The BA4558, BA4558F, and BA4558N are monolithic ICs with two operational amplifiers featuring low power consumption and internal phase compensation mounted on a single silicon chip. These products offer high speed, a wide band width, and low noise. Outstanding thermal characteristics and voltage gain band width make these ICs ideal for use in a wide variety of electronic circuits. The BA4558 comes in an 8-pin DIP package and is compatible with the 4558 operational amplifier. The BA4558F comes in an 8-pin SOP package, and the BA4558N in an 8-pin SIP package.

- **Applications**
  - Active filters
  - Audio amplifiers
  - VCOs
  - Other electronic circuits

- **Features**
  1) Low power dissipation of approximately 50mW (typ.).
  2) Built-in output short-circuit protection circuit.
  3) Internal phase compensation.
  4) No latch-up.
  5) Wide range of common mode and differential voltage.
  6) High gain and low noise.

- **Block diagram**

![Block diagram of BA4558 / BA4558F and BA4558N](image-url)
● Internal circuit configuration

![Internal circuit configuration diagram]

● Absolute maximum ratings (Ta = 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Limits</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BA4558</td>
<td>BA4558F</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>VCC</td>
<td>±18</td>
<td>±18</td>
</tr>
<tr>
<td>Power dissipation</td>
<td>Pd</td>
<td>800*</td>
<td>550*</td>
</tr>
<tr>
<td>Differential input voltage</td>
<td>V_id</td>
<td>±30</td>
<td>±30</td>
</tr>
<tr>
<td>Common-mode input voltage</td>
<td>V_i</td>
<td>±15</td>
<td>±15</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td>−40 + 85</td>
<td>−40 + 85</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>−55 + 125</td>
<td>−55 + 125</td>
</tr>
</tbody>
</table>

* Refer to Pd characteristics diagram.

The values for the BA4558F are those when it is mounted on a glass epoxy board (50mm × 50mm × 1.6mm).
### Electrical characteristics (unless otherwise noted, \( T_a = 25^\circ C, V_{CC} = +15V, V_{EE} = -15V \))

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input offset voltage</td>
<td>( V_{IO} )</td>
<td>—</td>
<td>0.5</td>
<td>6.0</td>
<td>mV</td>
<td>( R_s \leq 10k\Omega )</td>
</tr>
<tr>
<td>Input offset current</td>
<td>( I_{IO} )</td>
<td>—</td>
<td>5</td>
<td>200</td>
<td>nA</td>
<td></td>
</tr>
<tr>
<td>Input bias current</td>
<td>( I_B )</td>
<td>—</td>
<td>60</td>
<td>500</td>
<td>nA</td>
<td></td>
</tr>
<tr>
<td>High-amplitude voltage gain</td>
<td>( A_V )</td>
<td>86</td>
<td>100</td>
<td>—</td>
<td>dB</td>
<td>( R_L \geq 2k\Omega, V_O = \pm 10V )</td>
</tr>
<tr>
<td>Common-mode input voltage</td>
<td>( V_{ICM} )</td>
<td>± 12</td>
<td>± 14</td>
<td>—</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Maximum output voltage</td>
<td>( V_OH )</td>
<td>± 12</td>
<td>± 14</td>
<td>—</td>
<td>V</td>
<td>( R_L \geq 10k\Omega )</td>
</tr>
<tr>
<td>Minimum output voltage</td>
<td>( V_{OL} )</td>
<td>± 10</td>
<td>± 13</td>
<td>—</td>
<td>V</td>
<td>( R_L \geq 2k\Omega )</td>
</tr>
<tr>
<td>Common-mode rejection ratio</td>
<td>CMRR</td>
<td>70</td>
<td>90</td>
<td>—</td>
<td>dB</td>
<td>( R_s \leq 10k\Omega )</td>
</tr>
<tr>
<td>Power supply voltage rejection ratio</td>
<td>PSRR</td>
<td>—</td>
<td>30</td>
<td>150</td>
<td>( \mu V / V )</td>
<td>( R_s \leq 10k\Omega )</td>
</tr>
<tr>
<td>Slew rate</td>
<td>S.R.</td>
<td>—</td>
<td>1.0</td>
<td>—</td>
<td>V/\mu s</td>
<td>( A_V = 1, R_L \geq 2k\Omega )</td>
</tr>
<tr>
<td>Channel separation</td>
<td>CS</td>
<td>—</td>
<td>105</td>
<td>—</td>
<td>dB</td>
<td>( f = 1kHz )</td>
</tr>
</tbody>
</table>

### 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
### Operation notes

1. **Unused circuit connections**

If there are any circuits which are not being used, we recommend making connections as shown in Figure 9, with the non-inverted input pin connected to the potential within the in-phase input voltage range ($V_{ICM}$).

![Fig.9 Unused circuit connections](image)
Standard ICs

BA4558 / BA4558F / BA4558N

● External dimensions (Units: mm)

### DIP8

- **BA4558**
  - Width: 9.3 ± 0.3 mm
  - Height: 5.0 ± 0.3 mm
  - Pin spacing: 2.54 ± 0.1 mm
  - Package size: 14 ± 0.3 mm

- **BA4558F**
  - Width: 5.0 ± 0.2 mm
  - Height: 4.4 ± 0.2 mm
  - Pin spacing: 2.8 ± 0.2 mm
  - Package size: 7.62 ± 0.1 mm

### SIP8

- **BA4558N**
  - Width: 19.3 ± 0.2 mm
  - Height: 2.8 ± 0.2 mm
  - Pin spacing: 1.27 ± 0.1 mm
  - Package size: 5.0 ± 0.2 mm

- **SOP8**
  - Width: 5.0 ± 0.2 mm
  - Height: 3.4 ± 0.3 mm
  - Pin spacing: 3.2 ± 0.4 mm
  - Package size: 8.5 ± 0.2 mm

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ROHM