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## NTE7119 Integrated Circuit 22W BTL (2 x 11W) Stereo Power Amplifier

**Description:**

The NTE7119 integrated circuit is a class-B dual output amplifier in a 9-Lead SIP type package designed primarily for use in car radio applications. This device contains two identical amplifiers with differential input stages. The gain of each amplifier is fixed at 40dB.

**Features:**

- Stereo or BTL Application
- Few External Components for BTL
- High Output Power
- Low Offset Voltage at Output
- Fixed Gain
- Good Ripple Rejection
- Mute/Stand-by Switch
- Load Dump Protection
- Thermally Protected
- Reverse Polarity Safe
- Ability to Handle High Energy on Outputs
- No Switch-ON/OFF Pop
- Low Thermal Resistance
- Short Circuit Protected

**Absolute Maximum Ratings:**

Supply Voltage, $V_P$	
Operating	18V
Non-Operating	30V
Load Dump Protected (during 50ms, $t_r \geq 2.5ms$ )	45V
AC and DC Short-Circuit Safe Voltage, $V_{PSC}$	18V
Reverse Polarity, $V_{PR}$	6V
Energy Handling Capability at Outputs ( $V_P = 0V$ )	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, $T_{stg}$	-65° to +150°C

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Supply</b>						
Supply Voltage Range	$V_P$	Note 1	6.0	14.4	18.0	V
Total Quiescent Current	$I_{tot}$		-	40	80	mA
DC Output Voltage	$V_O$	Note 2	-	6.95	-	V
DC Output Offset Voltage	$ \Delta V_{4-6} $		-	-	250	mV
<b>Mute/Stand-by Switch</b>						
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), $f = 20Hz$ to $15kHz$	-	-	20	mV
DC Output Offset Voltage	$ \Delta V_{4-6} $		-	-	250	mV
Stand-by Condition	$V_{sb}$		0	-	2	V
DC Current in Stand-by Condition	$I_{sb}$		-	-	100	$\mu A$
Switch-ON Current	$I_{sw}$		-	12	40	$\mu A$

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  $\leq V_P/2$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Stereo Application</b>						
Output Power	$P_O$	THD = 0.5%, Note 3	4	5	-	W
		THD = 10%, Note 3	5.5	6.0	-	W
		THD = 0.5%, $R_L = 2\Omega$ , Note 3	7.5	8.5	-	W
		THD = 10%, $R_L = 2\Omega$ , Note 3	10	11	-	W
Total Harmonic Distortion	THD	$P_O = 1W$	-	0.1	-	%
Low Frequency Roll-Off	$f_L$	-3dB, Note 4	-	45	-	Hz
High Frequency Roll-Off	$f_H$	-1dB, Note 4	20	-	-	kHz
Closed Loop Voltage Gain	$G_V$		39	40	41	dB
Supply Voltage Ripple Rejection ON Mute Standby	RR	Note 5, Note 6	40	-	-	dB
		Note 5, Note 7	45	-	-	dB
		Note 5, Note 6, Note 7	45	-	-	dB
		Note 5, Note 6, Note 7	80	-	-	dB
Input Impedance	$ Z_i $		50	60	75	k $\Omega$
Noise Output Voltage (RMS Value) ON Mute	$V_{no(rms)}$	$R_S = 0\Omega$ , Note 8	-	150	-	$\mu V$
		$R_S = 10k\Omega$ , Note 8	-	250	500	$\mu V$
		Note 9	-	120	-	$\mu V$
Channel Separation	$\alpha$	$R_S = 10k\Omega$	40	-	-	dB
Channel Unbalance	$ \Delta G_V $		-	0.1	1	dB

Note 3. Output power is measured directly at the output pins of the IC.

Note 4. Frequency response externally fixed.

Note 5. Ripple rejection measured at the output with a source impedance of  $0\Omega$  (maximum ripple amplitude of  $2V$ )

Note 6. Frequency  $f = 100Hz$ .

Note 7. Frequency between  $1kHz$  and  $10kHz$ .

Note 8. Noise voltage measured in a bandwidth of  $20Hz$  to  $20kHz$ .

Note 9. Noise output voltage independent of  $R_S$  ( $V_I = 0V$ ).

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>BTL Application</b>						
Output Power	$P_O$	THD = 0.5%, Note 3	15	17	-	W
		THD = 10%, Note 3	20	22	-	W
		THD = 0.5%, $V_P = 13.2V$ , Note 3	-	13	-	W
		THD = 10%, $V_P = 13.2V$ , Note 3	-	17.5	-	W
Total Harmonic Distortion	THD	$P_O = 1W$	-	0.1	-	%
Power Bandwidth	$B_W$	THD = 0.5%, $P_O = -1dB$ , w.r.t 15W	35 to 15,000			Hz
Low Frequency Roll-Off	$f_L$	-1dB, Note 4	-	45	-	Hz
High Frequency Roll-Off	$f_H$	-1dB, Note 4	20	-	-	kHz
Closed Loop Voltage Gain	$G_V$		45	46	47	dB
Supply Voltage Ripple Rejection ON  Mute Standby	RR	Note 5, Note 6	34	-	-	dB
		Note 5, Note 7	48	-	-	dB
		Note 5, Note 6, Note 7	48	-	-	dB
		Note 5, Note 6, Note 7	80	-	-	dB
Input Impedance	$ Z_i $		25	30	38	k $\Omega$
Noise Output Voltage (RMS Value) ON  Mute	$V_{no(rms)}$	$R_S = 0\Omega$ , Note 8	-	200	-	$\mu V$
		$R_S = 10k\Omega$ , Note 8	-	350	700	$\mu V$
		Note 9	-	180	-	$\mu V$

Note 3. Output power is measured directly at the output pins of the IC.

Note 4. Frequency response externally fixed.

Note 5. Ripple rejection measured at the output with a source impedance of  $0\Omega$  (maximum ripple amplitude of 2V)

Note 6. Frequency  $f = 100Hz$ .

Note 7. Frequency between 1kHz and 10kHz.

Note 8. Noise voltage measured in a bandwidth of 20Hz to 20kHz.

Note 9. Noise output voltage independent of  $R_S$  ( $V_I = 0V$ ).

**Pin Connection Diagram**  
(Front View)



- 1** Non-Invert Input
- 2** GND (Signal)
- 3** RR
- 4** Output 1
- 5** GND (Substrate)
- 6** Output 2
- 7**  $V_P$
- 8** Mute/Stand-by Switch
- 9** Invert Input

