

Speaker / headphone switch power amplifier

BA5210FS

The BA5210FS is a power amplifier with a built-in monaural speaker/stereo headphone switch. The speaker drive is BTL for large output, and when the headphones are connected, the "center-amp" design means that coupling is not required. This significantly reduces the number of external components required, and makes this IC ideal for compact sets that have high component density. Mute and standby functions are provided, and direct microprocessor control is possible.

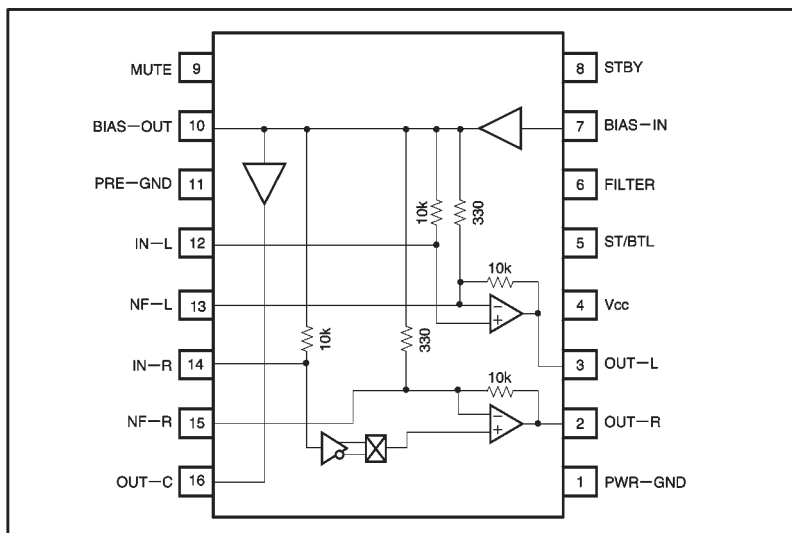
●Applications

Notebook computers, electronic books, portable CD players, video cameras with built-in monitors, LCD TVs, radios, and electronic instruments

●Features

- 1) Built-in BTL/stereo switch circuit.
- 2) Mute function.
- 3) Standby function.
- 4) Few external components required.
- 5) Low current dissipation and good sound quality.

●Block diagram



●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	6	V
Power dissipation	Pd	650*	mW
Operating temperature	Topr	-10~+60	°C
Storage temperature	Tstg	-55~+125	°C

* When mounted on a 90mm x 50mm x 1.6mm glass epoxy board, reduced by 6.5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	2.5~6.0	V

●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{CC} = 3.3V R_L = 8Ω, f = 1kHz and R_g = 600Ω)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current 1	I _{CC1}	2	8	14	mA	V _{IN} =0V _{rms} , R _L =∞
Circuit current 2	I _{CC2}	2	11	22	mA	V _{IN} =0V _{rms} , R _L =8Ω
Voltage gain 1	G _{V1}	32	35	38	dB	
Voltage gain 2	G _{V2}	9	12	15	dB	Stereo operation, R _L = 100 + 16Ω, measured at end of 16Ω
Rated output power 1	P _{OUT1}	350	450	—	mW	THD=10%
Rated output power 2	P _{OUT2}	1.2	1.7	—	mW	Measured at end of 16Ω
Maximum output voltage	V _{OM}	0.9	1.2	—	V _{rms}	Measured between L / R output pin and center amplifier output
Total harmonic distortion 1	THD1	—	0.5	1.0	%	Po=50mW
Total harmonic distortion 2	THD2	—	0.2	0.6	%	Stereo operation, R _L =100 + 16Ω, measured between L / R output pin and center amplifier output Vo=0.5V _{rms}
Output noise voltage	V _{NO}	—	50	100	μV _{rms}	Stereo operation, R _L =100 + 16Ω, R _g =0Ω, measured between L / R output pin and center amplifier output
Ripple rejection ratio	RR	58	65	—	dB	Stereo operation, R _L = 100 + 16Ω, V _{RR} =-20dBm, f _{RR} =1kHz, R _g =0Ω, measured at end of 16Ω
Channel separation	CS	55	65	—	dB	Stereo operation, R _L =100 + 16Ω, Vo =0dBm, at end of 100 + 16Ω
Input resistance	R _{IN}	8	10	12	kΩ	
Standby release threshold	V _{thSA}	—	1.5	2.0	V	Stereo operation, R _L =100 + 16Ω, measured at end of 16Ω, GV2 > 6dB
Standby threshold	V _{thSB}	0.2	0.6	—	V	V _{IN} =0V _{rms} , R _L =8Ω, I _{CC2} < 10μA
Mute on threshold	V _{thMA}	—	0.8	2.0	V	Stereo operation, R _L =100 + 16Ω, V _{IN} =-25dBm, Vo < -80dB (end of 16Ω)
Mute off threshold	V _{thMB}	0.2	0.7	—	V	Stereo operation, R _L =100 + 16Ω, measured at end of 16Ω, GV2 > 6dB
Standby pin source current	I _{SSS}	—	30	100	μA	
Mute pin source current	I _{SSM}	—	20	100	μA	

