

General-purpose dual line amplifier

BA3118L

The BA3118L is a dual-channel line amplifier with a flat frequency characteristic. It has been designed for use in radio cassette players and car stereos.

The feedback resistors are all on the chip, which reduces the number of external components required and simplifies PCB design. The gain can be set to one of 10 gain settings from 6dB to 20dB (6dB, 8dB, 10dB, 10.9dB, 12.4dB, 13.4dB, 15.1dB, 16dB, 17.9dB and 20dB), and external fine trimming is possible.

●Applications

Car stereos and radio cassette players

●Features

- 1) 10 gain settings over the range 6dB to 20dB (max. step 2dB) without external resistors.
- 2) Low distortion.
- 3) Good crosstalk characteristics.
- 4) Low noise.
- 5) Flat frequency characteristic.
- 6) Two channels on one chip allows compact set design.
- 7) Pin 9 is not connected which simplifies the PBC GND design.
- 8) Built-in feedback resistors reduces the number of external components required.
- 9) Low gain variance between the two channels.

●Absolute maximum ratings (Ta = 25°C)

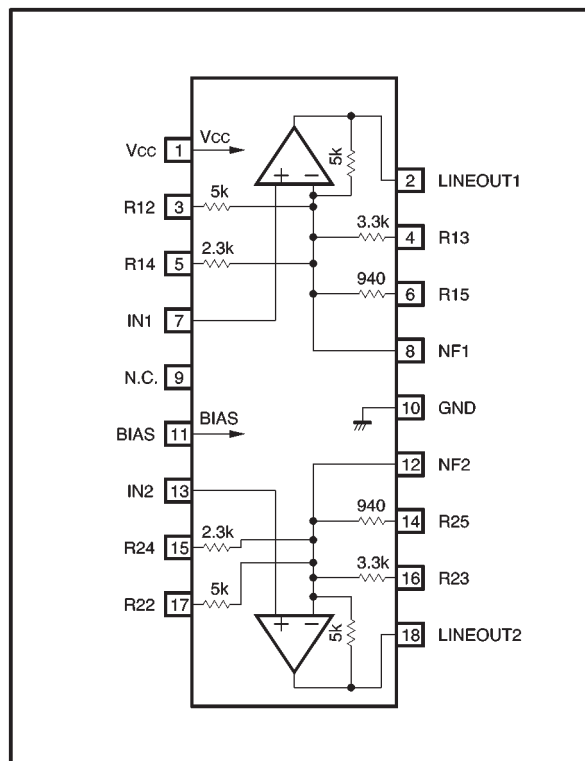
Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	18	V
Power dissipation	P _d	400*1	mW
Operating temperature	T _{opr}	−25~+85	°C
Storage temperature	T _{stg}	−55~+125	°C

*1 Reduced by 4.0mW 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}	4	—	16	V

●Block diagram



●Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = 8.0\text{V}$, $f = 1\text{kHz}$ and $G_{VC} = 20\text{dB}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I_Q	—	3.8	5.6	mA	$V_{IN} = 0V_{rms}$
Closed loop voltage gain	G_{VC}	19	20	21	dB	$V_{IN} = -20\text{dBm}$, DIN AUDIO
Maximum output voltage	V_{OM}	1.1	1.9	—	V_{rms}	THD = 1%, BPF400~30kHz
Total harmonic distortion	THD	—	0.017	0.15	%	$V_O = 0\text{dBm}$, $R_L = 30k\Omega$
Input conversion noise voltage	V_{NIN}	—	1.1	2.1	μV_{rms}	$V_{IN} = 0V_{rms}$, $R_g = 0\Omega$, DIN AUDIO
Interchannel crosstalk	CT	—	-92	-72	dB	$V_O = 0\text{dBm}$, $R_L = 30k\Omega$
Input resistance	R_{IN}	30	45	60	$k\Omega$	$V_{IN} = 0.1V_{rms}$
Ripple rejection ratio	RR	35	44	—	dB	$V_{RR} = -20\text{dBm}$, $f_{RR} = 100\text{Hz}$

