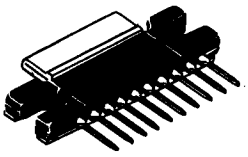
# HA1368/R

## 5.3W AUDIO POWER AMPLIFIER

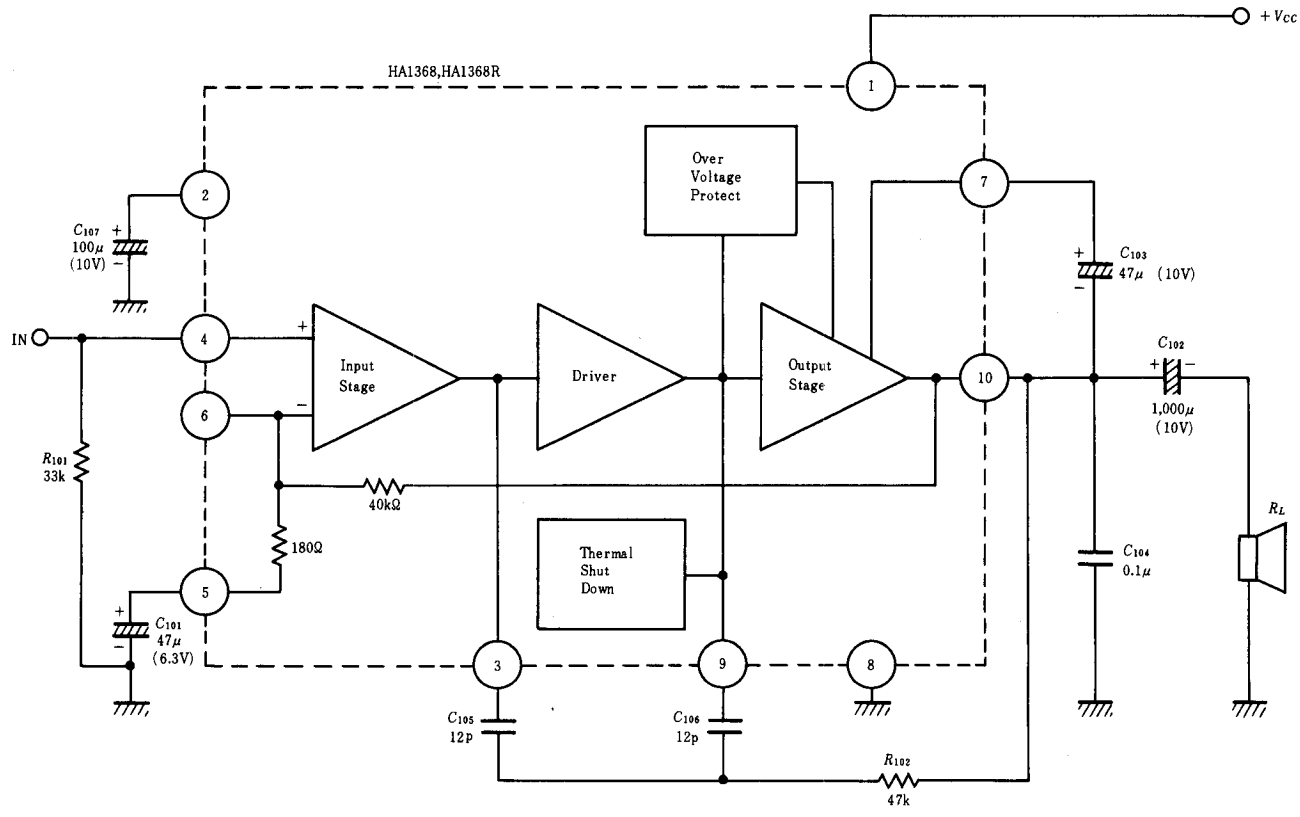
### ■ FEATURE

- Two kinds of pin configulation are available; normal (HA1368) and reverse (HA1368R) for easier layout design of printed circuit board when used in stereo applications
- Very low distortion in the wide range of frequency; Total harmonic distortion is lower than 0.5% (typ. 0.2%) when output power is from 0.1 watts to 3 watts and frequency range is from 100Hz to 10kHz.
- Easy to assemble a chassis by heat-sink, due to the single-in-line package with no electrical isolation.
- Thermal shut-down circuit provided,
  If the chip temperature reaches 150°C, the output power and current drain are automatically reduced to maintain the device safely.
- Overvoltage handling capability up to 40 volts for 200 ms pulse duration.
- No damage for reverse insertion on the printed circuit board.



