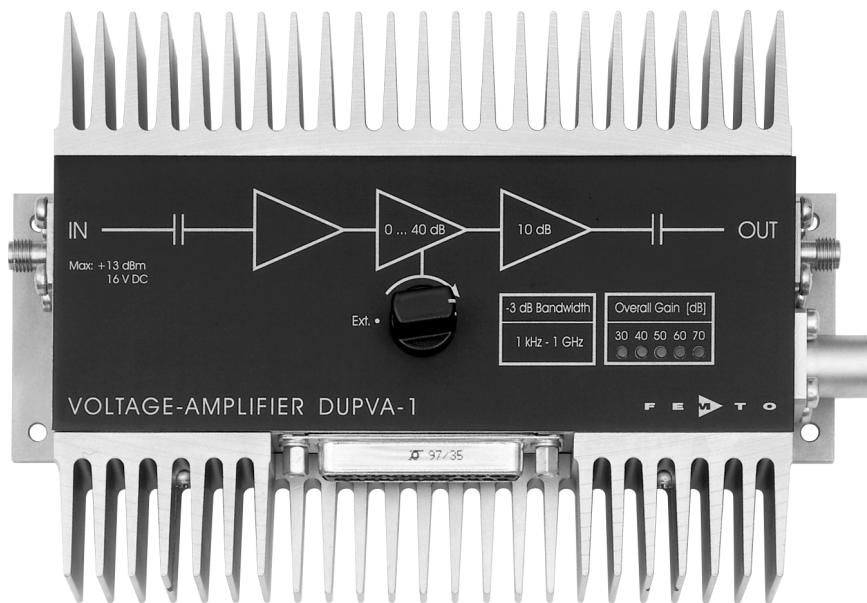


# Variable-Gain Ultra-Wideband Voltage Amplifier



<p>Features</p>	<ul style="list-style-type: none"> <li>• Variable Gain 20 to 60 dB, switchable in 10 dB Steps</li> <li>• Bandwidth 1 kHz ... 1.2 GHz</li> <li>• Bandwidth, Frequency- and Pulse Response independent of Gain Setting</li> <li>• Local and Remote Control</li> <li>• DC Monitor Output</li> </ul>
<p>Applications</p>	<ul style="list-style-type: none"> <li>• Oscilloscope and Transient-Recorder Preamplifier</li> <li>• Photomultiplier and Microchannel-Plate Amplifier</li> <li>• Signal-Booster for Optical Receivers and Current Amplifiers</li> <li>• Time-Resolved Pulse and Transient Measurements</li> <li>• Automated Measurement Systems</li> </ul>
<p>Block Diagram</p>	<p style="text-align: right; font-size: small;">BS01-0640-13</p>

