T-77-13

UM66T Series

Simple Melody Generator

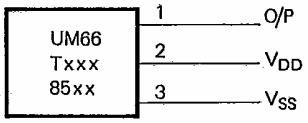
Features

- 62-note ROM memory
- 1.3V to 3.3V operating voltage and low power consumption
- Dynamic speaker can be driven with an external NPN transistor.
- OSC. resistor is built-in
- One-shot mode or level-hold mode can be selected
- Power on reset; melody begins from the first note
- Direct piezo drive.

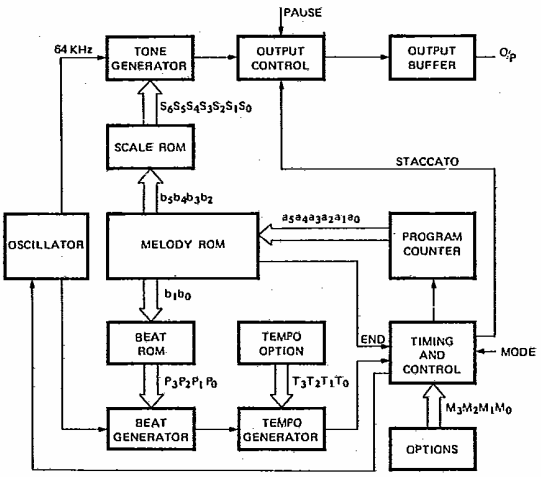
General Description

The UM66T series is a CMOS LSI designed for use in door bells, telephones and toy applications. It is an on-chip ROM programmed for musical performance. Produced by CMOS technology, the device results in very low power consumption. Since the UM66T series includes oscillator and mode selector circuits, a compact melody module can be constructed with only a few additional components.

Pin Configuration



Block Diagram



Pin Description

Pin No.	Designation	Description
1	O/P	Melody output
2	V_{DD}	Positive power supply
3	V_{SS}	Negative power supply

Absolute Maximum Ratings*

DC Supply Voltage . . . . . −0.3V to +5.0V
Operating Ambient Temperature . . . . . −10°C to 60°C
Storage Temperature . . . . . −55°C to 125°C

*Comments

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

D.C. Electrical Characteristics

(V_{SS} = 0V, T_A = 25°C, F_{OSC} = 65536 Hz, unless otherwise specified.)

Parameter		Symbol	Min.	Typ.	Max.	Conditions
Operating Voltage		V_{DD}	1.3V	–	3.3V	
Supply Current	Stand-by	I_S	–	–	1 μA	V_{DD} = 1.5V O/P open
	Operating	I_D	–	–	60 μA	V_{DD} = 1.5V $O_{/P}$ open
$O_{/P}$ Drive Current		$I\,O_{/P}$	600 μA	1.5mA	–	V_{DD} = 1.3V $VO_{/P}$ = 0.8V
O/P Sink Current		$I\,\overline{O_{/P}}$	600 μA	1.5mA	–	V_{DD} = 1.3V $VO_{/P}$ = 0.5V
Frequency Deviation Per Lot		ΔF/F	−12%	–	33%	V_{DD} = 1.5V
Frequency Stability		ΔF/F	–	–	12%	$\frac{F_{OSC}\,(1.6V) - F_{OSC}\,(1.3V)}{F_{OSC}\,(1.3V)}$

Functional Description

Oscillator Circuit

The oscillator frequency is used as a time base for tone and beat generators. Its accuracy affects the quality of the music.

Tone Generator

Tone frequencies are oscillator frequencies ÷M, where M is any even number from 64 to 254. Within a melody, 14 scales can be selected including PAUSE code and END code. The tone generator is a programmed divider. The range of scales is from "C4" to "C6" and range of frequency varies from 258 Hz to 32768 Hz.

Beat Generator

The beat generator is also a programmed divider. It contains 15 available beats as follows: 1/4, 1/2, 3/4, 1, 1-1/4, 1-1/2, 1-3/4, 2, 2-1/4, 2-1/2, 2-3/4, 3, 3-1/4, 3-1/2, 3-3/4 ♩. Four beats can be selected from these.

Melody ROM

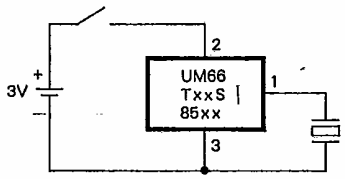
The mask ROM can memorize 64 notes with 6 bits; 4 bits are used for controlling the scale code and 2 bits are used for controlling the rhythm code.

