ADE-207-052

HA13150
21 W × 4-Channel BTL Power IC

HITACHI

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.

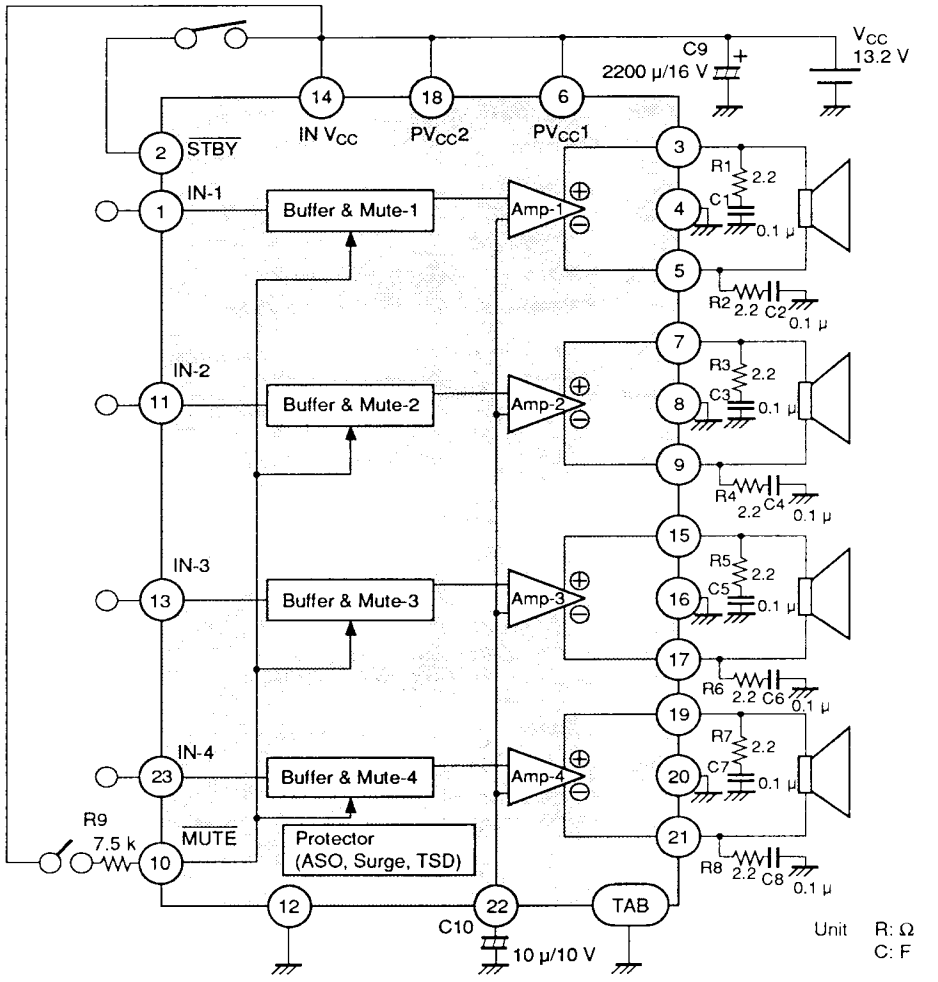
Functions

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

Features

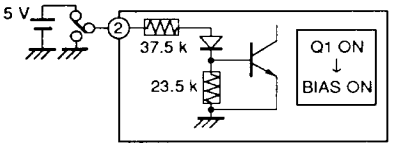
- Requires few external parts
- Low distortion (total harmonic distortion = 0.01% at 3 W)
- Low noise (at Rg = 620 Ω, noise is 0.15 mV (muting off) or 0.1 mV (muting on))
- Popping noise minimized
- Highly reliable current-limiting ASO protector keeps speakers safe from all kinds of trouble. Reliability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

Block Diagram

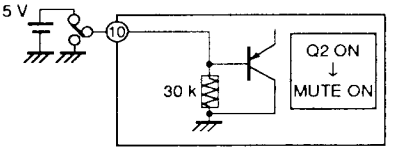


* C1 to C8 should be polyester film capacitors with no secondary resonance (non-inductive), to assure stable operation.

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).



