

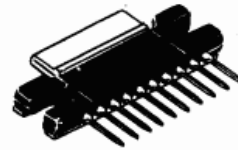
# HA1366W/WR

## 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)

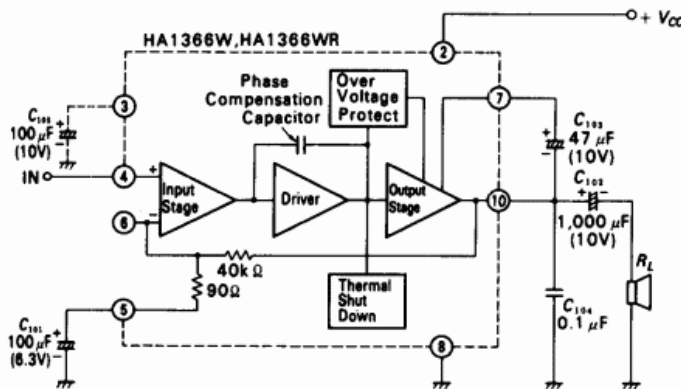
### ■ FEATURES

- Two kinds of pin configuration 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 electrolytic 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 connection.  
 2. Recommended capacitor for  $C_{104}$  is a non-inductive polyester film type or the equivalent.  
 3. When the shock noise occurring on supplying the power is to be reduced, the addition of  $C_{103}$  (100µF) is desirable. However,  $C_{101}$  is changed to 47µF when the  $C_{103}$  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 ( $T_a=25^\circ\text{C}$ )

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

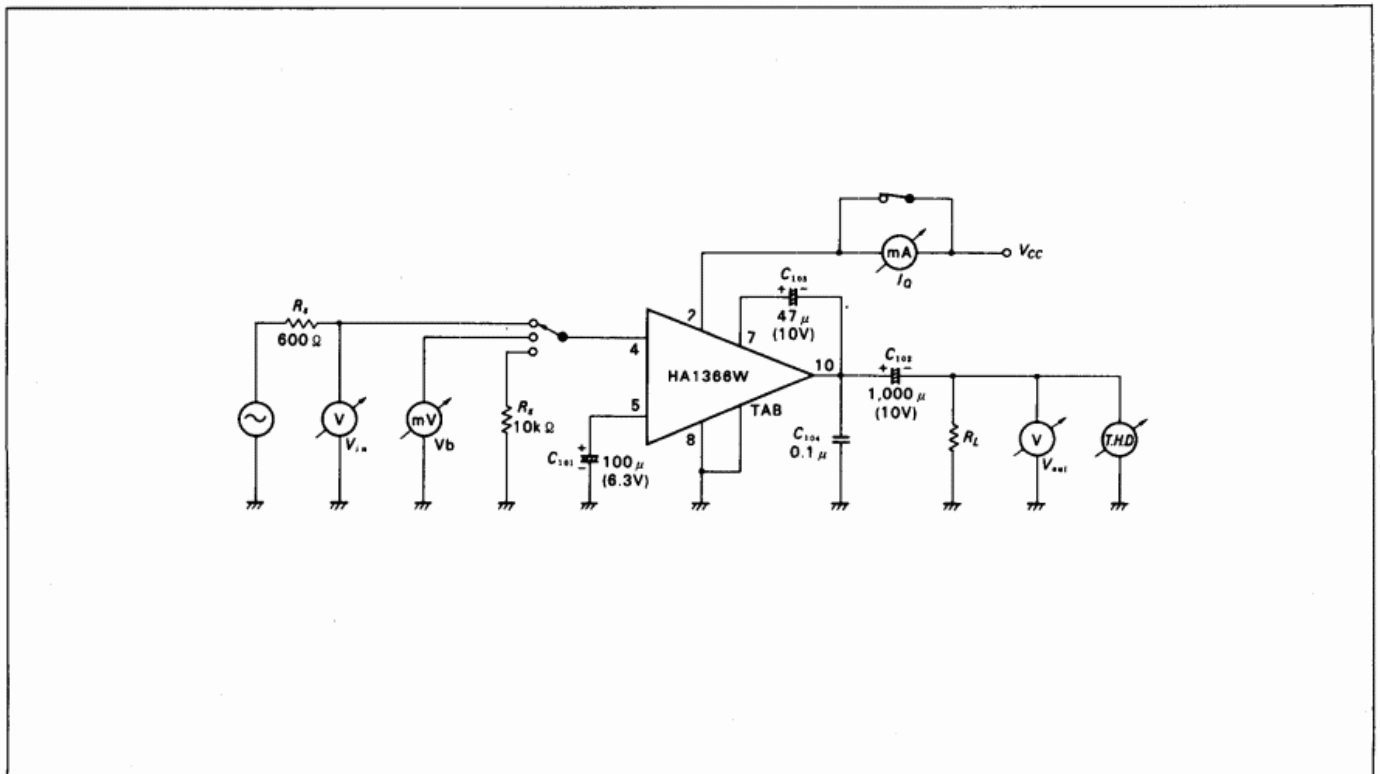
Notes : 1. Standard operating voltage is 13.2V  
 2.  $I_{O(\text{peak})}$  is determined from the ratio of  $V_{CC}$  to  $R_L$   
 3. The value when 2.8 watts are dissipated mounted on an aluminium plate ( $20\text{cm}^2 \times 1.5\text{mm}$ ), 2.8 watts is a maximum dissipation at  $V_{CC}=13.2\text{V}$