(SP-10TA)

### ■ BLOCK DIAGRAM AND TYPICAL APPLICATION CIRCUIT




Notes: 1. Recommended capacitor for $C_{104}$ is a non-inductive polyester film type or the equivalent.
2. The terminal 6 is for gain adjustment. When a resistor is connected between pin 6 and 5, $G_V$ becomes higher. When a resistor and capacitor are series connected between pin 6 and 10, $G_V$ is reduced.

## ■ ABSOLUTE MAXIMUM RATINGS ($Ta$=25°C)

| Item | Symbol | Rating | Unit | Notes |
|---|---|---|---|---|
| DC Supply Voltage | $V_{CC}$ | 18 | V | 1 |
| Peak Supply Voltage | $V_{surge}$ | 40 | V | 2 |
| Output Current | $i_{O(peak)}$ | 4.5 | A | 3 |
| Power Dissipation | $P_T$ | 7.2 | W | 4 |
| Junction Temperature | $T_j$ | 150 | °C | |
| Thermal Resistance | $\theta_{j-c}$ | 10 | °C/W | |
| Operating Temperature | $T_{opr}$ | −20 to +70 | °C | 5 |
| Storage Temperature | $T_{stg}$ | −55 to +125 | °C | |

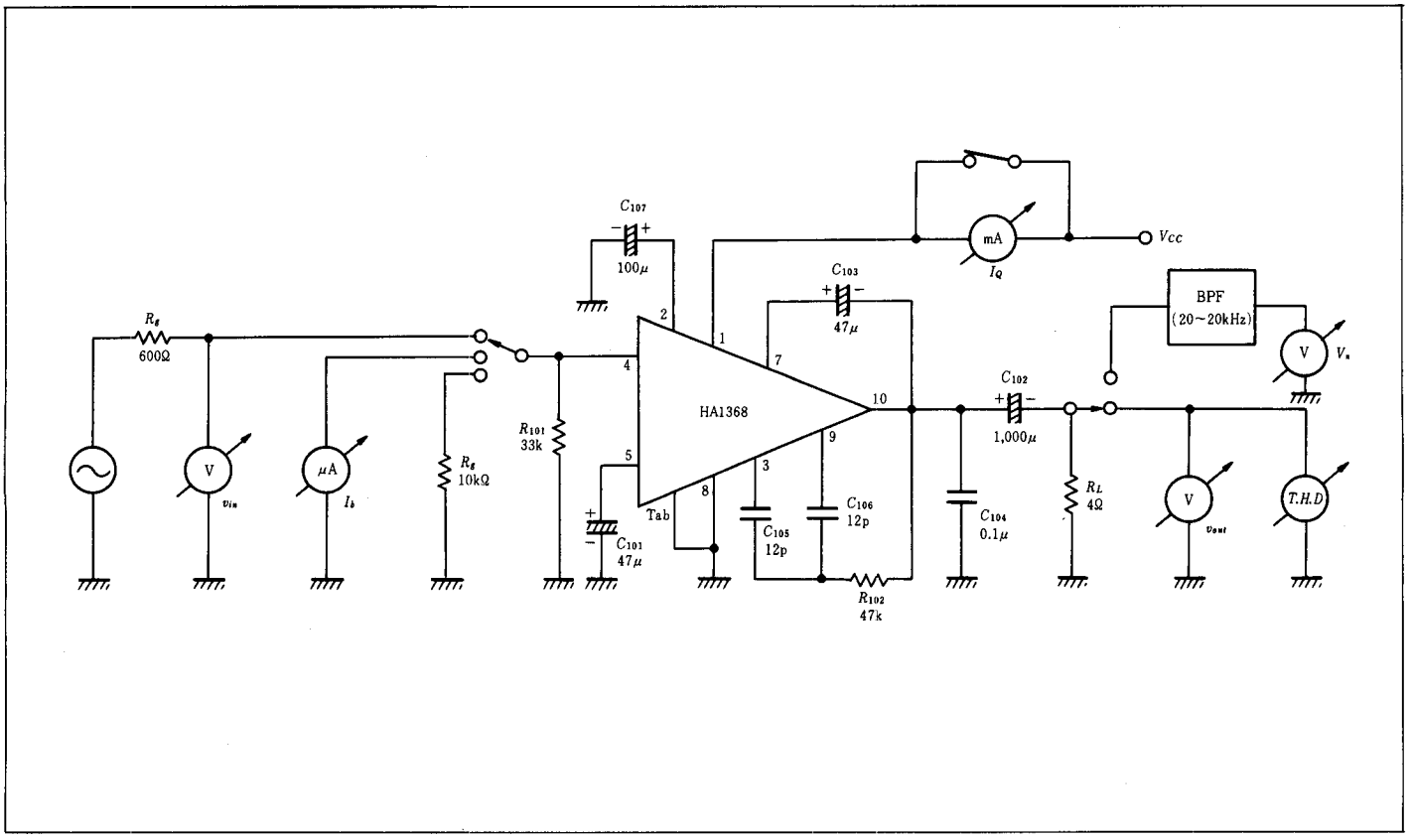
Notes : 1. Standard operating voltage is 13.2V
2. $t$=200ms
3. $i_{O(peak)}$ is determined from the ratio of $V_{CC}$ to $R_L$.
4. Value at $T_C$=78°C
5. The value when 2.8 watts are dissipated mounted on an aluminium plate (20cm² × 1.5mmt). 2.8watts is a maximum dissipation at $V_{CC}$=13.2V

