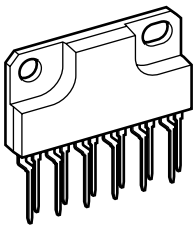
Preliminary TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

T A 8 2 5 8 H

Low-Frequency Power Amplifier

The TA8258H is a dual audio power amplifier for TV and home audio use. The device features high power, low noise and low distortion.



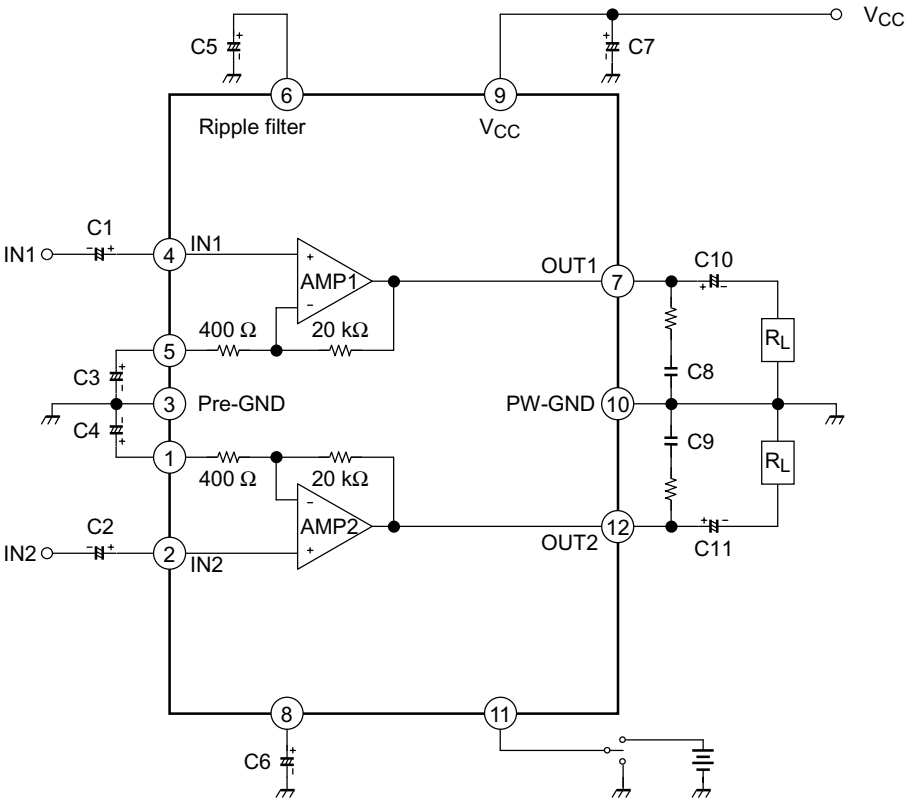
HZIP12-P-1.78B

Weight: 4.04 g (typ.)

Features

- High output power: P_{out} = 20 W/channel
  (V_{CC} = 37 V, R_L = 8 Ω, f = 1 kHz, THD = 10%)
- Few external parts
- Voltage gain: G_V = 34dB (typ.)
- Total harmonic distortion
  THD = 0.05% (P_{out} = 2 W, f = 1 kHz)
- Cross talk
  C.T. = −60dB (f = 1 kHz, R_g = 600 Ω)
- Output noise voltage
  V_{no} = 0.14 mVrms (R_g = 10 kΩ, BPF = 20 Hz~20 kHz)
- Built-in audio muting
- Various built-in protection circuits
  Protection circuits: thermal shutdown, OUT (ac)-GND short.
- Operating supply voltage range: V_{CC} = 15 V~42 V (Ta = 25°C)

Block Diagram



Cautions and Application Method

1. Voltage Gain

(1) Closed-loop voltage gain is determined by R1 and R2.

$$G_V = 20 \log \left(\frac{R_1 + R_2}{R_2}\right) (dB)$$
$$= 20 \log \left(\frac{20\,k + 400}{400}\right) (dB)$$
$$= 34\ (dB)$$

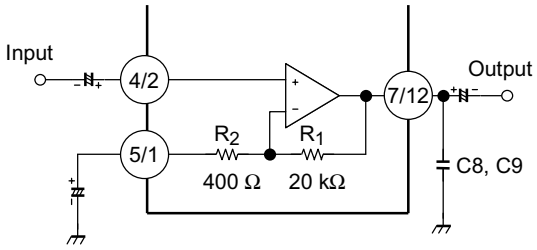


Figure 1

(2) Amplifier with gain < 34dB.

$$G_V = 20 \log \left(\frac{R_1 + R_2 + R_3}{R_2 + R_3}\right) (dB)$$

When R3 = 220 Ω
G_V = 30 (dB)
Is given.

