

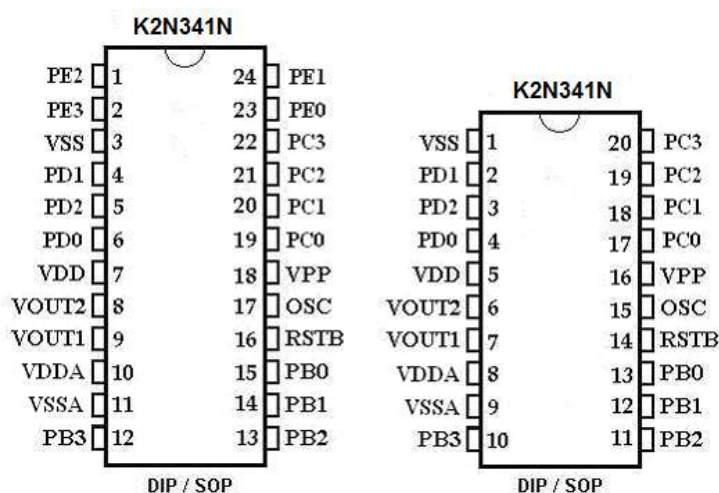


Single Button Trigger (SBT) with BUSY and /BUSY Output

FEATURES

- One key SBT sequential trigger
- Up to 128 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 outputs 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/VSSA	Power Ground / Analog Power Ground
OSC	Oscillator input
VPP	Program power pin, leave open during playback
VDD/VDDA	Positive Power Supply / Analog Positive Power Supply
PB0	SBT Input trigger pins with 1M Ohm internal pull-down
PB1	BUSY output, active HIGH during voice playback
PB2	/BUSY output, active LOW during voice playback
PB3	Unused I/O pins, leave open
PCn, PDm, PEn	Unused I/O pins, leave open
RSTB	Reset pin, Low active

Note: where n is from 0 to 3, m is from 0 to 2.

Pins for programming are: VDD, VDDA, VPP, VSS, VSSA, 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.

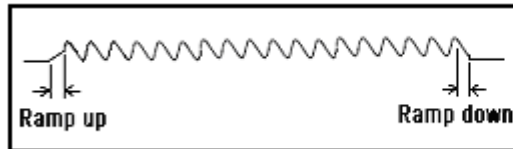


Fig. 1 Ramp-up-down Enable

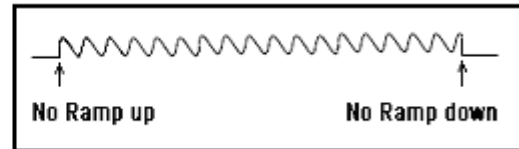


Fig. 2 Ramp-up-down Disable

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.

