

HA13150

21 W $\times$ 4-Channel BTL Power IC



Preliminary

Rev. 0

Sep. 1991

Description

HA13150 is a four-channel BTL amplifier IC designed for car audio, featuring high output and low distortion, and applicable to digital audio equipment. It provides 21 W output per channel, with a 14.4 V power supply and at 10% distortion.

Functions

- Built-in standby circuit
- Built-in muting circuit
- Built-in protection circuits (surge, TSD, and ASO)

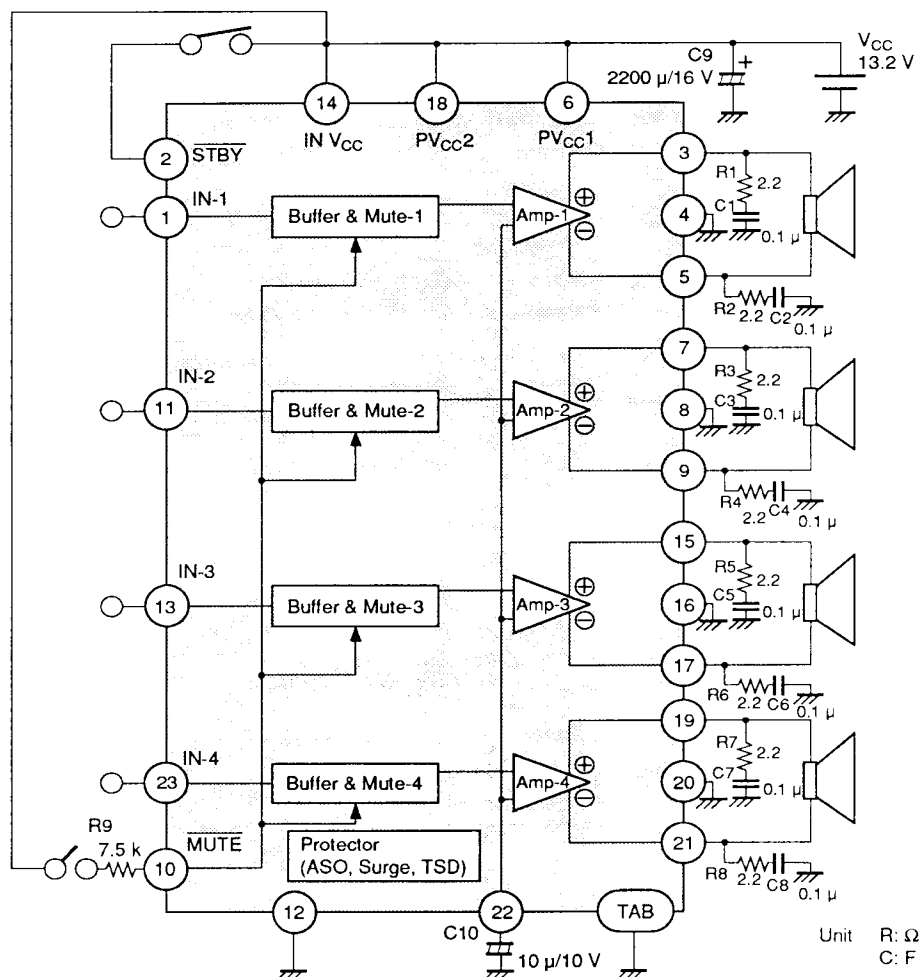
Features

- Requires few external parts
- Low distortion (total harmonic distortion = 0.01% at 3 W)
- Low noise (at $R_g = 620 \Omega$, noise is 0.15 mV (muting off) or 0.1 mV (muting on))
- Popping noise minimized
- Highly reliable current-limiting ASO protector keeps speakers safe from all kinds of trouble. Reliability is further enhanced by a fast-acting thermal shutdown protection circuit with on/off hysteresis.



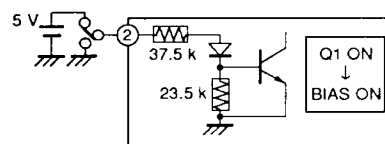
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Block Diagram

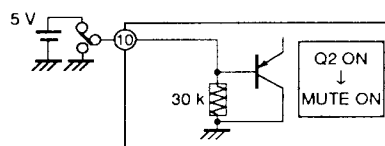


* C1 to C8 should be polyester film capacitors with no secondary resonance (non-inductive), to assure stable operation.

Notes: 1. Standby
Power is turned on when a signal of 3.5 V or 0.05 mA is impressed at pin 2.
When pin 2 is open or connected to GND, standby is turned on (output off).



