
HA13155

33 W × 4-Channel BTL Power IC

HITACHI

ADE-207-187A (Z)
2nd Edition
Jul. 1999

Description

The HA13155 is four-channel BTL amplifier IC designed for car audio, featuring high output and low distortion, and applicable to digital audio equipment. It provides 33 W output per channel, with a 13.7 V power supply and at Max distortion.

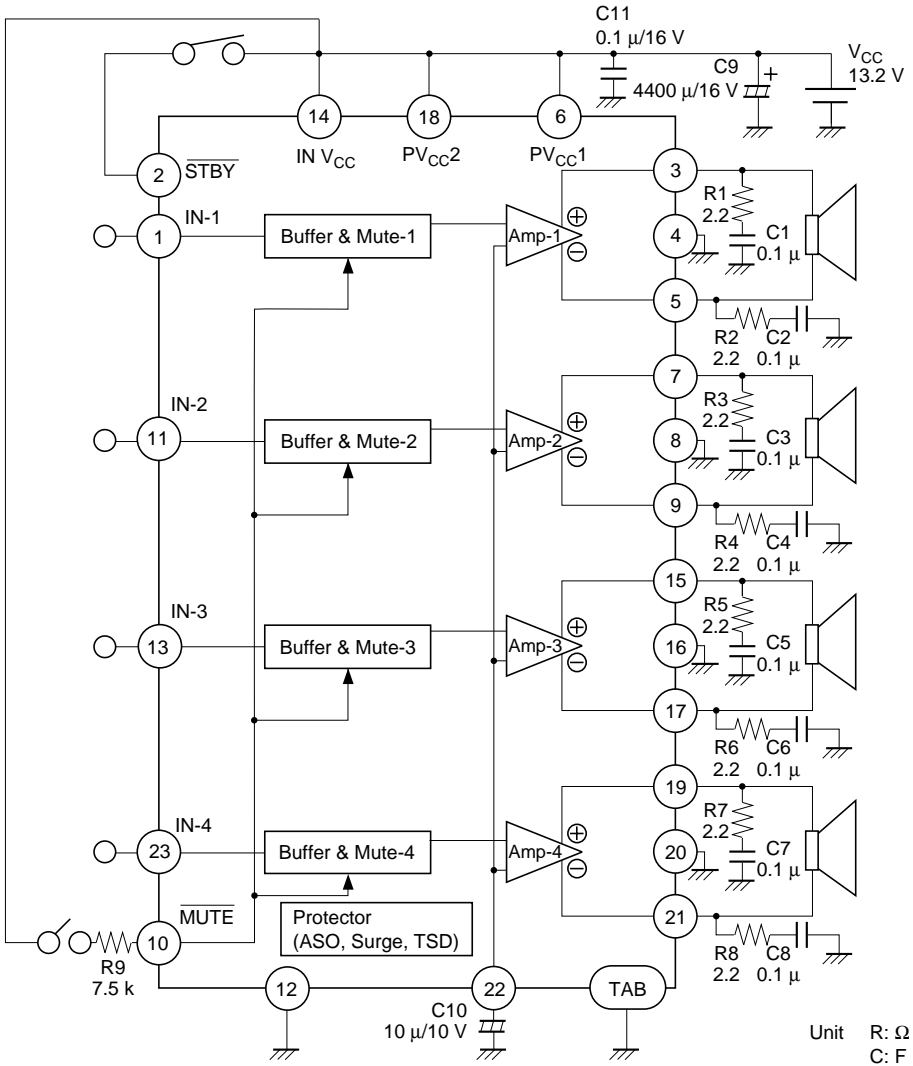
Functions

- 4 ch BTL power amplifiers
- Built-in standby circuit
- Built-in muting circuit
- Built-in protection circuit (surge, T.S.D, and ASO)

Features

- Requires few external parts
- Popping noise minimized
- Low output noise
- Built-in high reliability protection circuit
- Pin to pin with HA13150A/HA13151/HA13152/HA13153

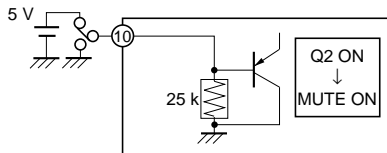
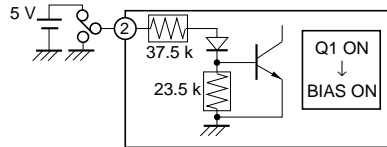
Block Diagram



