

BA4560 BA4560F BA4560N

Dual high slew rate operational amplifiers

BA4560, BA4560F, and BA4560N consist of internal phase compensated amplifiers that provide output currents up to twice as large as the BA4558.

They also have improved frequency characteristics with a higher slew rate (4 V/μs) and gain band width (10 MHz).

Features

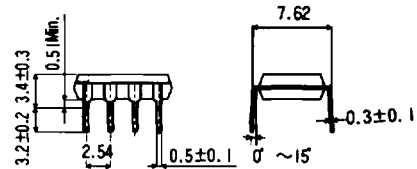
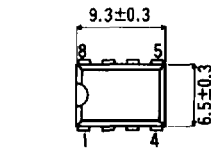
- available in DIP8, SOP8, and SIP8 packages
- wide power supply voltage range, ±4 V ~ ±15 V
- built-in short circuit protection
- no latch up
- wide common mode and differential voltage range
- high gain, low noise

Applications

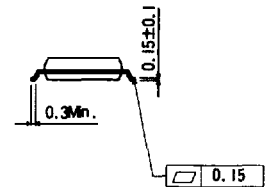
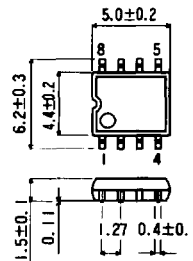
- active filters
- audio amplifiers
- VCO

Dimensions (Units : mm)

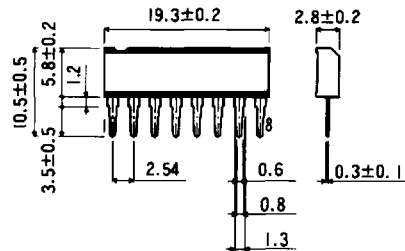
BA4560 (DIP8)



BA4560F (SOP8)

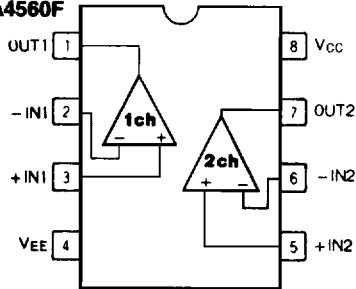


BA4560N (SIP8)

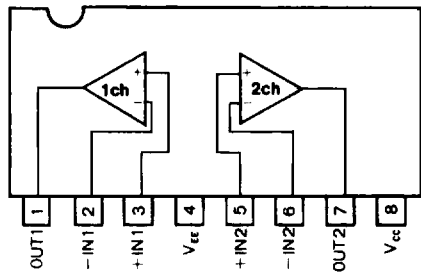


Block diagram

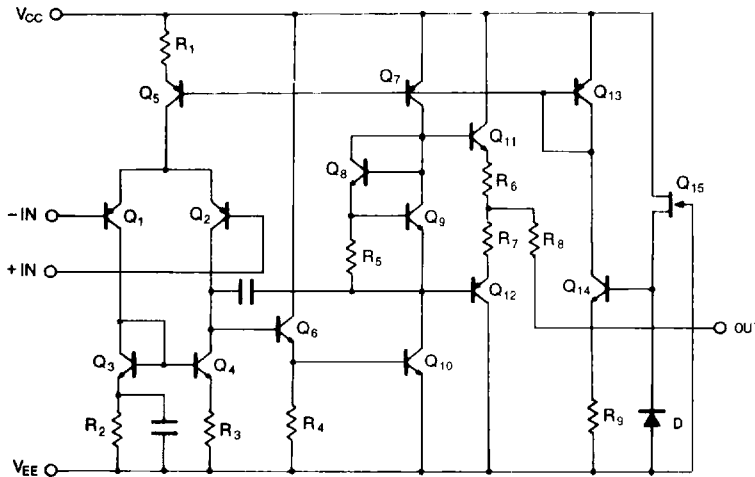
BA4560 and BA4560F



BA4560N



Circuit diagram



Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits	Unit	Conditions
Supply voltage	V_{CC}	± 18	V	
Power dissipation	BA4560	600	mW	Reduce power by 6 mW/ $^\circ\text{C}$ for each degree above 25 $^\circ\text{C}$.
	BA4560F	550		Reduce power by 5.5 mW/ $^\circ\text{C}$ for each degree above 25 $^\circ\text{C}$. Mounted on 50 x 50 x 1.6 mm glass-epoxy PCB.
	BA4560N	900		Reduce power by 9 mW/ $^\circ\text{C}$ for each degree above 25 $^\circ\text{C}$.
Differential input voltage	V_{ID}	± 30	V	
DC input voltage	V_I	± 15	V	
Operating temperature	T_{opr}	-20 ~ +75	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 ~ +125	$^\circ\text{C}$	

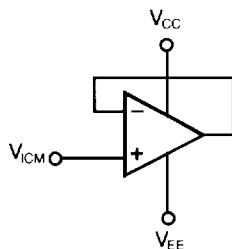
BA4560, BA4560F, BA4560N Operational amplifier

Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = +15\text{ V}$, $V_{EE} = -15\text{ V}$)

