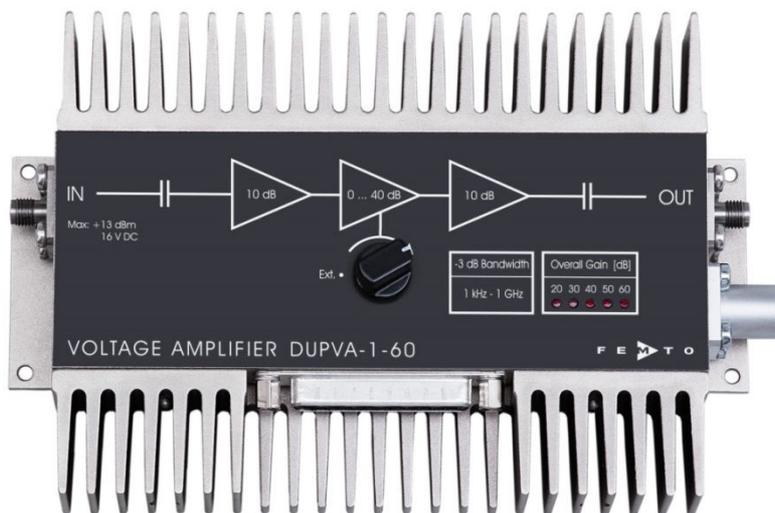


# Variable-Gain Ultra-Wideband Voltage Amplifier



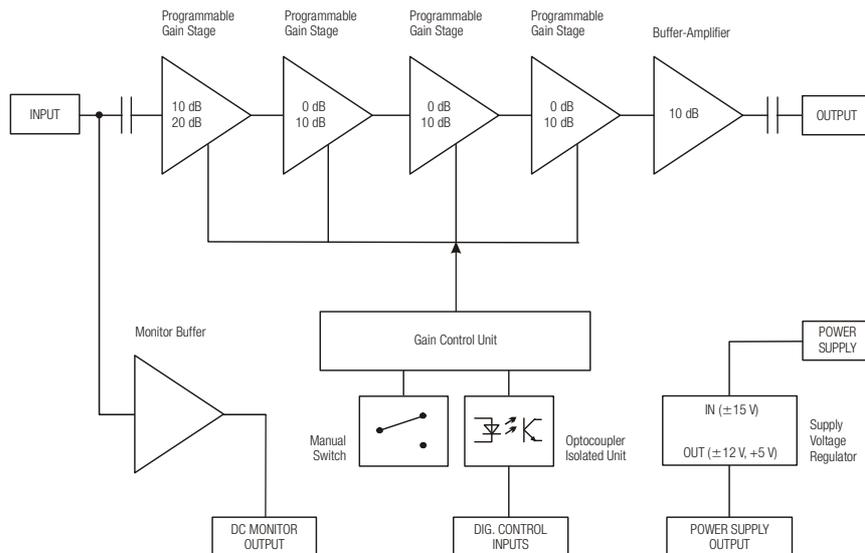
Features

- Variable gain 20 to 60 dB (x10 to x1000), switchable in 10 dB steps
- Bandwidth 1 kHz ... 1.2 GHz
- Bandwidth, frequency response 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

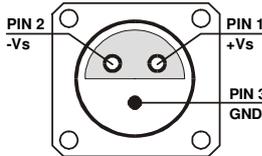


BS-DUPVA-1-60\_R1

## Variable-Gain Ultra-Wideband Voltage Amplifier

Specifications	Test conditions	$V_s = \pm 15\text{ V}$ , $T_A = 25\text{ }^\circ\text{C}$ , system impedance = $50\ \Omega$	
Gain	Gain values	20, 30, 40, 50, 60 dB	
	Gain accuracy	$\pm 0.1\text{ dB}$ (between settings) $\pm 1\text{ dB}$ (overall)	
	Gain flatness	$\pm 0.15\text{ dB}$	
Frequency Response	Lower cut-off frequency	1kHz	
	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	$50\ \Omega$	
	Input impedance DC	100 k $\Omega$	
	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 $\Omega$ noise figure	3.0 dB	(@ 60 dB gain)
		3.5 dB	(@ 30 - 50 dB gain)
	Equivalent input voltage noise	450 pV/ $\sqrt{\text{Hz}}$	(@ 60 dB gain)
500 pV/ $\sqrt{\text{Hz}}$		(@ 30 - 50 dB gain)	
1/f-noise corner	40 kHz		
Output	Output impedance	$50\ \Omega$	
	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 (without average)	70 dB	( $P_{1dB}$ – min. detectable signal)
Monitor Output	Monitor output gain	1 (@ $\geq 100\text{ k}\Omega$ load)	
	Monitor output impedance	$50\ \Omega$ (designed for $\geq 100\text{ k}\Omega$ load)	
	Monitor output voltage range	$\pm 10\text{ V}$	
	Monitor output current	$\pm 25\text{ mA}$	
	Monitor output bandwidth	DC ... 100 kHz	
Digital Control	Control input voltage range	Low: $-0.8\text{ ... }+0.8\text{ V}$ High: $+1.8\text{ ... }+12\text{ V}$	
Power Supply	Supply voltage	$\pm 15\text{ V}$	
	Supply current	$+350 / -100\text{ mA}$ (without current consumption from Sub-D-connector)	
	Stabilized power supply output	$\pm 12\text{ V} / \text{max. } 50\text{ mA}$ , $+5\text{ V} / \text{max. } 50\text{ mA}$ (Auxiliary voltage outputs Pin 1-4 Sub-D-connector)	
Case	Weight	510 g (1.1 lb)	
	Material	AlMg4.5Mn, nickel-plated	

