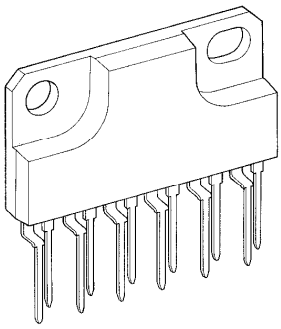
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8211AH

DUAL AUDIO POWER AMPLIFIER

The TA8211AH is dual audio power amplifier for consumer applications.
This IC provides an output power of 6 watts per channel (at V_{CC} = 20 V, f = 1 kHz, THD = 10%, R_L = 8 Ω).
It is suitable for power amplifier of TV and home stereo.



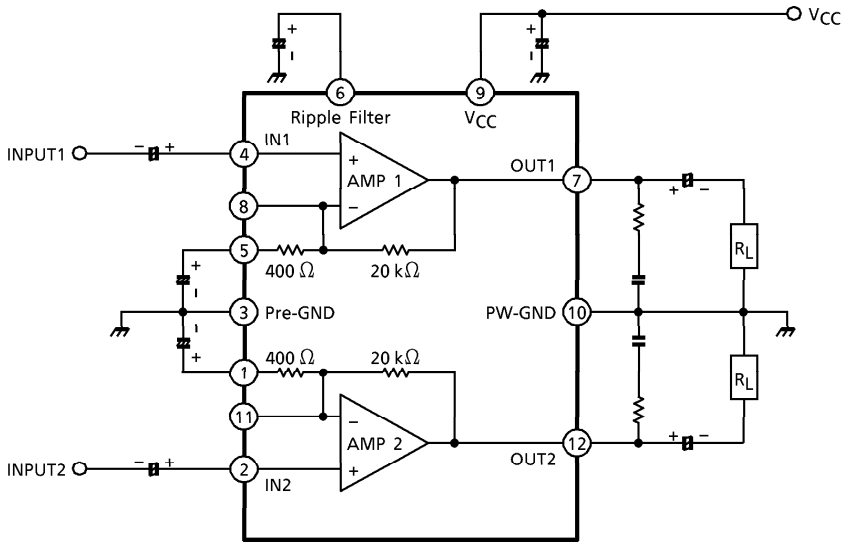
HZIP12-P-1.78B

Weight : 4.04 g (Typ.)

FEATURES

- High Output Power : P_{out} = 6 W / channel (Typ.)
  (V_{CC} = 20 V, R_L = 8 Ω, f = 1 kHz, THD = 10%)
- Low Noise : V_{no} = 0.14 mV_{rms} (Typ.)
  (V_{CC} = 28 V, R_L = 8 Ω, G_V = 34 dB, R_g = 10 kΩ, BW = 20 Hz~20 kHz)
- Very Few External Parts
- Built In Thermal Shut Down Protector Circuit
- Operating Supply Voltage Range : $V_{CC\,(opr)}$ = 10~30 V (Ta = 25°C)

BLOCK DIAGRAM



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APPLICATION INFORMATION

(1) Voltage gain

The closed loop voltage gain is determined by R_1, R_2.

$$G_V = 20 \log \frac{R_1 + R_2}{R_2} \text{ (dB)}$$

$$= 20 \log \frac{20\,k\Omega + 400\,\Omega}{400\,\Omega}$$

$$\fallingdotseq 34 \text{ (dB)}$$

(a) Amplifier with gain > 34 dB

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

When $R_3 = 400\,\Omega$

$G_V \fallingdotseq 40$ (dB)

is given.

(b) Amplifier with gain < 34 dB

$$G_V = 20 \log \frac{R_1 + R_2 + R_4}{R_2 + R_4} \text{ (dB)}$$

When $R_4 = 220\,\Omega$

$G_V \fallingdotseq 30$ (dB)

is given.

