BA3506A

3 V dual pre- and power amplifier

The BA3506A IC is a dual channel preamplifier and power amplifier.

The preamplifiers are direct coupled and the power amplifiers have a built-in fixed-gain NF circuit, making an output coupling capacitor unnecessary.

Features

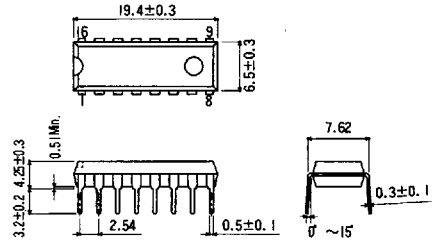
- available in DIP16 package
- low voltage operation (1.8 ~ 3.6 Vdc)
- preamplifier has high voltage gain (83 dB), low noise (0.9 μV_{rms}) and low distortion (0.03%).
- power amplifier has high output (69 mW × 2), low noise (80 μV_{rms}) and low distortion (0.6%)

Applications

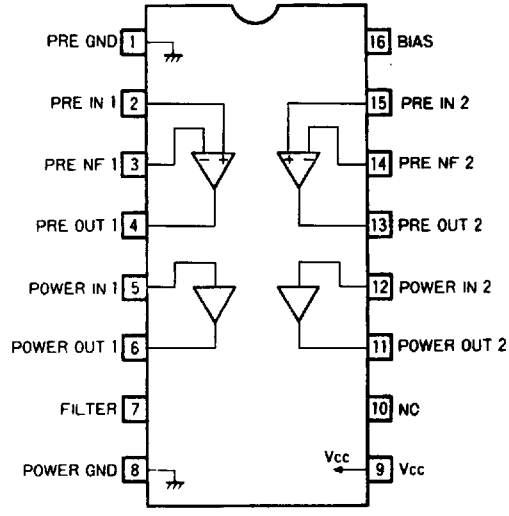
- 3 V headphone stereo player

Dimensions (Units : mm)

BA3506A (DIP18)



Block diagram



Absolute maximum ratings (T_a= 25°C)

Parameter	Symbol	Limits	Unit	Conditions
Power supply voltage	V_{CC}	4.5	V	
Power dissipation	P_d	1000	mW	Reduce power by 10.0 mW for each degree above 25°C.
Operating temperature	T_{opr}	−25 ~ +75	°C	
Storage temperature	T_{stg}	−55 ~ +125	°C	

Recommended operating conditions (T_a= 25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Power supply voltage	V_{CC}	1.8	3.0	3.6	V	
Load resistance	R_L	16		3.2	Ω	V_{CC} = 3 V

Electrical characteristics (unless otherwise noted, T_a = 25°C, V_{CC} = 3 V, f = 1 kHz) (Sheet 1 of 2)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Quiescent current	I_Q		9	15	mA	V_{IN} = 0 V_{rms}
Preamplifier (R_L = 10 kΩ)						
Open loop voltage gain	G_{VO}	72	83		dB	V_O = −10 dBm
Output voltage	V_{OM}	300	450		mV_{rms}	THD = 1%
Total harmonic distortion 1	THD_1		0.03	0.15	%	V_O = 0.2 V_{rms}, NAB 33 dB
Input bias current 1	I_{B1}		130	500	nA	V_{IN} = 0 V_{rms}
Input conversion noise voltage	V_{NIN}		0.9	1.8	μV_{rms}	R_g = 2.2 kΩ, BPF = 20 Hz ~ 20 kHz
Ripple rejection	RR_1	43	53		dB	V_{RR} = −20 dBm, f = 100 Hz, R_g = 2.2 kΩ, NAB 33 dB
Power amplifier (R_L = 16 Ω)						
Rated output	P_{OUT}	50	69		mW	THD = 10%
Closed loop voltage gain	G_{VC}	33	36	39	dB	V_{IN} = −40 dBm
Total harmonic distortion 2	THD_2		0.6	2.0	%	P_O = 1 mW
Output noise voltage	V_{NO}		80	125	μV_{rms}	R_g = 0 Ω, BPF = 20 Hz ~ 20 kHz
Ripple rejection	RR_2	35	51		dB	V_{RR} = −20 dBm, f = 100 Hz, R_g = 0 Ω
Input resistance	R_{IN}	21.4	30	38.6	kΩ	
Input bias current	I_{B2}		10	90	nA	V_{IN} = 0 V_{rms}

Electrical characteristics (unless otherwise noted, T_a = 25°C, V_{CC} = 3 V, f = 1 kHz) (Sheet 2 of 2)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Preamplifier and power amplifier						
Channel separation	CS	40	48		dB	Power amp: V_O = –5 dBm, R_g = 2.2 kΩ, BPF = 20 Hz ~ 20 kHz
Signal leak	SL		–66	–60	dBm	Preamp: V_O = –12 dBm Power amp: R_g = 0 Ω

Figure 1 Application example