

SINGLE TONE MELODY C-MOS

■ GENERAL DESCRIPTION

The NJU505 series is a single tone melody C-MOS IC incorporated 64 notes ROM.

It plays the melody using a piezo buzzer and single battery only.

The playing mode is one-shot mode with half-stops.

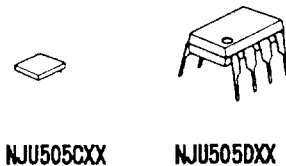
When the switch turns on at no melody status, the melody starts from the top and stops automatically if there is no switch operation during the play.

And if the switch turns on again during the melody playing status, the melody playing stops at halfway.

After melody playing, the LSI shifts to the power saving mode with oscillation stop to realize the long battery life.

The NJU505 series is suitable for melody greeting cards, toys, telephone rests and so on.

■ PACKAGE OUTLINE

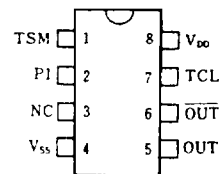


NJU505MXX

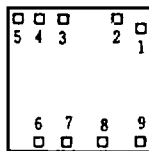
■ FEATURES

- Operating Voltage — 1.2 ~ 3.6V
- Low Operating Current
- 3 Kinds of Playing Modes
  - Bonding or Soldering Option
- CR Oscillation Circuits On-chip
- Piezo Buzzer Direct Drive
- Minimum External Components
- Power Saving Function
  - Oscillation Stop After Replay
  - Value Shifted Pull-down Resistance
- Package Outline : DIP / DMP / CHIP 8
- C-MOS Technology

■ PIN CONFIGURATION



■ PAD LOCATION



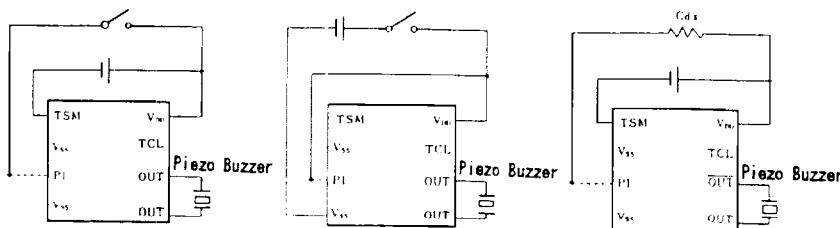
■ COORDINATES

UNIT:  $\mu\text{m}$

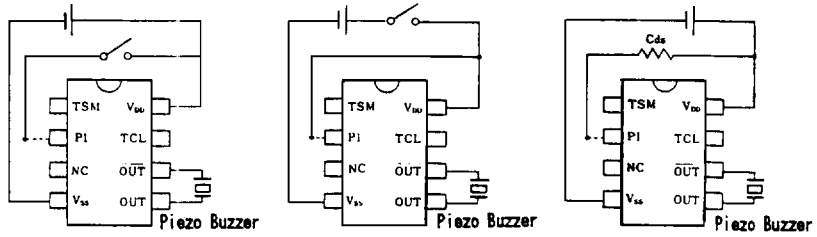
No.	PAD Name	X	Y
1	TSM(NG)	1830	1780
2	V <sub>SS</sub>	1540	1870
3	P <sub>1</sub>	870	1870
4	NC	460	1870
5	V <sub>SS</sub>	130	1840
6	OUT	460	130
7	OUT	870	130
8	TCL(NG)	1320	130
9	V <sub>DD</sub>	1830	130

CHIP SIZE: 1.96X2.00mm  
 CHIP THICKNESS: 400  $\mu\text{m} \pm 30 \mu\text{m}$

■ APPLICATION CIRCUITS (CHIP FORM)



■ APPLICATION CIRCUITS (PACKAGE FORM)



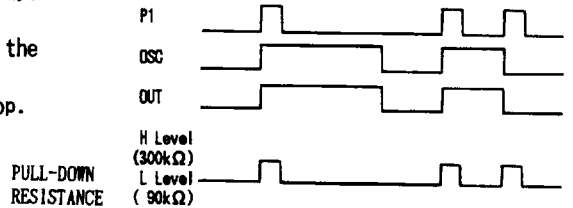
■ PLAYING MODE

The start and stop of the play is controlled by only one terminal of P1.

