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NTE1850
Integrated Circuit
Dual 12W/Channel Audio Power Amplifier

Description:

The NTE1850 is a dual Hi–Fi audio power amplifier in a 9–Lead SIP type package designed for mains–fed applications such as stereo TV sound and stereo radio. The circuit is optimal for symmetrical power supplies but is also well suited to asymmetrical power supply systems. An output power of 2 x 12W (THD = 0.5%) can be delivered into an 8Ω load with a symmetrical power supply of ±16V.

The gain is fixed internally at 30dB, but can be changed externally if required. Internal gain fixing gives low gain spread and very good balance between the amplifiers (0.2dB).

A special feature is an input mute circuit which provides suppression of unwanted signals at the inputs during switching on and off. This circuit disconnects the non–inverting inputs when the supply voltage is below ±6V, while allowing the amplifiers to remain in their DC operating condition.

Two thermal protection circuits are provided, one monitors the average junction temperature and the other the instantaneous temperature of the power transistors. Both protection circuits activate at +150°C, allowing safe operation to a maximum junction temperature of +150°C without added distortion.

Features:

- Few External Components Required
- Input Muted During Power ON/OFF
- Low Offset Voltage Between Output and GND
- Excellent Gain Balance Between Channels
- Short–Circuit Protected
- Thermally Protected

Applications:

- Stereo
- TV Sound
- Radio

Absolute Maximum Ratings:

Supply Voltage (Pin5 and Pin7), $V_{CC} = V_{5, 7-3}$ . . . . . +20V
Non–Repetitive Peak Output Current (Pin4 and Pin6), I_{OSM} 4A
Total Power Dissipation (T_A = +25°C, Infinite Heatsink), P_{TOT} 15W
Derate Above 25°C . . . . . 2.5°C/W
Operating Junction Temperature, T_J . . . . . +150°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Short–Circuit Time (Outputs Short–Circuited to GND), t_{SC} 1Hr
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 25°C/W

DC Electrical Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage Range	V_{CC}		–	±16	±20	V
Repetitive Peak Output Current	I_{ORM}		–	–	2.2	A
Operating Mode (Symmetrical Power Supply, V_{CC} = ±16V, R_L = 8Ω, T_A = +25°C, f = 1kHz)						
Supply Voltage Range	V_{CC}		±7.5	±16	±20	V
Total Quiescent Current	I_{TOT}	Without R_L	–	50	–	mA
Output Power	P_O	THD = 0.5%	10	12	–	W
		THD = 10%	10	15	–	W
Total Harmonic Distortion	THD	P_O = 6W	–	–	0.2	%
Power Bandwidth	B	THD = 0.5%, Note 1	20Hz to 20kHz			
Voltage Gain	G_V		29	30	31	dB
Noise Output Voltage	$V_{NO(RMS)}$	R_S = 2kΩ, unweighted (20Hz to 2okHz)	–	70	140	μV
Input Impedance	$\|Z_i\|$		14	20	26	kΩ
Ripple Rejection	RR	Note 2	40	60	–	dB
Channel Separation	∞	R_S = 0Ω	46	70	–	dB
Input Bias Current	I_{IB}		–	0.3	–	μA
DC Output Offset Voltage	V_{OFF}	WRT GND	–	20	200	mV
Input Mute Mode (Symmetrical Power Supply, V_{CC} = ±4V, R_L = 8Ω, T_A = +25°C, f = 1kHz)						
Supply Voltage	V_{CC}		±2	–	±5.8	V
Total Quiescent Current	I_{TOT}	Without R_L	–	30	–	mA
Output Voltage	V_{OUT}	V_I = 600mV	–	–	1.8	mV
Noise Output Voltage	$V_{NO(RMS)}$	R_S = 2kΩ, unweighted (20Hz to 2okHz)	–	70	140	μV
Ripple Rejection	RR	Note 2	35	–	–	dB
DC Output Offset Voltage	V_{OFF}	WRT GND	–	20	200	mV
Operating Mode (Asymmetrical Power Supply, V_{CC} = ±4V, R_L = 8Ω, T_A = +25°C, f = 1kHz)						
Total Quiescent Current	I_{TOT}	Without R_L	–	50	–	mA
Output Power	P_O	THD = 0.5%	5	6	–	W
		THD = 10%	5	8.5	–	W
Total Harmonic Distortion	THD	P_O = 4W	–	–	0.2	%
Power Bandwidth	B	THD = 0.5%, Note 1	40Hz to 20kHz			
Voltage Gain	G_V		29	30	31	dB
Gain Balance	ΔG_V		–	0.2	–	dB
Noise Output Voltage	$V_{NO(RMS)}$	R_S = 2kΩ, unweighted (20Hz to 2okHz)	–	70	140	μV
Input Impedance	$\|Z_i\|$		14	20	26	kΩ
Ripple Rejection	RR	Note 2	40	50	–	dB
Channel Separation	∞	R_S = 0Ω	40	–	–	dB

Note 1. Power Bandwidth at $P_{O(MAX)}$ = −3dB.

Note 2. Ripple Rejection at R_S = 0Ω, f = 100Hz to 20kHz; ripple voltage = 200mV (RMS value) applied to positive or negative supply rail.

Pin Connection Diagram
(Front View)