Dual ground sense operational amplifier

BA10358/BA10358F/BA10358FV/BA10358N

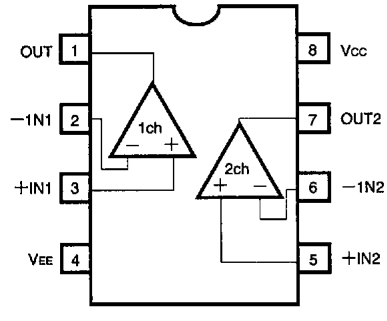
The BA10358, BA10358F, BA10358FV, and BA10358N are monolithic ICs with two independent built-in operational amplifiers featuring high gain and frequency compensation.
These products offer a particularly wide range of operating voltages, from 3 to 32V (when using a single power supply). Current consumption is low and remains constant regardless of the power supply voltage. Available packages include an 8-pin DIP (BA10358), an 8-pin SOP (BA10358F), an 8-pin SSOP-B (BA10358FV), and an 8-pin SIP (BA10358N).

●Features

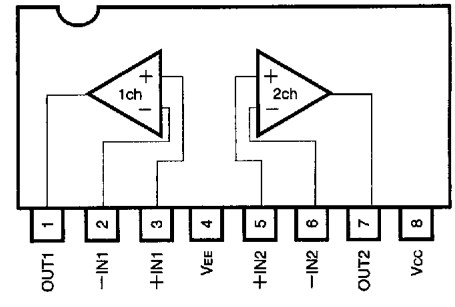
1) Can be driven with a single power supply.
2) Extremely low current consumption.
3) Level is compatible with any kind of logic circuit.
4) Operating voltage range is 3 to 32V for single power supply, ±1.5 to ±16V for dual power supply.
5) High DC voltage gain.
6) Wide frequency response.
7) Pin layout is the same as the general-purpose 4558 model.
8) Compatible with type 358 operation amplifier.

●Block diagram

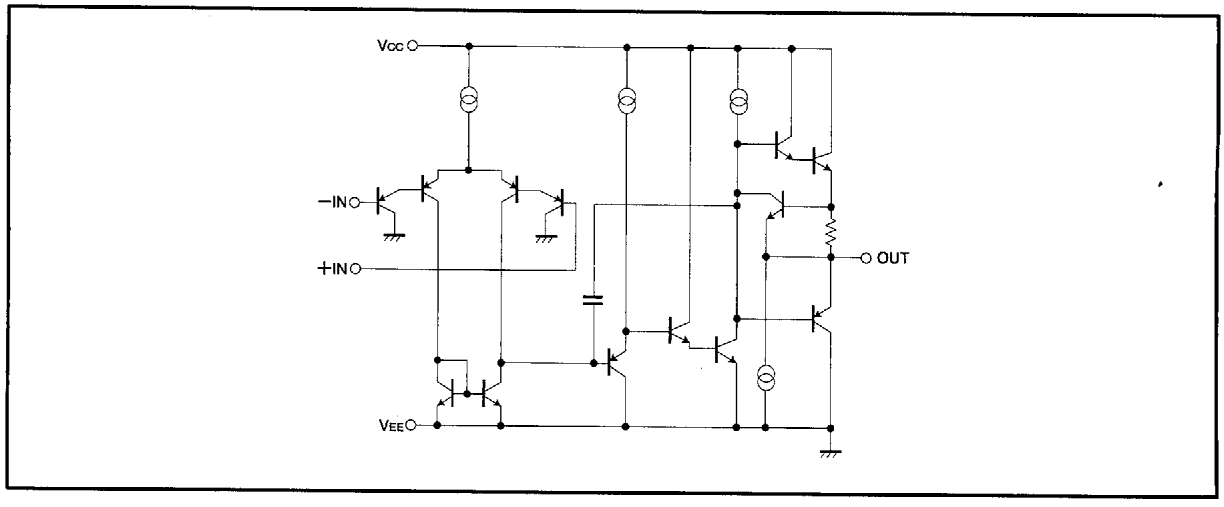
BA10358/BA10358F/BA10358FV



BA10358N



●Internal circuit configuration diagram



●Absolute maximum ratings

Parameter	Symbol	Limits				Unit
		BA10358	BA10358F	BA10358FV	BA10358N	
Power supply voltage	Vcc	32 (±16)	32 (±16)	32 (±16)	32 (±16)	V
Power dissipation	Pd	600*	550*	350*	900*	mW
Differential input voltage	VID	±Vcc	±Vcc	±Vcc	±Vcc	V
In-phase input voltage	VI	−0.3~Vcc	−0.3~Vcc	−0.3~Vcc	−0.3~Vcc	V
Operating temperature	Topr	−40~85	−40~85	−40~85	−40~85	℃
Storage temperature	Tstg	−55~125	−55~125	−55~125	−55~125	℃

* For Pd values, please see Pd characteristic diagram.
Values are those when BA10358F is mounted on a glass epoxy PCB (50 mm x 50 mm x 1.6 mm).
Values are those when BA10358FV is mounted on a glass epoxy PCB (70 mm x 70 mm x 1.6 mm).

