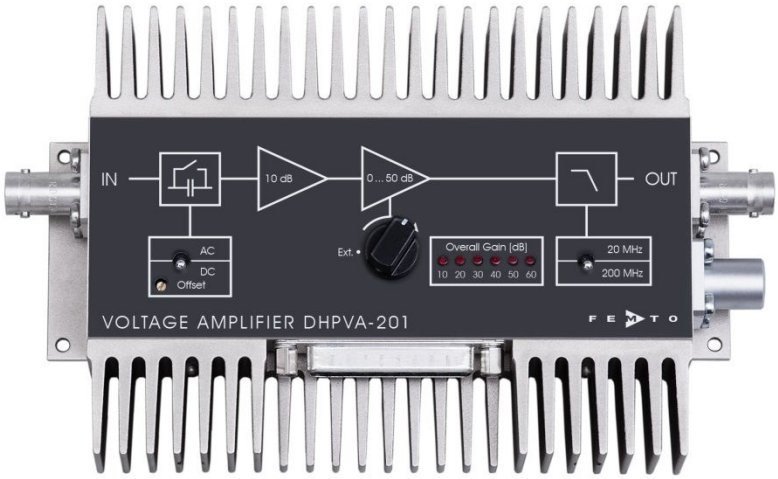
Variable Gain
200 MHz Wideband Voltage Amplifier



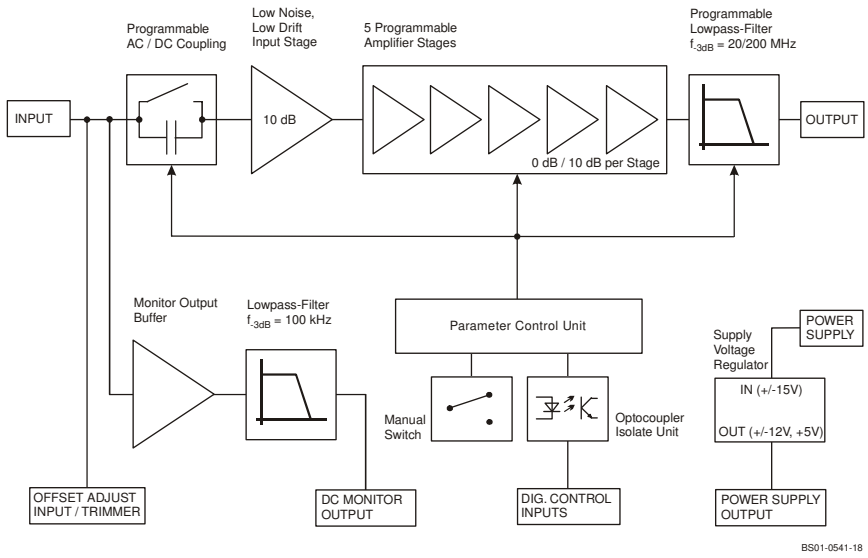
Features

- **Variable gain 10 to 60 dB (x3 to x1,000), switchable in 10 dB steps**
- **Bandwidth DC ... 200 MHz, switchable to 20 MHz**
- **Built-in temperature compensation for low offset drift of 0.3 µV/°C**
- **2.3 nV/√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



Variable Gain
200 MHz Wideband Voltage Amplifier

Specifications	Test conditions	$V_S = \pm 15$ V, $T_A = 25$ °C, system impedance = 50 Ω
Gain	Gain values	10, 20, 30, 40, 50, 60 dB, switchable
	Gain accuracy	±0.15 dB
Frequency Response	Lower cut-off frequency	DC / 10 Hz, switchable
	Upper cut-off frequency	200 MHz, switchable to 20 MHz (approx. Bessel filter characteristic for clean pulse response)
	Upper cut-off frequency roll-off	see frequency response diagram (page 4)
Time Response	Rise/fall time (10 % - 90 %)	1.8 ns (@ 200 MHz)
		18 ns (@ 20 MHz)
Input	Input impedance	50 Ω
	Input return loss S11	–31 dB @ 100 MHz
		–22 dB @ 200 MHz
		–10 dB @ 400 MHz
	Input voltage drift	0.3 µV/°C
	Equivalent input voltage noise	2.3 nV/√Hz (@ 30 - 60 dB gain)
	Equivalent input current noise	3.0 pA/√Hz
	1/f-noise corner	20 kHz
	Input bias current	<200 nA
	Input offset voltage	–10 mV ... +10 mV, adjustable by offset- potentiometer and external control voltage
Output	Output impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output return loss S22	–35 dB @ 100 MHz
		–30 dB @ 200 MHz
		–25 dB @ 400 MHz
	Output voltage range	2 V_{PP} (for linear amplification)
	Output power (max.)	+10 dBm
	Output current (max.)	70 mA
	THD	<0.5 % (@ 20 MHz, 1 V_{PP})
Monitor Output	Monitor output gain	x1 (@ ≥1 MΩ load)
	Monitor output voltage range	±5 V
	Monitor output current	±10 mA
	Monitor output bandwidth	DC ... 100 kHz
	Monitor output impedance	50 Ω (designed for ≥ 1 MΩ load)
Indicator LED	Function	gain setting
Digital Control	Control input voltage range	Low: –0.8 ... +0.8 V
		High: +1.8 ... +12 V, TTL / CMOS compatible
	Control input current	0 mA @ 0 V, 1.5 mA @ +5 V, 4.5 mA @ +12 V
	Gain control switching time	5 ms
Ext. Offset Control	Control voltage range	±10 V, corresponds to ±10 mV input offset
	Offset control input impedance	20 kΩ
Power Supply	Supply voltage	±15 V
	Supply current	±120 mA typ. (depends on operating conditions)
		±400 mA max.
	Stabilized power supply output	±12 V / max. 50 mA, +5V / max. 50 mA