Tempo Generator

There are 15 available tempos in the UM66T. The 15 tempos are: 128, 137, 148, 160, 175, 192, 213, 240, 274, 320, 384, 480, 640, 960, 1920 ♩/minute.

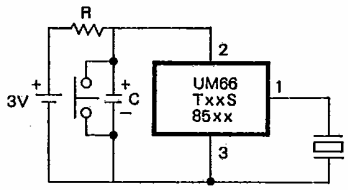
Typical Application Circuits

ONE SHOT MODE FOR PIEZO



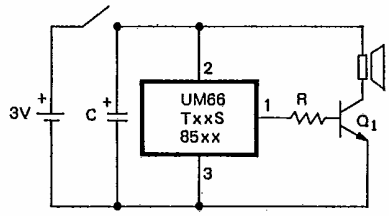
ONE SHOT MODE FOR PIEZO

(Normal open switch)



R: 220Ω
C: 1μF

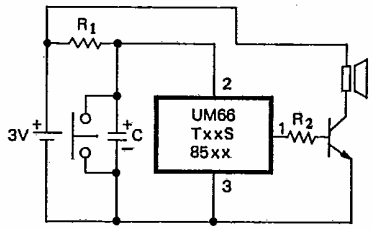
ONE SHOT MODE FOR SPEAKER



R: 4.7KΩ
Q_1: 2SC9013
C: 1μF

ONE SHOT MODE FOR SPEAKER

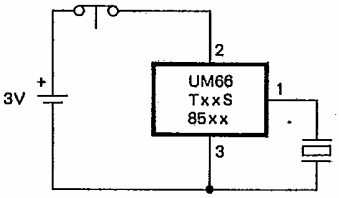
(Normal open switch)



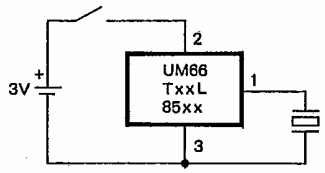
R_1: 220Ω
R_2: 4.7KΩ
Q_1: 2SC9013
C: 1μF

ONE SHOT MODE FOR PIEZO

(Normal closed switch)

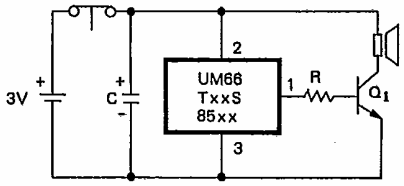


LEVEL HOLD MODE FOR PIEZO



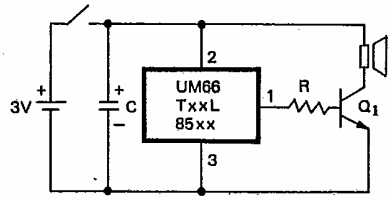
ONE SHOT MODE FOR SPEAKER

(Normal closed switch)



R: 4.7KΩ
Q_1: 2SC9013
C: 1μF

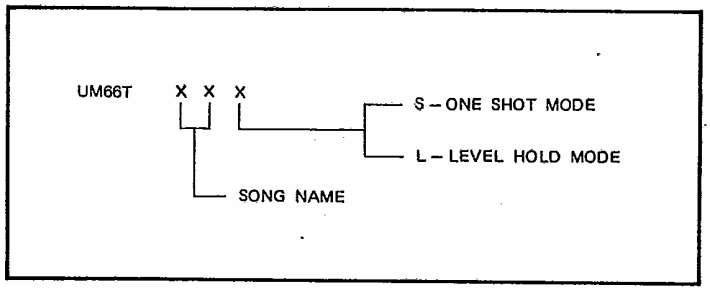
LEVEL HOLD MODE FOR SPEAKER



R: 4.7KΩ
Q_1: 2SC9013
C: 1μF

T-97-13

Ordering Information



Song Series List

Part No.	Song Name
UM66T01 L/S	Jingle Bells + Santa Claus is Coming To Town + We Wish You a Merry X'mas
UM66T02 L/S	Jingle Bells
UM66T04 L/S	Jingle Bells + Rudolph, the Red-nosed Reindeer + Joy to the World
UM66T05 L/S	Home Sweet Home
UM66T06 L/S	Let Me Call You Sweetheart
UM66T08 L/S	Happy Birthday to You
UM66T09 L/S	Wedding March (Mendelssohn)
UM66T11 L/S	Love Me Tender, Love Me True
UM66T13 L/S	Easter Parade
UM66T19 L/S	For Elise
UM66T32 L/S	Waltz
UM66T33 L/S	Mary Had a Little Lamb
UM66T34 L/S	The Train is Running Fast
UM66T68 L/S	It's a Small world