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NTE1802
Integrated Circuit
Power Amplifier for Car Stereo Radio, 12W/Ch or 24W BTL

Description:

The NTE1802 is an integrated class–B output amplifier in a 13–Lead SIP type package. This device contains two identical amplifiers with different input stages which can be used for stereo or bridge applications. The gain of each amplifier is fixed at 20dB. A special feature of the NTE1802 is the mute/stand–by switch.

Features:

- Requires Few External Components
- High Output Power (With Bootstrap)
- Low Offset Voltage at Output
- Fixed Gain
- Good Ripple Rejection
- Mute/Stand–By Switch
- Load Dump Protection
- AC and DC Short–Circuit Safe
- Thermally Protected
- Reverse Polarity Safe
- Capability to handle High Energy on Outputs
- No Switch–On/Switch–Off Pop
- Flexible Leads
- Low Thermal Resistance
- Identical Inputs (Inverting and Non–Inverting)

Absolute Maximum Ratings:

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

AC and DC Short–Circuit Safe Voltage, V_{PSC} 18V

Reverse Polarity, V_{PR} 6V

Energy Handling Capability at Output (V_P = 0V) 200mJ

Non–Repetitive Peak Output Current, I_{OSM} 6A

Repetitive Peak Output Current, I_{ORM} 4A

Total Power Dissipation, P_{tot} 25W

Crystal Temperature, T_C . . . . . +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	V_P	Note 1	6.0	14.4	18.0	V
Quiescent Current	I_P		–	40	80	mA
DC Output Voltage	V_O	at approximately V_P/2, Note 2	–	6.8	–	V
DC Output Offset Voltage	$\|\Delta V_{5-9}\|$		–	–	100	mV
Mute/Stand–by Switch						
Switch–On Voltage Level	V_{ON}		8.5	–	–	V
Mute Condition	V_{mute}		3.0	–	6.4	V
Output Signal in Mute Position	V_O	V_I = 1V Max, f = 20Hz to 18kHz	–	*	2	mV
DC Output Offset Voltage	$\|\Delta V_{5-9}\|$		–	–	100	mV
Stand–By Condition	V_{sb}		0	–	2	V
DC Current in Stand–By Condition	I_{sb}		–	–	100	µA
Swithc–On Current	I_{sw}		–	12	40	µA

* Value to be fixed.

Note 1. The circuit is DC adjusted at V_P = 6V to 18V and AC operating at V_P n= 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 Applications						
Output Power (Note 3)	P_O	THD = 0.5%	4.0	5.0	–	W
		THD = 10%	5.5	6.0	–	W
		THD = 10%, Note 4	6.0	7.0	–	W
		R_L = 2Ω, THD = 0.5%	7.5	8.5	–	W
		R_L = 2Ω, THD = 10%	10.0	11.0	–	W
		R_L = 2Ω, THD = 10%, Note 4	10.5	12.0	–	W
Low Frequency Roll–Off	f_L	–3dB, Note 5	–	45	–	Hz
High Frequency Roll–Off	f_H	–1dB	20	–	–	kHz
Closed Loop Voltage Gain	G_V		19	20	21	dB
Supply Voltage Ripple Rejection ON	RR	Note 6	48	–	–	dB
Mute			48	–	–	dB
Stand–By			80	–	–	dB

Note 3. Output power is measured directly at the output pins of the IC.
Note 4. With bootstrap and a 100kΩ resistor from Pin12 to the positive supply voltage (V_P), value of the bootstrap capacitor is 47µF.
Note 5. Frequency response externally fixed.
Note 6. Ripple rejection measured at the output with a source impedance of 0Ω (maximum ripple amplitude of 2V) and a frequency between 1kHz and 10kHz.

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 Applications (Cont'd)						
Input Impedance	$\|Z_I\|$		50	60	75	kΩ
Noise Output Voltage ON	$V_{no(rms)}$	R_S = 0Ω, Note 7	–	50	–	μV
		R_S = 10kΩ, Note 7	–	70	100	μV
Mute		Note 8	–	60	–	μV
Channel Separation	α	R_S = 10kΩ	40	–	–	dB
Channel Balance	G_V		–	–	1	dB
BTL Application						
Output Power	P_O	THD = 0.5%	15.5	17.0	–	W
		THD = 10%	20.0	22.0	–	W
		THD = 10%, Note 4	21.0	24.0	–	W
		V_P = 13.2V, THD = 0.5%	–	13.5	–	W
		R_L = 2Ω, THD = 10%	–	17.0	–	W
		R_L = 2Ω, THD = 10%, Note 4	–	19.0	–	W
Power Bandwidth	B_W	THD = 0.5%, P_O = 15W	20 to 15000			Hz
Low Frequency Roll–Off	f_L	–3dB, Note 5	–	25	–	Hz
High Frequency Roll–Off	f_H	–1dB	20	–	–	kHz
Closed Loop Voltage Gain	G_V		25	26	27	dB
Supply Voltage Ripple Rejection ON	RR	Note 6	48	–	–	dB
Mute			48	–	–	dB
Stand–By			80	–	–	dB
Input Impedance	$\|Z_I\|$		25	30	38	kΩ
Noise Output Voltage ON	$V_{no(rms)}$	R_S = 0Ω, Note 7	–	70	–	μV
		R_S = 10kΩ, Note 7	–	100	200	μV
Mute		Note 8	–	60	–	μV

Note 4. With bootstrap and a 100kΩ resistor from Pin12 to the positive supply voltage (V_P), value of the bootstrap capacitor is 47μF.

Note 7. Noise voltage measured in a bandwidth of 20Hz to 20kHz.

Note 8. Noise output voltage independent of R_S (V_I = 0V).

Pin Connection Diagram
(Front View)