



# UM3561A

## Three Siren Sound Generator

### Features

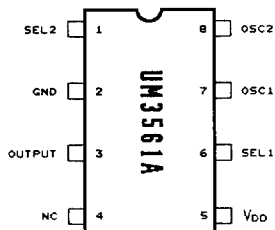
- Four sounds can be selected
- Typical 3V operating voltage
- RC oscillator with an external resistor
- A magnetic speaker can be driven by connecting an NPN transistor
- Power on reset

### General Description

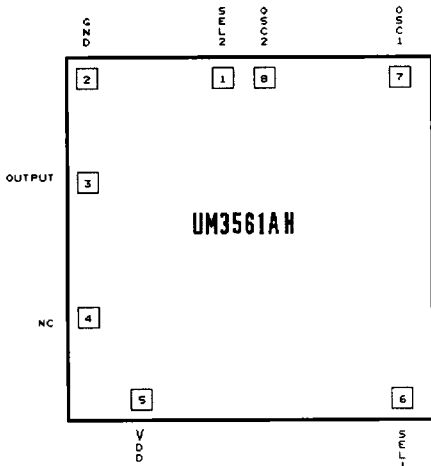
The UM3561A is a low-cost, low-power CMOS LSI designed for use in toy applications. Since the integrated circuit includes oscillator and selector circuits, a

compact sound module can be constructed with only a few additional components. The UM3561A contains a programmed mask ROM to simulate siren sounds.

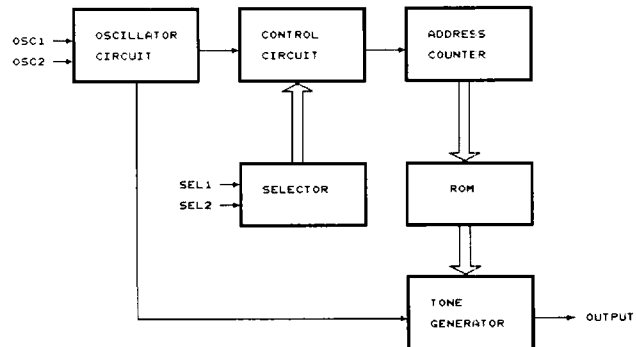
### Pin Configuration



### Pad Configuration



### Block Diagram



**Absolute Maximum Ratings\***

DC Supply Voltage. . . . . -0.3V to + 5.0V  
 Input/Output Voltage. . . . GND -0.3V to V<sub>DD</sub> + 0.3V  
 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.

**DC Electrical Characteristics** (V<sub>DD</sub> = 3V, GND = 0V, T<sub>A</sub> = 25°C, Fosc=130 KHz, unless otherwise specified.)

Parameter	Symbol	Min.	Typ.	Max.	unit	Conditions
Operating Voltage	V <sub>DD</sub>	1.3	-	3.6	V	
Operating Current	I <sub>DD</sub>	-	-	250	μA	V <sub>DD</sub> = 3V, no load
"H" Input Voltage	V <sub>IH</sub>	V <sub>DD</sub> - 0.2	-	V <sub>DD</sub>	V	
"L" Input Voltage	V <sub>IL</sub>	GND	-	GND + 0.2	V	
Frequency Deviation	ΔF/F	-	-	20	%	$\frac{F_{osc}(3.3V) - F_{osc}(2.7V)}{F_{osc}(2.7V)}$
Output Drive Current	I <sub>OH</sub>	1.5	-	-	mA	V <sub>DD</sub> = 3V, V <sub>OH</sub> = 2V
Frequency Deviation Per Lot	ΔF/F	-10%	-	+10	%	V <sub>DD</sub> = 3V

**Pin and Pad Descriptions**

Pin and Pad No.	Designation	Description
1	SEL2	Sound effect selection
2	GND	Ground pin
3	OUTPUT	Mono-tone output
4	NC	This pad is used for testing; in normal operation, this pad is open.
5	V <sub>DD</sub>	Positive power supply
6	SEL1	Sound effect selection
7	OSC1	RC oscillator
8	OSC2	RC oscillator or inverted clock output

## Functional Description

### Oscillating Circuit

There are two options for generating oscillator frequency. Either can be selected by mask option.

- (1) Only one external resistor is required to complete the oscillator circuit.
- (2) Oscillator resistor is built-in.