## Variable-Gain Ultra-Wideband Voltage Amplifier

Specifications	<i>Test Conditions</i>	<i>V<sub>s</sub> = ± 15 V, T<sub>a</sub> = 25°C, System Impedance = 50 Ω</i>
Gain	Gain Values	20, 30, 40, 50, 60 dB
	Gain Accuracy	± 0.1 dB (between Settings) ± 1 dB (Overall)
	Gain Flatness	± 0.15 dB
Frequency Response	Lower Cut-Off Frequency	1 kHz
	Upper Cut-Off Frequency	1.2 GHz
	Upper Cut-Off Frequency Rolloff	40 dB/Oct.
Time Response	Rise / Fall Time (10% - 90%)	380 ps
	Group Delay	2.2 ns
Input	Input Impedance AC	50 Ω
	Input Impedance DC	100 kΩ
	Input VSWR (@ 20 dB Gain)	1.12 : 1 (f < 1 GHz) 1.7 : 1 (f < 2 GHz)
	Input VSWR (@ 30 – 60 dB Gain)	1.2 : 1 (f < 1 GHz) 1.75 : 1 (f < 2 GHz)
	50 Ω Noise Figure	3.0 dB (@ 60 dB Gain) 3.5 dB (@ 30 – 50 dB Gain)
	Equivalent Input Voltage Noise	450 pV/√Hz (@ 60 dB Gain) 500 pV/√Hz (@ 30 – 50 dB Gain)
	1/f-Noise Corner	40 kHz
	Output	Output Impedance
Output Power P <sub>1dB</sub>		13 dBm (@ 100 MHz) 10 dBm (@ 500 MHz)
Output Peak-Peak Voltage for linear Amplification		2 V (@ 100 MHz) 1.7 V (@ 500 MHz)
Output VSWR		1.77 : 1 (f < 1 GHz) 2.0 : 1 (f < 2 GHz)
Third Order Intercept Point IP <sub>3</sub>		21 dBm
Reverse Isolation		80 dB
Dynamic Range (w/o Average)		70 dB (P <sub>1dB</sub> – Min. Detectable Signal)
Monitor Output		Monitor Output Gain
	Monitor Output Voltage Range	± 10 V
	Monitor Output Current	± 25 mA
	Monitor Output Bandwidth	DC ... 100 kHz
Digital Control	Control Input Voltage Range	Low: - 0.8 ... + 0.8 V High: + 1.8 ... + 12 V
Power Supply	Supply Voltage	± 15 V
	Supply Current	+ 350 / -100 mA
	Stabilized Power Supply Output	± 12 V / max. 100 mA, + 5V / max. 50 mA
Case	Weight	510 gr. (1.2 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	-40 ... +100 °C
	Operating Temperature	0 ... +60 °C

## Variable-Gain Ultra-Wideband Voltage Amplifier

Absolute Maximum Ratings	Signal Input Power                    + 13 dBm    (f > 1 kHz) Signal Input DC Voltage               ± 16 V Signal Output Reverse Power         + 20 dBm Signal Output Reverse DC Voltage   + 20 V / - 12 V Control Input Voltage                 + 16 V / - 5 V Power Supply Voltage                 ± 17 V
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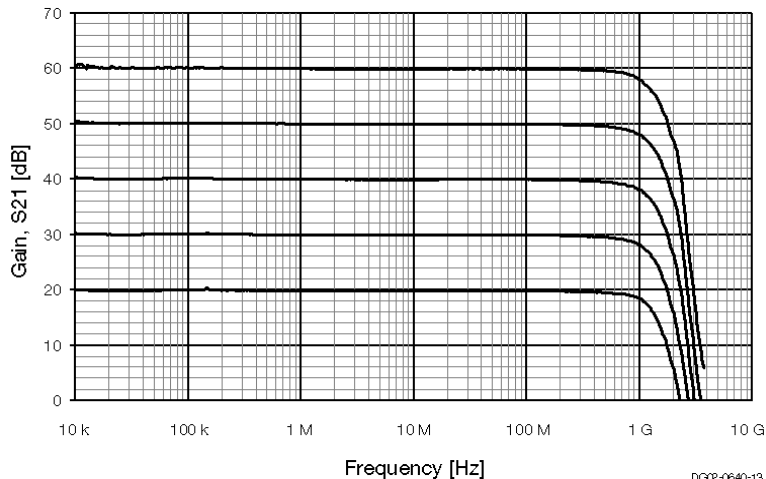
Connectors	Input                                        SMA  Output                                       SMA  Power Supply                              LEMO Series 1S, 3-pin fixed Socket Pin 1:                                        + 15V Pin 2:                                        - 15V Pin 3:                                        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 - 8:                                    NC Pin 9:                                        DGND (Ground f. Digital Control Pin 10 - 25) Pin 10 - 13:                                NC Pin 14:                                       Digital Control Input: Gain, LSB Pin 15:                                       Digital Control Input: Gain Pin 16:                                       Digital Control Input: Gain, MSB Pin 17 - 25:                                NC

