ELECTRONICS, INC.
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NTE890
Integrated Circuit
Voltage to Frequency Converter

Description:

The NTE890 is an integrated circuit in an 8–Lead DIP type package and provides a simple method of A/D conversion. It has all the inherent advantages of the voltage–to–frequency conversion technique. The output is a series of constant duration pulses. The frequency of the pulses is proportional to the applied input voltage. This converter is designed for use in a wide range of data conversion and remote sensing applications.

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Supply Voltage, V+ . . . . . 8V to 22V
Output Sink Current, I_{SINK} 20mA
Power Dissipation, P_D 500mW
Input Voltage, V_i . . . . . –0.2V to V+(V)
Operating Temperature Range, T_{opr} . . . . . –20° to +75°C
Storage Temperature Range, T_{stg} . . . . . –40° to +125°C

Electrical Characteristics: (V+ = +15V, T_A = +25°C unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
Supply Current	8V < V+ < 15V	2.0	3.5	6.0	mA
	15V < V+ < 22V	2.0	4.5	7.5	mA
Conversion Accuracy Scale Factor	V_{IN} = 10V, R_S = 14kΩ	0.9	1.0	1.1	kHz/V
Drift with Temperature	V_{IN} = 10V	–	±100	–	ppM/°C
Drift with V+	V_{IN} = 1V, 8V < V+ < 18V	–	0.2	1.0	%/V
Input Comparator Offset Voltage		–	5	10	mV
Offset Current		–	±50	±100	nA
Input Bias Current		–	–100	–300	nA
Common Mode Range	Note 1	0 to V+ –3	0 to V+ –2	–	V
One–Shot Threshold Voltage	Pin5	0.63	0.66	0.70	x V+
Input Bias Current	Pin5	–	–100	–500	nA
Reset V_{SAT}	Pin5, I = 2.2mA	–	0.15	0.50	V

Note 1 Input Common Mode Range includes GND.

Electrical Characteristics (Cont'd): (V+ = +15V, T_A = +25°C unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
Current Source					
Output Current	R_S = 14kΩ, Pin1, V+ = 0V	–	138.7	–	µA
Change with Voltage	Pin1, V+ = 0V to 10V	–	1.0	2.5	µA
Off Leakage	Pin1, V+ = 0V	–	1	50	nA
Reference Voltage	Pin2	1.70	1.90	2.08	V
Logic Output V_{SAT}	Pin3, I = 3mA	–	0.15	0.50	V
V_{SAT}	Pin3, I = 2mA	–	0.10	0.30	V
Off Leakage		–	0.1	1.0	µA

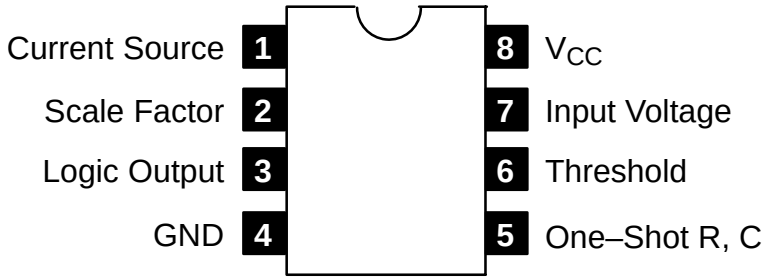
Note 2. The voltage applied to comparator input Pin6 and Pin7 should not be allowed to go below GND by more than 300mV.

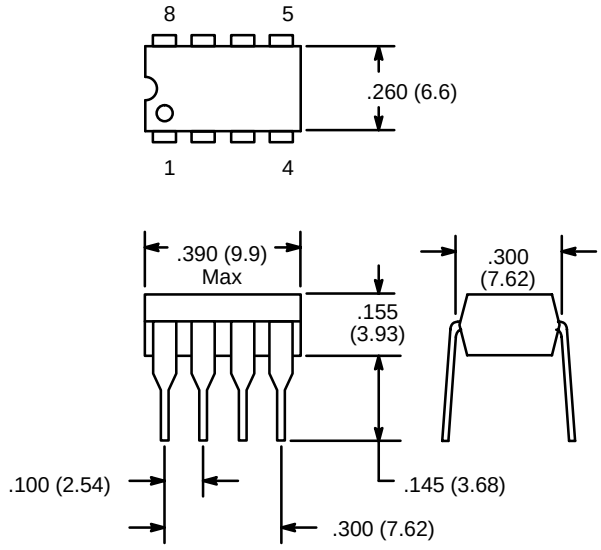
Note 3. Pin3 and Pin5 are open–collector outputs. Shorts between these pins and V+ can cause overheating and eventual destruction.

Note 4. Reference voltage terminal Pin2 is connected to the emitter of an NPN transistor and is held at approximately 1.9V. This terminal should be protected from accidental shorts to GND or supply voltages. Permanent damage may occur if current in Pin2 exceeds 5mA.

Note 5. Avoid stray coupling between Pin5 and Pin7 which could cause false triggering. If false triggering is experienced with the precision mode circuits, bypass Pin6 to GND with at least 0.01µF. This is necessary for operation above 10kHz.

Pin Connection Diagram





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