

3V recording / playback system preamplifier

BA3410AF

The BA3410AF is a playback/recording system preamplifier for mono tape recorders. It operates off a 3V supply. The BA3410AF includes playback equalizer, mic, line, and recording amplifiers, an ALC circuit, and a playback/recording control circuit. This construction allows switching between recording and playback modes with a single contact switch, for smaller and simpler PCB designs. When combined with a BTL power amplifier, almost all of the functions required for a 3V personal-memo or dictation tape recorder are provided, allowing compact set designs.

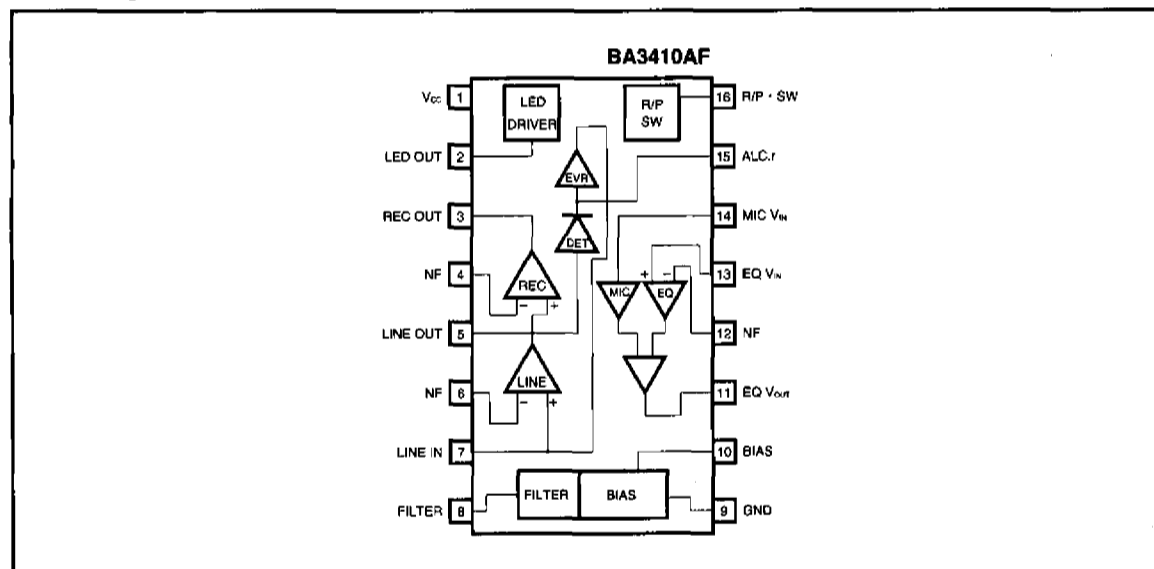
●Applications

3V personal-memo tape recorders

●Features

- 1) Internal recording / playback mode switch requires just a single contact switch.
- 2) Recording monitoring is possible.
- 3) Direct-head coupling is possible for playback.
- 4) Low power consumption (recording : 4.8mA, playback : 3.8mA)
- 5) 16-pin SOP package allows compact set designs.

●Block diagram



● Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V _{CC}	4.0	V
Power dissipation	P _d	500*	mW
Operating temperature	T _{opr}	-20~75	°C
Storage temperature	T _{stg}	-40~125	°C

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

● Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V _{CC}	1.8	3	3.5	V

● Electrical characteristics (unless otherwise specified Ta = 25°C, V_{CC} = 3V and f = 1kHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Recording quiescent current	I _Q R.	2.3	4.8	7.2	mA	V _{IN} = 0V _{rms}
Playback quiescent current	I _Q P.	1.8	3.8	6.2	mA	V _{IN} = 0V _{rms}
Open-circuit voltage gain (1)	G _{VO} -EQ	59	70	—	dB	V _{IN} = -90dBV
Closed-circuit voltage gain (2)	G _{VC} -EL	40	44	48	dB	V _{IN} = -64dBV
Closed-circuit voltage gain (3)	G _{VC} -ML	47	50	53	dB	V _{IN} = -75dBV
Closed-circuit voltage gain (4)	G _{VC} -MR	60	64	67	dB	V _{IN} = -80dBV
Maximum output voltage	V _{OM} -R	400	500	—	mV _{rms}	THD = 1%
Distortion (1)	THD-EL	—	0.1	0.7	%	V _{IN} = -54dBV
Distortion (2)	THD-MR	—	0.4	1.5	%	V _{IN} = -60dBV
Distortion (3)	THD-MR	—	0.3	1.5	%	V _{IN} = -32dBV
LED output current (1)	I _{OL} -P1	20	50	—	μA	V _{CC} = 2.3V
LED output current (2)	I _{OL} -P2	—	0	10	μA	V _{CC} = 1.7V
Input conversion-noise voltage (1)	V _{NIN} PL	—	1.2	2.0	μV _{rms}	R ₀ = 2.2kΩ, BPF = 20~20kHz
Input conversion-noise voltage (2)	V _{NIN} RL	—	1.4	2.0	μV _{rms}	R ₀ = 2.2kΩ, BPF = 20~20kHz

