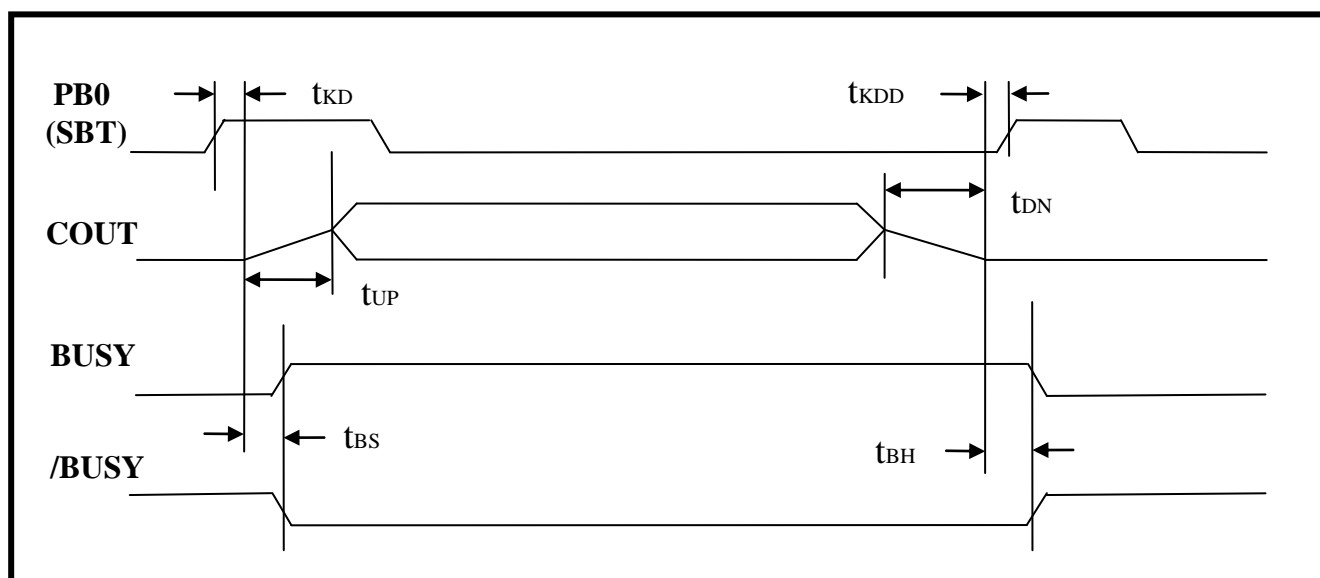


Fig. 4 SBT sequential trigger with Level Holdable and Unholdable



## TRIGGER TIMING



Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
$t_{KD}$	Key trigger debounce time	$64/F_s$	—	—	sec	1
$t_{UP}$	Ramp up time	0	$128/F_s$	—	sec	1
$t_{DN}$	Ramp down time	0	—	$256/F_s$	sec	2
$t_{KDD}$	Key trigger delay after ramp down	—	0	—	ms	
$t_{BS}$	BUSY output set up time	0	—	$1/F_s$	sec	1
$t_{BH}$	BUSY output hold time	—	—	$1/F_s$	sec	1

Note:

- 1) Where  $F_s$  is sampling rate.
- 2) Ramp down is from the value of the last sound sample.

