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.

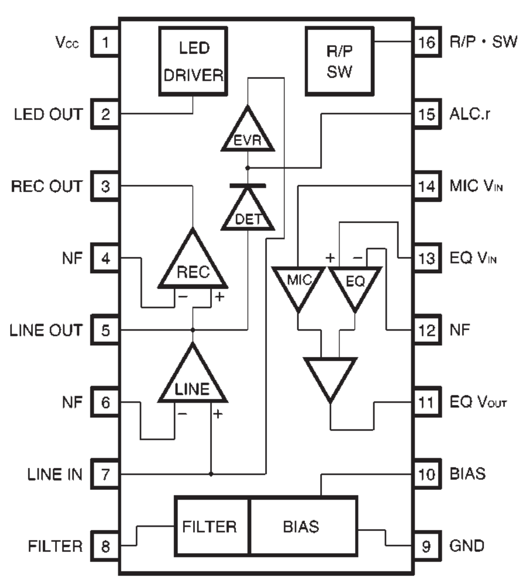
●Applications

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 dissipation (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
Power supply voltage	V_{CC}	4.0	V
Power dissipation	Pd	500*	mW
Operating temperature	Topr	−20～+75	℃
Storage temperature	Tstg	−40～+125	℃

* When mounted on a 50mm×50mm×1.6mm glass epoxy board. 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
Power supply voltage	V_{CC}	1.8	3	3.5	V

●Electrical characteristics (unless otherwise noted, 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 loop voltage gain (1)	G_{VO}−EQ	59	70	−	dB	V_{IN}=−90dBV
Closed loop voltage gain (2)	G_{VC}−EL	40	44	48	dB	V_{IN}=−64dBV
Closed loop voltage gain (3)	G_{VC}−ML	47	50	53	dB	V_{IN}=−75dBV
Closed loop 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_g=2.2kΩ, BPF=20～20kHz
Input conversion noise voltage (2)	$V_{NIN\ PL}$	−	1.4	2.0	μV_{rms}	R_g=2.2kΩ, BPF=20～20kHz

