BA3521

3 V dual pre- and power amplifier

The BA3521 is a dual channel preamplifier and power amplifier that contains all basic signal circuits necessary for a tape player.

The preamplifier is direct coupled and the power amplifier have a built-in fixed-gain NF circuit, making an output coupling capacitor unnecessary.

Features

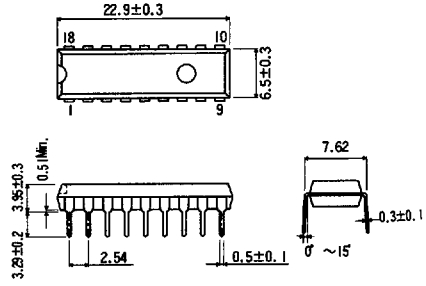
- available in DIP18 package
- low voltage operation (1.8 ~ 4.0Vdc)
- has a built in EVR. A-curve characteristics for EVR are obtained from the VR of the B-curve
- no oscillation protector required for power amplifier
- built in muting circuit

Applications

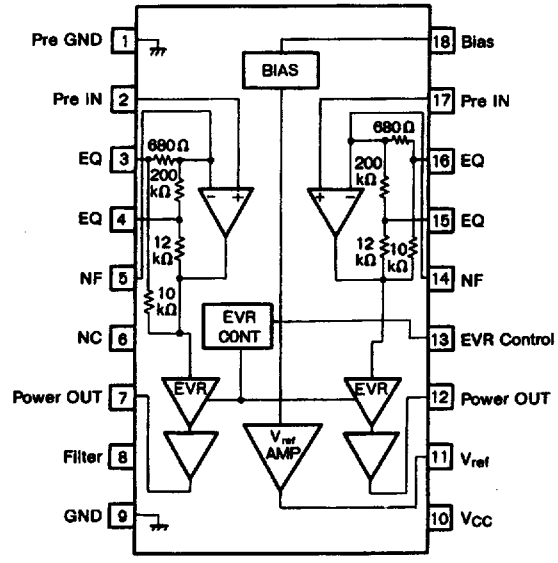
- 3 V tape player
- 3 V radio cassette player

Dimensions (Units : mm)

BA3521 (DIP18)



Block diagram



Absolute maximum ratings (T_a= 25°C)

Parameter		Symbol	Limits	Unit	Conditions
Power supply voltage		V_{CC}	6.0	V	
Power dissipation	BA3521	P_d	1000	mW	Reduce power by 10 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	4.0	V	

Electrical characteristics (unless otherwise noted, T_a = 25°C, V_{CC} = 3 V, f = 1 kHz, R_L = 32 Ω)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Quiescent current	I_Q		15	30	mA	V_{IN} = 0 V_{rms}, EVR = Min
Channel separation	CS	30	40		dB	R_g = 2.2 kΩ,
Closed loop voltage gain	G_{VC}	61	65	69	dB	V_O = 300 mV_{rms}
Total harmonic distortion	THD		0.9	2.0	%	V_O = 0.4 V_{rms}
Input bias current	I_B		100	300	nA	V_{IN} = 0 V_{rms}
Input conversion noise voltage	V_{NIN}		1.0	1.8	μV_{rms}	R_g = 2.2 kΩ, EVR = max, BPF = 20 Hz ~ 20 kHz
Ripple rejection	RR	21	27		dB	V_{RR} = −20 dBV, f_{RR} = 100 Hz
Rated output 1	P_{OUT1}	25	30		mW/ch	R_L = 16 Ω, THD = 10%
Rated output 2	P_{OUT2}	13	18		mW/ch	R_L = 32 Ω, THD = 10%
Output noise voltage	V_{NO}		50	80	μV_{rms}	EVR = min, BPF = 20 Hz ~ 20 kHz
EVR attenuation ratio	ATT	70	80		dB	0 dB = 0.5 V_{rms}, EVR = max When EVR = max, set the input so power amp output V_0 = 0.5 V_{rms}. Measure the attenuation of V when EVR = min in that state.

