

ECG[®] Semiconductors

ECG994, ECG994M Voltage Controlled Oscillator

Features

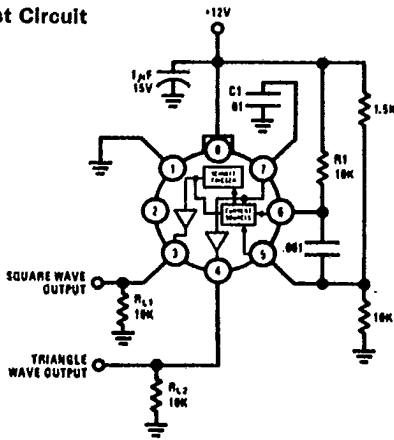
- Wide supply voltage ranges: 10 to 24 volts
- Very linear modulation characteristics
- High temperature stability
- Excellent supply voltage rejection
- 10 to 1 frequency range with fixed capacitor
- Frequency programmable by means of current, voltage, resistor or capacitor

The ECG994/ECG994M are general purpose voltage controlled oscillators which may be used to generate square and triangular waves, the frequency of which is a very linear function of a control voltage. The frequency is also a function of an external resistor and capacitor. Typical applications include FM modulation, FSK, signal generation, tone generation and function generation.

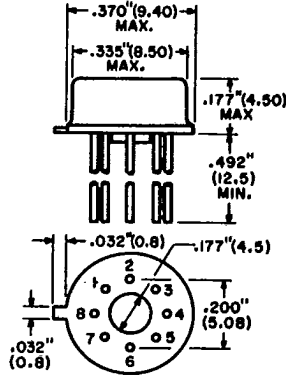
Absolute Maximum Ratings

Power Supply Voltage 26V
 Power Dissipation (Note 1) 300mW
 Operating Temperature Range 0°C to +70°C
 Lead Temperature (Soldering, 10 seconds) 300°C

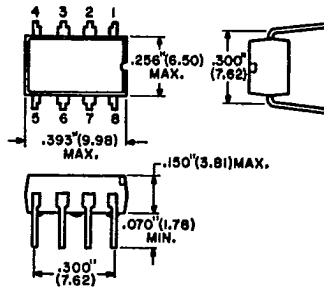
AC Test Circuit



ECG994



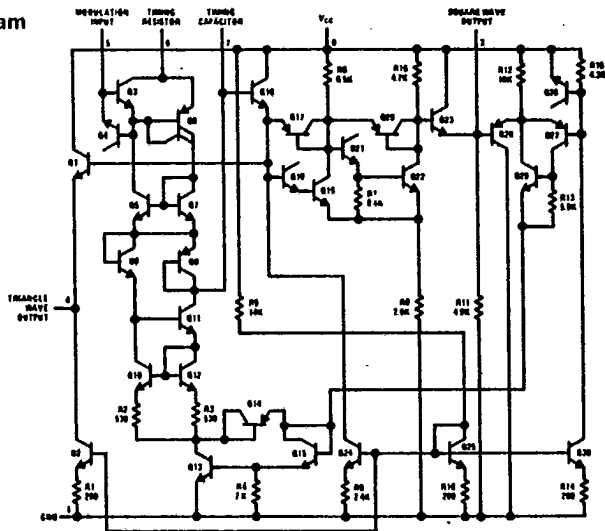
ECG994M



Pin Connections

- 1—Ground
- 2—N.C.
- 3—Square Wave Output
- 4—Triangle Wave Output
- 5—Modulation Input
- 6—Timing Resistor
- 7—Timing Capacitor
- 8—V_{cc}