●Measurement circuit

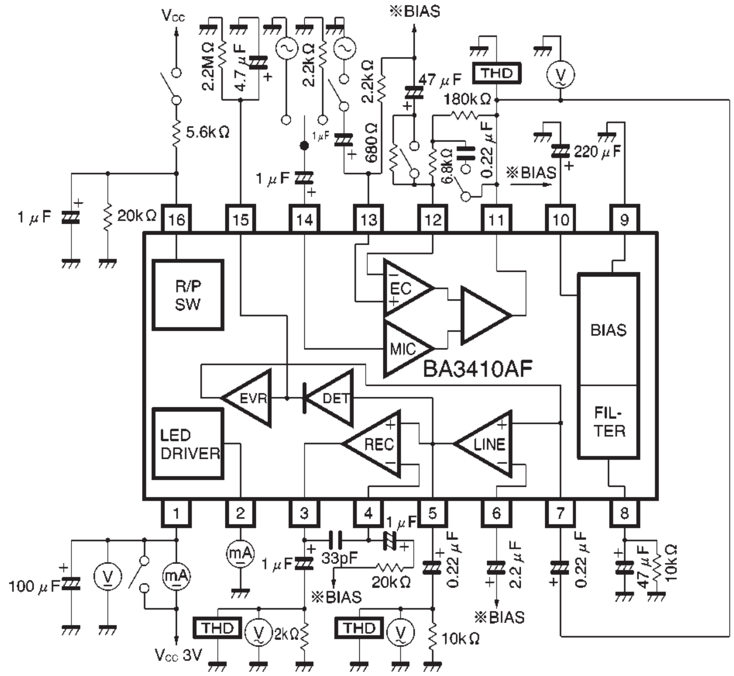


Fig. 1

●Electrical characteristics curves

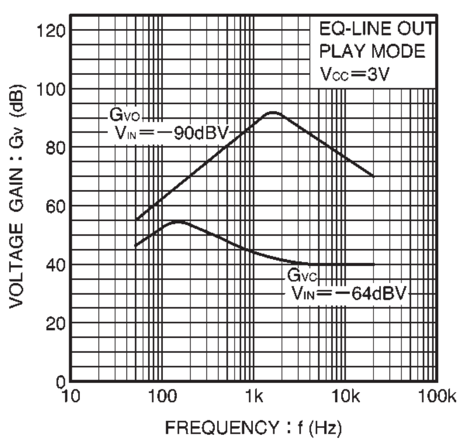


Fig. 2 Voltage gain vs. frequency

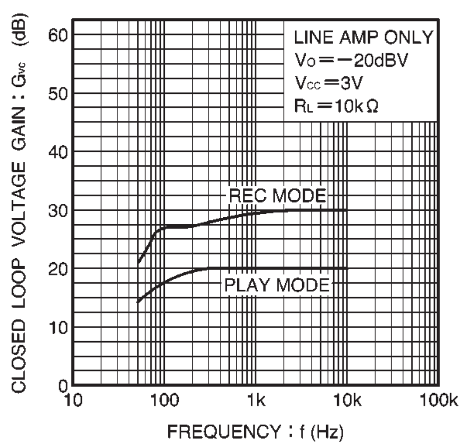


Fig. 3 Voltage gain vs. frequency

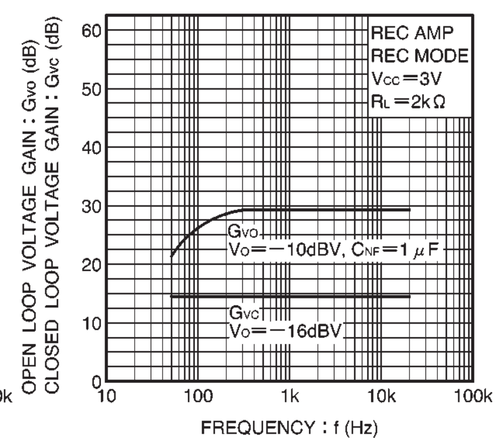


Fig. 4 Voltage gain vs. frequency

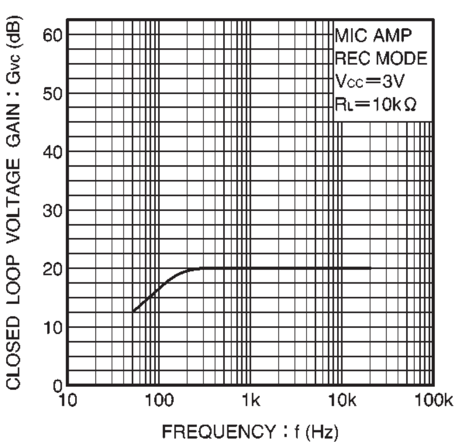


Fig. 5 Voltage gain vs. frequency

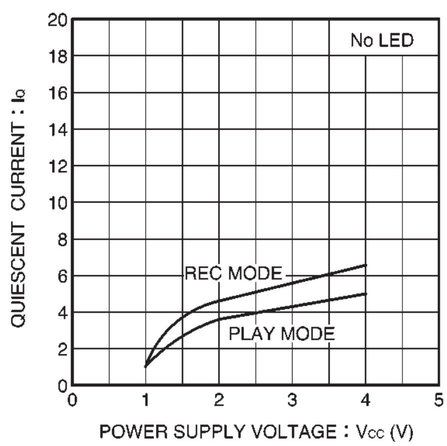


Fig. 6 Quiescent current vs. power supply voltage

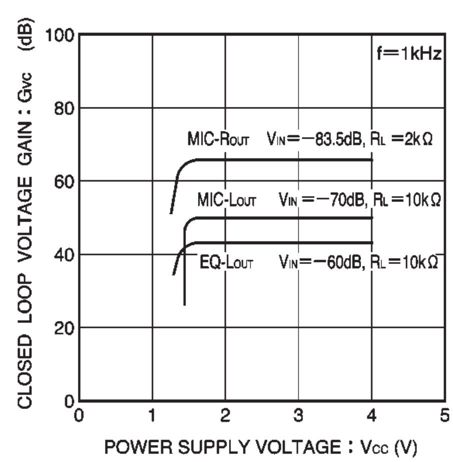


Fig. 7 Voltage gain vs. power supply voltage

