12V / 5W dual power amplifier

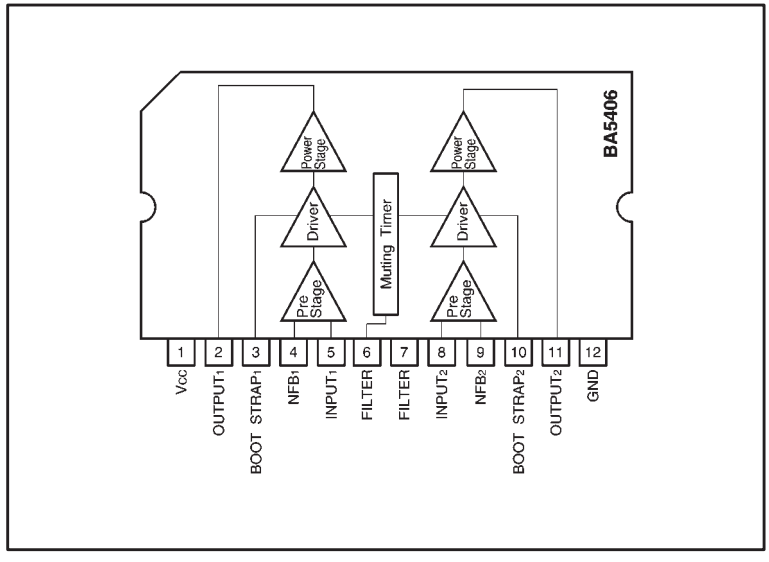
BA5406

The BA5406 is a dual-OTL monolithic power IC with two high-output, low-frequency power amplifiers. With a 12V power supply, it has a rated output of 5W × 2 into a 3Ω load, and with a 9V power supply, it has a rated output of 2.8W × 2 into a 3Ω load.
The BA5406 has good low-voltage characteristics, and the "pop" sound when power is applied is small. It generates little radio-band noise, and is ideal for use in stereo radio cassette players.

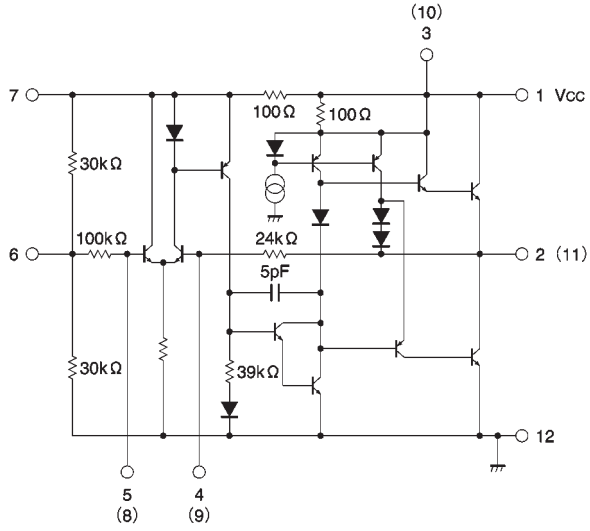
●Applications
Stereo radio cassette players, stereo component systems, and TVs.

●Features
1) Small "pop" noise.
2) Good low voltage characteristics. Begins operating V_{CC} = 5V (Typ.).
3) Good channel balance.
4) Good distortion characteristics (THD = 0.3% when P_O = 0.5W).
5) Easy-to-mount 12-pin SIP-M package that requires little PCB space.
6) The ripple filter pin (pin 6) can be used for muting (by setting it to ground potential).
7) Symmetrical pin assignments simplifies PCB artwork.
8) Package has low thermal resistance to simplify heatsink design.
9) Built-in treble phase compensation capacitors.
10) Low radio-band noise generated. Can be freely positioned in the set.

