

## NTE919D Integrated Circuit High Speed Dual Comparator

### **Description:**

The NTE919D is a precision high speed dual comparator fabricated on a single monolithic chip. This device is designed to operate over a wide range of supply voltages down to a single 5V logic supply and ground. Further, it has higher gain and lower input currents than devices like the NTE910. The uncommitted collector of the output stage makes it compatible with RTL, DTL, and TTL as well as capable of driving lamps and relays at currents up to 25mA.

Although designed primarily for applications requiring operation from digital logic supplies, the NTE919D is fully specified for power supplies up to  $\pm 15V$ .

### **Features:**

- Two Independent Comparators
- Operates from a Single 5V Supply
- Typically 80ns Response Time at  $\pm 15V$
- Minimum Fan-Out of 2 Each Side
- Maximum Input Current of  $1\mu A$  Over Temperature
- Inputs and Outputs can be Isolated from System Ground
- High Common Mode Slew Rate

### **Absolute Maximum Ratings:**

Total Supply Voltage	36V
Output to Negative Supply Voltage	36V
Ground to Negative Supply Voltage	25V
Ground to Positive Supply Voltage	18V
Differential Input Voltage	$\pm 5V$
Input Voltage (Note 1)	$\pm 15V$
Power Dissipation (Note 2)	500mW
Output Short Circuit Duration	10sec
Operating Temperature Range	0° to +70°C
Storage Temperature Range	-65° to +150°C
Lead Temperature (Soldering 10 sec)	+260°C

Note 1. For supply voltages less than  $\pm 15$  the absolute maximum input voltage is equal to the supply voltage.

Note 2. The maximum junction temperature is 85°C. For operating at elevated temperatures, devices must be derated based on a thermal resistance of 100°C/W, junction to ambient.

**Electrical Characteristics:** (Note 3)

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Offset Voltage	$T_A = +25^\circ\text{C}$ , $R_S \leq 5\text{k}$ , Note 4	–	2.0	8.0	mV
Input Offset Current	$T_A = +25^\circ\text{C}$ , Note 4	–	80	200	nA
Input Bias Current	$T_A = +25^\circ\text{C}$	–	250	1000	nA
Voltage Gain	$T_A = +25^\circ\text{C}$ , Note 6	8	40	–	V/mV
Response Time	$T_A = +25^\circ\text{C}$ , $V_S = \pm 15\text{V}$ , Note 5	–	80	–	ns
Saturation Voltage	$V_{IN} \leq -10\text{mV}$ , $I_{OUT} = 25\text{mA}$ , $T_A = +25^\circ\text{C}$	–	0.75	1.5	V
Output Leakage Current	$V_{IN} \geq 10\text{mV}$ , $V_{OUT} = 35\text{V}$ , $V_- = V_{GND} = 0\text{V}$ , $T_A = +25^\circ\text{C}$	–	0.2	10	$\mu\text{A}$
Input Offset Voltage	$R_S \leq 5\text{k}$ , Note 4	–	–	10	mV
Input Offset Current	Note 4	–	–	300	nA
Input Bias Current		–	–	1200	nA
Input Voltage Range	$V_S = \pm 15\text{V}$	–	$\pm 13$	–	V
	$V_+ = 5\text{V}$ , $V_- = 0$	1	–	3	V
Saturation Voltage	$V_+ \geq 4.5\text{V}$ , $V_- = 0$ , $V_{IN} \leq -10\text{mV}$ , $I_{SINK} \leq 3.2\text{mA}$	–	0.3	0.4	V
Differential Input Voltage		–	–	$\pm 5$	V
Positive Supply Current	$T_A = +25^\circ\text{C}$ , $V_+ = 5\text{V}$ , $V_- = 0$	–	4.3	–	mA
Positive Supply Current	$T_A = +25^\circ\text{C}$ , $V_S = \pm 15\text{V}$	–	8	12.5	mA
Negative Supply Current	$T_A = +25^\circ\text{C}$ , $V_S = \pm 15\text{V}$	–	3	5	mA

Note 3. These specifications apply for  $V_S = \pm 15\text{V}$ , and  $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ , unless otherwise stated. The offset voltage, offset current and bias current specifications apply for any supply voltage from a single 5V supply up to  $\pm 15\text{V}$  supplies. Do not operate the device with more than 16V from ground to  $V_S$ .

Note 4. The offset voltages and offset currents given are the maximum values required to drive the output within a volt of either supply with a 1mA load. Thus, these parameters define an error band and take into account the worst case effects of voltage gain and input impedance.

Note 5. The response time specified is for a 100mV input step with 5mV overdrive.

Note 6. Output is pulled up to 15V through a 1.4 $\Omega$  resistor.

**Pin Connection Diagram**

