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NTE1507
Integrated Circuit
10–Step Adjustable Analog Level Detector

Description:

The NTE1507 is an integrated circuit in a 16–Lead DIP type package consisting of ten comparators and a reference voltage network to detect the level of a signal at the analog input. Output Q1 is switched to a low logic level at a typical input voltage of 200mV with Threshold Adjust open and the cascade input grounded. After each 200mV increment, the next output is switched to a low logic level. All outputs are at low logic levels at a typical input voltage of 2000mV. The threshold–adjust pin allows the user to decrease the input voltage steps from 200mV to 100mV increments by connecting an external resistor from Threshold Adjust to GND.

This level detector is directly cascadable requiring only two external resistors to establish a zero–reference level voltage for the cascade input. The maximum number of devices that can be cascaded is determined by the threshold level and the maximum input voltages. If the cascade feature is not utilized, the cascade input must be grounded for proper operation.

The NTE1507 is especially designed to detect and indicate analog signal levels and may be used in various industrial, consumer, or automotive applications such as low–precision meters, warning–signal indicators, A/D converters, feedback regulators, pulse shapers, delay elements, and for automatic range switching. The open–emitter outputs are capable of sourcing currents up to 25mA and may be operated at voltages up to 35V. The power outputs are suitable for driving a variety of display elements such as vacuum flourescent displays, LED's, or filament lamps. The outputs may also drive digital integrated logic such as CMOS or other high–level logic.

Features:

- 10 Comparators to Digitize Analog Input Signals
- Cascade Feature Allows Stacking Output Display Strings
- Threshold Intervals Adjustable from 200mV to 100mV
- Open–Emitter Outputs Capable of Sourcing up to 25mA and Withstanding up to 35V
- Supply Voltage Range of 10V to 35V (V_{CC2})

Absolute Maximum Ratings: (T_A = 0° to +70°C unless otherwise specified)

Supply Voltage
- V_{CC1} (Note 1) 20V
- V_{CC2} 40V

Input Voltage
- Analog Input 8V
- Cascade Input 8V

Output Voltage Range . . . . . 0V to V_{CC2}
On–State Output Current (Each Output) . . . . . –30mA
Continuous Total Dissipation ($T_A \le +25°C$) 2075mW
- Derate Linearly Above 25°C . . . . . 16.6mW/°C

Operating Ambient Temperature Range, T_A . . . . . 0° to +70°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Lead Temperature (During Soldering, 1/16" (1.6mm) from case, 10sec), T_L . . . . . +260°C

Note 1. Voltage values are with respect to network ground terminal.

Recommended Operating Conditions:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC1}		10.8	12.0	13.2	V
	V_{CC2}		10.0	25.0	35.0	V
Cascade Input Voltage (When not at GND)			1	–	8	V
Output Current	I_O		–	–	25	mA
Operating Ambient Temperature	T_A		0	–	70	°C

Electrical Characteristics: (T_A = 0° to +70°C, Pin5 at GND, Pin6 Open, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Positive–Going Threshold Voltage at Input A Switching Q1	V_{T+}	T_A = +25°C	125	200	275	mV
Switching Q2			325	400	475	mV
Switching Q3			525	600	675	mV
Switching Q4			725	800	875	mV
Switching Q5			925	1000	1075	mV
Switching Q6			1125	1200	1275	mV
Switching Q7			1325	1400	1475	mV
Switching Q8			1525	1600	1675	mV
Switching Q9			1725	1800	1875	mV
Switching Q10			1925	2000	2075	mV
Input Hysteresis	$V_{T+} – V_{T–}$		–	10	–	mV
High–Level (On–State) Output Voltage	V_{OH}	I_{OH} = –10mA	V_{CC2}–1.3	V_{CC2}–0.8	–	V
		I_{OH} = –25mA	V_{CC2}–1.5	V_{CC2}–0.9	–	V
Low–Level (Off–State) Output Current	I_{OL}	V_{CC2} = 35V	–	0.5	200	µA
Input Current Analog Input	I_L	V_I = 2V	–	260	400	µA
Cascade Input			–	1000	1700	µA
Supply Current from V_{CC1} All Outputs High	I_{CC}	V_{CC1} = 12V, No Load	–	15	25	mA
All Outputs Low			–	9	15	mA
Supply Current from V_{CC2} All Outputs High		V_{CC1} = 12V, V_{CC2} = 35V, No Load	–	15	27	mA
All Outputs Low			–	1	200	µA

Note 2. All typical values are at V_{CC1} = 12V, V_{CC2} = 25V, and T_A = +25°C.

Pin Connection Diagram