

BA3412K

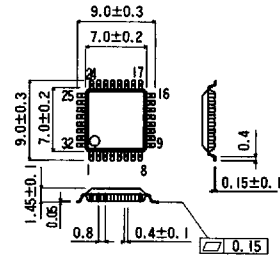
3-V dual-channel, auto-reverse tape preamplifier

The BA3412K IC is a dual-channel, auto-reverse, high-gain, low-noise preamplifier.

The IC contains a detector and electronic volume for the ALC. Both recording and playback selection, and auto-reverse switching are individually controlled by a single-contact electronic switch.

Dimensions (Units : mm)

BA3412K (QFP32)



Features

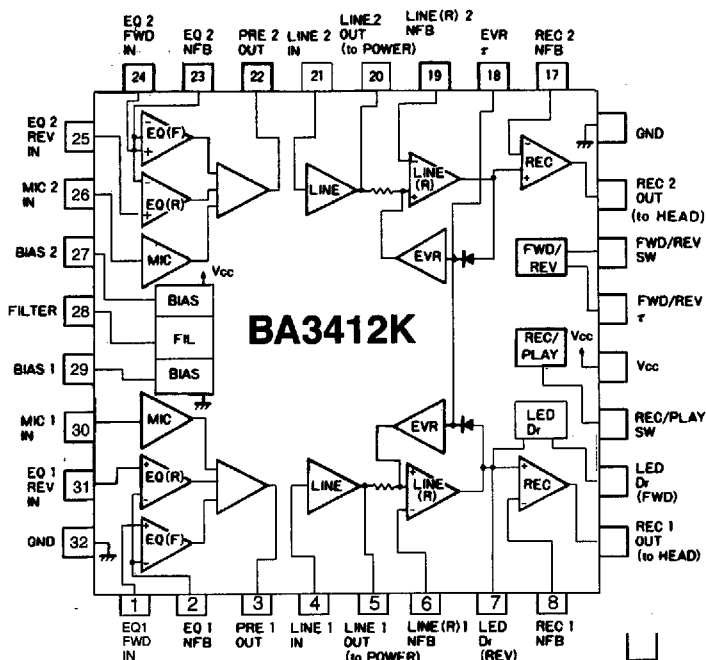
- available in QFP32 package
- low voltage power supply (1.8 ~ 3.3 V)
- low current consumption (7.0 mA when recording, 5.5 mA during playback)
- high open-loop voltage gain (66 dB)
- direct head coupling is possible during playback
- external resistor sets amplifier gain
- low noise ($V_{NIN} = 1.2 \mu V_{rms}$)

Applications

- 3-V auto-reverse headphone cassette tape recorder

BA3412K Preamplifiers

Block diagram



Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit	Conditions
Power supply voltage	V_{CC}	3.6	V	
Power dissipation	P_d	600	mW	Reduce power by 6.0 mW for each degree above 25°C . Mounted $70 \times 70 \times 1.6$ mm glass epoxy PCB.
Operating temperature	T_{opr}	$-20 \sim +75$	$^\circ\text{C}$	
Storage temperature	T_{stg}	$-40 \sim +125$	$^\circ\text{C}$	

Recommended operating conditions ($T_a = 25^\circ\text{C}$)

