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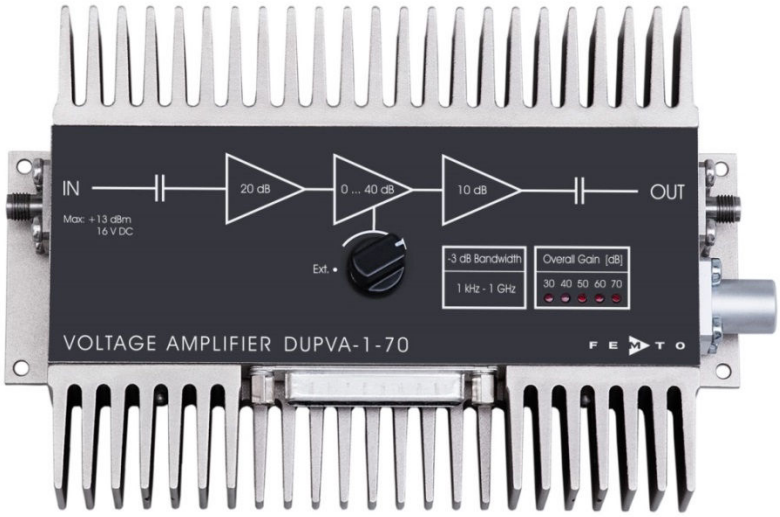
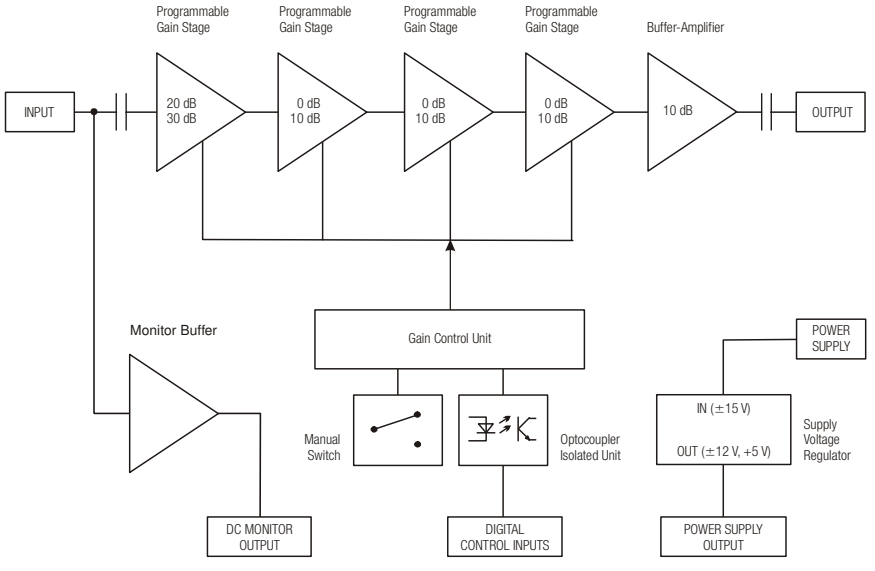
Datasheet DUPVA-1-70

Variable-Gain Ultra-Wideband Voltage Amplifier



Features	• **Variable gain 30 to 70 dB (approx. x30 to x3000), switchable in 10 dB steps** • **Bandwidth 1 kHz … 1.1 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	