●Electrical characteristics (unless otherwise noted, Ta=25℃, Vcc=+5V)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input offset voltage		V_{IO}	—	2	7	mV	R_S=50Ω
Input offset current		I_{IO}	—	5	50	nA	—
Input bias current		I_B	—	45	250	nA	—
High-amplitude voltage gain		A_V	25	100	—	V / mV	R_L≧2kΩ, V_{CC}=15V
Common mode input voltage range		V_{ICM}	0	—	V_{CC}−1.5	V	—
Output voltage range		V_O	0	—	V_{CC}−1.5	V	R_L=2kΩ
Common mode rejection ratio		CMRR	65	80	—	dB	—
Power supply voltage rejection ratio		PSRR	65	100	—	dB	R_S=50Ω
Quiescent circuit current		I_Q	—	0.7	1.2	mA	R_L=∞, on All Op - Amps
Slew rate		S. R.	—	0.2	—	V / μs	A_V=1, R_L≧2kΩ
Maximum frequency		f_T	—	0.5	—	MHz	—
Channel separation		CS	—	120	—	dB	f = 1 kHz input conversion
Maximum output voltage	source	I_{source}	10	20	—	mA	V_{IN}^+=1V, V_{IN}^-=0V, V_O=0V
	sink	I_{sink}	10	20	—	mA	V_{IN}^-=1V, V_{IN}^+=0V, V_O=V_{CC}

