

Description

The S567 is general purpose tone decoders designed to provide a saturated transistor switch to ground when an input signal is present within the passband.

Features

- Logic compatible output with 100mA current sinking capability
- 20 to 1 frequency range with an external resistor
- Bandwidth adjustable from 0 to 14%
- High rejection of out of band signals and noise.
- Immunity to false signals
- Highly stable center frequency
- Center frequency adjustable from 0.01Hz to 500KHz

Applications

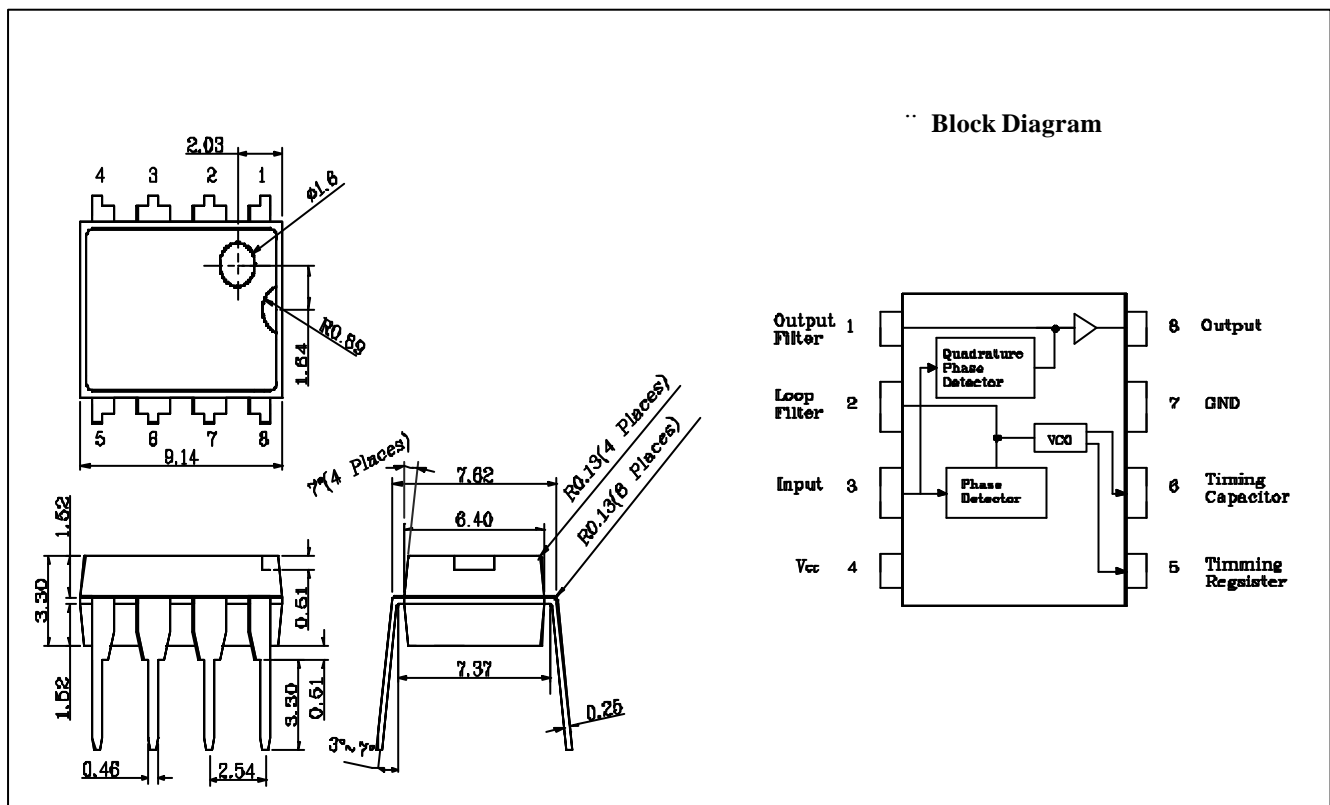
- Touch tone decoding
- Frequency monitoring and control
- Ultrasonic controls
- Communications paging decoders
- Precision oscillator
- Wide band FSK demodulation
- carrier current remote controls

