

Variable Gain 100 MHz Wideband Voltage Amplifier



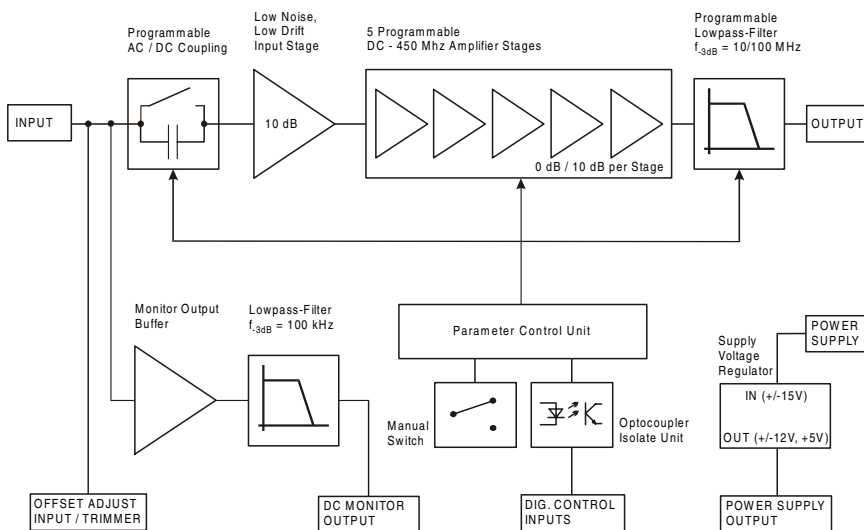
Features

- **Variable Gain 10 to 60 dB, Switchable in 10 dB Steps**
- **Bandwidth DC ... 100 MHz, Switchable to 10 MHz**
- **Built-In Temperature Compensation for Low Drift of 0.6 μ V/K**
- **2.5 nV/ \sqrt Hz Input Noise**
- **Switchable AC/DC-Coupling**
- **Bandwidth, Frequency- and Pulse Response Independent of Gain Setting**
- **Local and Remote Control**
- **DC Monitor Output**

Applications

- **Oscilloscope and Transient-Recorder Preamplifier**
- **Photomultiplier and Microchannel-Plate Amplifier**
- **Signal-Booster for Optical Receivers and Current Amplifiers**
- **Time-Resolved Pulse and Transient Measurements**
- **Automated Measurement Systems**
- **Integration in Compact Systems**

