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 dissipation 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 dissipation.
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 assignments is the same as the general-purpose 4558 model.
8) Compatible with model 358 operation amplifiers of other manufacturers.

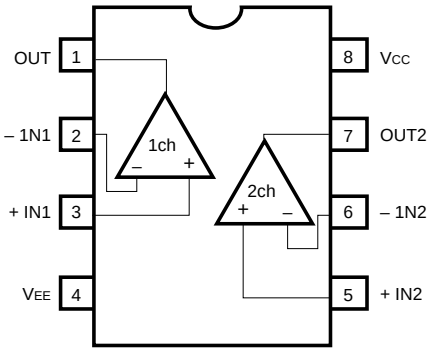
●Absolute maximum ratings

Parameter	Symbol	Limits				Unit
		BA10358	BA10358F	BA10358FV	BA10358N	
Power supply voltage	V_{CC}	32 (± 16)	32 (± 16)	32 (± 16)	32 (± 16)	V
Power dissipation	Pd	800*	550*	350*	900*	mW
Differential input voltage	V_{ID}	± V_{CC}	± V_{CC}	± V_{CC}	± V_{CC}	V
Common-mode input voltage	V_I	– 0.3 ~ V_{CC}	– 0.3 ~ V_{CC}	– 0.3 ~ V_{CC}	– 0.3 ~ V_{CC}	V
Operating temperature	Topr	– 40 ~ +85	– 40 ~ +85	– 40 ~ +85	– 40 ~ +85	°C
Storage temperature	Tstg	– 55 ~ +125	– 55 ~ +125	– 55 ~ +125	– 55 ~ +125	°C

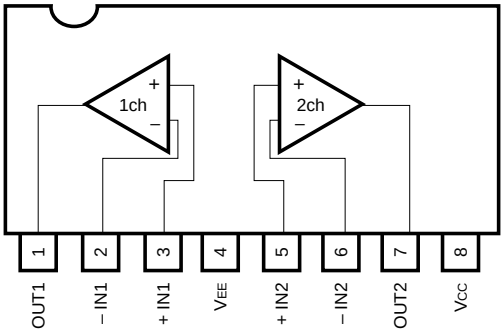
* Refer to the Pd characteristic diagram.
The values for the BA10358F are those when it is mounted on a glass epoxy board (50mm × 50mm × 1.6mm).
The values for the BA10358FV are those when it is mounted on a glass epoxy board (70mm × 70mm × 1.6mm).

●Block diagram

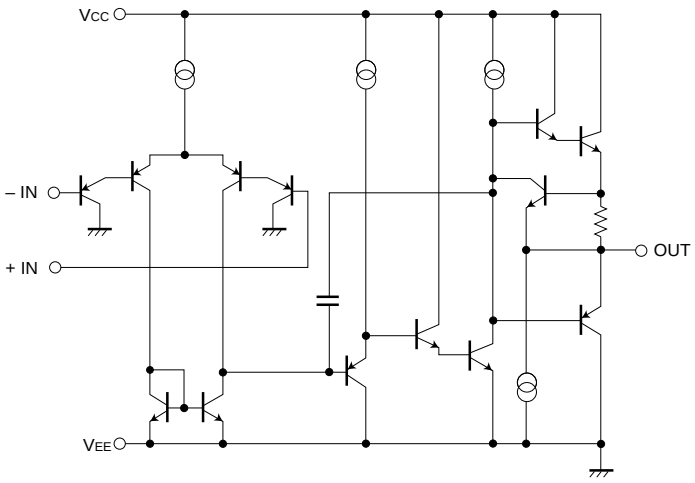
BA10358 / BA10358F / BA10358FV



BA10358N



●Internal circuit configuration (diagram shows only one channel)



●Electrical characteristics (unless otherwise noted, Ta = 25°C, V_{CC} = +5 V)

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	$R_L \geqq$ 2kΩ, V_{CC} = 15V
Common-mode input voltage		V_{ICM}	0	—	V_{CC} – 1.5	V	—
Output voltage		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 current		I_Q	—	0.7	1.2	mA	R_L = ∞, on All Op - Amps
Channel separation		CS	—	120	—	dB	f = 1 kHz input conversion
Maximum output current	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