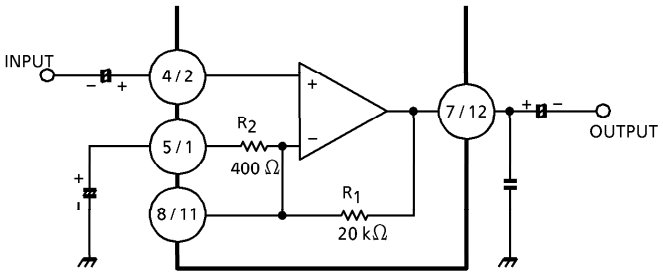


Fig.1

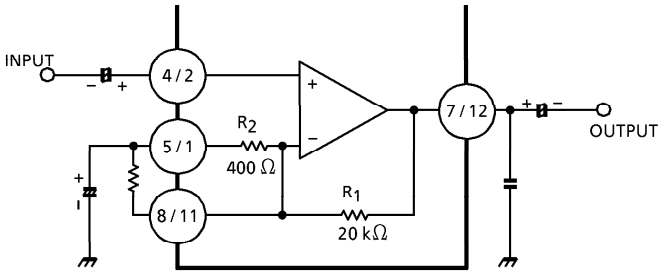


Fig.2

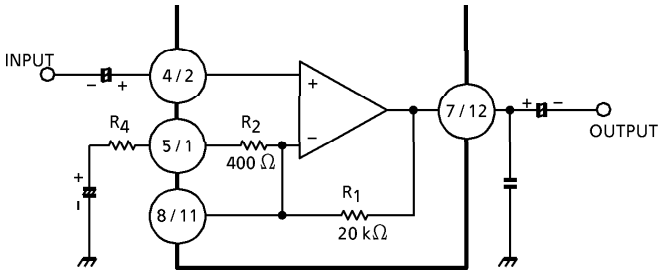
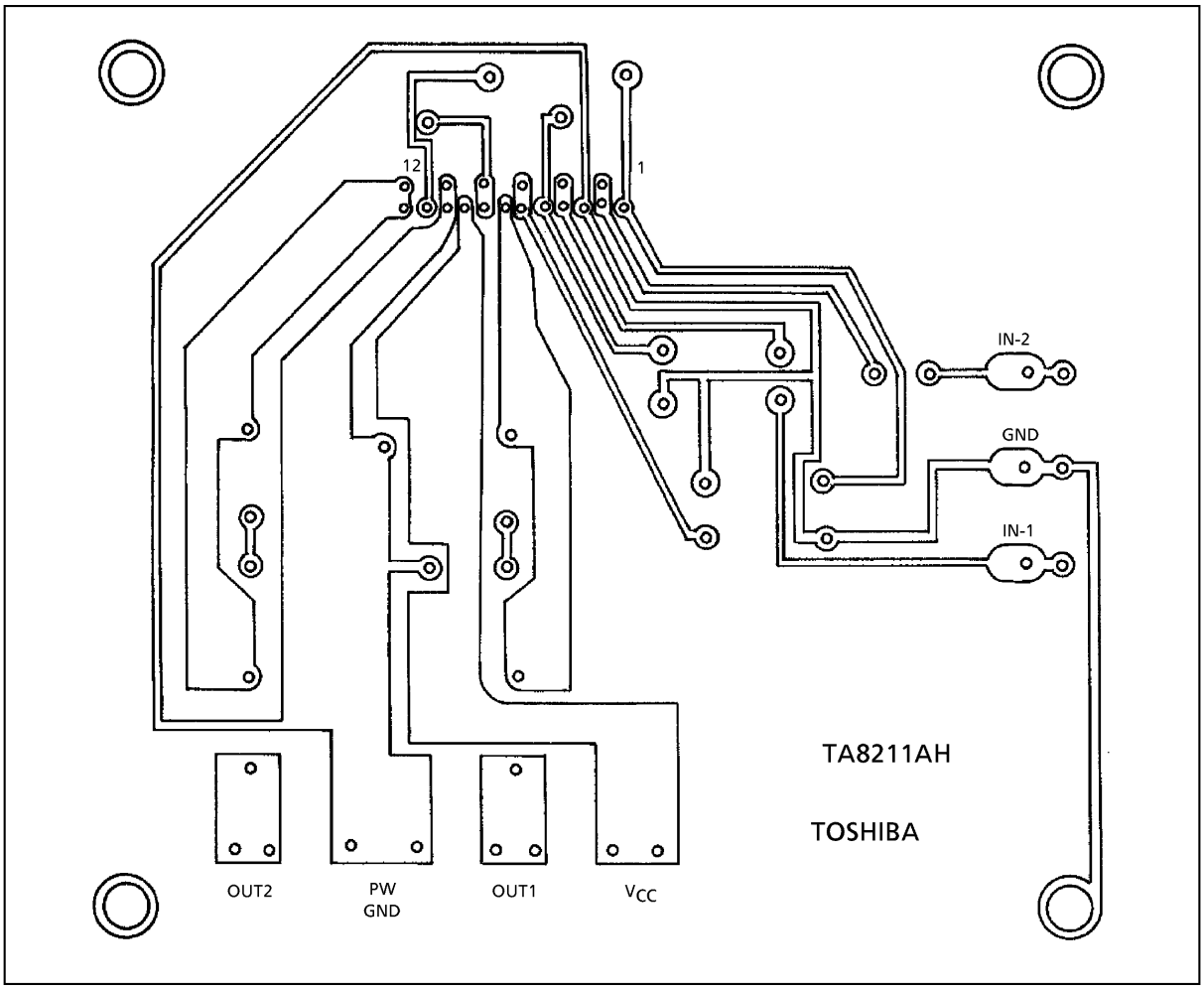


