

NTE1396 Integrated Circuit 20W Bridge Booster for Car Radio

Description:

The NTE1396 is a Class B dual audio power amplifier specifically designed for car radio applications. Power booster amplifiers are easily designed using this device that provides a high current capability (up to 3.5A) and that can drive very low impedance loads obtaining an output power of more than 20W. The NTE1396 has high reliability and guarantees complete safety during operation due to protection against:

- Output DC and AC Short Circuit to GND or Across the Head
- Overrating Chip Temperature (+150°C)
- Polarity Inversion
- Load Dump Voltage Surge
- Fortuitous Open GND
- Very Inductive Loads

Absolute Maximum Ratings:

Operating Supply Voltage, V_S	18V
DC Supply Voltage, V_S	28V
Peak Supply Voltage (for 50ms), V_S	40V
Output Peak Current (Note 1), I_O	
Non-Repetitive ($t = 0.1\text{ms}$)	4.5A
Repetitive ($f > 10\text{Hz}$)	3.5A
Power Dissipation ($T_C = +60^\circ\text{C}$), P_{tot}	30W
Operating Junction Temperature Range, T_J	-40° to +150°C
Storage Temperature Range, T_{stg}	-40° to +150°C
Maximum Thermal Resistance, Junction-to-Case, R_{thJC}	3°C/W

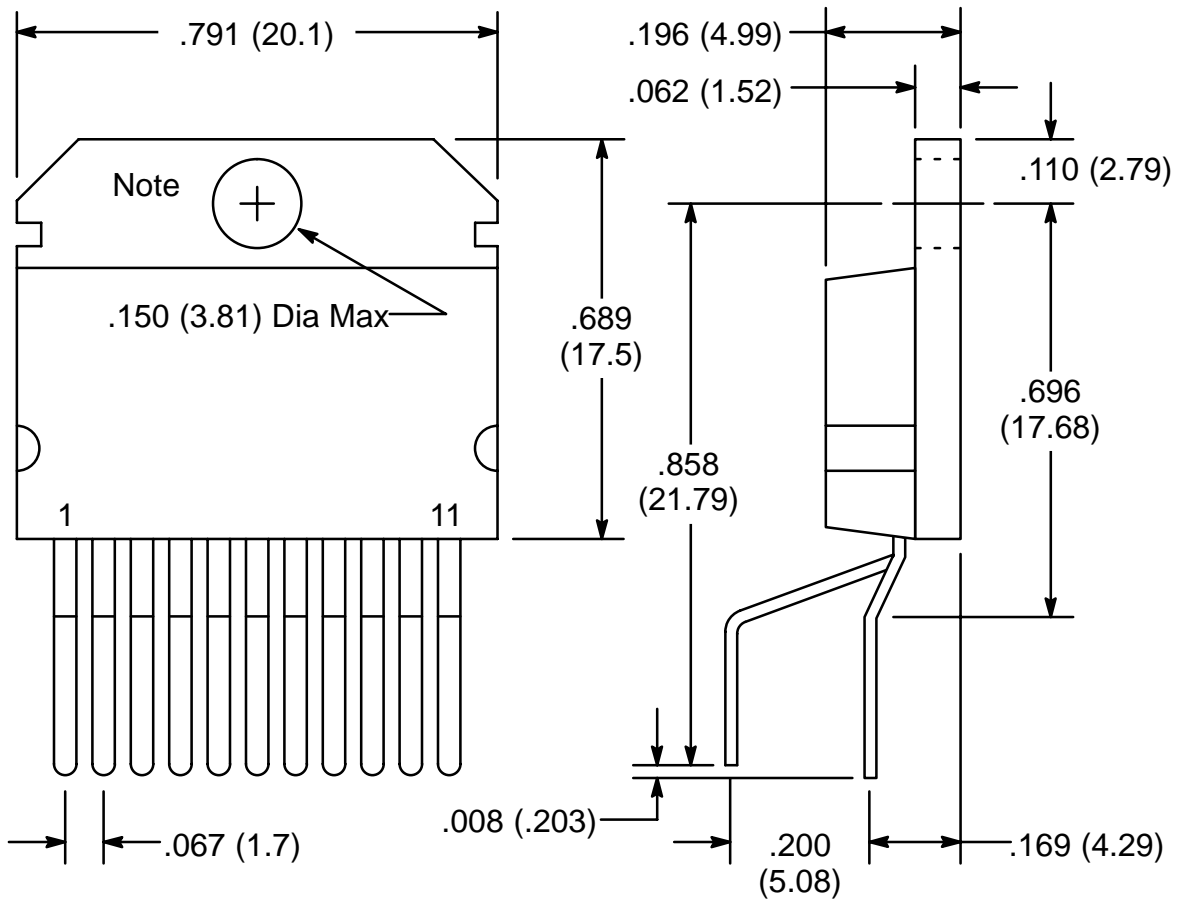
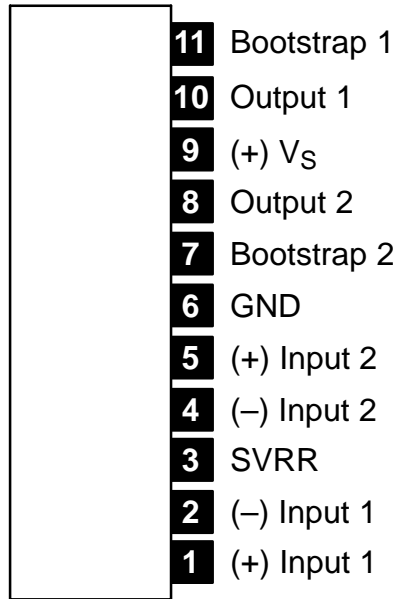
Note 1. Max output current is internally limited.