● Measurement circuit

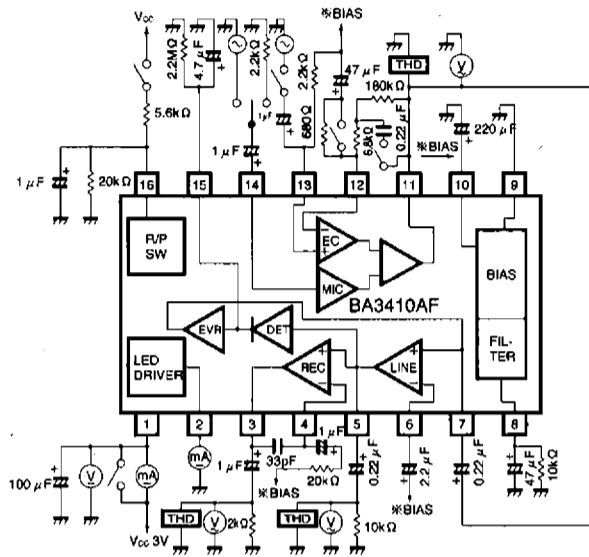


Fig. 1

● Electrical characteristics curves

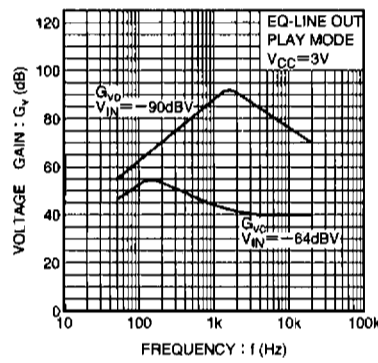


Fig. 2 Voltage gain vs. frequency

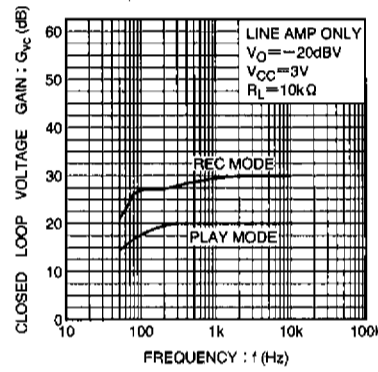


Fig. 3 Voltage gain vs. frequency

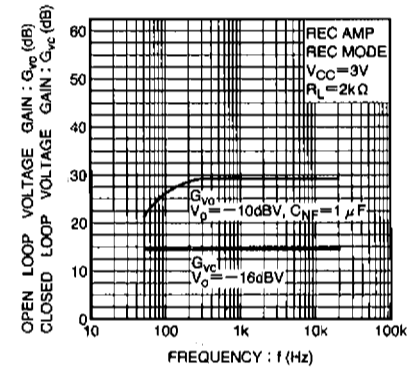


Fig. 4 Voltage gain vs. frequency

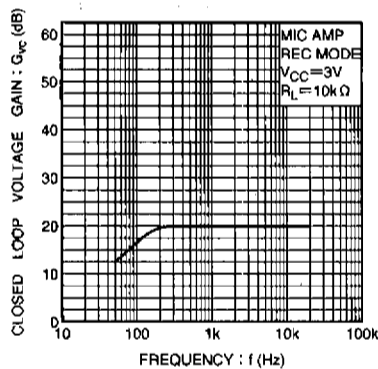


Fig. 5 Voltage gain vs. frequency

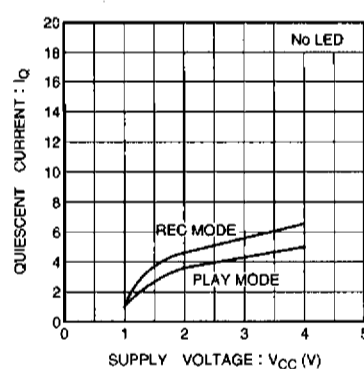


Fig. 6 Quiescent current vs. supply voltage

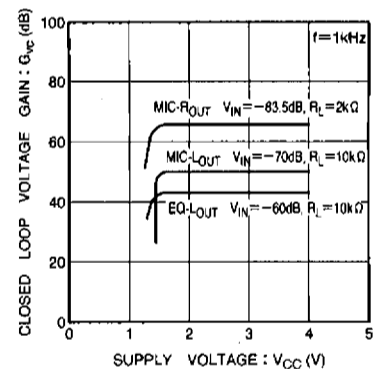


Fig. 7 Voltage gain vs. supply voltage