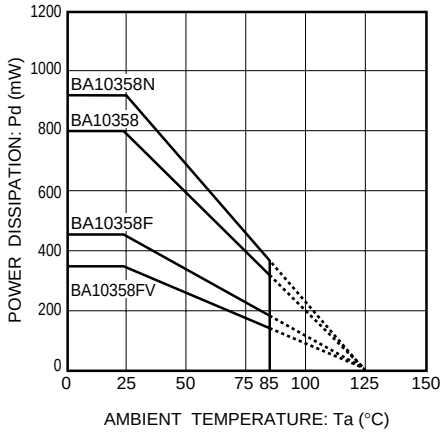


Fig. 1 Power dissipation vs. ambient temperature

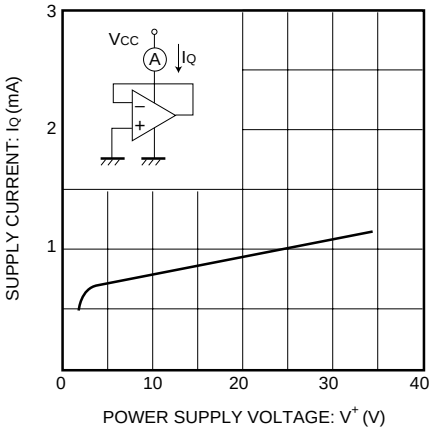


Fig. 2 Quiescent current vs. power supply voltage

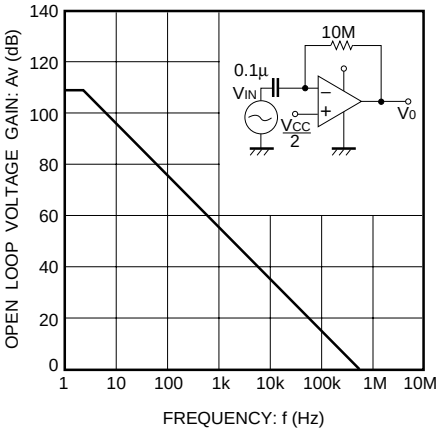


Fig. 3 Open loop voltage gain vs. frequency

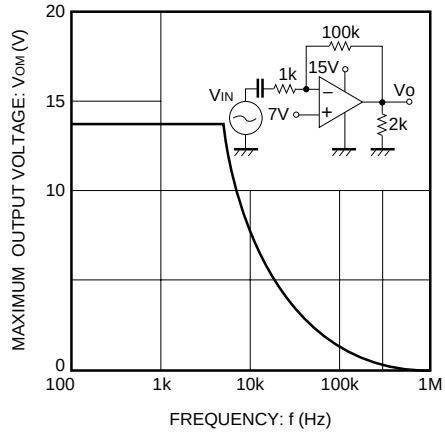


Fig. 4 Maximum output voltage vs.frequency

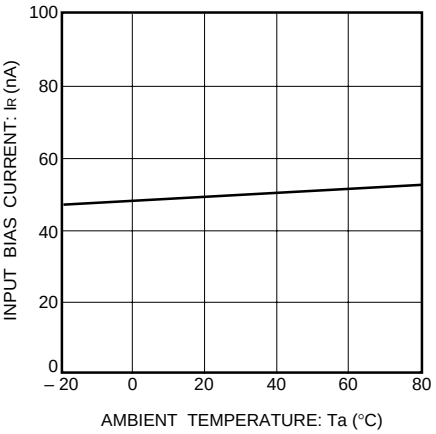


Fig. 5 Input bias current vs. ambient temperature

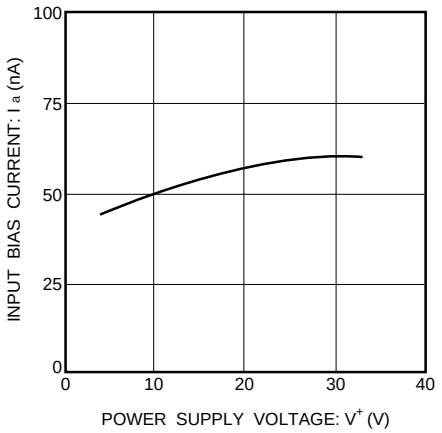


Fig. 6 Input bias current vs. power supply voltage

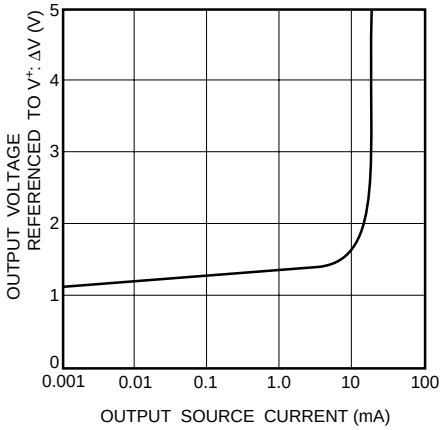


Fig. 7 Voltage difference during power supply output vs. output source current

