

LM566C Voltage Controlled Oscillator

General Description

The LM566CN is a general purpose voltage controlled oscillator 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.

The LM566CN is specified for operation over the 0°C to +70°C temperature range.

Features

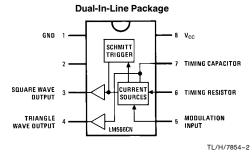
- Wide supply voltage range: 10V to 24V
- Very linear modulation characteristics

- 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

Applications

- FM modulation
- Signal generation
- Function generation
- Frequency shift keying
- Tone generation

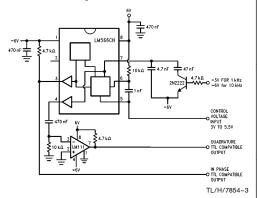
Connection Diagram



Order Number LM566CN See NS Package Number N08E

Typical Application

1 kHz and 10 kHz TTL Compatible Voltage Controlled Oscillator



Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

 $\begin{array}{lll} \mbox{Power Supply Voltage} & 26\mbox{V} \\ \mbox{Power Dissipation (Note 1)} & 1000\mbox{ mW} \\ \mbox{Operating Temperature Range, LM566CN} & 0^{\circ}\mbox{C to } +70^{\circ}\mbox{C} \\ \mbox{Lead Temperature (Soldering, 10 sec.)} & +260^{\circ}\mbox{C} \end{array}$

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

Parameter	Conditions	LM566C			Units
		Min	Тур	Max	Onits
Maximum Operating Frequency	R0 = 2k C0 = 2.7 pF	0.5	1		MHz
VCO Free-Running Frequency	$C_O = 1.5 \text{ nF}$ $R_O = 20k$ $f_O = 10 \text{ kHz}$	-30	0	+30	%
Input Voltage Range Pin 5		3/4 V _{CC}		V _{CC}	
Average Temperature Coefficient of Operating Frequency			200		ppm/°C
Supply Voltage Rejection	10-20V		0.1	2	%/V
Input Impedance Pin 5		0.5	1		MΩ
VCO Sensitivity	For Pin 5, From $8-10V$, $f_O = 10 \text{ kHz}$	6.0	6.6	7.2	kHz/V
FM Distortion	±10% Deviation		0.2	1.5	%
Maximum Sweep Rate			1		MHz
Sweep Range			10:1		
Output Impedance Pin 3			50		Ω
Pin 4			50		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 ½ V _{CC}		0.5		%

Note 1: The maximum junction temperature of the LM566CN is 150°C. For operation at elevated junction temperatures, maximum power dissipation must be derated based on a thermal resistance of 115°C/W, junction to ambient.

Applications Information

The LM566CN 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 3) is TTL compatible (2 mA current sink) with the addition of a 4.7 k Ω resistor from pin 3 to ground.

A 0.001 μF capacitor is connected between pins 5 and 6 to prevent parasitic oscillations that may occur during VCO switching.

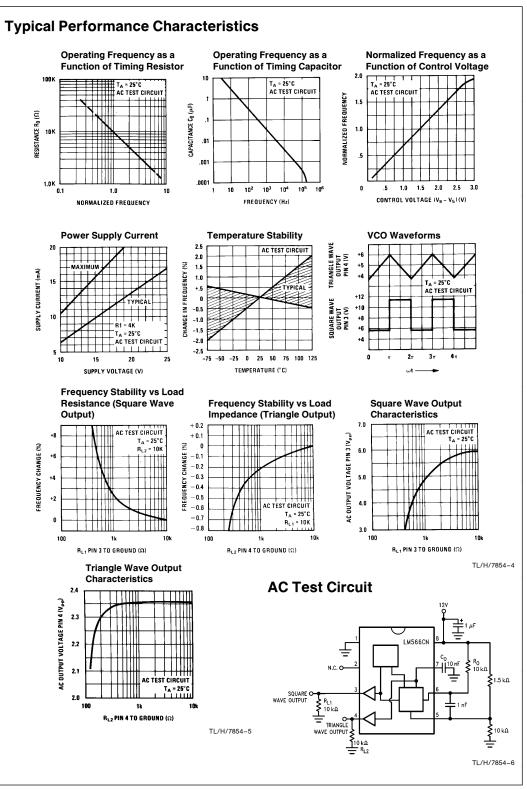
$$f_O = \frac{2.4(V^+ - V_5)}{R_O \, C_O \, V^+}$$

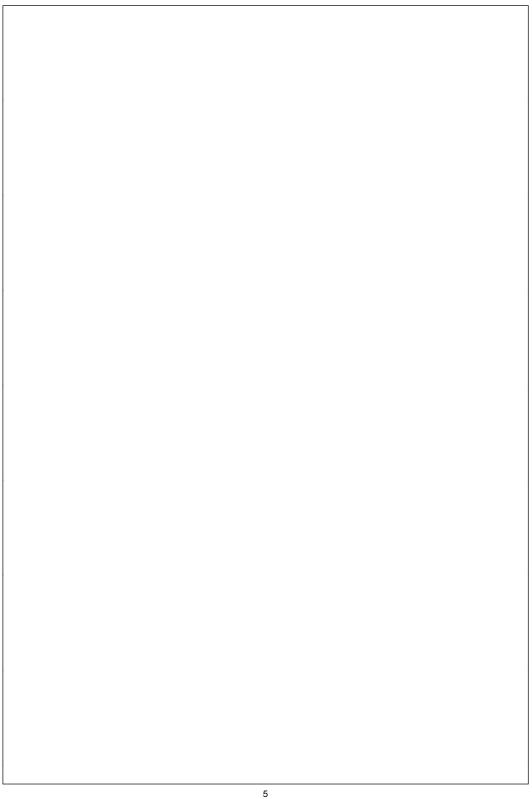
where

 $2K < R_{O} < 20K$

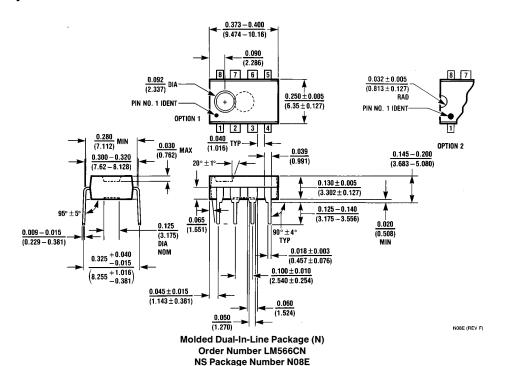
and V_5 is voltage between pin 5 and pin 1.

Schematic Diagram R14 >> R13 5.8K 71.8 16.4 4.8K R10 200 % SE 25 2.6 X → R16 4.7K ₩. 3.4 2.4 7.4 R6 6.5K **₩** ₹ × TIMING CAPACITOR R3 530 TIMING Resistor ^{R2} **→** TRIANGLE WAVE OUTPUT





Physical Dimensions inches (millimeters)



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