Block Diagram

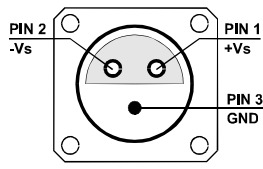


BS01-0540-17

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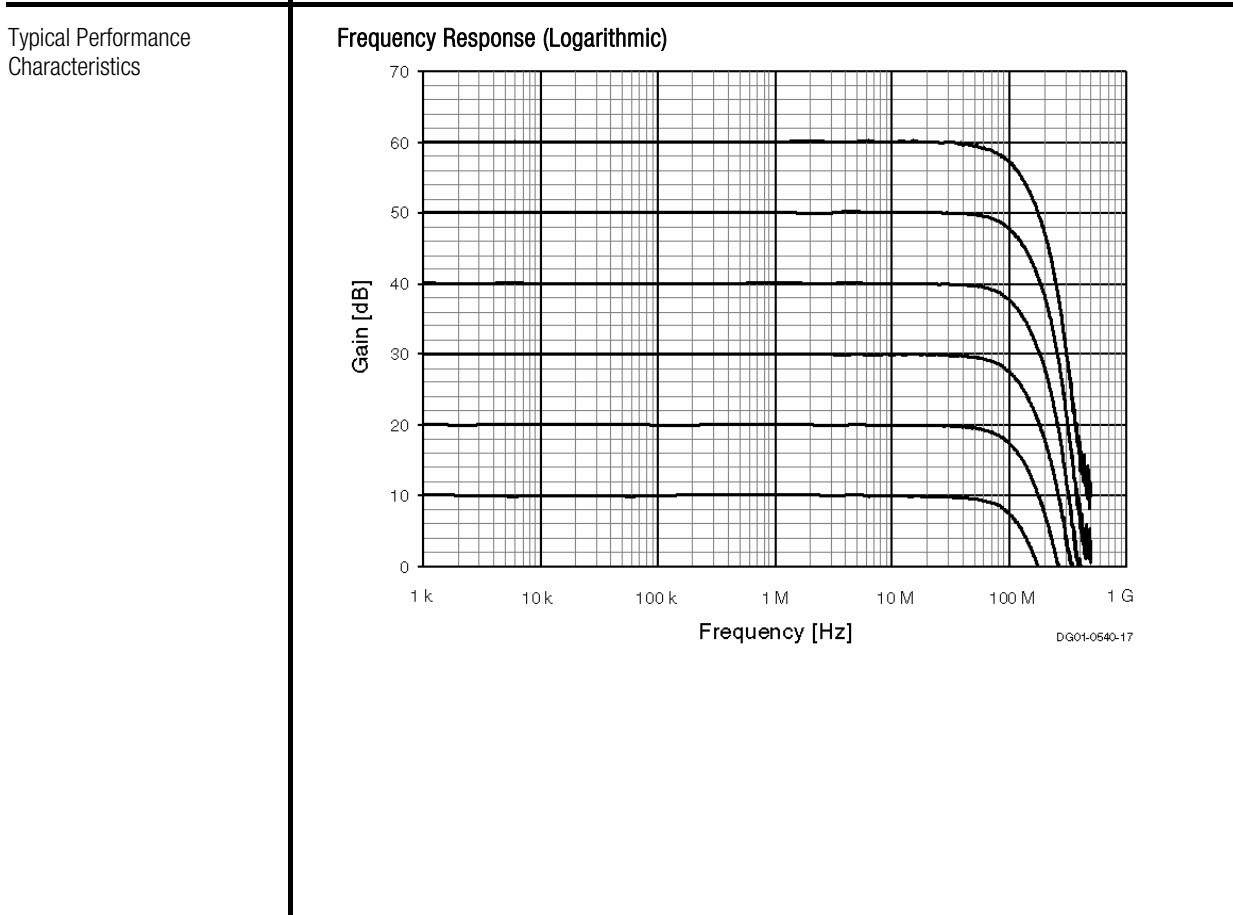
| Specifications | <i>Test Conditions</i> | <i>V_s = ± 15 V, T_a = 25°C, System Impedance = 50 Ω</i> |
|---------------------|--|--|
| Gain | Gain Values Gain Accuracy | 10, 20, 30, 40, 50, 60 dB ± 0.15 dB (between settings) ± 0.3 dB (overall) |
| Frequency Response | Lower Cut-Off Frequency Upper Cut-Off Frequency Upper Cut-Off Frequency Rolloff | DC / 10 Hz 100 MHz, switchable to 10 MHz (approx. Bessel filter characteristic for clear pulse response) 25 dB/Oct. |
| Time Response | Rise / Fall Time (10% - 90%) | 3.5 ns (@ 100 MHz) 35 ns (@ 10 MHz) |
| Input | Input Impedance Input Voltage Drift Equivalent Input Voltage Noise Equivalent Input Current Noise 1/f-Noise Corner Input BIAS Current Input Offset Voltage | 50 Ω // 5 pF 0.6 μV/K 2.5 nV/√Hz (@ 30 – 60 dB gain) 3.0 pA/√Hz 15 kHz < 200 nA - 10 mV ... + 10 mV, adjustable by offset-trimmer and external control voltage |
| Output | Output Impedance Output Voltage Range Output Power (max.) Output Current (max.) THD | 50 Ω (terminate with 50 Ω load for best performance) 2 V _{pp} (for linear amplification) + 10 dBm 70 mA < 0.5 % (@ 10 MHz, 1 V _{pp}) |
| Monitor Output | Monitor Output Gain Monitor Output Voltage Range Monitor Output Current Monitor Output Bandwidth | 1 ± 5 V ± 10 mA DC ... 100 kHz |
| Indicator LED | Function | gain setting |
| Digital Control | Control Input Voltage Range Control Input Current Gain Control Switching Time | Low: - 0.8 ... + 0.8 V High: + 1.8 ... + 12 V, TTL / CMOS compatible 0 mA @ 0V, 1.5 mA @ + 5 V, 4.5 mA @ + 12V 5 ms |
| Ext. Offset Control | Control Voltage Range Offset Control Input Impedance | ± 10 V, corresponds to ± 10 mV input offset 200 kΩ |
| Power Supply | Supply Voltage Supply Current Stabilized Power Supply Output | ± 15 V ± 120 mA typ. (depends on operating conditions, recommended power supply capability minimum 250 mA) ± 12 V / max. 100 mA, + 5V / max. 50 mA |
| Case | Weight Material | 350 g (0.81 lbs) AlMg4.5Mn, nickel-plated |
| Temperature Range | Storage Temperature Operating Temperature | - 40 °C ... + 100 °C 0 °C ... + 60 °C |

