

# HA1388

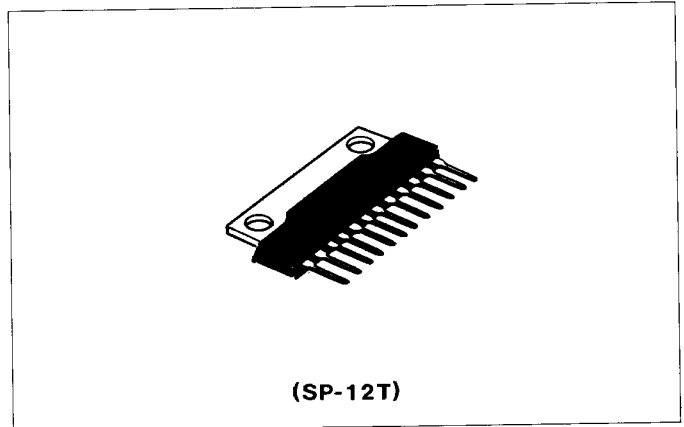
## 18W BTL Audio Power Amplifier

The HA1388 is specifically designed for Components Car Stereo Amplifiers.

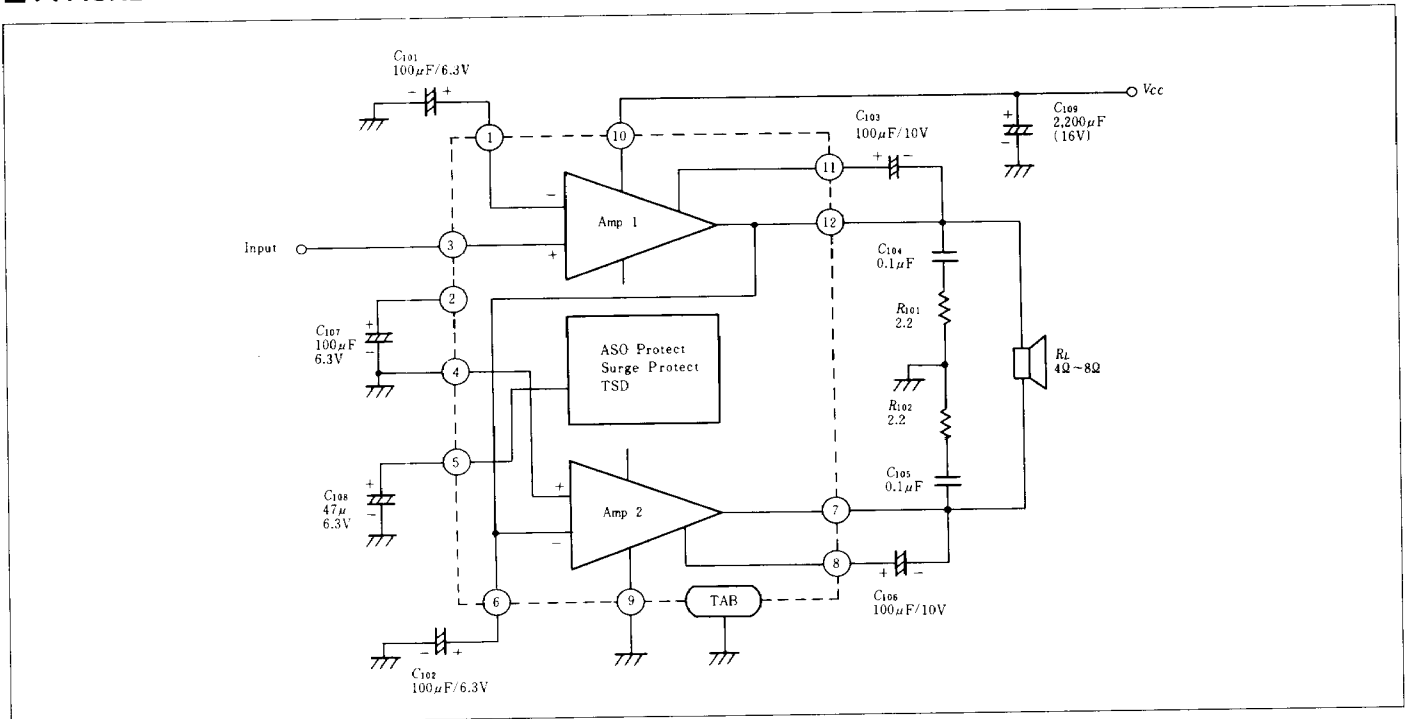
This power IC provides an output power of 18 watts at 13.2 volts to 4 ohm load with 10 percent distortion and can be used without output capacitors because of the excellent ASO protection circuit.