Figure 1 Test circuit

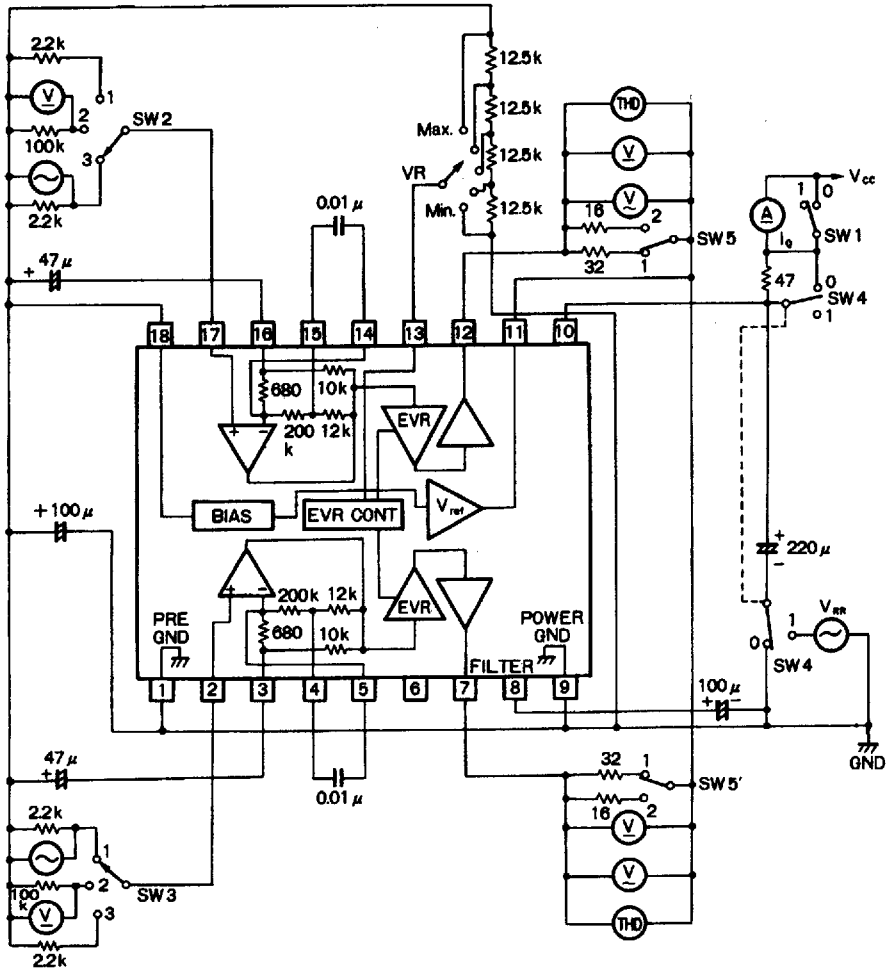
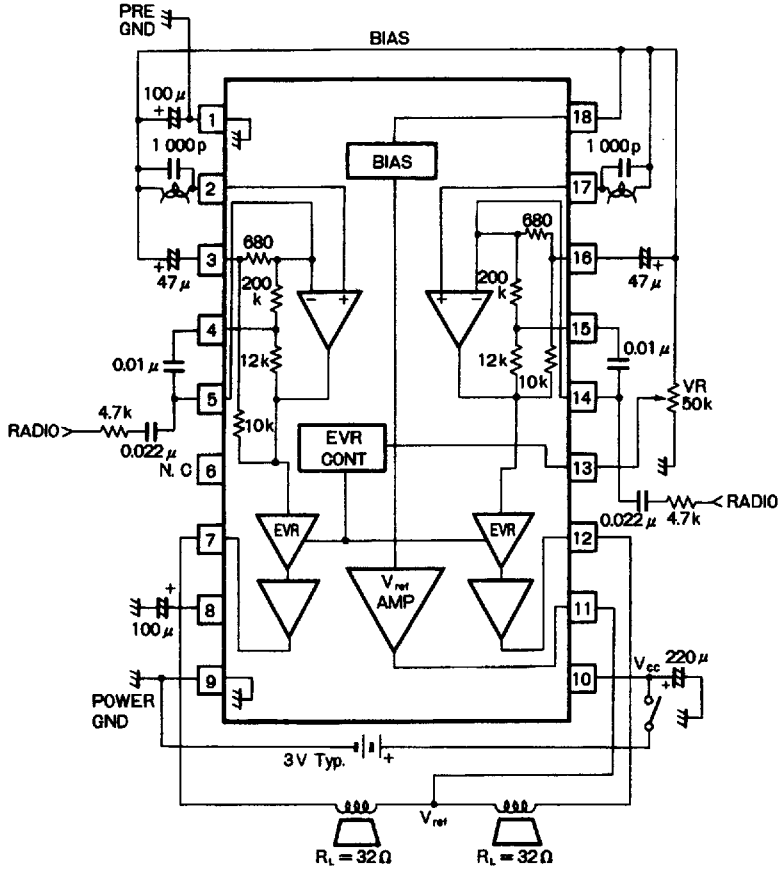


