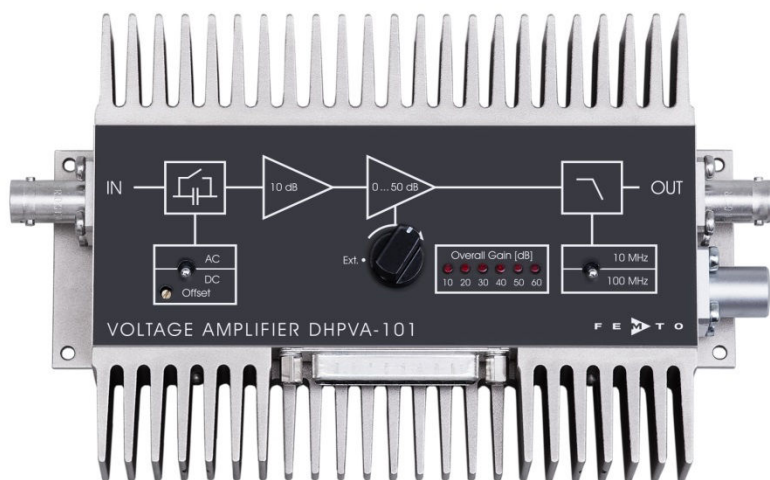


# Variable Gain 100 MHz Wideband Voltage Amplifier



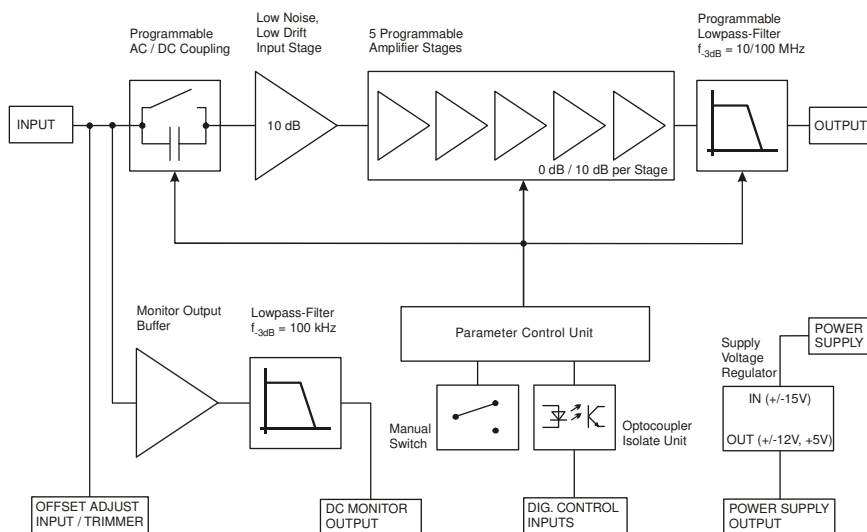
Features

- Variable gain 10 to 60 dB (x3 to x1,000), switchable in 10 dB steps
- Bandwidth DC ... 100 MHz, switchable to 10 MHz
- Built-in temperature compensation for low offset drift of 0.3  $\mu\text{V}/^\circ\text{C}$
- 2.3 nV/ $\sqrt{\text{Hz}}$  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

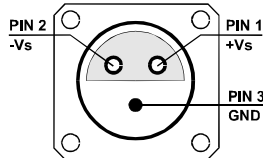


BS01-0540-18

## Variable Gain 100 MHz 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 Gain accuracy	10, 20, 30, 40, 50, 60 dB, switchable $\pm 0.15\text{ dB}$
Frequency Response	Lower cut-off frequency Upper cut-off frequency Upper cut-off frequency roll-off	DC / 10 Hz, switchable 100 MHz, switchable to 10 MHz (approx. Bessel filter characteristic for clean pulse response) see frequency response diagram (page 4)
Time Response	Rise/fall time (10 % - 90 %)	3.5 ns (@ 100 MHz) 35 ns (@ 10 MHz)
Input	Input impedance Input return loss S11  Input voltage drift Equivalent input voltage noise Equivalent input current noise 1/f-noise corner Input bias current Input offset voltage	$50\ \Omega$ -37 dB @ 50 MHz -31 dB @ 100 MHz -21 dB @ 200 MHz  0.3 $\mu\text{V}/^\circ\text{C}$ 2.3 nV/ $\sqrt{\text{Hz}}$ (@ 30 - 60 dB gain) 3.0 pA/ $\sqrt{\text{Hz}}$ 20 kHz <200 nA -10 mV ... +10 mV, adjustable by offset-potentiometer and external control voltage
Output	Output impedance Output return loss S22  Output voltage range Output power (max.) Output current (max.) THD	$50\ \Omega$ (terminate with $50\ \Omega$ load for best performance) -40 dB @ 50 MHz -35 dB @ 100 MHz -31 dB @ 200 MHz  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 Monitor output impedance	x1 (@ $\geq 1\ \text{M}\Omega$ load) $\pm 5\text{ V}$ $\pm 10\text{ mA}$ DC ... 100 kHz $50\ \Omega$ (designed for $\geq 1\ \text{M}\Omega$ load)
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 @ 0 V, 1.5 mA @ +5 V, 4.5 mA @ +12 V 5 ms
Ext. Offset Control	Control voltage range Offset control input impedance	$\pm 10\text{ V}$ , corresponds to $\pm 10\text{ mV}$ input offset 20 k $\Omega$
Power Supply	Supply voltage Supply current  Stabilized power supply output	$\pm 15\text{ V}$ $\pm 120\text{ mA}$ typ. (depends on operating conditions) $\pm 400\text{ mA}$ max.  $\pm 12\text{ V}$ / max. 50 mA, +5V / max. 50 mA

