

# BA3406AL BA3406AF

## Dual-channel tape preamplifier, with mute circuit

The BA3406AL and BA3406AF ICs are two channel high-gain, low-noise preamplifiers that contain switch circuits for muting and time constant (for use with metal tape).

### Features

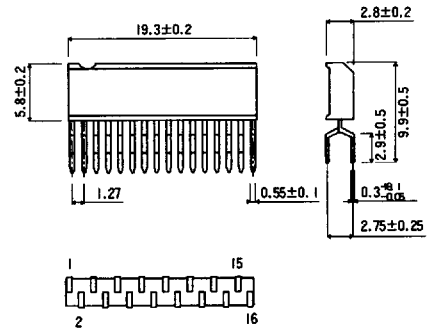
- available in ZIP16 and SOP16, packages
- wide power supply range (6 ~ 14 V)
- high open-loop gain (80 dB)
- good channel balance because of the 2-channels on a single chip
- built in bias circuit results in low pop noise when head switching
- emitter-follower output circuit ensures low output impedance
- low noise ( $V_{NIN} = 1.0 \mu V_{rms}$ )
- IC contains resistor to determine 70  $\mu s$  response of metal tape. Set exact timing with external capacitor only.
- built-in switching circuit for metal tape
- mute circuit included
- preamplifier, metal switching, and mute circuits are independent allowing different applications to use the same chip
- output terminal has reverse current prevention diode to allow parallel connection to other circuits

### Applications

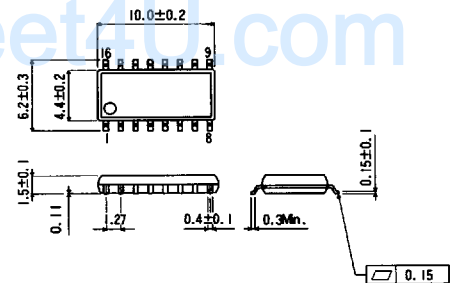
- car stereo player
- radio cassette tape recorder
- tape deck

### Dimensions (Units : mm)

#### BA3406AL (ZIP16)



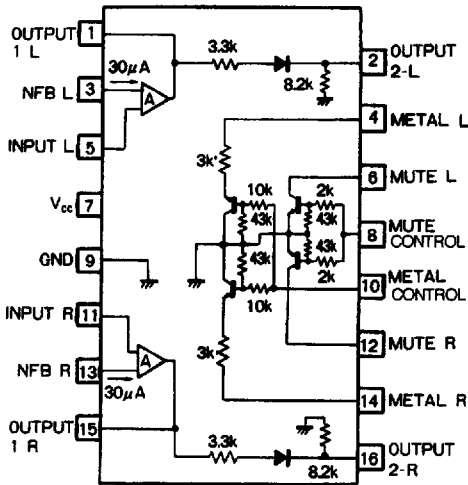
#### BA3406AF (SOP16)



