

Ultra Low Noise Variable Gain Low Frequency Voltage Amplifier

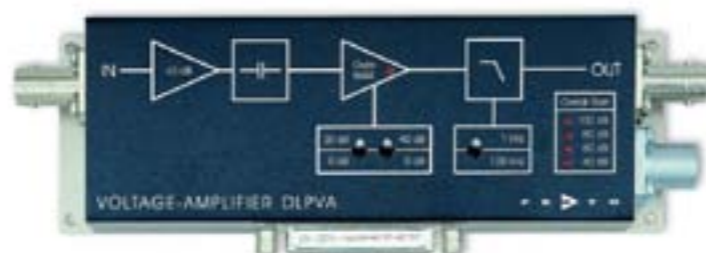
DLPVA-100-BUN-S

FEATURES

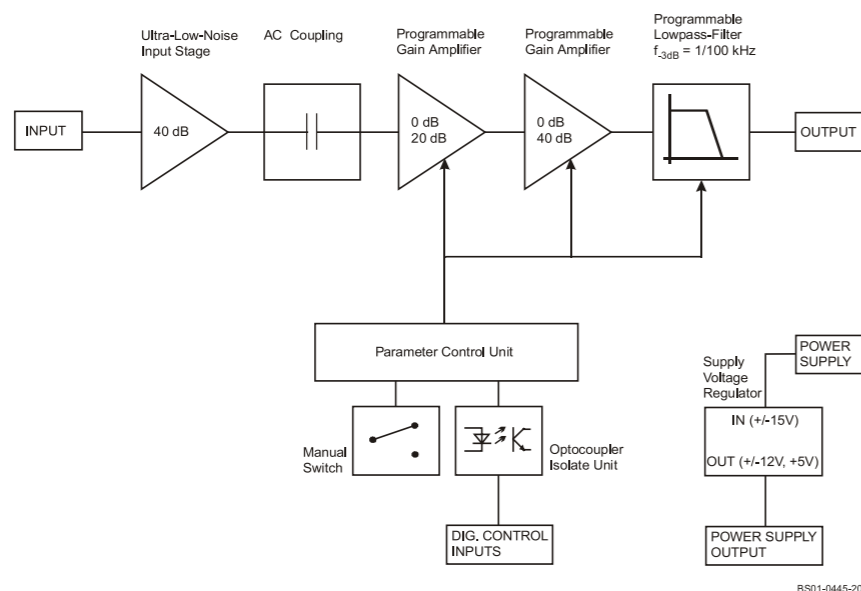
- Variable Gain 40 to 100 dB, Switchable in 20 dB Steps
- Bipolar Input Stage, Recommended for Low Impedance Sources Smaller than 50 Ω
- Ultra low Input Voltage Noise: 400 pV/√Hz
- AC Coupled, Single Ended
- Bandwidth 1.5 Hz - 100 kHz, Switchable to 1 kHz
- Local and Remote Control

APPLICATIONS

- Ultra-Low-Noise Laboratory Amplifier
- Pulsed Thermal EMF Analysis
- Chopped Thermopiles / Bolometers
- Industrial Sensors
- Detector Preamplifier
- Integrated Measurement Systems



Block Diagram

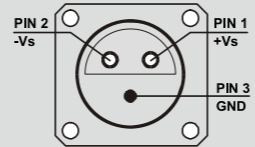


Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain Values	40, 60, 80, 100 dB indicated by four LEDs
	Gain Accuracy	± 0.1 % (between settings) ± 1 % (overall)
	Gain Flatness	± 0.1 dB

Frequency Response	Lower Cut-Off Frequency	1.5 Hz	
	Upper Cut-Off Frequency	100 kHz, switchable to 1 kHz	
	Upper Cut-Off Frequency Rolloff	12 dB/Oct.	
Time Response	Rise / Fall Time (10% - 90%)	3.5 μs (@ BW = 100 kHz) 350 μs (@ BW = 1 kHz)	
Input	Input Impedance	1 kΩ	
	Equivalent Input Voltage Noise	Gain Setting	Noise
		100 dB	400 pV/√Hz
		80 dB	420 pV/√Hz
		60 dB	800 pV/√Hz
	40 dB	6 nV/√Hz	
	Equivalent Input Current Noise	3 pA/√Hz	
	1/f-Noise Corner	100 Hz	
	Input Bias Current	30 μA	
	Maximum Input DC-Offset Voltage for Linear Amplification	± 90 mV	
Important Notice: The input must see a source Impedance below 200 Ω to function properly!			
Output	Output Impedance	50 Ω (terminate with > 10 kΩ for best performance)	
	Output Voltage Range for linear Amplification	± 10 V (@ > 10 kΩ load)	
	Output Current (max.)	± 20 mA	
	Output Overload Recovery Time	0.5 ms (after 20x overload)	
Overload LED	The amplifier features a LED to signalize an overload condition. The Overload LED will turn on if the signal level within the signal path exceeds the linear operating range. In order to ensure the correct operation of the amplifier without signal distortions reduce the gain setting until the Overload LED turns off. The Overload LED may also turn on when the amplifier is operated with open input or with a high source impedance. For proper operation please use a source impedance of less than 100 Ω or switch to a lower gain setting.		
Remote 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	
	Overload Output	Non active: + 5 V, max. 1 mA, active: 0.8 V, max. -10 mA	
Power Supply	Supply Voltage	± 15 V (± 14.5 V to ± 16 V)	
	Supply Current	± 55 mA typ. (depends on operating conditions, recommended power supply capability minimum 150 mA)	
Case	Weight	0.32 kg (0.7 lbs)	
	Material	AlMg4.5Mn, nickel-plated	

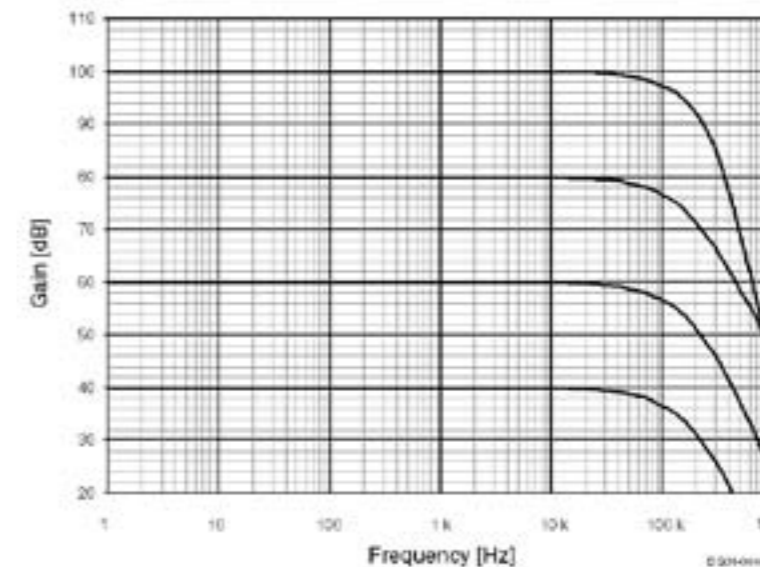
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Temperature Range	Storage Temperature	- 40 °C to + 100 °C		
	Operating Temperature	0 °C to + 60 °C		
Absolute Maximum Ratings	Power Supply Voltage	± 21 V		
	Control Input Voltage	+ 16 V / - 5 V		
	Signal Input Voltage	± 4 V		
	Overvoltage at the signal input can se severely degrade the noise performance or destroy the amplifier!			
Connectors	Input	BNC		
	Output	BNC		
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND		
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 "0 dB" and "1 kHz" 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 11
Remote Control Operation	Gain Setting	40 dB	low	low
		60 dB	high	low
		80 dB	low	high
Remote Control Operation	Bandwidth Setting	100 dB	high	high
		Bandwidth	Pin 14	
		1 kHz	low	
Remote Control Operation	Bandwidth Setting	100 kHz	high	

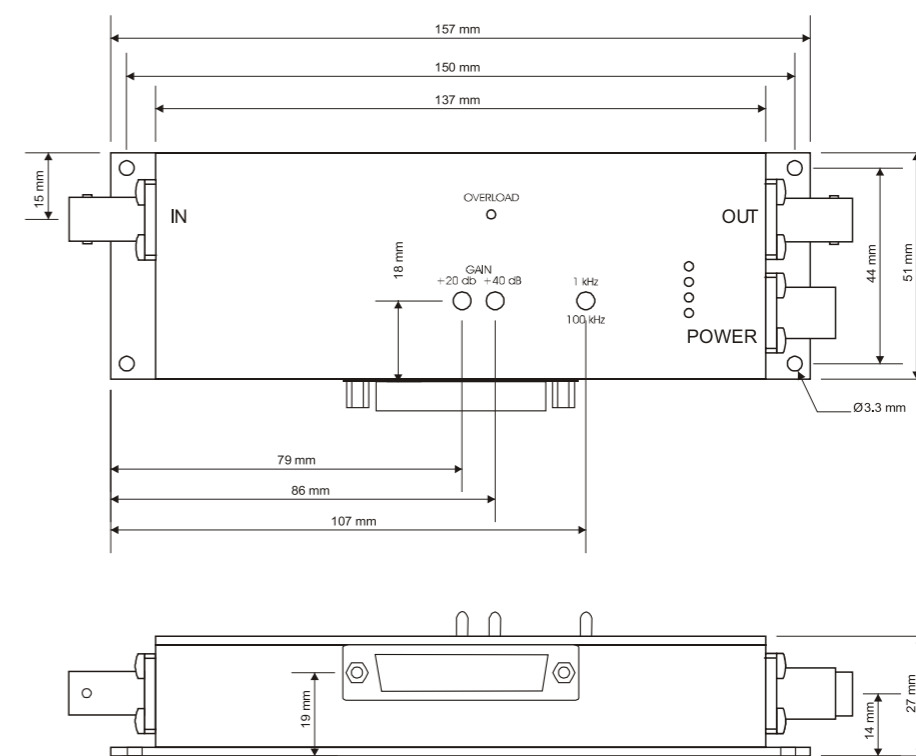


Typical Performance Characteristics

Frequency Response (Logarithmic)



Dimensions



DZ-DLPIA-BUN-S

Low Noise Variable Gain Low Frequency Voltage Amplifier

DLPVA-100-BLN-S

FEATURES

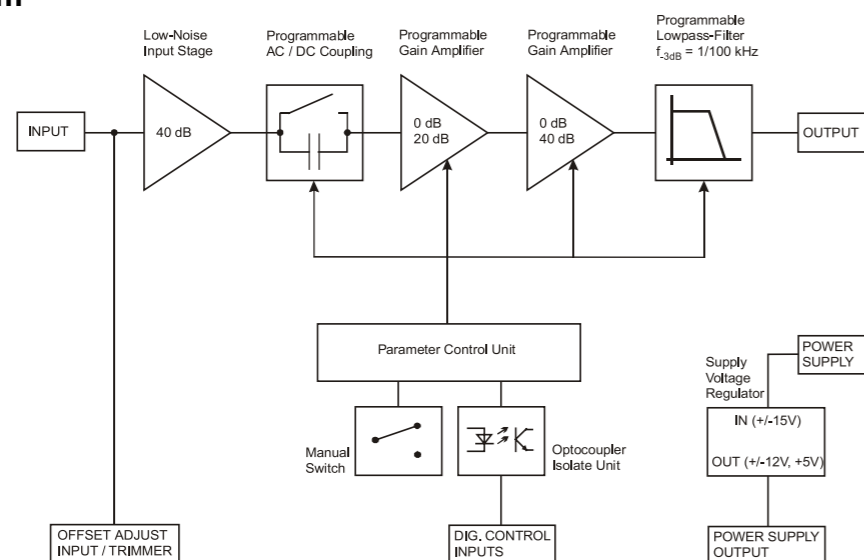
- Variable Gain 40 to 100 dB, Switchable in 20 dB Steps
- Bipolar Input Stage, Recommended for Low Impedance Sources Smaller than 100 Ω
- Very Low Input Voltage Noise: 700 pV/√Hz
- DC-Coupled, Single Ended
- 0.5 μV/°C DC-Drift
- Bandwidth DC - 100 kHz, Switchable to 1 kHz
- Switchable AC/DC-Coupling
- Local and Remote Control