Unit R: Ω
C: F

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

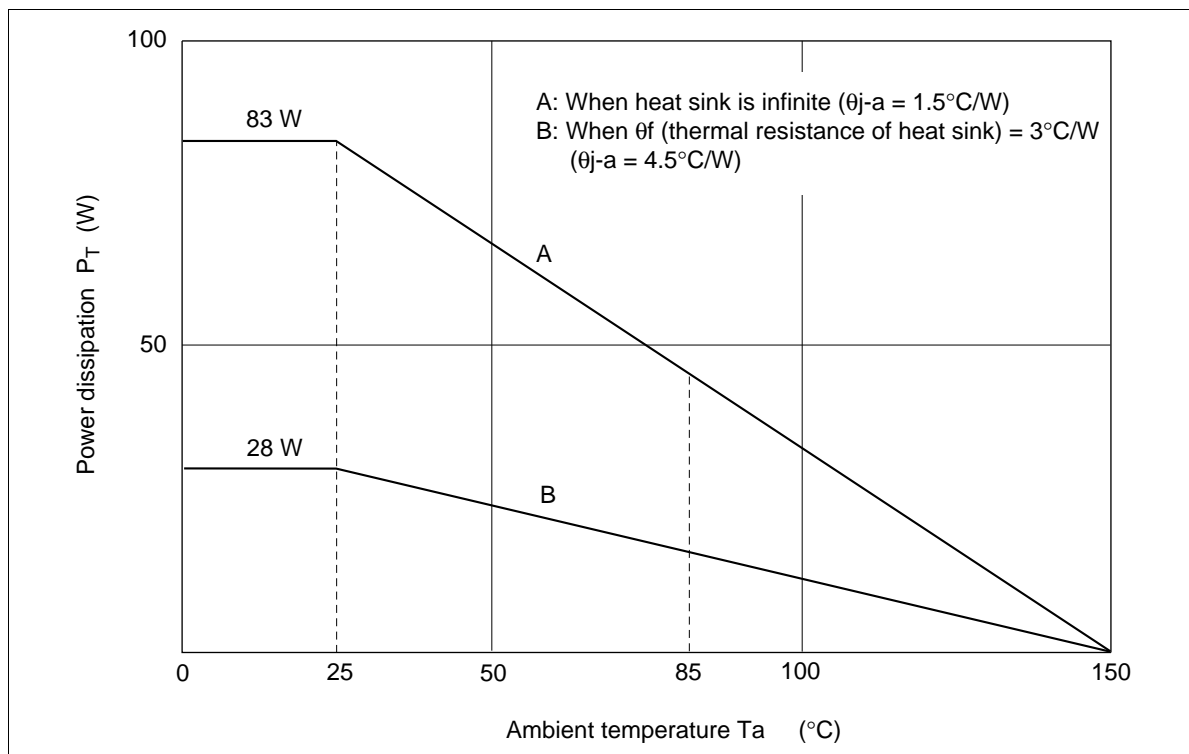
- Notes:
1. Standby
Power is turned on when a signal of 3.5 V or 0.05 mA is impressed at pin 2. When pin 2 is open or connected to GND, standby is turned on (output off).
 2. Muting
Muting is turned off (output on) when a signal of 3.5 V or 0.2 mA is impressed at pin 10. When pin 10 is open or connected to GND, muting is turned on (output off).
 3. TAB (header of IC) connected to GND.



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Operating supply voltage	V_{CC}	18	V
Supply voltage when no signal* ¹	V_{CC} (DC)	26	V
Peak supply voltage* ²	V_{CC} (PEAK)	50	V
Output current* ³	I_o (PEAK)	4	A
Power dissipation* ⁴	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

