

HA1377

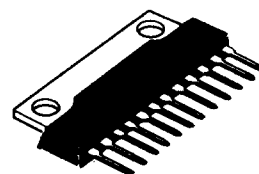
Dual 5.8W Audio Power Amplifiers

This audio power IC is specifically designed for car stereo amplifiers encapsulated in 12-lead single-in-line plastic package.

This IC provides an output power of 5.8 watts per channel under the condition of 4 ohm loaded, 10 percent distortion and 13.2 volt power supply.

■ FEATURES

- Easy to mount a chassis by heat-sink, due to the single-in-line package with no electrical isolation.
- Overvoltage handling capability up to 50 volts for 200 msec pulse duration.
- Thermal shut-down circuit included.
- Less number of external components.



(SP-12T)

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

Item	Symbol	Ratings	Unit	Notes
Operating Supply Voltage	V_{CC}	18	V	
DC Supply Voltage	$V_{CC(DC)}$	26	V	1
Peak Supply Voltage	$V_{CC(peak)}$	50	V	
Output Current per Channel	I_o	4	A	
Power Dissipation	P_T	15	W	2
Thermal Resistance (Junction-Case)	θ_{j-c}	3	$^\circ\text{C/W}$	
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 = 200ms, $t_r \geq 1\text{ms}$

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

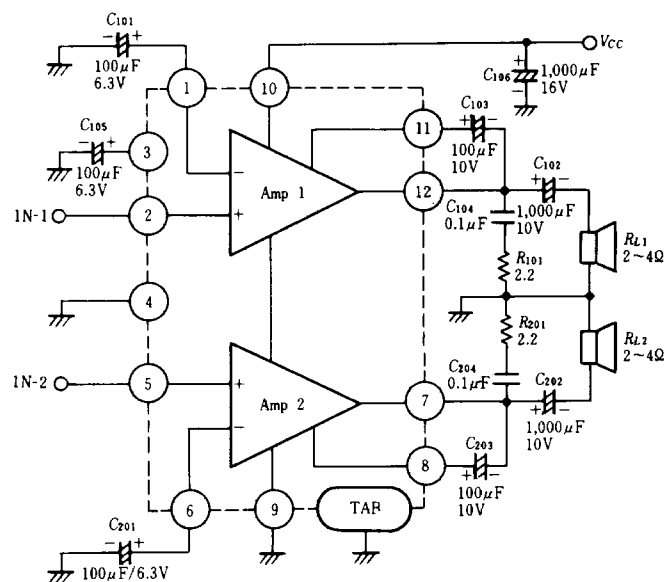
● ONE-HALF OPERATION

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Quiescent Current	I_Q	$V_i = 0$	—	80	160	mA
Input Bias Voltage	V_B	$V_i = 0$	—	—	40	mV
Voltage Gain	G_v	$V_i = 2.45\text{mV}$	53	55	57	dB
Difference of Voltage Gain	ΔG_v	$V_i = 2.45\text{mV}$	—	—	± 1.5	dB
Output Power per Channel	P_{out}	$R_L = 4\Omega$	5.0	5.8	—	W
		$THD = 10\%$	—	7.0	—	
Total Harmonic Distortion	THD	$P_{out} = 0.5\text{W}$	—	0.15	1.0	%
Noise Output	WBN	$R_s = 10\text{k}\Omega$, $BW = 20\text{Hz}$ to 20kHz	—	1.0	2.0	mV
Supply Voltage Rejection Ratio	SVR	$R_s = 600\Omega$, $f = 500\text{Hz}$	30	40	—	dB
Input Resistance	R_{in}	$f = 1\text{kHz}$	—	30	—	k Ω
Rolloff Frequency	f_L	$G_v = -3\text{dB}$ from	—	40	—	Hz
	f_H	$f = 1\text{kHz}$ Ref.	—	25	—	
Cross-talk	CT	$f = 500\text{Hz}$, $R_s = 600\Omega$	40	58	—	dB

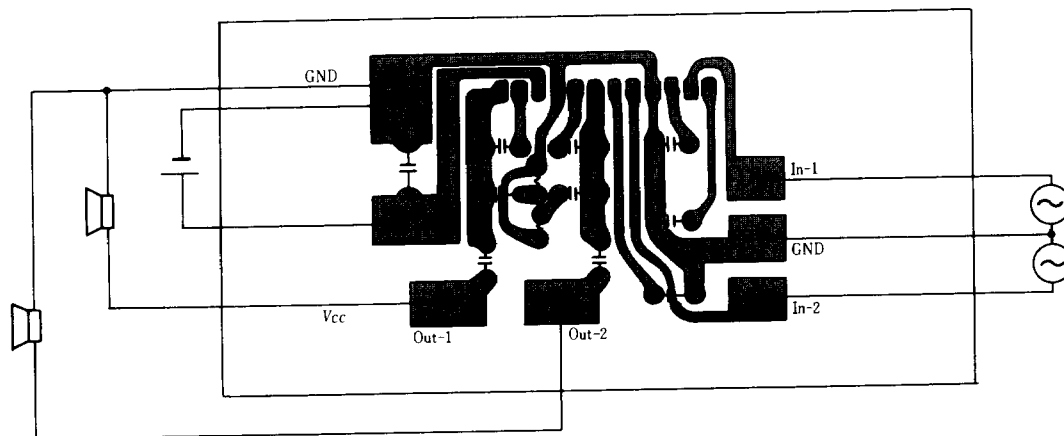
● DUAL OPERATION

Output Power per Channel	P_{out}	$THD = 10\%$, $R_L = 4\Omega$	—	5.6	—	W
Total Harmonic Distortion	THD	$P_{out} = 0.5\text{W}$	—	0.15	—	%