## ■ ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ )

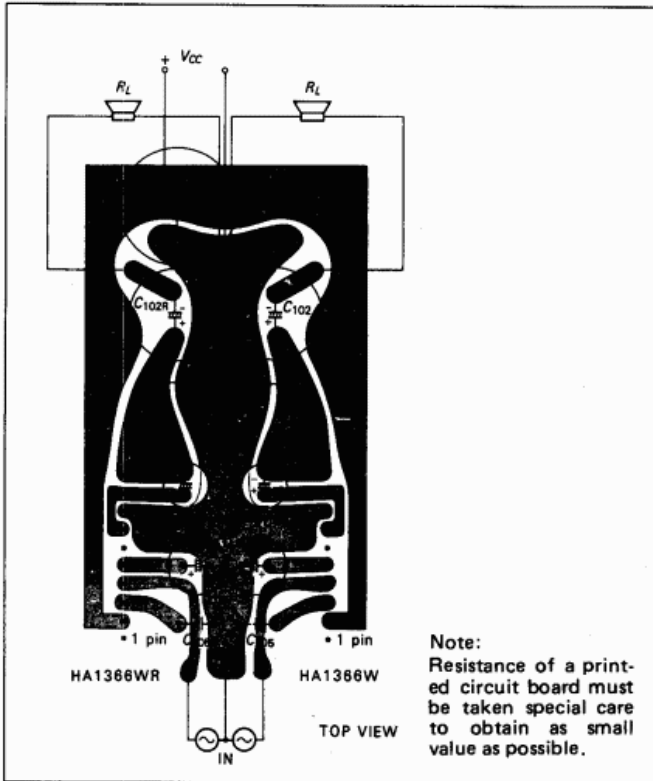
Item	Symbol	Test Conditions	min	typ	max	Unit
Quiescent Current	$I_Q$	$V_{in}=0$	—	30	60	mA
Input Bias Voltage	$V_b$	DC Biasing Point between 4 and GND	—	—	20	mV
Voltage Gain	$G_V$	$f=1\text{kHz}$	50	52.5	55	dB
Output Power	$P_O$	$f=1\text{kHz}$ , $T.H.D=10\%$	4.5	5.5	—	W
Total Harmonic Distortion	$T.H.D$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