Remote Control Operation	General                                    Remote Control Input Bits are opto-isolated and connected by logical OR to local switch setting. For remote control of the gain setting, set the local switch to "Ext." and select the wanted gain setting via a 3-bit-code at the corresponding digital inputs:																														
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;">Gain Setting - Corresponding Inputs</th> <th>Gain</th> <th>Pin 14</th> <th>Pin 15</th> <th>Pin 16</th> </tr> </thead> <tbody> <tr> <td></td> <td>20 dB</td> <td>Low</td> <td>Low</td> <td>Low</td> </tr> <tr> <td></td> <td>30 dB</td> <td>High</td> <td>Low</td> <td>Low</td> </tr> <tr> <td></td> <td>40 dB</td> <td>Low</td> <td>High</td> <td>Low</td> </tr> <tr> <td></td> <td>50 dB</td> <td>High</td> <td>High</td> <td>Low</td> </tr> <tr> <td></td> <td>60 dB</td> <td>Low</td> <td>Low</td> <td>High</td> </tr> </tbody> </table>	Gain Setting - Corresponding Inputs	Gain	Pin 14	Pin 15	Pin 16		20 dB	Low	Low	Low		30 dB	High	Low	Low		40 dB	Low	High	Low		50 dB	High	High	Low		60 dB	Low	Low	High
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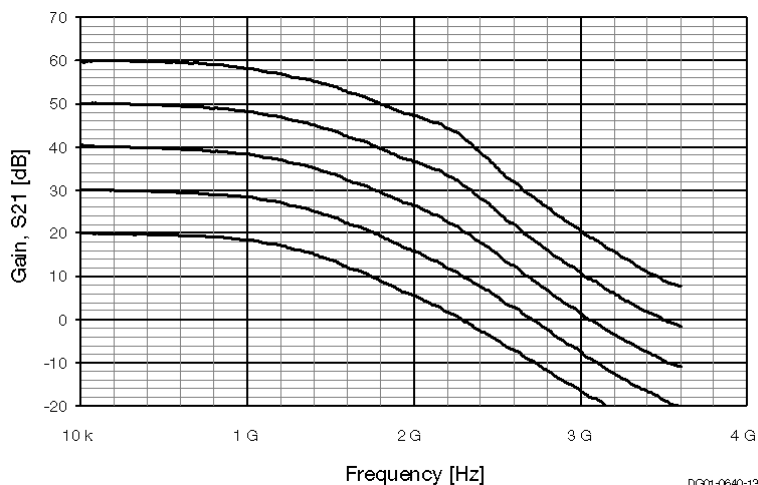
# Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance  
Characteristics

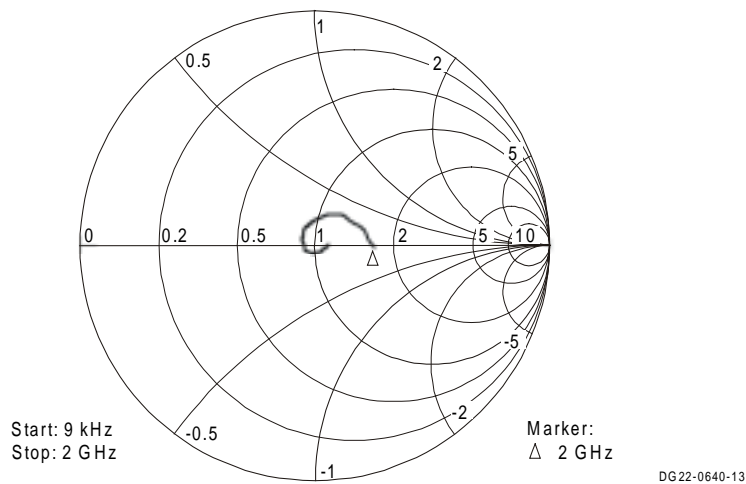
Frequency Response (Logarithmic)



Frequency Response (Linear)