●Electrical characteristics curves

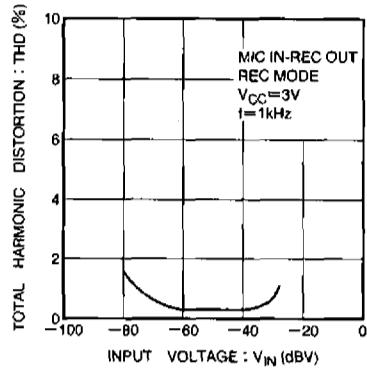


Fig. 8 Distortion vs. input voltage

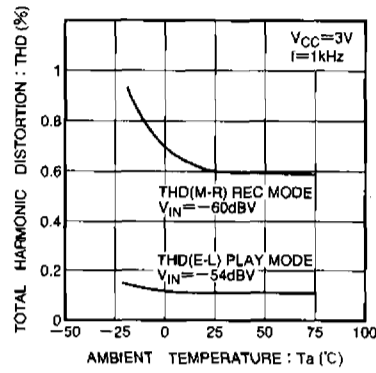


Fig. 9 Distortion vs. ambient temperature

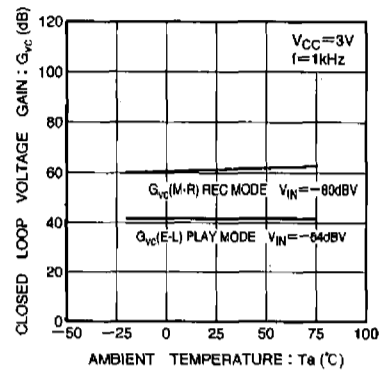


Fig. 10 Voltage gain vs. ambient temperature

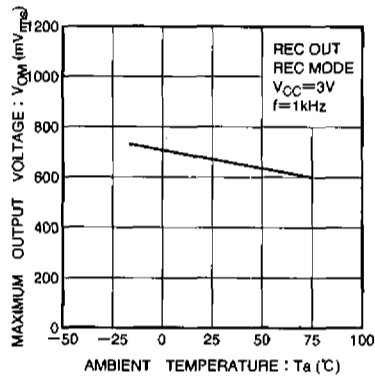


Fig. 11 Output voltage vs. ambient temperature

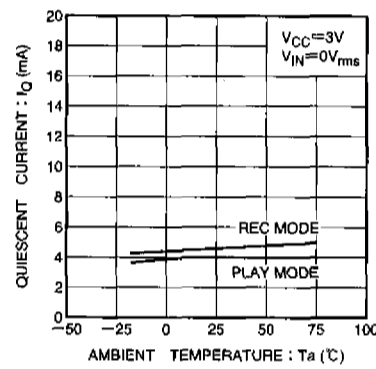
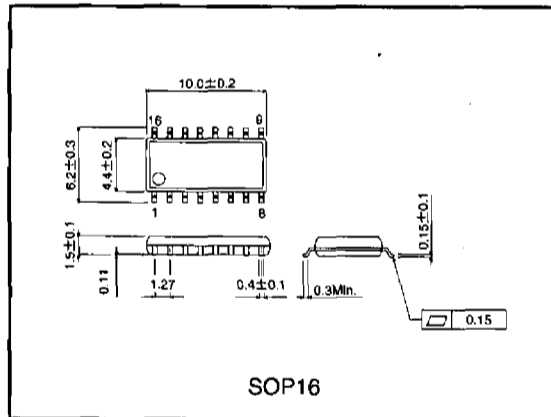


Fig. 12 Quiescent current vs. ambient temperature

●External dimensions (Unit: mm)



SOP16

Preamplifiers

Low-frequency amplifiers