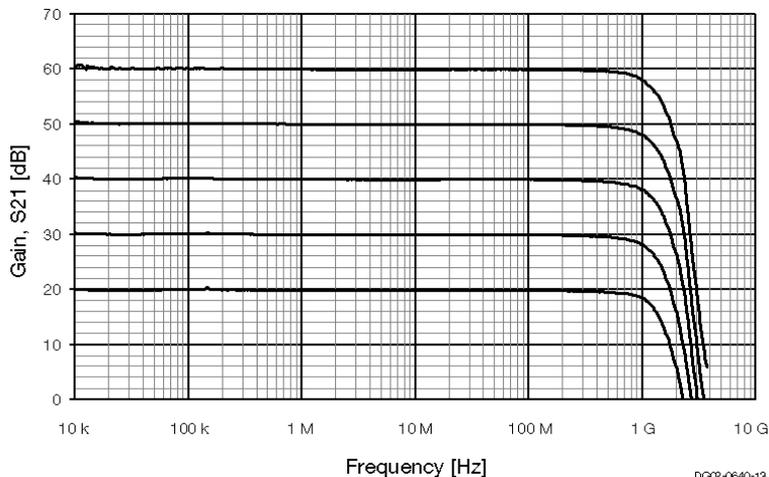
## Variable-Gain Ultra-Wideband Voltage Amplifier

Specifications (continued)  Temperature Range	Storage temperature            -40 ... +100 °C Operating temperature            0 ... +60 °C																								
Absolute Maximum Ratings	Signal input power                    +13 dBm                                    (f > 500 Hz) Signal input DC voltage                ±16 V                                        (slope max. ±1 V/ms) Signal output reverse power            +13 dBm Signal output reverse DC voltage      +16 V / -12 V                              (slope max. ±1 V/ms) Control input voltage                    +16 V / -5 V Power supply voltage                    ±17 V																								
Connectors	Input                                        SMA female  Output                                        SMA female  Power supply                                Lemo® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)  Pin 1:                                        +15 V Pin 2:                                        -15 V Pin 3:                                        GND  <div style="text-align: center;">  </div> Control port                                Sub-D 25-pin, female, qual. class 2 Pin 1:                                        +12 V (stabilized power supply output) Pin 2:                                        -12 V (stabilized power supply output) Pin 3:                                        AGND (analog ground) Pin 4:                                        +5 V (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 <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="border-bottom: 1px solid black;">Gain</th> <th style="border-bottom: 1px solid black;">Pin 14</th> <th style="border-bottom: 1px solid black;">Pin 15</th> <th style="border-bottom: 1px solid black;">Pin 16</th> </tr> </thead> <tbody> <tr> <td>20 dB</td> <td>Low</td> <td>Low</td> <td>Low</td> </tr> <tr> <td>30 dB</td> <td>High</td> <td>Low</td> <td>Low</td> </tr> <tr> <td>40 dB</td> <td>Low</td> <td>High</td> <td>Low</td> </tr> <tr> <td>50 dB</td> <td>High</td> <td>High</td> <td>Low</td> </tr> <tr> <td>60 dB</td> <td>Low</td> <td>Low</td> <td>High</td> </tr> </tbody> </table>	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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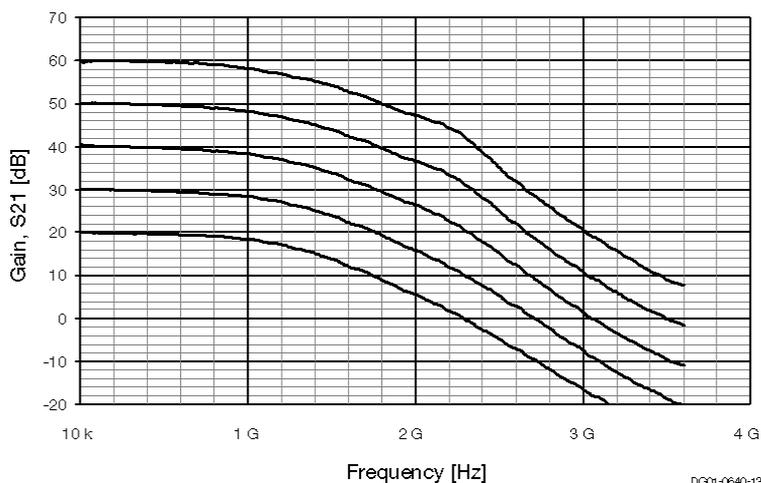
# Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance  
Characteristics

