UM3481A Multi-Instrument Melody Generator

Features

- Powered by a 1.5V battery
- Low standby current
- 512-note memory, up to 16 songs
- 8 playing modes by user setting
- One built-in RC oscillator
- 8 beats selectable
- 3 timbres - piano, organ, and mandolin
- 5 tempos available through mask setting
- 14 tones selectable
- On-chip envelope modulator and pre-amplifier

General Description

The UM3481 series is a mask-ROM-programmed multi-instrument melody generator , implemented by CMOS technology. It is designed to play the melody according to the previously programmed information and is capable of generating 16 songs with 3 instrument effects : piano, organ and mandolin. The device also includes a pre-amplifier which provides a simple interface to the driver circuit. The M3481 series is intended for applications such as toys, door bells, music box, melody clock/timers and telephones.

Absolute Maximum Ratings

DC Supply Voltage ..... -0.3V to +5.0V
Input Voltage Range ..... Vss-0.3V to Vdd+0.3V
Operating Ambient Temperature ..... 0°C to +70°C
Storage Temperature ..... -10°C to +125°C

Electrical Characteristics

(Vss=0V, Vdd=1.5V, Ta=25°C, unless otherwise specified.)

Parameter	Symbol	Min.	Typ.	Max.	Conditions
Operating Voltage	Vdd	1.3V	1.5V	5V	
Stand-by Current	Isb	-	-	12μA	No load
Input Voltage High	Vih	Vdd-0.3V	-	Vdd	
Input Voltage Low	Vil	Vss	-	Vss+0.3V	
Input Current High	Iih	1.5μA	3μA	6μA	Vih=Vdd
Input Current Low	Iil	-	-	0.1μA	Vil =Vss
ENV Pin Drive Current	Ienv	500μA	-	-	Venv=0.8V
Output Current (OP1)	Iol	200μA	-	1200μA	Vol=0.8V
Output Current (OP2)	Ioh	200μA	-	1200μA	Voh=0.7V

Playing modes

Mode	CE	SL	LP	AS	Program
0	0	X	X	X	Standby
1	1	0	0	0	First melody→...→Last melody→Stop
2	↑	0	0	1	First melody→...→Last melody→Repeat from first melody
3	↑	0	1	0	Start from the present melody→Stop
4	1	0	1	1	Repeat the present melody
5	1	↑	0	0	Change to the next melody→...→Last melody→Stop
6	1	↑	0	1	Next melody→...→Last melody→Repeat from first melody
7	1	↑	1	0	Change to the next melody→Stop
8	1	↑	1	1	Change to the next melody→Repeat the same melody

(↑ means a low to high voltage level transaction)

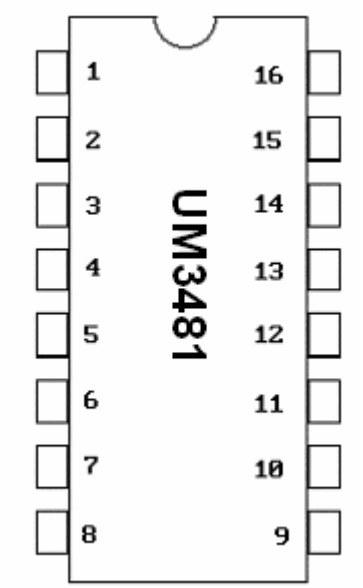
Song Series List (Fewer songs version provides longer duration for each song)

UM3481 (8 songs)
Jingle Bells
Santa Claus Is Coming To Town
Silent Night, Holy Night
Joy To The World
Rudolph, The Red-nosed Reindeer
We Wish You A Merry Christmas
O Come, All Ye Faithful
Hark, The Herald Angels Sing

UM3482 (12 songs)
American Patrol
Rabbits
Oh My Darling, Clementine
Butterfly
London Bridge Is Falling Down
Row, Row, Row Your Boat
Are You Sleeping
Happy Birthday
Joy Symphony
Home Sweet Home
Weigenlied
Melody On Purple Bamboo

UM3485 (5 songs)
The Hawaiian Wedding Song
Try To Remember
Aloha OE
Love Story
Yesterday