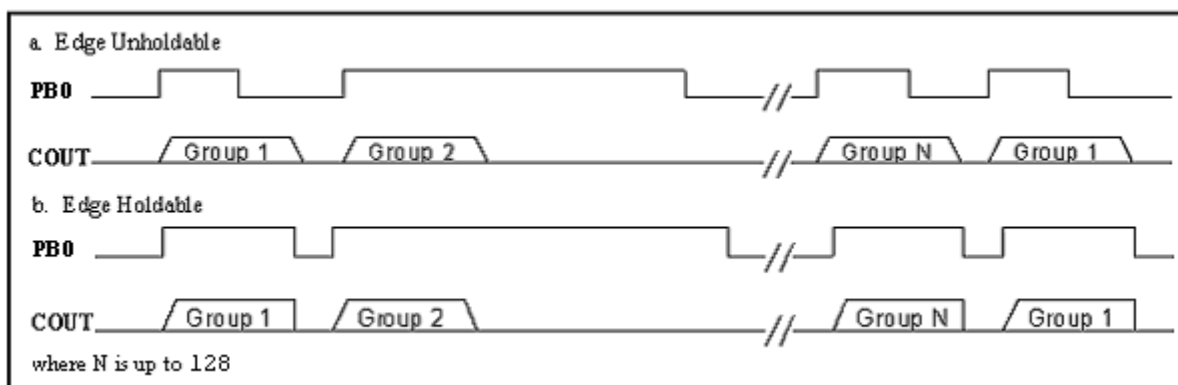


Fig. 3 SBT sequential trigger with Edge Holdable and Unholdable

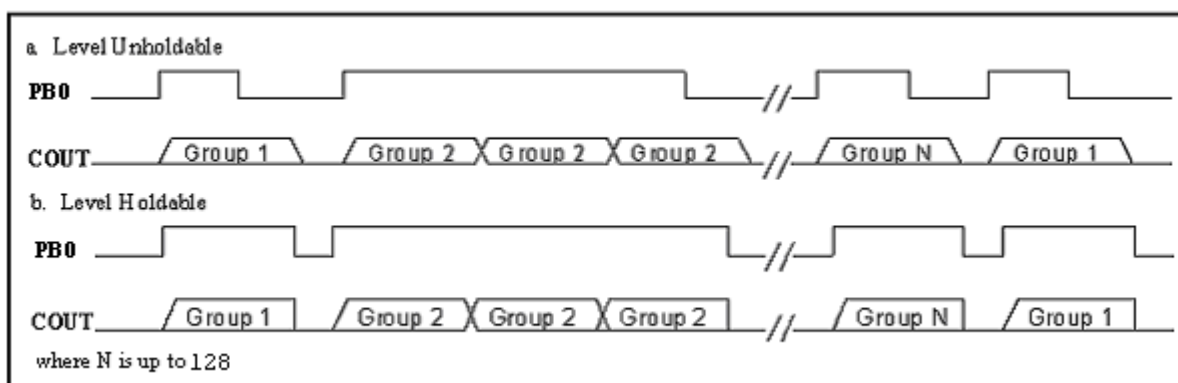
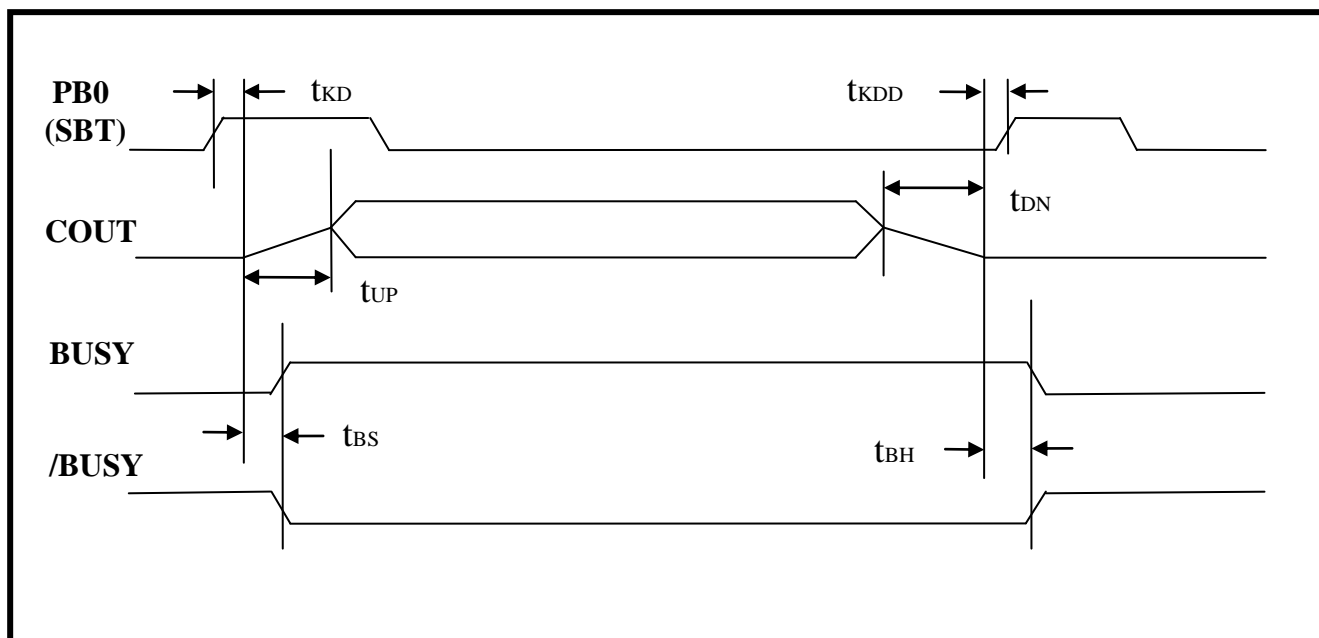