2. Muting
Muting is turned off (output on) when a signal of 5 V or 0.1 mA is impressed at pin 10.
When pin 10 is open or connected to GND, muting is turned on (output off).



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

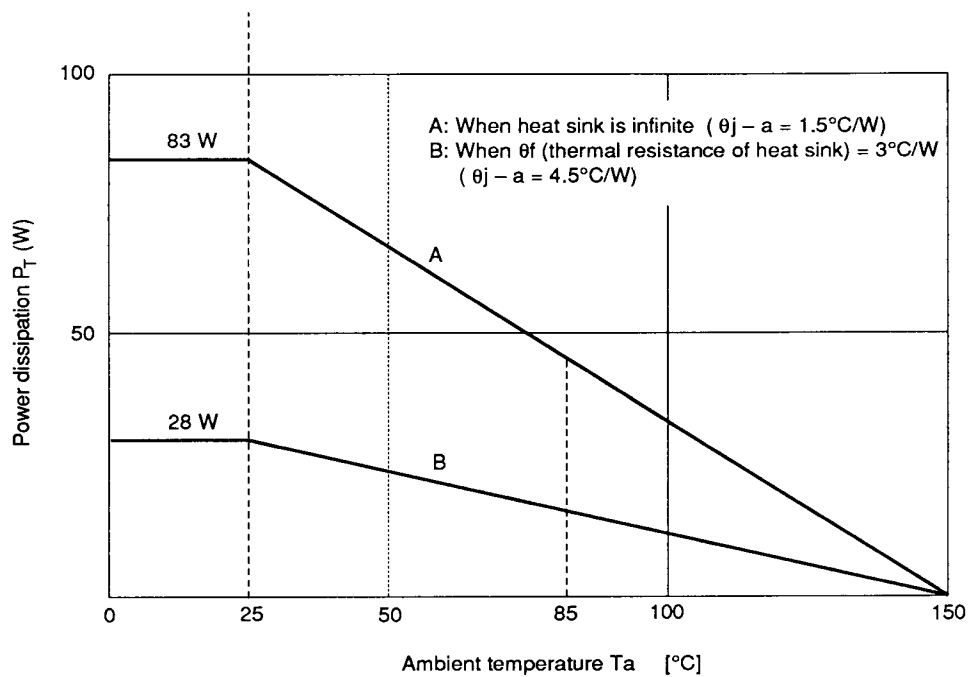
Item	Symbol	Rating	Unit	Remarks
Operating supply voltage	V_{CC}	18	V	
Supply voltage when no signal*	$V_{CC} \text{ (DC)}$	26	V	
Peak supply voltage**	$V_{CC} \text{ (PEAK)}$	50	V	
Output current	I_o	4	A	
Power dissipation***	P_T	83	W	
Junction temperature	T_j	150	$^\circ\text{C}$	
Operating temperature	T_{opr}	-30 to +85	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +125	$^\circ\text{C}$	

Notes: * Tolerance within 30 seconds

** Tolerance in surge pulse waveform

*** Value when attached on the infinite heat sink plate at $T_a = 25^\circ\text{C}$.

The derating curve is as shown in the graph below.



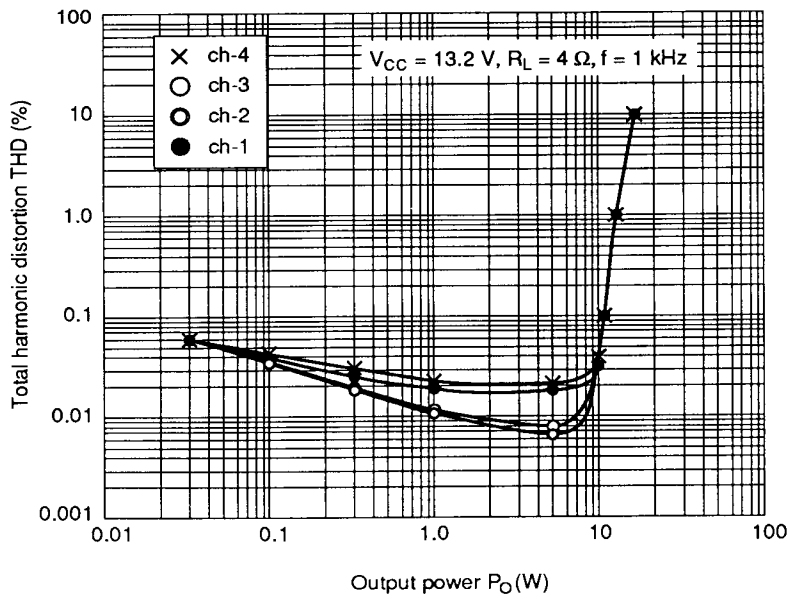
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Electrical Characteristics ($T_a = 25^\circ\text{C}$)