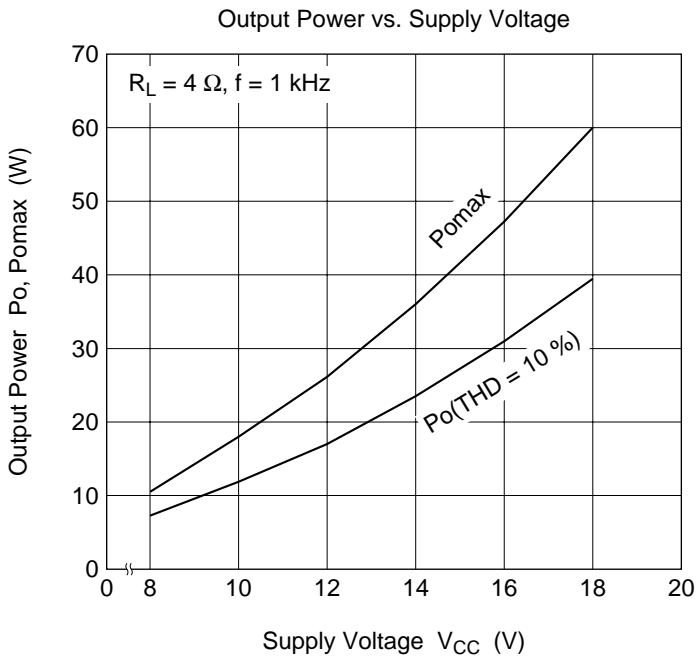
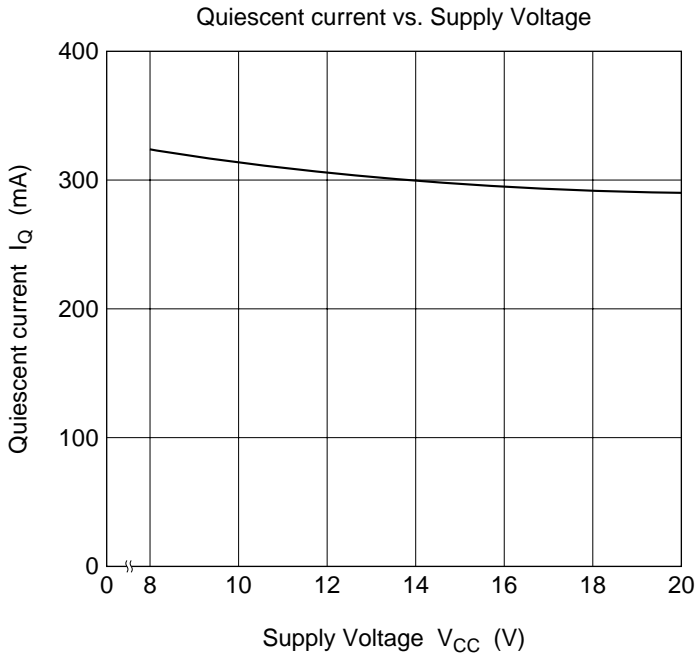
- Notes: 1. Tolerance within 30 seconds.
 2. Tolerance in surge pulse waveform.
 3. Value per 1 channel.
 4. Value when attached on the infinite heat sink plate at $T_a = 25^\circ\text{C}$.
 The derating curve is as shown in the graph below.



