



UM5101

Voice Recording and Reproducing

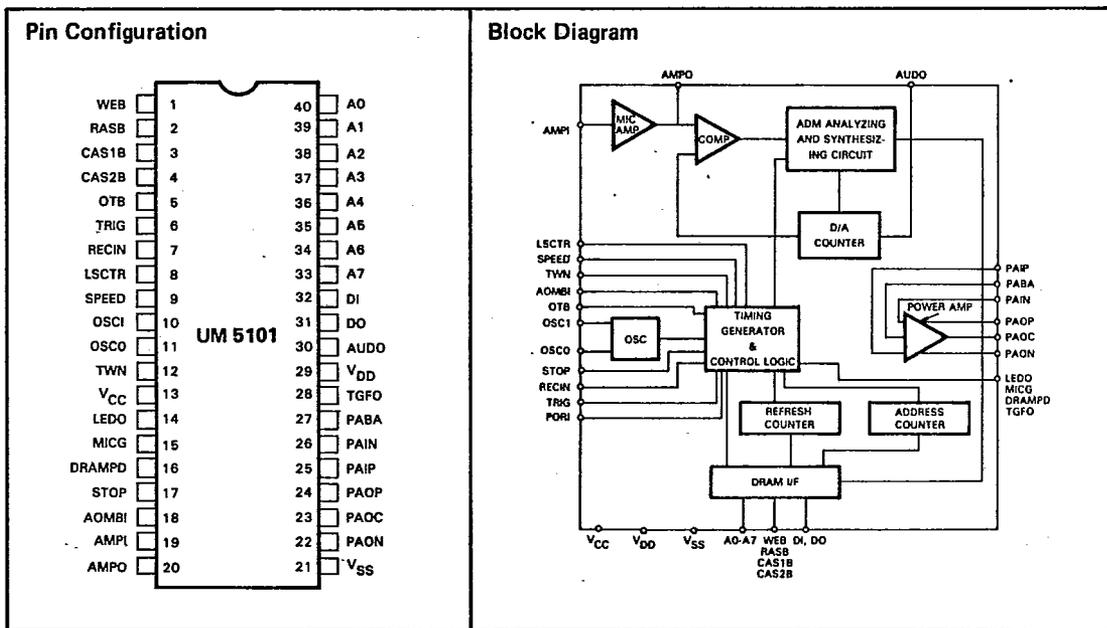
ADVANCED PRODUCT DESCRIPTION

Features

- DRAM is used as a voice data memory. One or two 64K DRAM can be selected by pin
- Bit rates can be selected by changing oscillator frequency and pin control (8K-32K bps)
- Built-in voice recording mic-amplifier and voice reproducing power amplifier minimizes the external components to a minimum
- Built-in 8-bit D/A converter
- The RC oscillator makes sample rate changing feasible
- Low stand-by current in stand-by mode
- Talking back mode and manual control mode is selected
- Single power supply (Vmax. = 9V)

General Description

UM5101 is an ADM voice recording & reproducing IC. Voice data is stored in external DRAM which can be directly connected to UM5101.





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Electric Characteristics

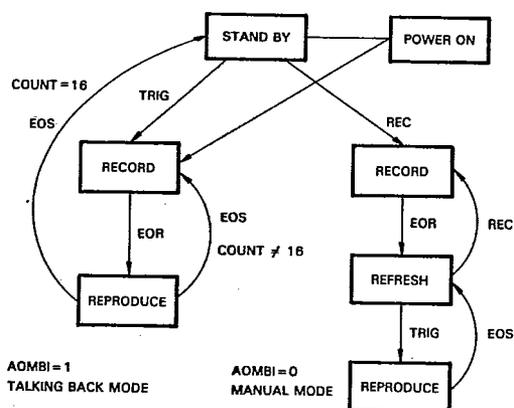
Operation Voltage	9V
Stand-by Current	Typical 2 μ A at V _{DD} = 5V
Output Buffer Current	
LEDO	6mA
TGFO	5mA
MICG	1.5mA
DRAMPD	2.5mA
Others	0.5mA

Manual Mode

In this mode it will stay in stand-by only after power on. The trigger of the REC pin makes it enter the record state. After the end of the record, it goes to refresh state in order to keep the DRAM data. It can enter the reproduce state when it is in refresh state and TRIG pin is stimulating. However it must return to refresh state after the end of recording or reproducing.

