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RoHS
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NTE7197
Integrated Circuit
High–Performance 68W Audio Power Amplifier w/Mute

Description:

The NTE7197 is a high–performance audio power amplifier in an 11–Lead Staggered SIP type package capable of delivering 68W of continuous average power to a 4Ω load and 38W into 8Ω with 0.1% THD+N from 20Hz to 20kHz.

The performance of the NTE7197, utilizing proprietary protection circuitry, puts it in a class above discrete and hybrid amplifiers by providing an inherently, dynamically protected Safe Operating Area (SOA). This protection means that these devices are completely safeguarded at the output against overvoltage, undervoltage, overloads, including shorts to the supplies, thermal runaway, and instantaneous temperature peaks.

The NTE7197 maintains an excellent signal–to–noise ratio of greater than 92dB with a typical low noise floor of 2.0μV. It exhibits extremely low THD+N values of 0.03% at the rated output into the rated load over the audio spectrum, and provides excellent linearity with an IMD (SMPTE) typical rating of 0.004%.

Features:

- Continuous Average Output Power:
  68W into 4Ω at V_{CC} = ±28V
  38W into 8Ω at V_{CC} = ±28V
  50W into 8Ω at V_{CC} = ±35V
- 135W Instantaneous Peak Output Power Capability
- Signal–to–Noise Ratio ≥ 92dB
- An Input Mute Function
- Output Protection from a Short to GND or to the Supplies via Internal Current Limiting Circuitry
- Output Overvoltage Protection Against Transients from Inductive Loads
- Supply Undervoltage Protection, not allowing Internal Biasing to occur when $|V_{EE}| + |V_{CC}| \le 12V$, thus Eliminating Turn–On and Turn–Off Transients
- Wide Supply Range: +20V to +90V

Applications:

- Component Stereo
- Compact Stereo
- Self–Powered Speakers
- Surround–Sound Amplifiers
- High–End Stereo TVs

Absolute Maximum Ratings: (Note 1, Note 2)

Supply Voltage, |V+| + |V−|
- No Signal 94V
- Input Signal 84V

Common Mode Input Voltage . . . . . (V+ or V−) and |V+| + |V−| ≤ 80V
Differential Input Voltage (Note 3) 60V
Output Current . . . . . Internally Limited
Power Dissipation (Note 4), P_D 125W
ESD Susceptibility (Note 5) 3000V
Operating Junction Temperature (Note 6), T_J . . . . . +150°C
Lead Temperature (During soldering, 10sec), T_L . . . . . +260°C
Thermal Resistance, Junction−to−Case, R_{thJC} . . . . . 1°C/W
Thermal Resistance, Junction−to−Ambient, R_{thJA} . . . . . 43°C/W

Note 1. All voltages are measured with respect to the GND pin (Pin7), unless otherwise specified.
Note 2. 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. Electrical Characteristics state DC and AC electrical specifications under particular test conditions which guarantee specific performance limits. This assumes that the device is within the Operating Ratings. Specifications are not guaranteed for parameters where no limit is given, however, the typical value is a good indication of device performance.
Note 3. The differential input voltage Absolute Maximum Rating is based on supply voltages of V+ = +40V and V− = −40V.
Note 4. For operating at case temperatures above +25°C, the device must be derated based on a +150°C maximum junction temperature and a thermal resistance of R_{thJC} = 1.0°C/W (junction−to−case).
Note 5. Human body model, 100pF discharged through a 1.5kΩ resistor.
Note 6. The operating junction temperature maximum is +150°C, however, the instantaneous sage Operating Area temperature is +250°C.

Operating Ratings: (Note 1)

Supply Voltage, |V+| + |V−| . . . . . +20 to +84V
Temperature Range, T_A . . . . . −20° to +85°C

Note 1. All voltages are measured with respect to the GND pin (Pin7), unless otherwise specified.