### ■ FEATURES

- Can be used as OCL.
- Over voltage handling capability up to 50 volts for 200ms pulse duration.
- Less number of external components.
- Thermal shutdown circuit included.



### ■ TYPICAL APPLICATION



### ■ ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

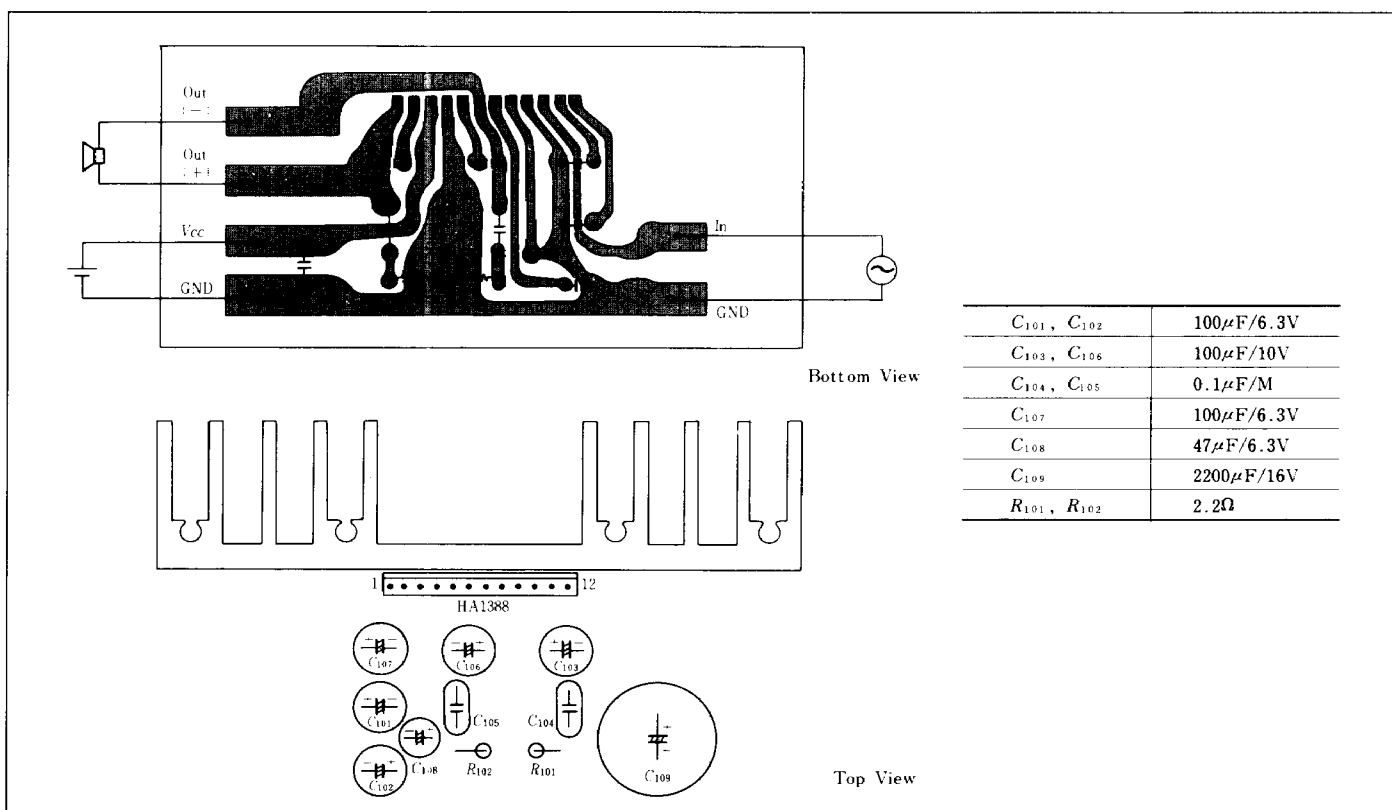
Item	Symbol	Rating	Unit	Note
Operating Supply Voltage	$V_{CC}$	18	V	
DC Supply Voltage	$V_{CC(DC)}$	26	V	1
Peak Supply Voltage	$V_{CC(peak)}$	50	V	2
Output Current	$I_{O(peak)}$	4	A	
Power Dissipation	$P_T$	15	W	
Thermal Resistance (Junction-Case)	$\theta_{j-c}$	3	$^\circ\text{C}/\text{W}$	
Junction Temperature	$T_j$	150	$^\circ\text{C}$	
Operating Temperature	$T_{opr}$	-20 to +70	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$	

Notes. 1. Value at 30sec. 2. Pulse width  $\leq$  200ms, Rise time  $\geq$  1ms.

