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# NTE7114
# Integrated Circuit
# Audio Power Amplifier,
# Quad 11W (2 x 22W)

**Description:**

The NTE7114 is an integrated class–B output amplifier in a 17–Lead Staggered SIP type package designed for use in car radio applications. The circuit contains 4 x 11W single–ended or 2 x 22W bridge amplifiers.

**Features:**

- Few External Components
- Flexible in Use: Quad Single–Ended or Stereo BTL
- High Output Power
- Low Offset Voltage at Outputs (Important for BTL)
- Fixed Gain
- Good Ripple Rejection
- Mute/Stand–by Switch
- AC & DC Short–Circuit–Safe to GND and $V_P$
- Load Dump Protection
- Thermally Protected
- Protected Against Electrostatic Discharge
- Low Thermal Resistance
- Capable of Handling High Energy on Output ($V_P$ = 0V)
- Identical Inputs (Inverting & Non–Inverting)

**Absolute Maximum Ratings:**

Supply Voltage, $V_P$
- Operating . . . . . 18V
- Non–Operating . . . . . 30V
- Load Dump Protected (During 50ms, $t_r \leq 2.5$ms) . . . . . 45V

Peak Output Current, $I_{OM}$
- Repetitive . . . . . 4A
- Non–Repetitive . . . . . 6A

Total Power Dissipation, $P_{tot}$ . . . . . 60W

AC & DC Short–Circuit–Safe Voltage, $V_{PSC}$ . . . . . 18V

Energy Handling Capability at Outputs ($V_P$ = 0V) . . . . . 200mJ

Reverse Polarity, $V_{PR}$ . . . . . 6V

Junction Temperature, $T_J$ . . . . . +150°C

Storage Temperature Range, $T_{stg}$ . . . . . –55° to +150°C

**DC Characteristics:** ($V_P$ = 14.4V, $T_A$ = +25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Supply** | | | | | | |
| Supply Voltage Range | $V_P$ | Note 1 | 8.0 | 14.4 | 18.0 | V |
| Total Quiescent Current | $I_{tot}$ | | – | 80 | 180 | mA |
| DC Output Voltage | $V_O$ | Note 2 | – | 8.9 | – | V |
| DC Output Offset Voltage | $\|\Delta V_O\|$ | | – | – | 100 | nV |
| **Mute/Stand−by Switch** | | | | | | |
| Switch−ON Voltage Level | $V_{ON}$ | | 8.5 | – | – | V |
| Mute Condition | $V_{mute}$ | | 3.3 | – | 6.4 | V |
| Output Signal in Mute Position | $V_O$ | $V_I$ = 1V (max), f = 1kHz | – | – | 2 | mV |
| DC Output Offset Voltage (Between Pins 6 to 8 & 10 to 12) | $\|\Delta V_O\|$ | | – | – | 100 | mV |
| Stand−by Condition | $V_{sb}$ | | 0 | – | 2 | V |
| DC Current in Stand−by Condition | $I_{sb}$ | | – | – | 100 | μA |
| Switch−ON Current | $I_{sw}$ | | – | 12 | 40 | μA |

Note 1. The circuit is DC adjusted at $V_P$ = 6V to 18V and AC operating at $V_P$ = 8.5V to 18V.

Note 2. At 18V < $V_P$ < 30V the DC output voltage ≤ $V_P$/2.