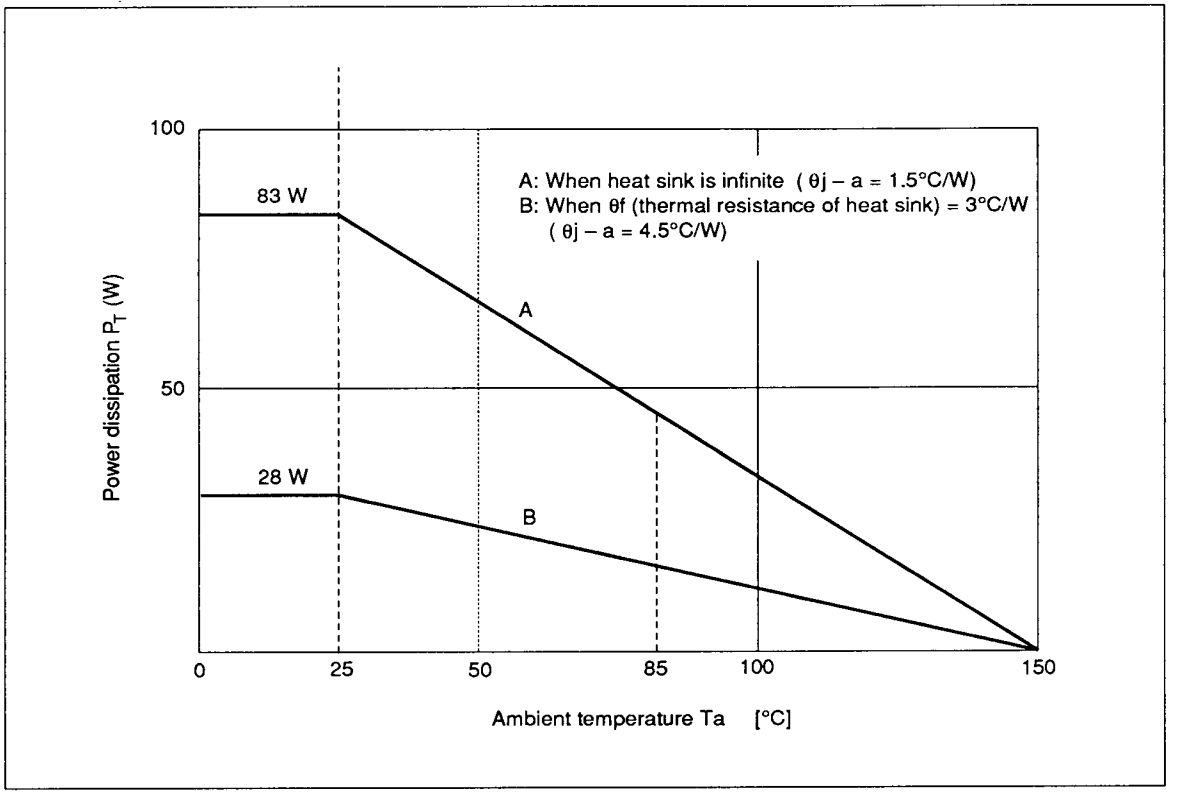
2. Muting
Muting is turned off (output on) when a signal of 5 V or 0.1 mA is impressed at pin 10.
When pin 10 is open or connected to GND, muting is turned on (output off).



Absolute Maximum Ratings (T_a = 25°C)

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

Notes: * Tolerance within 30 seconds
** Tolerance in surge pulse waveform
*** Value when attached on the infinite heat sink plate at Ta = 25 °C.
The derating carve is as shown in the graph below.

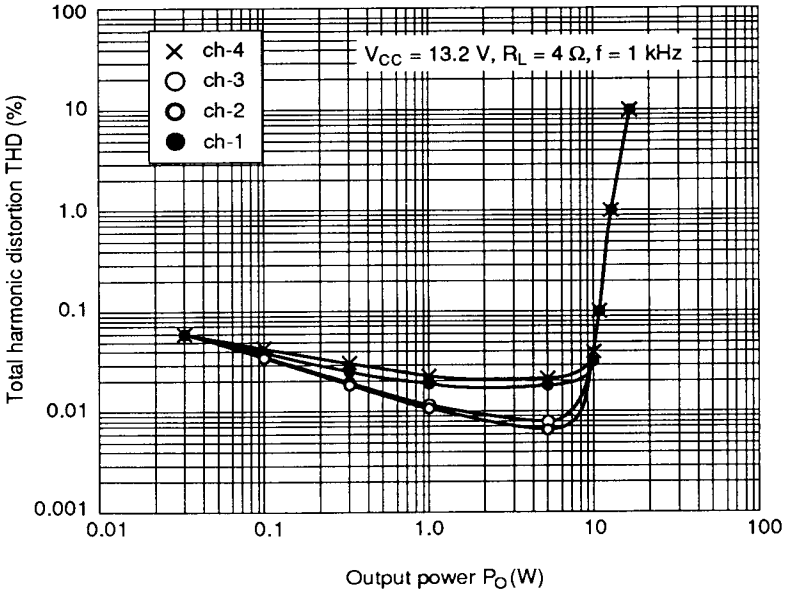


Electrical Characteristics (T_a = 25°C)