Variable-Gain Ultra-Wideband Voltage Amplifier

Specifications			
	Test conditions	V_S = ±15 V, T_A = 25 °C, system impedance = 50 Ω	
Gain	Gain values	30, 40, 50, 60, 70 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	1.1 GHz	
	Upper cut-off frequency rolloff	40 dB/oct.	
Time Response	Rise/fall time (10 % - 90 %)	390 ps	
	Group delay	2.2 ns	
Input	Input impedance AC	50 Ω	
	Input impedance DC	100 kΩ	
	Input VSWR (@ 30 dB gain)	1.1 : 1	(f < 1 GHz)
		1.2 : 1	(f < 2 GHz)
	Input VSWR (@ 40 - 70 dB gain)	1.7 : 1	(f < 1 GHz)
		1.7 : 1	(f < 2 GHz)
	50 Ω noise figure	1.9 dB	(@ 70 dB gain)
		2.5 dB	(@ 40 - 60 dB gain)
	Equivalent input voltage noise	330 pV/√Hz	(@ 70 dB gain)
		400 pV/√Hz	(@ 40 - 60 dB gain)
	1/f-noise corner	20 kHz	
Output	Output impedance	50 Ω	
	Output power P_{1dB}	12 dBm	(@ 100 MHz)
		11 dBm	(@ 500 MHz)
	Output peak-to-peak voltage for linear amplification	2 V	(@ 100 MHz)
		1.7 V	(@ 500 MHz)
	Output VSWR	1.5 : 1	(f < 1 GHz)
		1.7 : 1	(f < 2 GHz)
	Third order intercept point IP_3	20 dBm	
	Reverse isolation	80 dB	
	Dynamic range (without average)	62 dB	(P_{1dB} – min. detectable signal)
Monitor Output	Monitor output gain	1	(@ ≥100 kΩ load)
	Monitor output impedance	50 Ω	(designed for ≥100 kΩ load)
	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	+250 / –100 mA	
		(without current consumption from Sub-D-connector)	
	Stabilized power supply output	±12 V / max. 50 mA, +5 V / max. 50 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

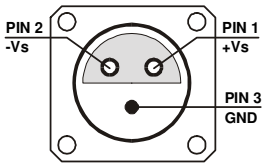
Output

SMA female

Power supply

Lemo® series 1S, 3-pin fixed socket
(mating plug type: FFA.1S.303.CLAC52)

Pin 1: +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
30 dB	Low	Low	Low
40 dB	High	Low	Low
50 dB	Low	High	Low
60 dB	High	High	Low
70 dB	Low	Low	High

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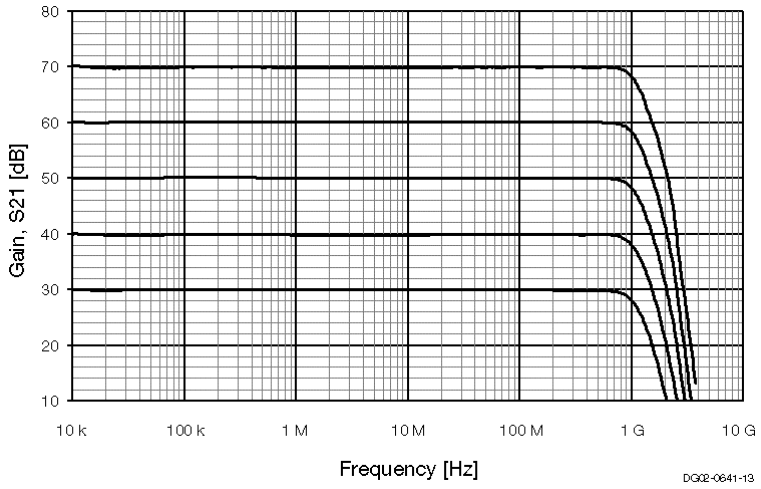
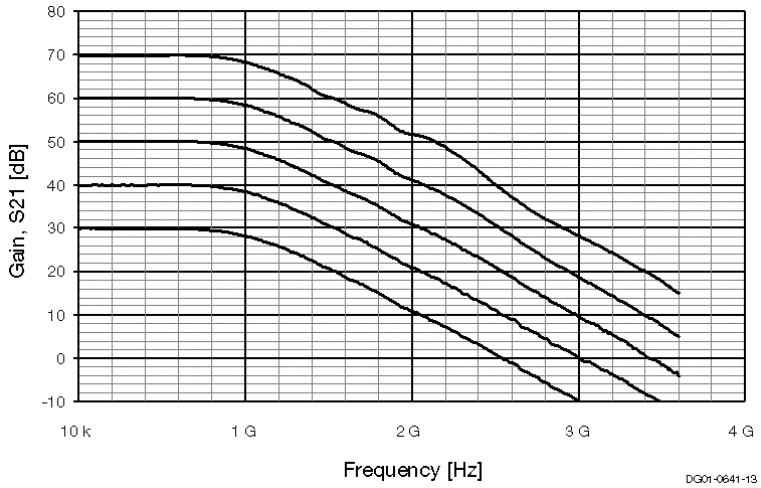
Typical Performance Characteristics

Frequency response (logarithmic)