**AC Characteristics:** ($V_P$ = 14.4V, $R_L$ = 4Ω, f = 1kHz, $T_A$ = +25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Stereo BTL Application** | | | | | | |
| Output Power | $P_O$ | THD = 0.5% | 15 | 17 | – | W |
| | | THD = 0.5%, $V_P$ = 13.2V | – | 12 | – | W |
| | | THD = 10% | 20 | 22 | – | W |
| | | THD = 10%, $V_P$ = 13.2V | – | 17 | – | W |
| Total Harmonic Distortion | THD | $P_O$ = 1W | – | 0.1 | – | % |
| Power Bandwidth | BW | THD = 0.5%, $P_O$ = −1dB, w.r.t = 15W | 20 to 15000 | | | Hz |
| Low Frequency Roll−Off | $f_L$ | −1dB, Note 3 | – | 45 | – | Hz |
| High Frequency Roll−Off | $f_H$ | −1dB, Note 3 | 20 | – | – | kHz |
| Closed Loop Voltage Gain | $G_V$ | | 25 | 26 | 27 | dB |
| Supply Voltage Ripple Rejection ON | RR | Note 4 | 48 | – | – | dB |
| Mute | | | 48 | – | – | dB |
| Stand−by | | | 80 | – | – | dB |
| Input Impedence | $\|Z_i\|$ | | 25 | 30 | 38 | kΩ |

Note 3. Frequency response externally fixed.

Note 4. Ripple Rejection measured at the output with source impedence of 0Ω (maximum ripple amplitude of 2V) and a frequency between 100Hz and 20kHz.

**AC Characteristics (Cont'd):** ($V_P$ = 14.4V, $R_L$ = 4Ω, f = 1kHz, $T_A$ = +25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Stereo BTL Application (Cont'd)** | | | | | | |
| Noise Output Voltage (rms) ON | $V_{NO(rms)}$ | $R_S$ = 0Ω, Note 5 | – | 70 | – | μV |
| | | $R_S$ = 10kΩ, Note 5 | – | 100 | 200 | μV |
| Mute | | Note5 & Note 6 | – | 60 | – | μV |
| Channel Separation | α | $R_S$ = 10Ω, Note 5 | – | 70 | – | dB |
| Channel Unbalance | $\|\Delta G_V\|$ | | – | – | 1 | dB |
| **Quad Single−Ended Application** | | | | | | |
| Power Output | $P_O$ | THD = 0.5%, Note 7 | 4.0 | 5.0 | – | W |
| | | THD = 0.5%, $R_L$ = 2Ω, Note 7 | 7.5 | 8.5 | – | W |
| | | THD = 10%, Note 7 | 5.5 | 6.0 | – | W |
| | | THD = 10%, $R_L$ = 2Ω, Note 7 | 10.0 | 11.0 | – | W |
| Total Harmonic Distortion | THD | $P_O$ = 1W | – | 0.1 | – | % |
| Low Frequency Roll−Off | $f_L$ | −3dB, Note 3 | – | 45 | – | Hz |
| High Frequency Roll−Off | $f_H$ | −1dB, Note 3 | 20 | – | – | kHz |
| Closed Loop Voltage Gain | $G_V$ | | 19 | 20 | 21 | kHz |
| Supply Voltage Ripple Rejection ON | RR | Note 4 | 48 | – | – | dB |
| Mute | | | 48 | – | – | dB |
| Stand−by | | | 80 | – | – | dB |
| Input Impedence | $\|Z_i\|$ | | 50 | 60 | 75 | kΩ |
| Noise Output Voltage (rms) ON | $V_{NO(rms)}$ | $R_S$ = 0Ω, Note 5 | – | 50 | – | μV |
| | | $R_S$ = 10kΩ, Note 5 | – | 70 | 100 | μV |
| Mute | | Note5 & Note 6 | – | 50 | – | μV |
| Channel Separation | α | $R_S$ = 10Ω, Note 5 | – | 70 | – | dB |
| Channel Unbalance | $\|\Delta G_V\|$ | | – | – | 1 | dB |

Note 3. Frequency response externally fixed.

Note 4. Ripple Rejection measured at the output with source impedence of 0Ω (maximum ripple amplitude of 2V) and a frequency between 100Hz and 20kHz.

Note 5. Noise voltage measured in a bandwidth of 20Hz to 20kHz.

Note 6. Noise output voltage independent of $R_S$ ($V_I$ = 0V).

Note 7. Output power is measured directly at the output pins on the IC.

**Pin Connection Diagram**
(Front View)