● Measurement circuit

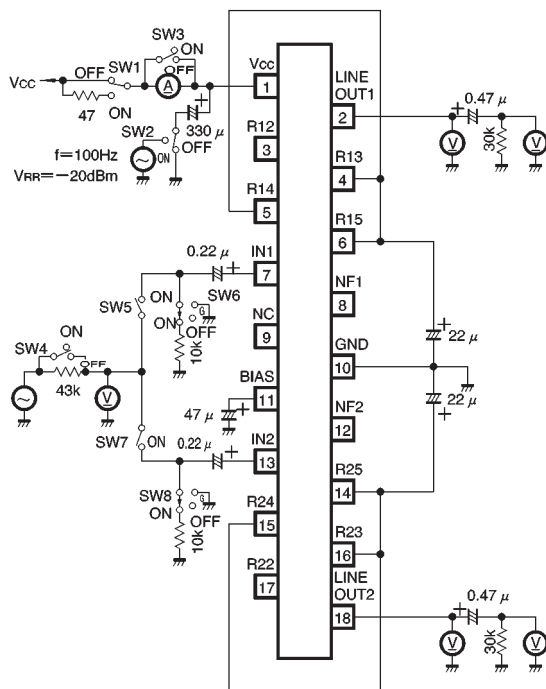
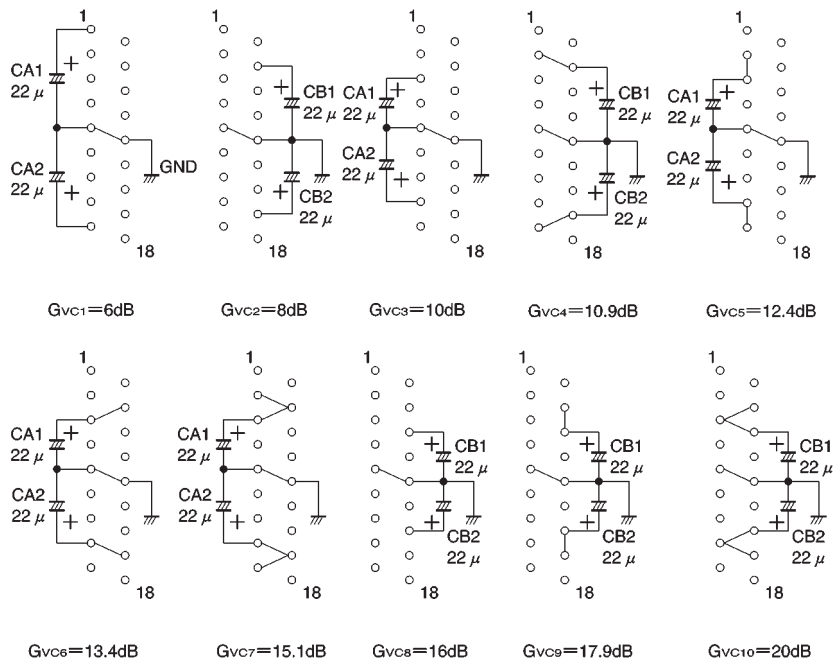


Fig. 1

Measurement circuit switch setting table

SW No. Item	1	2	3	4	5	6	7	8
I _Q	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
G _{VC}	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
V _{OM}	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
THD	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
V _{NIN}	OFF	OFF	OFF	OFF	OFF	G	OFF	G
CT	OFF	OFF	OFF	OFF	ON/OFF	OFF/ON	OFF/ON	ON/OFF
R _{IN}	OFF	OFF	OFF	ON	ON/OFF	OFF	OFF/ON	OFF
RR	ON	ON	OFF	OFF	OFF	ON	OFF	ON

