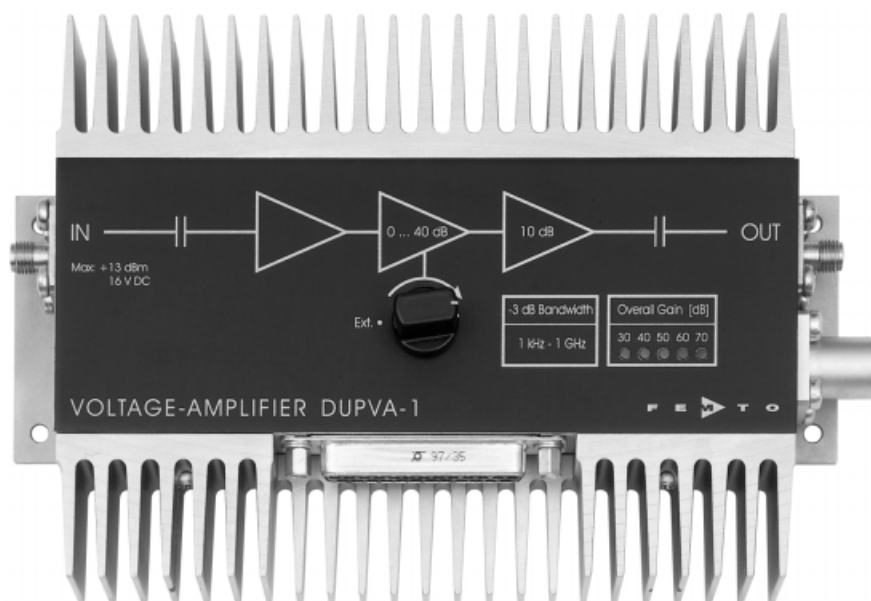


Variable-Gain Ultra-Wideband Voltage Amplifier



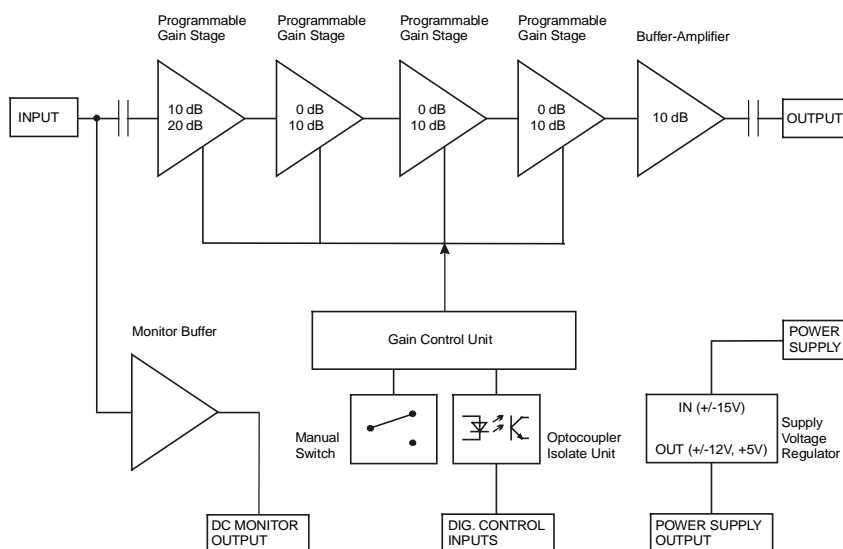
Features

- **Variable Gain 20 to 60 dB, switchable in 10 dB Steps**
- **Bandwidth 1 kHz ... 1.2 GHz**
- **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**

Block Diagram



Variable-Gain Ultra-Wideband Voltage Amplifier

Specifications	Test Conditions	<i>V_s = ± 15 V, T_a = 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	50 Ω	
	Output Power P _{1dB}	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 ₃	21 dBm	
	Reverse Isolation	80 dB	
	Dynamic Range (w/o Average)	70 dB	(P _{1dB} – Min. Detectable Signal)
Monitor Output	Monitor Output Gain	1	
	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	