●Block diagram



●Internal circuit configuration



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	18*1	V
Power dissipation	Pd	20*2	W
Operating temperature	Topr	−20～+75	℃
Storage temperature	Tstg	−30～+125	℃
Junction temperature	Tj	150	℃

*1 No signal

*2 Back metal temperature: 75°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{CC}	5	12	15	V

●Electrical characteristics (unless otherwise noted, Ta = 25°C and V_{CC} = 12V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I_Q	20	40	70	mA	V_{IN}=0V_{rms}
Closed loop voltage gain	G_{VC}	43	46	49	dB	f=1kHz, V_{IN}=−46dBm
Rated output 1	$P_{OUT\ 1}$	4.0	5.0	—	W	f=1kHz, THD=10%, R_L=3Ω
Rated output 2	$P_{OUT\ 2}$	3.4	4.2	—	W	f=1kHz, THD=10%, R_L=4Ω
Total harmonic distortion	THD	—	0.3	1.5	%	f=1kHz, P_O=0.5W
Output noise voltage	V_{NO}	—	0.6	1.0	mV_{rms}	Rg=10kΩ
Input resistance	R_{IN}	50	100	—	kΩ	f=1kHz, V_{IN}=5mV_{rms}

●Measurement circuit

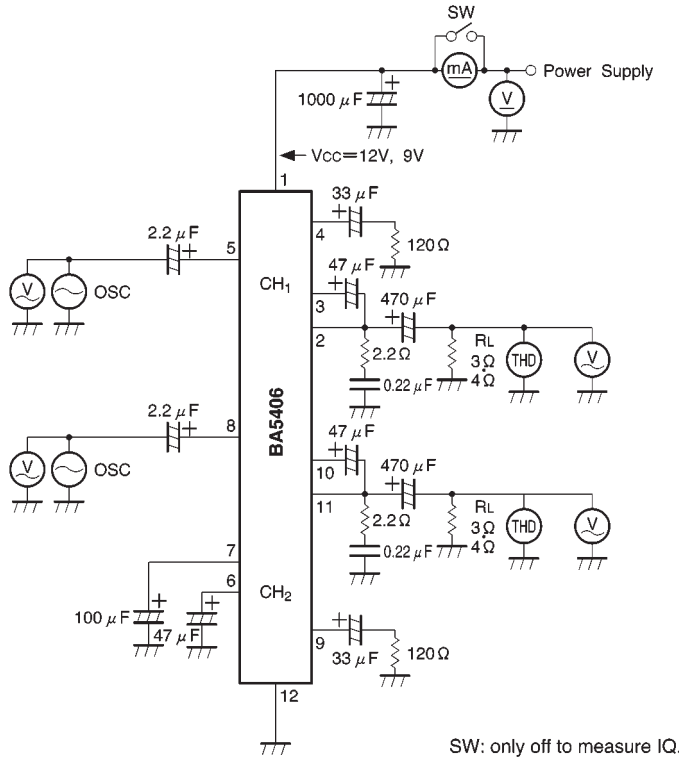


Fig. 1

●Application example

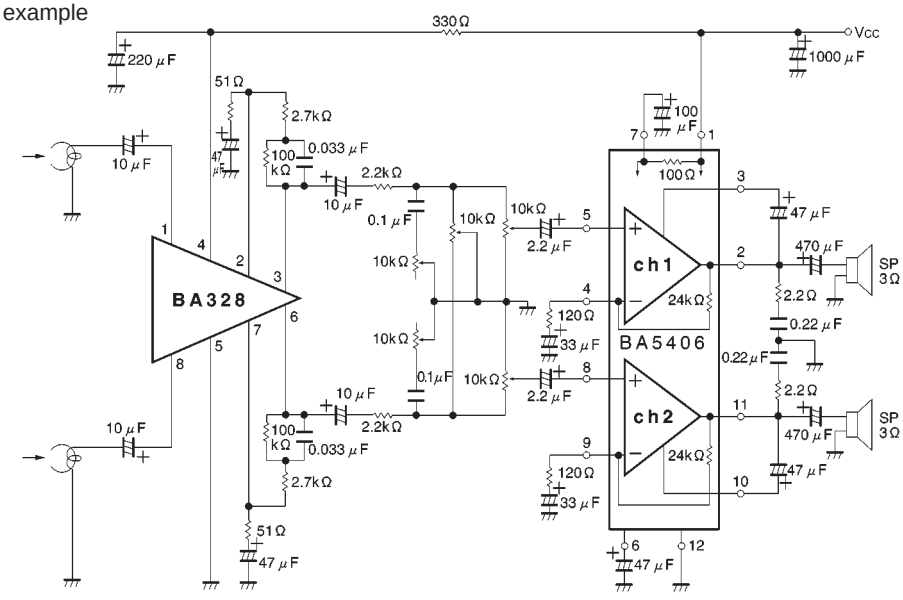


Fig. 2

●Electrical characteristics curves

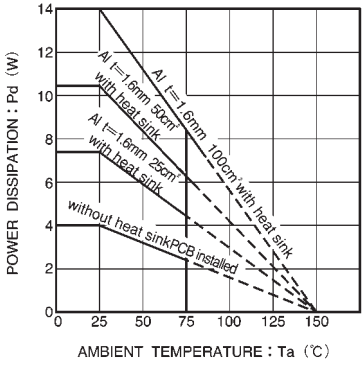


Fig. 3 Thermal derating curve

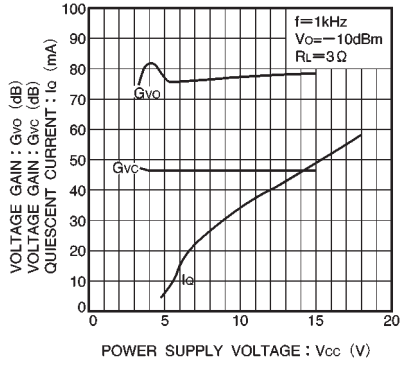


Fig. 4 Quiescent current and voltage gain vs. power supply voltage

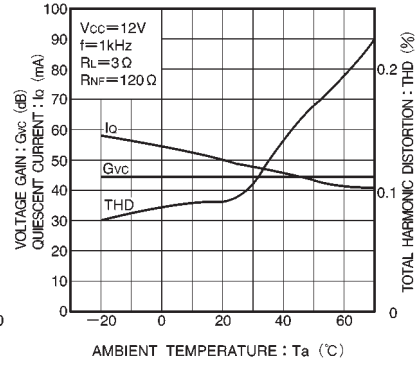


Fig. 5 Distortion, voltage gain and quiescent current vs. frequency

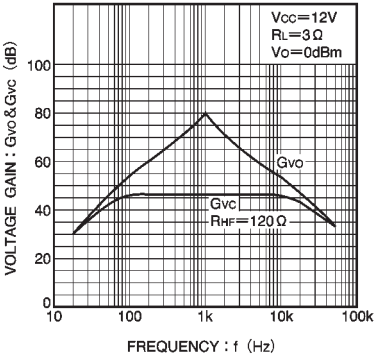


Fig. 6 Voltage gain vs. frequency

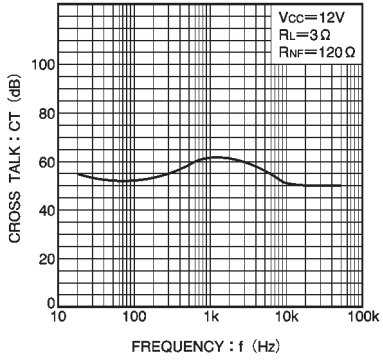


Fig. 7 Crosstalk vs. frequency

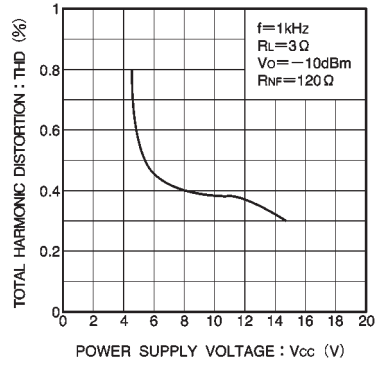


Fig. 8 Distortion vs. power supply voltage

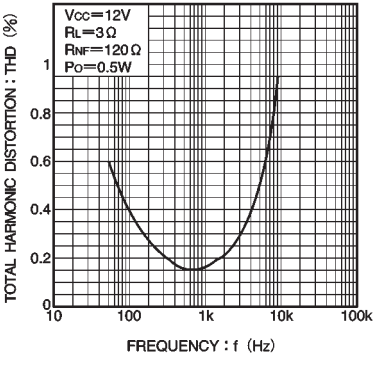