Figure 2 Application example



Gain and the dynamic range with EVR IN

Figure 3 EVR equivalent circuit diagram

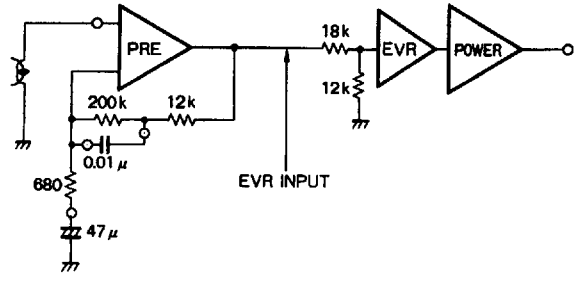
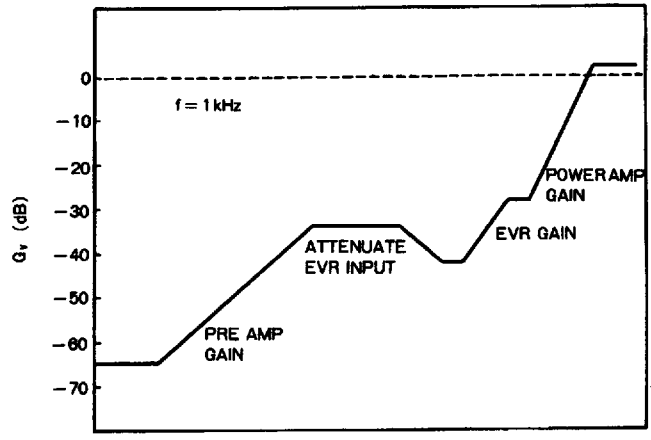


Figure 4 Gain distribution



The total harmonic distortion for the input dynamic range is a minimum for V_{IN} = −30.4 dBV as shown in Figure 7. A gain distribution for the application example is shown in Figure 4.

Note: When connecting to a graphic equalizer it is necessary to set the signal level so that it does not exceed the limitations to the EVR IN.