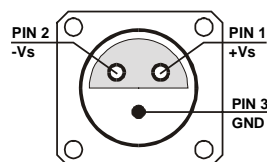
Variable-Gain Ultra-Wideband Voltage Amplifier

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	

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

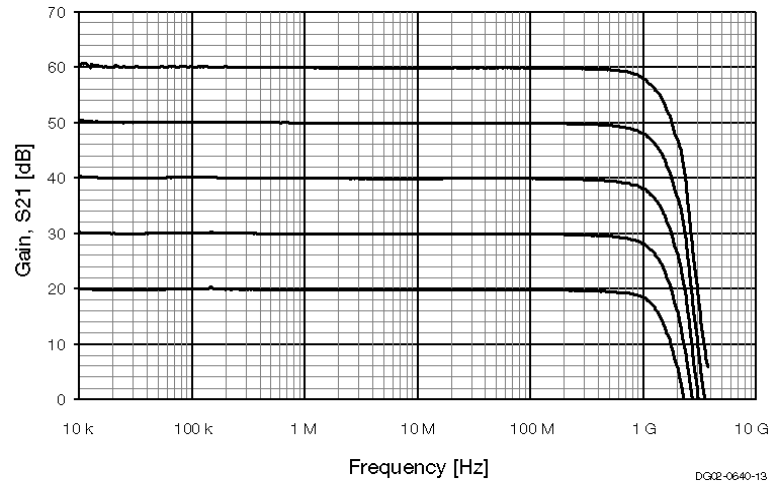
Remote Control Operation

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:			
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

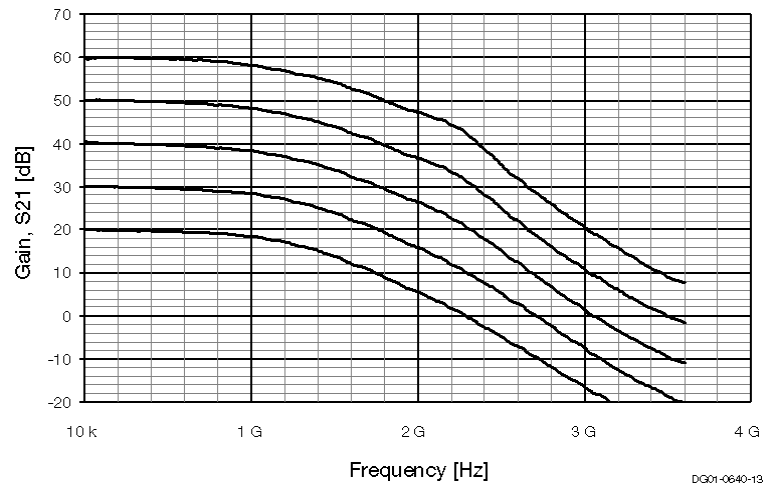
Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance
Characteristics

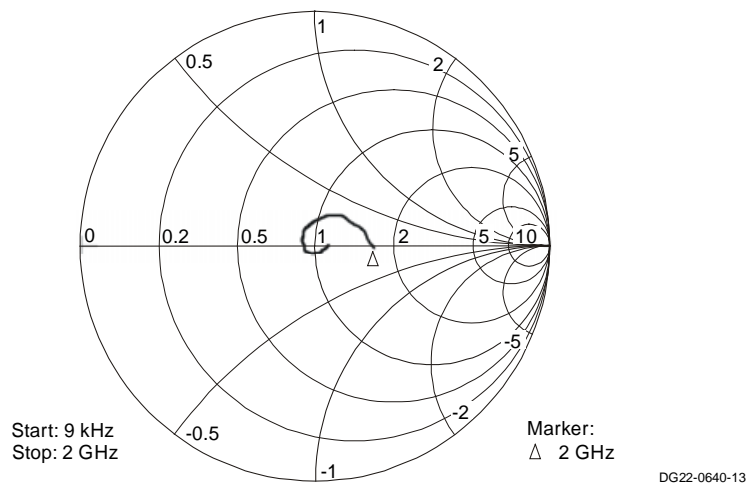
Frequency Response (Logarithmic)



