

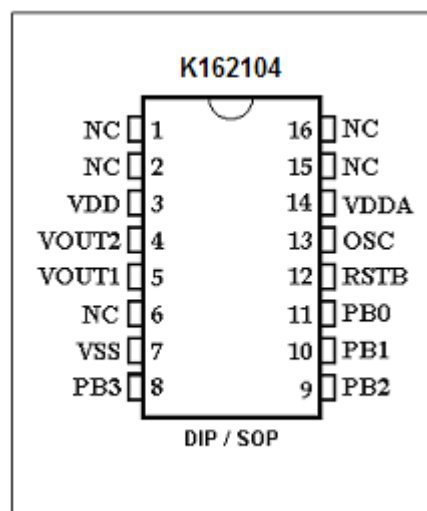


Four Input Key Trigger without Output

FEATURES

- Key triggers mode with up to 4 input triggers
- Up to 13 voice groups
- Any combination of the trigger options:
Level/Edge; Hold/Un-hold; Retrigger/Non-retrigger
- PWM through VOUT1 and VOUT2
- COUT DAC through VOUT2_COUT
- No output signal supported
- 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
VSS	Power Ground
OSC	Oscillator input
VDDA	Program power pin, connect to VDD during playback
VDD	Positive Power Supply
RSTB	Low active reset pin
PBn	Input trigger pins with 1M Ohm internal pull-down

Note: where n is from 0 to 3.

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



Key Trigger Table

Up to 13 Voice Groups can be triggered by PB0 to PB3.

Voice Group	PB0	PB1	PB2	PB3
1	HIGH	NC	NC	NC
2	NC	HIGH	NC	NC
3	NC	NC	HIGH	NC
4	NC	NC	NC	HIGH
5	HIGH	HIGH	NC	NC
6	NC	HIGH	HIGH	NC
7	NC	NC	HIGH	HIGH
8	HIGH	NC	NC	HIGH
9	HIGH	HIGH	HIGH	NC
10	NC	HIGH	HIGH	HIGH
11	HIGH	NC	HIGH	HIGH
12	HIGH	HIGH	NC	HIGH
13	HIGH	HIGH	HIGH	HIGH

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.

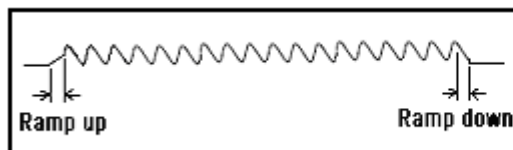


Fig. 1 Ramp-up-down Enable

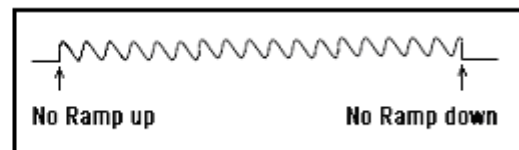


Fig.2 Ramp-up-down Disable



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. 2 to Fig. 6 show the voice playback with different combination of triggering mode and the relationship between outputs and voice playback.