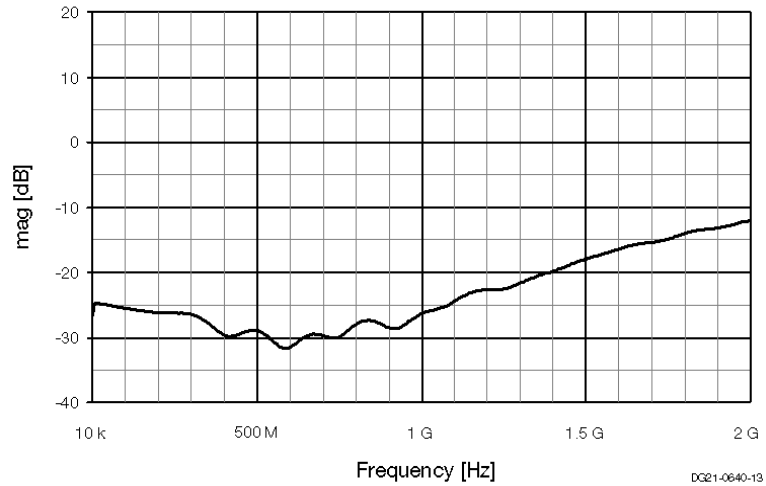
Input Reflection, S11



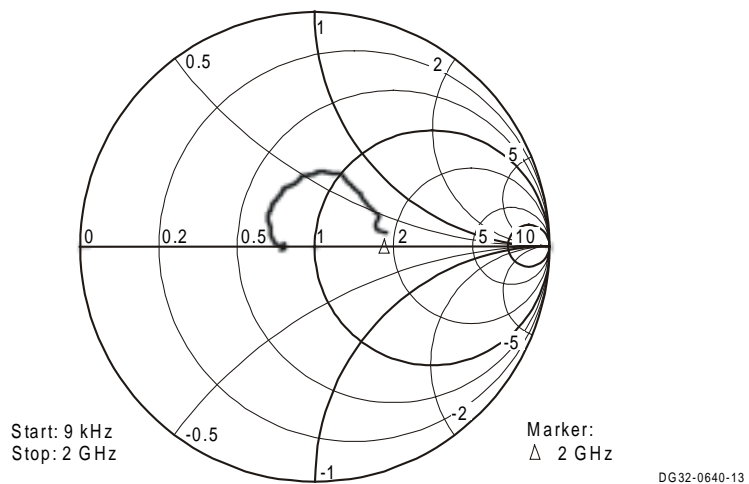
# Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance  
Characteristics

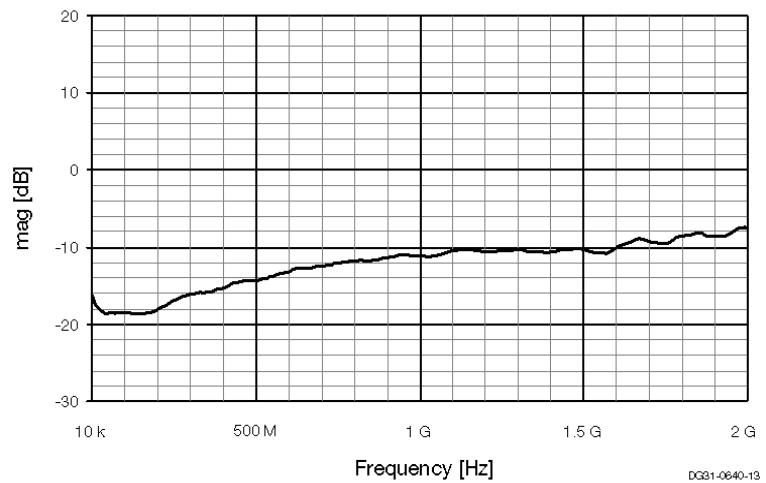
Input Return Loss, S11 (Linear Magnitude)