Fig. 9 Distortion vs. frequency

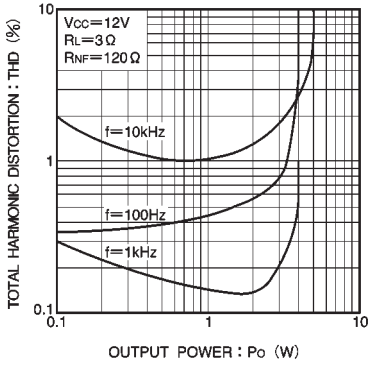


Fig. 10 Distortion vs. Output power

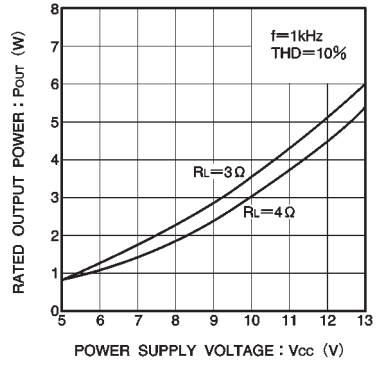


Fig. 11 Output power vs. power supply voltage

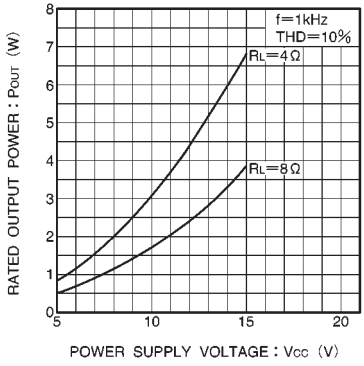


Fig. 12 Output power vs. power supply voltage

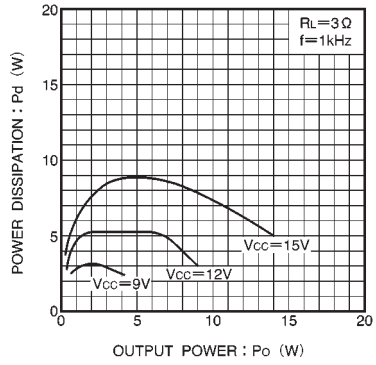


Fig. 13 Power dissipation vs. output power(Ⅰ)

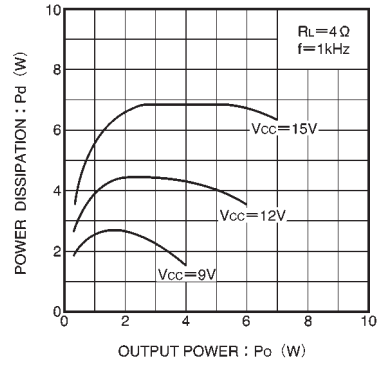


Fig. 14 Power dissipation vs. output power(Ⅱ)

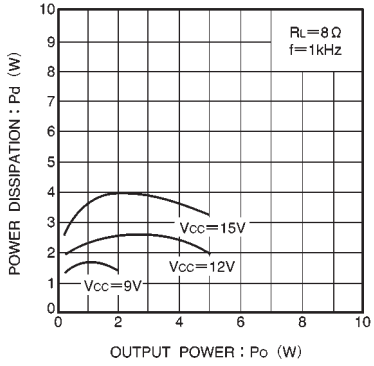


Fig. 15 Power dissipation vs. output power(Ⅲ)

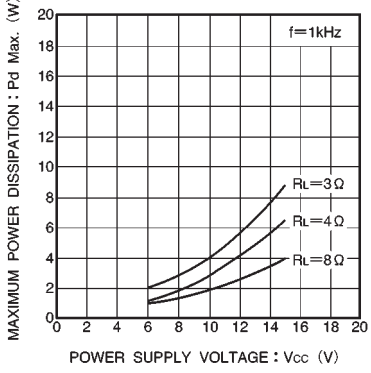


Fig. 16 Maximum power dissipation vs. power supply voltage

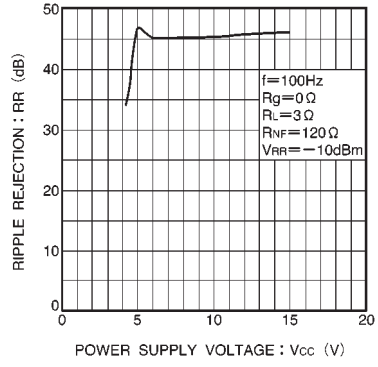
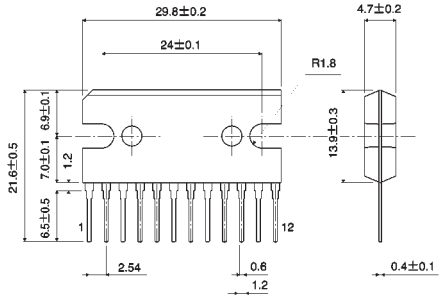


Fig. 17 Ripple rejection ratio vs. power supply voltage

●External dimensions (Units: mm)



SIP-M12