Ordering Information

| Type NO. | Marking | Package Code |
|----------|---------|--------------|
| S567P | S567P | DIP-8 |

Outline Dimensions

unit : mm



Absolute Maximum Ratings

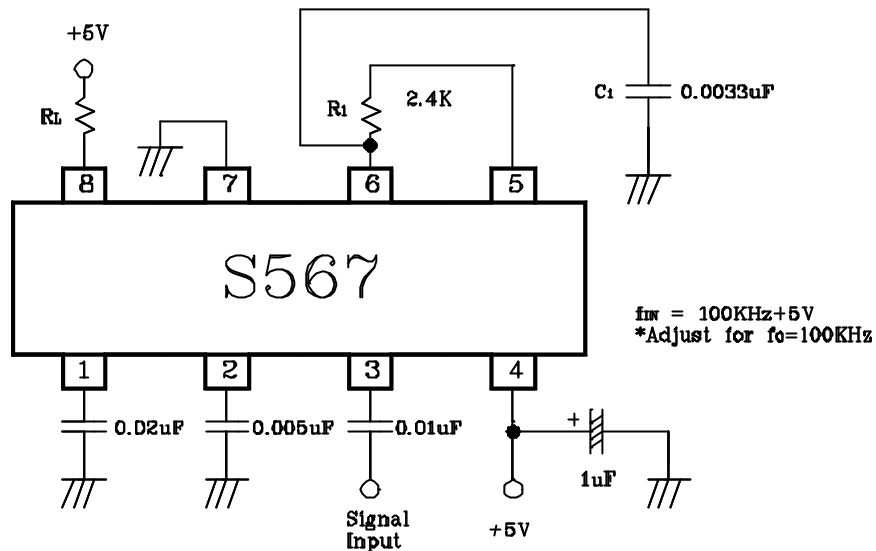
| Characteristic | Symbol | Ratings | Unit |
|---------------------|-----------|-------------|------|
| Supply Voltage | V_{IN} | 10 | V |
| Power Dissipation | P_D | 300 | mW |
| V_8 | - | 15 | V |
| V_3 | - | -10 | V |
| V_3 | - | $V_8 + 0.5$ | V |
| Storage Temperature | T_{stg} | -55 ~ +150 | °C |

Electrical Characteristics

(AC Test Circuit, $T_a=25$, $V_{CC}=5V$)

| Characteristic | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|--|---------------|--------------------------------|------|--------------|------------|-------------------|
| Power Supply Voltage Range | V_{CC} | - | 4.75 | 5 | 9 | V |
| Power Supply Current Quiescent | I_{CCQ} | $R_L=20K$ | - | 6 | 8 | mA |
| Power Supply Current Activated | I_{CC} | $R_L=20K$ | - | 11 | 13 | mA |
| Input Resistance | R_{IN} | - | 15 | 20 | 25 | K |
| Smallest Detectable Input Voltage | V_{IN-1} | $I_L=100mA, f=f_o$ | - | 20 | 25 | mV _{rms} |
| Largest No Output Input Voltage | V_{IN-2} | $I_c=100mA, f=f_o$ | 10 | 15 | - | mV _{rms} |
| Largest Simultaneous Outband Signal to Inband Signal Ratio | S_i/S_o | - | - | 6 | - | dB |
| Minimum Input Signal to Wideband Noise Ratio | S/N | $B_n = 140KHz$ | - | -6 | - | dB |
| Largest Detection Bandwidth | B.W | - | 10 | 14 | 18 | %of f_o |
| Largest Detection Bandwidth Skew | $B.W_s$ | - | - | 2 | 3 | %of f_o |
| Largest Detection Bandwidth Variation With Temperature | $B.W_T$ | - | - | ± 0.1 | ± 0.25 | %1 |
| Largest Detection Bandwidth Variation With Supply Voltage | $B.W_V$ | 4.75V ~ 6.75V | - | ± 1 | ± 2 | %/V |
| Highest Center Frequency | f_{O-H} | - | 100 | 500 | - | KHz |
| Center Frequency Stability | f_{O-S} | $0 < T_a < 70$ | - | 35 ± 60 | - | ppm/ |
| | | $-55 < T_a < +125$ | - | 35 ± 140 | - | ppm/ |
| Center Frequency Shift with Supply Voltage | f_{O-V} | 4.75V ~ 6.75V | - | 0.5 | 2 | %/V |
| Fastest ON-OFF Cycling Rate | CR_{ON-OFF} | - | - | $f_o/20$ | - | - |
| Output Leakage Current | I_{LEAK} | $V_8 = 15V$ | - | 0.01 | 25 | uA |
| Output Saturation Voltage | V_{SAT} | $V_{IN}=25mV_{rms}, I_8=30mA$ | - | 0.2 | 0.4 | V |
| | | $V_{IN}=25mV_{rms}, I_8=100mA$ | - | 0.6 | 1 | V |
| Output Fall Time | t_F | - | - | 30 | - | ns |
| Output Rise Time | t_R | - | - | 150 | - | ns |