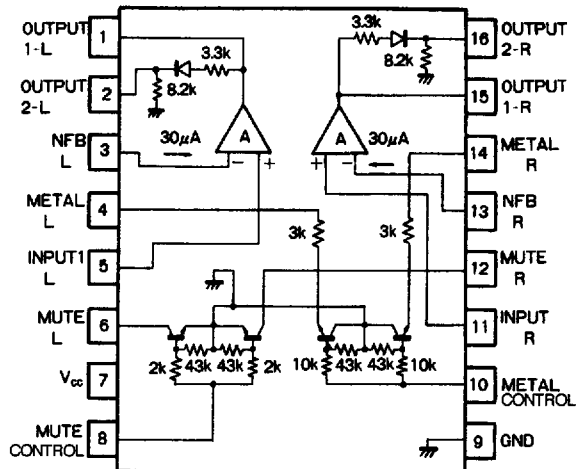
# BA3406AL, BA3406AF Preamplifiers

## Block diagram

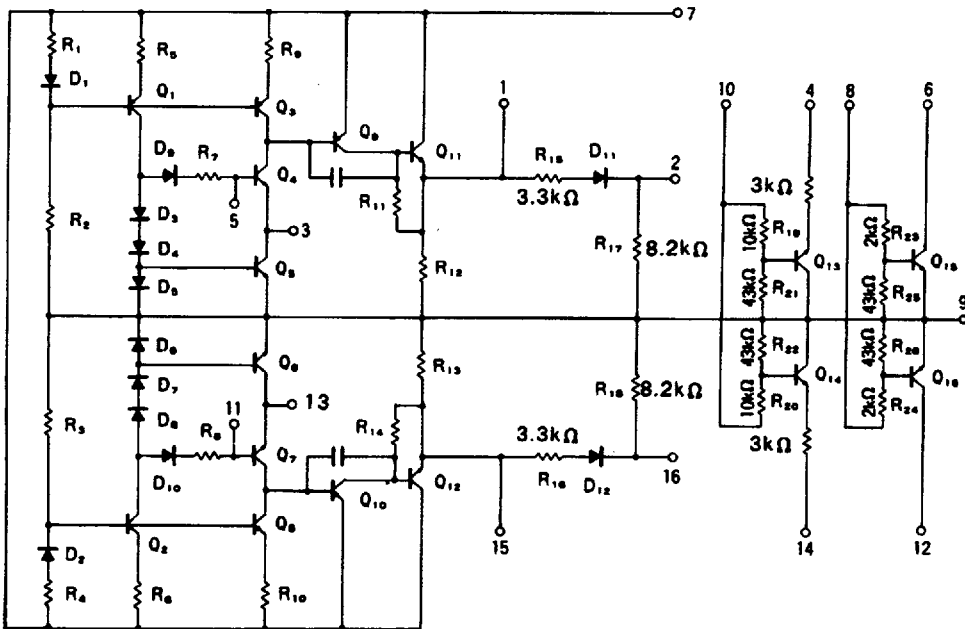
**BA3406AL**



**BA3406AF**



## Circuit diagram (BA3406AL)



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

Parameter		Symbol	Limits	Unit	Conditions
Power supply voltage		$V_{CC}$	16	V	
Power dissipation	BA3406AL	$P_d$	400	mW	Reduce power by 4.0 mW for each degree above $25^\circ\text{C}$ .
	BA3406AF		500		Reduce power by 5.0 mW for each degree above $25^\circ\text{C}$ .
Operating temperature		$T_{opr}$	$-25 \sim +75$	$^\circ\text{C}$	
Storage temperature		$T_{stg}$	$-55 \sim +125$	$^\circ\text{C}$	

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

Parameter	Symbol	Min	Typical	Max	Unit
Power supply voltage	$V_{CC}$	6	8	14	V

**Electrical characteristics ( $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 8\text{V}$ )**

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Quiescent current	$I_Q$		3.0	4.5	mA	$V_{IN} = 0 V_{rms}$
Open loop voltage gain	$G_{VO}$	75	80		dB	$V_{OUT} = 0.3 V_{rms}$ , $f = 1 \text{ kHz}$
Maximum output voltage	$V_{OM}$	1.0	1.4		$\mu\text{V}_{rms}$	THD = 1%, $f = 1 \text{ kHz}$
Total harmonic distortion	THD		0.1	0.6	%	$V_{OUT} = 0.3 V_{rms}$
Input conversion noise voltage	$V_{NIN}$		1.0	2.0	$\mu\text{V}_{rms}$	$V_{IN} = 0 V_{rms}$ , $R_g = 2.2 \text{ k}\Omega$
Input impedance	$R_{IN}$	50			$\text{k}\Omega$	
Crosstalk	CT	50	65		dB	$f = 1 \text{ kHz}$ , $R_g = 2.2 \text{ k}\Omega$
Channel balance	CB		0	1.5	dB	$V_{OUT} = 0.3 V_{rms}$

