Keysight Technologies
Bias Network Series Precision Bias Networks for Microwave Semiconductor Measurements
Models 11590B, 11612A

Broadband
Excellent port match
Low insertion loss
The Models 11590B and 11612A bias networks are precision broadband components for supplying DC bias to the center conductor of a coaxial line which can be connected to a semiconductor under test. They also provide a DC block to the RF input port.

Models 11590B and 11590B Option 001 are microwave frequency bias networks. They are specified for 0.1 to 12.4 GHz and 0.1 to 18.0 GHz operation, respectively. The 12.4 GHz version has Type N RF connectors and the 18 GHz version has APC-7® precision RF connectors. Model 11512A is an insertable microwave bias network with extremely broad bandwidth and excellent port match. It is specified to operate from 0.045 to 26.5 GHz and has precision 3.5 mm RF connectors, APC-3.5, which mate with type SMA.

A schematic diagram for each bias network is shown in Figure 1. Model 11590B has two bias ports. Either bias port may be used for bias input and the other bias port for bias sensing. To double the maximum current handling capability, both bias ports may be used for bias input. Model 11612A has one bias input since its low resistance from “Bias” input to “Bias & RF” output obviates the need for separate bias and sense ports.

### Specifications

Specifications describe the instrument’s warranted performance over the temperature range 0° to 55°C (except where noted). Supplemental characteristics are intended to provide information useful in applying the instrument by giving typical, but non-warranted, performance parameters. These are denoted as “typical,” “nominal,” or “approximately.”

<table>
<thead>
<tr>
<th>Specification</th>
<th>Model 11590B</th>
<th>Model 11590B Option 001</th>
<th>Model 11612A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency range</td>
<td>0.1 to 12.4 GHz</td>
<td>0.1 to 18.0 GHz</td>
<td>0.045 to 26.5 GHz</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 ohms non-imp</td>
<td>50 ohms nominal</td>
<td>50 ohms nominal</td>
</tr>
<tr>
<td>Return loss minimum</td>
<td>19.1 dB (1.25)</td>
<td>19.1 dB (1.25)</td>
<td>20 dB (1.22)</td>
</tr>
<tr>
<td>(SWR, maximum)</td>
<td>0.1-12.4 GHz</td>
<td>0.1-12.4 GHz</td>
<td>0.045-8.0 GHz</td>
</tr>
<tr>
<td></td>
<td>14 dB (1.5)</td>
<td>14 dB (1.5)</td>
<td>18dB (1.29)</td>
</tr>
<tr>
<td></td>
<td>12.4-18.0 GHz</td>
<td>12.4-18.0 GHz</td>
<td>8.0-18.0 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14 dB (1.50)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>18.0-26.5 GHz</td>
</tr>
<tr>
<td>Insertion loss maximum</td>
<td>0.8 dB</td>
<td>0.8 dB, 0.1-12.4 GHz</td>
<td>0.8 dB, 0.045-12.4 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2 dB, 12.4-18.0 GHz</td>
<td>1.3 dB, 12.4-26.5 GHz</td>
</tr>
<tr>
<td>Maximum bias voltage</td>
<td>100 VDC</td>
<td>100 VDC</td>
<td>40 VDC</td>
</tr>
<tr>
<td>Maximum bias current</td>
<td>500 mA each bias port</td>
<td>500 mA each bias port</td>
<td>500 mA</td>
</tr>
<tr>
<td>Maximum RF power</td>
<td>+40 dBm</td>
<td>+40 dBm</td>
<td>+24 dBm</td>
</tr>
<tr>
<td>DC resistance from</td>
<td>3.0 ohms</td>
<td>3.0 ohms</td>
<td>0.5 ohms</td>
</tr>
<tr>
<td>Bias port to</td>
<td>typical @ 23°C</td>
<td>typical @ 23°C</td>
<td>typical @ 23°C</td>
</tr>
<tr>
<td>(RF &amp; bias) port</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF connectors</td>
<td>Type-N female</td>
<td>APC-7</td>
<td>RF input: APC-3.5* female</td>
</tr>
<tr>
<td>(non-hermetic)</td>
<td></td>
<td></td>
<td>“RF &amp; Bias” Output:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>APC-3.5 male</td>
</tr>
<tr>
<td>Bias connectors</td>
<td>BNC female</td>
<td>BNC female</td>
<td>SMB snap-on male (with</td>
</tr>
<tr>
<td>(non-hermetic)</td>
<td></td>
<td></td>
<td>SMB (f) BNC (m) cable)</td>
</tr>
<tr>
<td>Net weight</td>
<td>0.30 kg (0.67 lb)</td>
<td>0.30 kg (0.67 lb)</td>
<td>0.05 kg (0.1 lb)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>54x51x28 (2.2x2x1.1)</td>
<td>54x51x28 (2.2x2x1.1)</td>
<td>35x31x26 (1.4x1.3x1)</td>
</tr>
</tbody>
</table>

*Note: APC-3.5 connectors mate with Type SMA.

### Ordering information

11590B Bias network
   Option 001 18 GHz operation
11612A Bias network
Evolving Since 1939
Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology. From Hewlett-Packard to Agilent to Keysight.

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