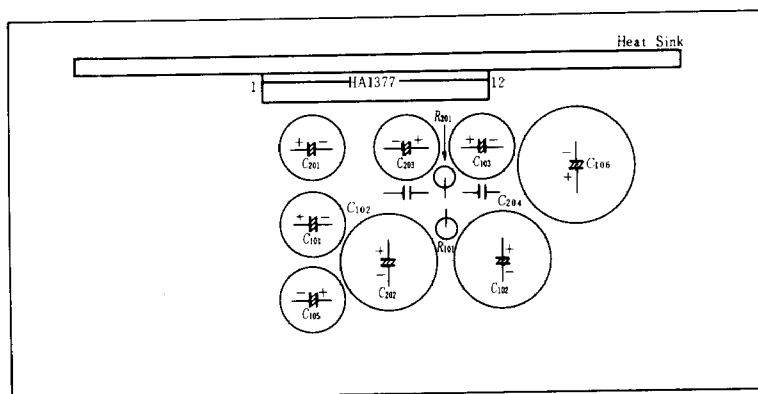
TYPICAL APPLICATION



PC-BOARD LAYOUT PATTERN



Bottom View

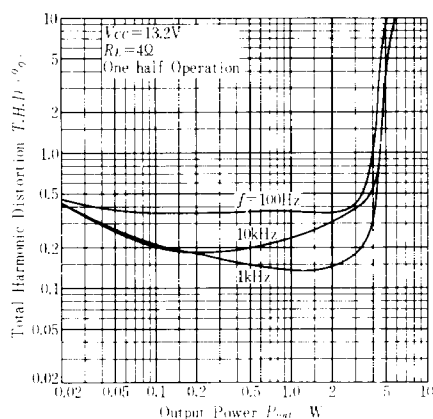


Top View

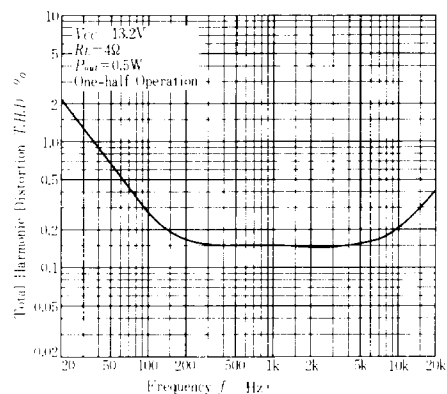
EXTERNAL COMPONENTS

Parts No.	Recommended value	Purpose	Larger than recommended value	Smaller than recommended value
C_{101}, C_{201}	$100\mu\text{F}$	Inverting DC decoupling		Higher low frequency rolloff
C_{102}, C_{202}	$1000\mu\text{F}$	Output coupling to load	Danger of burn-out	Higher low frequency rolloff
C_{103}, C_{203}	$100\mu\text{F}$	Boot strap	Danger of burn-out at load dump surge	Smaller power bandwidth
C_{104}, C_{204}	$0.1\mu\text{F}$	Frequency stability	Increase of drain current at high frequency	Danger of oscillation
C_{105}	$100\mu\text{F}$	Ripple rejection		Pop sound at switch-on
C_{106}	$1000\mu\text{F}$	Supply bypassing		Danger of oscillation
R_{101}, R_{201}	2.2Ω	Frequency stability	Danger of oscillation	Danger of oscillation

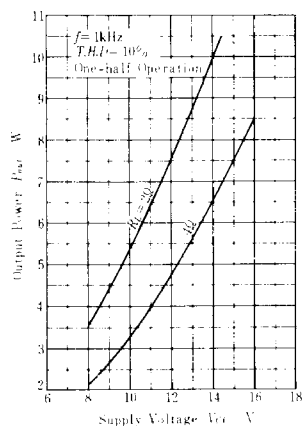
TOTAL HARMONIC DISTORTION VS. OUTPUT POWER