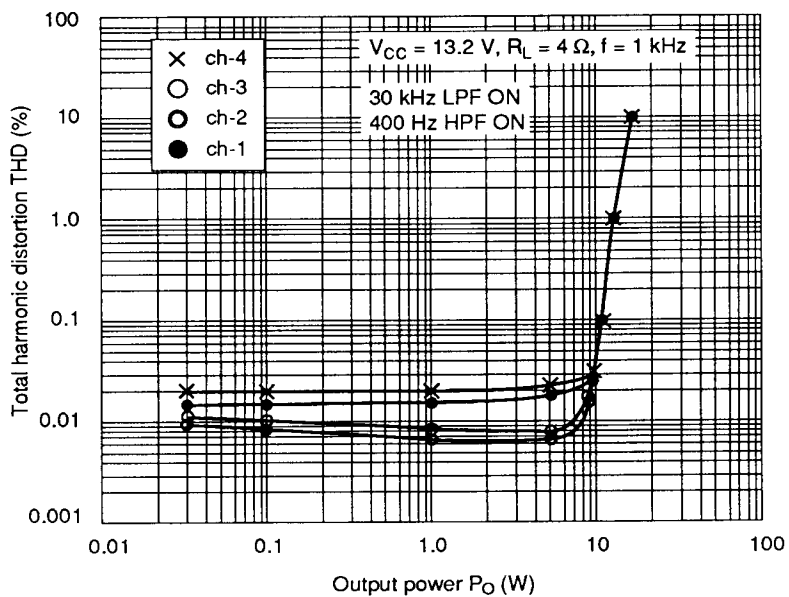
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Current when no signal	I _{q1}	—	240	—	mA	V _{in} = 0
Output offset voltage	ΔV _q	−250	0	+250	mV	
Gain	G _v	30.5	32	33.5	dB	
Gain difference between channels	ΔG _v	−1.5	0	+1.5	dB	
Rated output power	P _o	—	18	—	W	V _{CC} = 13.2 V R _L = 4 Ω, THD = 10%
		—	21	—		V _{CC} = 14.4 V R _L = 4 Ω, THD = 10%
Total harmonic distortion	T.H.D	—	0.01	—	%	P _o = 3 W
Output noise voltage	WBN	—	0.15	0.5	mV _{rms}	R _g = 0 Ω SW = 20 to 20 kHz
Ripple rejection	SVR	—	55	—	dB	R _g = 600 Ω f = 120 Hz
Channel crosstalk	C.T	—	70	—	dB	R _g = 600 Ω V _{00t} = 0 dBm
Input impedance	R _{in}	21	30	39	kΩ	
Standby current	I _{q2}	—	—	200	μA	
Standby control voltage (high)	V _{STH}	3.5	—	V _{CC}	V	
Standby control voltage (low)	V _{STL}	0	—	1.5	V	
Muting control voltage (high)	V _{MH}	3.5	—	V _{CC}	V	
Muting control voltage (low)	V _{ML}	0	—	1.5	V	
Muting attenuation	A _{TTM}	—	70	—	dB	V _{in} = 0 dBm

HA13150 THD vs. P_O , and THD vs. f

Total Harmonic Distortion vs. Output Power (1)



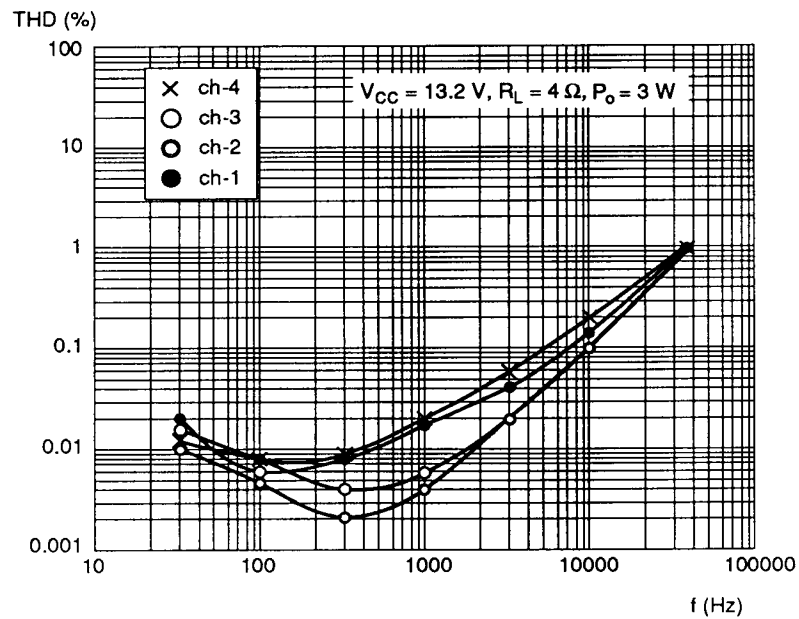
Total Harmonic Distortion vs. Output Power (2)



