

Dual preamplifier

BA328 / BA328F

The BA328 and BA328F are monolithic, dual-preamplifier ICs designed for car-audio systems. They require few external components and allow compact set designs while reducing the number of assembly processes.

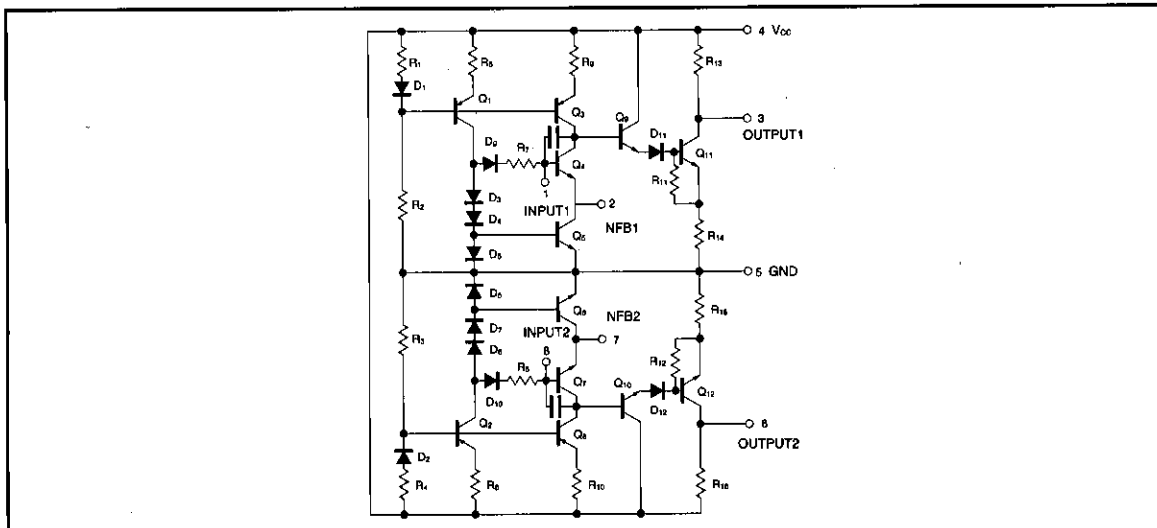
●Applications

Car and home stereos

●Features

- 1) Low noise.
- 2) Wide operating voltage range.
- 3) Built-in bias circuit minimizes the number of external components required.
- 4) High open-loop gain.
- 5) Good channel balance.

●Internal circuit diagram



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V _{CC}	18	V
Power dissipation	BA328	Pd	mW
	BA328F		
Operating temperature	T _{opr}	-25~75	°C
Storage temperature	T _{stg}	-55~125	°C

*1 Reduced by 9.0mW for each increase in Ta of 1°C over 25°C.

*2 Reduced by 5.0mW for each increase in Ta of 1°C over 25°C. (When mounted on a 50mm x 50mm x 1.6mm glass-epoxy PCB)

●Recommended operating voltage range (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V _{CC}	6	8	16	V

●Electrical characteristics (unless otherwise specified Ta = 25°C, V_{CC} = 8V, f = 1kHz, R_L = 10kΩ and R_E = 100Ω)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Quiescent circuit current	I _Q	2	5	8	mA	V _{IN} =0V _{rms}	Fig.4
Open-circuit voltage gain	G _{VO}	65	80	—	dB	V _{OUT} =0.3V _{rms} , R _E =0Ω	Fig.4
Maximum output voltage	V _{OM}	1.0	1.5	—	V _{rms}	THD=1%	Fig.4
Input resistance	R _{IN}	50	—	—	kΩ	—	Fig.4
Total harmonic distortion	THD	—	0.1	0.3	%	V _{OUT} =0.3V _{rms}	Fig.4
Input conversion-noise voltage	V _{NIN}	—	1.2	2.0	μV _{rms}	R _g =2.2kΩ BPF (30Hz~20kHz)	Fig.4
Crosstalk level	CT	—	-65	-50	dB	Other channel V _{OUT} =0.3V _{rms} , R _g =2.2kΩ	Fig.4
Channel balance	CB	—	0	1.5	dB	V _{OUT} =0.3V _{rms}	Fig.4