Fig.3

STANDARD P.C.B



(BOTTOM VIEW)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	30	V
Output Current (Peak / Ch)	$I_{O\ (peak)}$	2	A
Power Dissipation	P_D (Note)	25	W
Operating Temperature	T_{opr}	−20~75	°C
Storage Temperature	T_{stg}	−55~150	°C

(Note) : Derated above Ta = 25°C in the proportion of 200 mW / °C.

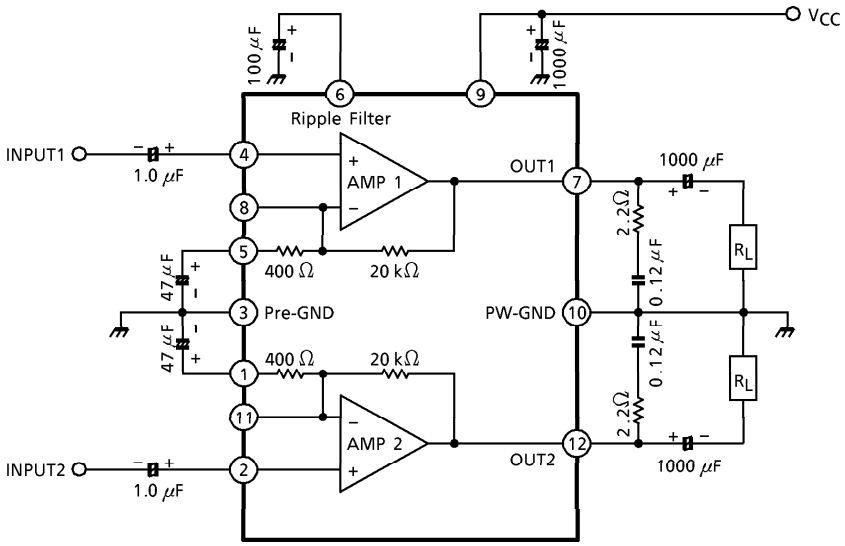
ELECTRICAL CHARACTERISTICS
(Unless otherwise specified, V_{CC} = 20 V, R_L = 8 Ω, R_g = 600 Ω, f = 1 kHz, Ta = 25°C)

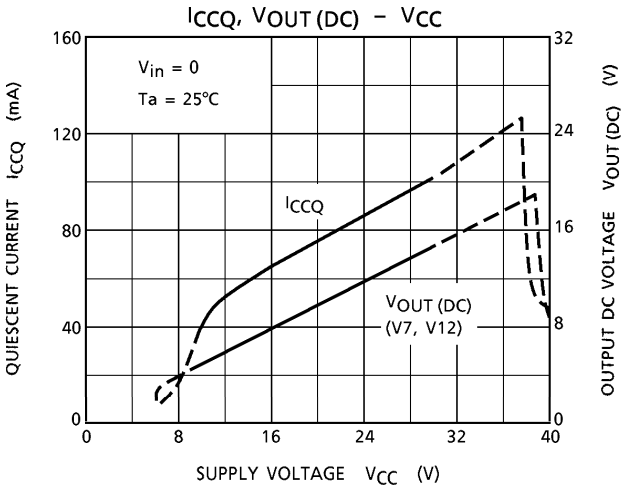
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	—	V_{in} = 0	—	75	130	mA
Output Power	$P_{out\ (1)}$	—	THD = 10%	5.0	6.0	—	W
	$P_{out\ (2)}$	—	THD = 1%	—	4.5	—	
Total Harmonic Distortion	THD	—	P_{out} = 2 W	—	0.1	0.6	%
Closed Loop Voltage Gain	G_V	—	V_{out} = 0.775 V_{rms} (0 dBm)	32.5	34.0	35.5	dB
Open Loop Voltage Gain	G_{VO}	—		—	60	—	dB
Input Resistance	R_{IN}	—		—	30	—	kΩ
Ripple Rejection Ratio	R.R.	—	R_g = 0, f_{ripple} = 100 Hz V_{ripple} = 0.775 V_{rms} (0 dBm)	−45	−57	—	dB
Output Noise Voltage	V_{no}	—	R_g = 10 kΩ, BW = 20 Hz~20 kHz	—	0.14	0.3	mV_{rms}