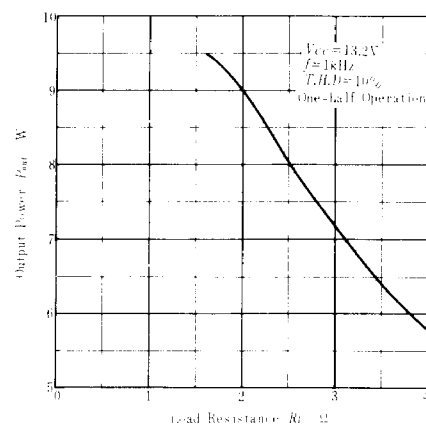
TOTAL HARMONIC DISTORTION VS. FREQUENCY



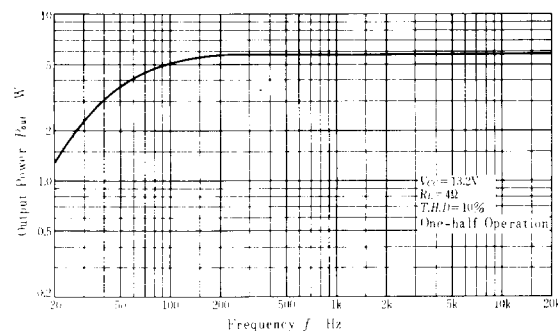
OUTPUT POWER VS. SUPPLY VOLTAGE



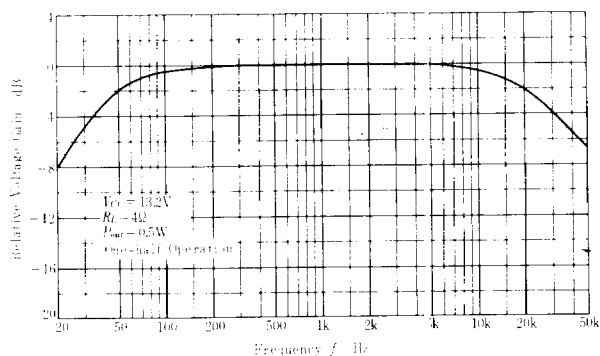
OUTPUT POWER VS. LOAD RESISTANCE



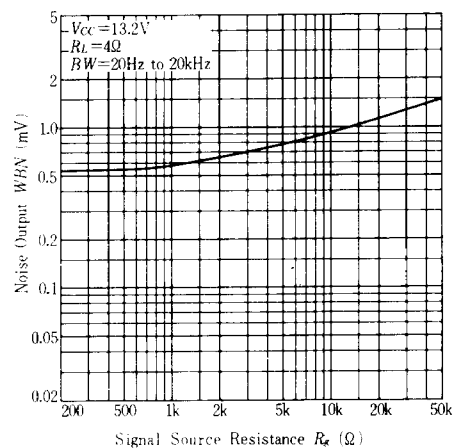
OUTPUT POWER VS. FREQUENCY



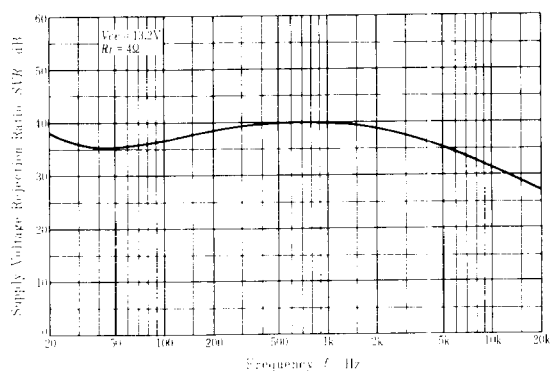
RELATIVE VOLTAGE GAIN VS. FREQUENCY



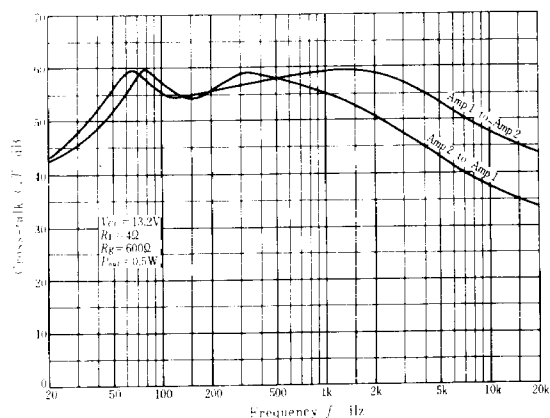
NOISE OUTPUT VS. SIGNAL SOURCE RESISTANCE



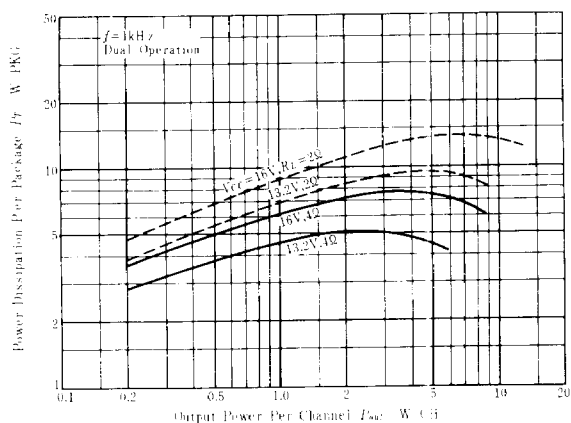
SUPPLY VOLTAGE REJECTION RATIO VS. FREQUENCY



CROSS-TALK VS. FREQUENCY



POWER DISSIPATION VS. OUTPUT POWER



QUIESCENT CURRENT VS. SUPPLY VOLTAGE