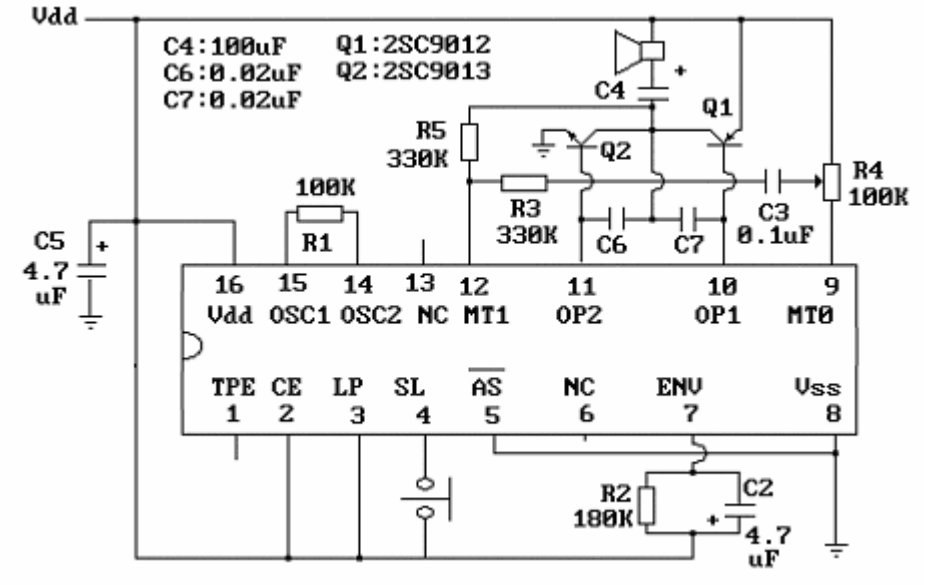
Pin Configuration



Pin	Symbol	Description
1	TSP	Output flag signal of melody auto stop : In normal operation, this should be open.
2	CE	Chip is enabled if connected to Vdd. Chip is disabled if connected to Vss.
3	LP	Only one song plays if connected to Vdd. All songs play if connected to Vss.
4	SL	A positive going edge will change to play the next song.
5	$\overline{AS}$	The melody will repeat if connected to Vdd and will stop automatically if to Vss.
6	NC	No connection
7	ENV	Envelope circuit terminal
8	Vss	Negative power supply
9	MTO	Modulated tone signal output
10	OP1	Pre-amplifier output 1
11	OP2	Pre-amplifier output 2
12	MT1	Modulated tone signal input to the pre-amplifier.
13	NC	No connection
14	OSC2	External oscillator terminal 1
15	OSC1	External oscillator terminal 2
16	Vdd	Positive power supply

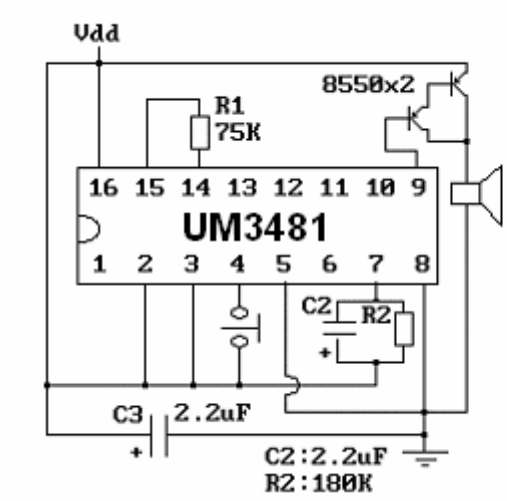
Typical Application Circuit

A. MELODY DOOR BELL

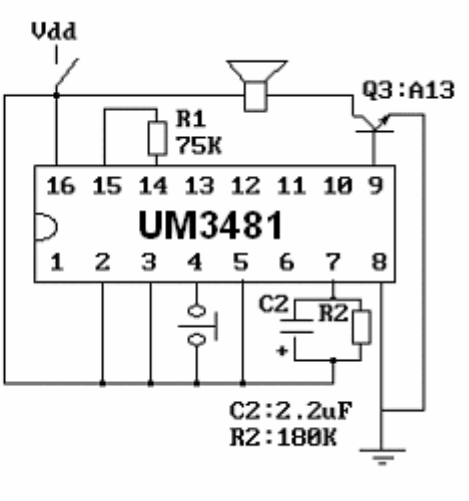


B. LOW COST APPLICATIONS USING SPEAKER

(1) One-shot

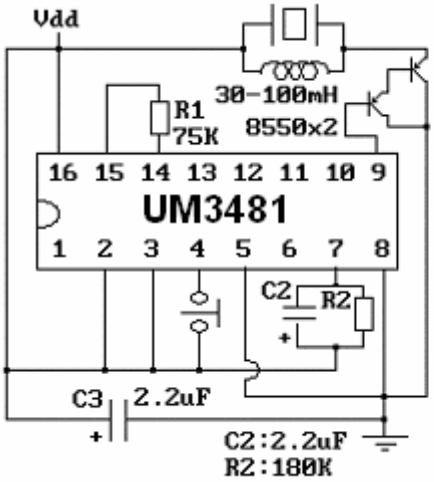


(2) Level-hold

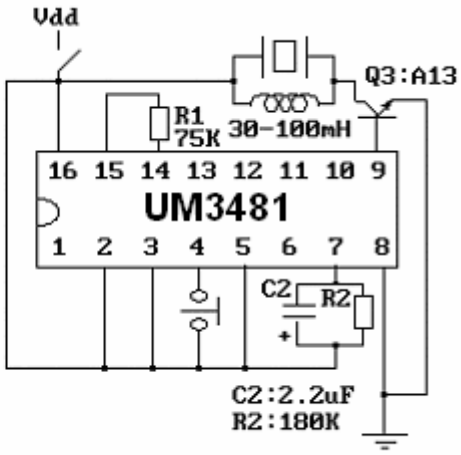


C. LOW COST APPLICATIONS USING PIEZO BUZZER

(1) One-shot



(2) Level-hold



The inductor in parallel can be replaced by a 100kΩ resistor but the sound level will be lower.

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