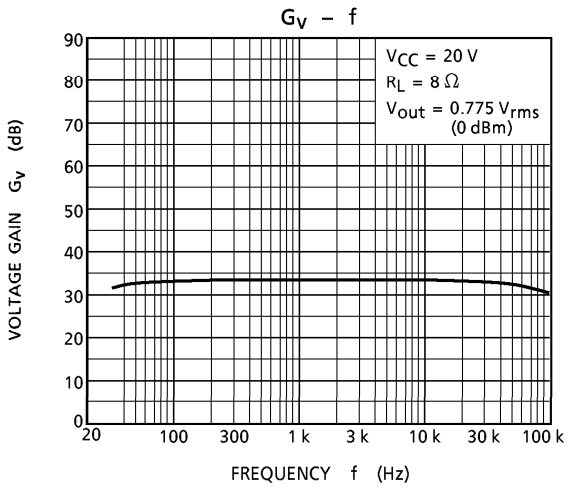
TYP. DC VOLTAGE OF EACH TERMINAL (V_{CC} = 20 V, Ta = 25°C)

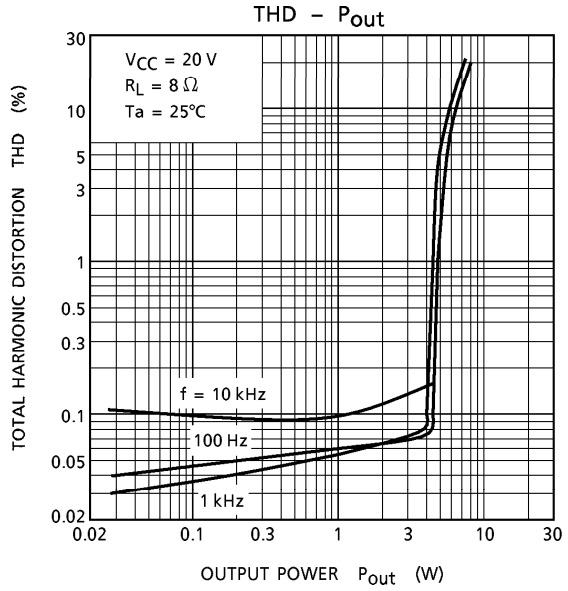
TERMINAL No.	1	2	3	4	5	6	7	8	9	10	11	12
DC Voltage (V)	2.1	2.25	GND	2.25	2.1	6.8	9.8	2.25	V_{CC}	GND	2.25	9.8

