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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)