APPLICATIONS

- Low-Noise Laboratory Amplifier
- Pulsed Thermal EMF Analysis
- Industrial Sensors
- Detector Preamplifier
- Integrated Measurement Systems
- Detector Preamplifier
- Integrated Measurement Systems



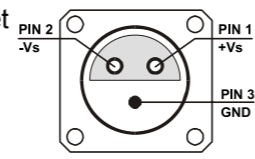
Block Diagram



Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain Values	40, 60, 80, 100 dB indicated by four LEDs
	Gain Accuracy	± 0.1 % (between settings) ± 1 % (overall)
	Gain Flatness	± 0.1 dB

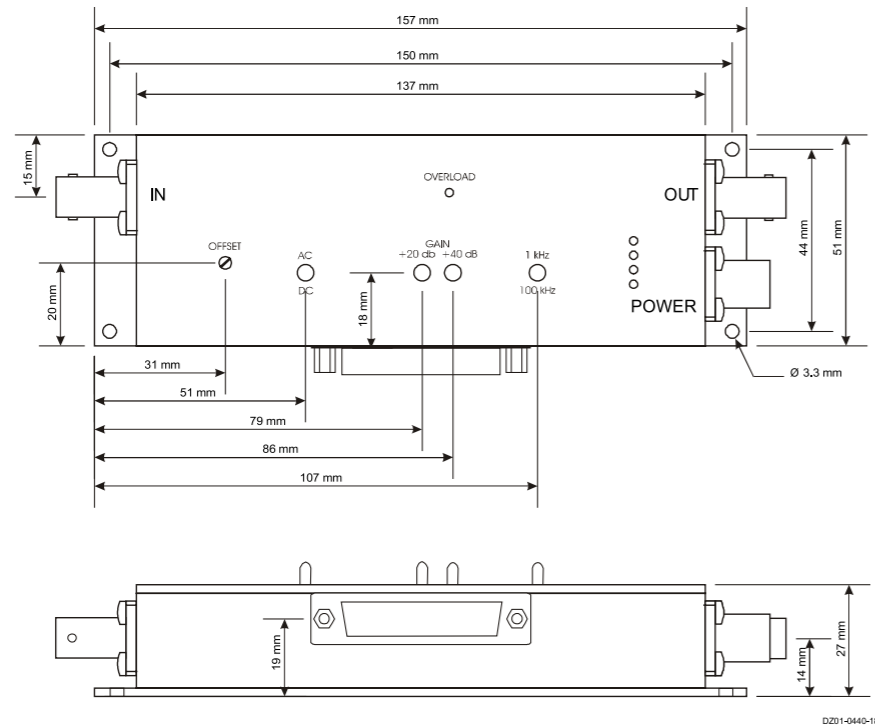
Frequency Response	Lower Cut-Off Frequency	DC, switchable to 1.5 Hz		
	Upper Cut-Off Frequency	100 kHz, switchable to 1 kHz		
	Upper Cut-Off Frequency Rolloff	12 dB/Oct.		
Time Response	Rise / Fall Time (10% - 90%)	3.5 μs (@ BW = 100 kHz) 350 μs (@ BW = 1 kHz)		
Input	Input Impedance	1 MΩ		
	Input Voltage Drift	0.5 μV/°C		
	Equivalent Input Voltage Noise	Gain Setting	Noise	
		100 dB	700 pV/√Hz	
		80 dB	730 pV/√Hz	
		60 dB	860 pV/√Hz	
	40 dB	6 nV/√Hz		
	Equivalent Input Current Noise	3 pA/√Hz		
	1/f-Noise Corner	80 Hz		
	Input Bias Current	1 μA		
Input Bias Current Drift	8 nA/°C			
Input Offset Voltage	± 500 μV, adjustable by offset trimmer and external control voltage			
Output	Output Impedance	50 Ω (terminate with > 10 kΩ for best performance)		
	Output Voltage Range			
	For Linear Amplification	± 10 V (@ > 10 kΩ load)		
	Output Current (max.)	± 20 mA		
	Output Overload Recovery Time	0.5 ms (after 20x overload)		
Overload LED	The amplifier features a LED to signalize an overload condition. The Overload LED will turn on if the signal level within the signal path exceeds the linear operating range. In order to ensure the correct operation of the amplifier without signal distortions reduce the gain setting until the Overload LED turns off. The Overload LED may also turn on when the amplifier is operated with open input or with a high source impedance. For proper operation please use a source impedance of less than 1 kΩ or switch to a lower gain setting.			
Remote Offset Control	Offset Control Voltage Range	± 10 V, corresponds to ± 500 μV input offset		
	Offset Control Input Impedance	200 kΩ		
Remote 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		
	Overload Output	Non active: + 5 V, max. 1 mA, active: 0.8 V, max. -10 mA		
Power Supply	Supply Voltage	± 15 V (± 14.5 V to ± 16 V)		
	Supply Current	± 75 mA typ. (depends on operating conditions, recommended power supply capability minimum 200 mA)		

Case	Weight	0.32 kg (0.7 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 °C to + 100 °C
	Operating Temperature	0 °C to + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 21 V
	Control Input Voltage	+ 16 V / - 5 V
	Signal Input Voltage	± 4.5 V
	Overvoltage at the signal input can se severely degrade the noise performance or destroy the amplifier!	
Connectors	Input	BNC
	Output	BNC
	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: +12 V (stabilized power supply output, max. 100 mA) Pin 2: -12 V (stabilized power supply output, max. 100 mA) Pin 3: AGND (analog ground) Pin 4: +5 V (stabilized power supply output, max. 50 mA) Pin 5: digital output: overload Pin 6: NC Pin 7: NC Pin 8: offset control voltage input Pin 9: DGND (ground f. digital control Pin 10 - 25) Pin 10: NC Pin 11: digital control input: gain, LSB Pin 12: digital control input: gain, MSB Pin 13: digital control input: AC/DC Pin 14: digital control input: 100 kHz / 1 kHz Pin 15 - 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 a switch setting, set the corresponding local switch to “0 dB”, “AC” and “1 kHz” 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 11	Pin 12
		40 dB	low	low
		60 dB	high	low
		80 dB	low	high
	AC/DC Setting	100 dB	high	high
		Coupling	Pin 13	
		AC	low	
	Bandwidth Setting	DC	high	
		Bandwidth	Pin 14	
1 kHz		low		
100 kHz		high		
Typical Performance Characteristics	Frequency Response (Logarithmic)			

Dimensions



Variable Gain Low Frequency Voltage Amplifier

DLPVA-100-B Series

FEATURES

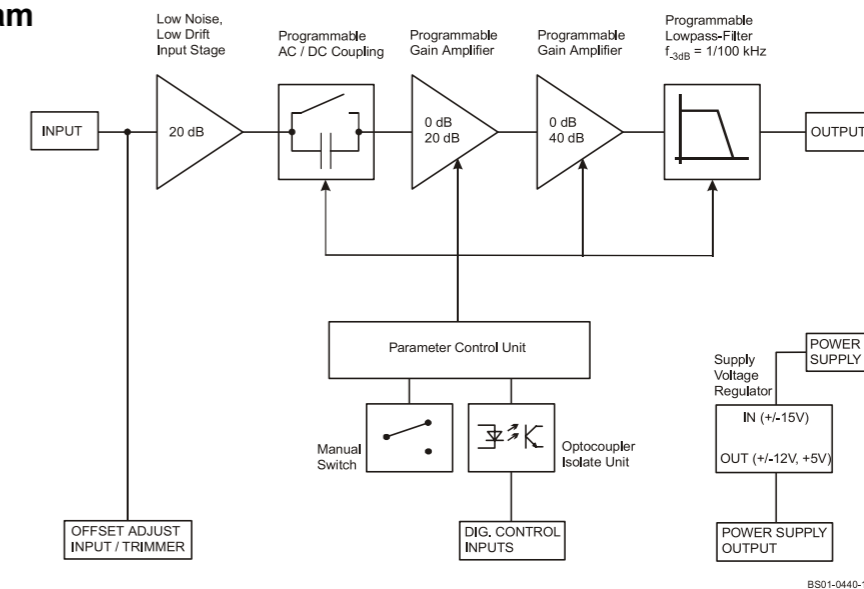
- Variable Gain 20 to 80 dB, Switchable in 20 dB Steps
- Bipolar Input Stage, Recommended for Low Impedance Sources Smaller than 1 kΩ
- Single Ended and True Differential Input Models
- Bandwidth DC - 100 kHz, Switchable to 1 kHz
- 0.7 $\mu\text{V}/^\circ\text{C}$ DC-Drift
- 120 dB CMRR
- 2.4 $\text{nV}/\sqrt{\text{Hz}}$ Input Noise
- Switchable AC/DC-Coupling
- Local and Remote Control

APPLICATIONS

- Universal Laboratory Amplifier
- Automated Measurements
- Industrial Sensors
- Detector Preamplifier
- Integrated Measurement Systems



Block Diagram

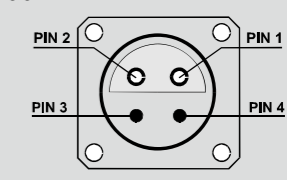
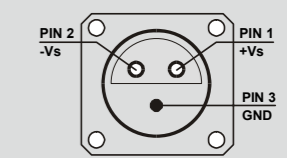


Specifications	Test Conditions	$V_s = \pm 15 \text{ V}, T_a = 25^\circ\text{C}$
Gain	Gain Values	20, 40, 60, 80 dB indicated by four LEDs
	Gain Accuracy	$\pm 0.1 \%$ (between settings) $\pm 1 \%$ (overall)
	Gain Flatness	$\pm 0.1 \text{ dB}$