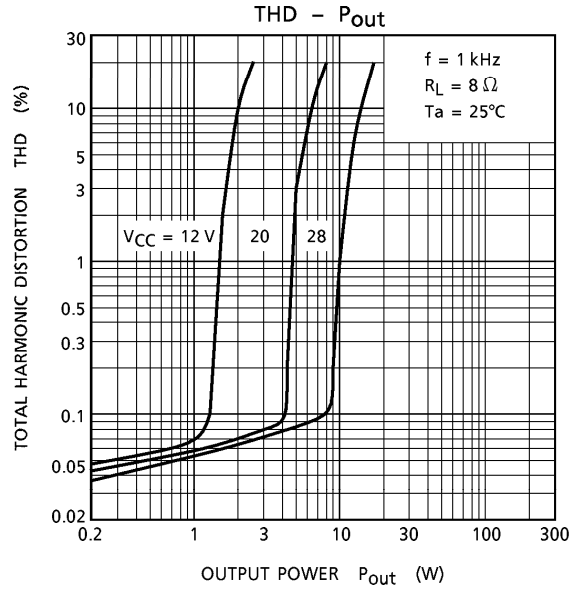
TEST CIRCUIT

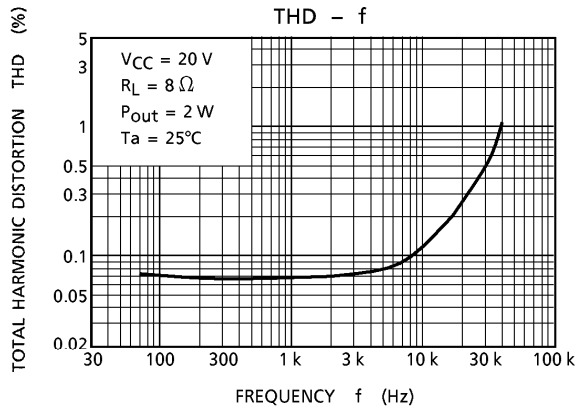


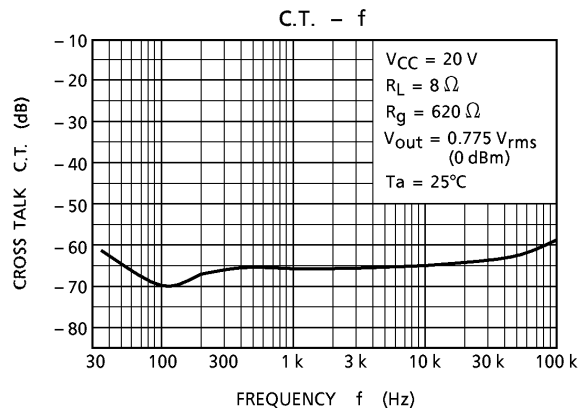

I_{CCQ}, $V_{OUT\,(DC)}$ – V_{CC}
V_{in} = 0
Ta = 25°C
I_{CCQ}
$V_{OUT\,(DC)}$
(V7, V12)
QUIESCENT CURRENT I_{CCQ} (mA)
OUTPUT DC VOLTAGE $V_{OUT\,(DC)}$ (V)
SUPPLY VOLTAGE V_{CC} (V)


G_V – f
V_{CC} = 20 V
R_L = 8 Ω
V_{out} = 0.775 V_{rms}
(0 dBm)
VOLTAGE GAIN G_V (dB)
FREQUENCY f (Hz)

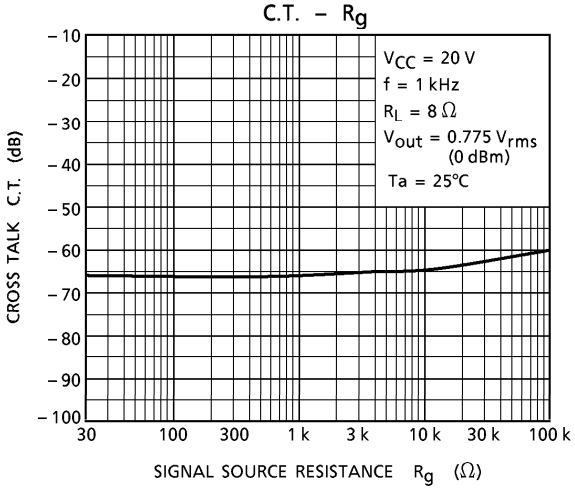

THD – P_{out}
V_{CC} = 20 V
R_L = 8 Ω
Ta = 25°C
f = 10 kHz
100 Hz
1 kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{out} (W)


THD – P_{out}
f = 1 kHz
R_L = 8 Ω
Ta = 25°C
V_{CC} = 12 V
20
28
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT POWER P_{out} (W)