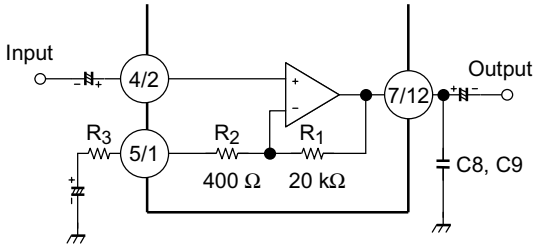


Figure 2

2. The Mounting Place of an Integrated Circuit

This IC cannot withstand the strong electromagnetic fields generated by a CRT. These are likely to cause the device to exhibit malfunctions such as leakage.
Please ensure that the IC is kept away from CRT.

3. Preventive Measures Against Oscillation

To prevent oscillation, it is advisable to use capacitors made of polyester film, which have low temperature and frequency fluctuation daracteristics, as C8 and C9.
The resistance R in series with C8 and C9 performs phase correction at high frequencies and improves the oscillation allowance.

(1) Capacitor rating and type

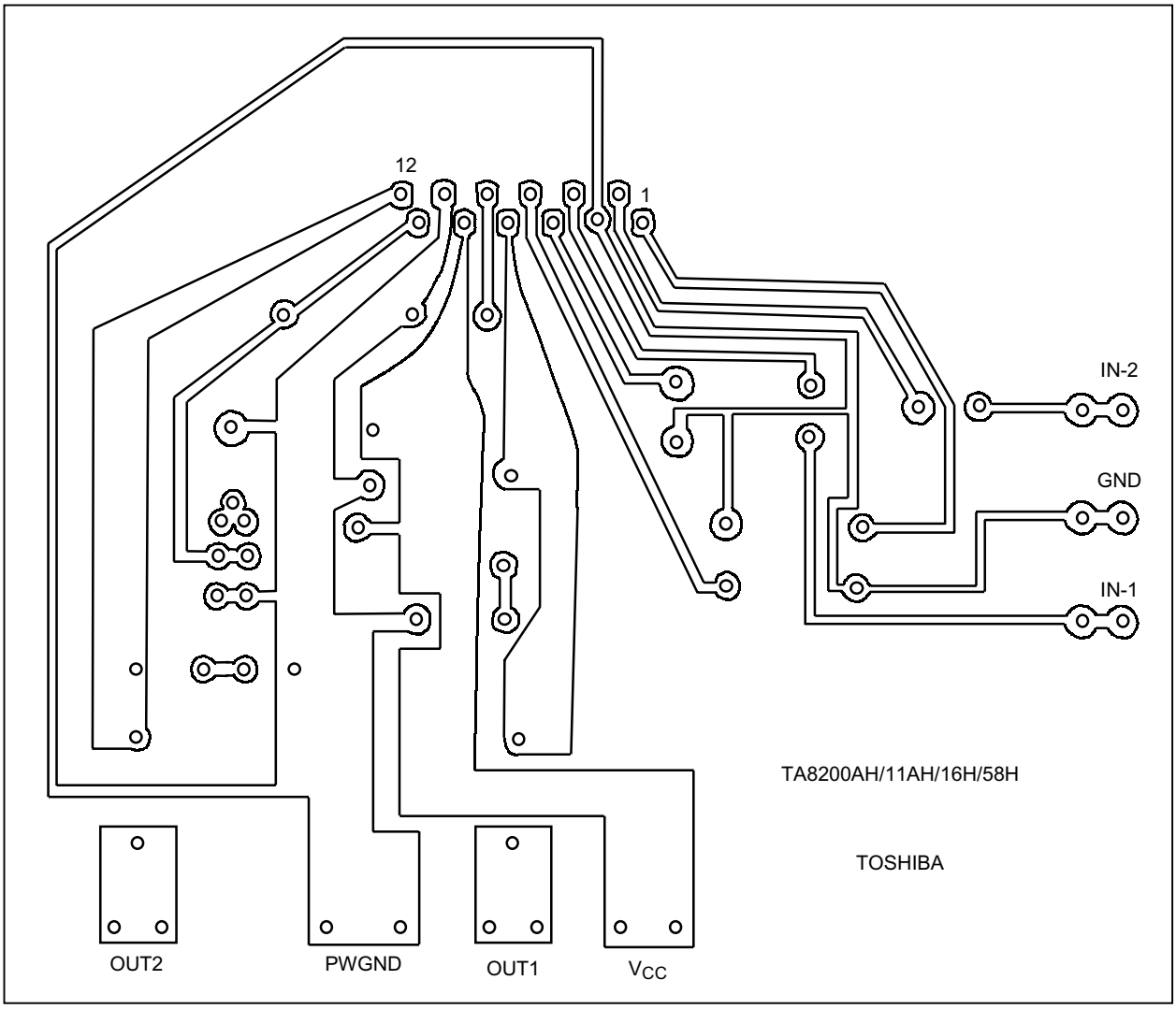
(2) PCB layout