Functional Description

The operation of UM5101 is very simple. It can be generally described in the following state diagram below:



REC = RECIN pin is triggered
 TRIG = TRIG pin is triggered
 EOR = End Of Record
 EOS = End Of Speech

Talking Back Mode

It will enter the record state after power is on or the TRIG pin is stimulated in stand-by state. When the recording has been completed, it will automatically change to reproduce state. If the counting number is less than sixteen, it will go to record state again after reproducing is finished. This procedure will continue until the counting number equals to sixteen. After that, it goes to standby state.

Pin Description

AMPI, AMPO

Microphone amplifier input and output. Amplifier's gain can be control via external resistor which connects between these two pins.

LSCTR

Low speed control pin is used to guarantee the RAS width meets the requirement of DRAM. When low sample rate is desired. This pin should be in "H" level and the sample rate is equal to $f_{OSC}/32$ (f_{OSC} = Oscillating frequency). When normal this pin is in "L" level and the sample rate is $f_{OSC}/16$. However this pin should be in "H" when sample rate is below 12.5KHz.

SPEED

Speed controls the output voice rate. As this pin is in "H" level, the output rate will increase by two during voice reproduction.

TWN

If this pin is in "H" level, the voice output will be reproduced twice after each trigger

AOMBI

Automatic or manual mode control pin indicate the current mode of this IC. When this pin is in "H", it is in talking back mode. After a trigger it will start to record the voice and then reproduce it. The process will be carried out 16 times. When this pin is in "L", it is in manual mode. It will stay in stand-by after power is on. If REC pin is triggered, it will start to record and go to refresh state after recording end. Then it will enter record or reproduce state by stimulating RECI pin or TRIG pin.

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OTB

This pin is used to indicate one or two DRAMs being connected externally. When OTB is "H", one DRAM is connected. It should be "L" if two DRAMs are connected.

OSCI, OSCO

Oscillator input and output pin. A resistor is placed between these two pins in order to oscillate. If 11 pin OSCO is triggered low, the talking back function will pause for a period as long as trigger time.

STOP

If talking back operates over two times and the STOP pin is triggered by high, then talking back function will immediately stop.

RECIN

In manual mode, it will enter record state when this pin is triggered.

TRIG

In talking back mode, it will carry out record and reproduce 16 times, when this pin is triggered. In manual mode, it will enter reproduce state when this pin is triggered, a CdS can be used to trigger this pin.

V_{DD}, V_{SS}

Power pins.

A0 ~ A7

DRAM address pins.

WEB, RASB, CAS1B, CAS2B

DRAM control timing pins.

DI, DO

DRAM data input and output pins.

LEDO

N-channel open drain output. It will stay in "L" during the record state.

MICG

N-channel open drain output. It will stay in "L" during the record state.

DRAMPD

N-channel open drain output. It will stay in "L" when it is not in standby state.

TGFO

P-channel open drain output. It will stay in "H" during the reproduce state.

PAIP, PABA, PAIN, PAOP, PAOC, PAON

Power amplifies input and output pins. PAIP is positive terminal. PAOP is used to drive PNP transistor. PAON is used to drive NPN transistor. PAOC is connected to output push-pull. PAIN is negative terminal. PABA is bias input pin.

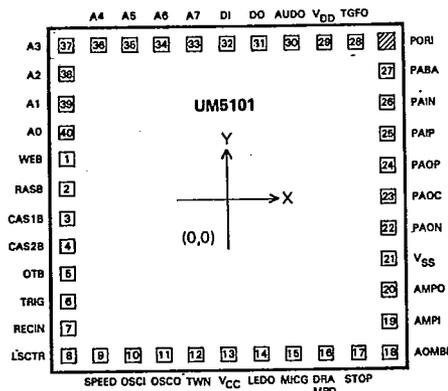
AUDO

D/A reproducing output.

V_{CC}

Power supply for logic-level conversion. The high level of output pins: A0-A7, DI, RASB, CAS1B, CAS2B, WEB is "V_{CC}". V_{CC} should less than or equal to V_{DD}.