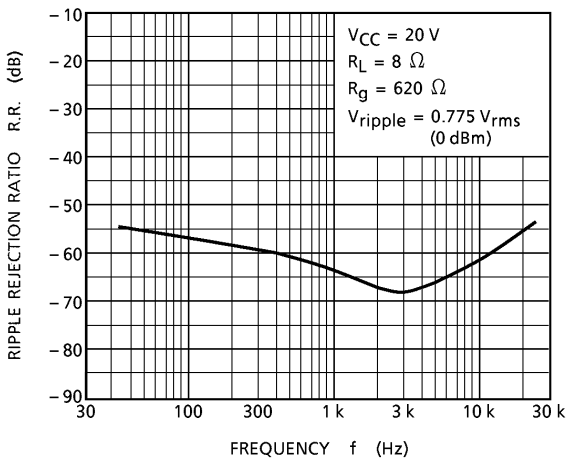

THD – f
V_{CC} = 20 V
R_L = 8 Ω
P_{out} = 2 W
Ta = 25°C
TOTAL HARMONIC DISTORTION THD (%)
FREQUENCY f (Hz)


C.T. – f
V_{CC} = 20 V
R_L = 8 Ω
R_g = 620 Ω
V_{out} = 0.775 V_{rms}
(0 dBm)
Ta = 25°C
CROSS TALK C.T. (dB)
FREQUENCY f (Hz)