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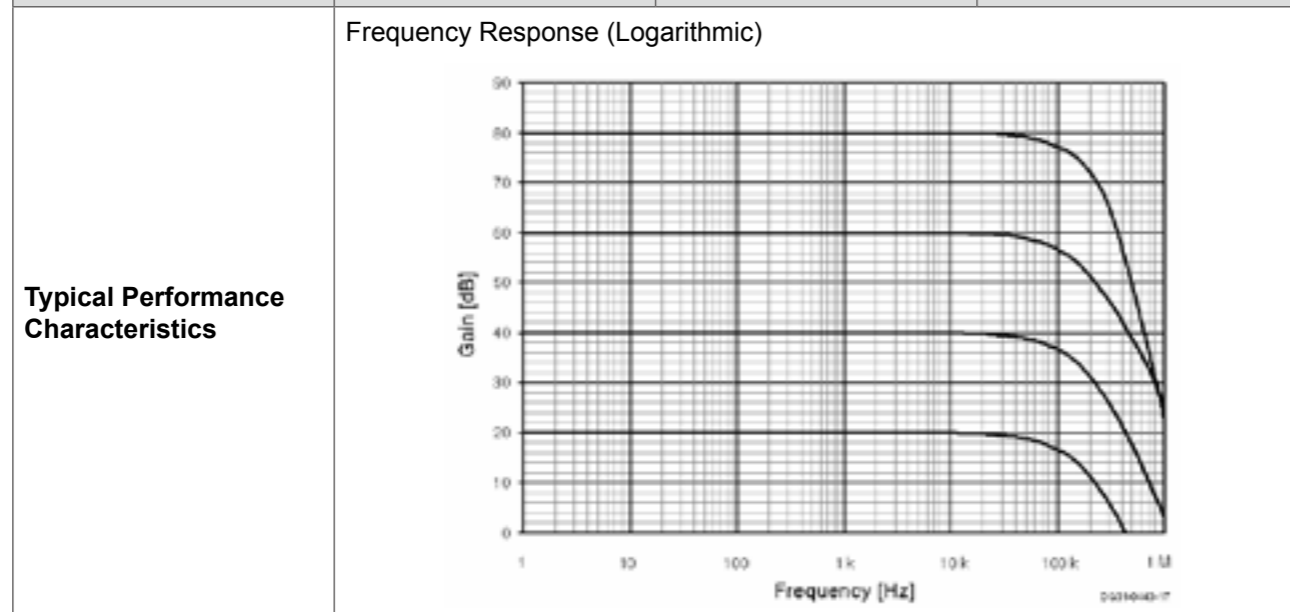
Frequency Response	Lower Cut-Off Frequency	DC, switchable to 1.5 Hz			
	Upper Cut-Off Frequency	100 kHz, switchable to 1 kHz			
	Upper Cut-Off Frequency Rolloff	12 dB/Oct.			
Time Response	Rise / Fall Time (10% - 90%)	3.5 μ s (@ BW = 100 kHz) 350 μ s (@ BW = 1 kHz)			
Input	Input Impedance	1 M Ω			
	Input Voltage Drift	0.7 μ V/K			
	Equivalent Input Voltage Noise	Gain Setting	DLPVA-100-B-S	DLPVA-100-B-D	
		60, 80 dB	2.4 nV/ \sqrt Hz	3.6 nV/ \sqrt Hz	
		40 dB	6.4 nV/ \sqrt Hz	7.3 nV/ \sqrt Hz	
	20 dB	60 nV/ \sqrt Hz	60 nV/ \sqrt Hz		
	Equivalent Input Current Noise	2 pA/ \sqrt Hz			
	1/f-Noise Corner	80 Hz			
	Input Bias Current	0.8 μ A			
	Input Bias Current Drift	6 nA/ $^{\circ}$ C			
	Input Offset Voltage	\pm 4 mV, adjustable by offset trimmer and external control voltage			
<i>True Differential Input, Model "DLPVA-100-B-D" only:</i>					
Common Mode Voltage Range	\pm 9 V				
CMRR	120 dB (@ 100 Hz)				
	100 dB (@ 10 kHz)				
	80 dB (@ 60 kHz)				
Output	Output Impedance	50 Ω (terminate with > 10 k Ω for best performance)			
	Output Voltage Range				
	For Linear Amplification	\pm 10 V (@ > 10 k Ω load)			
	Output Current (max.)	\pm 20 mA			
	Output Overload Recovery Time	0.5 ms (after 20x overload)			
Overload LED	<p>The amplifier features a LED to signalize an overload condition. The Overload LED will turn on if the signal level within the signal path exceeds the linear operating range. In order to ensure the correct operation of the amplifier without signal distortions reduce the gain setting until the Overload LED turns off.</p> <p><i>The Overload LED may also turn on under the following operating conditions:</i></p> <ul style="list-style-type: none"> - The amplifier is operated with open input or with a high source impedance. For proper operation please use a source impedance of less than 1 kΩ for model "B-S" and less than 10 kΩ for model "B-D", respectively, or switch to a lower gain setting. - When using a DLPVA-B-D with differential input stage the Overload LED may turn on if the common mode input voltage exceeds \pm 5 V or if the source is totally floating with respect to the amplifier ground. For proper operation make sure that the common mode voltage stays within \pm 5 V with respect to the amplifier ground and make a valid connection between the source ground and the amplifier ground to ensure that the inputs cannot drift outside the tolerable common mode range. 				

Remote Offset Control	Offset Control Voltage Range	\pm 10 V, corresponds to \pm 4 mV input offset
	Offset Control Input Impedance	200 k Ω
Remote 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
	Overload Output	Non active: + 5 V, max. 1 mA, active: 0.8 V, max. -10 mA
Power Supply	Supply Voltage	\pm 15 V (\pm 14.5 V to \pm 16 V)
	Supply Current	\pm 75 mA typ. (depends on operating conditions, recommended power supply capability minimum 150 mA)
Case	Weight	0.32 kg (0.7 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 $^{\circ}$ C to + 100 $^{\circ}$ C
	Operating Temperature	0 $^{\circ}$ C to + 60 $^{\circ}$ C
Absolute Maximum Ratings	Power Supply Voltage	\pm 21 V
	Control Input Voltage	+ 16 V / - 5 V
	Single Ended Input, Model "DLPVA-100-B-S" only:	
	Signal Input Voltage	\pm 4.5 V
	True Differential Input, Model "DLPVA-100-B-D" only:	
	Signal Input Differential Voltage	\pm 7.7 V
	Signal Input Com. Mode Voltage	\pm 12 V

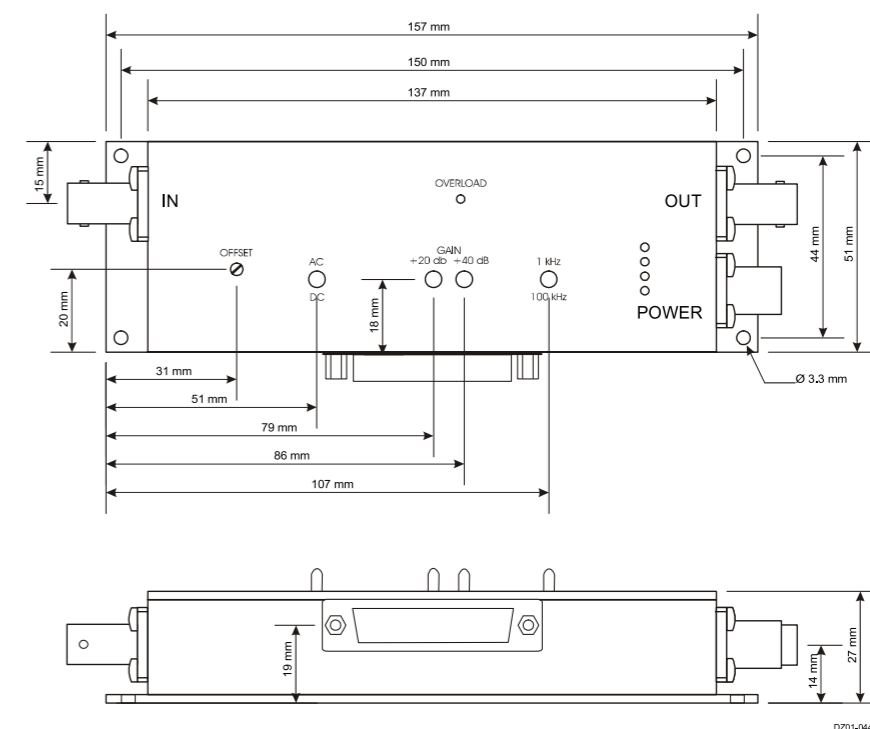
Connectors	Input	<p><i>Single Ended Input, Model "DLPVA-100-B-S":</i> BNC</p> <p><i>True Differential Input, Model "DLPVA-100-B-D":</i> LEMO series 1S, 4-pin fixed socket Pin 1: non inverting input Pin 2: inverting input Pin 3: GND Pin 4: N.C.</p> 
	Output	BNC
	Power Supply	<p>LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND</p> 

Connectors	Control Port	Sub-D 25-pin, female, qual. class 2 Pin 1: +12 V (stabilized power supply output, max. 100 mA) Pin 2: -12 V (stabilized power supply output, max. 100 mA) Pin 3: AGND (analog ground) Pin 4: +5 V (stabilized power supply output, max. 50 mA) Pin 5: digital output: overload Pin 6: NC Pin 7: NC Pin 8: offset control voltage input Pin 9: DGND (ground f. digital control Pin 10 - 25) Pin 10: NC Pin 11: digital control input: gain, LSB Pin 12: digital control input: gain, MSB Pin 13: digital control input: AC/DC Pin 14: digital control input: 100 kHz / 1 kHz Pin 15 - 25: NC		
	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 "0 dB", "AC" and "1 kHz" 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.		
Remote Control Operation	Gain Setting	Gain	Pin 11	Pin 12
		20 dB	low	low
		40 dB	high	low
		60 dB	low	high
		80 dB	high	high

Remote Control Operation	AC/DC Setting	Coupling	Pin 13
		AC	low
		DC	high
	Bandwidth Setting	Bandwidth	Pin 14
		1 kHz	low
		100 kHz	high



Dimensions



Ordering Information	Available Models	Model No.: DLPVA-100-B-S - Bipolar, single-ended input (BNC-connector input)
		Model No.: DLPVA-100-B-D - Bipolar, true differential input (LEMO-connector input)

Variable Gain Low Frequency Voltage Amplifier

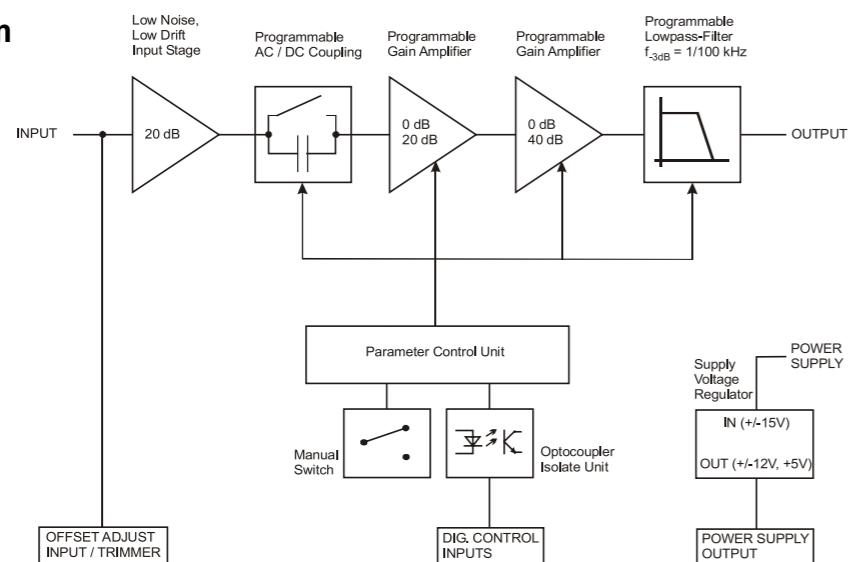
DLPVA-100-F Series

FEATURES

- Variable Gain 20 to 80 dB, Switchable in 20 dB Steps
- ET Input Stage, 1 TΩ Impedance
- Protection against ± 3 kV Transients
- Single Ended and True Differential Input Models
- Bandwidth DC - 100 kHz, Switchable to 1 kHz
- 1.3 μV/°C DC-Drift
- 120 dB CMRR
- 5.5 nV/√Hz Input Noise
- Switchable AC/DC-Coupling
- Loc



Block Diagram

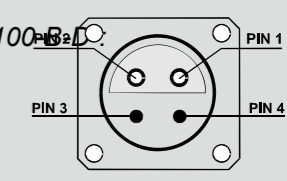
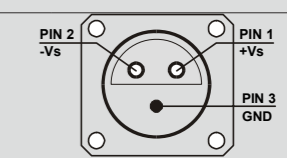


Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain Values	20, 40, 60, 80 dB indicated by four LEDs
	Gain Accuracy	± 0.1 % (between settings) ± 1 % (overall)
	Gain Flatness	± 0.1 dB

Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C			
Gain	Gain Values	20, 40, 60, 80 dB indicated by four LEDs			
	Gain Accuracy	± 0.1 % (between settings) ± 1 % (overall)			
	Gain Flatness	± 0.1 dB			
Frequency Response Lower Cut-Off Frequency	DC, switchable to 1.5 Hz				
	Upper Cut-Off Frequency	100 kHz, switchable to 1 kHz			
	Upper Cut-Off Frequency Rolloff	12 dB/Oct.			
Time Response	Rise / Fall Time (10% - 90%)	3.5 μs (@ BW = 100 kHz) 350 μs (@ BW = 1 kHz)			
Input	Input Impedance	1 TΩ			
	Input Voltage Drift	1.3 μV/K			
	Equivalent Input Voltage Noise	Gain Setting	DLPVA-100-F-S	DLPVA-100-F-D	
		60, 80 dB	5.5 nV/√Hz		6.9 nV/√Hz
		40 dB	8 nV/√Hz		10 nV/√Hz
		20 dB	60 nV/√Hz		60 nV/√Hz
	Equivalent Input Current Noise	1.6 fA/√Hz			
	1/f-Noise Corner	80 Hz			
	Input Bias Current	1 pA			
	Input Bias Current Drift	Factor 2.3 / 10 °C			
Input Offset Voltage	± 5 mV, adjustable by offset trimmer and external control voltage				
Single Ended Input, Model "DLPVA-100-F-S" only:					
Input Voltage Range for linear Amplification:	± 0.6 V				
<i>True Differential Input, Model "DLPVA-100-F-D" only:</i>					
Common Mode Voltage Range	± 5 V				
CMRR	120 dB (@ 100 Hz) 100 dB (@ 10 kHz) 80 dB (@ 60 kHz)				
Output	Output Impedance	50 Ω (terminate with > 10 kΩ load for best performance)			
	Output Voltage Range				
	For Linear Amplification	± 10 V (@ > 10 kΩ load)			
	Output Current (max.)	± 20 mA			
	Output Overload Recovery Time	0.5 ms (after 20x overload)			