Electrical Characteristics: (T_A = +25°C, V+ = +28V, V− = −28V, I_{MUTE} = −0.5mA, R_L = 4Ω, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Power Supply Voltage	|V+| + |V−|	V_{Pin7} = V− ≥ 9V, Note 7		18	20	84	V
Mute Attenuation	A_M	Pin8 Open or at 0V, Mute: ON Current out of Pin8 > 0.5mA, Mute: OFF		80	115	–	dB
Output Power (Continuous Average)	P_O	THD+N = 0.1% max, f = 1kHz, f = 20kHz	|V+| + |V−| = 28V, R_L = 4Ω	60	68	–	V
			|V+| + |V−| = 28V, R_L = 8Ω	30	38	–	W
			|V+| + |V−| = 35V, R_L = 8Ω	–	50	–	W
Instantaneous Peak Output Power	Peak P_O			–	135	–	W
Total Harmonic Distortion Plus Noise	THD+N	60W, R_L = 4Ω, 30W, R_L = 8Ω, 20Hz ≤ f ≤ 20kHz, A_V = 26dB		–	0.03	–	%

Note 1. All voltages are measured with respect to the GND pin (Pin7), unless otherwise specified.
Note 7. V− must have at least −9V at its pin with reference to GND in order for the undervoltage protection circuitry to be disabled.

Electrical Characteristics (Cont'd): (T_A = +25°C, V+ = +28V, V− = −28V, I_{MUTE} = −0.5mA, R_L = 4Ω, Note 1 unless otherwise specified)

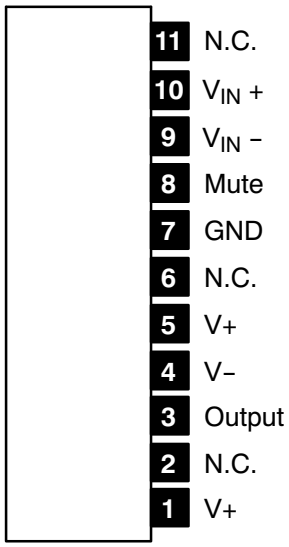
Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Slew Rate (Note 8)	SR	V_{IN} = 2.0V_{P-P}, t_{RISE} = 2ns		8	19	–	V/μs
Total Quiescent Power Supply Current	I+	V_{CM} = 0V, V_O = 0V, I_O = 0A		–	50	85	mA
Input Offset Voltage	V_{OS}	V_{CM} = 0V, I_O = 0A		–	1	10	mV
Input Bias Current	I_B	V_{CM} = 0V, I_O = 0A		–	0.2	1.0	μA
Input Offset Current	I_{OS}	V_{CM} = 0V, I_O = 0A		–	0.01	0.2	μA
Output Current Limit	I_O	|V+| = |V−| = 20V, t_{ON} = 10ms, V_O = 0V		7.0	11.5	–	A
Output Dropout Voltage (Note 9)	V_{OD}	|V+ − V_O|, V+ = +28V, I_O = +100mA		–	1.6	2.0	V
		|V_O − V−|, V− = −28V, I_O = −100mA		–	2.5	3.0	V
Power Supply Rejection Ratio	PSRR	V+ = 40V to 20V, V− = −40V, V_{CM} = 0V, I_O = 0mA		85	120	–	dB
		V+ = 40V, V− = −40V to −20V, V_{CM} = 0V, I_O = 0mA		85	105	–	dB
Common Mode Rejection Ratio	CMRR	V+ = 60V to 20V, V− = −20V to −60V, V_{CM} = 20V to −20V, I_O = 0mA		85	110	–	dB
Open Loop Voltage Gain	A_{VOL}	|V+| = |V−| = 28V, R_L = 2kΩ, ΔV_O = 40V		90	115	–	dB
Gain−Bandwidth Product	GBWP	|V+| = |V−| = 30V, f_o = 100kHz, V_{IN} = 50mV_{rms}		2	8	–	MHz
Input Noise	e_{IN}	IHF — A Weighting Filter, R_{IN} = 600Ω (Input Referred)		–	2	10	μV
Signal−to−Noise Ratio	SNR	A−Wieghted, Measured at 1kHz, R_S = 25Ω	P_O = 1W	–	92.5	–	dB
			P_O = 60W	–	110	–	dB
Intermodulation Distortion Test	IMD	60Hz, 7kHz	4:1 (SMPTE)	–	0.004	–	%
			1:1 (SMPTE)	–	0.009	–	%

