

27-TONE ALARM GENERATOR

DESCRIPTION

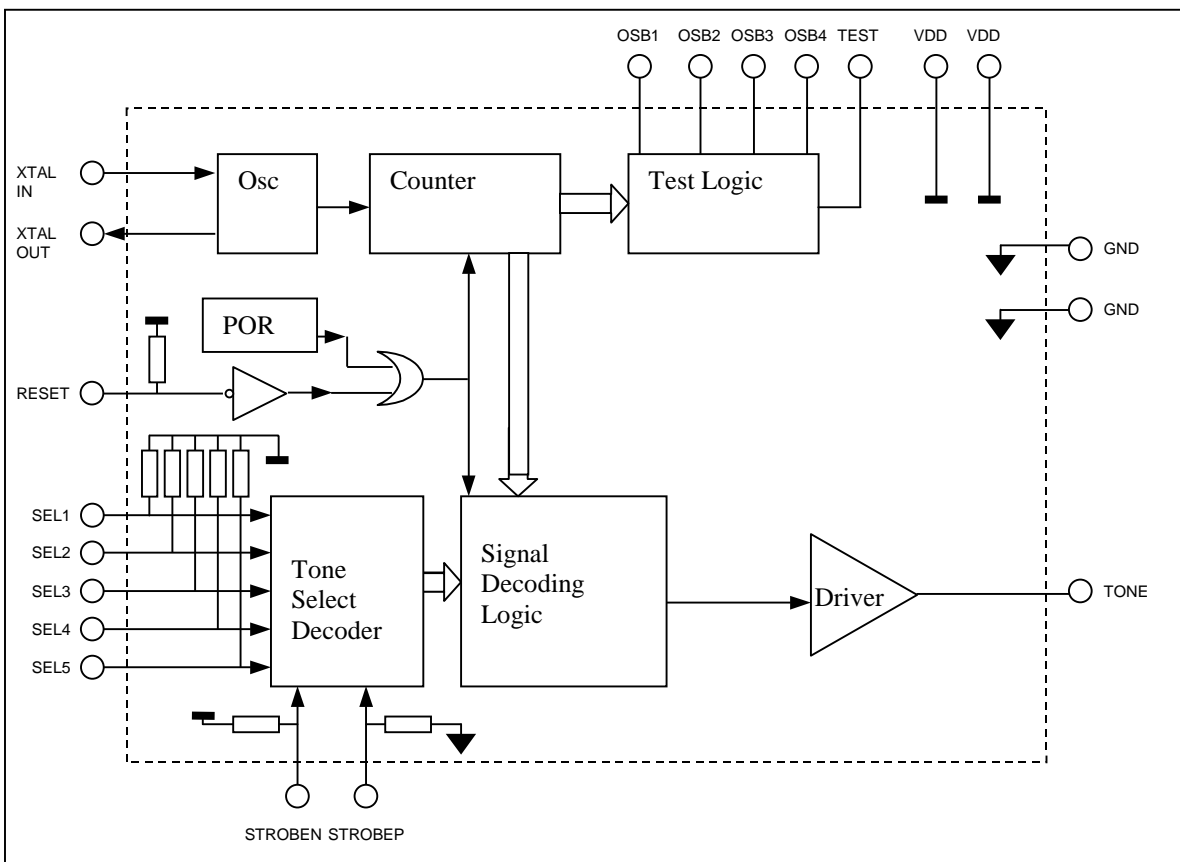
The ASIC is a full custom CMOS device. The design is based on a standard 3 micron silicon gate process.

The device is used to generate a number of industry standard Alarm Tones and is used primarily in fire protection systems. The Alarm tones are generated digitally by counting and decoding logic. All the tones originated from a 4.00MHz oscillator. The accuracy and stability of the tones is set primarily by the accuracy of the external XTAL or ceramic resonator.