## ■ ELECTRICAL CHARACTERISTICS ($Ta$=25°C)

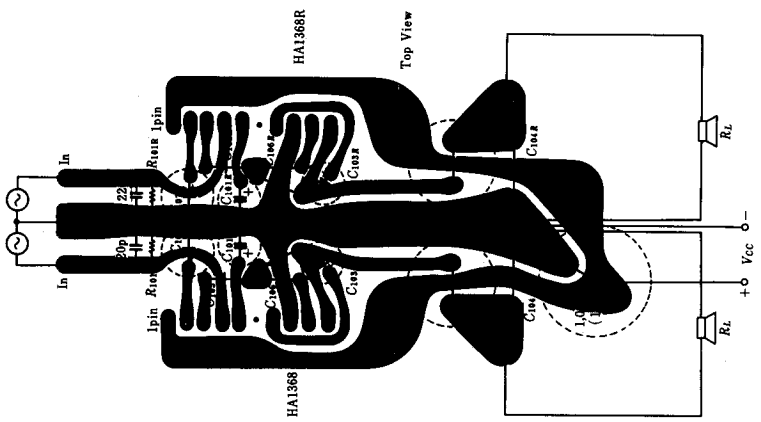
| Item | Symbol | Test Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Quiescent Current | $I_Q$ | $V_{in}$=0 | — | 40 | 80 | mA |
| Input Bias Current | $I_b$ | | — | — | 2 | μA |
| Voltage Gain | $G_V$ | $f$=1kHz | 44.5 | 47 | 49.5 | dB |
| Output Power | $P_{out}$ | $f$=1kHz, $T.H.D$=10% | 4.5 | 5.3 | — | W |
| Total Harmonic Distortion | $T.H.D$ | $f$=1kHz, $P_{out}$=0.5W | — | 0.08 | 0.5 | % |
| Noise Output | $V_N$ | $Rg$=10kΩ, $BW$=20 to 20kHz | — | — | 1.2 | mV |
| Input Resistance | $R_{in}$ | $f$=1kHz | — | 33 | — | kΩ |