Frequency response (logarithmic)



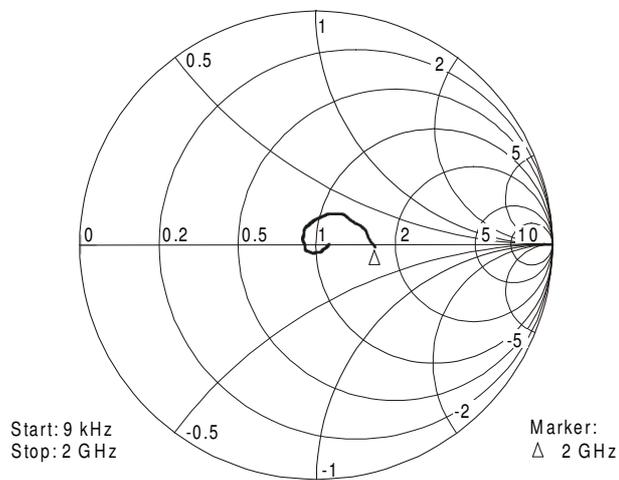
Frequency response (linear)



# Variable-Gain Ultra-Wideband Voltage Amplifier

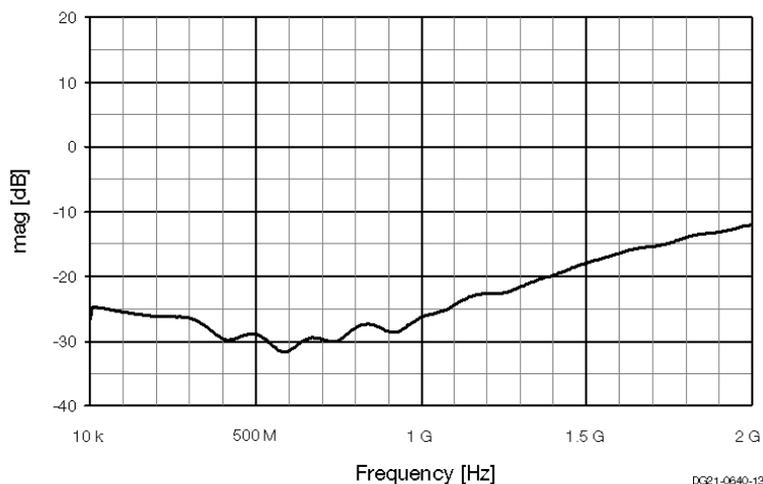
Typical Performance  
Characteristics

Input reflection, S11



DG22-0640-13

Input return loss, S11 (linear magnitude)