# TYPICAL APPLICATIONS

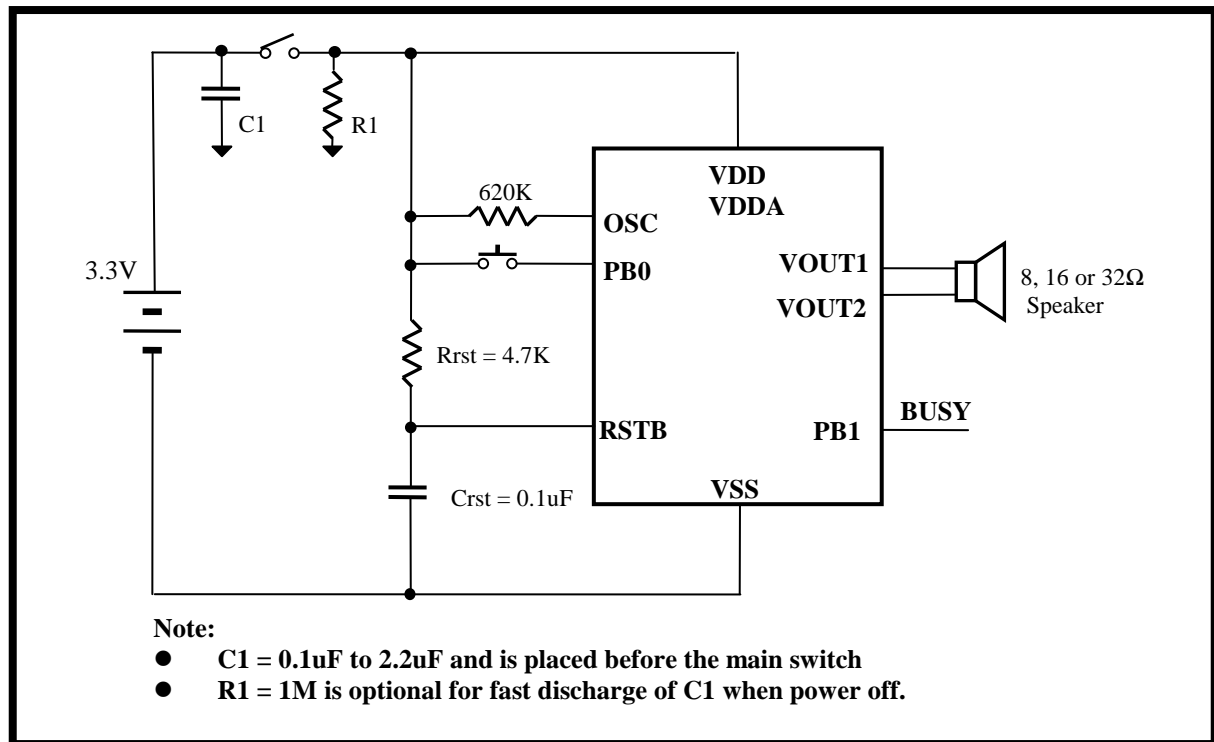


Fig 5. 3.3V Battery with PWM speaker direct speaker

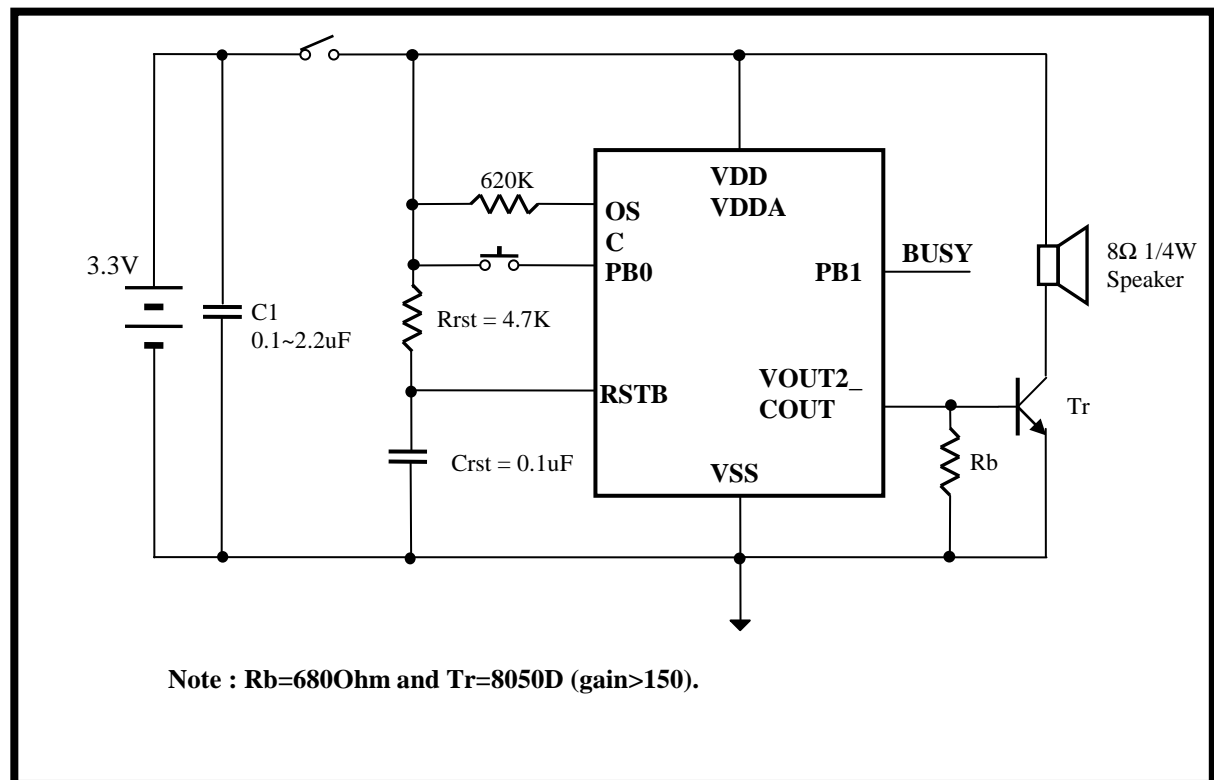
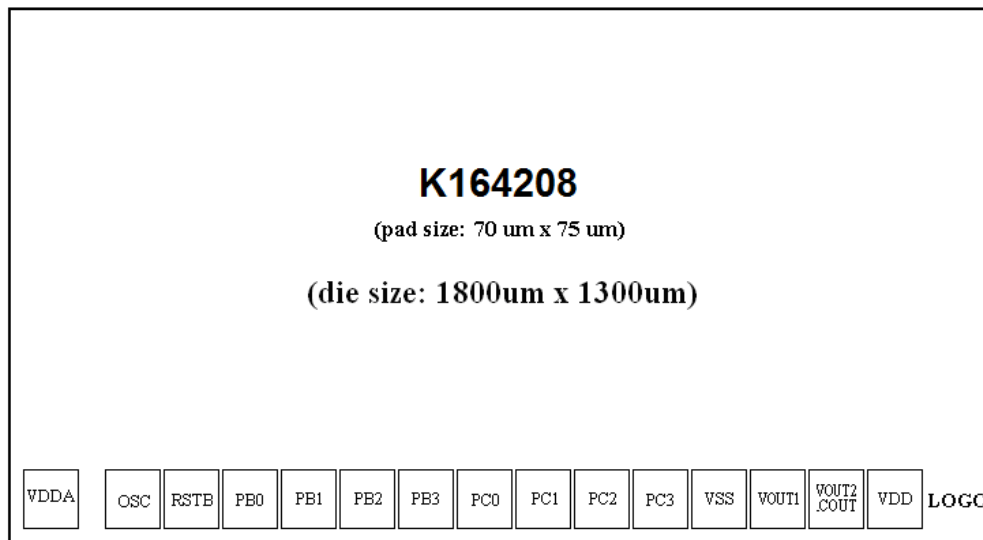


Fig 6. 3.3V Battery with Transistor direct drive



## Bonding Diagrams



Note:

1. Substrate must be connected to VSS
2. Bonding pad size is 70 um x 75 um