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NTE7202
Integrated Circuit
4 x 45W Quad Bridge Car Radio Amplifier Plus HSD

Description:

The NTE7202 is a breakthrough BCD (Bipolar/CMOS/DMOS) technology class AB Audio Power Amplifier in a 25–Lead Staggered SIP type package designed for use as an amplifier in high power car radio applications. The fully complementary P–Channel/N–Channel output structure allows a rail to rail output voltage swing which, combined with high output current and minimised saturation losses sets new power reference in the car radio field, with unparalleled distortion performance.

Features:

- Superior Output Power Capability:
  - 4 x 50W/4Ω Max.
  - 4 x 45W/4Ω EIAJ
  - 4 x 30W/4Ω at 14.4V, 1kHz, 10%
  - 4 x 80W/2Ω Max.
  - 4 x 77W/2Ω EIAJ
  - 4 x 55W/2Ω at 14.4V, 1kHz, 10%
- Multipower BCD Technology
- MOSFET Output Power Stage
- Excellent 2Ω Driving Capability
- Hi–Fi Class Distortion
- Low Output Noise
- Stand–By Function
- Mute Function
- Automute at Min. Supply Voltage Detection
- Low External Component Count:
  - Internally Fixed Gain (26dB)
  - No External Compensation
  - No Bootstrap Capacitors
- On Board 0.35A High Side Driver (HSD)

Protections:

- Output Short Circuit to GND, to V_S, Across the Load
- Very Inductive Loads
- Overrating Chip Temprature with Soft Thermal Limiter
- Output DC Offset Detection
- Load Dump Voltage
- Fortuitous Open End
- Reversed Battery
- ESD

Absolute Maximum Ratings:

Operating Supply Voltage, V_{CC} 18V
DC Supply Voltage, $V_{CC(DC)}$ 28V
Peak Supply Voltage (t = 50ms), $V_{CC(pk)}$ 50V
Output Peak Current, I_O
  Repetitive (Duty Cycle 10% at f = 10Hz) 9A
  Non–Repetitive (t = 100μs) 10A
Power Dissipation (T_C = +70°C), P_{tot} 80W
Operating Junction Temperature, T_J . . . . . +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1°C/W

Electrical Characteristics: (V_S = 13.2V, R_L = 4Ω, R_g = 600Ω, f = 1kHz, T_A = +25°C unless otherwise specified)

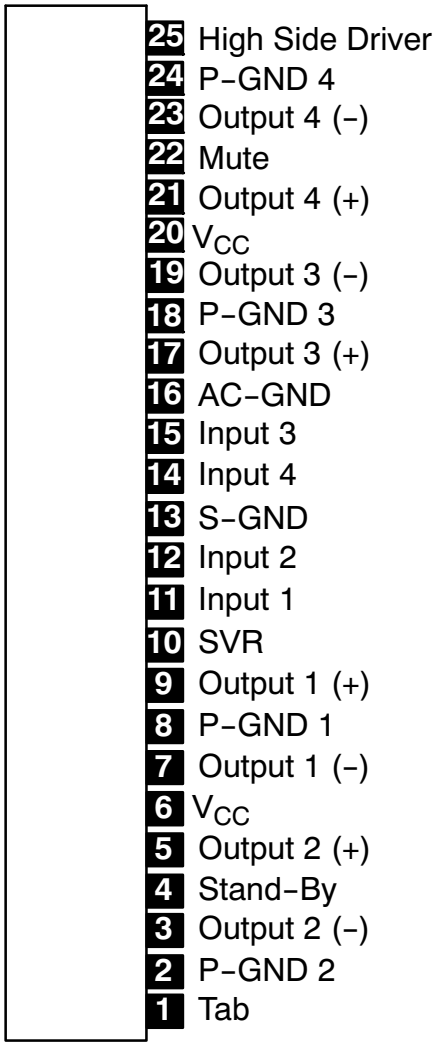
Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Quiescent Current	I_{q1}	R_L = ∞		120	200	320	mA
Output Offset Voltage	V_{OS}	Play Mode		–	–	±60	mV
ON/OFF Output Offset Voltage	dV_{OS}	During Mute		–	–	±60	mV
Voltage Gain	G_v			25	26	27	dB
Channel Gain Unbalance	dG_v			–	–	±1	dB
Output Power	P_o	V_S = 13.2V	THD = 10%	23	25	–	W
			THD = 1%	16	19	–	W
		V_S = 14.4V	THD = 10%	28	30	–	W
			THD = 1%	20	23	–	W
		V_S = 13.2V	THD = 10%, 2Ω	42	45	–	W
			THD = 1%, 2Ω	32	34	–	W
		V_S = 14.4V	THD = 10%, 2Ω	50	55	–	W
			THD = 1%, 2Ω	40	43	–	W
EIAJ Output Power (Note 1)	$P_{o\ EIAJ}$	V_S = 13.7V	R_L = 4Ω	41	45	–	W
			R_L = 2Ω	72	77	–	W
Max. Output Power (Note 1)	$P_{o\ MAX}$	V_S = 14.4V	R_L = 4Ω	–	50	–	W
			R_L = 2Ω	–	80	–	W
Total Harmonic Distortion	THD	P_o = 4W		–	0.006	0.05	%
		P_o = 15W, R_L = 2Ω		–	0.015	0.07	%
Output Noise	e_{No}	"A" Weighted		–	35	50	μV
		Bw = 20Hz to 20kHz		–	50	70	μV
Supply Voltage Rejection	SVR	f = 100Hz, V_r = 1V_{rms}		50	70	–	dB
High Cut-Off Frequency	f_{ch}	P_O = 0.5W		100	300	–	kHz
Input Impedance	R_i			80	100	120	kΩ
Crosstalk	CT	P_O = 4W	f = 1kHz	60	70	–	dB
			f = 10kHz	–	60	–	dB
Stand-By Current Consumption	I_{SB}	V_{ST-BY} = 1.5V		–	–	20	μA
Stand-By Pin Current	I_{Pin5}	V_{ST-BY} = 1.5V to 3.5V		–	–	±10	μA
Stand-By Out Threshold Voltage	$V_{SB\ out}$	(Amp: ON)		3.5	–	–	V
Stand-By In Threshold Voltage	$V_{SB\ in}$	(Amp: OFF)		–	–	1.5	V
Mute Attenuation	A_M	P_{Oref} = 4W		80	90	–	dB
Mute Out Threshold Voltage	$V_{M\ out}$	(Amp: Play)		3.5	–	–	V
Mute In Threshold Voltage	$V_{M\ in}$	(Amp: Mute)		–	–	1.5	V
VS Automute Threshold	$V_{AM\ in}$	(Amp: Mute) Att ≥ 80dB, P_{Oref} = 4W		6.5	7.0	–	V
		(Amp: Play) Att < 0.1dB, P_O = 0.5W		–	7.5	8.0	V
Muting Pin Current	I_{Pin23}	V_{MUTE} = 1.5V (Sourced Current)		7	12	18	μA
		V_{MUTE} = 3.5V		–5	–	+18	μA
HSD Section							
Dropout Voltage	$V_{dropout}$	I_O = 0.35A, V_S = 9V to 16V		–	0.25	0.6	V
Current Limits	I_{prot}			400	–	800	mA