Barding Diagram



Pad No.	X	Y	Pad No.	X	Y
1.	-1352.04	485.90	21.	1368.04	-489.46
2.	-1380.93	274.57	22.	1389.89	-263.40
3.	-1352.04	24.38	23.	1368.04	-27.43
4.	-1352.04	-204.47	24.	1368.04	226.06
5.	-1352.04	-440.94	25.	1368.04	454.91
6.	-1360.93	-680.47	26.	1368.04	694.44
7.	-1360.93	-927.10	27.	1388.04	937.51
8.	-1312.93	-1180.59	28.	1368.04	1163.57
9.	-1082.55	-1173.48	29.	1003.05	1183.89
10.	-839.47	-1180.59	30.	781.56	1180.59
11.	-595.88	-1169.92	31.	494.54	1180.59
12.	-378.43	-1173.48	32.	277.62	1191.01
13.	77.47	-1253.49	33.	46.99	1180.59
14.	286.00	-1253.49	34.	-166.12	1183.89
15.	550.93	-1253.49	35.	-391.92	1183.89
16.	764.03	-1253.49	36.	-609.09	1183.89
17.	1038.10	-1197.61	37.	-826.52	1180.59
18.	1263.90	-1187.45	38.	-1052.58	1183.89
19.	1368.04	-958.09	39.	-1352.04	1152.91
20.	1368.04	-711.45	40.	1360.93	930.40
				1352.04	708.41