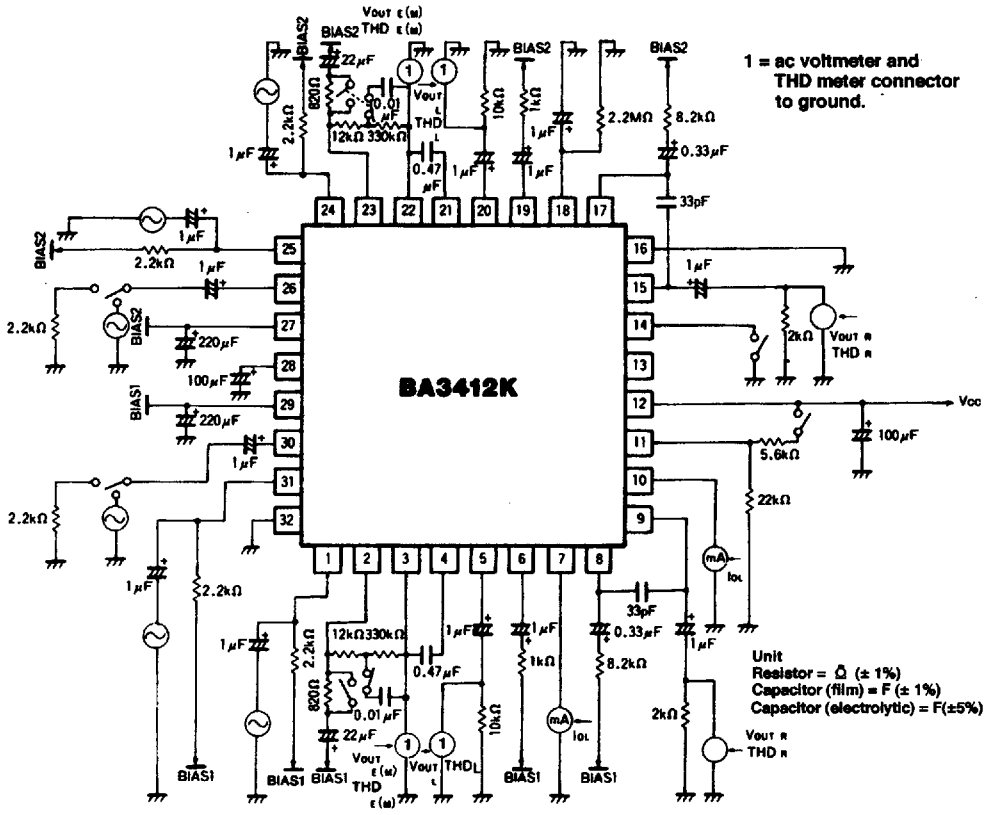
Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Power supply voltage	V_{CC}	1.8		3.3	V	When $V_{CC} \leq 2$ V, LED may not light

Electrical characteristics (T_a = 25°C, V_{CC} = 3V, f = 1 kHz)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Quiescent current (record)	I _{QR}	3.6	7.0	12.0	mA	V _{IN} = 0 V _{rms} (REC)
Quiescent current (playback)	I _{QP}	2.6	5.5	9.0	mA	V _{IN} = 0 V _{rms} (PLAY)
Closed loop voltage gain 1	G _{VC-EL}	35	38	41	dB	V _{IN} = -58 dBV, line out (play)
Closed loop voltage gain 2	G _{VC-ML}	27	30	33	dB	V _{IN} = -58 dBV, line out (rec)
Closed loop voltage gain 3	G _{VC-MR}	63	66	69	dB	V _{IN} = -80 dBV, rec out (rec)
Maximum output voltage	V _{OM-R}	400	650		mV _{rms}	THD = 2%, rec out (rec)
Total harmonic distortion 1	THD _{EL}		0.1	0.6	%	V _{IN} = -58 dBV, line out (play)
Total harmonic distortion 2	THD _{MR}		1.5	2.0	%	V _{IN} = -60 dBV, rec out (rec)
Total harmonic distortion 3	THD _{MR}		1.5	2.0	%	V _{IN} = -32 dBV, rec out (rec)
Input conversion noise voltage 1	V _{NIN-P}		1.2	2.0	μV _{rms}	R _G = 22 kΩ, BPF: 20 Hz ~ 20 kHz
Input conversion noise voltage 2	V _{NIN-R}		1.4	2.0	μV _{rms}	R _G = 22 kΩ, BPF: 20 Hz ~ 20 kHz
LED current 1	I _{OL-P1}	30	100		μA	Play fwd
LED current 2	I _{OL-P2}	30	100		μA	Play rev