Note 1: Since the oscillation allowance varies according to the PCB layout, it is recommended that a standard Toshiba PCB be used as a reference for design.

4. It is related with the potential of a Heat-sink

Please connected a Heat-sink to GND potential in the case of use, this product.
When the Heat-sink is not connected to GND, THD may get worse.

Standard PCB



(bottom view)

Maximum Ratings (Ta = 25°C)

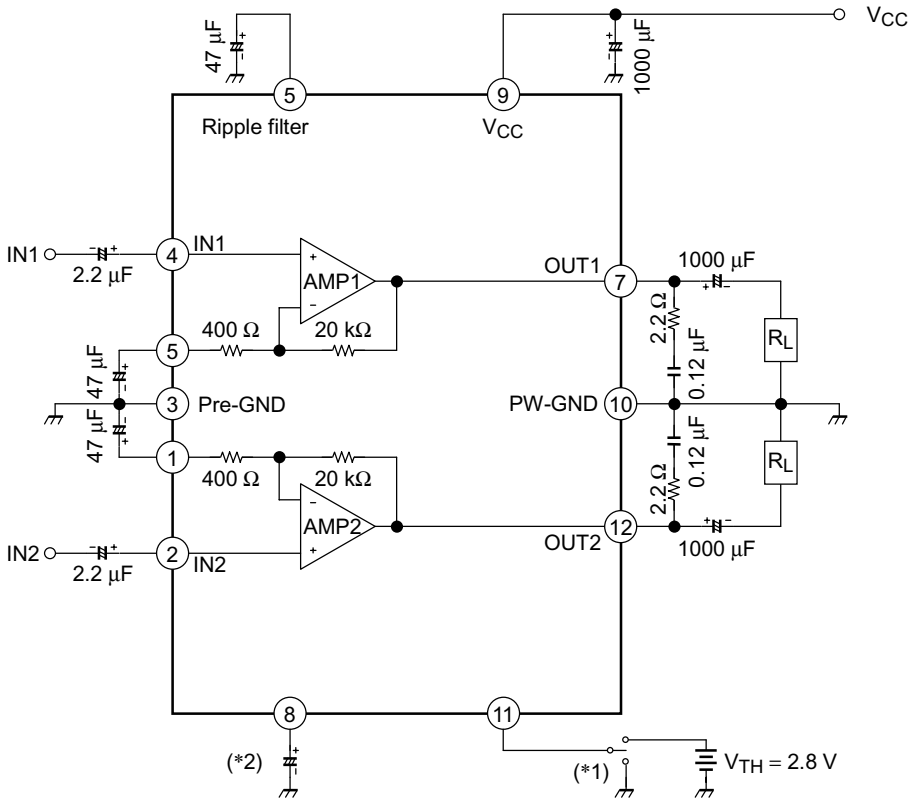
Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	50	V
Output current	$I_{O\ (peak)}$	(3.5)	A
Power dissipation	P_D (Note 2)	25	W
Operating temperature	T_{opr}	−25~75	°C
Storage temperature	T_{stg}	−55~150	°C

Note 2: If Ta > 25°C, derate this value by 200 mW/°C.