## Variable Gain 100 MHz Wideband Voltage Amplifier

Specifications (continued)		
Case	Weight Material	560 g (1.24 lb) AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	-40 °C ... +85 °C 0 °C ... +50 °C
Absolute Maximum Ratings	Power supply voltage Signal input voltage Digital control input voltage	±16.5 V ±5 V +16 V / -5 V
Connectors	Input Output Power supply	<p>BNC jack (female) BNC jack (female) Lemo® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)</p> <p>Pin 1: +15 V Pin 2: -15 V Pin 3: GND</p> <div style="text-align: center;">  </div>
	Control port	<p>Sub-D 25-pin, female, qual. class 2</p> <p>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, 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</p>

## Variable Gain 100 MHz Wideband Voltage Amplifier

Remote Control Operation

General

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.

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

AC/DC setting

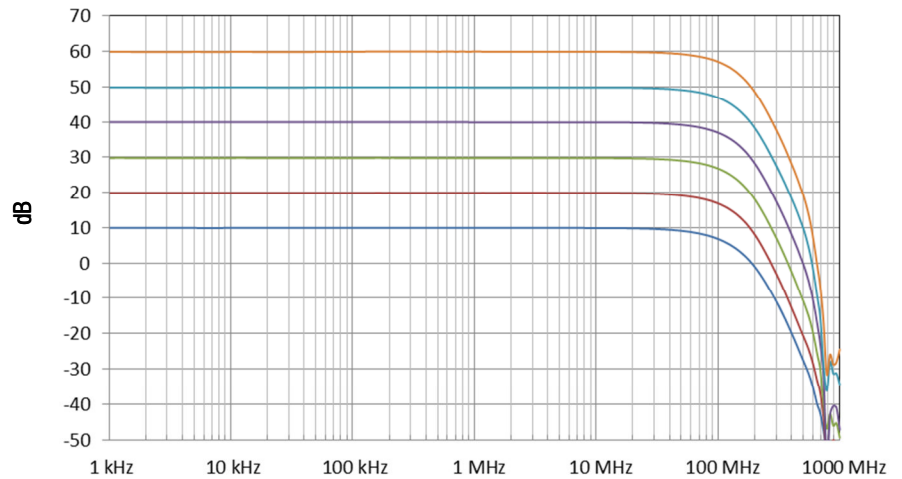
Coupling	Pin 13
AC	low
DC	high

Bandwidth setting

Bandwidth	Pin 14
10 MHz	low
100 MHz	high

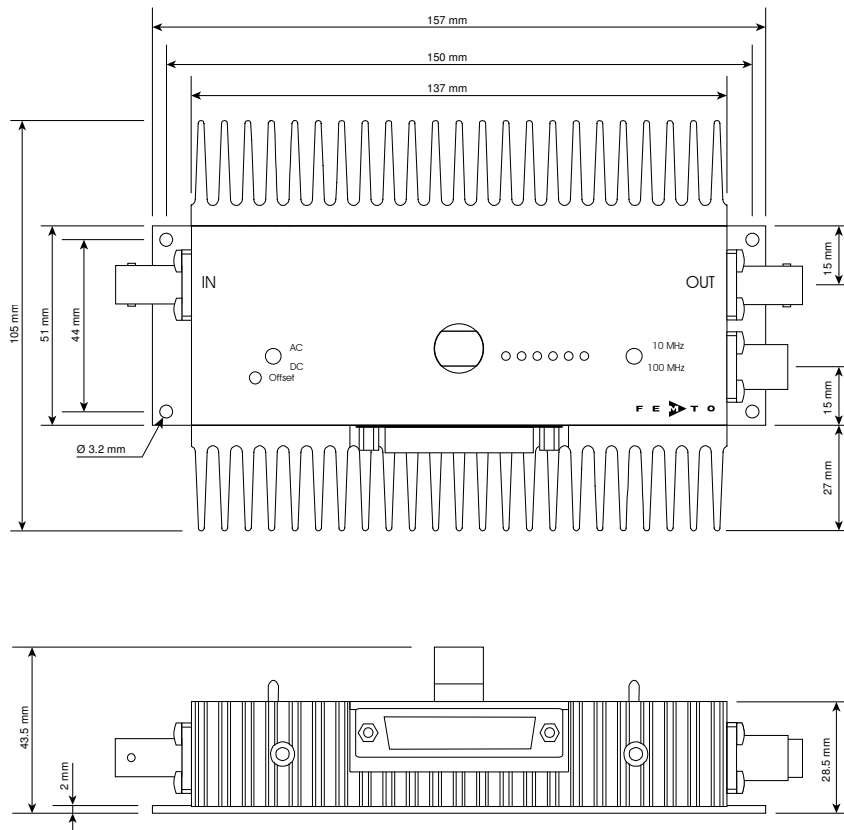
Typical Performance Characteristics

Frequency response (logarithmic)



# Variable Gain 100 MHz Wideband Voltage Amplifier

Dimensions



DZ-DHPVA-101\_R1

One or both heat sinks may be removed (two recessed head screws) if sufficient cooling of the case is provided otherwise ( $< 2 \text{ K/W}$ ), for example by mounting the amplifier with good thermal contact on a sufficiently large solid metal case/rack system.

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