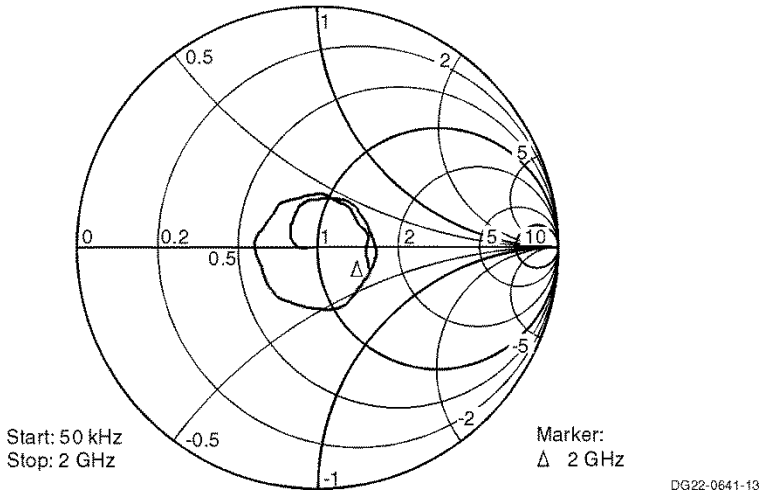
Frequency response (linear)



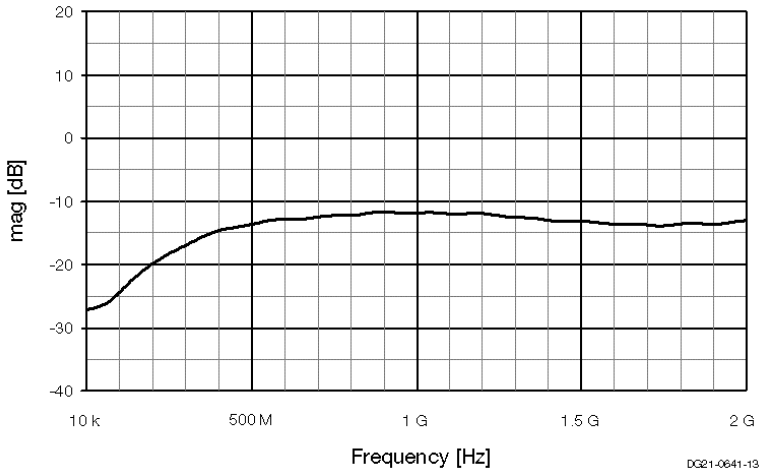
Variable-Gain Ultra-Wideband Voltage Amplifier

Typical Performance Characteristics

Input reflection, S11



Input return loss, S11 (Linear Magnitude)



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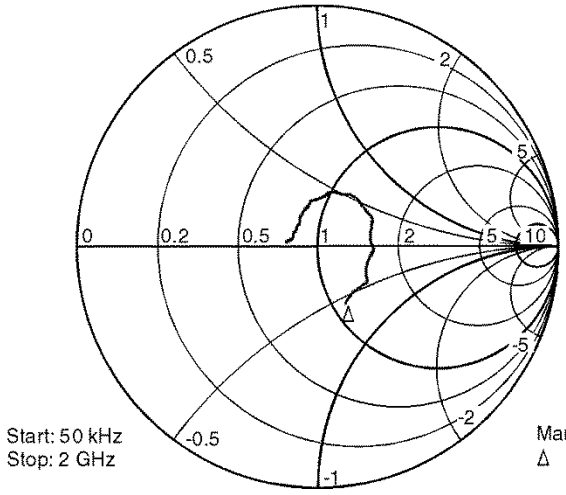
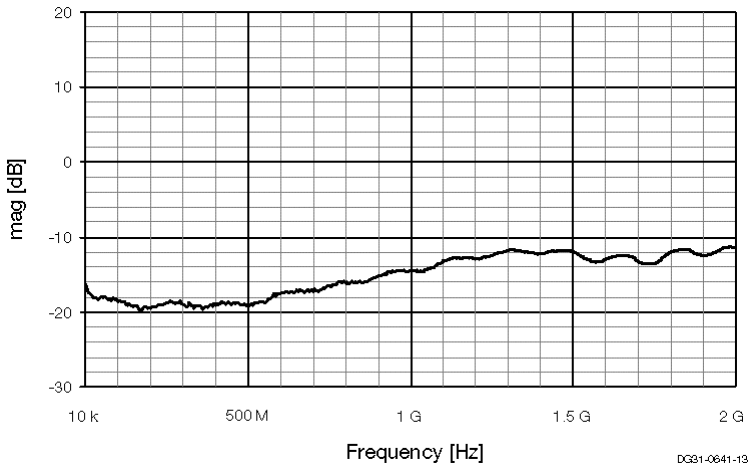
Typical Performance Characteristics

