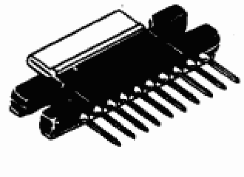
# HA1366W/WR

## 5.5W AUDIO POWER AMPLIFIER

Hitachi HA1366W/HA1366WR is a class-B power amplifier designed especially for car radios and car stereo amplifiers encapsulated in a plastic single-in-line package, and is capable of driving low impedance loads down to 2 ohms.

The HA1366W/HA1366WR provides an output power of 5.5 watts to 4 ohm load with 10 percent distortion at 13.2 volts, and also 6.6 watts to 4 ohm load with 10 percent distortion at 14.4 volts.

It exhibits high output current capability up to 4.5 amperes, very low harmonic distortion and cross-over distortion.

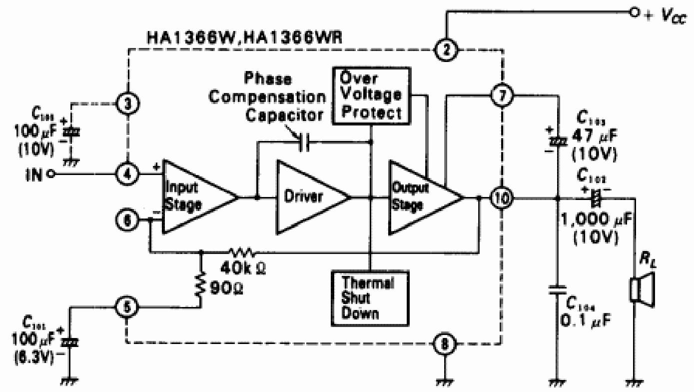


(SP-10TA)

### ■ FEATURES

- Two kinds of pin configulation are available: normal (HA1366W) and reverse (HA1366WR) for easier layout design of pc-board when used in stereo applications
- Only a few number of external components:
  ---- three electrolithic capacitors
  ---- one polyester film capacitor
- Easy to mount 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 msec pulse duration
- No damage for reverse insertion on the pc-board
- Using BTL connection, output power of 13 watts at 10 percent distortion is obtained with 4 ohm load at 13.2 volts.

### ■ BLOCK DIAGRAM AND TYPICAL APPLICATION CIRCUIT




Notes:
1. Terminals 1 and 9 have no conneciton.
2. Recommended capacitor for $C_{104}$ is a non-inductive polyester film type or the equivalent.
3. When the shock noise occuring on suppling the power is to be reduced, the addition of $C_{105}$ (100μF) is desirable.
   However, $C_{101}$ is changed to 47μF when the $C_{105}$ is used.
4. The terminal 6 is for gain adjustment. When a resistor is connected between pin 6 and 5, $G_V$ comes higher. When a resistor and a capacitor are series connected between pin 6 and 10, $G_V$ is reduced. Lower $G_V$ than 40 dB is not recommended.

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

| Item | Symbol | Rating | Unit | Notes |
|---|---|---|---|---|
| DC Supply Voltage | $V_{CC}$ | 18 | V | 1 |
| Peak Supply Voltage ($t=200ms$) | $V_{surge}$ | 40 | V | |
| Output Current | $I_{O(peak)}$ | 4.5 | A | 2 |
| Power Dissipation ($T_C=78°C$) | $P_T$ | 7.2 | W | |
| Junction Temperature | $T_j$ | 150 | °C | |
| Thermal Resistance | $\theta_{j-c}$ | 10 | °C/W | |
| Operating Temperature Range | $T_{opr}$ | −20 to +70 | °C | 3 |
| Storage Temperature Range | $T_{stg}$ | −55 to +125 | °C | |