●Electrical characteristic curves

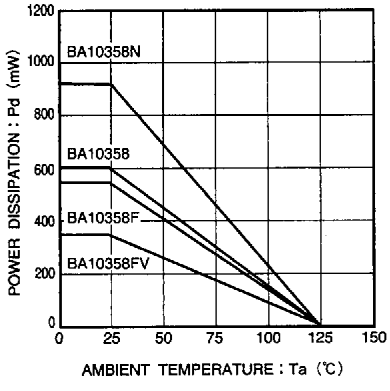


Fig. 1 Power dissipation - ambien temperature characteristic

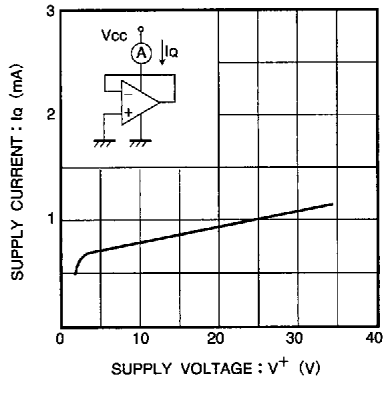


Fig. 2 Quiescent current - power supply voltage characteristic

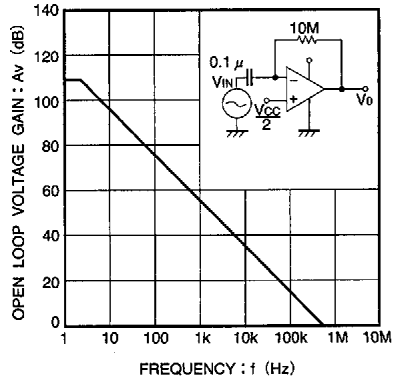


Fig. 3 Open loop voltage gain - frequency characteristic

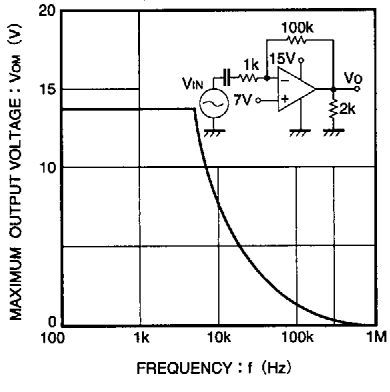


Fig. 4 Maximum output voltage - frequency characteristic

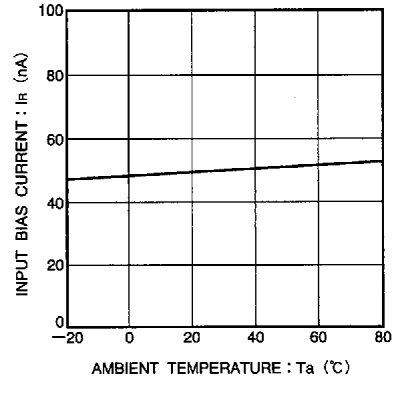


Fig. 5 Input bias current - ambient temperature characteristic

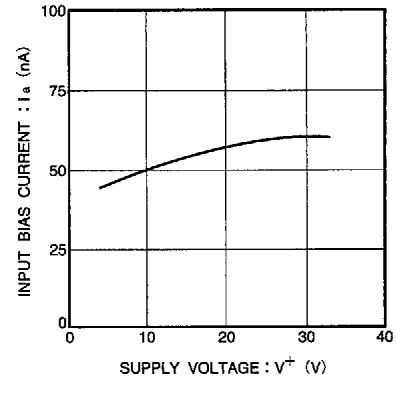


Fig. 6 Input bias current - power supply voltage characteristic

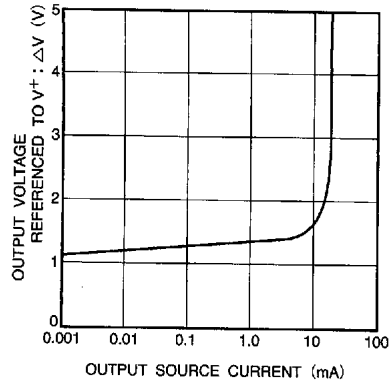


Fig. 7 Voltage difference during power supply output - output source current characteristic

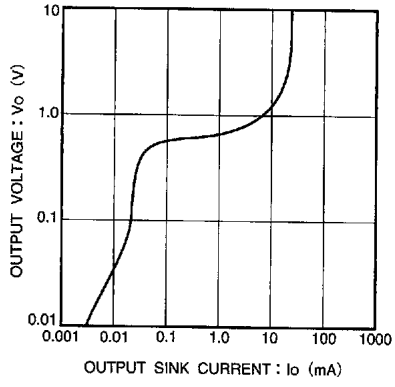


Fig. 8 Output voltage - output sink current characteristic

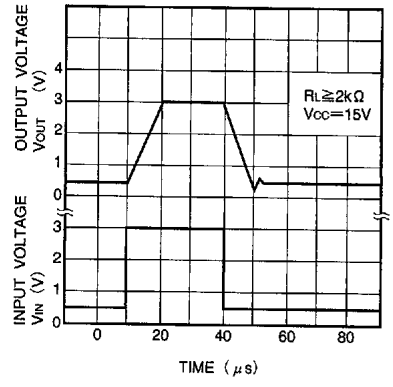


Fig. 9 Output response characteristic

●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}).

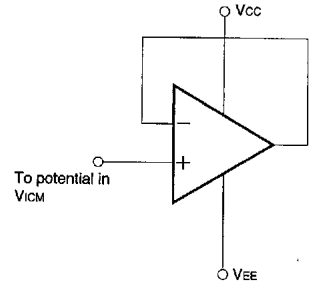
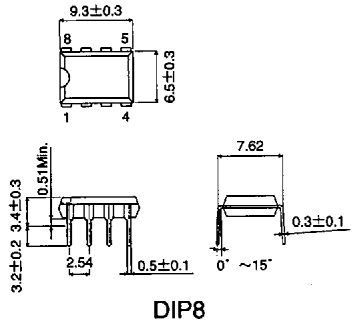


Fig. 10 Unused circuit connections

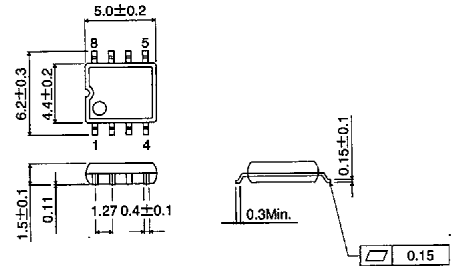
●External dimensions (Units: mm)

BA10358



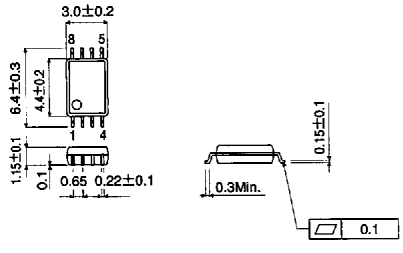
DIP8

BA10358F



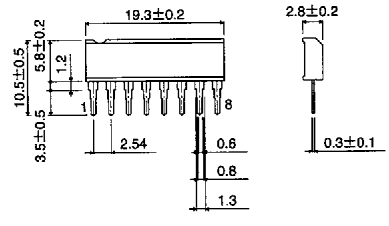
SOP8

BA10358FV



SSOP-B8

BA10358N



SIP8