



ELECTRONICS, INC.
 44 FARRAND STREET
 BLOOMFIELD, NJ 07003
 (973) 748-5089
<http://www.nteinc.com>

NTE1635 Integrated Circuit Speaker Protector/Voltage/Temperature/Overload

Description:

The NTE1635 is a monolithic integrated circuit in an 8-Lead SIP type package designed for use in protecting power amplifiers and speakers in various amplifier and receiver applications.

Features:

- Built-In Relay Driver
- Single Power Source
- Wide Operating Supply Range: 25V to 60V
- Plus and Minus Voltage using One Pin (Both Pin3 and Pin4 Posses the Same Functions and Detect Plus and Minus Voltage)
- AC Voltage Detector (Pin5)
- Circuit Protection by Plus Voltage Detection is Provided by Connecting D1 Diode Externally (Pin6)
- Relay-On Lag Time Adjustable by External Applications
- Short Relay-Off Time (25ms Typ Under the Standard External Applications)

Typical Applications:

- For Speaker Protection, use Pin3 (or Pin4) to Detect Setoff of Quiescent Output DC Voltage and to Turn the Relay Off
- For Power Amplifier Protection, use Pin3 (or Pin4) with an External Thermo-Sensitive Device to Detect the Temperature Increase and to Turn the Relay Off
- Power Amplifier can be Protected by Detecting Overload and Turning the Relay Off with Pin6
- In case of Overload Detection by Constant-Current or by Constant-Voltage Drive using an External Diode D1, the Latch Mechanism keeps the Relay On until the Power is Switched Off
- For Prevention of Pop Noise at Power Off use Pin5. AC Voltage Disappearance is Immediately Detected when the Amp's Switch has been Off. This Minimizes the Relay-Off Time and thus can Prevent Pop Noise Generated by Mute-Off Time Lag

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Total Power Disipation ($T_A = +70^\circ\text{C}$), P_T	400mW
Operating Temperature Range, T_{opr}	-20° to $+70^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+125^\circ\text{C}$
Supply Voltage (Pin1), $V_{CC(max)}$	60V

Supply Current (Pin1), $I_{1(max)}$ 80mA

Absolute Maximum Ratings (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Supply Current (Pin3, Note 1), $I_{3(max)}$ $\pm 3\text{mA}$

Supply Current (Pin4, Note 1), $I_{4(max)}$ $\pm 3\text{mA}$

Supply Voltage (Pin5), $V_{5(max)}$ -10V

Supply Current (Pin6), $I_{6(max)}$ 3mA

Supply Voltage (Pin7, Note 2), $V_{7(max)}$ 8V

Supply Current (Pin7, Note 2), $I_{7(max)}$ 25mA

Supply Voltage (Pin8), $V_{8(max)}$ Less than Pin7

Supply Current (Peak, Pin8), $I_{8(max)}$ 50mA

Note 1. Positive current denotes input current at Pin3 and Pin4, Negative current denotes output current

Note 2. $V_{7(max)} = 8\text{V}$ is derived when driven by a constant voltage source without any resistance. When applying current to V_7 through a resistance V_{CC} the maximum value of input current to Pin7 should be used instead of the above values.

Electrical Characteristics: ($V_{CC} = +45\text{V}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Threshold Voltage at Pin3, Positive Side	$+V_{th(3)}$	Apply positive voltage to Pin3 through an external resistance ($56\text{k}\Omega$). Measure Pin3 voltage while Pin1 voltage changes from low (1V) to high (45V) during the above process.	0.89	1.20	1.61	V
Threshold Voltage at Pin3, Negative Side	$-V_{th(3)}$	Apply negative voltage to Pin3 through an external resistance ($56\text{k}\Omega$). Measure Pin3 voltage while Pin1 voltage changes from low (1V) to high (45V) during the above process.	-1.86	-1.20	-0.84	V
Threshold Voltage at Pin4, Positive Side	$+V_{th(4)}$	Apply positive voltage to Pin4 through an external resistance ($56\text{k}\Omega$). Measure Pin4 voltage while Pin1 voltage changes from low (1V) to high (45V) during the above process.	0.89	1.20	1.61	V
Threshold Voltage at Pin4, Negative Side	$-V_{th(4)}$	Apply negative voltage to Pin4 through an external resistance ($56\text{k}\Omega$). Measure Pin4 voltage while Pin1 voltage changes from low (1V) to high (45V) during the above process.	-1.86	-1.20	-0.84	V
Threshold Voltage at Pin6	$V_{th(6)}$	Apply voltage to Pin6 through D1. Measure voltage on Pin6 while Pin1 voltage changes from low (1V) to high (45V) during the above process.	0.90	1.15	1.40	V
Threshold AC Voltage at Pin5	$V_{AC(on)}$	Apply AC voltage to Pin5 through D2. Measure AC voltage on Pin5 while Pin1 voltage changes from low (1V) to high (45V) during the above process.	-	2.5	-	V_{rms}
Threshold Voltage at Pin5	$V_{th(5)}$	Apply voltage to Pin5 directly. Measure voltage on Pin5 when Pin1 voltage change from low (1V) to High (45V) during the above process.	-1.8	-1.2	0	V
Current Drain at Pin7	$I_{(7)}$	Measure Pin7 input current when turning relay on.	16.5	18.5	20.5	mA

Pin Connection Diagram
(Front View)