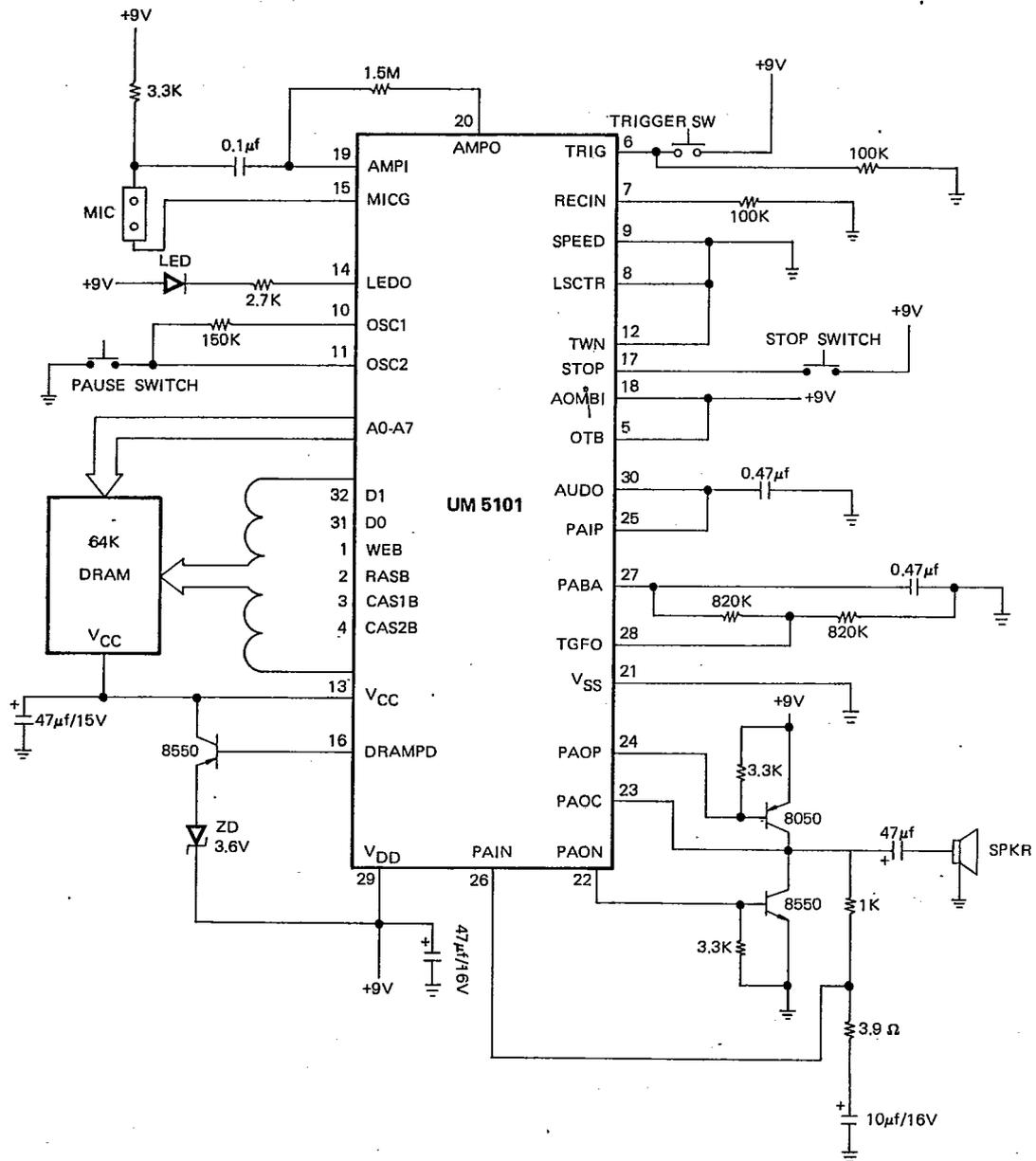
unit: μ m



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Application Circuit

(For Talking Back Mode)



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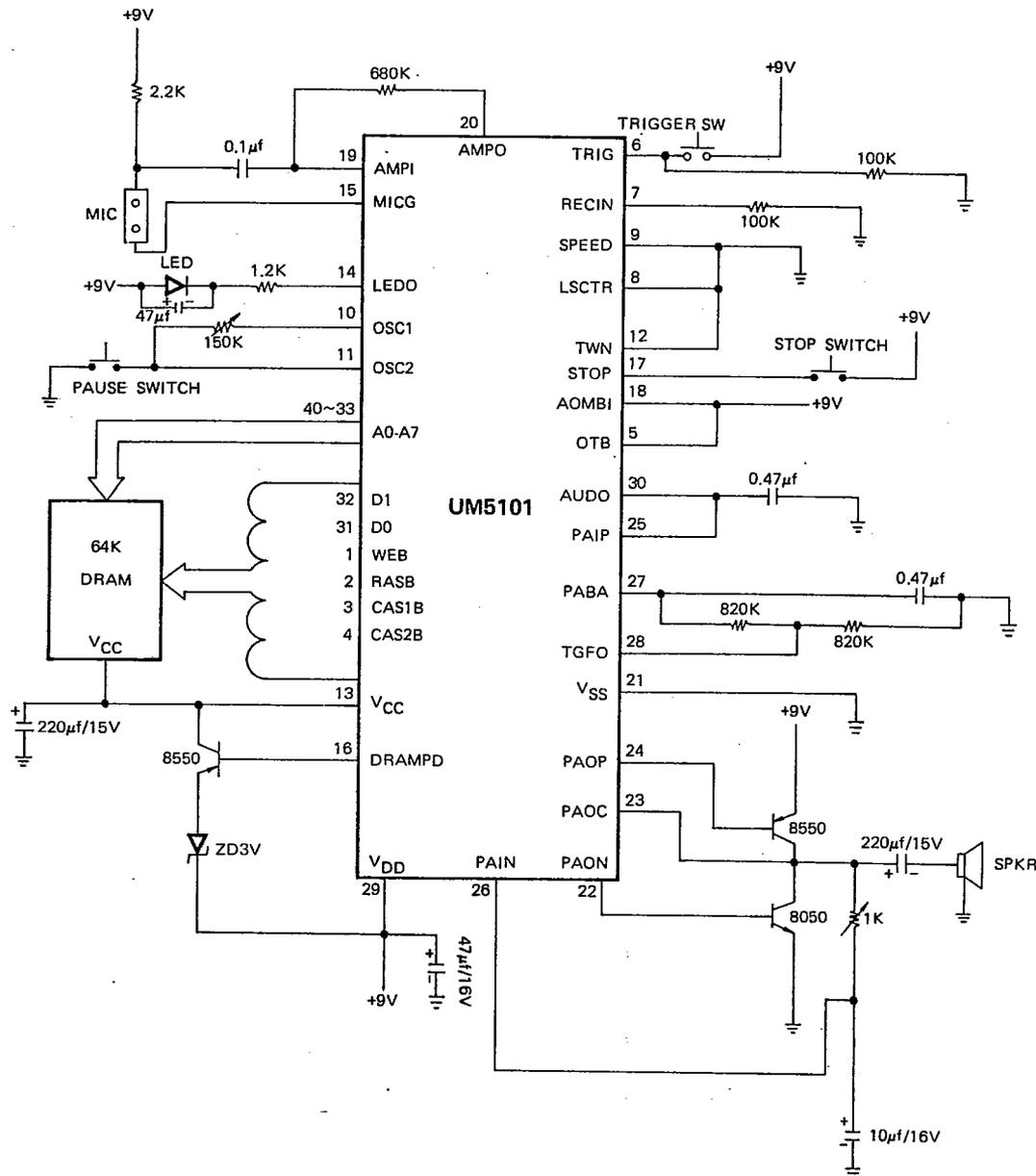
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Application Circuit