HA13150

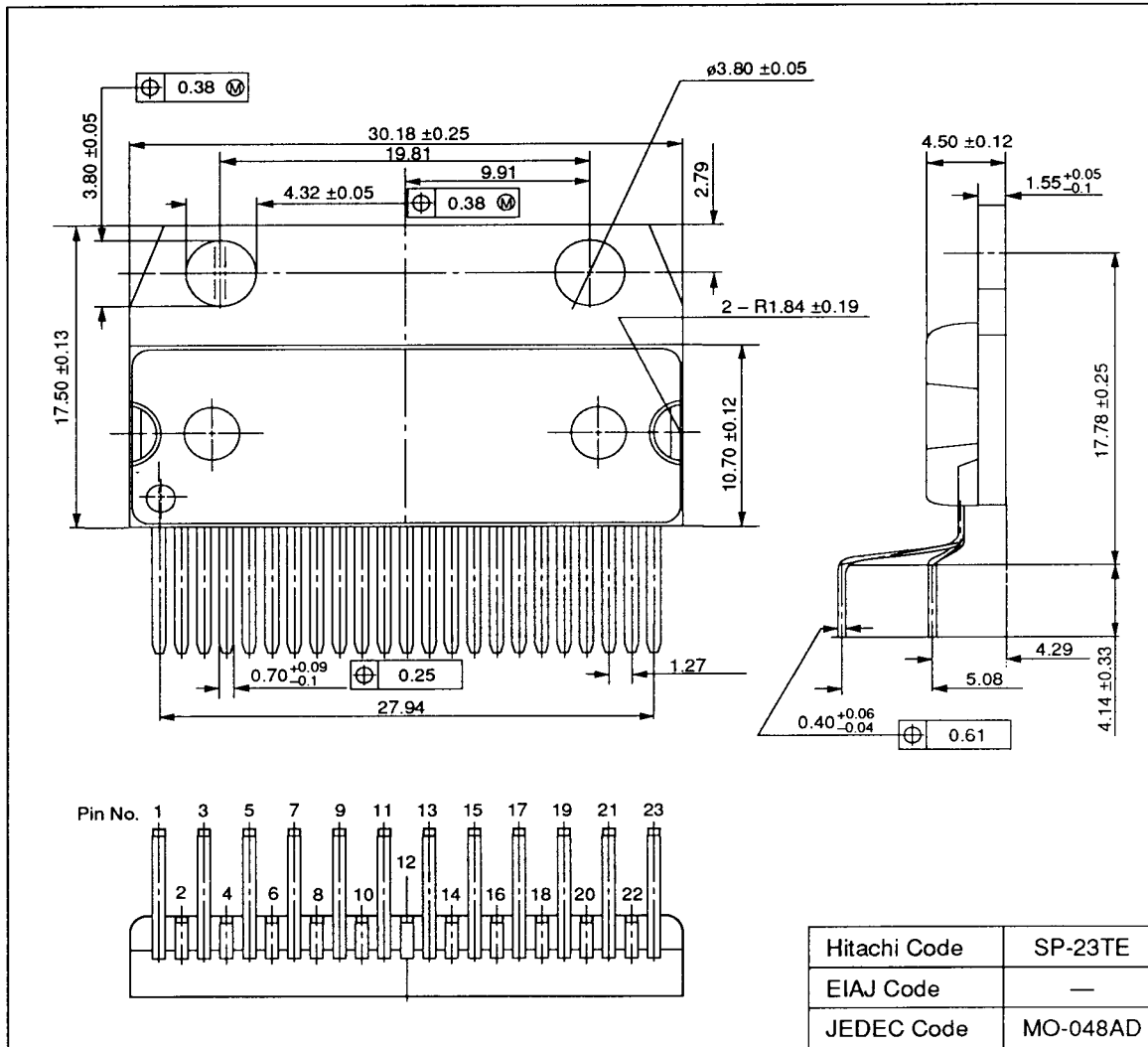
HA13150 THD vs. P_O , and THD vs. f (cont)

(3) f vs. THD



Package Dimension

Unit: mm



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