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 = 0.1ms) 4.5A
       Repetitive (f > 10Hz) 3.5A

Power Dissipation (T_C = +60°C), P_{tot} 30W

Operating Junction Temperature Range, T_J . . . . −40° to +150°C

Storage Temperature Range, T_{stg} . . . . −40° to +150°C

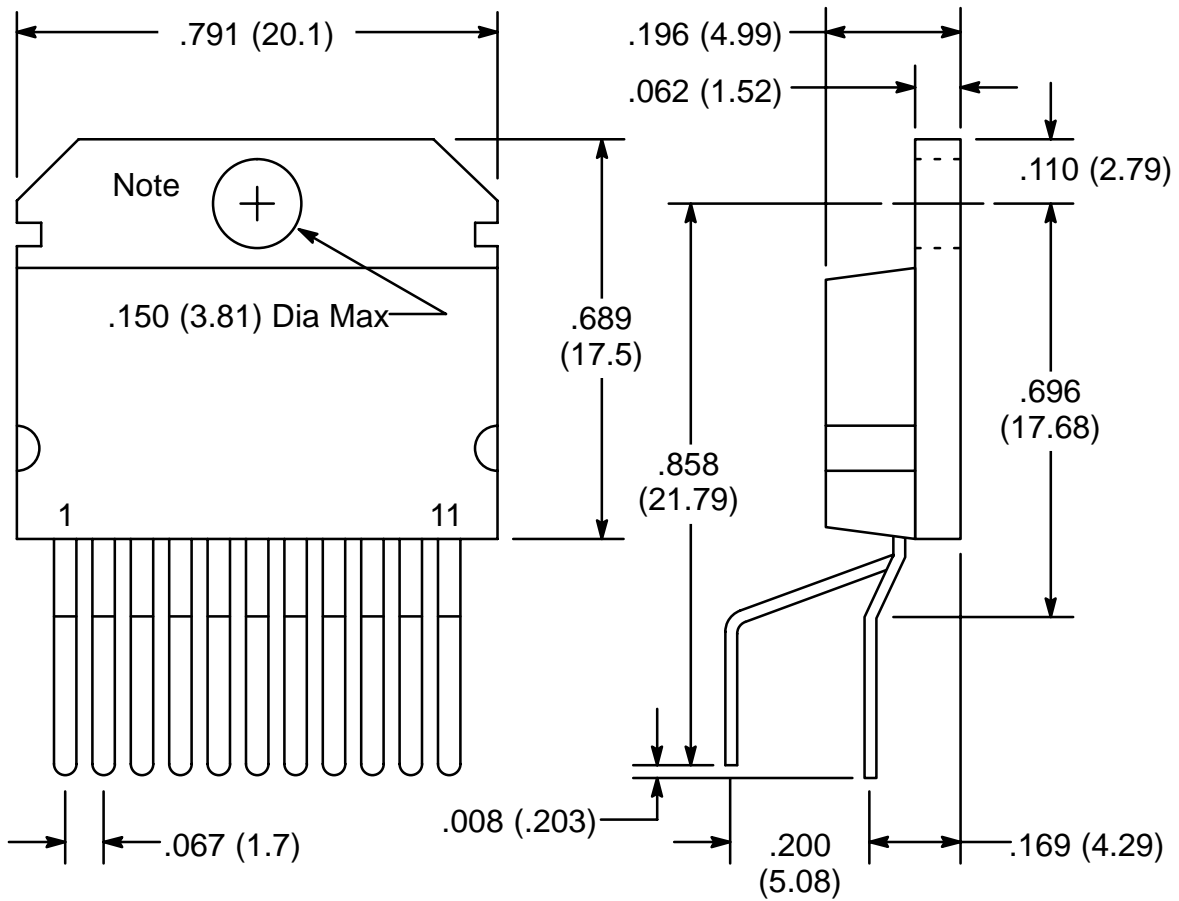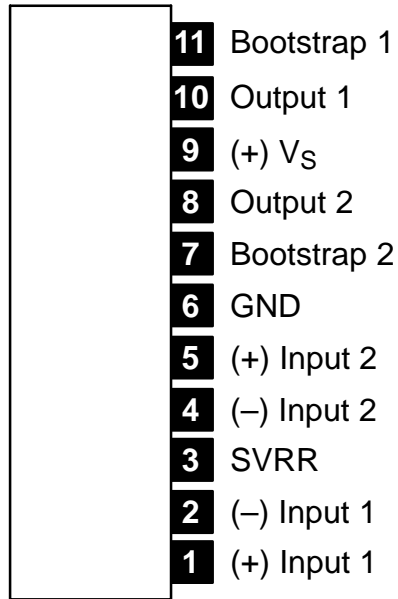Maximum Thermal Resistance, Junction–to–Case, R_{thJC} . . . . 3°C/W

