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NTE74LS624
Integrated Circuit
TTL – Voltage Controlled Oscillator

Description:

The NTE74LS624 is a voltage controlled oscillator in a 14–Lead plastic DIP type package that is an improved version of the original NTE74LS324 VCO. This new device features improved voltage–to–frequency linearity, range, and compensation and has complementary Z outputs. The output frequency is established by a single external capacitor in combination with voltage–sensitive inputs used for frequency control and frequency range. This device has a voltage–sensitive input for frequency control as well as one for frequency range.

The NTE74LS624 features a 600Ω internal timing resistor.

A single 5V supply can be used; however, one set of supply voltage and ground pins (V_{CC} and GND) is provided fo the enable, synchronization–gating, and output sections, and a separate set (OSC V_{CC} and OSC GND) is provided for the oscillator and associated frequency–control circuits so that effective isolation can be accomplished in the system. For operation of frequencies greater than 10Mhz, it is recommended that two independent supplies be used. When the enable input is low, the output is enabled; when the enable input is high, the internal oscillator i disabled, Y is high, and Z is low.

The pulse–synchronization–gating section ensures that the first output pulse is neither clipped nor extended. The duty cycle of the square–wave output is fixed at approximately 50 percent.

Features:

- Separate Supply Voltage Pins for Isolation of Frequency Control Inputs and Oscillator from Output Circuitry
- Highly Stable Operation over Specified Temperature and/or Supply Voltage Ranges

Absolute Maximum Ratings: (Note 1)

Supply Voltage (Note 2), V_{CC} 7V

Input Voltage

Enable Input 7V

Frequency Control or Range Input . . . . . V_{CC}

Operating Temperature Range, T_A . . . . . 0°C to +70°C

Storage Temperature Range, T_{stg} . . . . . –65°C to +150°C

Note 1. Unless otherwise specified, all voltages are referenced to GND.

Note 2. Throughout the datasheet, the symbol V_{CC} is used for the voltage applied to both the V_{CC} and OSC V_{CC} terminals, unless otherwise noted.

Recommended Operating Conditions:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.0	5.25	V
Input Voltage at Frequency Control or Range Input	$V_{I(freq)}$ or $V_{I(rng)}$	0	–	5	V
High−Level Output Current	I_{OH}	–	–	−1.2	mA
Low−Level Output Current	I_{OL}	–	–	24	mA
Output Frequency	f_o	1	–	–	Hz
		–	–	20	MHz
Operating Temperature Range	T_A	0	–	+70	°C

Electrical Characteristics: (Note 3, Note 4)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
High−Level Input Voltage at Enable	V_{IH}			2	–	–	V
Low−Level Input Voltage at Enable	V_{IL}			–	–	0.8	V
Input Clamp Voltage at Enable	V_{IK}	V_{CC} = MIN, I_I = −18mA		–	–	−1.5	V
High−Level Output Voltage	V_{OH}	V_{CC} = MIN, $\overline{EN}$ at V_{IL} = MAX, I_{OH} = −1.2mA, Note 5		2.7	3.4		V
Low Level Output Voltage	V_{OL}	V_{CC} = MIN, $\overline{EN}$ at V_{IL} = MAX, Note 5	I_{OL} = 12mA	–	0.25	0.4	V
			I_{OL} = 24mA	–	0.35	0.5	V
Input Current Freq Control or Range	I_I	V_{CC} = MAX	V_I = 5V	–	50	250	μA
			V_I = 1V	–	10	50	μA
Enable			V_I = 7V	–	–	0.2	mA
High Level Input Current Enable	I_{IH}	V_{CC} = MAX, V_I = 2.7V		–	–	40	μA
Low Level Input Current Enable	I_{IL}	V_{CC} = MAX, V_I = 0.4V		–	–	−0.8	mA
Short−Circuit Output Current	I_{OS}	V_{CC} = MAX, Note 6		−40	–	−225	mA
Supply Current, Total into V_{CC} and OSC V_{CC} Pins	I_{CC}	V_{CC} = MAX, Enable = 4.5V, Note 7		–	20	35	mA

Note 3. .For conditions shown as MIN or MAX, use the appropriate value specified under “Recommended Operation Conditions”.

Note 4. All typical values are at V_{CC} = 5V, T_A = +25°C.

Note 5. V_{OH} for Y outputs and V_{OL} for Z outputs are measured while enable inputs are connected to ground, with individual 1kΩ resistors connected from CX1 to V_{CC} and from CX2 to ground. The resistor connections are reversed for testing V_{OH} for Z outputs and V_{OL} for Y inputs.

Note 6. Not more than one output should be shorted at a time, and duration of the short−circuit should not exceed one second.

Note 7. I_{CC} is measured with the outputs disabled and open.

Switching Characteristics: (V_{CC} = 5V, R_L = 667Ω, C_L = 45pF, T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Output Frequency	f_O	C_{ext} = 50pF	$V_{I(freq)}$ = 5V, $V_{I(rng)}$ = 0V	15	20	25	MHz
			$V_{I(freq)}$ = 1V, $V_{I(rng)}$ = 5V	1.1	1.6	2.1	MHz

Pin Connection Diagram