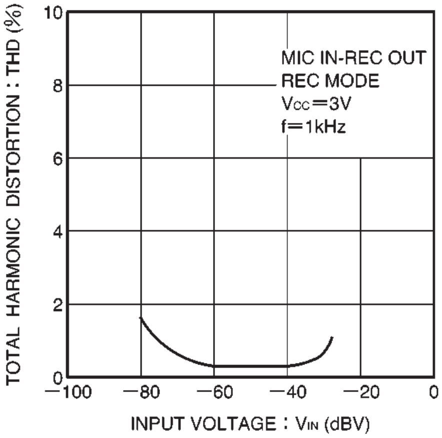


Fig. 8 Distortion vs. input voltage

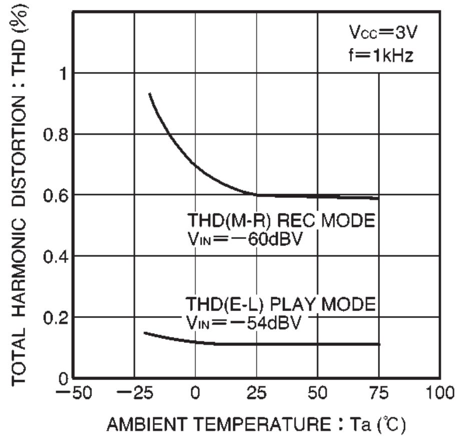


Fig. 9 Distortion vs. ambient temperature

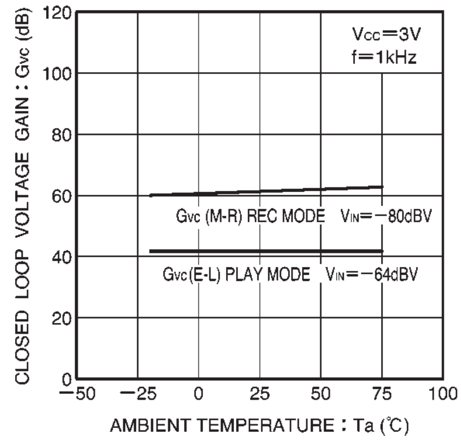


Fig. 10 Voltage gain vs. ambient temperature

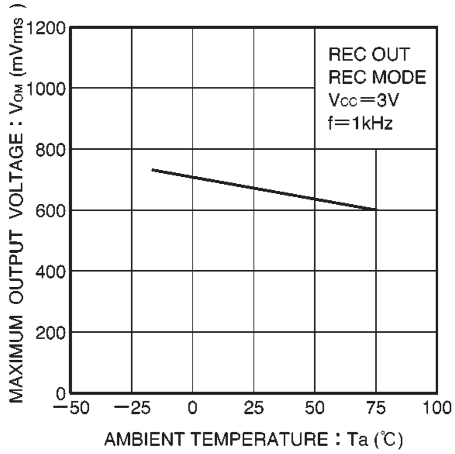


Fig. 11 Output voltage vs. ambient temperature

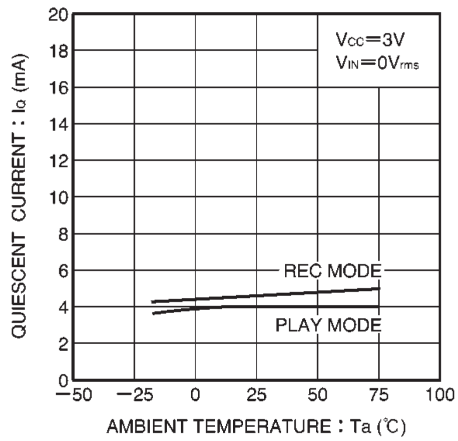
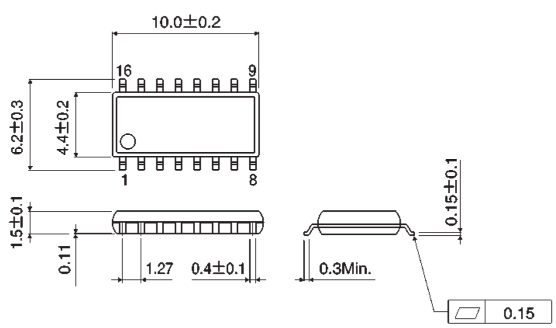


Fig. 12 Quiescent current vs. ambient temperature

●External dimensions (Units: mm)



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