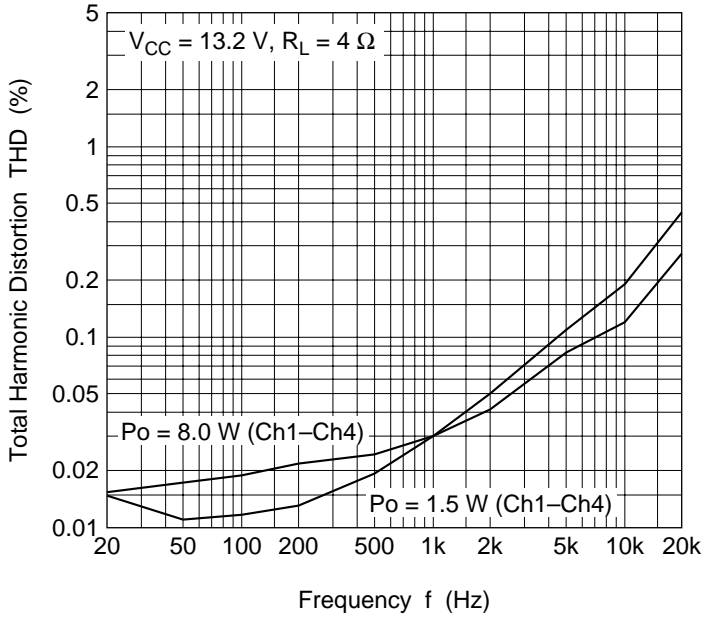
Electrical Characteristics ($V_{CC} = 13.2 \text{ V}$, $f = 1 \text{ kHz}$, $R_L = 4 \text{ } \Omega$, $R_g = 600 \text{ } \Omega$, $T_a = 25^\circ\text{C}$)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Quiescent current	I_{Q1}	—	300	—	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	-1.0	0	+1.0	dB	
Rated output power	P_o	—	19	—	W	$V_{CC} = 13.2 \text{ V}$ THD = 10%, $R_L = 4 \text{ } \Omega$
Max output power	$P_{o\max}$	—	33	—	W	$V_{CC} = 13.7 \text{ V}$, $R_L = 4 \text{ } \Omega$
Total harmonic distortion	T.H.D.	—	0.02	—	%	$P_o = 3 \text{ W}$
Output noise voltage	WBN	—	0.15	—	mVrms	$R_g = 0 \text{ } \Omega$ BW = 20 to 20 kHz
Ripple rejection	SVR	—	55	—	dB	$R_g = 600 \text{ } \Omega$, $f = 120 \text{ Hz}$
Channel cross talk	C.T.	—	70	—	dB	$R_g = 600 \text{ } \Omega$ $V_{out} = 0 \text{ dBm}$
Input impedance	R_{in}	—	25	—	k Ω	
Standby current	I_{Q2}	—	—	10	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	ATTM	—	70	—	dB	$V_{out} = 0 \text{ dBm}$