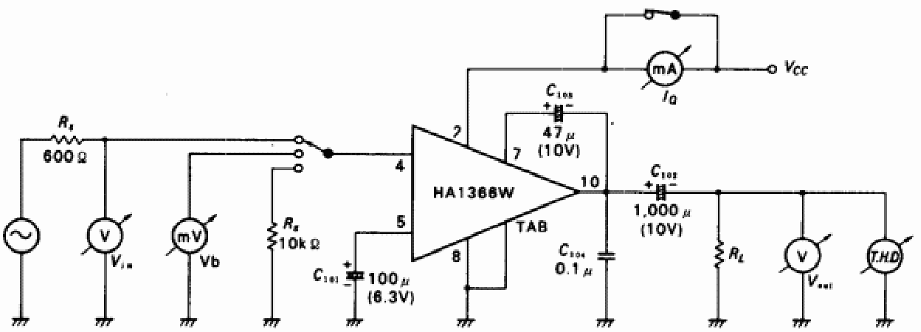
Notes : 1. Standard operating voltage is 13.2V
2. $I_{O(peak)}$ is determined from the ratio of $V_{CC}$ to $R_L$
3. The value when 2.8 watts are dissipated mounted on an aluminium plate ($20cm^2 \times 1.5mmt$). 2.8 watts is a maximum dissipation at $V_{CC}=13.2V$

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

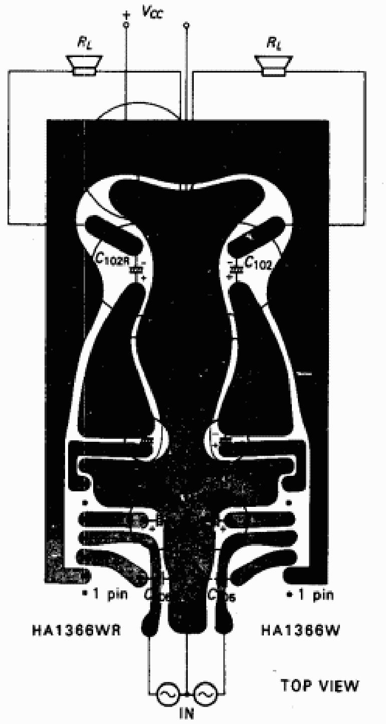
| Item | Symbol | Test Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Quiescent Current | $I_Q$ | $V_{in}=0$ | — | 30 | 60 | mA |
| Input Bias Voltage | $V_b$ | DC Biasing Point between 4 and GND | — | — | 20 | mV |
| Voltage Gain | $G_V$ | $f=1kHz$ | 50 | 52.5 | 55 | dB |
| Output Power | $P_O$ | $f=1kHz$, $T.H.D=10\%$ | 4.5 | 5.5 | — | W |
| Total Harmonic Distortion | $T.H.D$ | $f=1kHz$, $P_O=0.5W$ | — | — | 1.5 | % |
| Noise Output | $V_N$ | $R_g=10k\Omega$, $BW=20$ to $20kHz$ | — | — | 2.0 | mV |
| Input Resistance | $R_{in}$ | $f=1kHz$ | — | 24 | — | kΩ |