Electrical Characteristics: ($T_A = +25^\circ\text{C}$, $G_v = 50\text{dB}$, $R_{th(HS)} = 4^\circ\text{C/W}$, unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Supply Voltage	V_S			8	–	18	V
Output Offset Voltage (Between Pin8 & Pin10)	V_{OS}	$V_S = 14.4\text{V}$		–	–	150	mV
		$V_S = 13.2\text{V}$		–	–	150	mV
Total Quiescent Drain Current	I_d	$V_S = 14.4\text{V}$, $R_L = 4\Omega$		–	75	150	mA
		$V_S = 13.2\text{V}$, $R_L = 3.2\Omega$		–	70	160	mA
Output Power	P_O	d = 10%, f = 1kHz	$V_S = 14.4\text{V}$, $R_L = 4\Omega$	18	20	–	W
			$V_S = 14.4\text{V}$, $R_L = 3.2\Omega$	20	22	–	W
			$V_S = 13.2\text{V}$, $R_L = 3.2\Omega$	17	19	–	W
Distortion	d	f = 1kHz	$V_S = 14.4\text{V}$, $R_L = 4\Omega$, $P_O = 50\text{mW}$ to 15W	–	–	1	%
			$V_S = 13.2\text{V}$, $R_L = 3.2\Omega$, $P_O = 50\text{mW}$ to 13W	–	–	1	%
Input Sensitivity	V_i	$R_L = 4\Omega$	f = 1kHz, $P_O = 2\text{W}$	–	9	–	mV
		$R_L = 3.2\Omega$		–	8	–	mV
Input Resistance	R_i	f = 1kHz		70	–	–	k Ω
Low Frequency Roll Off (–3.2 Ω)	f_L	$R_L = 3.2\Omega$		–	–	40	Hz
High Frequency	f_H	$R_L = 3.2\Omega$		20	–	–	kHz
Closed Loop Voltage Gain	G_v	f = 1kHz		–	50	–	dB
Total Input Noise Voltage	e_N	$R_g = 10\text{K}\Omega$, Note 2		–	3	10	μV
Supply Voltage Rejection	SVR	$R_g = 10\text{K}\Omega$, $C_4 = 10\mu\text{F}$, $f_{\text{ripple}} = 100\text{Hz}$, $V_{\text{ripple}} = 0.5\text{V}$		45	55	–	dB
Efficiency	η	$V_S = 14.4\text{V}$, f = 1kHz	$P_O = 20\text{W}$, $R_L = 4\Omega$	–	60	–	%
			$P_O = 22\text{W}$, $R_L = 3.2\Omega$	–	60	–	%
		$V_S = 13.2\text{V}$, f = 1kHz, $P_O = 19\text{W}$, $R_L = 3.2\Omega$		–	58	–	%
Thermal Shut-Down Case Temperature	T_{sd}	$V_S = 14.4\text{V}$, $R_L = 4\Omega$, f = 1kHz, $P_{\text{tot}} = 13\text{W}$		100	110	–	$^\circ\text{C}$
Output Voltage with One Side of the Speaker Shorted to GND	V_{OSH}	$V_S = 14.4\text{V}$, $R_L = 4\Omega$		–	–	2	V
		$V_S = 13.2\text{V}$, $R_L = 3.2\Omega$		–	–	2	V

Note 2. Bandwidth filter 22Hz to 22kHz

Pin Connection Diagram
(Front View)



NOTE: Tab connected to Pin6