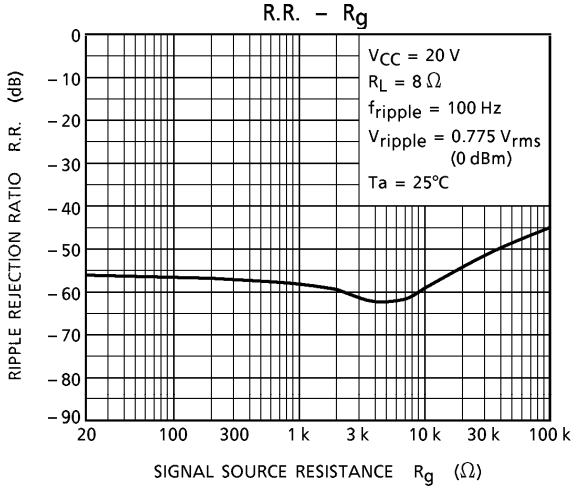
C.T. – R_g



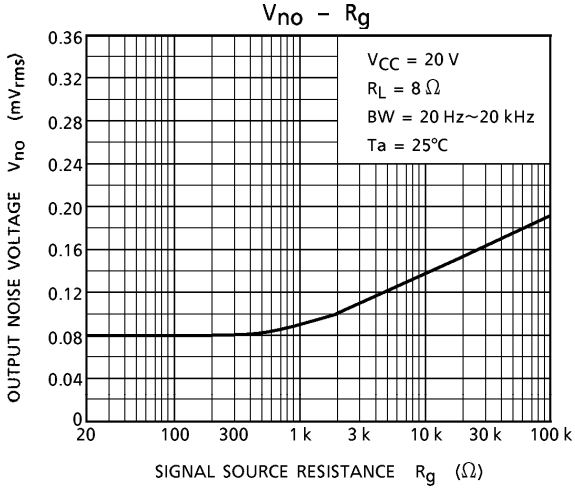
R.R. – f



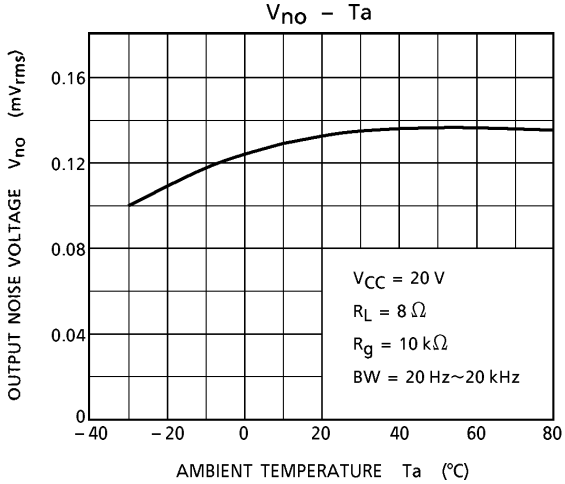
R.R. – R_g



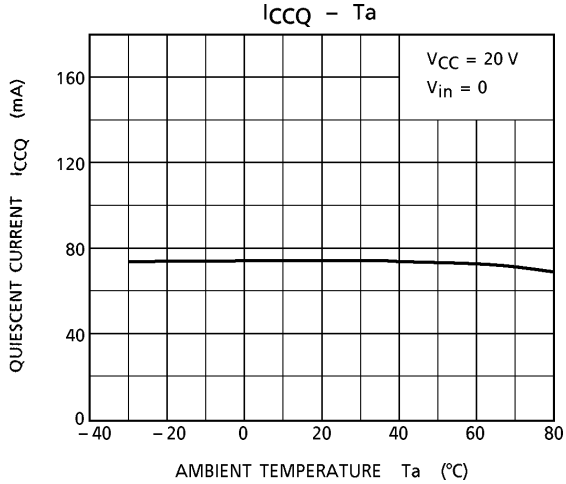
V_{no} – R_g



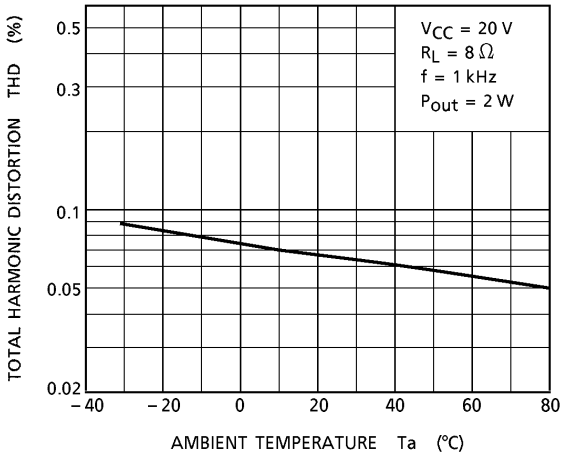
V_{no} – Ta



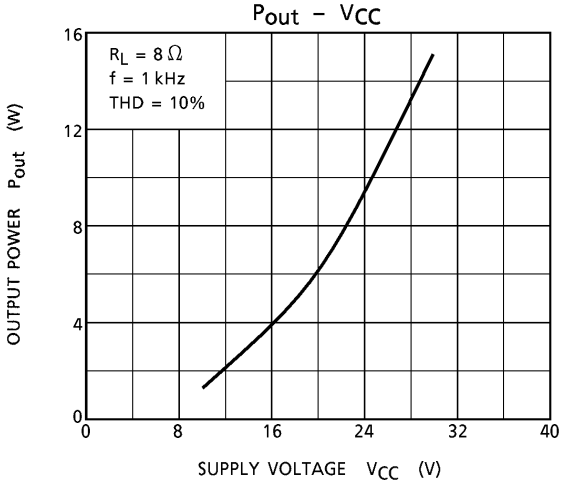
I_{CCQ} – Ta