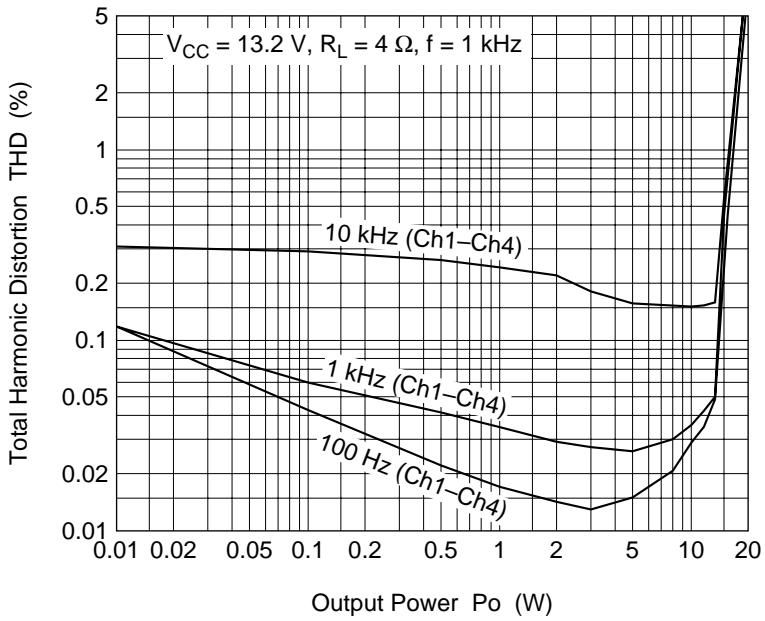
Characteristics Curve

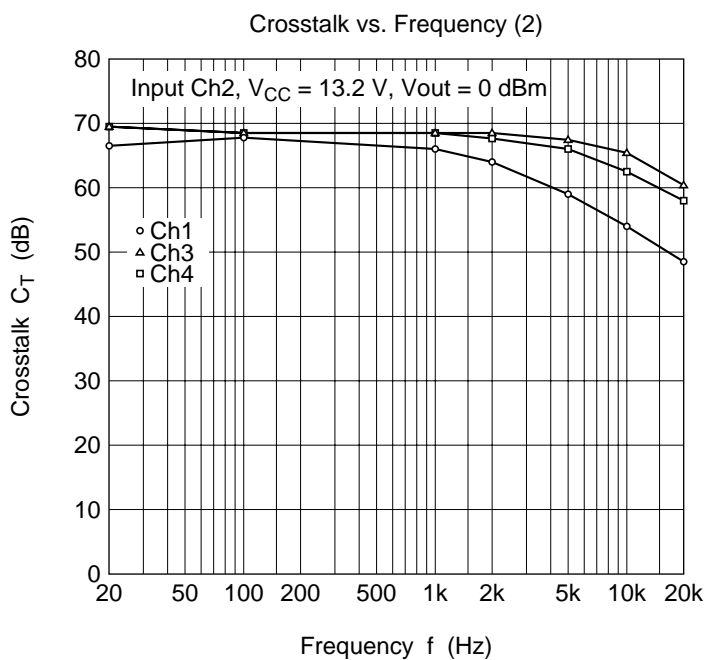
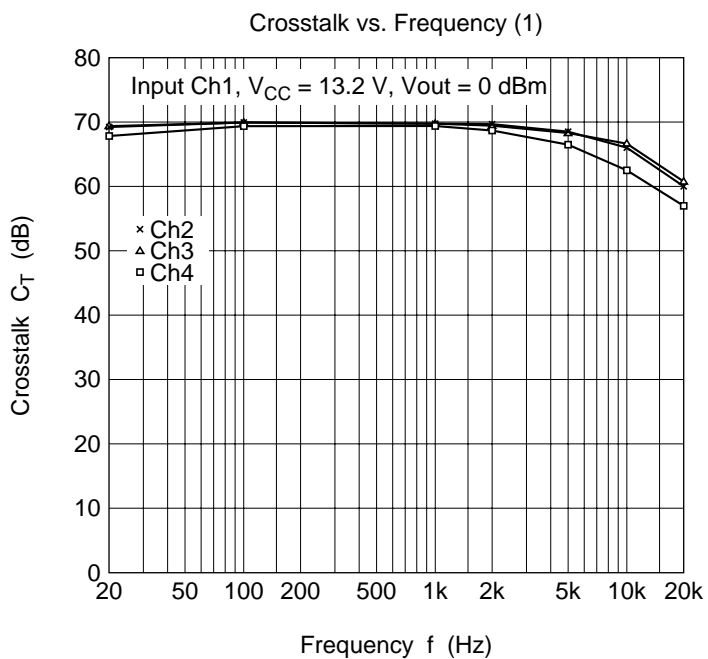


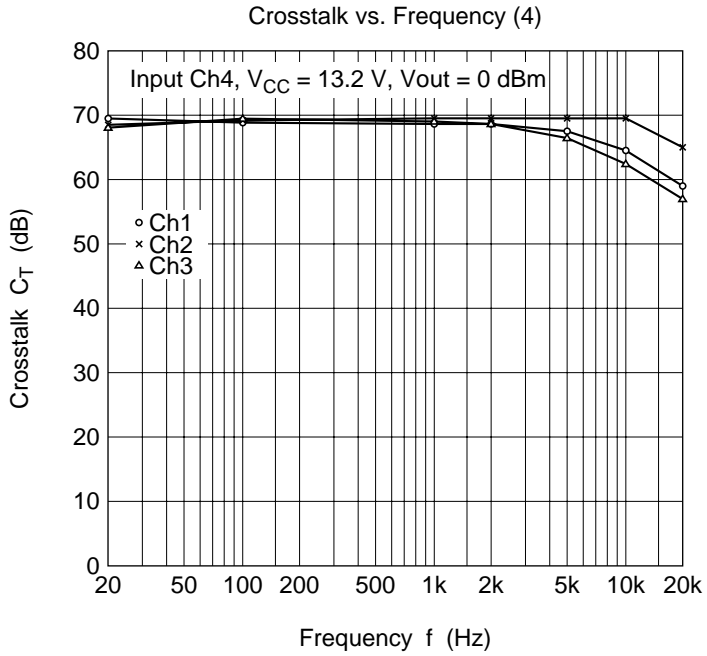
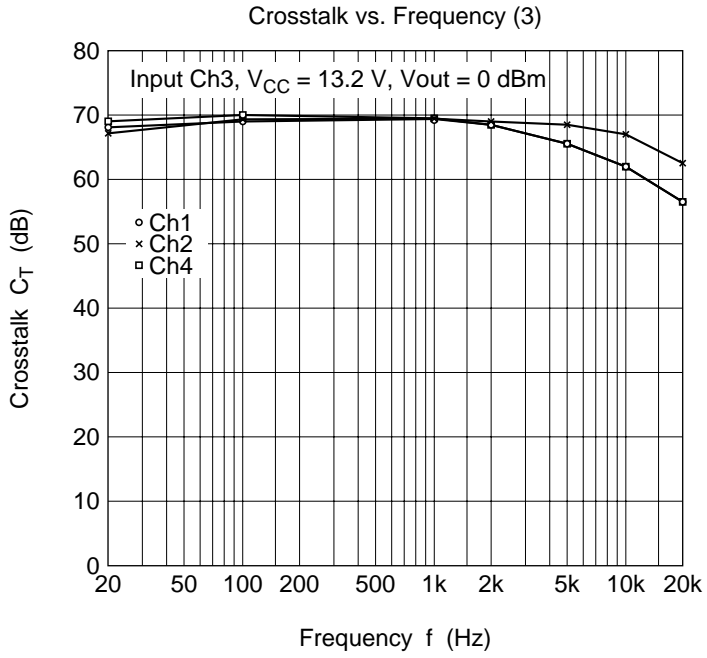
Total Harmonic Distortion vs. Frequency