■ ELECTRICAL CHARACTERISTICS ( $V_{CC}=13.2V, f=1kHz, R_L=4\Omega, T_a=25^\circ C$ )

Item	Symbol	Test Condition	min.	typ.	max.	Unit	
Quiescent Current	$I_Q$	$V_{in}=0$	40	80	160	mA	
Input Bias Voltage	$V_B$	$V_{in}=0$	—	20	40	mV	
Output Offset Voltage	$\Delta V_Q$	$V_{in}=0$	—	—	$\pm 330$	mV	
Voltage Gain	$G_V$	$V_{in}=-55dBm$	53	55	57	dB	
Output Power	$P_{out}$	$THD=10\%$	$R_L=4\Omega$	15	18	—	W
			$R_L=8\Omega$	—	11	—	
Total Harmonic Distortion	$THD$	$P_{out}=1.5W$	—	0.2	1.0	%	
Wide Band Noise	$WBN$	$R_g=10k\Omega, BW=20Hz$ to 20kHz	—	1.0	2.0	mV	
Supply Voltage Rejection Ratio	$SVR$	$f=500Hz$	33	44	—	dB	
Input Resistance	$R_{in}$		20	30	40	k $\Omega$	
Rolloff Frequency	$f_L$	$G_V=-3dB$ from $f=1kHz$ Ref.	Low	—	20	—	Hz
	$f_H$		High	10	20	40	kHz

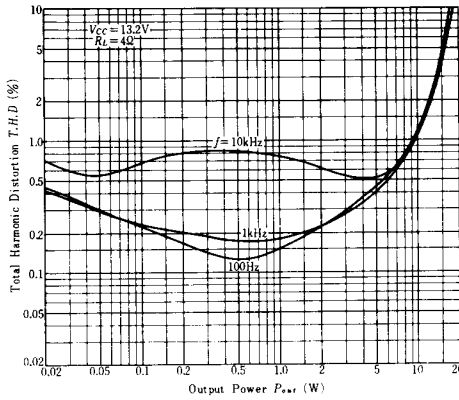
■ PC-BOARD LAYOUT PATTERN



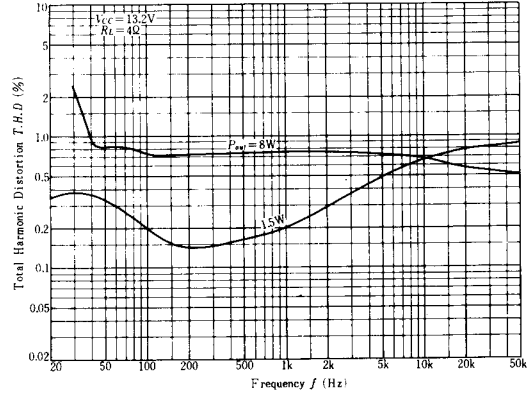
■ EXTERNAL COMPONENTS

Parts No.	Recommended Value	Purpose	Larger than recommended value	Smaller than recommended value
$C_{101}, C_{102}$	100 $\mu F$	Inverting DC decoupling	Danger of burn-out	Higher low frequency rolloff
$C_{103}, C_{106}$	100 $\mu F$	Boot Strap	Danger of burn-out at load dump surge	Smaller power bandwidth
$C_{104}, C_{105}$	0.1 $\mu F$	Frequency stability	Increase of drain current at high frequency	Danger of oscillation
$C_{107}$	100 $\mu F$	Ripple rejection	—	Danger of oscillation at low supply voltage
$C_{108}$	47 $\mu F$	ASO protection	Danger of burn-out	Danger of burn-out
$R_{101}, R_{102}$	2.2 $\Omega$	Frequency stability	Danger of oscillation	Danger of oscillation