● Gain setting pattern diagrams



●Application example

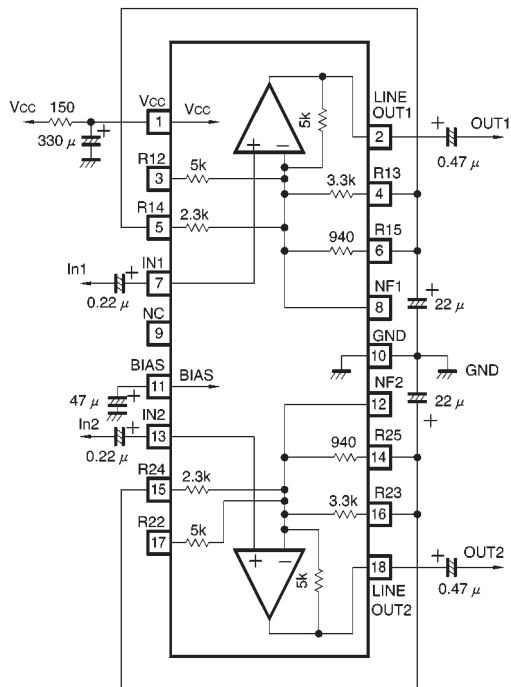


Fig. 2

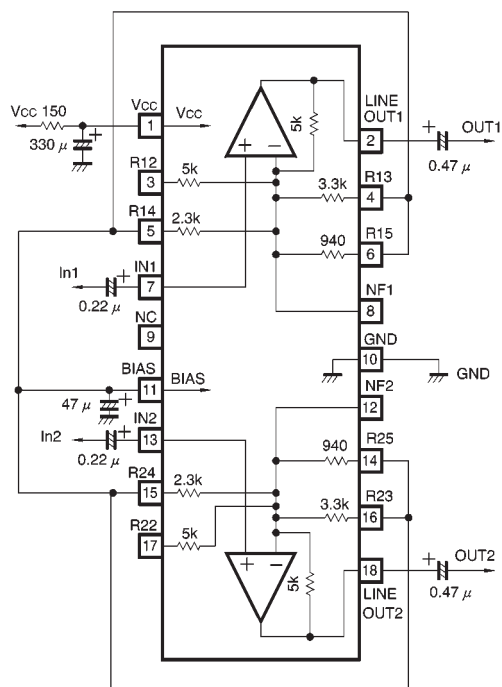


Fig. 3

●Electrical characteristics curves

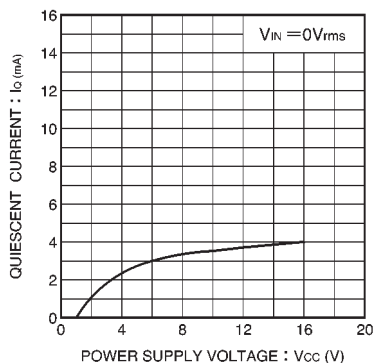


Fig. 4 Quiescent current vs. power supply voltage

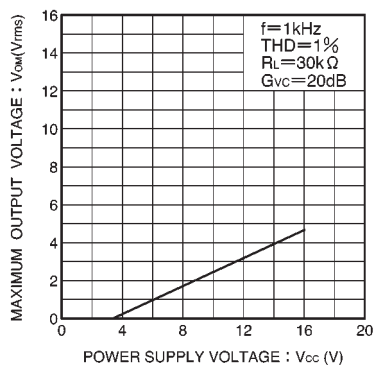


Fig. 5 Maximum output voltage vs. power supply voltage

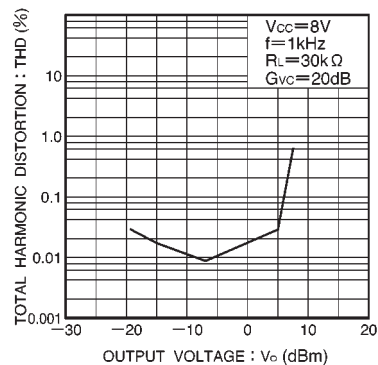


Fig. 6 Total harmonic distortion vs. output voltage

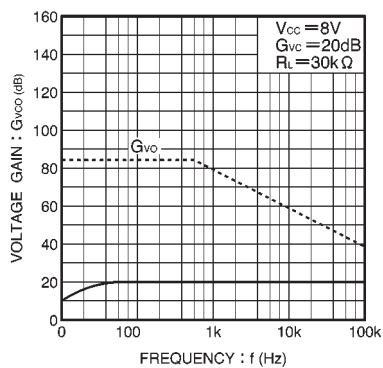


Fig. 7 Voltage gain vs. frequency

●External dimensions (Units: mm)