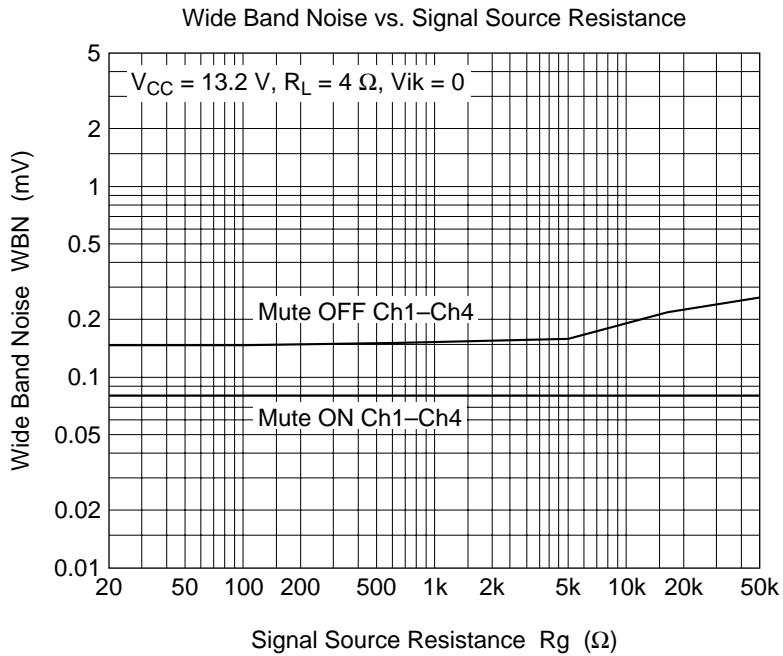
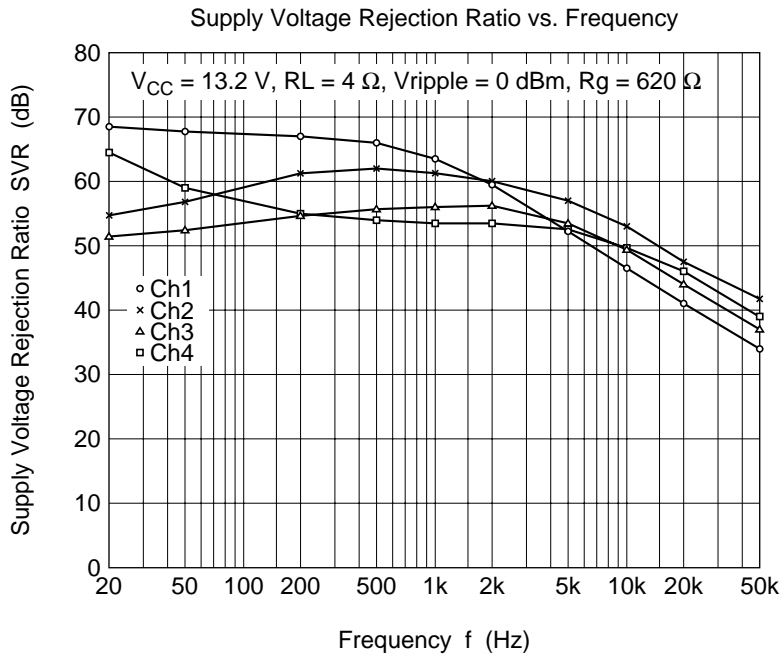


