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.	Тур.	Max.	Conditions
Operating Voltage	Vdd	1.3V	1.5V	5V	
Stand-by Current	lsb	-	-	12µA	No load
Input Voltage High	Vih	Vdd-0.3V	-	Vdd	
Input Voltage Low	Vil	Vss	-	Vss+0.3V	
Input Current High	lih	1.5µA	3μΑ	6μΑ	Vih=Vdd
Input Current Low	lil	-	-	0.1µA	Vil =Vss
ENV Pin Drive Current	lenv	500μΑ	-	-	Venv=0.8V
Output Current (OP1)	lol	200µA	-	1200µA	Vol=0.8V
Output Current (OP2)	loh	200µA	-	1200µA	Voh=0.7V

Playing modes

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

(1 means a low to high voltage level transaction)

BOWIN Bowin Microelectronics

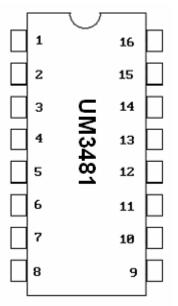
Song Series List (Fewer songs version provides longer duration for each song)

UM3481	(8 songs)	UM3
Jingle Bells		Amer
Santa Claus Is	Coming To Town	Rabb
Silent Night, H	oly Night	Oh M
Joy To The W	orld	Butte
Rudolph, The	Red-nosed Reindeer	Londo
We Wish You	A Merry Christmas	Row,
O Come, All Y	e Faithful	Are Y
Hark, The Her	ald Angels Sing	Happ
	- •	

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

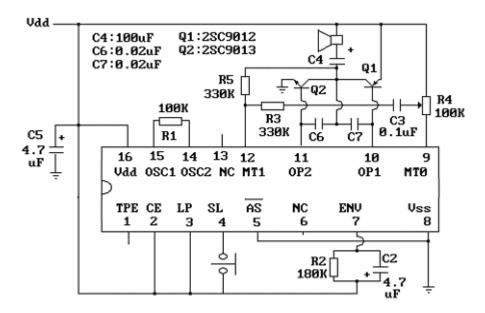
Pin Configuration



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	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

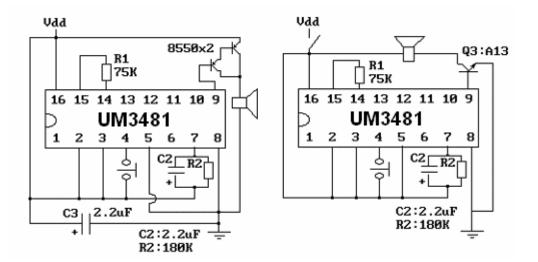
A. MELODY DOOR BELL



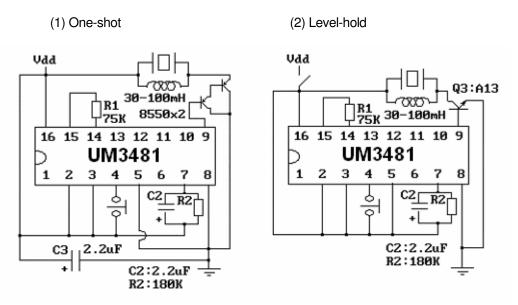
B. LOW COST APPLICATIONS USING SPEAKER

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(1) One-shot
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(2) Level-hold



C. LOW COST APPLICATIONS USING PIEZO BUZZER



The inductor in parallel can be replaced by a $100k\Omega$ resistor but the sound level will be lower.

REV.6-03 (4 pages)