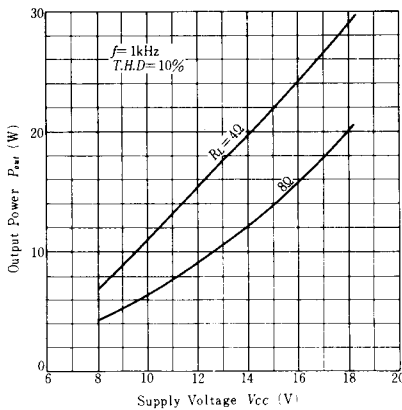
**TOTAL HARMONIC DISTORTION VS. OUTPUT POWER**



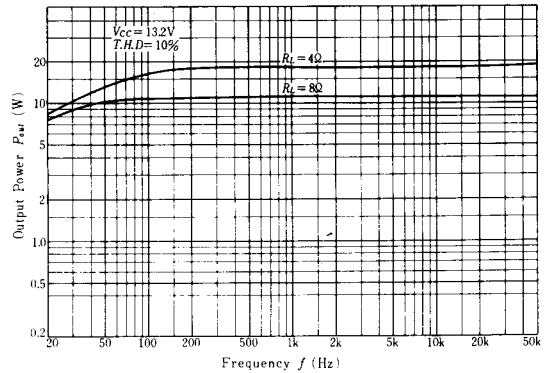
**TOTAL HARMONIC DISTORTION VS. FREQUENCY**



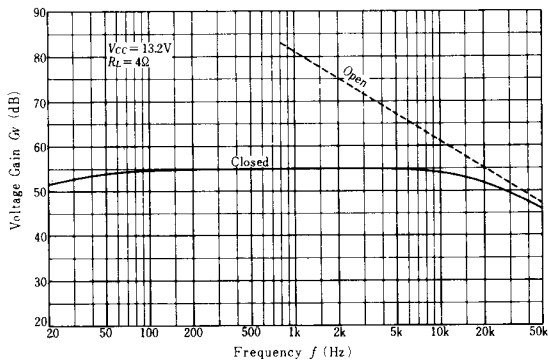
**OUTPUT POWER VS. SUPPLY VOLTAGE**



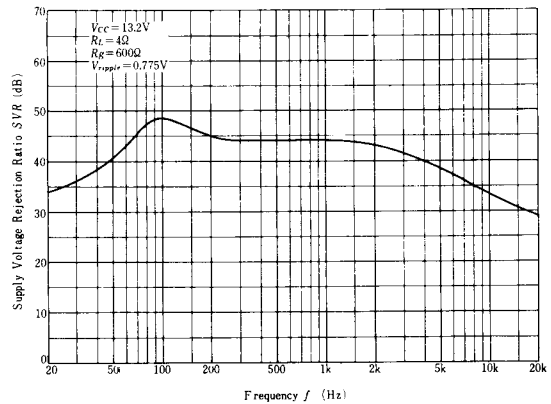
**OUTPUT POWER VS. FREQUENCY**



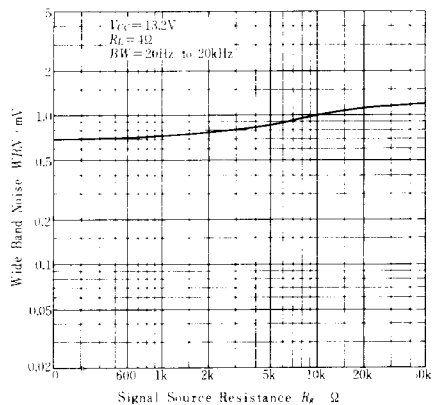
**VOLTAGE GAIN VS. FREQUENCY**



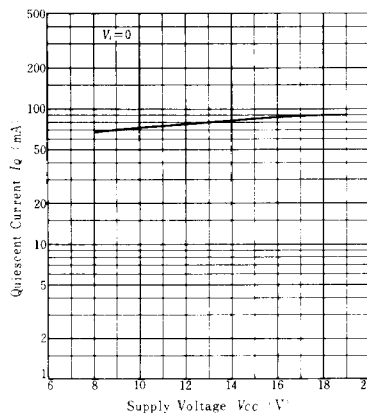
**SUPPLY VOLTAGE REJECTION RATIO VS. FREQUENCY**



**WIDE BAND NOISE VS. SIGNAL SOURCE RESISTANCE**



**QUIESCENT CURRENT VS. SUPPLY VOLTAGE**



**POWER DISSIPATION VS. OUTPUT POWER**