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Input offset voltage	V_{IO}		0.5	4	mV	$R_S \leq 10\text{ k}\Omega$
Input offset current	I_{IO}		5	200	nA	
Input bias current	I_B		50	500	nA	
Large signal voltage gain	A_V	86	100		dB	$R_L \geq 2000\ \Omega$, $V_O = \pm 10\text{ V}$
Common mode input voltage	V_{ICM}	± 12	± 14		V	
Maximum output voltage-1	V_{OM}	± 12	± 14		V	$R_L \geq 10\text{ k}\Omega$
Maximum output voltage-2	V_{OM}	± 10	± 13		V	$R_L \geq 2\text{ k}\Omega$
Common mode rejection ratio	CMRR	70	90		dB	$R_S \geq 10\text{ k}\Omega$
Supply voltage ratio	PSRR		100		$\mu\text{V/V}$	$R_S \geq 10\text{ k}\Omega$
Quiescent current	I_Q		4	7.5	mA	$R_L = \infty$, on all op-amps
Output current with short	I_{OS}		38		mA	Shorted output pins to V_{CC} or V_{EE} Within package power dissipation limits
Slew rate	SR		8		V/ μs	$A_V = 1$, $R_L \geq 2\text{ k}\Omega$
Voltage gain bandwidth	GBW		10		MHz	$A_V = 1$
Maximum frequency	f_T		2		MHz	
Input voltage	V_n			1.5	μV	

Precautions for use

If a circuit is not in use, connect the terminals as shown following:



Electrical characteristic curves

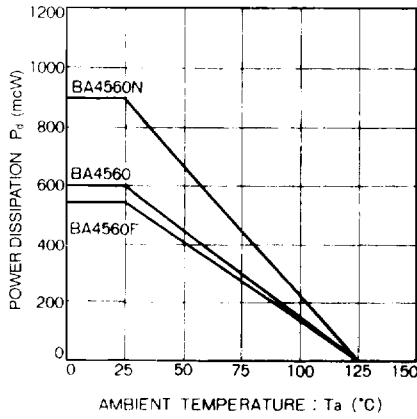


Figure 1

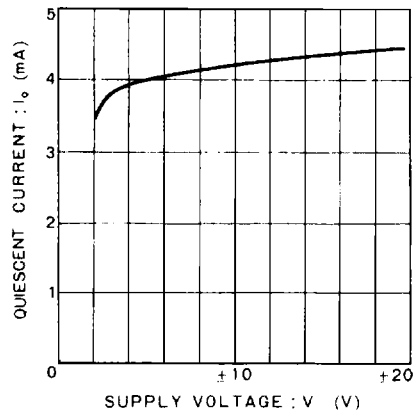


Figure 2

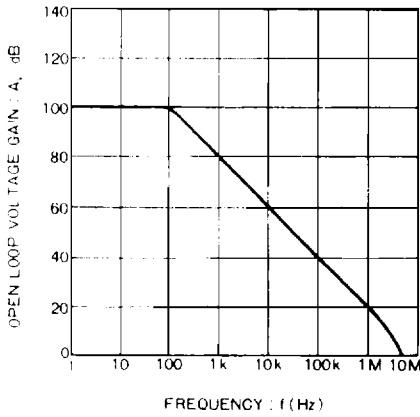


Figure 3

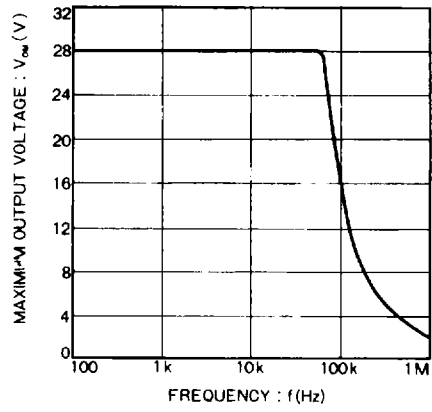


Figure 4

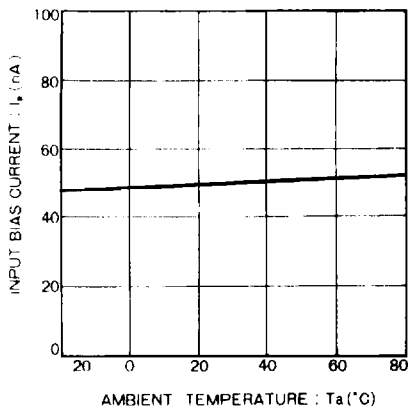


Figure 5

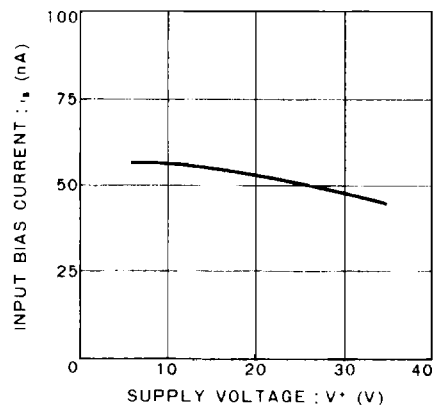


Figure 6

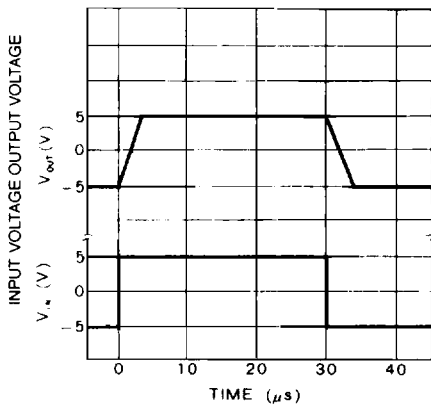


Figure 7

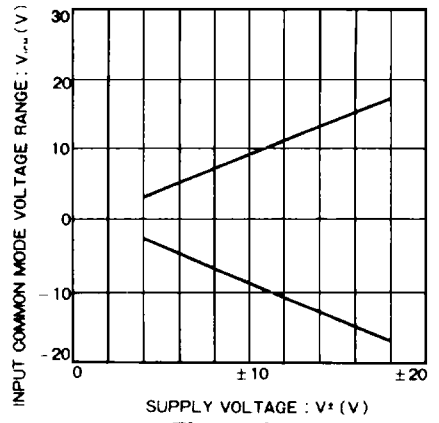


Figure 8