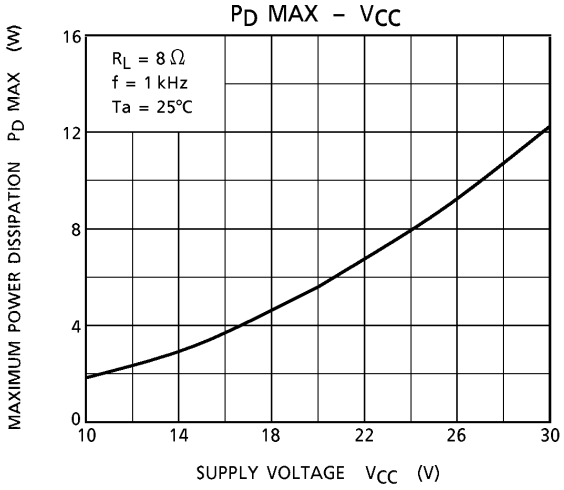
THD – Ta



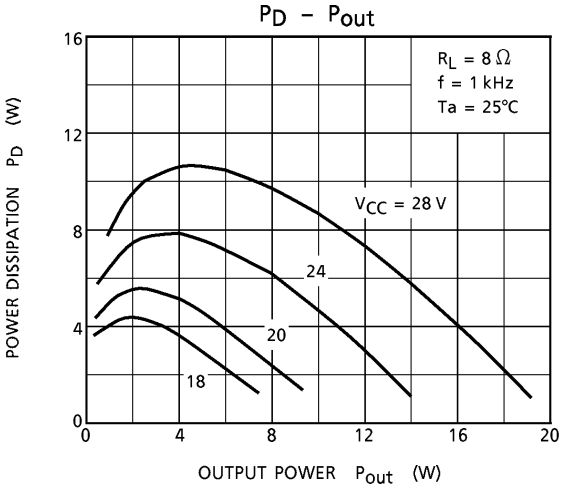
P_{out} – V_{CC}



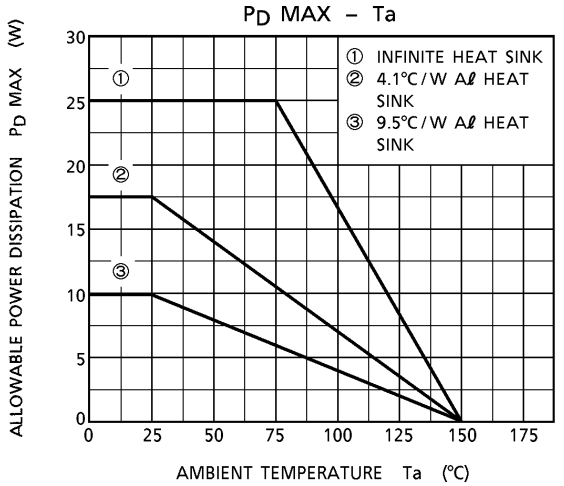
P_D MAX – V_{CC}



P_D – P_{out}



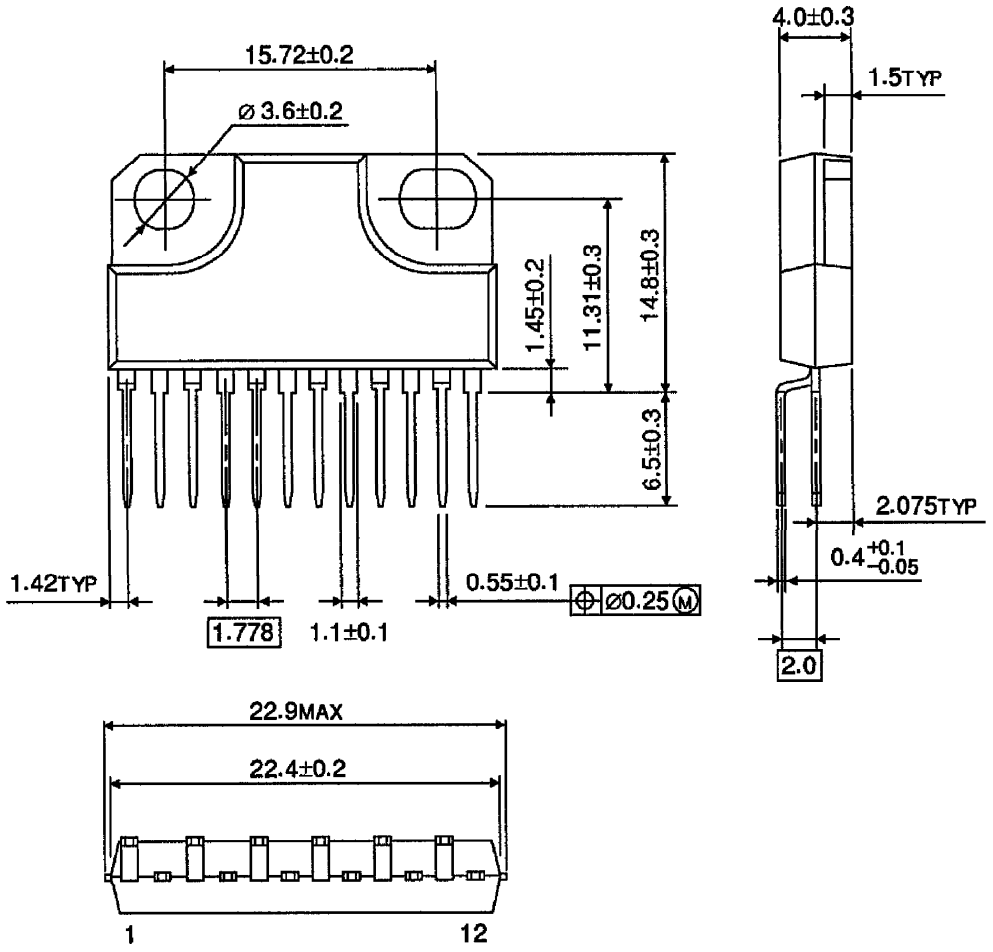
P_D MAX – Ta



PACKAGE DIMENSIONS

HZIP12-P-1.78B

Unit : mm



Weight : 4.04 g (Typ.)