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Overload LED	The amplifier features a LED to signalize an overload condition. The Overload LED will turn on if the signal level within the signal path exceeds the linear operating range. In order to ensure the correct operation of the amplifier without signal distortions reduce the gain setting until the Overload LED turns off.	
	The Overload LED may also turn on under the following operating conditions:	
	<ul style="list-style-type: none"> - The amplifier is operated with open input or with a high source impedance. For proper operation please use a source impedance of less than 100 MΩ or switch to a lower gain setting. - When using a DLPVA-F-D with differential input stage the Overload LED may turn on if the common mode input voltage exceeds ± 5 V or if the source is totally floating with respect to the amplifier ground. For proper operation make sure that the common mode voltage stays within ± 5 V with respect to the amplifier ground and make a valid connection between the source ground and the amplifier ground to ensure that the inputs cannot drift outside the tolerable common mode range. 	
Remote 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
	Overload Output	Non active: + 5 V, max. 1 mA, active: 0.8 V, max. -10 mA
Power Supply	Supply Voltage	± 15 V (± 14.5 V to ± 16 V)
	Supply Current	± 75 mA typ. (depends on operating conditions, recommended power supply capability minimum 150 mA)
Case	Weight	0.32 kg (0.7 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 °C to + 100 °C
Operating Temperature	0 °C to + 60 °C	
Absolute Maximum Ratings	Power Supply Voltage	± 21 V
	Control Input Voltage	+ 16 V / - 5 V
	Signal Input Voltage	± 15 Vp
	Transient Input Voltage	± 3 kV (discharge from 5 nF source)

Connectors	Input	<p>Single Ended Input, Model "DLPVA-100-B-S": BNC</p> <p>True Differential Input, Model "DLPVA-100-B-S": LEMO series 1S, 4-pin fixed socket Pin 1: non inverting input Pin 2: inverting input Pin 3: GND Pin 4: N.C.</p> 		
	Output	BNC		
	Power Supply	<p>LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND</p> 		
	Control Port	<p>Sub-D 25-pin, female, qual. class 2 Pin 1: +12 V (stabilized power supply output, max. 100 mA) Pin 2: -12 V (stabilized power supply output, max. 100 mA) Pin 3: AGND (analog ground) Pin 4: +5 V (stabilized power supply output, max. 50 mA) Pin 5: digital output: overload Pin 6: NC Pin 7: NC Pin 8: offset control voltage input Pin 9: DGND (ground f. digital control Pin 10 - 25) Pin 10: NC Pin 11: digital control input: gain, LSB Pin 12: digital control input: gain, MSB Pin 13: digital control input: AC/DC Pin 14: digital control input: 100 kHz / 1 kHz Pin 15 - 25: NC</p>		
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 "0 dB", "AC" and "1 kHz" 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 11	Pin 12
		20 dB	low	low
		40 dB	high	low
		60 dB	low	high
		80 dB	high	high

10 MHz Low-Noise Voltage Amplifier

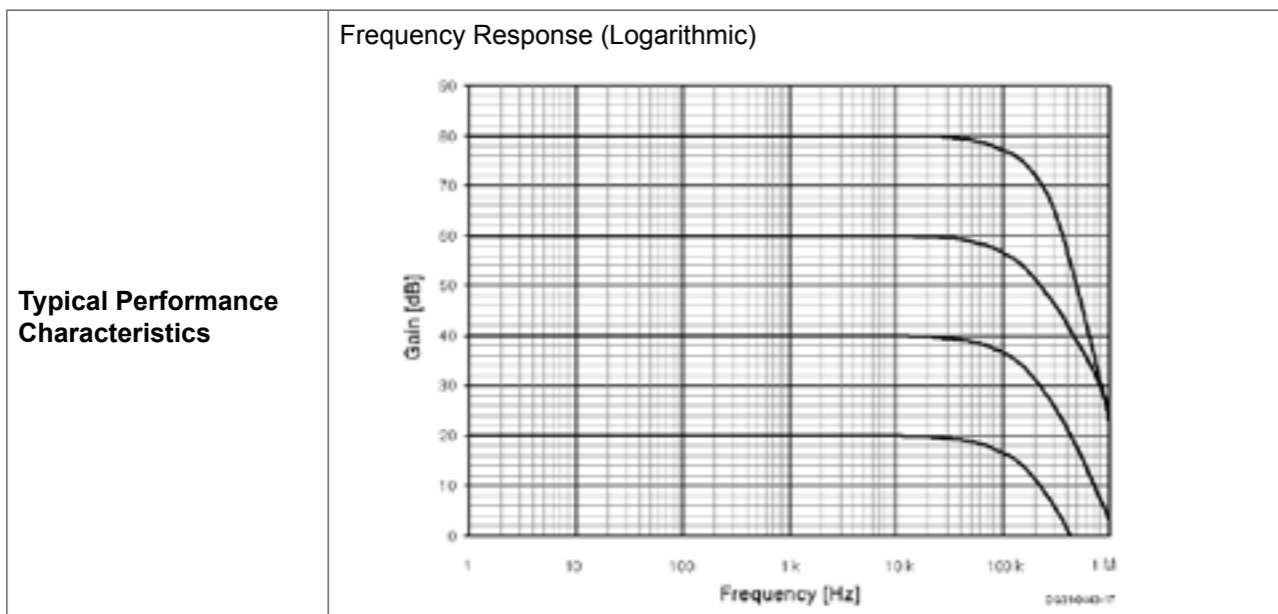
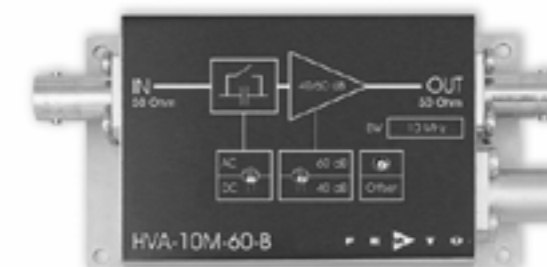
HVA-10M-60-B

FEATURES

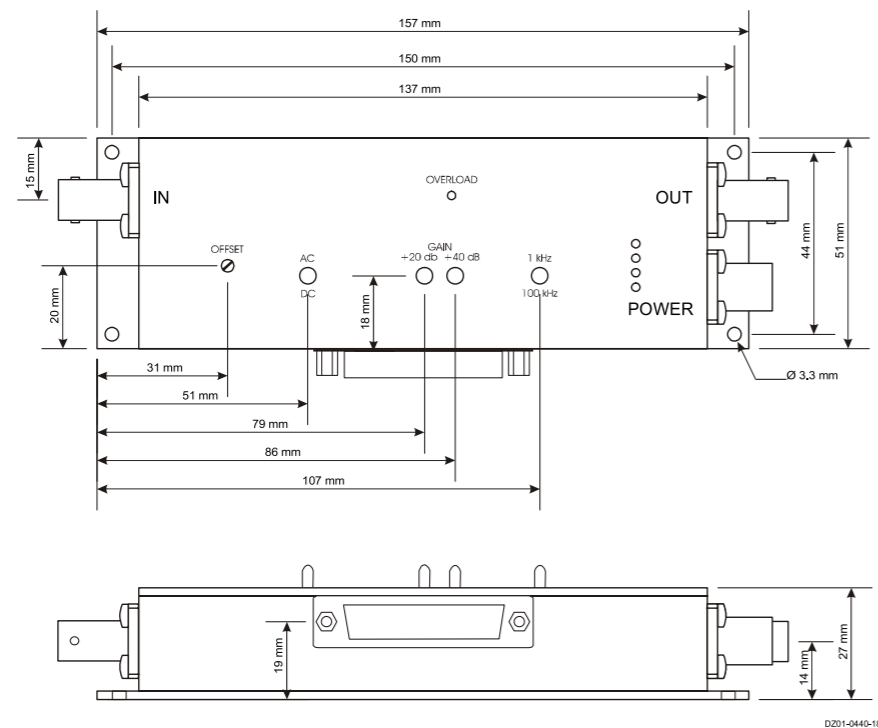
- Switchable Gain 40/60 dB (x100 / x1,000)
- Bandwidth DC ... 10 MHz
- Low Input Noise of 0.9 nV/√Hz
- Switchable AC/DC Coupling

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



Dimensions



Ordering Information	Available Models	Model No.: DLPVA-100-B-S - Bipolar, single-ended input (BNC-connector input)
		Model No.: DLPVA-100-B-D - Bipolar, true differential input (LEMO-connector input)

Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain	40/60 dB switchable
	Gain Accuracy	± 0.2 dB
Frequency Response	Lower Cut-Off Frequency (-3 dB)	DC/1 kHz switchable
	Upper Cut-Off Frequency (-3 dB)	10 MHz
	Rise/Fall Time (10% - 90%)	35 ns
Input	Input Impedance	50 Ω 12 pF
	Input Voltage Noise	0.9 nV/√Hz (@ 2 MHz, 60 dB gain) 1.8 nV/√Hz (@ 2 MHz, 40 dB gain)
	Integrated Input Noise	20 μV peak-peak (@ 60 dB gain) 50 μV peak-peak (@ 40 dB gain)
	Input Bias Current	18 μA
	Input Offset Voltage	500 μV typ.
	Input Voltage Drift	1 μV/°C
Output	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Voltage	± 3.5 V (@ 50 Ω load, for linear amplification)
	Max. Output Current	100 mA
	Output Offset Trimmer Range	± 500 mV
	Slew Rate	500 V/μs (@ 50 Ω load)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 70 mA typ. (depends on operating conditions, recommended power supply capability min. ± 150 mA)
Case	Weight	200 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated

10 MHz High Input Impedance Voltage Amplifier

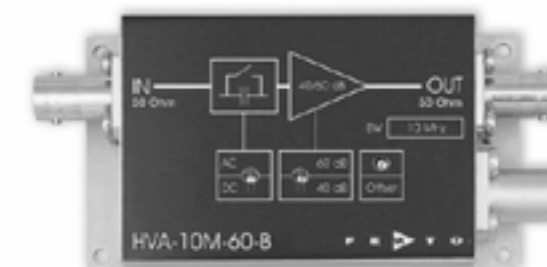
HVA-10M-60-F

FEATURES

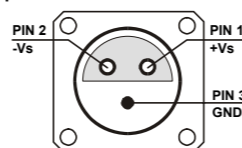
- Switchable Gain 40/60 dB (x100 / x1,000)
- Bandwidth DC ... 10 MHz
- High Input Impedance 1 MΩ
- Switchable AC/DC Coupling

APPLICATIONS

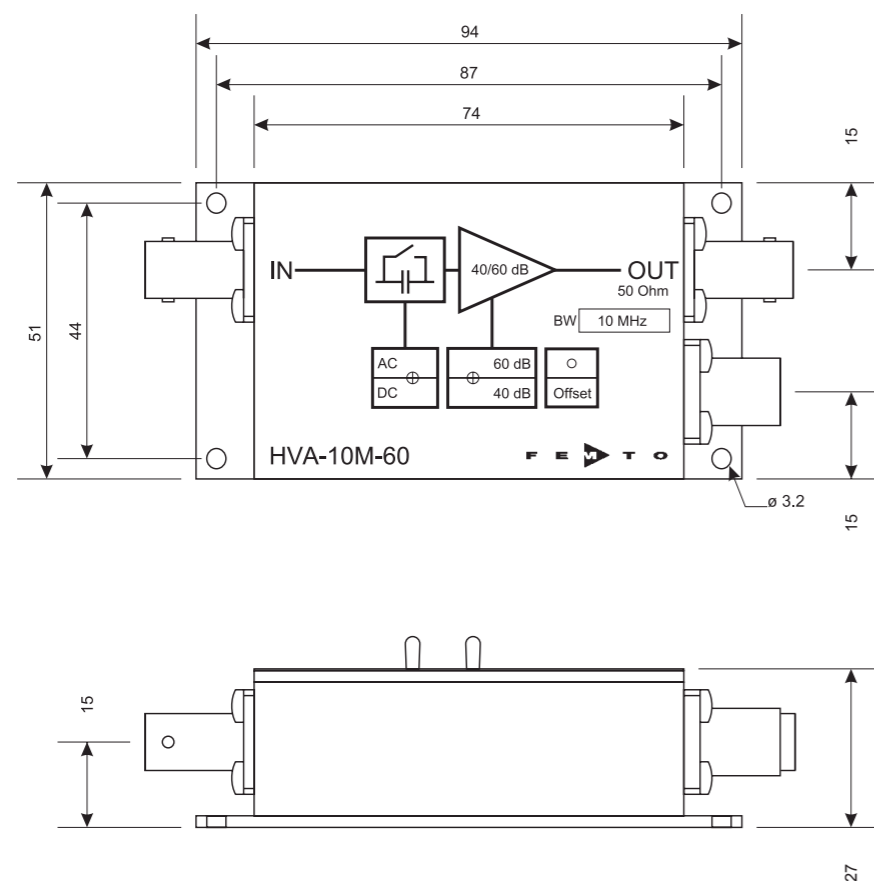
- Oscilloscope and Transient Recorder Preamplifier
- Photomultiplier and Microchannel Plate Amplifier
- Signal Booster for Optical Receivers and Current Amplifiers
- Time-Resolved Pulse and Transient Measurements