● Measurement circuit

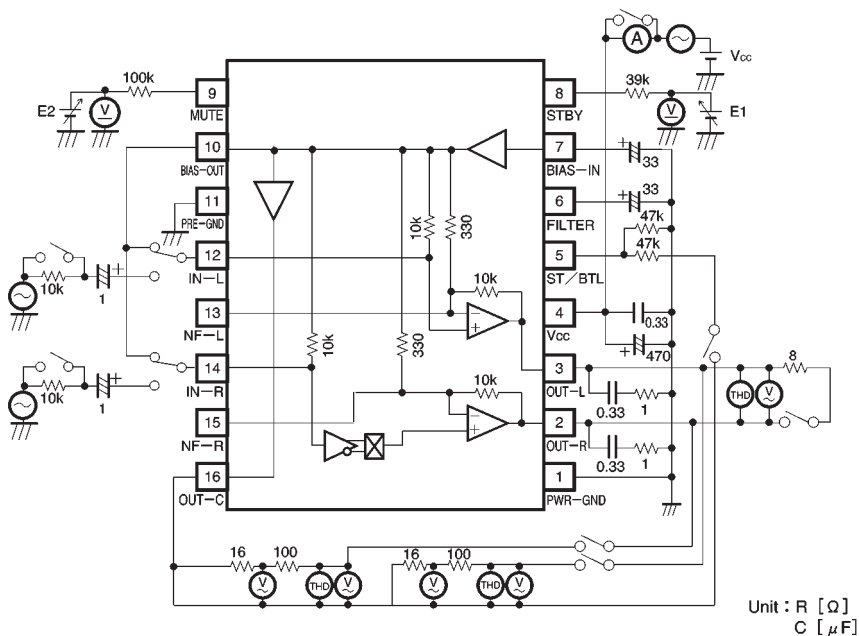


Fig. 1

● Application example

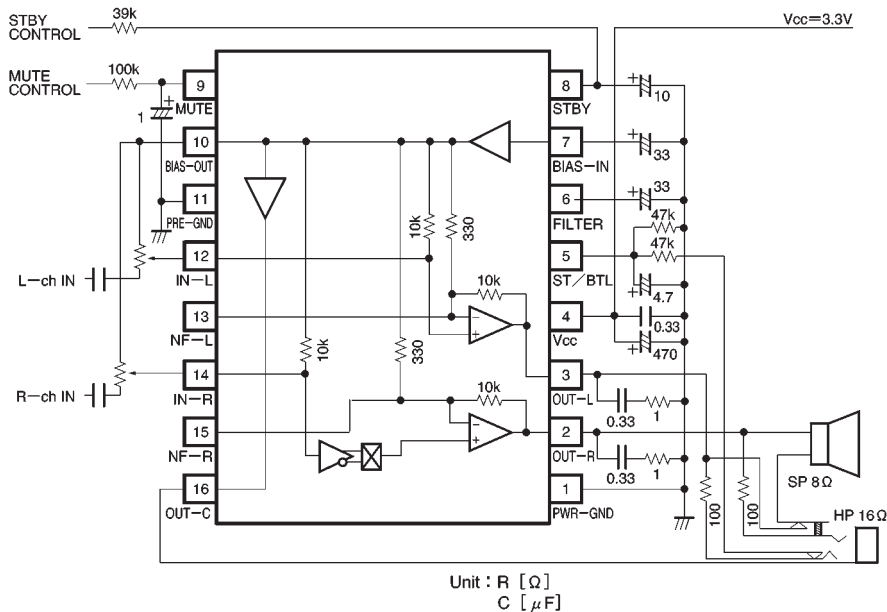


Fig. 2

●External dimensions (Units: mm)