Frequency Response (Linear)



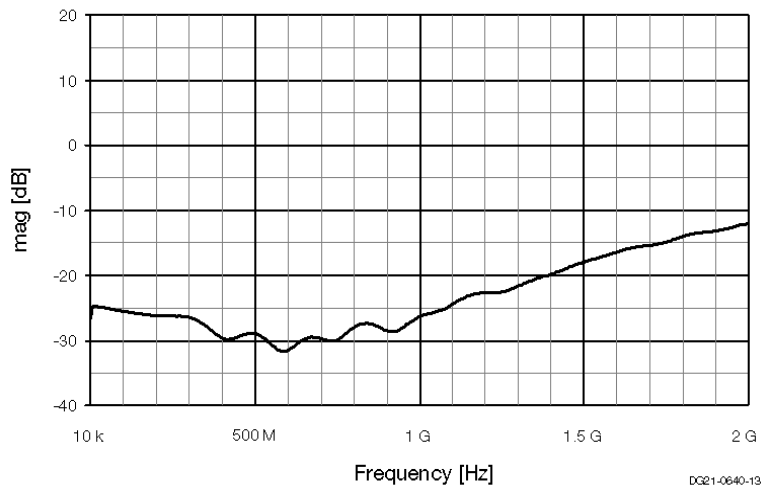
Input Reflection, S11



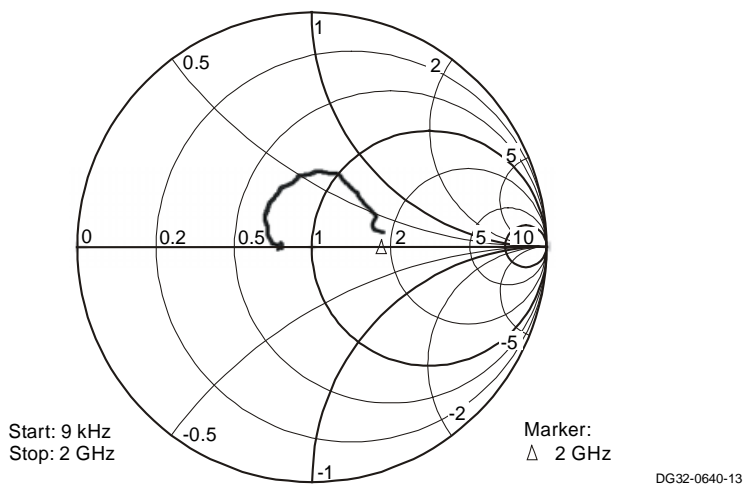
Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance
Characteristics

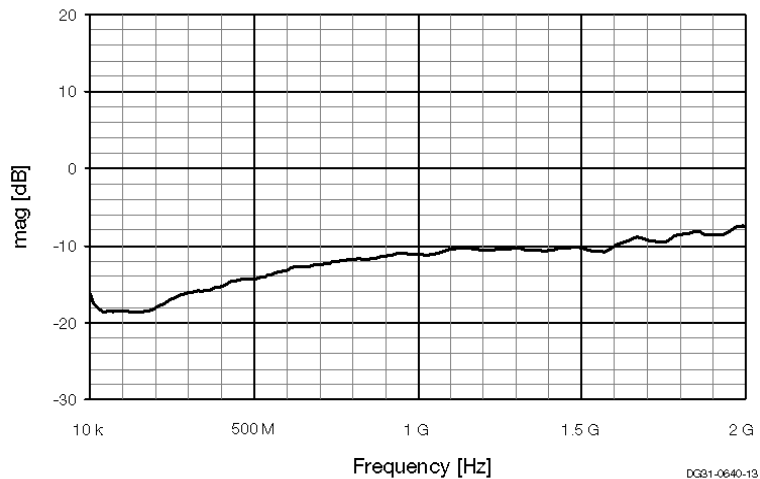
Input Return Loss, S11 (Linear Magnitude)