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Figure 1 Test circuit

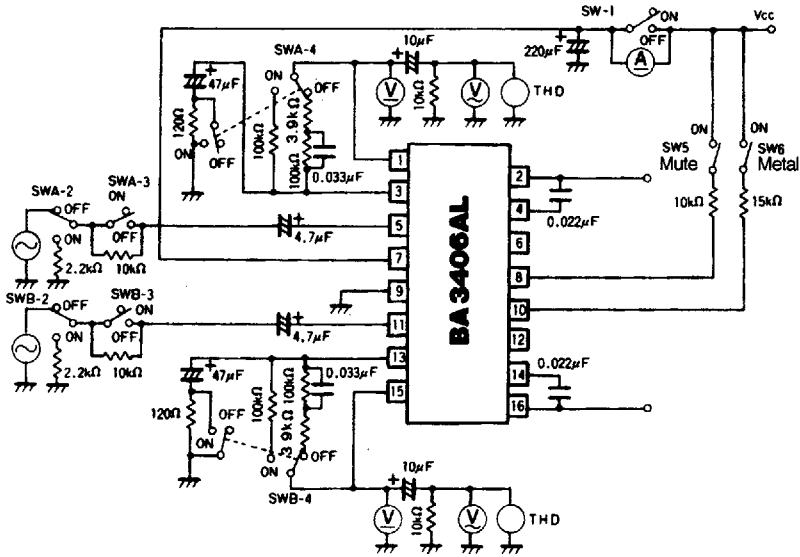
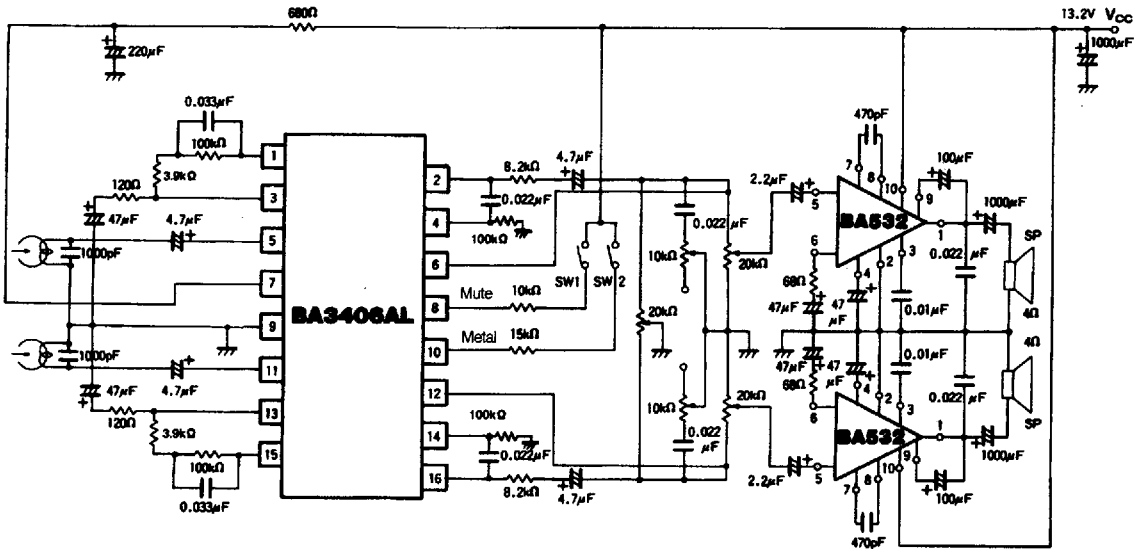