(For Talking Back Mode)



Voice Products

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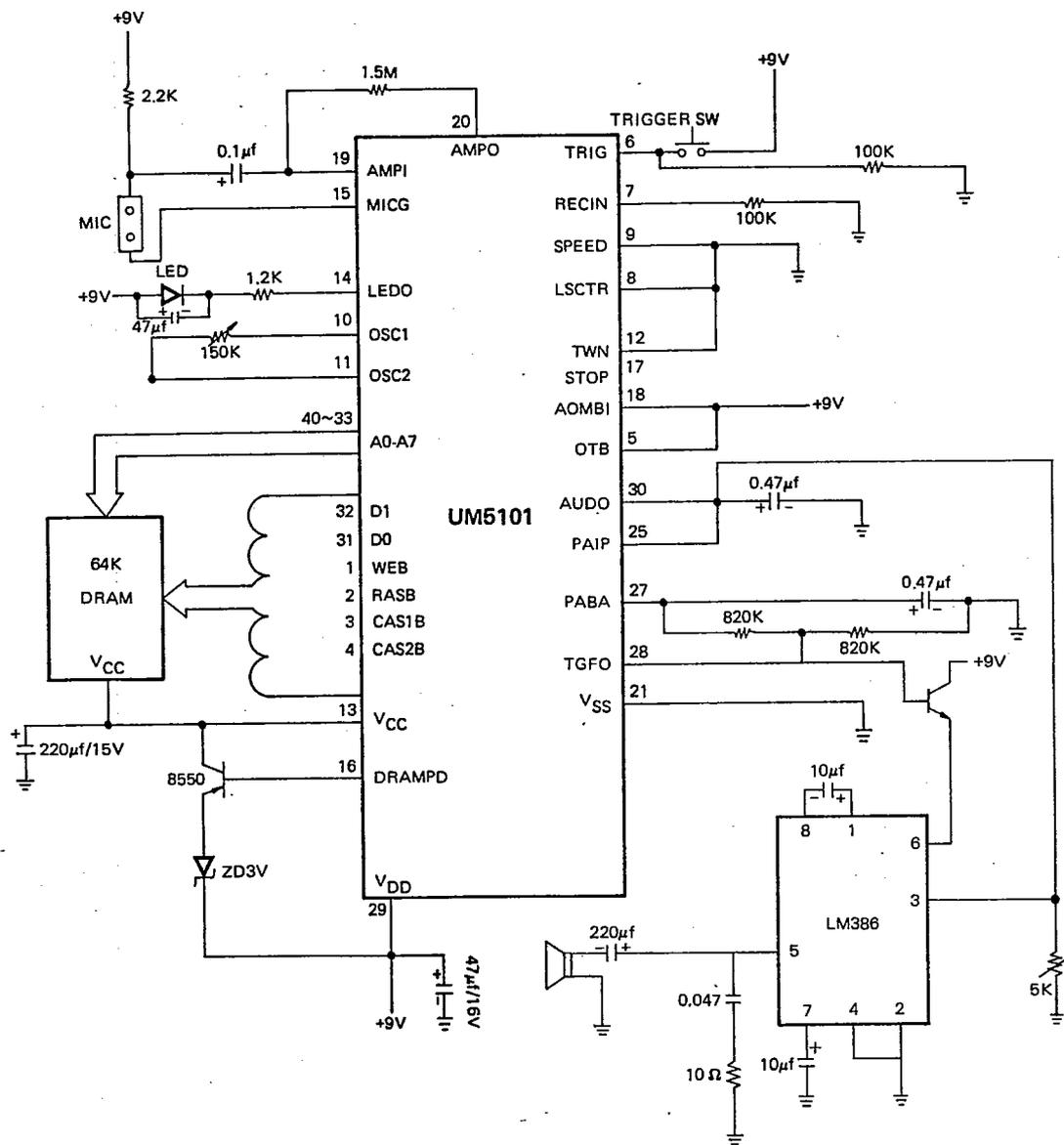
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Application Circuit