Specifications (continued)		
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 20 V
	Input Voltage	± 5 V
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND



Dimensions



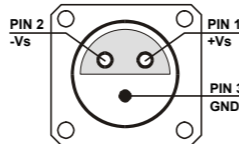
all measures in mm unless otherwise noted

DZ_HVA-10M-60_R2

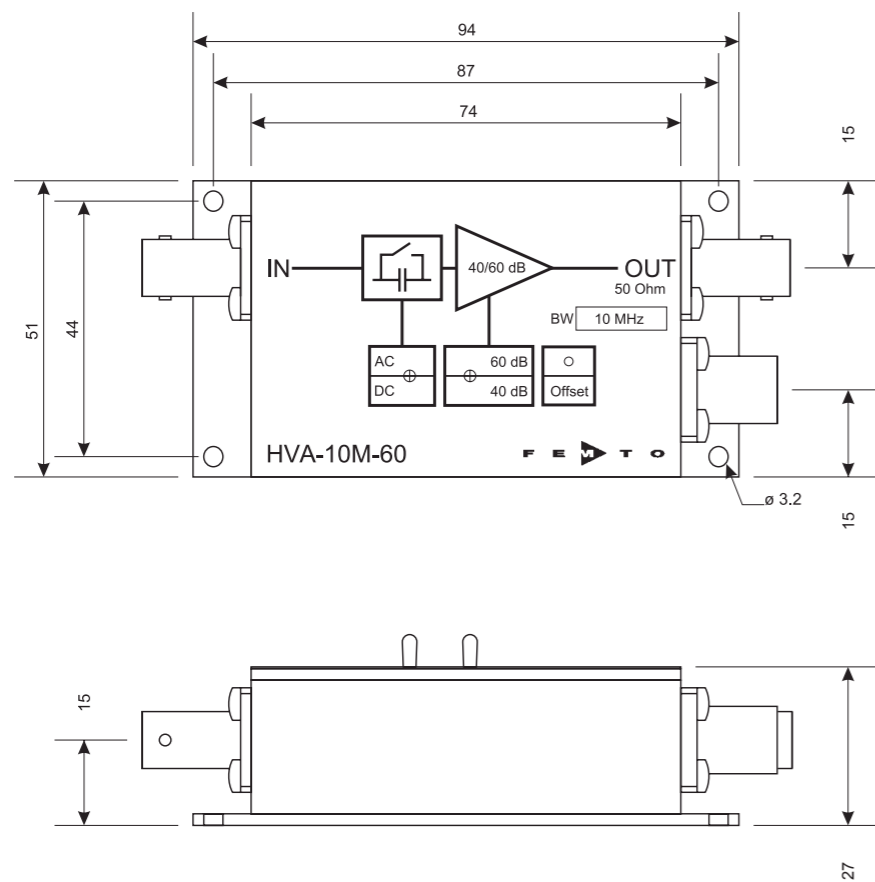
Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain	40/60 dB switchable
	Gain Accuracy	± 0.2 dB
Frequency Response	Lower Cut-Off Frequency (-3 dB)	DC/1 kHz switchable
	Upper Cut-Off Frequency (-3 dB)	10 MHz
	Rise/Fall Time (10% - 90%)	35 ns
Input	Input Impedance	1 MΩ 15 pF
	Input Voltage Noise	4.7 nV/√Hz (@ 2 MHz)
	Integrated Input Noise	100 μV peak-peak
	Input Bias Current	2 μA
	Input Offset Voltage	250 μV max.
	Input Voltage Drift	2 μV/°C
Output	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Voltage	± 3.5 V (@ 50 Ω load, for linear amplification)
	Max. Output Current	100 mA
	Output Offset Trimmer Range	± 500 mV
	Slew Rate	500 V/μs (@ 50 Ω load)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 70 mA typ. (depends on operating conditions, recommended power supply capability min. ± 150 mA)
Case	Weight	200 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated

Spectroscopes · CCD Cameras · Imaging · Semiconductors · Communications · Lighting · Solar Cells · Tests · Instruments · Sensors · Detection · Components · Mechanics · Positioning · Lasers · Light Sources

Specifications (continued)		
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 20 V
	Input Voltage	± 5 V
	Transient Input Voltage	200 V (out of a 200 pF Source)
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND



Dimensions



all measures in mm unless otherwise noted

DZ_HVA-10M-60_R2

200 MHz Low-Noise Voltage Amplifier

HVA-200M-40-B

FEATURES

- Switchable Gain 20/40 dB (x10 / x100)
- Bandwidth DC ... 200 MHz
- Low Input Noise of 1.2 nV/√Hz
- Switchable AC/DC Coupling

APPLICATIONS

- Oscilloscope and Transient Recorder Pre-amplifier
- Photomultiplier and Microchannel Plate Amplifier
- Signal Booster for Optical Receivers and Current Amplifiers
- Time-Resolved Pulse and Transient Measurements



Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain	20/40 dB switchable
	Gain Accuracy	± 0.2 dB
Frequency Response	Lower Cut-Off Frequency (-3 dB)	DC/1 kHz switchable
	Upper Cut-Off Frequency (-3 dB)	200 MHz
	Rise/Fall Time (10% - 90%)	1.8 ns
Input	Input Impedance	50 Ω 12 pF
	Input Voltage Noise	1.2 nV/√Hz (@ 50 MHz, 40 dB gain) 3.5 nV/√Hz (@ 50 MHz, 20 dB gain)
	Integrated Input Noise	150 μV peak-peak (@ 40 dB gain) 400 μV peak-peak (@ 20 dB gain)
	Input Bias Current	20 μA
	Input Offset Voltage	500 μV max.
	Input Voltage Drift	1 μV/°C
Output	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Voltage	± 1 V (@ 50 Ω load, for linear amplification)
	Max. Output Current	60 mA
	Output Offset Trimmer Range	± 100 mV
	Slew Rate	500 V/μs (@ 20 dB, 50 Ω load) 1,000 V/μs (@ 40 dB, 50 Ω load)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 70 mA typ. (depends on operating conditions, recommended power supply capability min. ± 150 mA)

200 MHz High Input Impedance Voltage Amplifier

HVA-200M-40-F

FEATURES

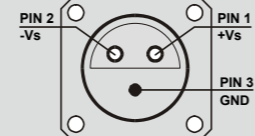
- Switchable Gain 20/40 dB (x10 / x100)
- Bandwidth DC ... 200 MHz
- High Input Impedance 1 MΩ
- Switchable AC/DC Coupling

APPLICATIONS

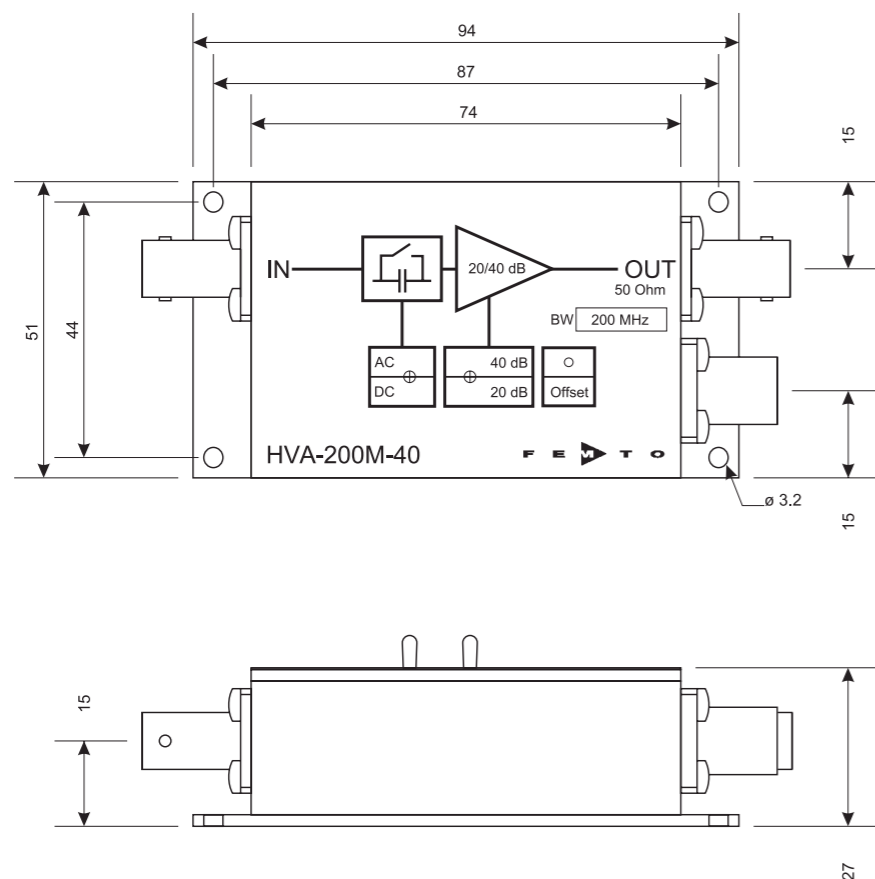
- Oscilloscope and Transient Recorder Preamplifier
- Photomultiplier and Microchannel Plate Amplifier
- Signal Booster for Optical Receivers and Current Amplifiers
- Time-Resolved Pulse and Transient Measurements



Specifications (continued)		
Case	Weight	200 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 20 V
	Input Voltage	± 5 V
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND



Dimensions

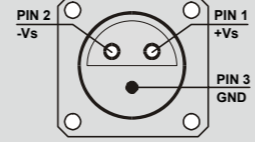


all measures in mm unless otherwise noted

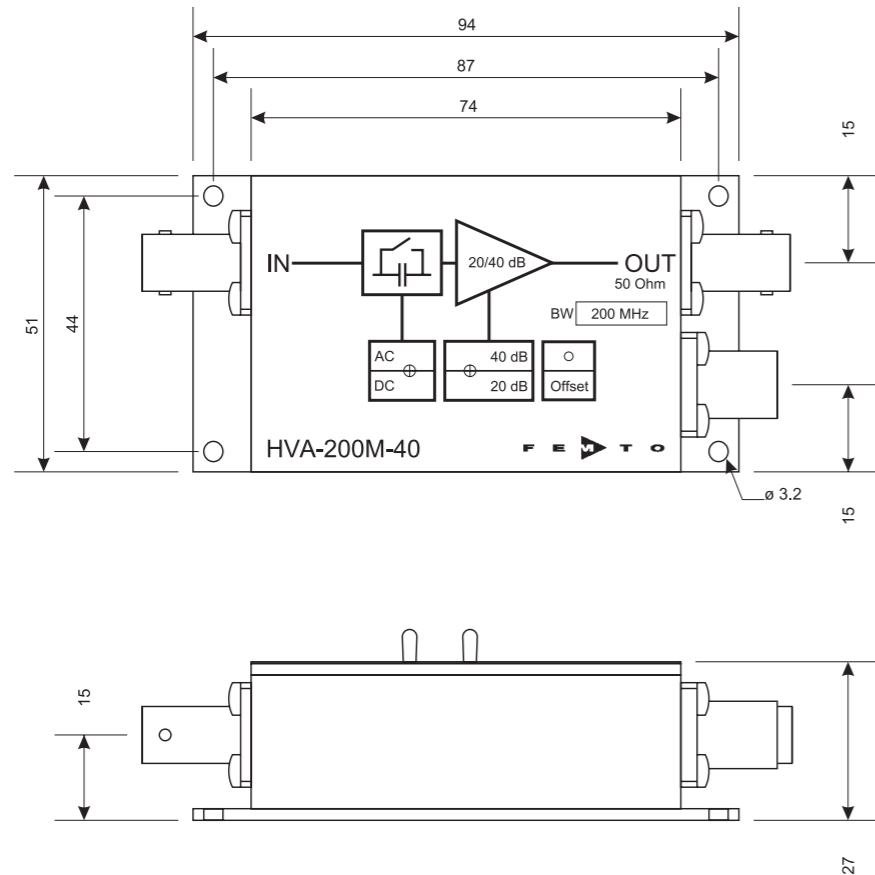
DZ_HVA-200M-40_R2

Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain	20/40 dB switchable
	Gain Accuracy	± 0.2 dB
Frequency Response	Lower Cut-Off Frequency (-3 dB)	DC/1 kHz switchable
	Upper Cut-Off Frequency (-3 dB)	200 MHz
	Rise/Fall Time (10% - 90%)	1.8 ns
Input	Input Impedance	1 MΩ 15 pF
	Input Voltage Noise	4.5 nV/√Hz (@ 50 MHz, 40 dB gain) 5.5 nV/√Hz (@ 50 MHz, 20 dB gain)
	Integrated Input Noise	450 μV peak-peak (@ 40 dB gain) 600 μV peak-peak (@ 20 dB gain)
	Input Bias Current	10 μA
	Input Offset Voltage	500 μV max.
	Input Voltage Drift	5 μV/°C
	Output	Output Impedance
Output Voltage		± 1 V (@ 50 Ω load, for linear amplification)
Max. Output Current		60 mA
Output Offset Trimmer Range		± 100 mV
Slew Rate		600 V/μs (@ 20 dB, 50 Ω load) 1,100 V/μs (@ 40 dB, 50 Ω load)
Power Supply		Supply Voltage
	Supply Current	± 70 mA typ. (depends on operating conditions, recommended power supply capability min. ± 150 mA)

Specifications (continued)		
Case	Weight	200 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 20 V
	Input Voltage	± 5 V
	Transient Input Voltage	200 V (out of a 200 pF source)
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND



Dimensions



all measures in mm unless otherwise noted

DZ_HVA-200M-40_R2

True DC-Coupled 500 MHz Low Noise Voltage Amplifier

HVA-500M-20-B

FEATURES

- Gain 20 dB (x10)
- Bandwidth DC ... 500 MHz
- True DC-Coupling, Adjustable Output Offset Voltage
- 3.0 nV/√Hz Input Noise

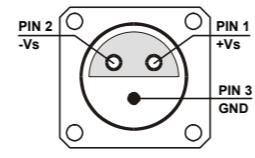


APPLICATIONS

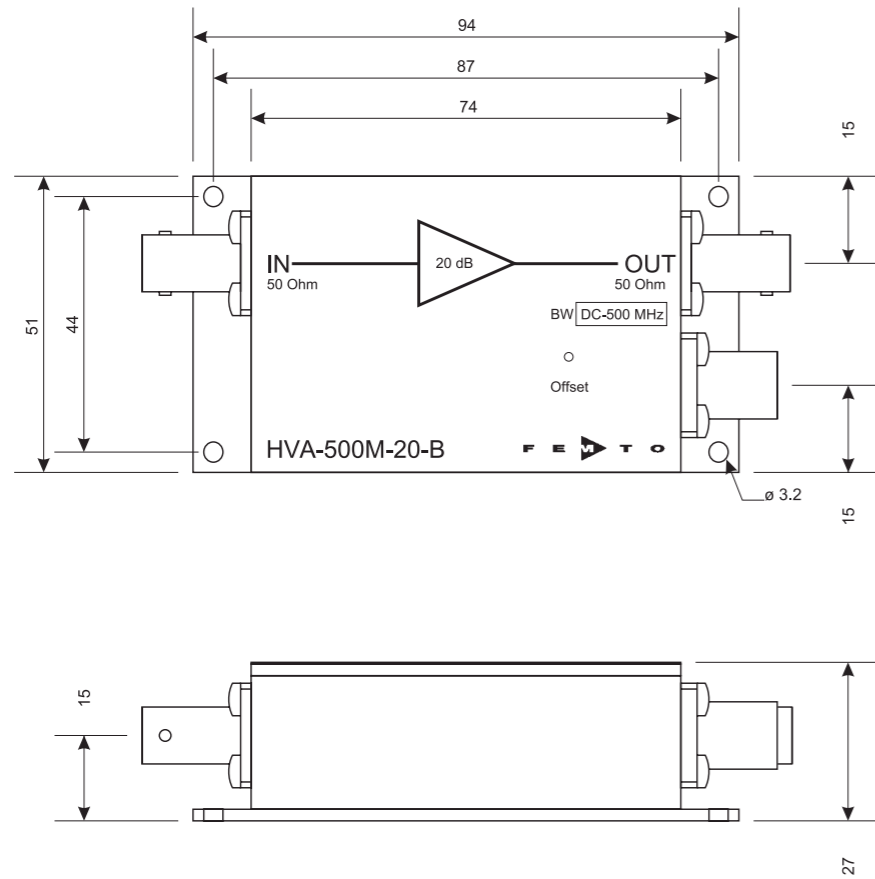
- Oscilloscope and Transient Recorder Pre-amplifier
- Ideal for Analyzing Digital Signals (No Baseline Shift at any Digital Code)
- Photomultiplier and Microchannel Plate Amplifier
- Signal Booster for Optical Receivers and Current Amplifiers
- Time-Resolved Pulse and Transient Measurements

Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C
Gain	Gain	20 dB (@ 50 Ω load)
	Gain Accuracy	± 0.2 dB
Frequency Response	Lower Cut-Off Frequency (-3 dB)	DC
	Upper Cut-Off Frequency (-3 dB)	500 MHz (± 10 %)
	Rise/Fall Time (10% - 90%)	750 ps
Input	Input Impedance	50 Ω 3 pF
	Input Voltage Noise	3.0 nV/√Hz (@ 200 MHz)
	Integrated Input Noise	0.5 mV peak-peak
	Input Bias Current	15 μA typ.
	Input Offset Voltage	1 mV typ.
	Input Voltage Drift	10 μV / °C
Output	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Voltage	± 1 V (@ 50 Ω load, for linear amplification)
	Max. Output Current	100 mA
	Output Offset Trimmer Range	± 100 mV
	Slew Rate	2,600 V/μs (@ 50 Ω load)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 40 mA typ. (depends on operating conditions, recommended power supply capability minimum ± 150 mA)
Case	Weight	200 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated

Specifications (continued)		
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 20 V
	Input Voltage	± 5 V
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND



Dimensions



all measures in mm unless otherwise noted

DZ_HVA-500M-20_R2

Variable Gain 100 MHz Wideband Voltage Amplifier

DHPVA-100



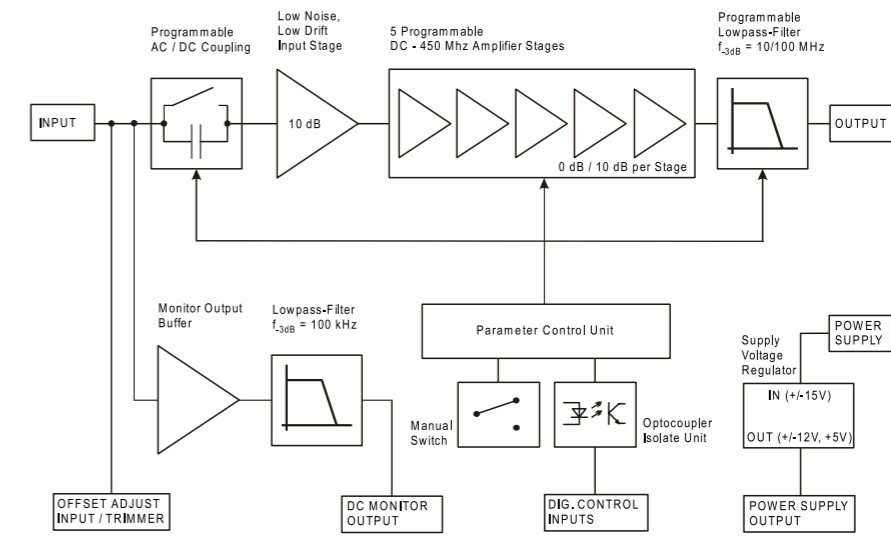
FEATURES

- Variable Gain 10 to 60 dB, Switchable in 10 dB Steps
- Bandwidth DC ... 100 MHz, Switchable to 10 MHz
- Built-In Temperature Compensation for Low Drift of 0.6 $\mu\text{V}/\text{K}$
- 2.5 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



B801-0540-17

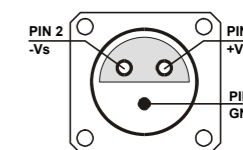
Spectroscopes
 CCD Cameras
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 Semiconductors
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 Solar Cells
 Tests
 Instruments
 Sensors
 Detection
 Components
 Mechanics
 Positioning
 Lasers
 Light Sources

Voltage Amplifiers



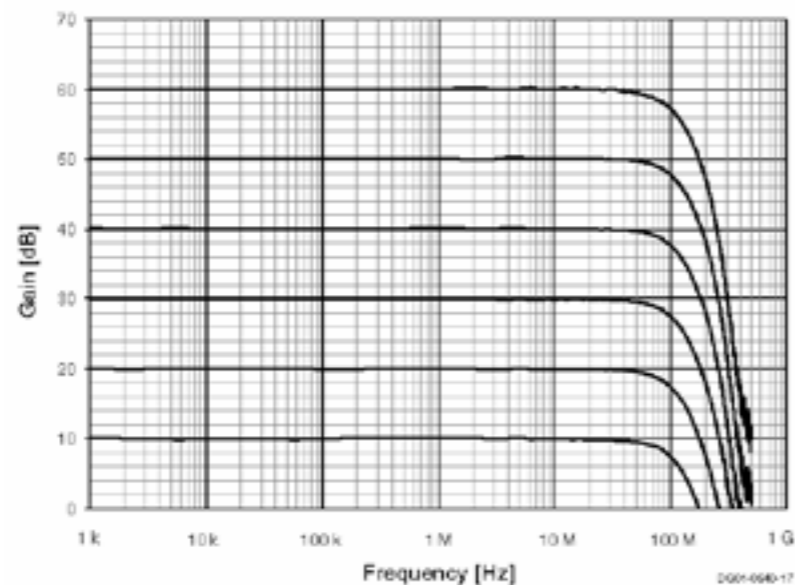
Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C, System Impedance = 50 Ω
Gain	Gain Values	10, 20, 30, 40, 50, 60 dB
	Gain Accuracy	± 0.15 dB (between settings) ± 0.3 dB (overall)
Frequency Response	Lower Cut-Off Frequency	DC / 10 Hz
	Upper Cut-Off Frequency	100 MHz, switchable to 10 MHz (approx. Bessel filter characteristic for clear pulse response)
	Upper Cut-Off Frequency Rolloff	25 dB/Oct.
Time Response	Rise / Fall Time (10% - 90%)	3.5 ns (@ 100 MHz) 35 ns (@ 10 MHz)
	Input	Input Impedance
Input Voltage Drift		0.6 μV/K
Equivalent Input Voltage Noise		2.5 nV/√Hz (@ 30 – 60 dB gain)
Equivalent Input Current Noise		3.0 pA/√Hz
1/f-Noise Corner		15 kHz
Input BIAS Current		< 200 nA
Input Offset Voltage		- 10 mV ... + 10 mV, adjustable by offset-trimmer and external control voltage
Output	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Voltage Range	2 Vpp (for linear amplification)
	Output Power (max.)	+ 10 dBm
	Output Current (max.)	70 mA
	THD	< 0.5 % (@ 10 MHz, 1 Vpp)
Monitor Output	Monitor Output Gain	1
	Monitor Output Voltage Range	± 5 V
	Monitor Output Current	± 10 mA
	Monitor Output Bandwidth	DC ... 100 kHz
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 @ 0V, 1.5 mA @ + 5 V, 4.5 mA @ + 12V
	Gain Control Switching Time	5 ms
Ext. Offset Control	Control Voltage Range	± 10 V, corresponds to ± 10 mV input offset
	Offset Control Input Impedance	200 kΩ
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 120 mA typ. (depends on operating conditions, recommended power supply capability minimum 250 mA)
Case	Weight	200 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 °C ... + 100 °C
	Operating Temperature	0 °C ... + 60 °C