Note 1. Max output current is internally limited.

Electrical Characteristics: (T_A = +25°C, G_v = 50dB, $R_{th(HS)}$ = 4°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 = 14.4V		–	–	150	mV
		V_S = 13.2V		–	–	150	mV
Total Quiescent Drain Current	I_d	V_S = 14.4V, R_L = 4Ω		–	75	150	mA
		V_S = 13.2V, R_L = 3.2Ω		–	70	160	mA
Output Power	P_O	d = 10%, f = 1kHz	V_S = 14.4V, R_L = 4Ω	18	20	–	W
			V_S = 14.4V, R_L = 3.2Ω	20	22	–	W
			V_S = 13.2V, R_L = 3.2Ω	17	19	–	W
Distortion	d	f = 1kHz	V_S = 14.4V, R_L = 4Ω, P_O = 50mW to 15W	–	–	1	%
			V_S = 13.2V, R_L = 3.2Ω, P_O = 50mW to 13W	–	–	1	%
Input Sensitivity	V_i	R_L = 4Ω	f = 1kHz, P_O = 2W	–	9	–	mV
		R_L = 3.2Ω		–	8	–	mV
Input Resistance	R_i	f = 1kHz		70	–	–	kΩ
Low Frequency Roll Off (–3.2Ω)	f_L	R_L = 3.2Ω		–	–	40	Hz
High Frequency	f_H	R_L = 3.2Ω		20	–	–	kHz
Closed Loop Voltage Gain	G_v	f = 1kHz		–	50	–	dB
Total Input Noise Voltage	e_N	R_g = 10KΩ, Note 2		–	3	10	μV
Supply Voltage Rejection	SVR	R_g = 10KΩ, C_4 = 10μF, f_{ripple} = 100Hz, V_{ripple} = 0.5V		45	55	–	dB
Efficiency	η	V_S = 14.4V, f = 1kHz	P_O = 20W, R_L = 4Ω	–	60	–	%
			P_O = 22W, R_L = 3.2Ω	–	60	–	%
		V_S = 13.2V, f = 1kHz, P_O = 19W, R_L = 3.2Ω		–	58	–	%
Thermal Shut–Down Case Temperature	T_{sd}	V_S = 14.4V, R_L = 4Ω, f = 1kHz, P_{tot} = 13W		100	110	–	°C
Output Voltage with One Side of the Speaker Shorted to GND	V_{OSH}	V_S = 14.4V, R_L = 4Ω		–	–	2	V
		V_S = 13.2V, R_L = 3.2V		–	–	2	V

Note 2. Bandwidth filter 22Hz to 22kHz

Pin Connection Diagram
(Front View)

Pin	Signal
11	Bootstrap 1
10	Output 1
9	(+) V_S
8	Output 2
7	Bootstrap 2
6	GND
5	(+) Input 2
4	(−) Input 2
3	SVRR
2	(−) Input 1
1	(+) Input 1

.791 (20.1)

.196 (4.99)

.062 (1.52)

.110 (2.79)

Note

.150 (3.81) Dia Max

.689 (17.5)

.858 (21.79)

.696 (17.68)

1   11

.067 (1.7)

.008 (.203)

.200 (5.08)

.169 (4.29)

NOTE: Tab connected to Pin6