●Electrical characteristics curves

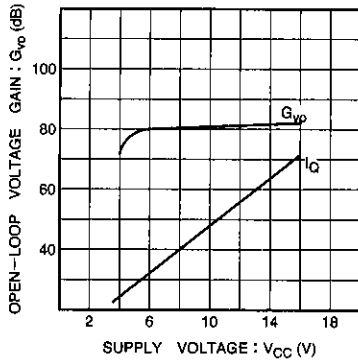


Fig. 1 Quiescent current and voltage gain vs. supply voltage

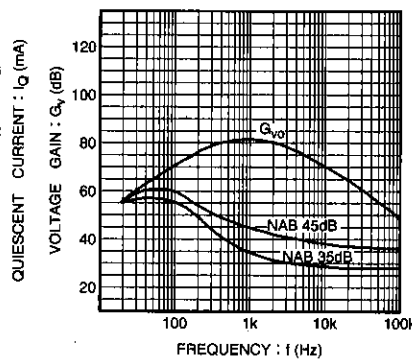


Fig. 2 Voltage gain vs. frequency

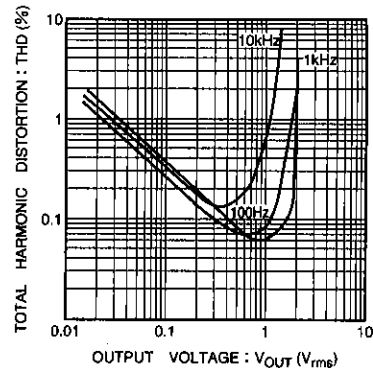


Fig. 3 Distortion vs. output voltage

Pre-amplifiers

Low-frequency amplifiers

●Application example

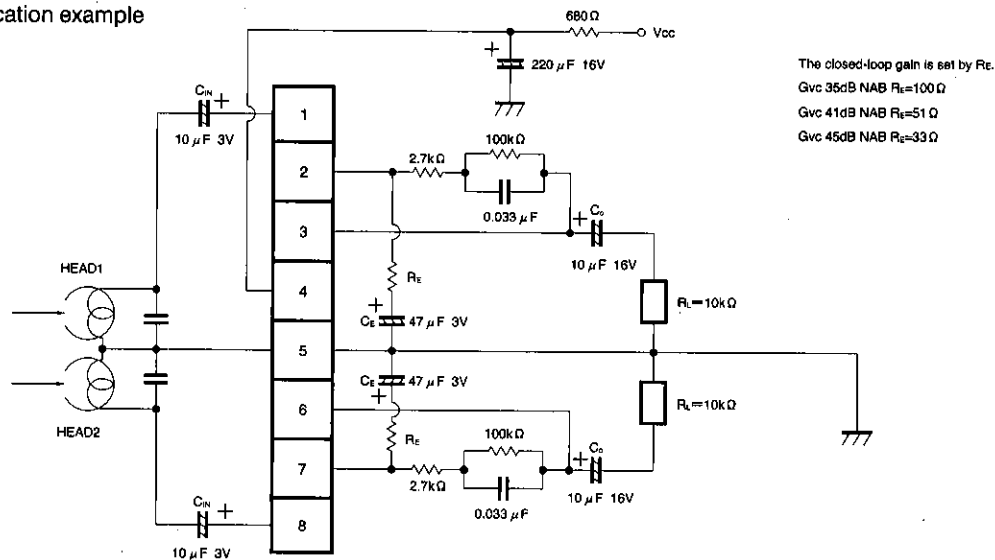


Fig. 6 Car stereo application

●Operation notes

Determining the DC output voltage (see Fig. 7)

The DC output voltage is determined as follows :

$$V_{ODC} = (R_{nt} \times I_o) + V_{P2} (7)$$

$V_{P2} (7)$: DC voltage on pin 2 (7)

R_{nt} : DC feedback resistance

I_o is set internally.

In other words, pin 7 is a fixed current source, and when that current flows into the feedback pin, the voltage generated becomes the DC voltage. $V_{P2} (7)$ is fixed at about 0.8V. When V_{ODC} is about 1/2 the supply voltage, V_{OM} is maximized.

I_o is fixed regardless of the supply voltage. Therefore, it is possible to set the DC feedback resistance after considering the required dynamic range and the minimum voltage applied to pin 4 (V_{CC}).

The recommended value is 100kΩ for a supply voltage of 6V to 16V.

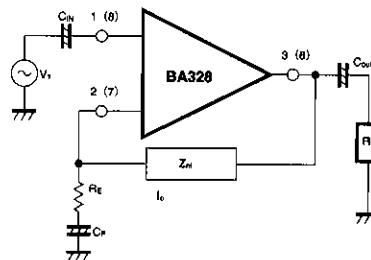


Fig. 7

Preamplifiers

Low-frequency amplifiers

●External dimensions (Unit: mm)

