

Quad ground sense operational amplifier

BA10324A/BA10324AF/BA10324AFV

The BA10324A, BA10324AF, and BA10324AFV are monolithic ICs with four built-in operational amplifiers featuring internal phase compensation.

Either a dual or single power supply can be driven, and these products can be driven by a digital system 5V single power supply. These products can be used in a wide range of administrative and industrial applications, including transducer amplifiers and DC amplifiers.

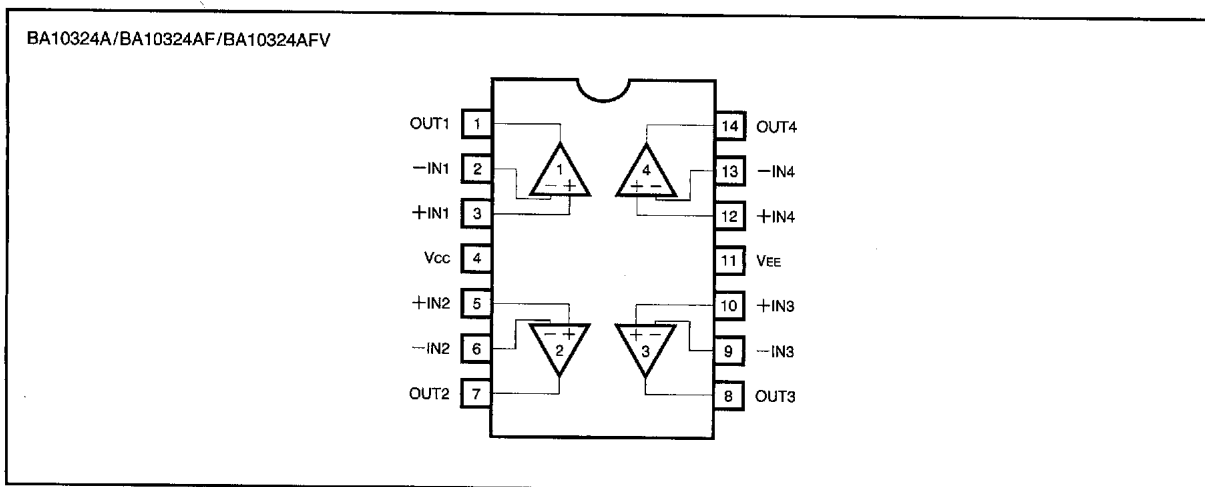
●Applications

Ground sensing type pre-amplifiers
Active filters
DC amplifiers
Pulse generators

●Features

- 1) Wide range of operating voltages and single power supply drive enabled.
(single power supply : 3 to 32V, dual power supply : ± 1.5 to ± 16 V)
- 2) Common mode input voltage can be operated from the ground level.
- 3) Differential input voltage can be operated up to the power supply voltage level.
- 4) Low current consumption ($I_o = 0.6\text{mA}$)
- 5) Low offset voltage and offset current ($V_{io} = 2\text{mV}$, $I_{io} = 5\text{nA typ.}$)
- 6) Four operational amplifiers with phase compensation are built into the DIP/SOP Pin 14.
- 7) Compatible with model 324 operational amplifiers of other manufacturers.