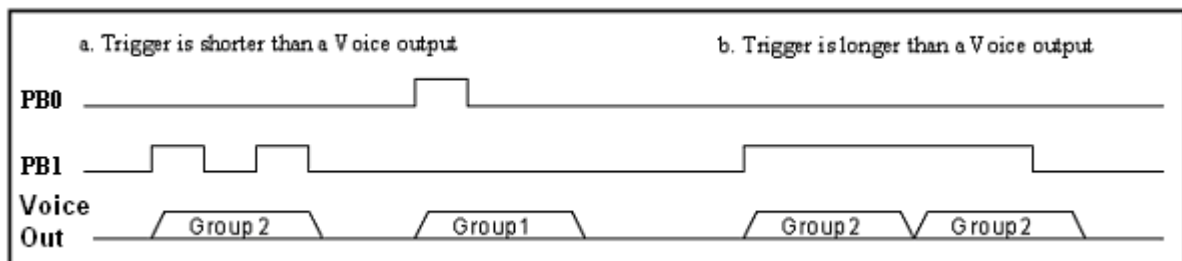


Fig. 3 Level, Unholdable, Non-retriggerable

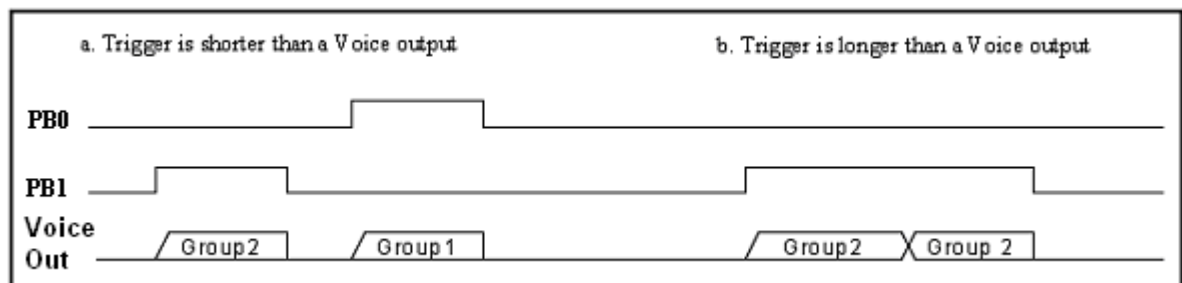


Fig. 4 Level Holdable

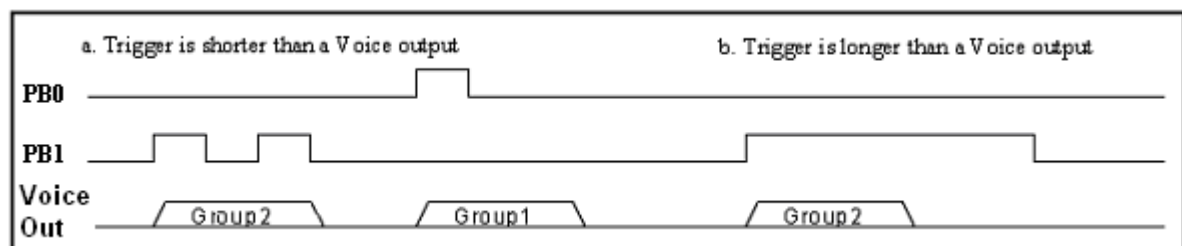


Fig. 5 Edge, Unholdable, Non-retrigger

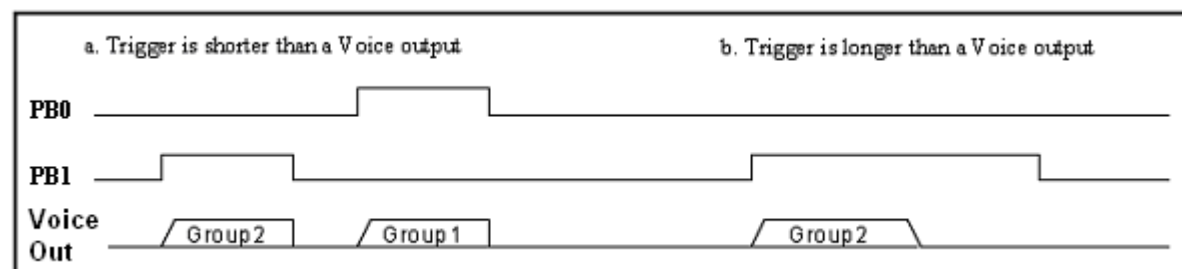
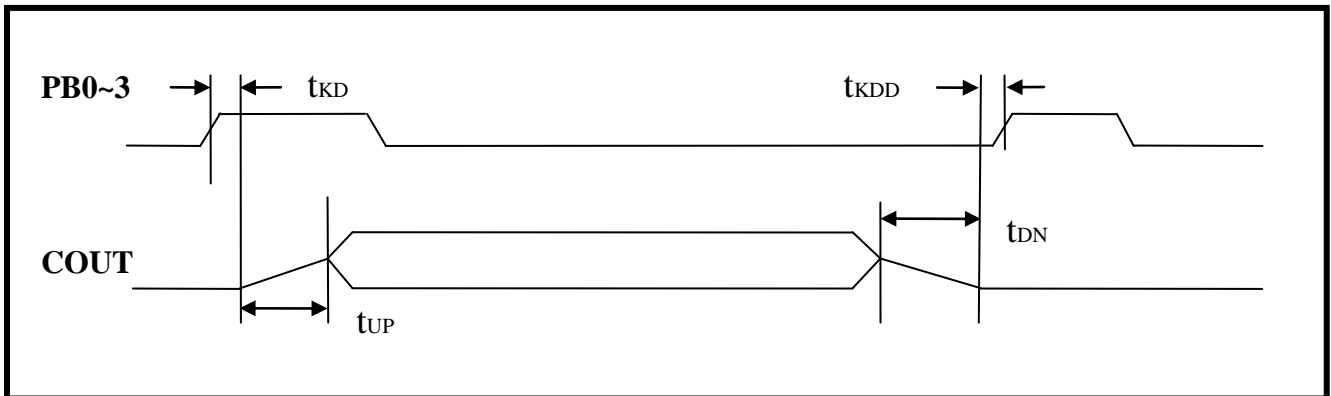