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|-------------------------------|---|----------------------|--------|----------------------|-------|-------------------------------|--|--------------|---|
| Absolute Maximum Ratings | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Power Supply Voltage</td> <td style="padding: 2px; text-align: right;">± 20 V</td> </tr> <tr> <td style="padding: 2px;">Signal Input Voltage</td> <td style="padding: 2px; text-align: right;">± 5 V</td> </tr> <tr> <td style="padding: 2px;">Digital Control Input Voltage</td> <td style="padding: 2px; text-align: right;">+ 16 V / - 5 V</td> </tr> </table> | Power Supply Voltage | ± 20 V | Signal Input Voltage | ± 5 V | Digital Control Input Voltage | + 16 V / - 5 V | | |
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| Signal Input Voltage | ± 5 V | | | | | | | | |
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| Connectors | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Input</td> <td style="padding: 2px;">BNC</td> </tr> <tr> <td style="padding: 2px;">Output</td> <td style="padding: 2px;">BNC</td> </tr> <tr> <td style="padding: 2px;">Power Supply</td> <td style="padding: 2px;"> LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND </td> </tr> </table> <div style="text-align: center; margin: 10px 0;">  </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Control Port</td> <td style="padding: 2px;"> Sub-D 25-pin, female, qual. class 2 Pin 1: +12V (stabilized power supply output) Pin 2: -12V (stabilized power supply output) Pin 3: AGND (analog ground) Pin 4: +5V (stabilized power supply output) Pin 5: monitor output Pin 6, 7: NC Pin 8: offset control voltage input Pin 9: DGND (ground f. digital control Pin 10 - 25) Pin 10: digital control input: gain, LSB Pin 11: digital control input: gain Pin 12: digital control input: gain, MSB Pin 13: digital control input: AC/DC Pin 14: digital control input: 100 MHz/10 MHz Pin 15 - 25: NC </td> </tr> </table> | Input | BNC | Output | BNC | Power Supply | LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND | Control Port | Sub-D 25-pin, female, qual. class 2 Pin 1: +12V (stabilized power supply output) Pin 2: -12V (stabilized power supply output) Pin 3: AGND (analog ground) Pin 4: +5V (stabilized power supply output) Pin 5: monitor output Pin 6, 7: NC Pin 8: offset control voltage input Pin 9: DGND (ground f. digital control Pin 10 - 25) Pin 10: digital control input: gain, LSB Pin 11: digital control input: gain Pin 12: digital control input: gain, MSB Pin 13: digital control input: AC/DC Pin 14: digital control input: 100 MHz/10 MHz Pin 15 - 25: NC |
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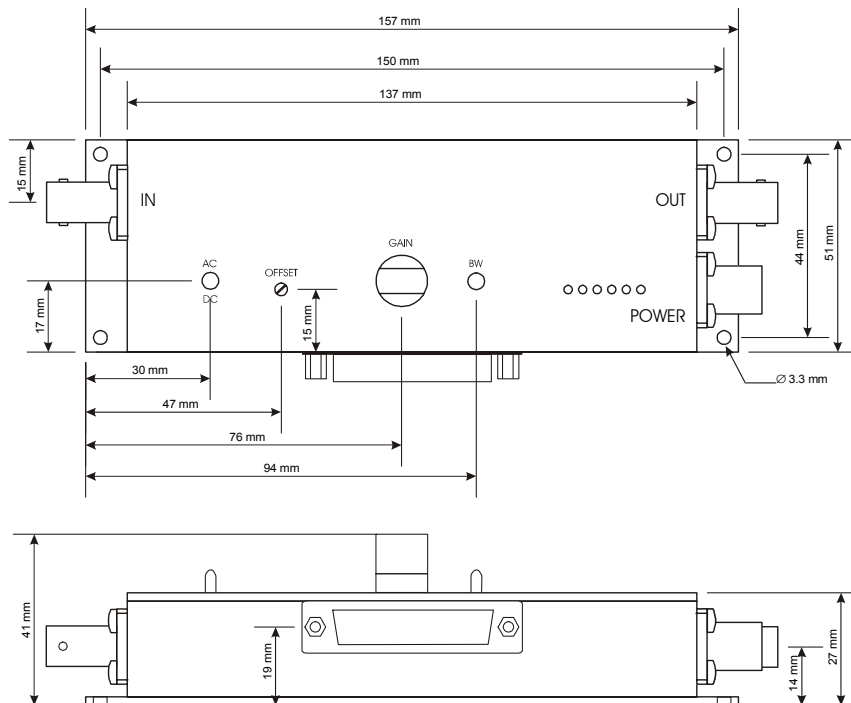