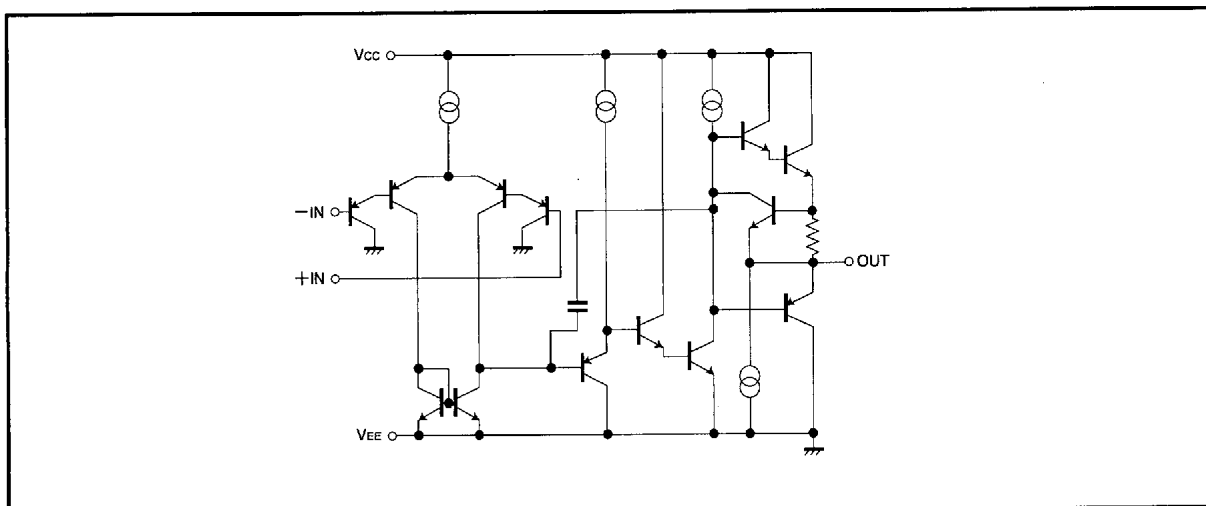
●Block diagram



7828999 0021402 510

ROHM

● Internal circuit configuration diagram



● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits			Unit
		BA10324A	BA10324AF	BA10324AFV	
Power supply voltage	V _{cc}	32 (±16)	32 (±16)	32 (±16)	V
Power dissipation	P _d	1000*	450*	350*	mW
Differential input voltage	V _{ID}	±V _{cc}	±V _{cc}	±V _{cc}	V
In-phase input voltage	V _I	-0.3~V _{cc}	-0.3~V _{cc}	-0.3~V _{cc}	V
Operating temperature	T _{opr}	-40~85	-40~85	-40~85	°C
Storage temperature	T _{stg}	-55~125	-55~125	-55~125	°C

* For P_d values, please see P_d characteristic diagram.

Values are those when BA10324AF/BA10324AFV is mounted on a glass epoxy PCB (50 mm x 50 mm x 1.6 mm).

●Electrical characteristics (unless otherwise noted, $T_a=25^\circ\text{C}$, $V_{CC}=5\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
Input offset voltage	V_{IO}	—	2	7	mV	$R_s=50\Omega$	
Input offset current	I_{IO}	—	5	50	nA		
Input bias current	I_b	—	20	250	nA	*1	
Common mode input voltage	V_{ICM}	0	—	$V_{CC}-1.5$	V		
Common mode rejection ratio	CMRR	65	75	—	dB		
High-amplitude voltage gain	A_{VOL}	87	100	—	dB	$R_L \geq 2k\Omega$, $V_{CC}=15\text{V}$	
Power supply voltage rejection ratio	PSRR	65	100	—	dB	$R_s=50\Omega$	
Quiescent circuit current	I_Q	—	0.6	2.0	mA	$R_L=\infty$, on All Op - Amps	
Maximum output voltage	V_{OH}	3.5	3.6	—	V	$R_L=2k\Omega$	
	V_{OL}	—	0	0.25	V	$R_L=\infty$	
Maximum output current	(Source)	I_{OH}	20	35	—	mA	$V_O=0$
	(Sink)	I_{OL}	10	20	—	mA	$V_O=V_{CC}$
Channel separation	CS	—	120	—	dB	$f=1\text{kHz}$ input conversion	

*1 Because the first stage is configured of a PNP transistor, input bias current is from the IC.