Electrical characteristic curves

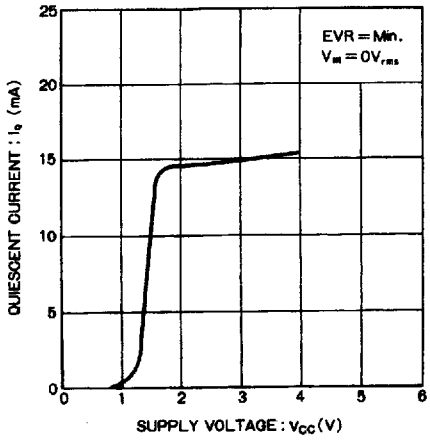


Figure 5

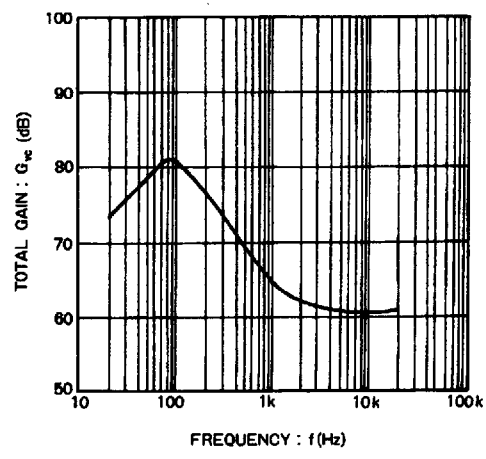


Figure 6

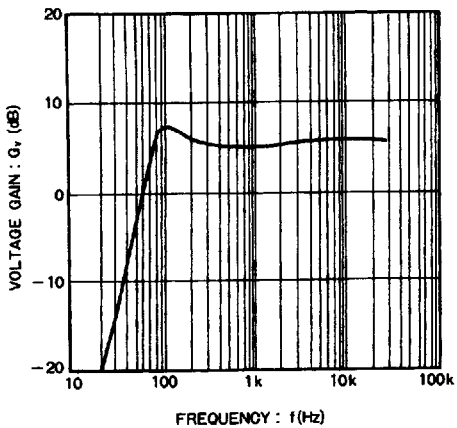


Figure 7

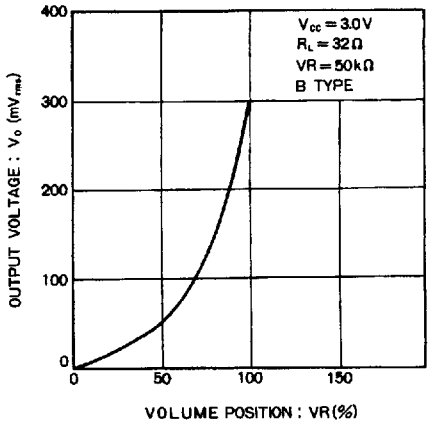


Figure 8

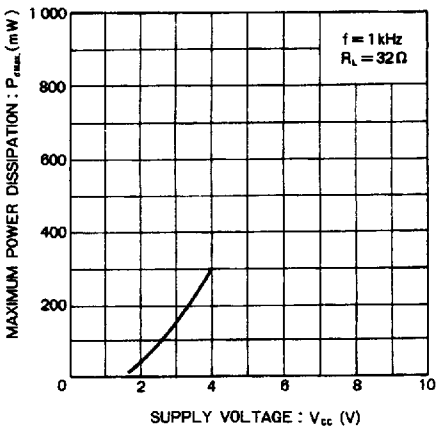


Figure 9

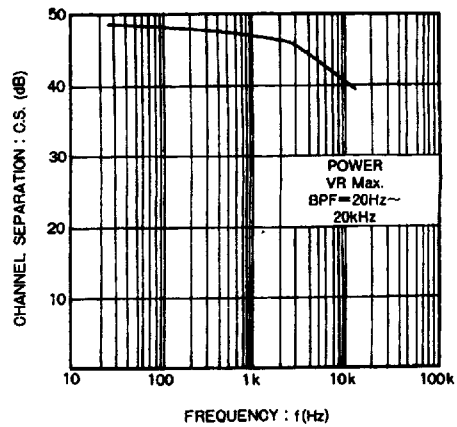


Figure 10

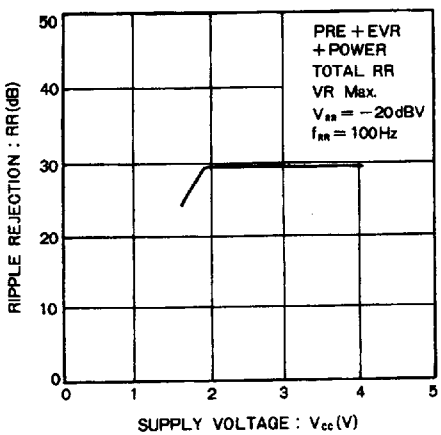


Figure 11