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NTE1439
Integrated Circuit
Dual Attenuator

Description:
The NTE1439 is an integrated circuit in a 14–Lead DIP type package which logarithmically controls the throughput (gain) of an audio signal by the DC voltage or resistance value and has 2 circuits. Since voltage is internally stabilized, the stable operations are assured at the allowable supply voltage range (8V to 14.4V). The current source is provided with control circuit so that operation can be controlled by the voltage drop. This device is used for electronic volume control in radio, television, stereo, tape recorder, an transceiver applications.

Features:
- Wide Operating Voltage Range
- High Attenuation Level
- Easy to Control Signal Gain with a Simple Circuit
- Less Crosstalk Between Each Channel

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)
Supply Voltage, V_{CC} 14.4V
Circuit Voltage (Note 1), V_6, V_{13} 6V
Circuit Voltage, V_3, V_{10} . . . . V_{CC}
Total Current Dissipation, I_{tot} 25mA
Total Power Dissipation, P_{tot} 360mW
Operating Ambient Temperature Range, T_{opr} . . . . –20° to +75°C
Storage Temperature Range, T_{stg} . . . . –55° to +150°C

Note 1. DC voltage must not be applied to Pin1, Pin2, Pin8, and Pin9 from the outside. 6V is used as voltage for V_6 and V_{13} and no larger than V_{CC} voltage.

Electrical Characteristics: (T_A = +25°C, V_{CC} = 12V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gain	G_{V1}	v_i = 100mV, V_{cont} = 5V, f = 1kHz	11.7	–	15.7	dB
	G_{V2}	v_i = 100mV, V_{cont} = 4V, f = 1kHz	10.5	–	15.0	dB
	G_{V3}	v_i = 100mV, V_{cont} = 3V, f = 1kHz	–14	–	2	dB
Gain Ratio (Ch2/Ch1)	$G_{V3(2)}/G_{V3(1)}$	v_i = 100mV, V_{cont} = 3V, f = 1kHz	–6	–	+6	dB

Note 2. The same measurement should be applied for Ch2.

Electrical Characteristics (Cont'd): (T_A = +25°C, V_{CC} = 12V unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Residual Noise	v_O	v_i = 100mV, V_C = 1V, f = 1kHz, B = 20kHz	–	–	100	µV
Noise	v_N	v_i = 0V, V_C = 3.5V, B = 20kHz	–	–	150	µV
Crosstalk	CT	v_i = 500mV, V_C = 5V, f = 1kHz	60	–	–	dB
Output DC Voltage	V_O	V_C = 5V	5.7	–	8.2	V
Output Voltage Fluctuation	ΔV_O	V_C = 5V to 0V	–0.65	–	+0.65	V
Control Input Current	$-I_{cont}$	R_{cont} = 0 Ω	0.15	–	0.33	mA
		R_{cont} = 20kΩ	0.15	–	0.33	mA
Supply Current	I_{CC}	V_C = 5V	–	–	22	mA
Distortion Factor	THD	v_i = 100mV, V_C = 5V, f = 1kHz	–	–	0.5	%
D_6 Breakdown	$V_{(BR)D}$	I_6, I_{13} = 10µA	6	–	–	V

Note 2. The same measurement should be applied for Ch2.

Pin Connection Diagram