Fig. 4 SBT sequential trigger with Level Holdable and Unholdable

TRIGGER TIMING



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

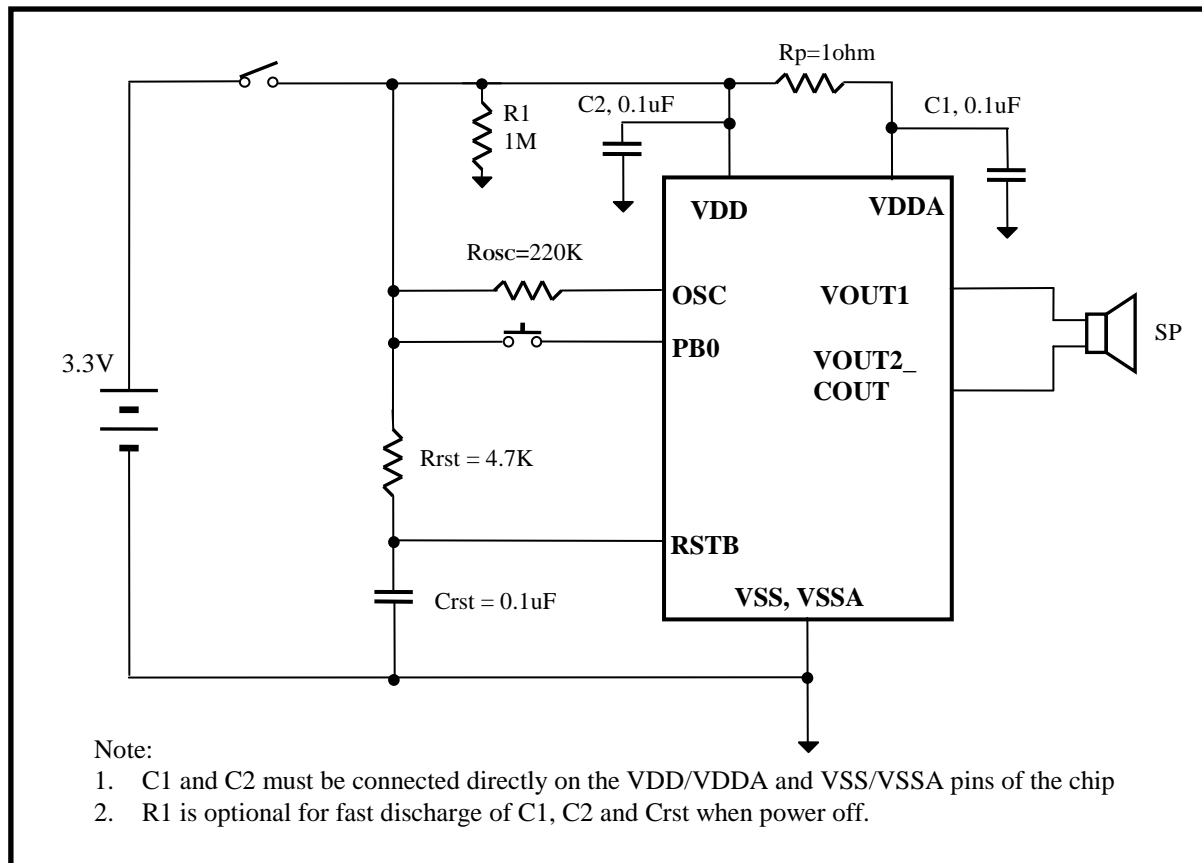