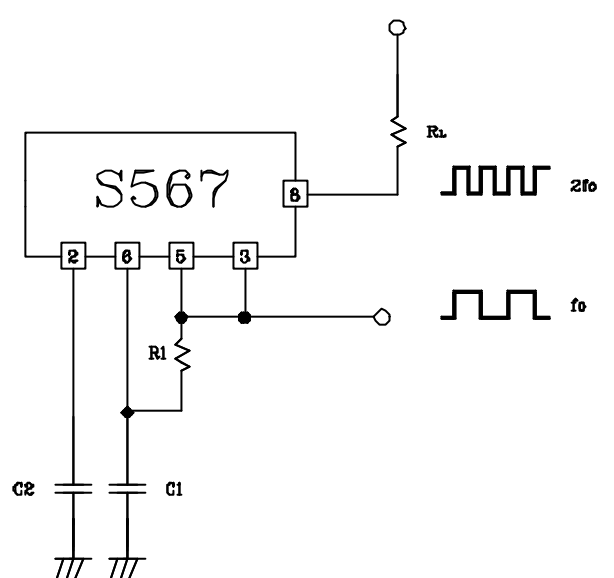
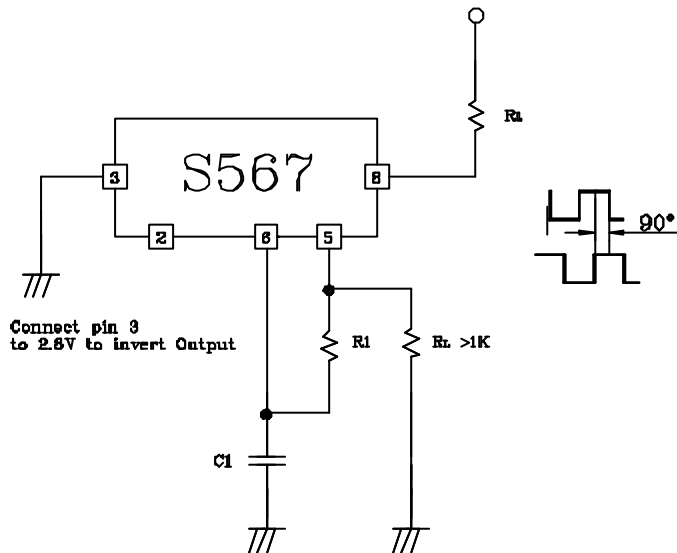
TEST Circuit



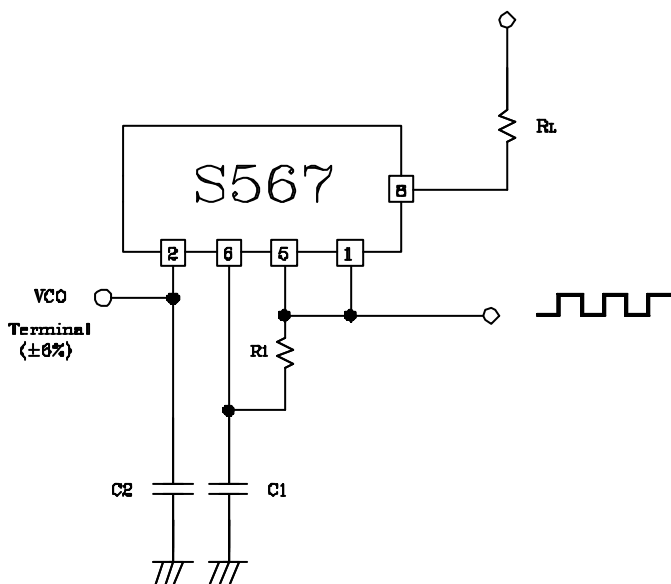
Applications

1. Oscillator with Quadrature Output

2. Oscillator with Double Frequency Output



3. Precision Oscillator to switch 100mA Loads



The center frequency of the tone decoder is equal to the free running frequency of the VCO.