(For Talking Back Mode)



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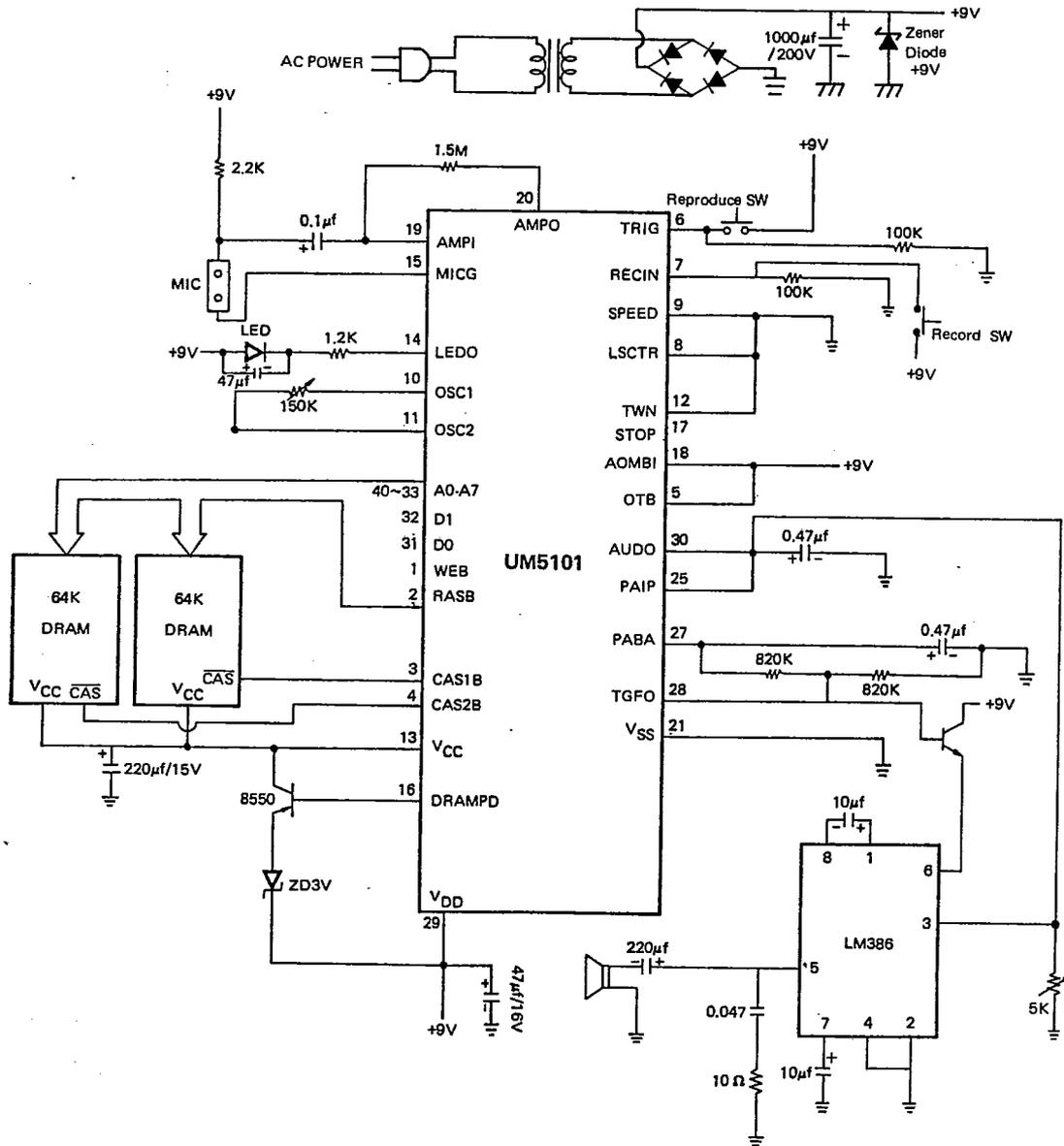
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Application Circuit

(For Message Box with AC Power)



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