FEATURES

- Flexible Implementation
- One Device suits all applications
- Simple to design with

1.0 BLOCK DIAGRAM

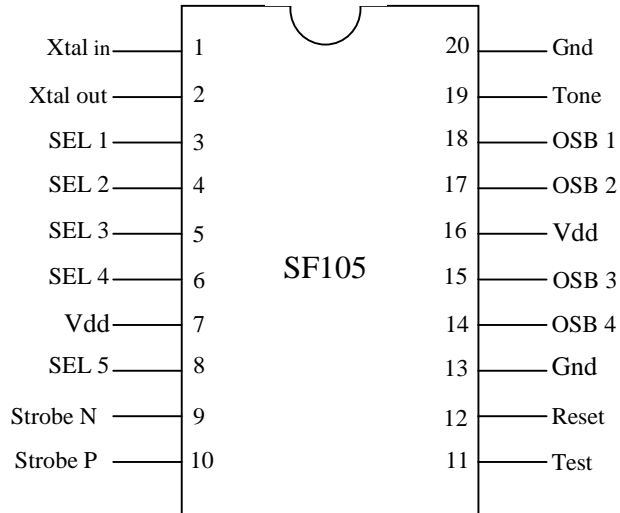


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2.0 PIN CONFIGURATION



These devices have been designed to withstand up to 1kV of electrostatic discharge between pin pairs. As such, precautions must be taken to ensure that the device is not damaged during handling and transportation.



2.1 PIN DESCRIPTION for 20SOICW

PIN NO	PIN NAME	PIN DESCRIPTION	PIN NO	PIN NAME	PIN DESCRIPTION
1	Xtal in	4.0MHz crystal	11	Test	Test mode select.
2	Xtal out	4.0MHz crystal	12	Reset	Reset input, active low
3	SEL 1	Tone selection input	13	Gnd	Power supply
4	SEL 2	Tone selection input	14	OSB 4	Test waveform output
5	SEL 3	Tone selection input	15	OSB 3	Test waveform output
6	SEL 4	Tone selection input	16	Vdd	Power supply
7	Vdd	Power supply	17	OSB 2	Test waveform output
8	SEL 5	Tone selection input	18	OSB 1	Test waveform output
9	Strobe N	Second tone select.	19	Tone	Output
10	Strobe P	Second tone select.	20	Gnd	Power supply

3.0 ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNITS
Supply voltage V_{DD}	7.0	V
Any pin	-0.3V to $V_{DD} + 0.3$	V
Operating Temperature, T_O	-40 to 70	°C
Storage Temperature, T_S	-65 - +125	°C
Lead Temp soldering	260 for < 10 secs	°C



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4.0 ELECTRICAL SPECIFICATION

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
Supply voltage Vdd		4.5	5.0	6.0	V
Supply current	nom with Vdd = 5.0, max with Vdd = 6V SEL inputs high, STROBEN high, STROBEP low, RESET high.	-	1.25	2.5	mA
SEL i/p source current	Vdd = 5V, switch Vin = OV	15	30	45	uA
STROBEN i/p source current	Vdd = 5V, switch Vin = OV	15	30	45	uA
RESET i/p source current	Vdd = 5V, switch Vin = OV	8	12	18	uA
STROBEP input sink current	Vdd = 5V, switch Vin = Vdd	50	90	135	uA
Tone output source current	Vdd = 5V, Vout = 1V	50	100	150	uA
Tone output sink current	Vdd = 5V, Vout = 1V	2.8	4.2	6.3	mA
Starting Current	For 2ms after power up			30	mA
Starting Time	After power up			1.5	msec
Frequency Tolerance			±0.015		%



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5.0 GENERAL DESCRIPTION

The device offers a full set of 27 different sounds, including a range of tones, sweeping and intermittent alarms, that are ideal for all distress, danger and warning devices.