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

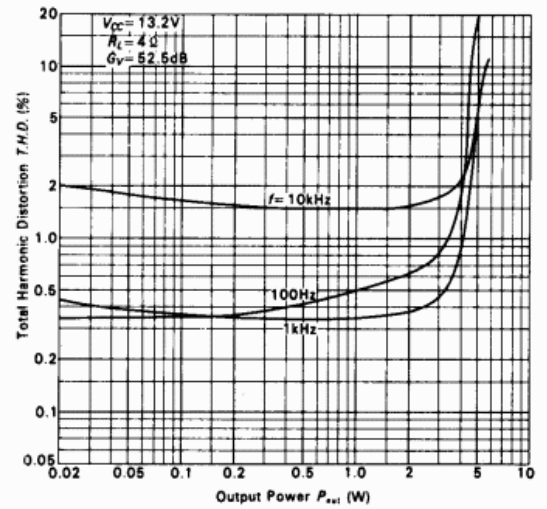
## ■ TEST CIRCUIT



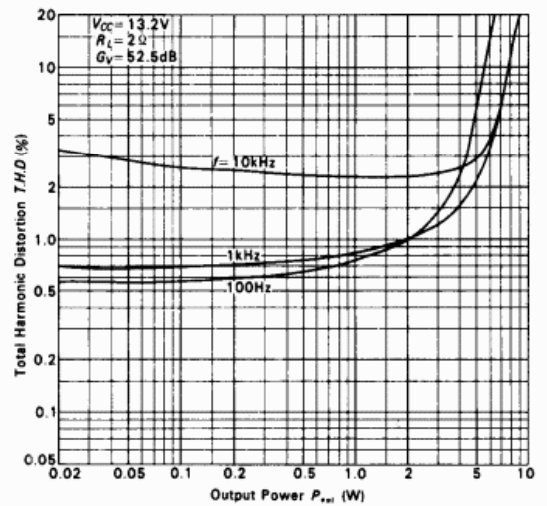
## ■ PC-BOARD LAYOUT RATTERN



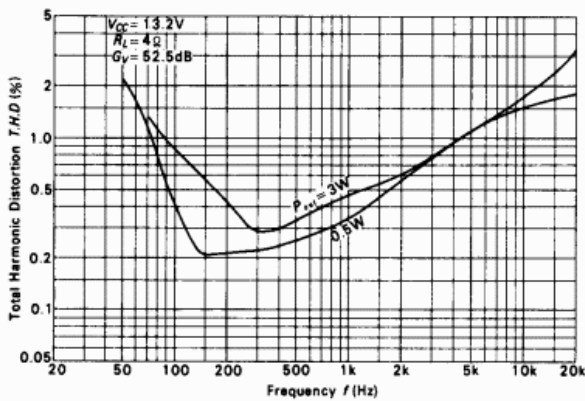
## TOTAL HARMONIC DISTORTION VS. OUTPUT POWER (1)



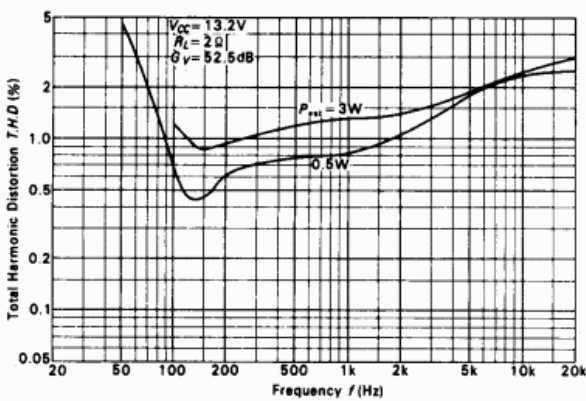
## TOTAL HARMONIC DISTORTION VS. OUTPUT POWER (2)



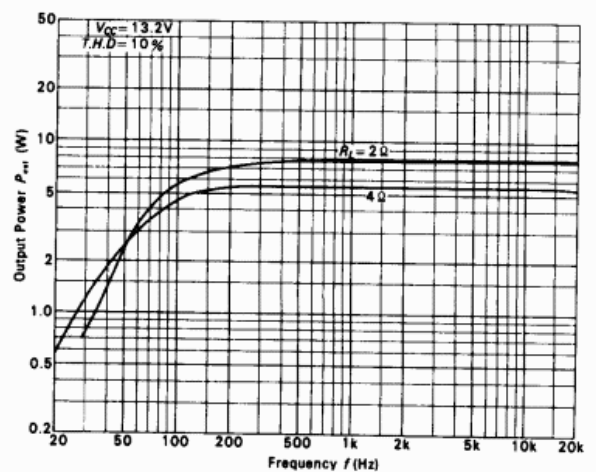
## TOTAL-HARMONIC DISTORTION VS. FREQUENCY (1)