Output Reflection, S22

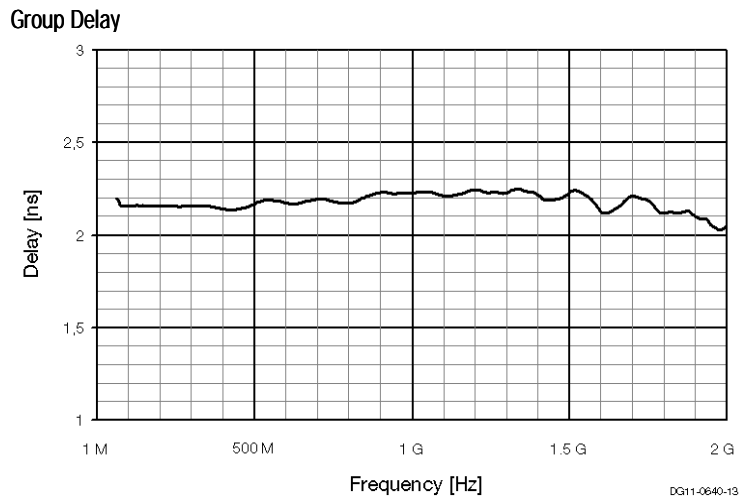


Output Return Loss, S22 (Linear Magnitude)

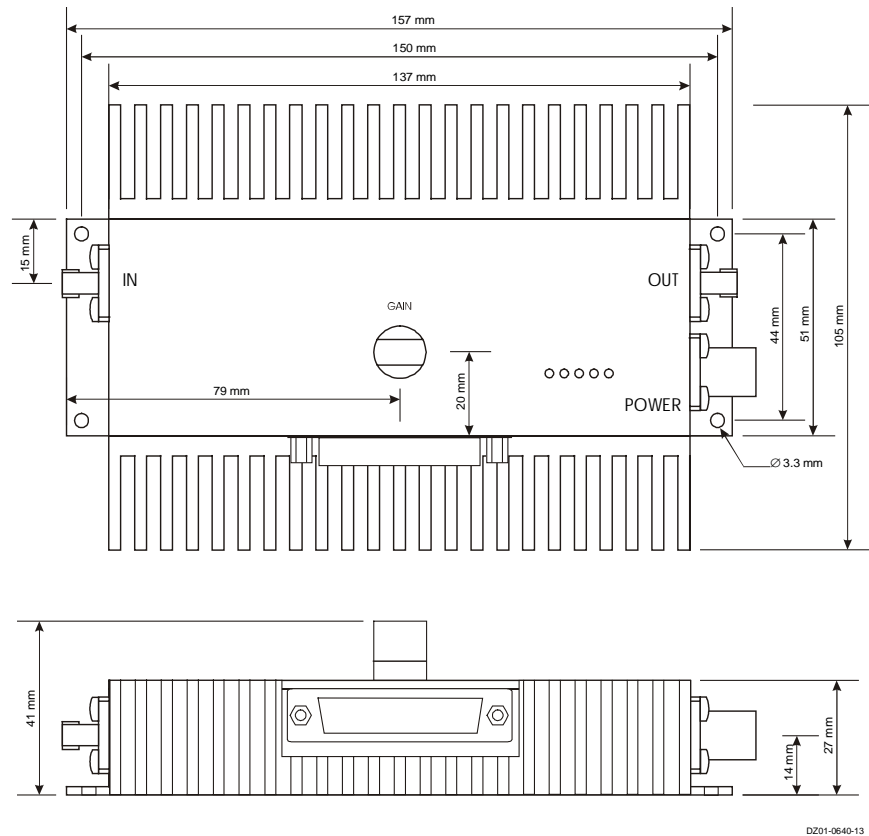


# Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance  
Characteristics



Dimensions



Accessories

BNC-Adapterset

Model No.: ADAP-SMA-BNC-1  
- Set of 2 SMA to BNC Adapters

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