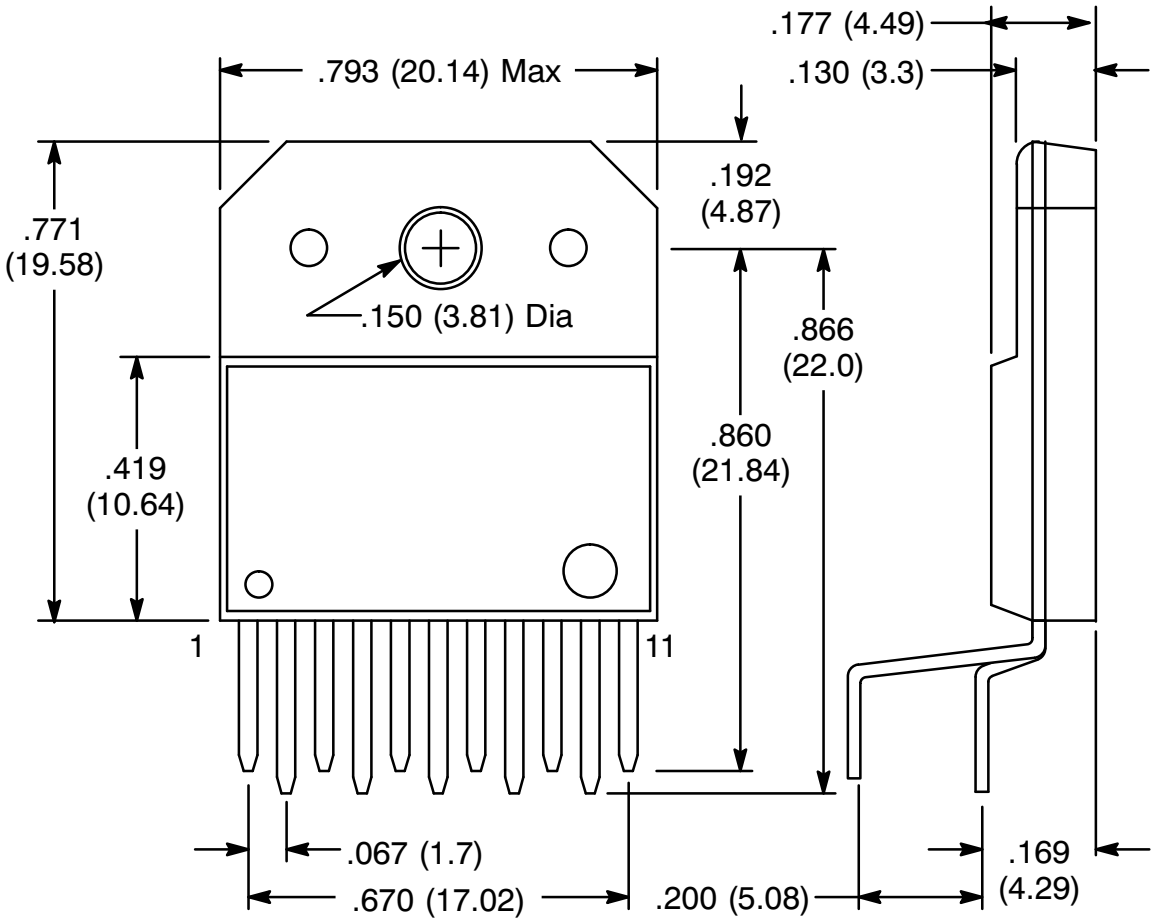
Note 1. All voltages are measured with respect to the GND pin (Pin7), unless otherwise specified.

Note 8. The feedback compensation network limits th bandwidth of the closed−loop response and so the slew rate will be reduced due o the high frequency roll−off. Without feedback compensation, the slew rate is typically larger.

Note 9. The output dropout voltage is the supply voltage minus the clipping voltage.

Pin Connection Diagram
(Front View)

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.130 (3.3)
.793 (20.14) Max
.192
(4.87)
.771
(19.58)
.150 (3.81) Dia
.866
(22.0)
.860
(21.84)
.419
(10.64)
1
11
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.670 (17.02)
.200 (5.08)
.169
(4.29)