Electrical Characteristics
(unless otherwise specified, V_{CC} = 37 V, R_L = 8 Ω, f = 1 kHz, R_g = 600 Ω, Ta = 25°C)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Quiescent current	I_{ccq}	—	V_{IN} = 0	—	75	(110)	mA
Output power	P_{out} (1)	—	THD = 10%	(17)	20	—	W
	P_{out} (2)	—	THD = 1%	—	10	—	
Voltage gain	G_V	—	V_{out} = 0.775 Vrms	32.5	34	35.5	dB
Total harmonic distortion	THD	—	P_{out} = 2 W	—	0.05	(0.2)	%
Input resistance	R_{IN}	—	—	—	30	—	kΩ
Output noise voltage	V_{no}	—	Rg = 10 kΩ BPF: 20 Hz~20 kHz	—	0.13	(0.3)	mVrms
Ripple rejection ratio	R.R.	—	f = 100 Hz, V_{rip} = 0.775 Vrms	(−40)	(−45)	—	dB
Cross talk	C.T.	—	V_{out} = 0.775 Vrms	(−50)	−60	—	dB
Mute threshold voltage	V_{th} (11)	—	Mute ON	GND	—	2.0	V
Mute ATT	ATT	—	V_{out} = 0.775 Vrms → Mute	(−50)	(−60)	—	dB

Test Circuit

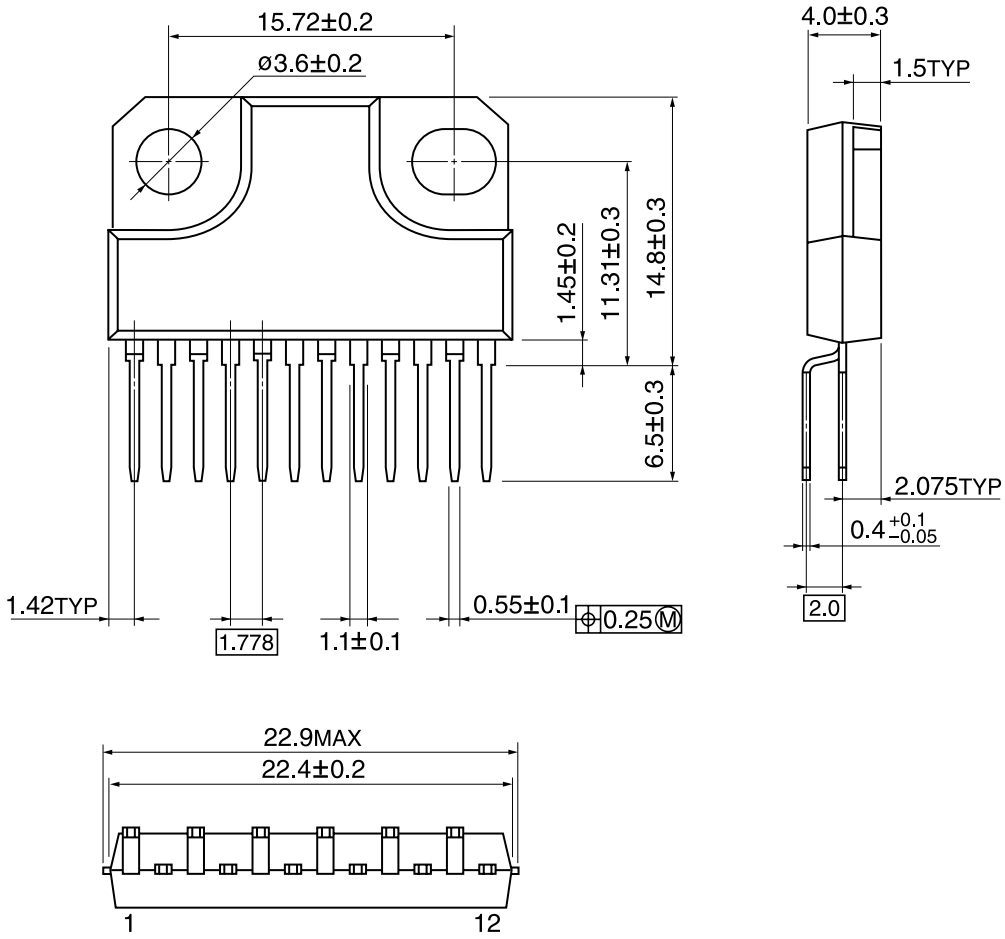


*1: Mute ON when pin 11 Low
V_{TH} = 2.8 V (typ.), V_{CC} = 37 V, Ta = 25°C

*2: Capacitor for reducing popnoise when mute ON

Package Dimensions

HZIP12-P-1.78B Unit: mm



Weight: 4.04 g (typ.)