BA3412K Preamplifiers

Figure 1 Test circuit



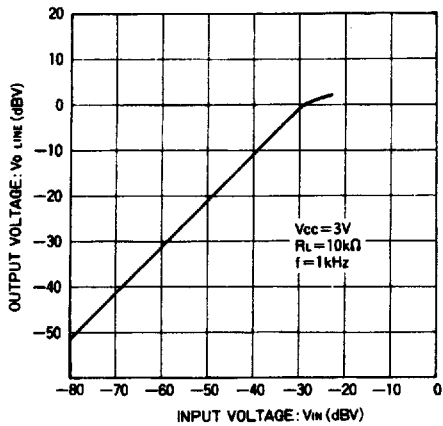


Figure 5

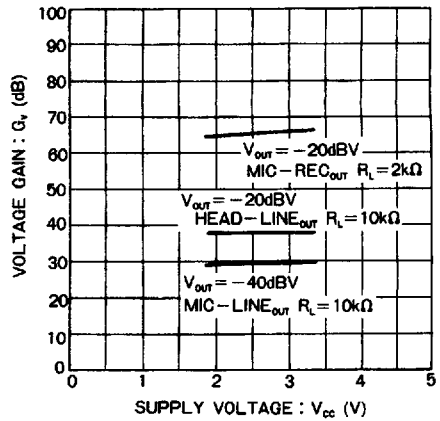


Figure 6

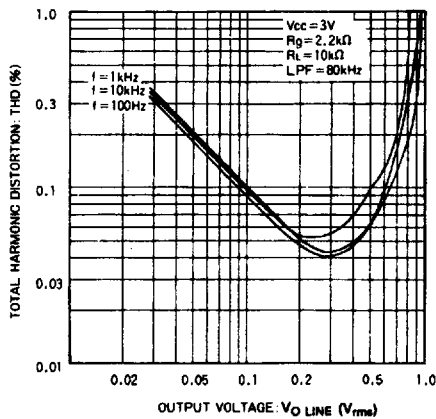


Figure 7

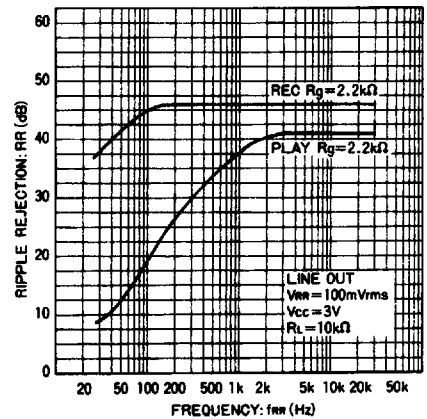


Figure 8

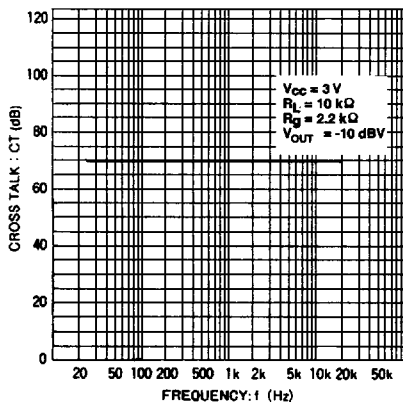


Figure 9

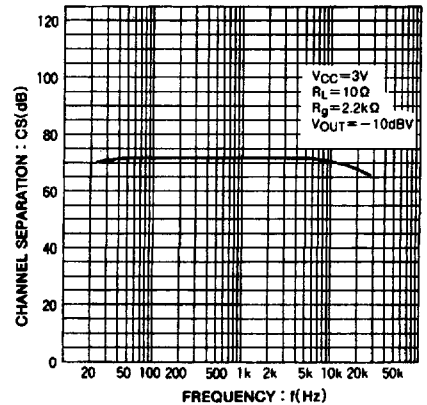


Figure 10

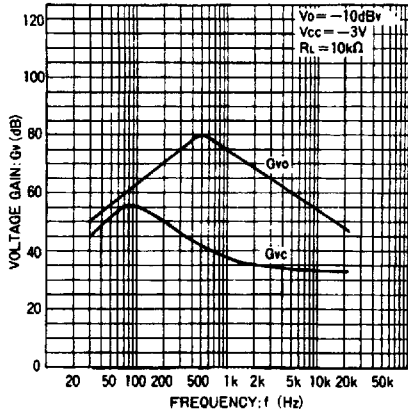


Figure 11

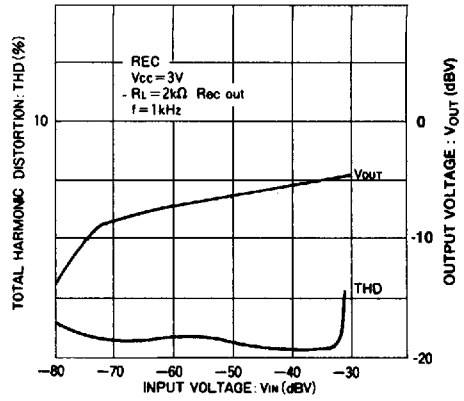


Figure 12

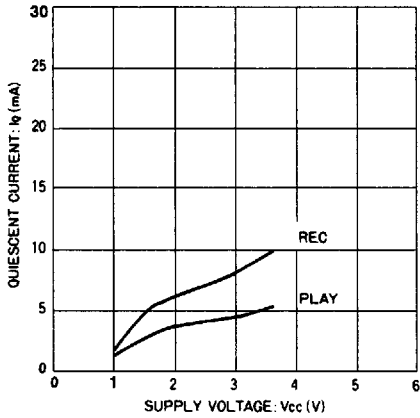


Figure 13