no	Characteristics	Code	2 nd tone	Description
1	Alt Tones 800/970 Hz @ 2Hz	00000	14	Fast Nee-Naw (LF)
2	Sweeping 800/970 Hz @ 7Hz	00001	14	Fast Sweep (LF)
3	Sweeping 800/970 Hz @ 1Hz	00010	14	Medium Sweep (LF)
4	Continuous @ 2850 Hz	00011	14	High Tone
5	Sweeping 2400-2850 Hz @ 7Hz	00100	4	Fast Sweep
6	Sweeping 2400-2850 Hz @ 1Hz	00101	4	Medium Sweep
7	Slow Whoop	00110	14	Slow Whoop (LF-HF)
8	Sweep 1200-500 Hz @ 1Hz	00111	14	Din Tone (HF-LF)
9	Alt Tones 2400-2850 Hz @ 2Hz	01000	4	Nee-Naw (HF)
10	Int Tone of 970 Hz @ 1Hz	01001	14	Back-Up Alarm (LF)
11	Alt Tones 800/970 Hz @ 1Hz	01010	14	Nee-Naw (LF)
12	Int Tone of 2850 Hz @ 1Hz	01011	4	Back-Up Alarm (HF)
13	970 Hz @ ¼ sec on 1 sec off	01100	14	Beep
14	Continuous at 970 Hz	01101	14	Medium Tone
15	100ms @ 554Hz, 400ms @ 440Hz	01110	14	French Fire Sound
16	Int 660 Hz 150ms On/ 150ms Off	01111	16	Swedish Fire Alarm
17	Int 660 Hz 1.8s On/ 1.8 Off	10000	17	Slow Beep
18	Int 660 Hz 6.5s On/ 13s Off	10001	18	Long Delay Tone
19	Continuous @ 660 Hz	10010	19	Low Tone
20	Alt 554/440 Hz @ 1Hz	10011	20	Nee-Naw (VLF)
21	Int 660 Hz @ 1 Hz	10100	21	Fast Beep
22	Int 2850 Hz 150ms On/ 100ms Off	10101	14	Pelican Crossing
23	Sweep 800-970 Hz @ 50 Hz	10110	14	Low Frequency Buzz
24	Sweep 2400-2850 Hz @ 50 Hz	10111	4	High Frequency Buzz
25	ISO 8201	11000	26	3 beeps (LF)
26	ISO 8201	11001	25	3 beeps (HF)
27	3.9KHz continuous	11010	n/a	Continuous tone

6.0 DESCRIPTION OF FUNCTION

XTAL Input and XTAL output.

The 4MHz XTAL or ceramic resonator should be connected between these pins. The data sheet for the XTAL will usually specify additional capacitors to "pull " the XTAL to its centre frequency. A typical configuration for a 4.00MHz XTAL would be a single 33pF ceramic cap between pin 2 and GND. The oscillator is internally biased to the active region to ensure it starts under all conditions, and the ASIC power on-reset is applied to the oscillator to ensure a quick start up.



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Select Pins SEL1-SEL5:

These pins are used to select the tones. They have internal pull up devices to Vdd. Normally these inputs would be connected via option jumpers or switches to GND. When a switch is open, the input is pulled up to a logic 1 by the internal pull up. When the switches are closed, the pull up devices source a nominal 30 micro-amps from the Vdd supply.

Tones 1-24:

Tones 1-24 are as described later in this data sheet . Tone 1 corresponds to binary 0 at the select inputs. SEL1 is the LSB and SEL5 is the MSB of the 5 bit code. The " 2nd Tones " are generated when STROBEN pin is switched to GND. This would normally be accomplished by a wire from an alarm control panel to the connector on the sounder module.

Tone 25: binary 24 at the select inputs.

When STROBEN is high (switch open) this tone is the " temporal pattern" superimposed on 970Hz. When STROBEN is low (switch closed) this tone is the " temporal pattern " superimposed on 285Hz

Tone 26: binary 25 at the select inputs.

When STROBEN is high this tone is the temporal pattern superimposed on 285Hz. When STROBEN is low, this tone is the temporal pattern superimposed on 970Hz.

Temporal Pattern:

This consists of the following pattern, which is superimposed on the selected tone. (0.5 = 0.5 sec, 1.5 = 1.5 sec)

ON 0.5: OFF 0.5: ON 0.5: OFF 0.5: ON 0.5: OFF 1.5: repeat

The temporal pattern can be superimposed on suitable tones other than 25 and 26 by switching the STROBEP pin to logic 1. (Switch open)

BT Tones: binary 27 at select inputs.

When STROBEN is high (switch open) the Evacuate Tone is generate, which is the same as to Tone 1.

When STROBEN is low (switch closed) the ALERT Tone is generated, which is the same as Tone 10.

RESET Input:

If this input is pulled to Gnd, the ASIC is held in a low power reset condition, with the oscillator stopped, and the Tone output low. The current consumption is minimised and consists only of the source current due to the SELECT switches and the RESET pull up. The RESET input has an internal pull up to Vdd, which sources a nominal 11uA when the input is held to Gnd.

