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NTE7143
Integrated Circuit
Audio Power Amplifier, 20W

Description:

The NTE7143 is a monolithic power amplifier in a 5–Lead TO220 type package offering very low distortion and high quality performance for consumer audio applications.

This device delivers 20W into a 4Ω or 8Ω load on ±25V supplies. Using an 8Ω load and ±30V supplies, over 30W of power may be delivered. The amplifier is designed to operate with a minimum of external components. Device overload protection consists of both internal current limit and thermal shutdown.

The NTE7143 design takes advantage of advanced circuit techniques and processing to achieve extremely low distortion levels even at high output power levels. Other outstanding features include high gain, fast slew rate and a wide power bandwidth, large output voltage swing, high current capability, and a very wide supply range. The amplifier is internally compensated and stable for gains of 10 or greater.

Features:

- Up to 30W Output Power
- A_{VO} Typically 90dB
- Low Distortion: 0.015%, 1kHz, 20W
- Wide Power Bandwidth: 70kHz
- Protection for AC and DC Short Circuits to GND
- Thermal Protection with Parole Circuit
- High Current Capability: 4A
- Wide Supply Range: 16V – 60V
- Internal Output Protection Diodes
- 94dB Ripple Rejection

Applications:

- High Performance Audio Systems
- Bridge Amplifiers
- Stereo Phonographs
- Servo Amplifiers
- Instrument Systems

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 60V
Input Voltage, V_I . . . . . $-V_{EE}$ to V_{CC}
Power Dissipation (Note 2), P_D 30W
Operating Temperature Range, T_{opr} . . . . . 0° to +70°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Operating Junction Temperature, T_J . . . . . 150°C
Lead Temperature (During Soldering, 10sec), T_L . . . . . +260°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 3°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 73°C/W

Note 1. “Absolute Maximum Ratings” indicate limits beyond which damage to the device may occur. Operating ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits.

Note 2. Assumes T_{TAB} equals 60°C max. For operation at higher tab temperature and at ambient temperatures greater than 25°C, the NTE7143 must be derated based on a maximum 150°C junction temperatur. Thermal resistance depends upon device mounting techniques. R_{thJC} is typically 2°C/W.

Electrical Characteristics: V_{CC} = +25V, $-V_{EE}$ = –25V, T_A = +25°C, R_L = 8Ω, A_V = 20 (26dB), f_o = 1kHz unless otherwise specified)

Parameter	Test Conditions	Typ	Tested Limits	Unit
Supply Current	P_{OUT} = 0W	70	100	mA
Output Power	THD = 1%, Note 3	25	–	W
Total Harmonic Distortion	P_{OUT} = 20W, f_o = 1kHz, Note 3	0.015	–	%
	P_{OUT} = 20W, f_o = 20kHz, Note 3	0.05	0.4	%
	P_{OUT} = 20W, R_L = 4Ω, f_o = 1kHz, Note 3	0.022	–	%
	P_{OUT} = 20W, R_L = 4Ω, f_o = 20kHz, Note 3	0.07	0.6	%
Offset Voltage		±1	±15	mV
Input Bias Current		±0.2	±2	µA
Input Offset Current		0	±0.5	µA
Gain–Bandwidth Product	f_o = 20kHz	5.5	–	MHz
Open Loop gain	DC	90	–	dB
PSRR	V_{CC}, 1kHz, $1V_{rms}$	95	52	dB
	V_{EE}, 1kHz, $1V_{rms}$	83	52	dB
Max. Slew rate	20W, 8Ω, 70kHz BW	8	–	V/µs
Current Limit	V_{OUT} = V_{SUPPLY} –10V	4	3	A
Equivalent Input Noise Voltage	R_S = 600Ω, CCIR	3	–	μV_{rms}

Note 3. Assumes the use of a heat sink having a thermal resistance of 1°C/W and no insulator with an ambient temperature of 25°C. Because the output limiting circuitry has a negative temperature coefficient, the maximum output power delivered to a 4Ω load may be slightly reduced when the tab temperature exceeds 55°C.

Pin Connection Diagram
(Front View)