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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 fluorescent 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: ($T_A = 0^\circ$ to $+70^\circ\text{C}$ 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 ($T_A \leq +25^\circ\text{C}$)	2075mW
Derate Linearly Above 25°C	16.6mW/ $^\circ\text{C}$
Operating Ambient Temperature Range, T_A	0° to $+70^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Lead Temperature (During Soldering, 1/16" (1.6mm) from case, 10sec), T_L	$+260^\circ\text{C}$

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: ($T_A = 0^\circ$ to $+70^\circ\text{C}$, 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	V_{T+}	$T_A = +25^\circ\text{C}$								
Switching Q1							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}	$I_{OH} = -10\text{mA}$	$V_{CC2} - 1.3$	$V_{CC2} - 0.8$	–	V				
		$I_{OH} = -25\text{mA}$	$V_{CC2} - 1.5$	$V_{CC2} - 0.9$	–	V				
Low-Level (Off-State) Output Current	I_{OL}	$V_{CC2} = 35\text{V}$	–	0.5	200	μA				
Input Current	I_L	$V_I = 2\text{V}$								
Analogue Input							–	260	400	μA
Cascade Input										
Supply Current from V_{CC1}	I_{CC}	$V_{CC1} = 12\text{V}$, No Load								
All Outputs High							–	15	25	mA
All Outputs Low							–	9	15	mA
Supply Current from V_{CC2}										
All Outputs High		$V_{CC1} = 12\text{V}$, $V_{CC2} = 35\text{V}$, No Load	–	15	27	mA				
All Outputs Low			–	1	200	μA				

Note 2. All typical values are at $V_{CC1} = 12\text{V}$, $V_{CC2} = 25\text{V}$, and $T_A = +25^\circ\text{C}$.

Pin Connection Diagram