Power On Reset:

The ASIC has an internal power on reset to ensure that the tones always start at the same point on power up. The POR time depends on the rise time of the ASIC supply. It is removed when the supply reaches approx. 2.6V, and is re-applied when the supply falls below this level.

Tone Output:

This output drives the sounder via an external level shifter and driver circuit. The output waveform is a digital data stream based on pulse width encoding and is normally integrated using a filter to produce an audio waveform.

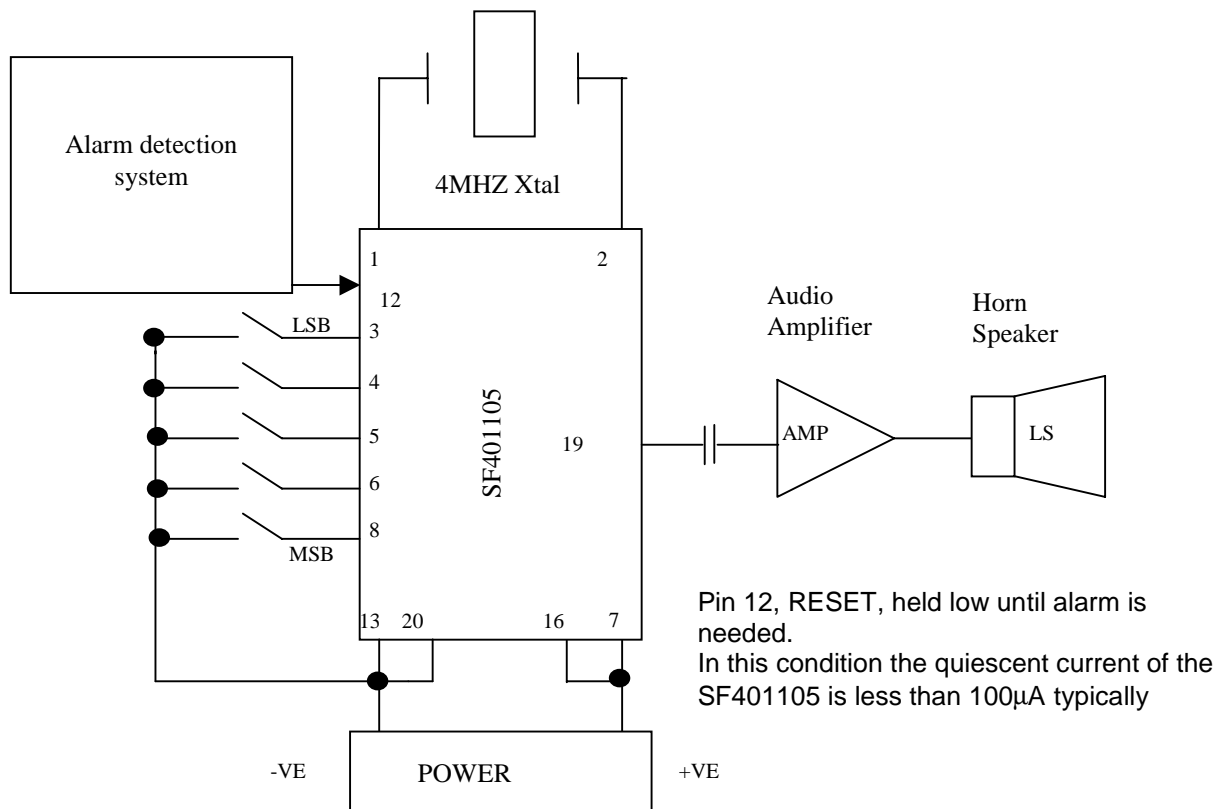
The output is push-pull with a relatively high impedance pull up and a low impedance pull down. The high impedance pull up is to allow the ASIC to drive the base of the level shifting NPN transistor directly.

7.0 APPLICATIONS INFORMATION

7.1 COMPONENT TABLE

Not Available

7.2 CIRCUIT DIAGRAM





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8.0 ORDERING INFORMATION

Order products using the following code:
SF105C DD for 20 SOICW package in tubes
SF105C DD T for 20 SOICW package on Tape and Reel

Datasheets contain specifications current on publication date.

Semefab (Scotland) Ltd. may change this specification at any time without notification.

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