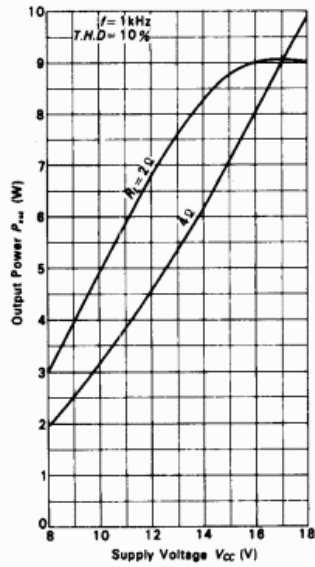
## TOTAL HARMONIC DISTORTION VS. FREQUENCY (2)



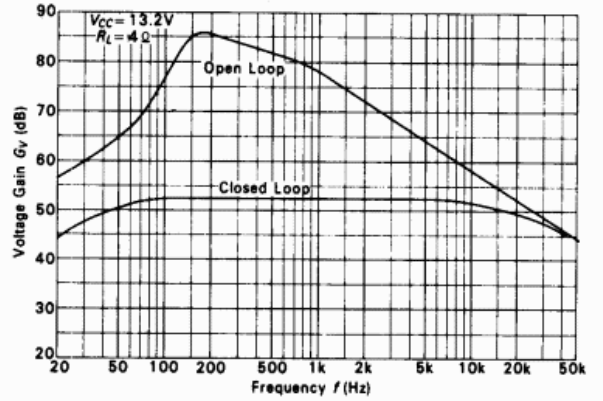
## OUTPUT POWER VS. FREQUENCY



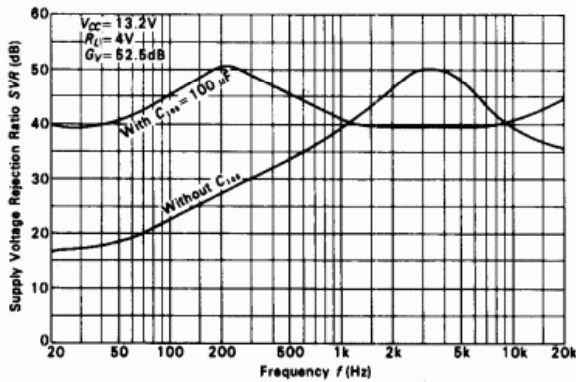
OUTPUT POWER VS. SUPPLY VOLTAGE



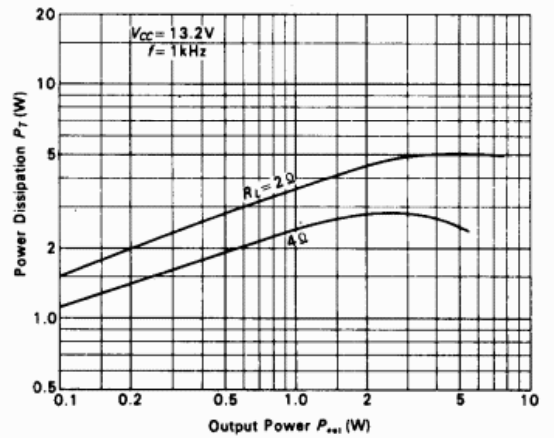
VOLTAGE GAIN VS. FREQUENCY



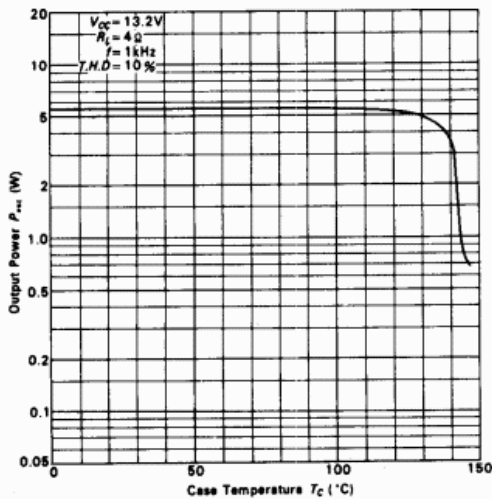
SUPPLY VOLTAGE REJECTION RATIO VS. FREQUENCY



POWER DISSIPATION VS. OUTPUT POWER



OUTPUT POWER VS. CASE TEMPERATURE



QUIESCENT CURRENT VS. SUPPLY VOLTAGE