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| Remote Control Operation | <p>General</p> <p>Remote control input bits are opto-isolated and connected by logical OR to local switch setting. For remote control a switch setting, set the corresponding local switch to "Ext.", "AC" or "10 MHz" and select the wanted setting via a bit-code at the corresponding digital inputs. Mixed operation, e.g. local gain setting and remote controlled bandwidth setting is also possible.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Gain Setting</td> <td style="border-bottom: 1px solid black; text-align: center;">Gain</td> <td style="border-bottom: 1px solid black; text-align: center;">Pin 10</td> <td style="border-bottom: 1px solid black; text-align: center;">Pin 11</td> <td style="border-bottom: 1px solid black; text-align: center;">Pin 12</td> </tr> <tr> <td></td> <td>10 dB</td> <td style="text-align: center;">low</td> <td style="text-align: center;">low</td> <td style="text-align: center;">low</td> </tr> <tr> <td></td> <td>20 dB</td> <td style="text-align: center;">high</td> <td style="text-align: center;">low</td> <td style="text-align: center;">low</td> </tr> <tr> <td></td> <td>30 dB</td> <td style="text-align: center;">low</td> <td style="text-align: center;">high</td> <td style="text-align: center;">low</td> </tr> <tr> <td></td> <td>40 dB</td> <td style="text-align: center;">high</td> <td style="text-align: center;">high</td> <td style="text-align: center;">low</td> </tr> <tr> <td></td> <td>50 dB</td> <td style="text-align: center;">low</td> <td style="text-align: center;">low</td> <td style="text-align: center;">high</td> </tr> <tr> <td></td> <td>60 dB</td> <td style="text-align: center;">high</td> <td style="text-align: center;">low</td> <td style="text-align: center;">high</td> </tr> </table> | Gain Setting | Gain | Pin 10 | Pin 11 | Pin 12 | | 10 dB | low | low | low | | 20 dB | high | low | low | | 30 dB | low | high | low | | 40 dB | high | high | low | | 50 dB | low | low | high | | 60 dB | high | low | high |
| Gain Setting | Gain | Pin 10 | Pin 11 | Pin 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 dB | low | low | low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 20 dB | high | low | low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 30 dB | low | high | low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 40 dB | high | high | low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 dB | low | low | high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 60 dB | high | low | high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">AC/DC Setting</td> <td style="border-bottom: 1px solid black; text-align: center;">Coupling</td> <td style="border-bottom: 1px solid black; text-align: center;">Pin 13</td> </tr> <tr> <td></td> <td>AC</td> <td style="text-align: center;">low</td> </tr> <tr> <td></td> <td>DC</td> <td style="text-align: center;">high</td> </tr> </table> | AC/DC Setting | Coupling | Pin 13 | | AC | low | | DC | high | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AC/DC Setting | Coupling | Pin 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | AC | low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | DC | high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | 10 MHz | low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 MHz | high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



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Dimensions



D201-0540-17

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