Variable Gain
200 MHz Wideband Voltage Amplifier

Specifications (continued)

Case	Weight	560 g (1.24 lb)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature	–40 °C ... +85 °C
	Operating temperature	0 °C ... +50 °C

Absolute Maximum Ratings	Power supply voltage	±16.5 V
	Signal input voltage	±5 V
	Digital control input voltage	+16 V / –5 V

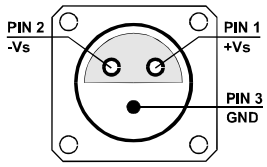
Connectors

Input: BNC jack (female)

Output: BNC jack (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



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, 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: 200 MHz/20 MHz
Pin 15 - 25: NC

Variable Gain
200 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 "20 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

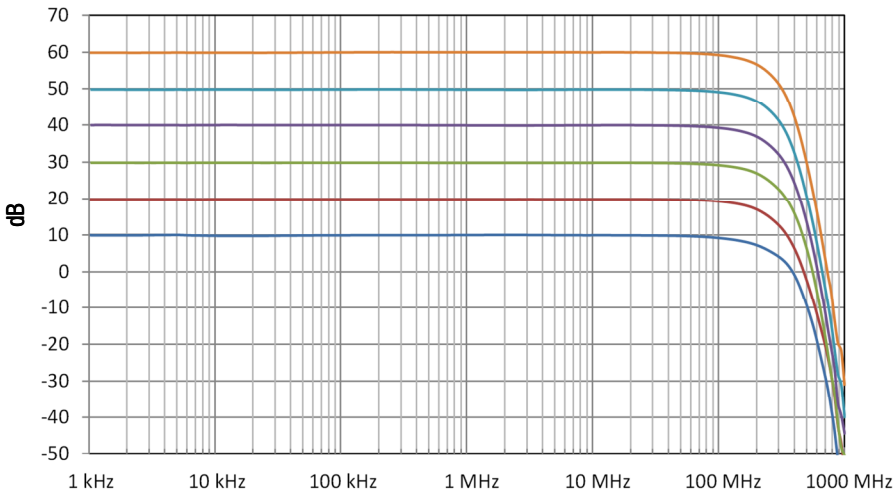
Coupling	Pin 13
AC	low
DC	high

Bandwidth setting

Bandwidth	Pin 14
20 MHz	low
200 MHz	high

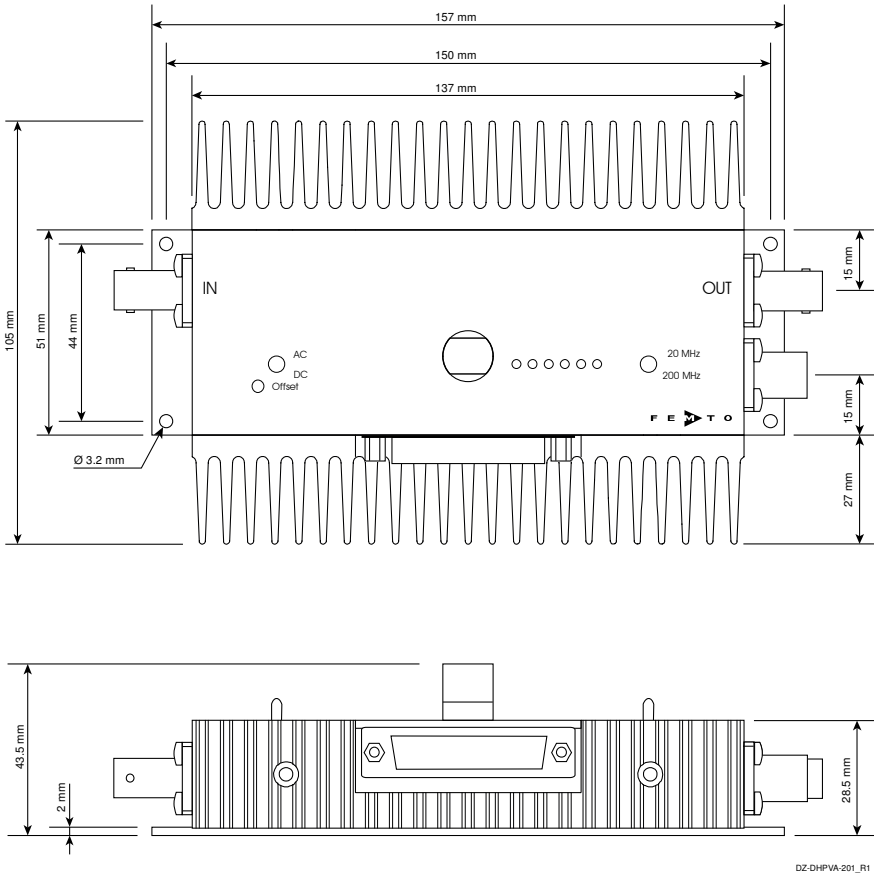
Typical Performance Characteristics

Frequency response (logarithmic)



Variable Gain
200 MHz Wideband Voltage Amplifier

Dimensions



DZ-DHPVA-201_R1

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

FEMTO Messtechnik GmbH
Klosterstr. 64
10179 Berlin · Germany
Phone: +49 30 280 4711-0
Fax: +49 30 280 4711-11
Email: info@femto.de
www.femto.de