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

## ■ TEST CIRCUIT

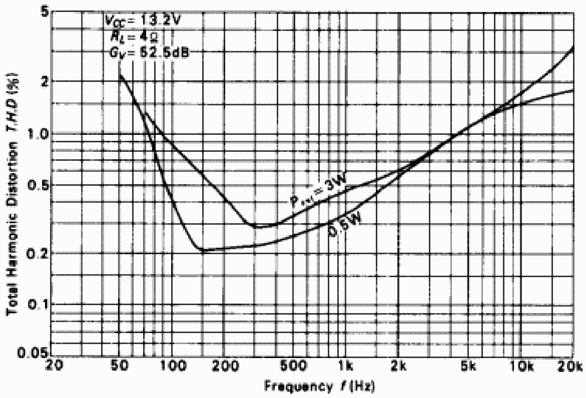


## ■ PC-BOARD LAYOUT RATTERN

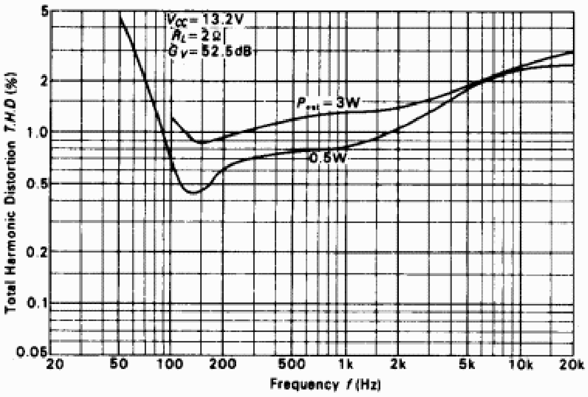



Note:
Resistance of a printed circuit board must be taken special care to obtain as small value as possible.

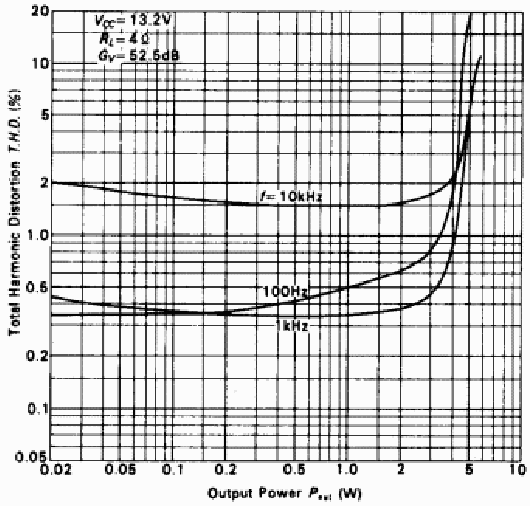
## TOTAL-HARMONIC DISTORTION VS. FREQUENCY (1)