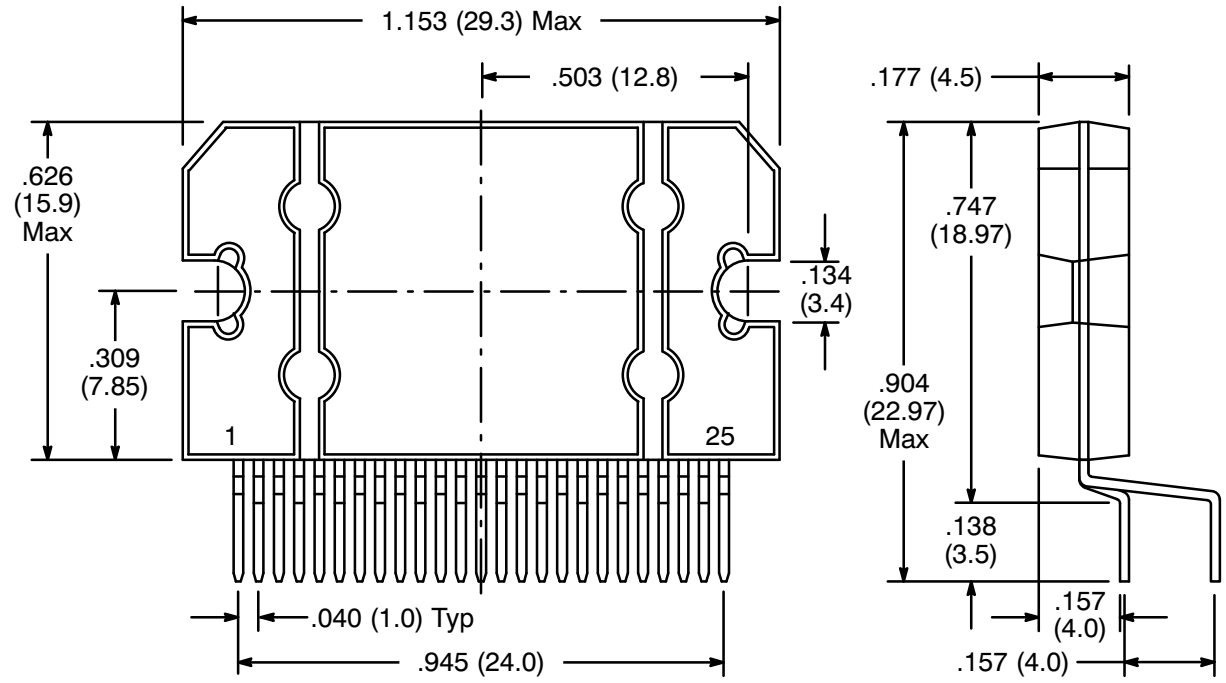
Note 1. Saturated square wave output.

Electrical Characteristics (Cont'd): (V_S = 13.2V, R_L = 4Ω, R_g = 600Ω, f = 1kHz, T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Offset Detector (Pin26)							
Mute Voltage for DC Offset Detection Enabled	V_{M_ON}	V_{stby} = 5V		8	–	–	V
	V_{M_OFF}			–	–	6	V
Detected Differential Output Offset	V_{OFF}	V_{stby} = 5V, V_{mute} = 8V		±2	±3	±4	V
Pin25 Voltage for Detection = TRUE	V_{25_T}	V_{stby} = 5V, V_{mute} = 8V	V_{OFF} > ±4V	0	–	1.5	V
Pin25 Voltage for Detection = FALSE	V_{25_F}		V_{OFF} > ±2V	12	–	–	V

Pin Connection Diagram
(Front View)




1.153 (29.3) Max
.503 (12.8)
.177 (4.5)
.626
(15.9)
Max
.309
(7.85)
.134
(3.4)
.747
(18.97)
.904
(22.97)
Max
.138
(3.5)
1
25
.040 (1.0) Typ
.945 (24.0)
.157
(4.0)
.157 (4.0)