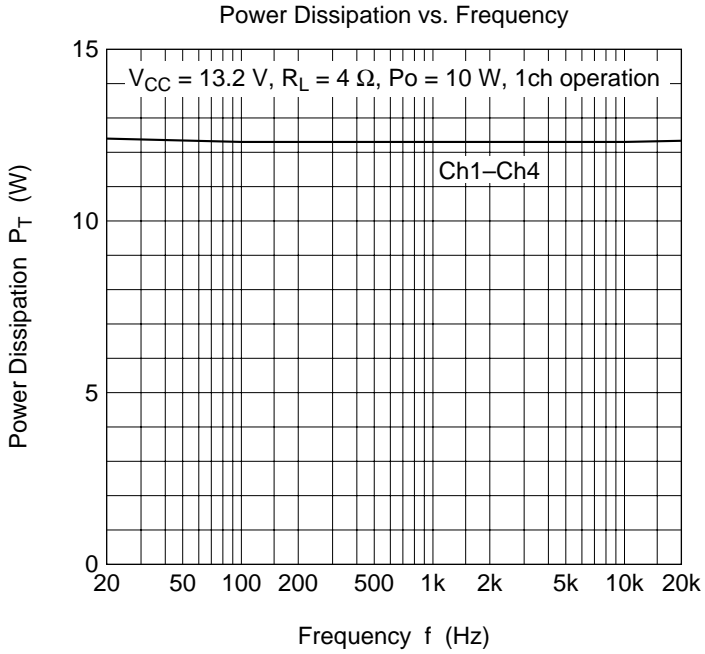
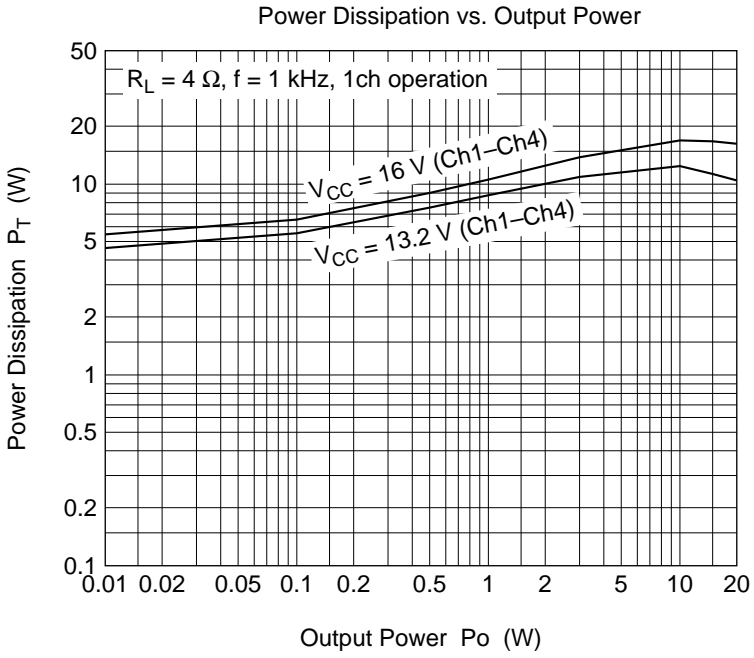
Total Harmonic Distortion vs. Output Power