Absolute Maximum	Ratings Power Supply Voltage	± 20 V			
	Signal Input Voltage	± 5 V			
	Digital Control Input Voltage	+ 16 V / - 5 V			
Connectors	Input	BNC			
	Output	BNC			
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND			
Remote Control Operation	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, 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			
	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
AC/DC Setting	Bandwidth Setting	10 dB	low	low	low
		20 dB	high	low	low
		30 dB	low	high	low
Coupling	Pin 13	40 dB	high	high	low
		50 dB	low	low	high
DC	Pin 14	60 dB	high	low	high
		AC	low		
Bandwidth	Pin 14	DC	high		
		10 MHz	low		
		100 MHz	high		

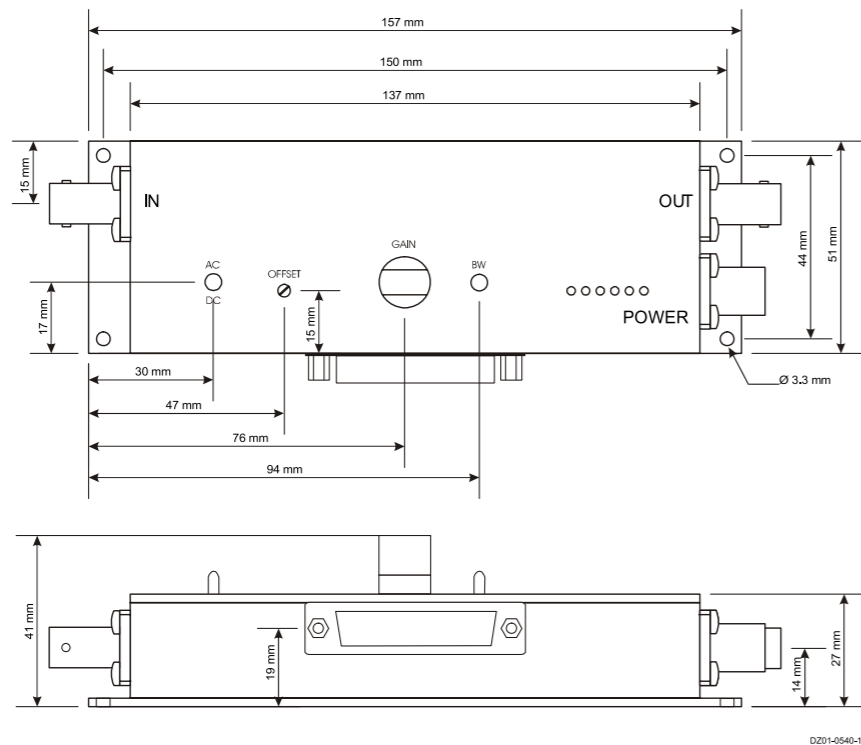


Typical Performance Characteristics

Frequency Response (Logarithmic)



Dimensions



Variable Gain 200 MHz Wideband Voltage Amplifier

DHPVA-200



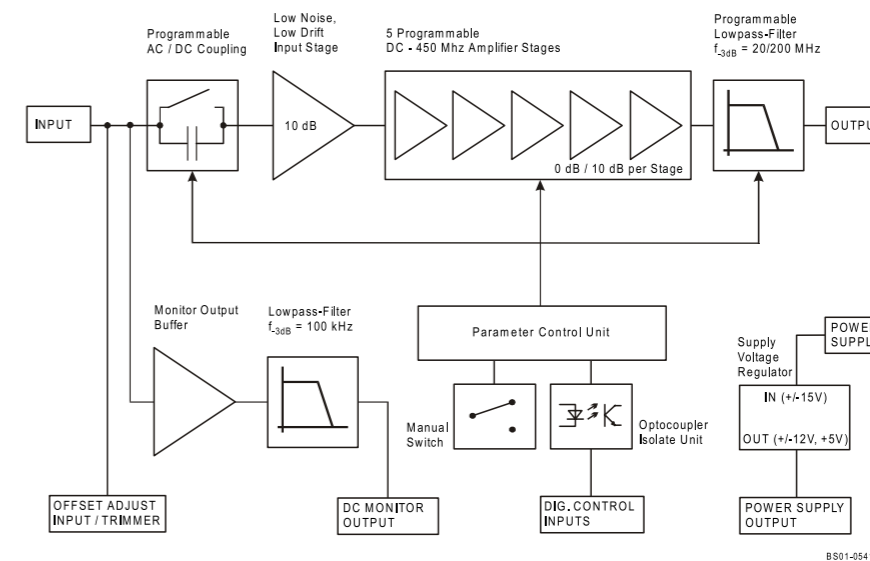
FEATURES

- Variable Gain 10 to 60 dB, Switchable in 10 dB Steps
- Bandwidth DC ... 200 MHz, Switchable to 20 MHz
- Built-In Temperature Compensation for Low Drift of 0.6 $\mu\text{V}/\text{K}$
- 2.5 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

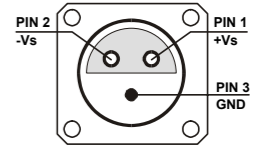
APPLICATIONS

- 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

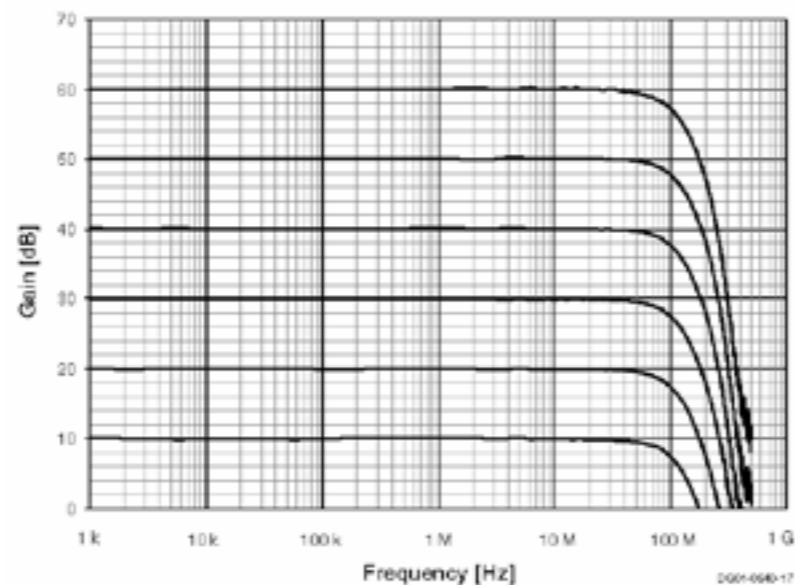
Block Diagram



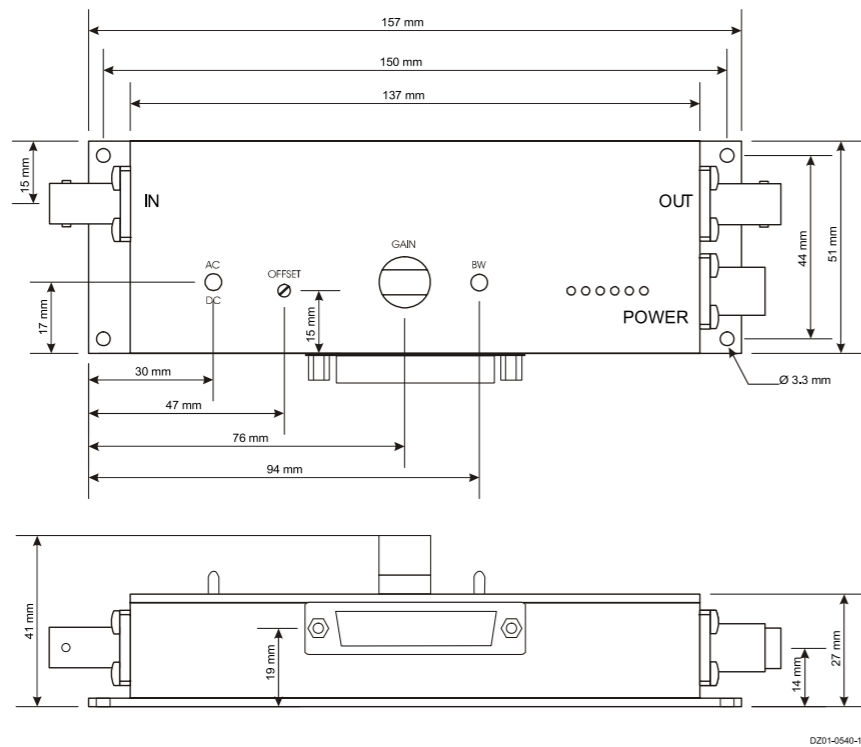
Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C, System Impedance = 50 Ω
Gain	Gain Values	10, 20, 30, 40, 50, 60 dB
	Gain Accuracy	± 0.15 dB (between settings) ± 0.3 dB (overall)
Frequency Response	Lower Cut-Off Frequency	DC / 10 Hz
	Upper Cut-Off Frequency	200 MHz, switchable to 20 MHz (approx. Bessel filter characteristic for clear pulse response)
	Upper Cut-Off Frequency Rolloff	40 dB/Oct.
Time Response	Rise / Fall Time (10% - 90%)	1.8 ns (@ 200 MHz) 18 ns (@ 20 MHz)
Input	Input Impedance	50 Ω // 5 pF
	Input Voltage Drift	0.6 μV/K
	Equivalent Input Voltage Noise	2.5 nV/√Hz (@ 30 – 60 dB gain)
	Equivalent Input Current Noise	3.0 pA/√Hz
	1/f-Noise Corner	15 kHz
	Input BIAS Current	< 200 nA
	Input Offset Voltage	- 10 mV ... + 10 mV, adjustable by offset-trimmer and external control voltage
Output	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)
	Output Voltage Range	2 Vpp (for linear amplification)
	Output Power (max.)	+ 10 dBm
	Output Current (max.)	70 mA
	THD	< 0.5 % (@ 20 MHz, 1 Vpp)
Monitor Output	Monitor Output Gain	1
	Monitor Output Voltage Range	± 5 V
	Monitor Output Current	± 10 mA
	Monitor Output Bandwidth	DC ... 100 kHz
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 @ 0V, 1.5 mA @ + 5 V, 4.5 mA @ + 12V
	Gain Control Switching Time	5 ms
Ext. Offset Control	Control Voltage Range	± 10 V, corresponds to ± 10 mV input offset
	Offset Control Input Impedance	200 kΩ
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 120 mA typ. (depends on operating conditions, recommended power supply capability minimum 250 mA)
	Stabilized Power Supply Output	± 12 V / max. 100 mA, + 5V / max. 50 mA
Case	Weight	350 g (0.81 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 °C ... + 100 °C
	Operating Temperature	0 °C ... + 60 °C

Absolute Maximum	Ratings Power Supply Voltage	± 20 V			
	Signal Input Voltage	± 5 V			
	Digital Control Input Voltage	+ 16 V / - 5 V			
	Input	BNC			
	Output	BNC			
Connectors	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, 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			
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	Pin 10	Pin 11	Pin 12
	Gain Setting	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		
Bandwidth Setting	DC		high		
	Bandwidth		Pin 14		
	20 MHz		low		
	200 MHz		high		

Typical Performance Characteristics
Frequency Response (Logarithmic)

