



ELECTRONICS, INC.

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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 temperature. Thermal resistance depends upon device mounting techniques. R_{thJC} is typically 2°C/W.

Electrical Characteristics: $V_{CC} = +25V$, $-V_{EE} = -25V$, $T_A = +25^\circ C$, $R_L = 8\Omega$, $A_V = 20$ (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 | % |
| | $P_{OUT} = 20W$, $R_L = 4\Omega$, $f_o = 1kHz$, Note 3 | 0.022 | – | % |
| | $P_{OUT} = 20W$, $R_L = 4\Omega$, $f_o = 20kHz$, 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 | $R_S = 600\Omega$, CCIR | 3 | – | μV_{rms} |

Note 3. Assumes the use of a heat sink having a thermal resistance of $1^\circ C/W$ and no insulator with an ambient temperature of $25^\circ C$. 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 $55^\circ C$.