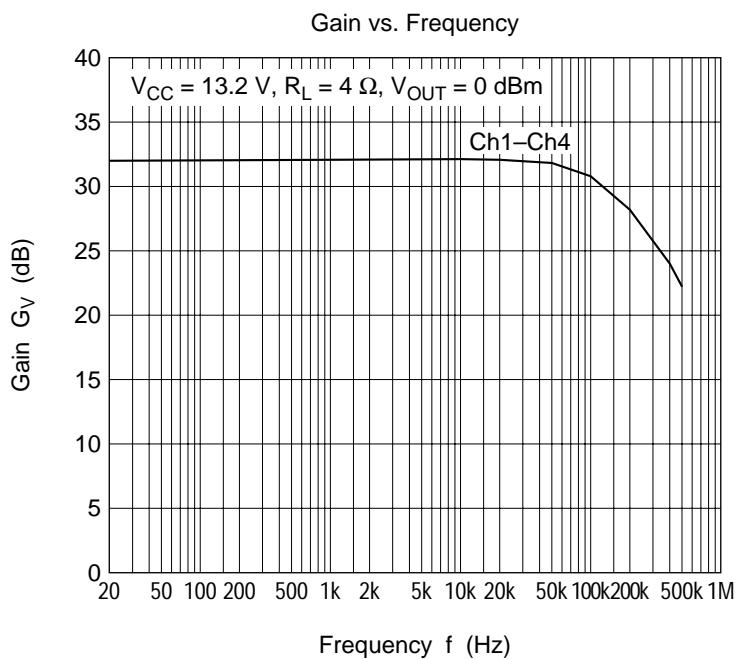






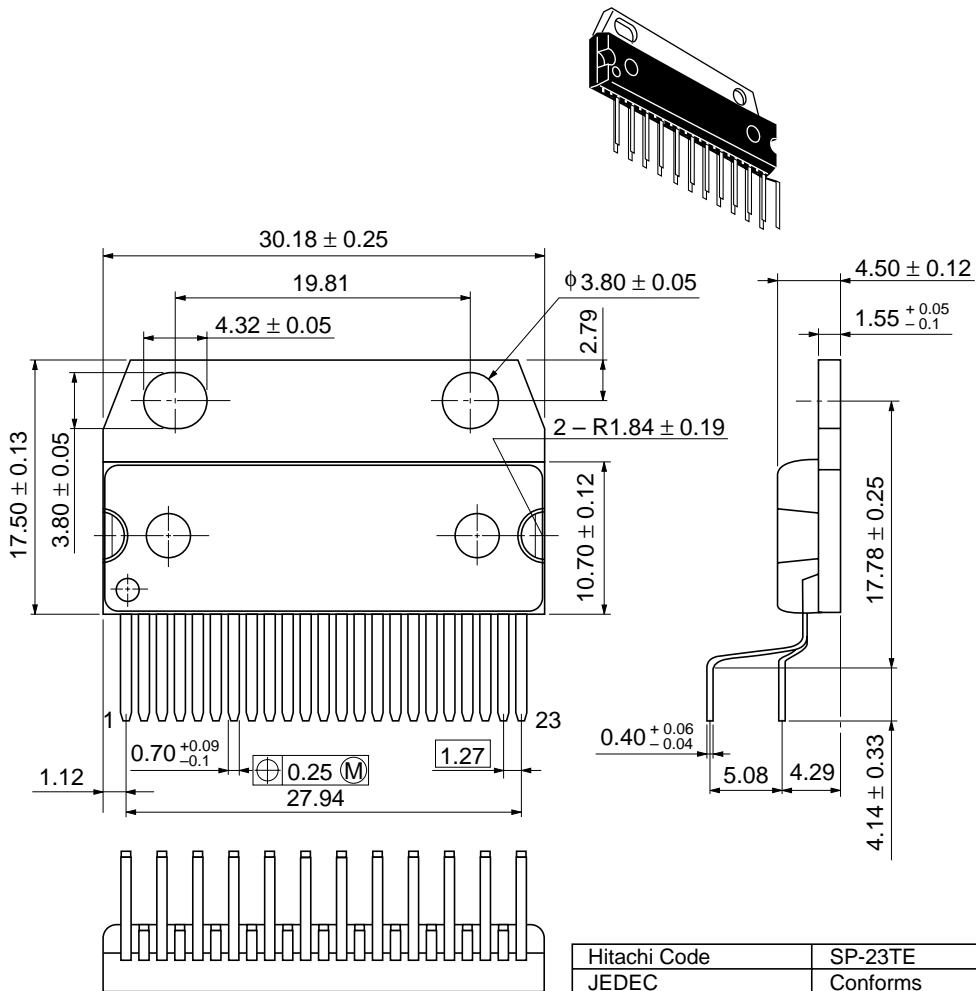






Package Dimensions

Unit: mm



Hitachi Code	SP-23TE
JEDEC	Conforms
EIAJ	—
Weight (reference value)	8.5 g

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