Note : Standard test conditions are,
$V_{CC}$=13.2V, $R_L$=4Ω, $R_g$=600Ω

## ■ TEST CIRCUIT



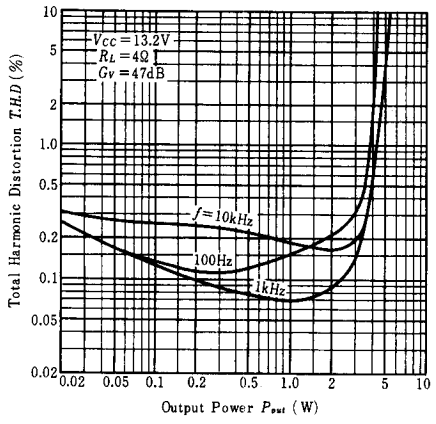
## ■ PC-BOARD LAYOUT PATTERN



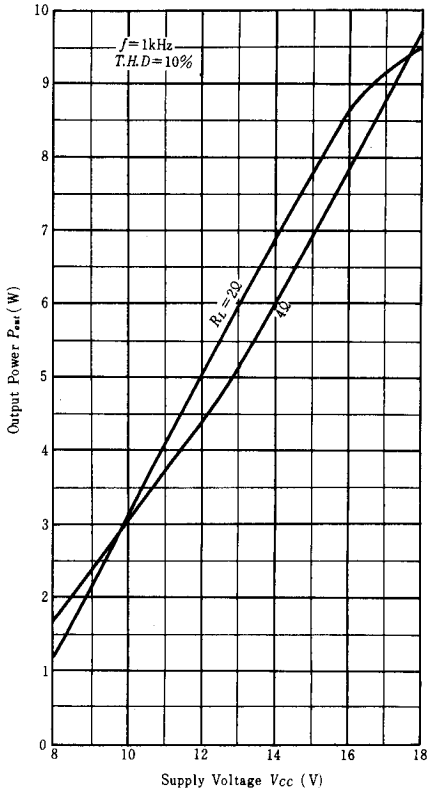

(Bottom View)

Note: Resistance of a printed circuit board must be taken special care to obtain as small value as possible.

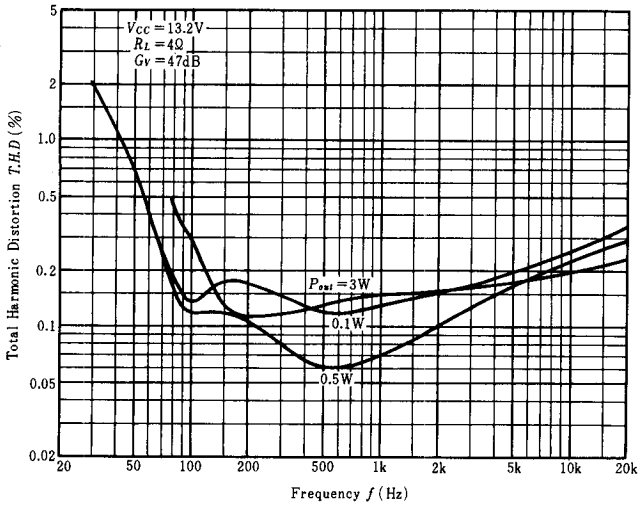
## TOTAL HARMONIC DISTORTION VS. OUTPUT POWER