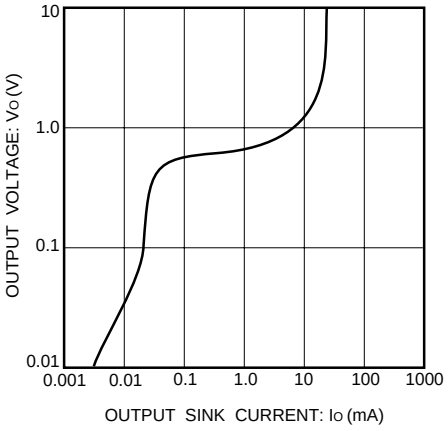


Fig. 8 Output voltage vs. output sink current

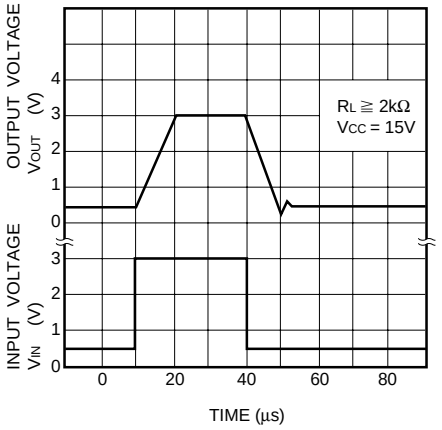


Fig. 9 Output response characteristics

●Operation notes

(1) Handling unused circuits

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}).

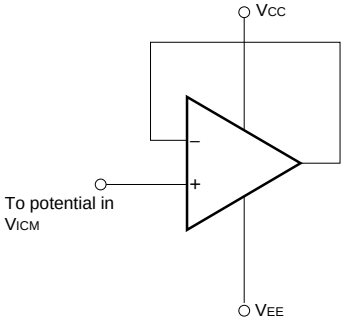
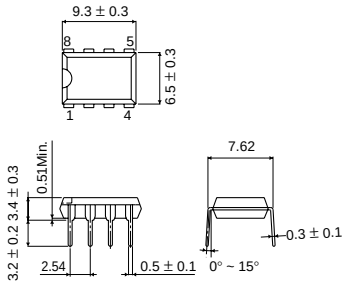


Fig. 10 Handling unused circuits

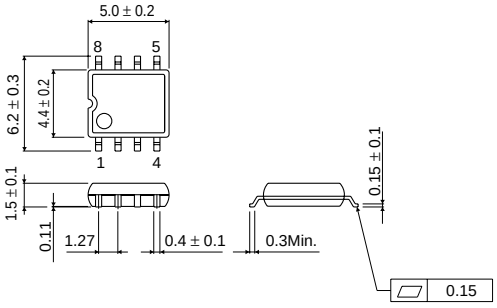
●External dimensions (Units: mm)

BA10358



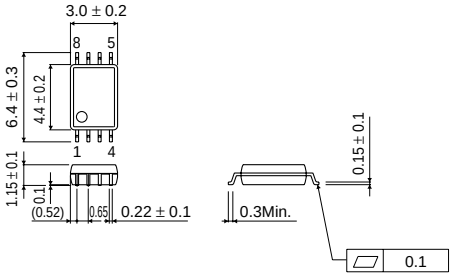
DIP8

BA10358F



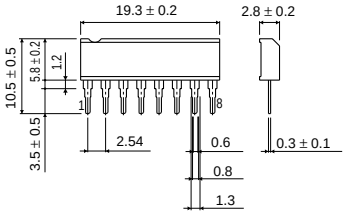
SOP8

BA10358FV



SSOP-B8

BA10358N



SIP8