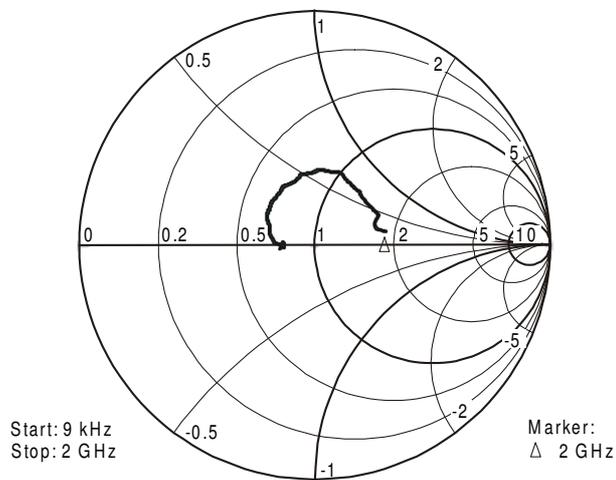


DC21-0640-13

# Variable-Gain Ultra-Wideband Voltage Amplifier

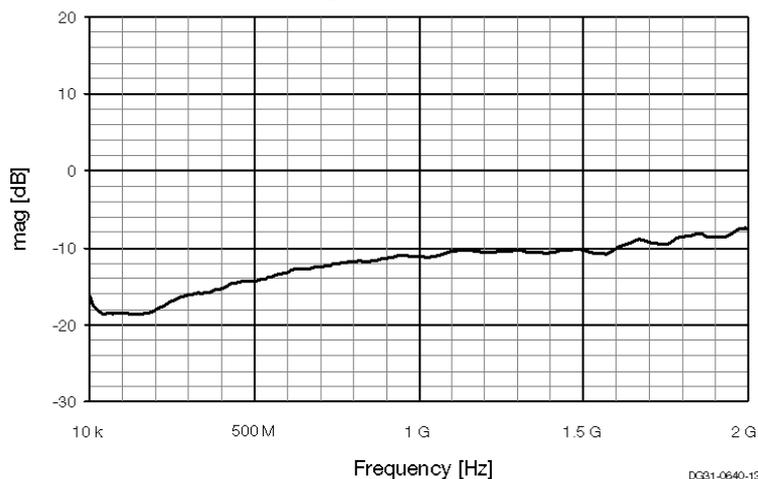
Typical Performance  
Characteristics

Output reflection, S22



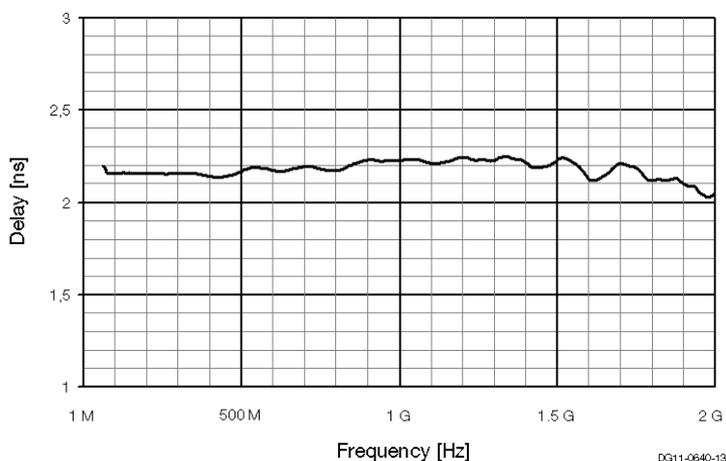
DG32-0640-13

Output return loss, S22 (linear magnitude)



DG31-0640-13

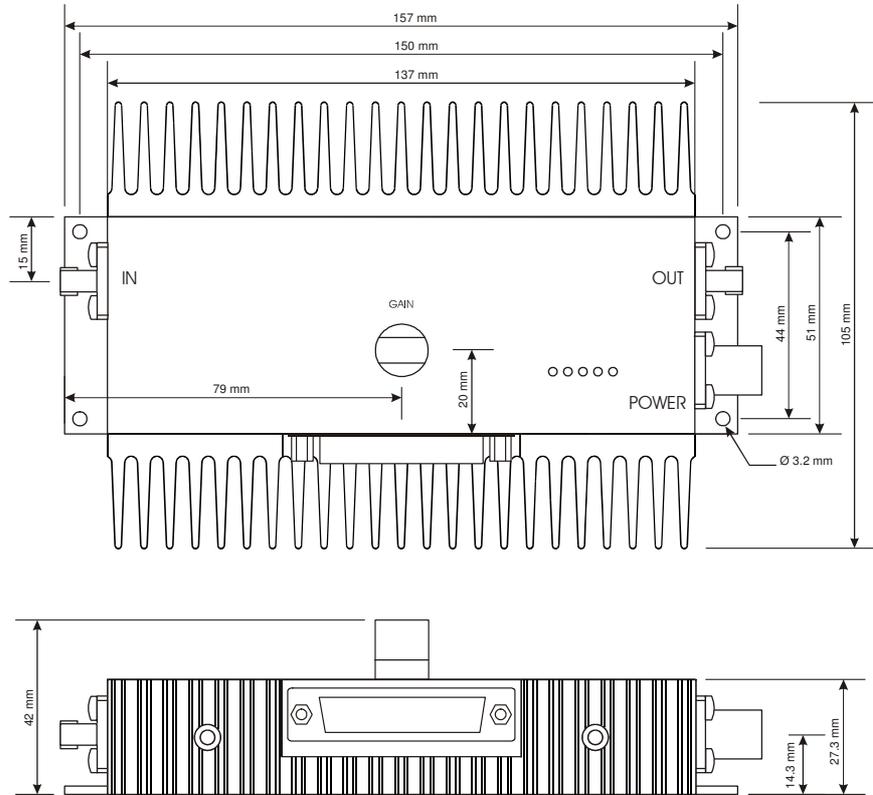
Group delay



DG11-0640-13

# Variable-Gain Ultra-Wideband Voltage Amplifier

Dimensions



DZ01-0640-14

Accessories

BNC-adaptor set

Model no.: ADAP-SMA-BNC-1  
- Set of 2 SMA to BNC adapters

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