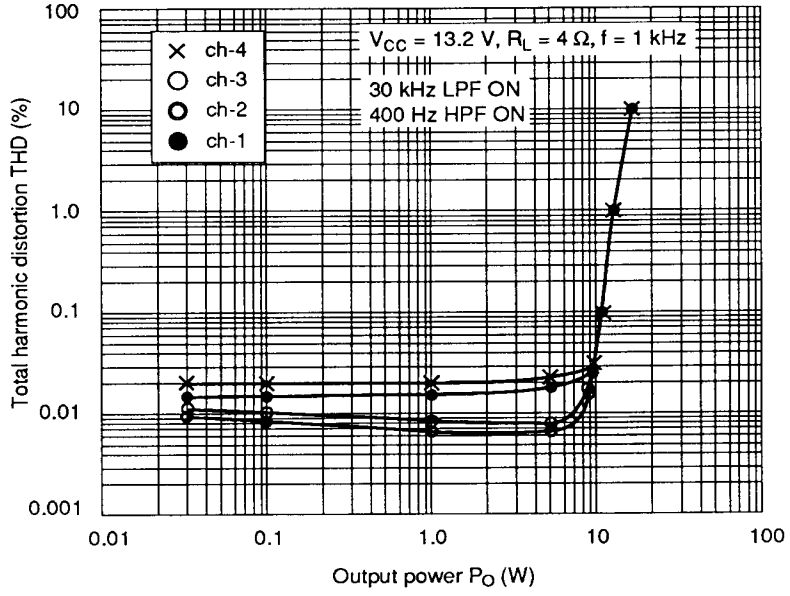
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Current when no signal	Iq1	—	240	—	mA	Vin = 0
Output offset voltage	ΔVq	–250	0	+250	mV	
Gain	Gv	30.5	32	33.5	dB	
Gain difference between channels	ΔGv	–1.5	0	+1.5	dB	
Rated output power	Po	—	18	—	W	V_{CC} = 13.2 V R_L = 4 Ω, THD = 10%
		—	21	—		V_{CC} = 14.4 V R_L = 4 Ω, THD = 10%
Total harmonic distortion	T.H.D	—	0.01	—	%	Po = 3 W
Output noise voltage	WBN	—	0.15	0.5	mVrms	Rg = 0 Ω SW = 20 to 20 kHz
Ripple rejection	SVR	—	55	—	dB	Rg = 600 Ω f = 120 Hz
Channel crosstalk	C.T	—	70	—	dB	Rg = 600 Ω V00t = 0 dBm
Input impedance	Rin	21	30	39	kΩ	
Standby current	Iq2	—	—	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	Vin = 0 dBm

HA13150 THD vs. P_O, and THD vs. f

Total Harmonic Distortion vs. Output Power (1)

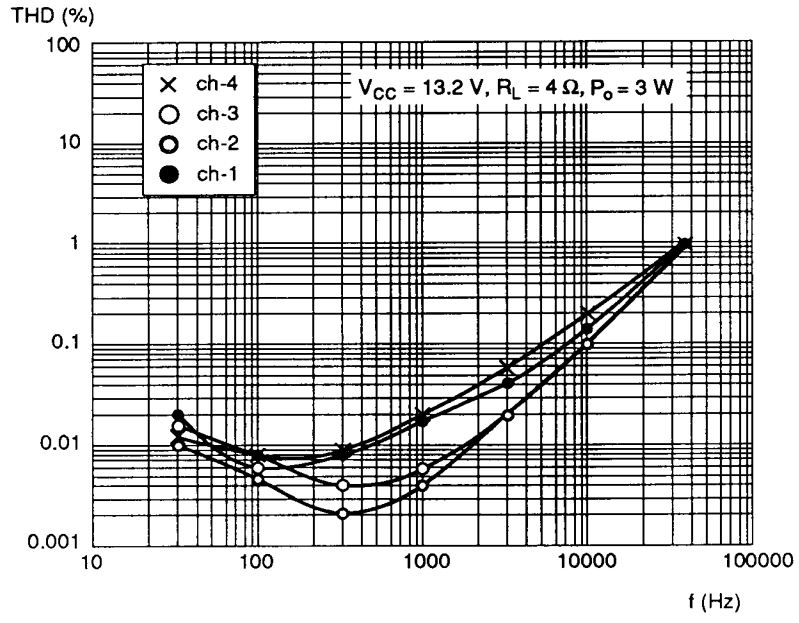


Total Harmonic Distortion vs. Output Power (2)