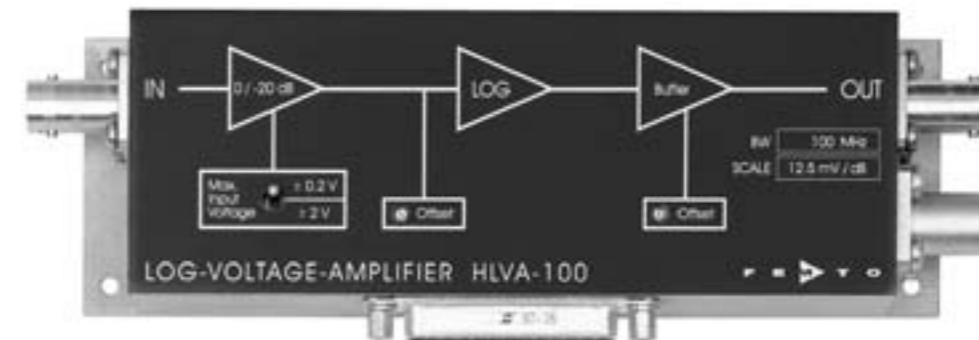


Dimensions



Logarithmic Voltage Amplifier

HLVA-100



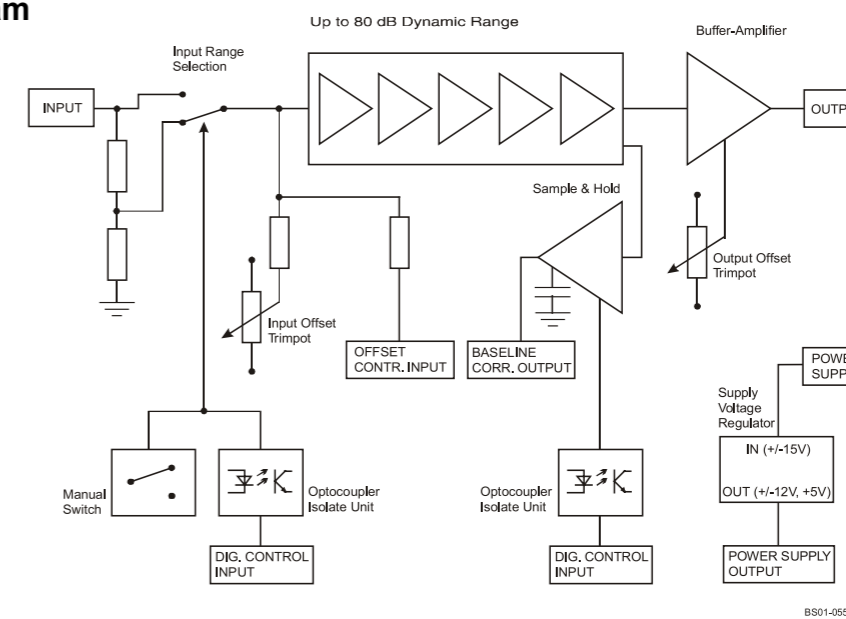
FEATURES

- Wide Dynamic Range typ. 60 dB, max. 80 dB,
- 5 ns Rise/Fall Time @ 40 dB step
- Accuracy ± 1 dB @ pulse width of min. 20 ns
- Switchable Input Range $\pm 20 \mu\text{V} \dots \pm 200 \text{mV}$ or $\pm 200 \mu\text{V} \dots \pm 2 \text{V}$
- DC coupled input
- Local and Remote Control
- Integrated Sample & Hold Baseline Correction

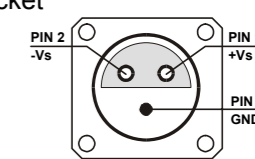
APPLICATIONS

- LIDAR systems
- Signal Compression, Pulse Measurements
- Time-Resolved Pulse and Transient Measurements
- Mass Spectroscopy
- Particle Detection

Block Diagram

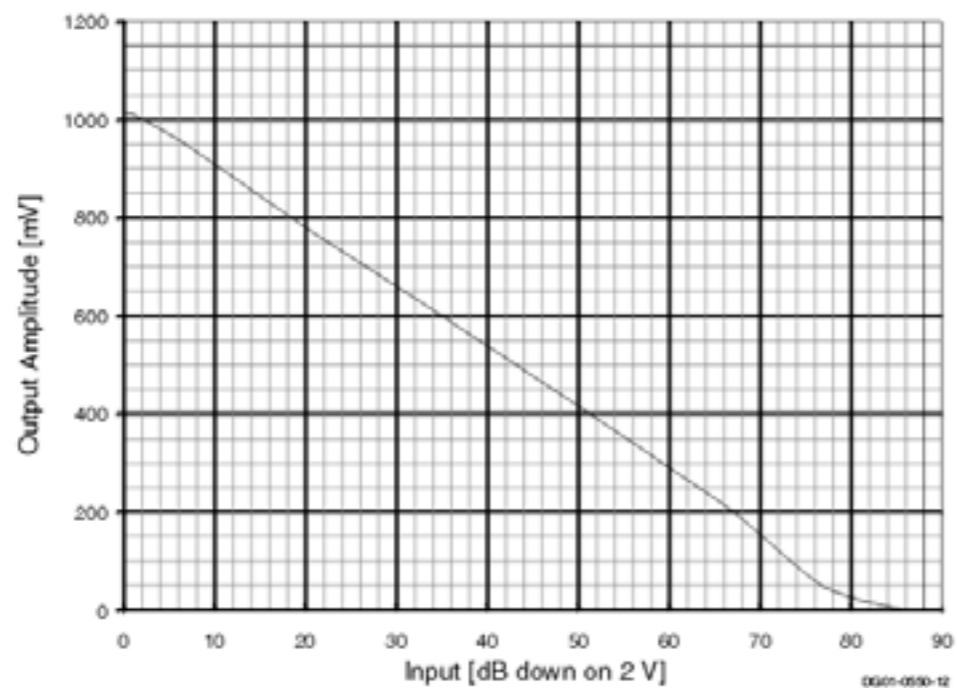


Specifications	Test Conditions	Vs = ± 15 V, Ta = 25°C, System Impedance = 50 Ω
Dynamic Performance	Dynamic Range	typ. 60 dB (for accurate amplitude measurements) max. 80 dB (signal detection)
	Input Voltage Range	± 20 μV ... ± 200 mV / ± 200 μV ... ± 2 V switchable
	Scaling	12.5 mV/dB equals 250 mV/ decade (@ 50 Ω Load)
	Linearity	± 1 dB (for pulse of min. 20 ns pulse width)
Pulse Response	Rise/Fall time	5 ns @ 40 dB step
Input	Input Impedance	50 Ω
	Input Voltage Drift	0.6 μV/K
	Equivalent Input Voltage Noise	2 nV/√Hz
	Input BIAS Current	< 4 μA
	Input Offset Voltage	± 2.5 mV, adjustable by Offset-Trimpot and external Control Voltage
Output	Output Impedance	50 Ω
	Output Voltage Range	+50 ... +1075 mV typ. (@ 50 Ω Load) (if Output is adjusted to 1V at 100mV Input)
	Output Offset Voltage Range	± 500 mV, adjustable by Offset-Trimmer
Digital Control	Control Input Voltage Range	Low: - 0.8 ... + 0.8 V High: + 3 ... + 12 V, TTL / CMOS compatible
	Control Input Current	Low: 0 mA High: + 1.5 mA @ + 5 V (Input Range Control) + 7 mA @ + 5 V (Baseline Correction Control)
Baseline Correction	Acquisition Time	30 μs (min. sample pulse width)
	Baseline Hold Droop Rate	1 μV/s (typ. @ 25°C)
	Loop cut-off frequency	1.5 kHz
Ext. Offset Control	Control Voltage Range	± 10 V (for ± 2.5 mV Offset Control)
	Offset Control Input Impedance	100 kΩ
Power Supply	Supply Voltage	± 15 V
	Supply Current	+ 90 / -120 mA typ.
	Stabilized Power Supply Output	± 12 V / max. 100 mA, + 5 V / max. 50 mA
Case	Weight	320 gr. (0.74 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Power Supply Voltage	± 20 V
	Signal Input Voltage	± 3 V @ ± 2 V Input Range Setting - 3 V / + 300 mV @ ± 200 mV Input Range Setting
	Digital Control Input Voltage	+ 16 V / - 5 V

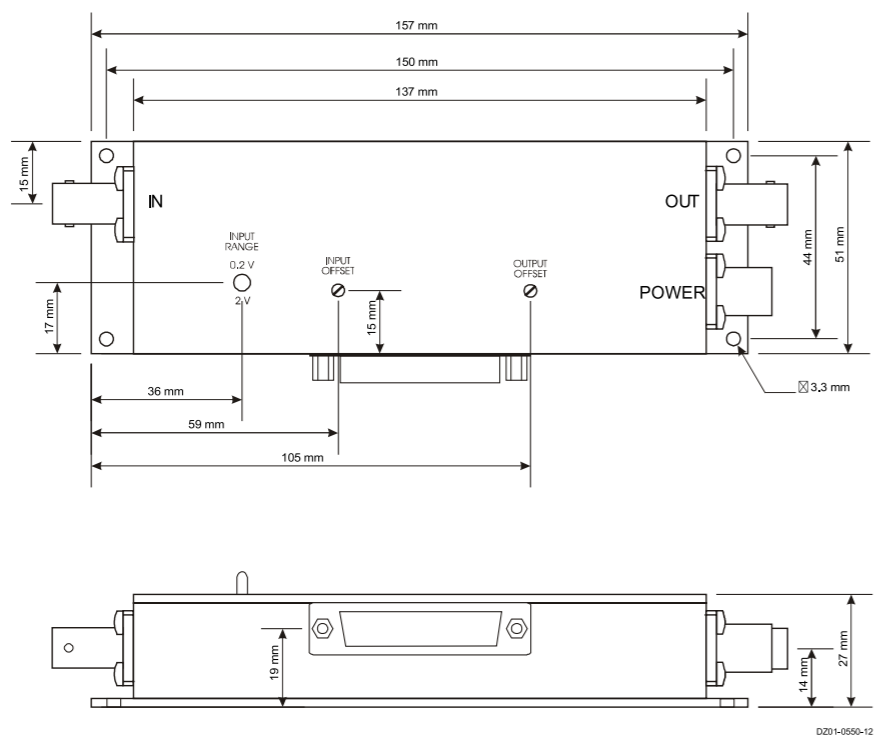
Connectors	Input	BNC						
	Output	BNC						
Connectors	Power Supply	LEMO Series 1S, 3-pin fixed Socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND 						
	Control Port	Sub-D 25-pin, female, Qual. Class 2 Pin 1: +12V (Stabilized Power Supply Output) Pin 2: -12V (Stabilized Power Supply Output) Pin 3: AGND (Analog Ground) Pin 4: +5V (Stabilized Power Supply Output) Pin 5 - 6: NC Pin 7: Baseline Correction Output Pin 8: Offset Control Voltage Input Pin 9: DGND (Ground f. Digital Control Pin 10 - 25) Pin 10: Digital Control Input: Input Voltage Range Pin 11: Digital Control Input: Baseline Correction Pin 12 - 25: NC						
Remote Control Operation	Input Range Setting	Remote control input is opto-isolated and connected by logical OR to local switch setting. For remote control the switch setting, set the local switch to " ± 2 V " and select the wanted setting via a bit-code at the digital input.						
	Baseline Correction	<table border="1"> <thead> <tr> <th>Input Range</th> <th>Pin 1</th> </tr> </thead> <tbody> <tr> <td>± 2 V</td> <td>low</td> </tr> <tr> <td>± 200 mV</td> <td>high</td> </tr> </tbody> </table>	Input Range	Pin 1	± 2 V	low	± 200 mV	high
		Input Range	Pin 1					
		± 2 V	low					
± 200 mV	high							
The integrated auto-null function can be performed by remote digital control only. The input is opto-isolated by a ultra-fast opto-coupler. Please note the min. pulse width.								
<table border="1"> <thead> <tr> <th>Function</th> <th>Pin 1</th> </tr> </thead> <tbody> <tr> <td>Hold previous value</td> <td>low</td> </tr> <tr> <td>Null Output</td> <td>high</td> </tr> </tbody> </table>	Function	Pin 1	Hold previous value	low	Null Output	high		
Function	Pin 1							
Hold previous value	low							
Null Output	high							

Typical Performance Characteristics

Logarithmic Response (@ ± 2 V Input Range Setting)



Dimensions



D201-0550-12