Schematic Diagram

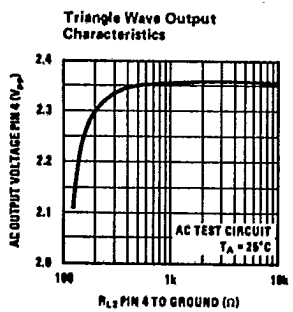
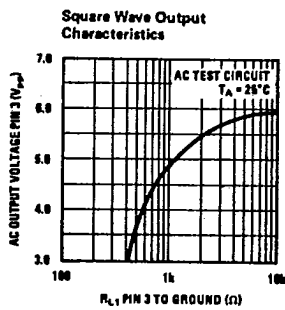
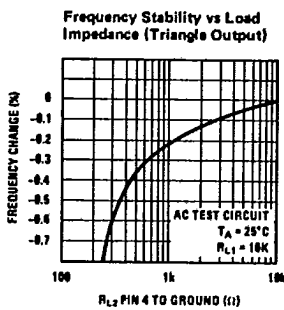
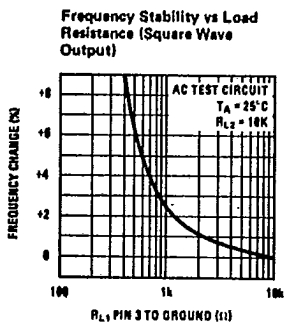
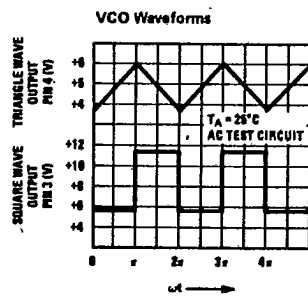
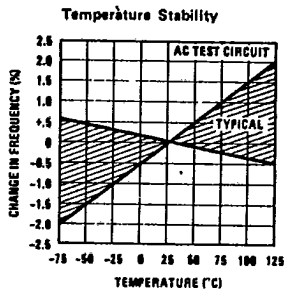
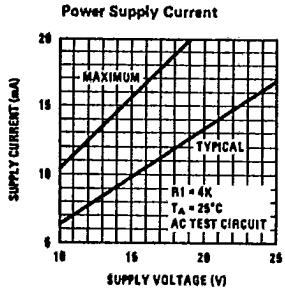
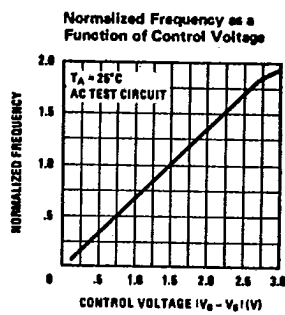
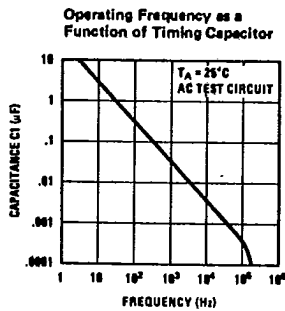
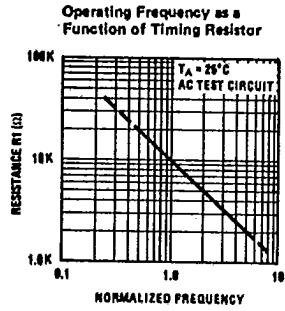


Electrical Characteristics ($V_{cc} = 12V$, $T_A = 25^\circ C$, AC Test Circuit)

Parameter	Conditions	Min	Typ	Max	Units
Maximum Operating Frequency	$R_O = 2k$ $C_O = 2.7pF$		1		MHz
Input Voltage Range Pin 5		$3/4 V_{cc}$		V_{cc}	
Average Temperature Coefficient of Operating Frequency			200		ppm/ $^\circ C$
Supply Voltage Rejection	10 - 20V		0.1	2	%/V
Input Impedance Pin 5		0.5	1		$M\Omega$
VCO Sensitivity	For Pin 5, From 8 - 10V, $f_0 = 10kHz5$	6.0	6.6	7.2	kHz/V
FM Distortion	$\pm 10\%$ Deviation		0.2	1.5	%
Maximum Sweep Rate		500	1		MHz
Sweep Range			10:1		
Output Impedance Pin 3 Pin 4			50 50		Ω Ω
Square Wave Output Level	$R_{L1} = 10k$	5.0	5.4		Vp-p
Triangle Wave Output Level	$R_{L2} = 10k$	2.0	2.4		Vp-p
Square Wave Duty Cycle		40	50	60	%
Square Wave Rise Time			20		ns
Square Wave Fall Time			50		ns
Triangle Wave Linearity	+1V Segment at $1/2 V_{cc}$		0.5	1	%

Note 1: The maximum junction temperature of ECG994 is $100^\circ C$. For operating at elevated junction temperatures, ECG994M must be derated based on a thermal resistance of $150^\circ C/W$. The thermal resistance of ECG994M is $100^\circ C/W$.

Typical Performance Characteristics



Applications Information

The ECG994/ECG994M may be operated from either a single supply as shown in this test circuit, or from a split (\pm) power supply. When operating from a split supply, the square wave output (pin 4) is TTL compatible (2mA current sink) with the addition of a 4.7k Ω resistor from pin 3 to ground.

A .001 μ F capacitor is connected between pins 5 and 6 to prevent parasitic oscillations that may occur during VCO switching.

$$f_o = \frac{2(V^+ - V_s)}{R_1 C_1 V^+}$$

where

$$2K < R_1 < 20K$$

and V_s is voltage between pin 5 and pin 1.

Typical Application

1kHz and .10kHz TTL Compatible Voltage Controlled Oscillator