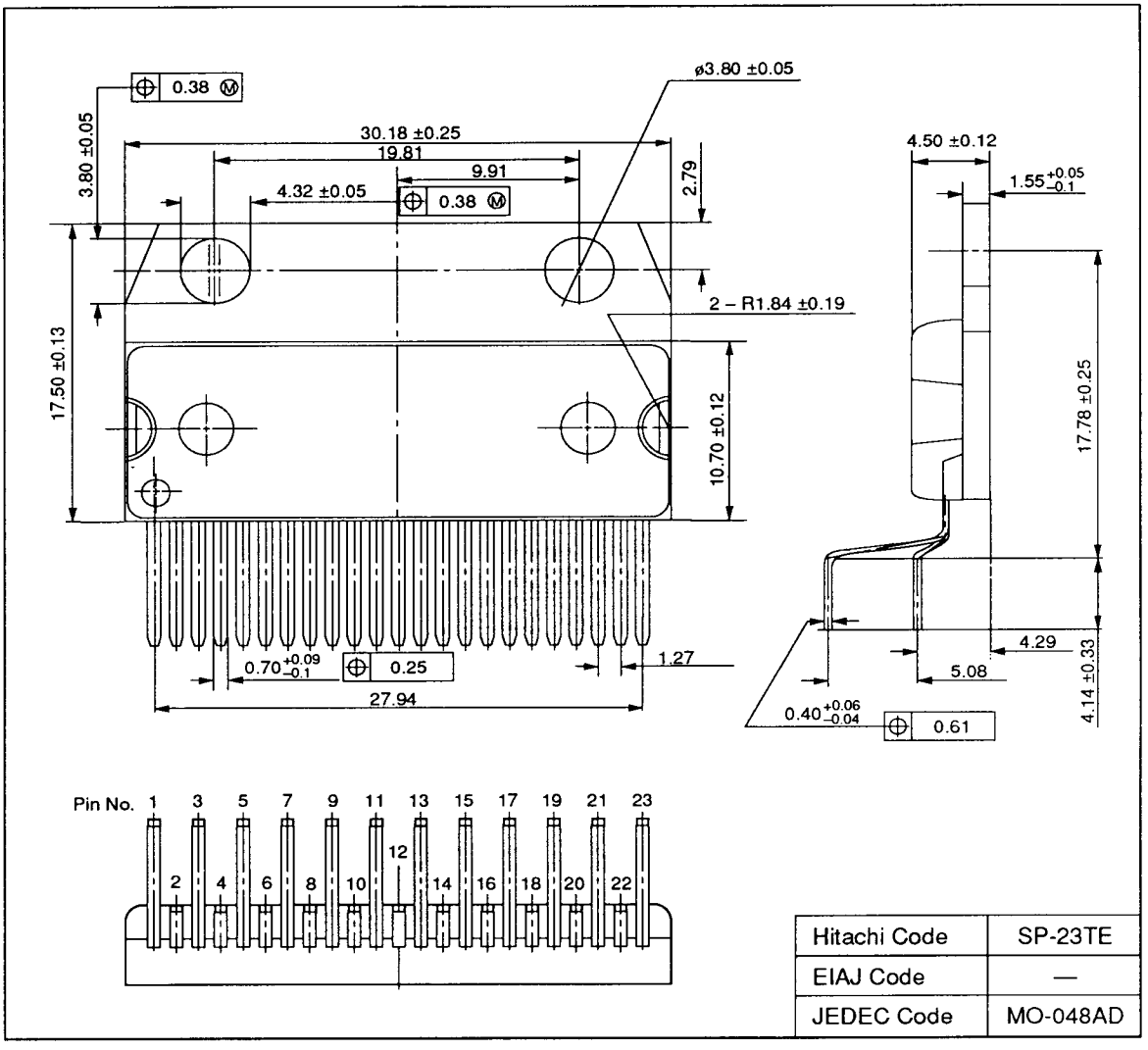
HA13150 THD vs. P_O, and THD vs. f (cont)

(3) f vs. THD



Package Dimension

Unit: mm



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EIAJ Code	—
JEDEC Code	MO-048AD

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