Output Reflection, S22



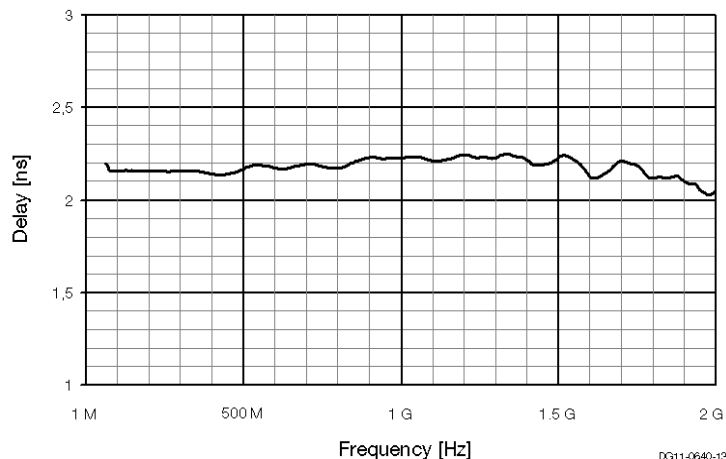
Output Return Loss, S22 (Linear Magnitude)



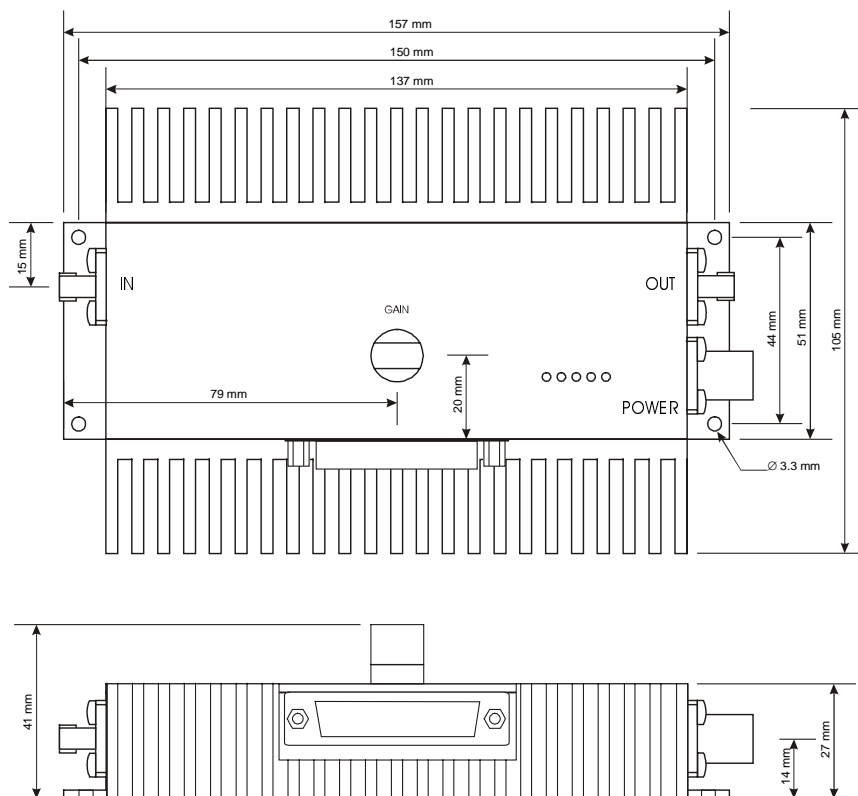
Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance
Characteristics

Group Delay



Dimensions



Accessories

BNC-Adapterset

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

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