Fig. 6 Edge, Holdable



TRIGGER TIMING



Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
t_{KD}	Key trigger debounce time	$64/F_s$	—	—	sec	1
t_{KDD}	Key trigger delay after end of voice	--	0	--	ms	
t_{UP}	Ramp up time	0	$128/F_s$	--	sec	1
t_{DN}	Ramp down time	0	--	$256/F_s$	sec	2

Note:

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

TYPICAL APPLICATIONS

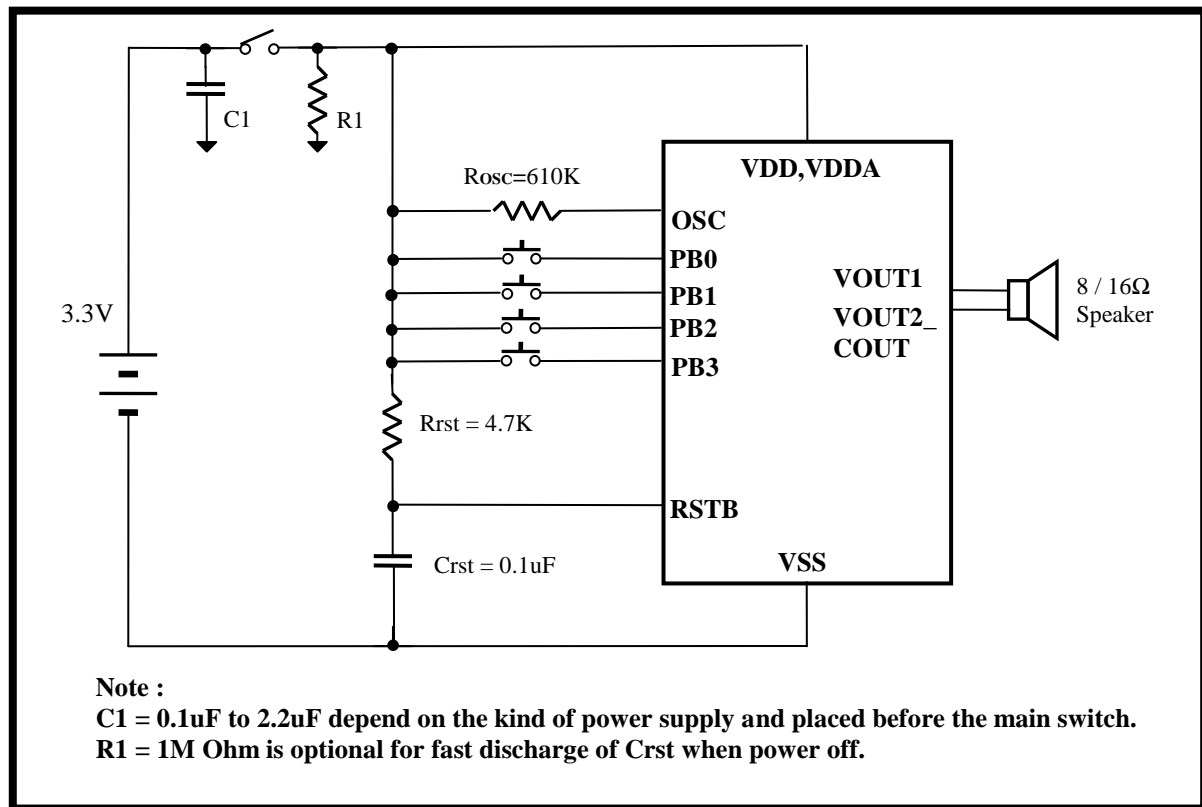


Fig 7. 3.3V Battery with PWM speaker direct drive

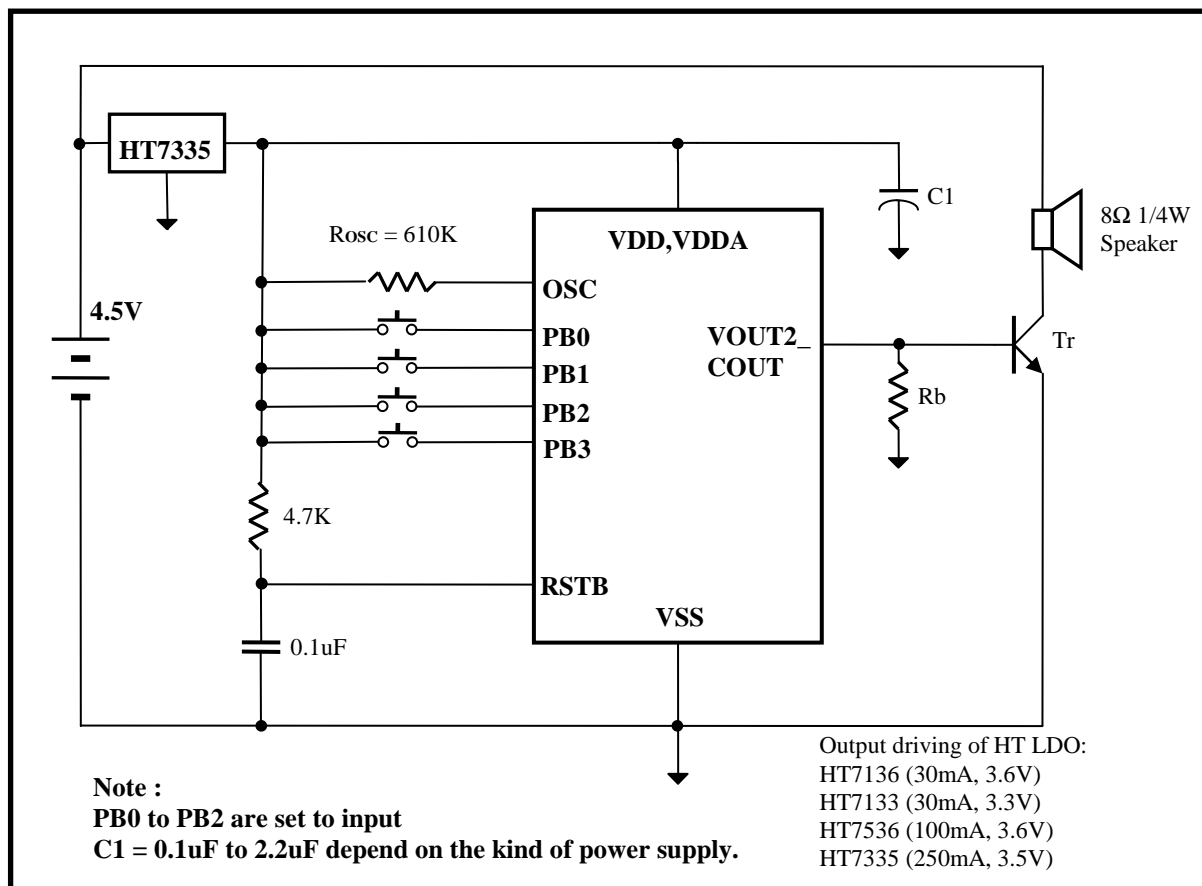
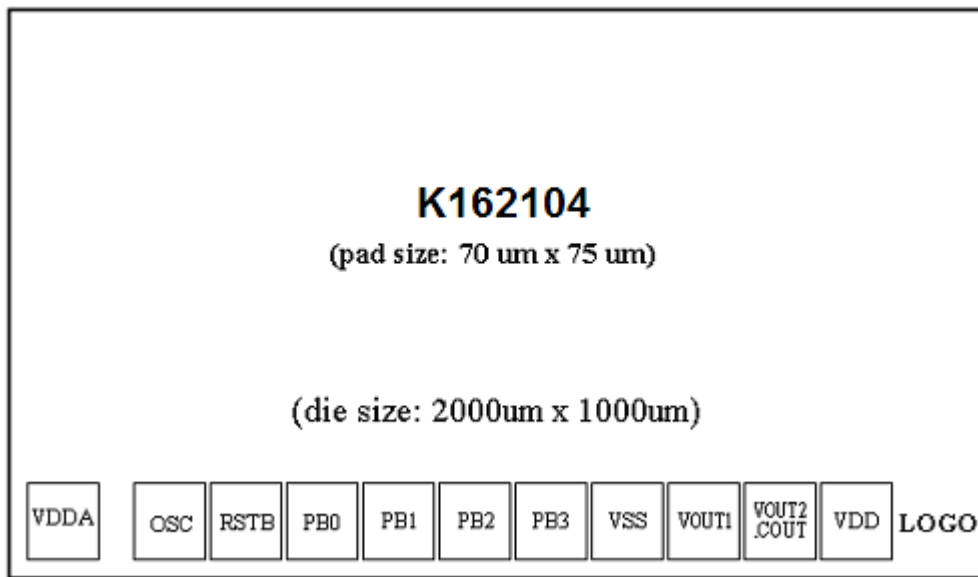


Fig. 8 Using 4.5V Battery

**Bonding Diagrams****Note:**

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