When the P1 terminal turns on, the melody plays one time.

If the P1 turns on again during the play, the melody is stopped.

And next turn on starts the melody from the top.



Note 1) Turn on level of P1 is  $V_{DD}$ .

Note 2) Minimum pulse width of all inputs are required over then 64msec as chatter free time.

■ POWER SAVE FUNCTION

(1) Oscillation Stop Function.....Oscillation stops automatically when melody stops.

The current consumption is less then  $0.3\mu A$  while no playing.

(2) Input Current on P1.....Variable Pull-down resistance of P1 is controlled by switch conditions is as follows:

During making ( $V_{DD}$ )..... $300K\Omega/1$  Input

During breaking ( $V_{SS}$ )..... $90K\Omega/1$  Input

This function is especially effective for Cds using application.

## ■ ABSOLUTE MAXIMUM RATINGS

 (  $T_a=25^{\circ}\text{C}$  )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{DD}-V_{SS}$	- 0.3 ~ + 5.0	V
Input Voltage	$V_{IN}$	$V_{SS}-0.2 \sim V_{DD}+0.2$	V
Operating Temperature	$T_{OPR}$	- 30 ~ + 85	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	- 65 ~ + 125	$^{\circ}\text{C}$

## ■ ELECTRICAL CHARACTERISTICS

 (  $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=1.5\text{V}$  )

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT	
Operating Voltage	$V_{DD}$		1.2	1.5	3.6	V	
Stand-by Current	$I_{DD1}$	No Play, P1 Open		0.01	0.3	$\mu\text{A}$	
Operating Current	$I_{DD2}$	Playing, OUT, $\overline{\text{OUT}}$ Open		40	70	$\mu\text{A}$	
Input Current	$I_{IL}$	P1	$V_{IL}=0.4\text{V}$	0.7	1.5	3.0	$\mu\text{A}$
	$I_{IH}$		$V_{IH}=1.1\text{V}$	0.7	1.5	3.0	
Output Current	$I_{OL}$	OUT, $\overline{\text{OUT}}$	$V_{OL}=0.75\text{V}$	2.0		mA	
	$I_{OH}$		$V_{OH}=0.75\text{V}$	2.0			
Oscillation Frequency	$f_o$		80	100	120	kHz	
Osc. Stop Voltage	$V_{DS}$				1.2	V	

■ MUSICAL SPECIFICATION

(1) TEMPO

NJU505 series can take from any one of following 15 different tempos.

$\text{♩} =$	Tempo
43.5	LARGO
46.4	
49.7	
53.5	ADAGIO
58.0	
63.3	
69.6	ANDANTE
77.3	
87.0	
99.4	MODERAT
116	
139	ALLEGRO
174	
232	PRESET
348	

(2) NOTE/REST

The following 8 different notes and rest are provided.

Other kinds of note and rests may also be played by using TIE function.

音 符	休 符

(3) JUMP FUNCTION

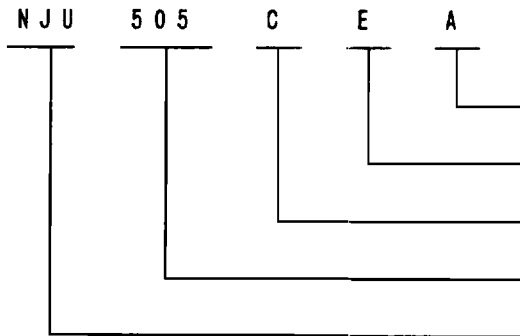
Jump function saves the number of notes programmed by repeating the same part. Maximum 7 jumps are available.

(4) COMPASS & SCALE

NJU505 series can play 15 kinds of scales over  $3 \frac{1}{2}$  octave of G3 to D7 or G4 to D8.

■ ORDERING INFORMATION

The NJU505 series is named by following rules:



Music title

Music field

Package outline (C: Chip, D: DIP, M: DMP)

Device name

The mark of NJRC C-MOS products