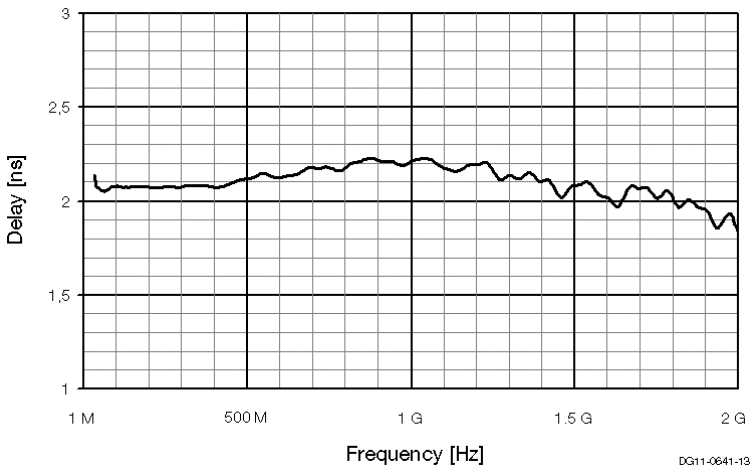
Output reflection, S22



Output return ross, S22 (Linear Magnitude)



Group delay



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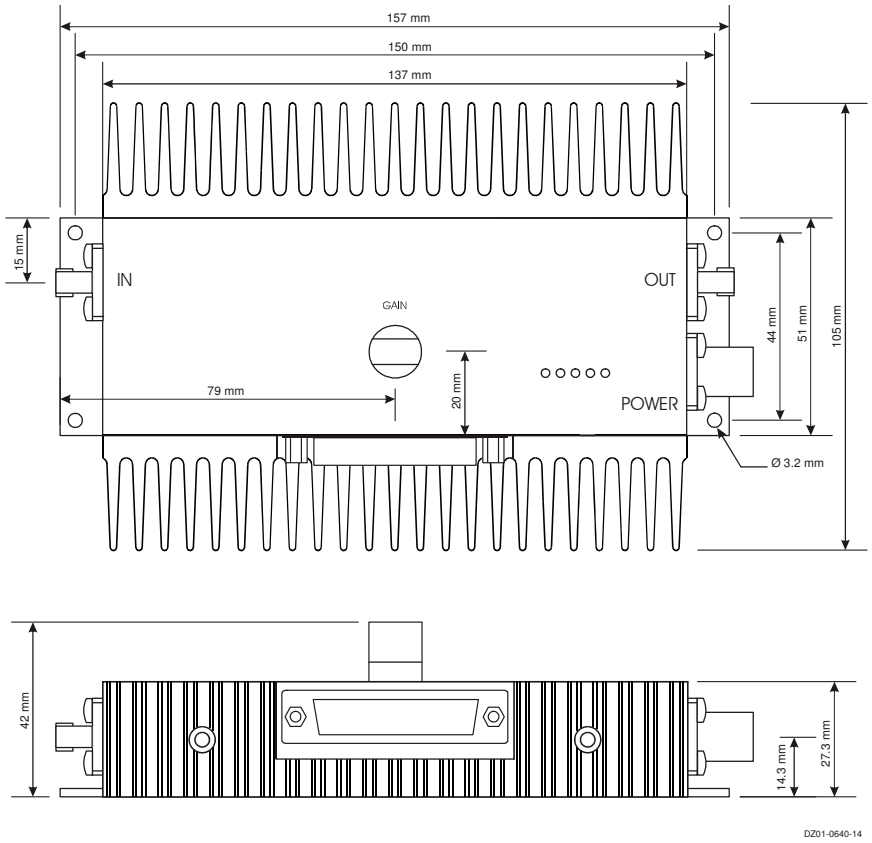
Dimensions



Accessories

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