Fig 5. 3.3V Battery with PWM speaker direct drive

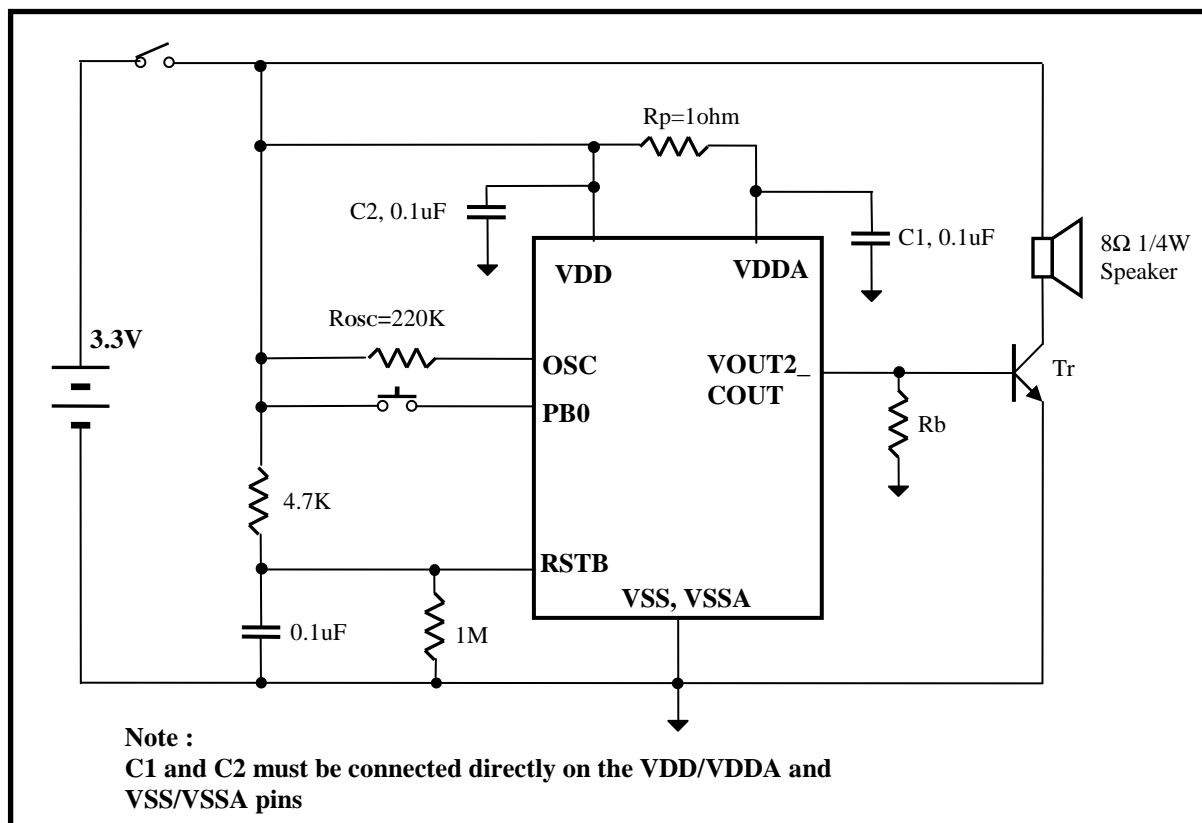


Fig 6. 3.3V Battery with Transistor direct drive



Bonding Diagrams



Note: Substrate must be connected to VSS