Figure 2 Application example



Electrical characteristic curves BA3408

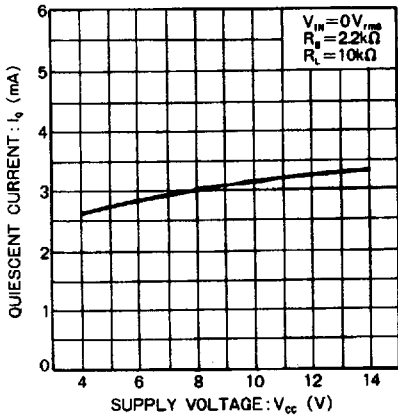


Figure 3

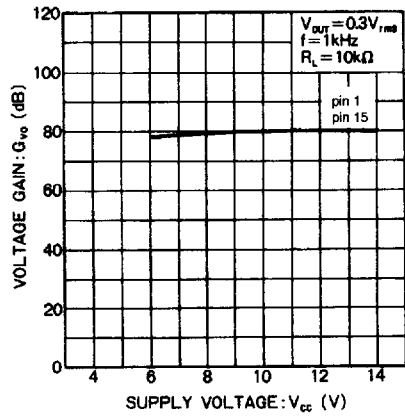


Figure 4

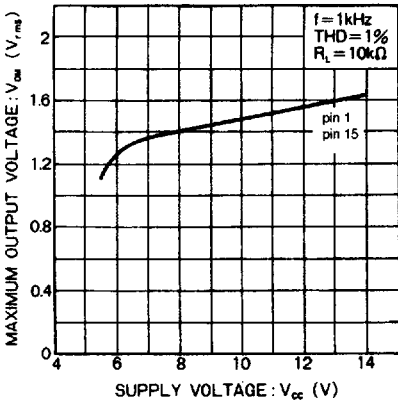


Figure 5

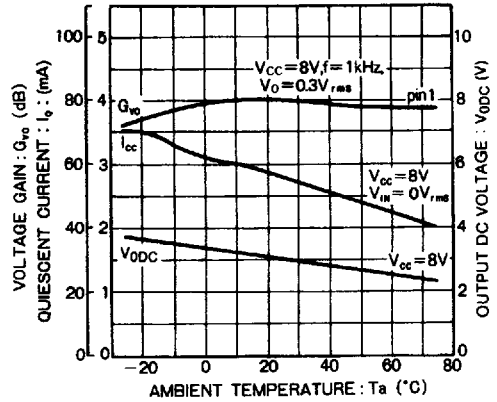


Figure 6

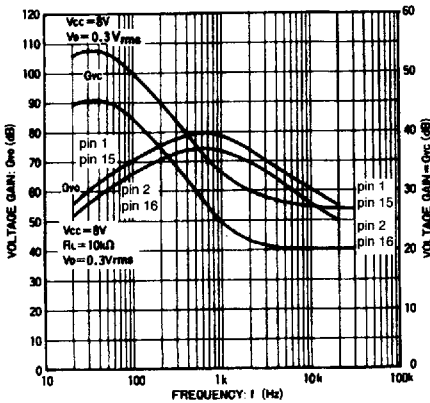


Figure 7

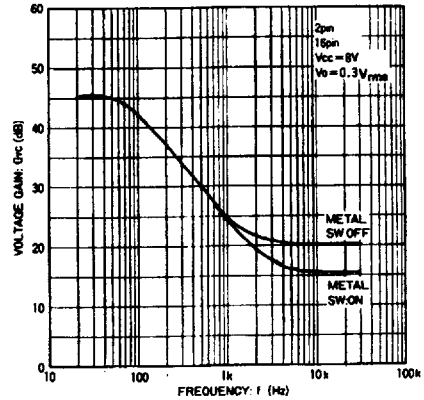


Figure 8