### Sound Effect ROM

The sound effect ROM is organized as 256 words by 8 bits. The sound effect program and the options are mask programmable in the N<sup>+</sup> layer.

### Sound Selection

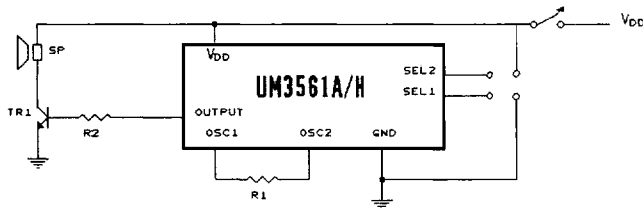
The SEL2 incorporates a resistor for internal pull low, and SEL1 is a tri-state control pin. Two pads SEL1 and SEL2, should be selected for the sound effect mode.

Bonding Pad		Sound Effect
SEL1	SEL2	
No Connection	No Connection	Police Siren
V <sub>DD</sub>	No connection	Fire Engine Siren
GND	No Connection	Ambulance Siren
"-" Don't Care	V <sub>DD</sub>	Machine Gun

## Application Circuits (for reference only)

### Four-sound Application:

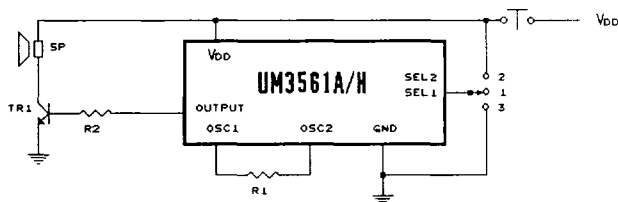
1. Police Siren
2. Fire Engine Siren
3. Ambulance Siren
4. Machine Gun



- | SEL1                                 | SEL2 |
|--------------------------------------|------|
| 1. (No Connection, No Connection)    |      |
| 2. ( V <sub>DD</sub> , NoConnection) |      |
| 3. ( GND , NoConnection)             |      |
| 4. (No Connection, V <sub>DD</sub> ) |      |

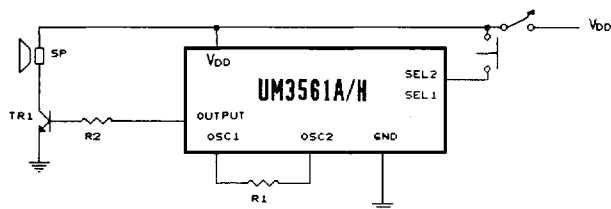
### Three-sound Application:

1. Police Siren
2. Fire Engine Siren
3. Ambulance Siren

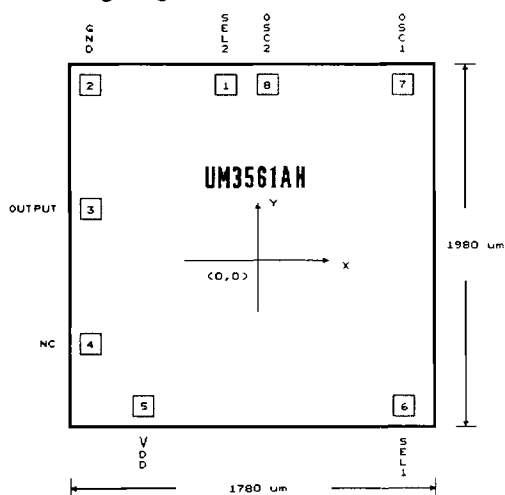


**Two-sound Application:**

1. Police Siren    2. Machine Gun


**Recommended Value**

VDD	R1	R2	TR1	SP
1.5V	200K $\Omega$	0 $\Omega$	2SC9013 or 8050	8 $\Omega$ 0.2W speaker
3.0V	240K $\Omega$	10K $\Omega$	2SC9013 or 8050	8 $\Omega$ 0.2W speaker

**Bonding Diagram**


Pad No.	Designation	X	Y
1	SEL2	-126	817
2	GND	-715	828
3	OUTPUT	-713	116
4	NC	-744	-439
5	VDD	-499	-844
6	SEL1	761	-832
7	OSC1	761	816
8	OSC2	71	808

\* Substrate connect to VDD.

**Ordering Information**

Part No.	Package
UM3561AH	CHIP FORM
UM3561A	8L DIP