●Electrical characteristic curves

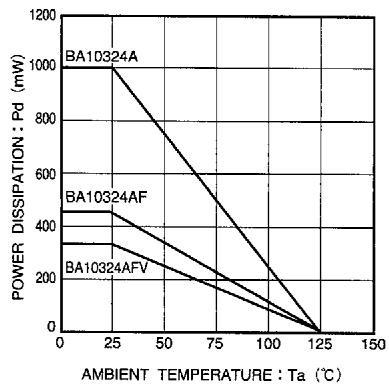


Fig.1 Power dissipation - ambient temperature characteristic

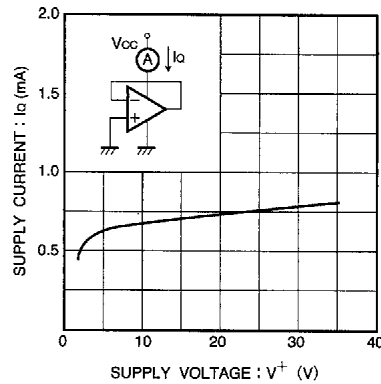


Fig.2 Quiescent current - power supply voltage characteristic

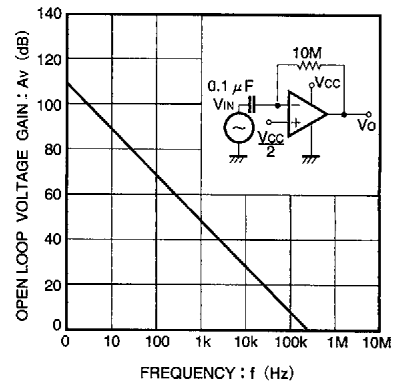


Fig.3 Open loop voltage gain - frequency characteristic

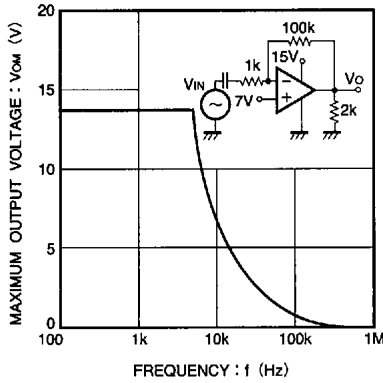


Fig.4 Maximum output voltage - frequency characteristic

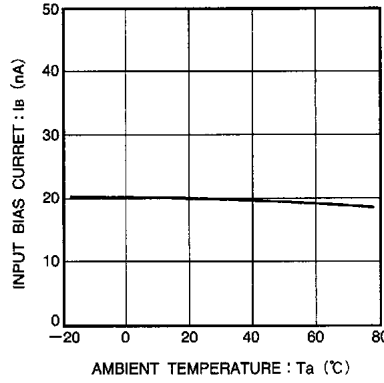


Fig.5 Input bias current - ambient temperature characteristic

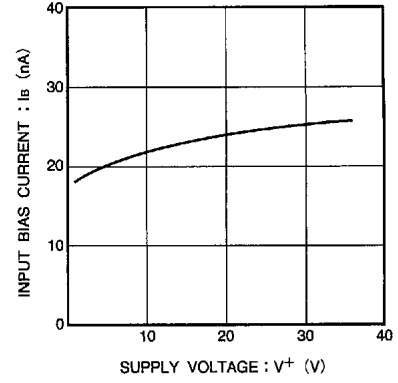


Fig.6 Input bias current - power supply voltage

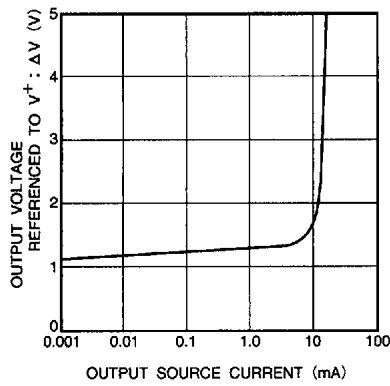


Fig.7 Potential difference during power supply output - output source current characteristic

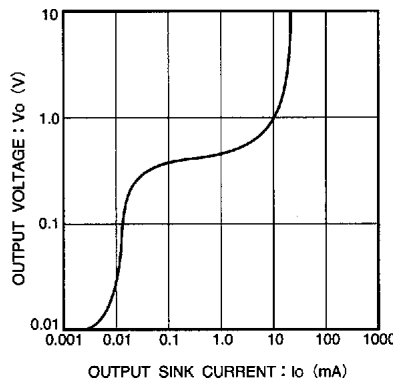


Fig.8 Output voltage - output sink current characteristic

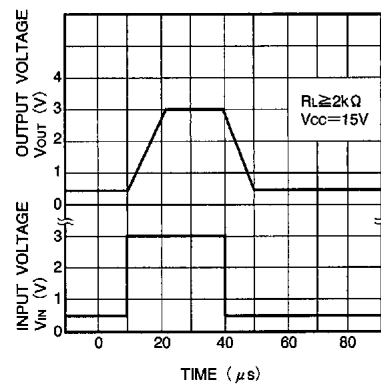


Fig.9 Output response characteristic

● Operation notes

• Unused circuit connections

If there are any circuits which are not being used, we recommend making connections as shown in Figure 10, with the non-inverted input pin connected to the potential within the in-phase input voltage range (V_{ICM}).

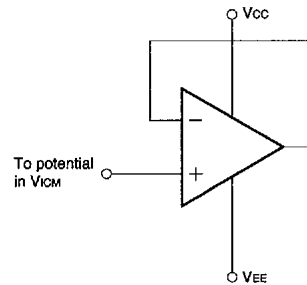


Fig.10 Unused circuit connections

● External dimensions (Units: mm)