This is given by $f_o = 1/(1.1R_1C_1)$

The bandwidth of the filter may be found from the approximation

$$B.W = 1070(\frac{V_{IN}}{f_o C_2}) \text{ in \% of } f_o$$

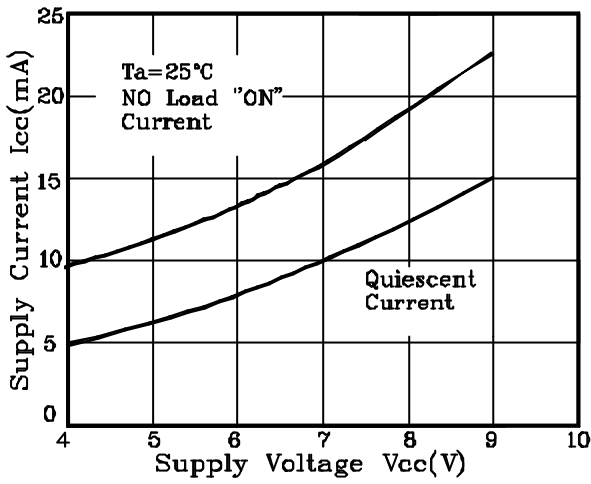
Where

V_{IN} = Input voltage (Volts_{rms}), $V_{IN} > 200mV$

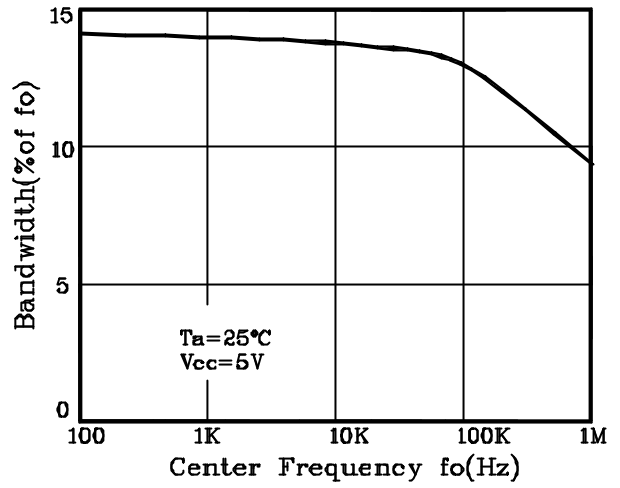
C_2 = Capacitance at pin2 (uF)

Electrical Characteristic Curves

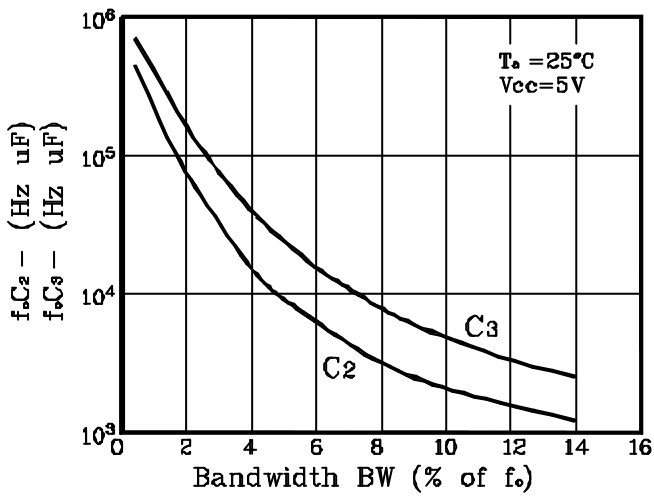
1. $I_{CC} - V_{CC}$



2. BW - f_o



3. BW (C_2, C_3 Function)



4. $V_{IN} - \text{BW}$