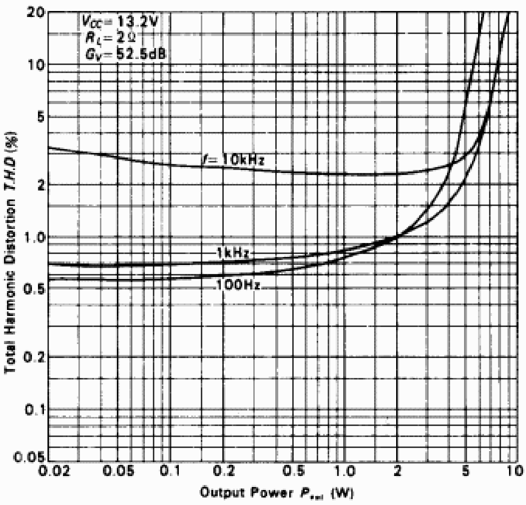

## TOTAL HARMONIC DISTORTION VS. FREQUENCY (2)



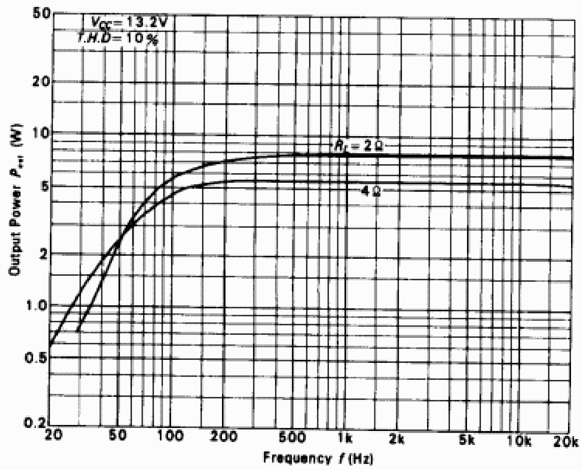

## TOTAL HARMONIC DISTORTION VS. OUTPUT POWER (1)



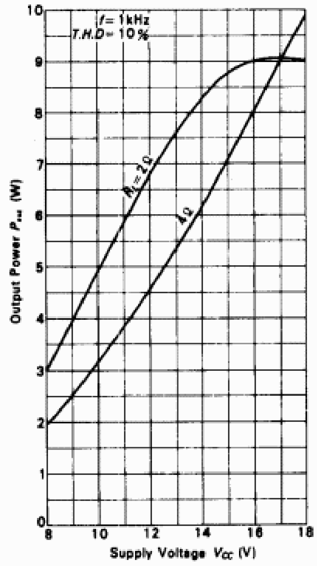

## TOTAL HARMONIC DISTORTION VS. OUTPUT POWER (2)



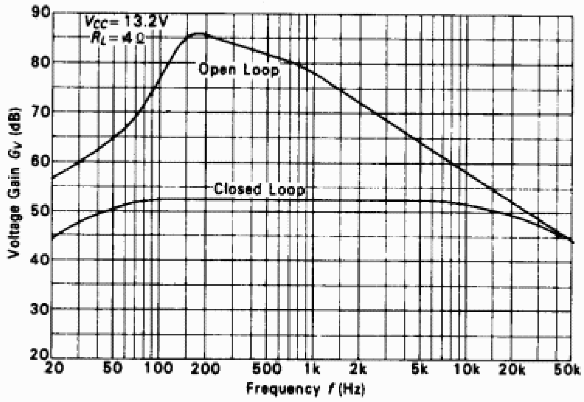

## OUTPUT POWER VS. FREQUENCY



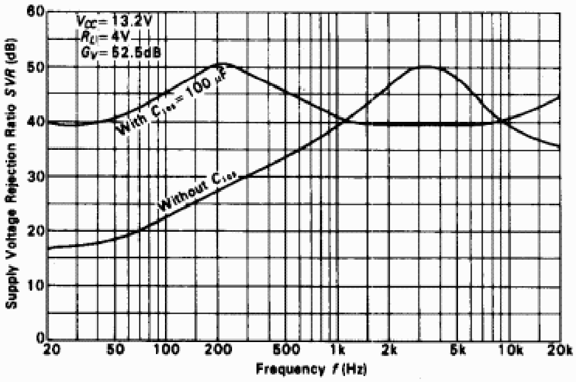
### OUTPUT POWER VS. SUPPLY VOLTAGE



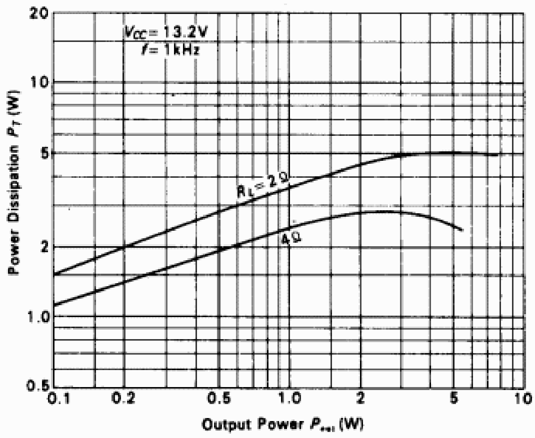

### VOLTAGE GAIN VS. FREQUENCY



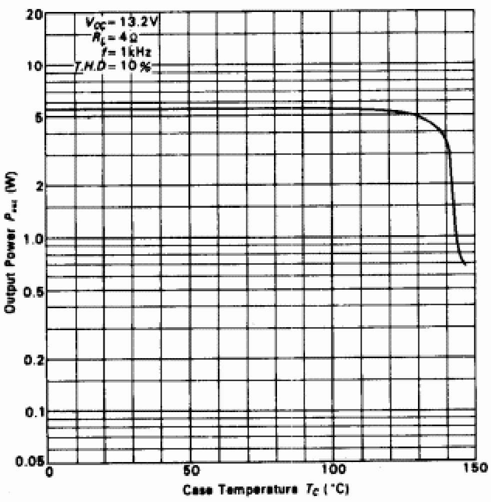

### SUPPLY VOLTAGE REJECTION RATIO VS. FREQUENCY




### POWER DISSIPATION VS. OUTPUT POWER




### OUTPUT POWER VS. CASE TEMPERATURE




### QUIESCENT CURRENT VS. SUPPLY VOLTAGE