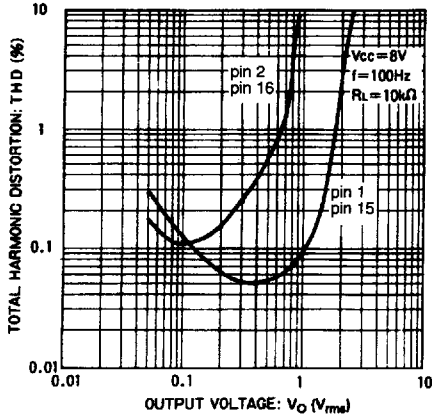


Figure 9

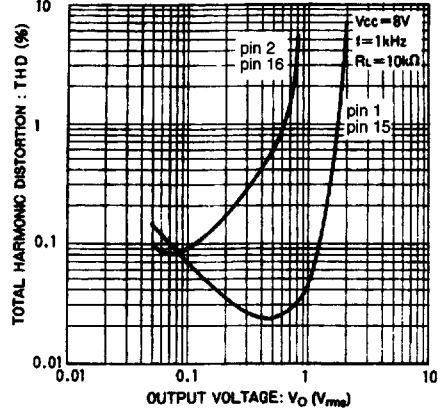


Figure 10

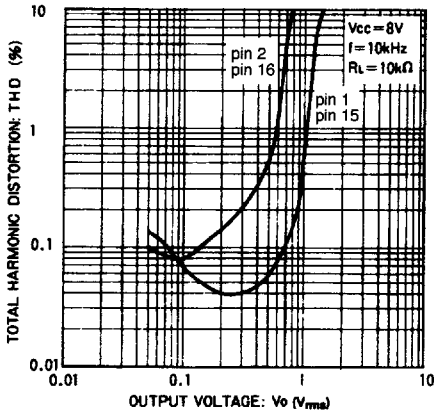


Figure 11

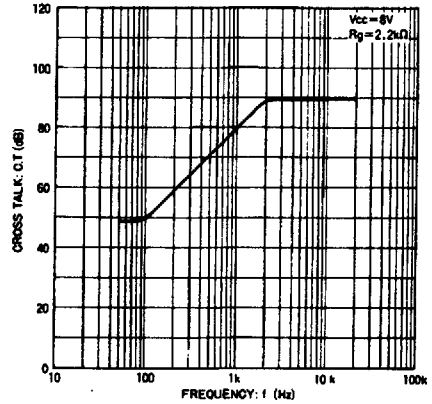


Figure 12

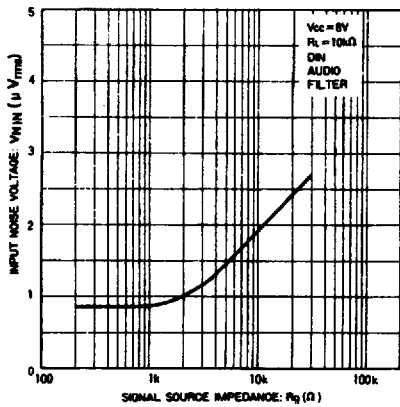


Figure 13

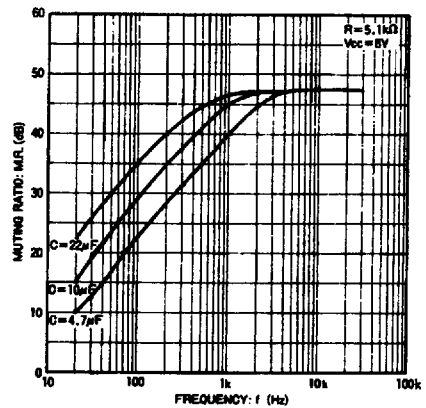


Figure 14

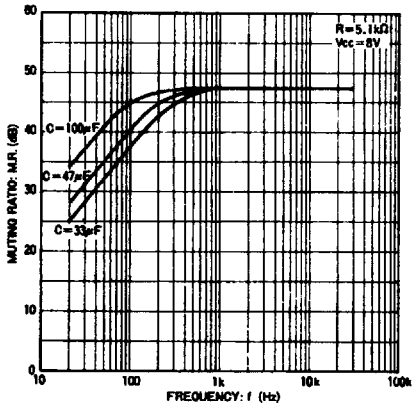


Figure 15

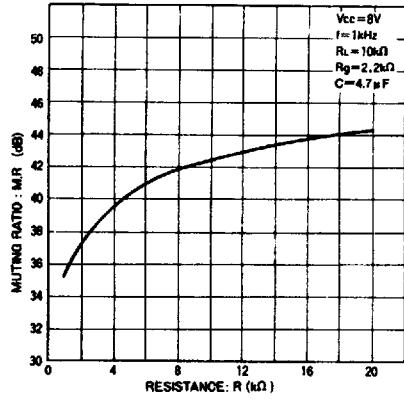


Figure 16