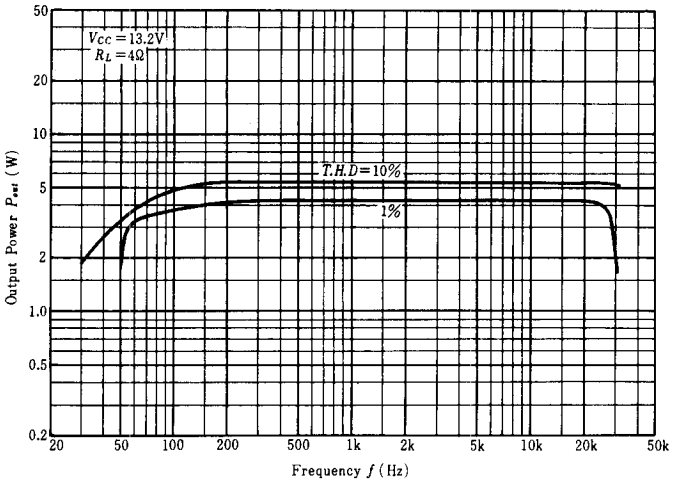

## OUTPUT POWER VS. SUPPLY VOLTAGE



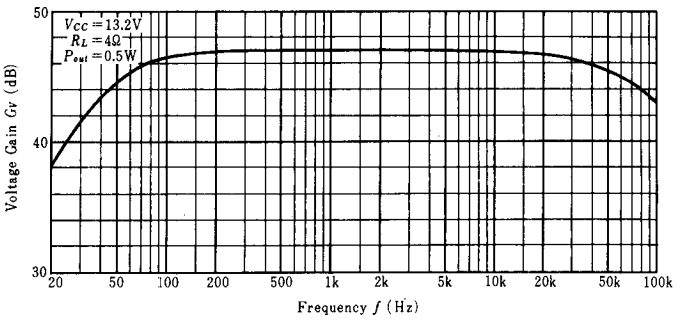

## TOTAL HARMONIC DISTORTION VS. FREQUENCY



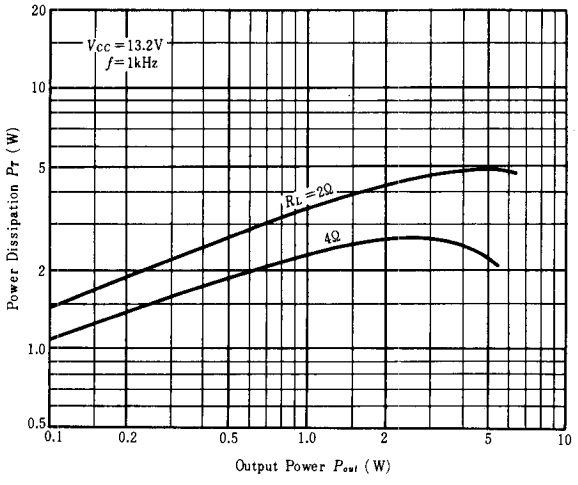
## OUTPUT POWER VS. FREQUENCY



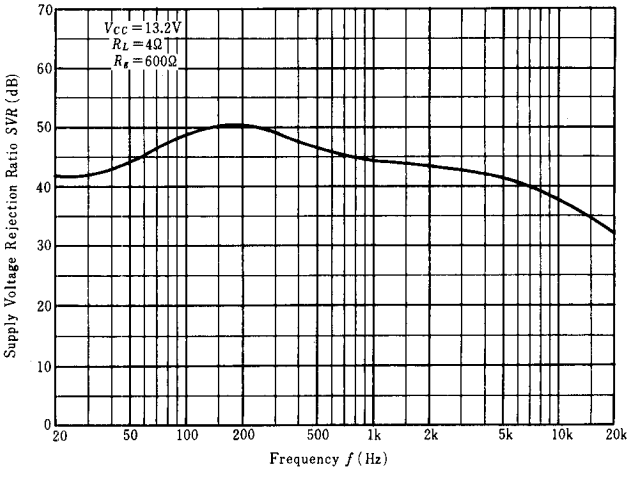

## VOLTAGE GAIN VS. FREQUENCY



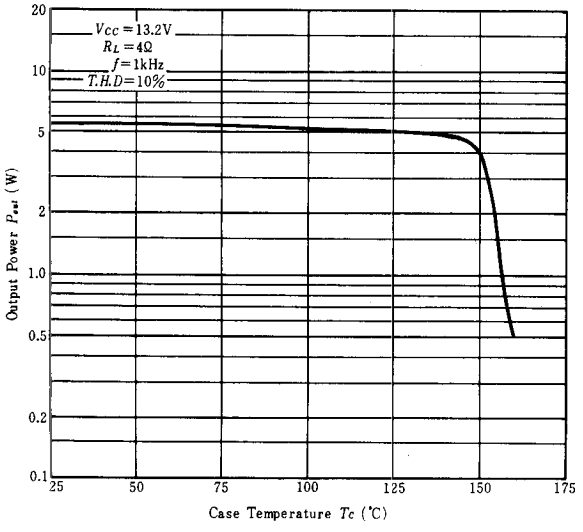

## POWER DISSIPATION VS. OUTPUT POWER




## SUPPLY VOLTAGE REJECTION RATIO VS. FREQUENCY




## OUTPUT POWER VS. CASE TEMPERATURE




## QUIESCENT CURRENT VS. SUPPLY VOLTAGE