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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY — FEMTO

DATASHEET
DLPCA-D-S1
Dual Channel Low Noise Current Amplifier

Dual Channel Low Noise Current Amplifier

Features

- **Two Separate Channels in One Compact Housing**
- **Transimpedance (Gain) 1 x 10^5, 1 x 10^7 and 1 x 10^9 V/A**
- **Transimpedance (Gain) Individually Switchable for Channels A and B by Opto-Isolated Control Interface**
- **Bandwidth DC ... 2 kHz**
- **Fast Switching Time of Typically 1 ms between Gain Settings**
- **Protection Against ± 3 kV Transients**

Applications

- **Dual Channel Photodiode Amplifier**
- **Spectroscopy**
- **Beam Monitoring for Particle Accelerators / Synchrotrons**
- **Ionisation Detectors**

Specifications

	Test Conditions	*Vs = ± 15 V, Ta = 25°C*
Gain	Transimpedance	1 x 10^5, 1 x 10^7 and 1 x 10^9 V/A
	Gain Accuracy	± 2 %
	Linearity	typ. < 0.1 %
	Gain Drift	see table below
	Switching Time	1 ms typ. for gain increase/decrease
Frequency Response	Lower Cut-Off Frequency	DC
	Upper Cut-Off Frequency	up to 2 kHz (see table below)
Input	Equ. Input Noise Current	see table below (value per √Hz, @ 100 Hz)
	Equ. Input Noise Voltage	4 nV/√Hz (@ 100 Hz)
	Input Bias Current	1 pA typ.
	Max. Input Current	see table below (value for linear amplification)
	Input Offset	< 1 mV for all gain settings
	Input Offset Drift	< 20 µV/°C
	Crosstalk between Channels	better -90 dB

Performance depending on Gain Setting

Gain Setting	10^5 V/A	10^7 V/A	10^9 V/A
Upper Cut-Off Frequency (- 3 dB)	2 kHz	2 kHz	1.5 kHz
Rise / Fall Time (10% - 90%)	180 µs	180 µs	240 µs
Equ. Input Noise Current (/√Hz)	500 fA	45 fA	4.5 fA
Output Noise (peak-peak)	< 1 mV	< 1 mV	2 mV
Gain Drift (/°C)	0.01%	0.01%	0.02%
Max. Input Current (±)	100 µA	1 µA	10 nA
DC Input Impedance (// 5 pF)	50 Ω	200 Ω	10 kΩ

Output	Output Voltage	± 10 V (@ > 10 kΩ load)
	Output Impedance	50 Ω (terminate with > 10 kΩ load for best performance)
	Max. Output Current	± 20 mA
	Output Offset	< 1 mV for all gain settings (no signal)
	Output Offset Drift	< 20 µV/°C
Digital Control	Control Input Voltage Range	Low: -1 ... +1 V, High: +3 ... +12 V
	Control Input Current	0 mA @ 0 V, 1.8 mA @ + 5 V, 5 mA @ + 12 V

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Specifications (continued)

Power Supply	Supply Voltage	± 15 V
	Supply Current	+ 60 / - 40 mA typ. (depends on operating conditions, recommended power supply capability min. ± 80 mA)
Case	Weight	0.44 kg (0.97 lbs)
	Material	AlMgSi0.5F22, transparent passivated
Temperature Range	Storage Temperature	-40 ... +100 °C
	Operating Temperature	0 ... +40 °C

Absolute Maximum Ratings

Signal Input Voltage	± 5V
Transient Input Voltage	± 3 kV (out of 200 pF source)
Control Input Voltage	- 5 V / + 20 V
Power Supply Voltage	± 22 V

Connectors

Input	2 x BNC
Output	2 x BNC
Power Supply and Interface	Sub-D 15-pin, female, qual. class 2

Pin 1:	+ 15 V supply voltage
Pin 2:	- 15 V supply voltage
Pin 3:	AGND (analog ground)
Pin 4:	not connected
Pin 5:	AGND (analog ground)
Pin 6:	not connected
Pin 7:	AGND (analog ground)
Pin 8:	not connected
Pin 9:	DGND (digital ground for control pins 10 - 13)
Pin 10:	digital control input: gain channel B, bit B1
Pin 11:	digital control input: gain channel B, bit B2
Pin 12:	digital control input: gain channel A, bit A1
Pin 13:	digital control input: gain channel A, bit A2
Pin 14:	not connected
Pin 15:	not connected

Remote Control Operation

General: Remote control input bits are opto-isolated. Select the desired gain setting via a bit code at the corresponding digital inputs.

Gain Setting

Gain (V/A)	Channel A Pin 13 A2	Pin 12 A1	Channel B Pin 11 B2	Pin 10 B1
10^5	Low	High	Low	High
10^7	High	Low	High	Low
10^9	Low	Low	Low	Low
Not defined	High	High	High	High

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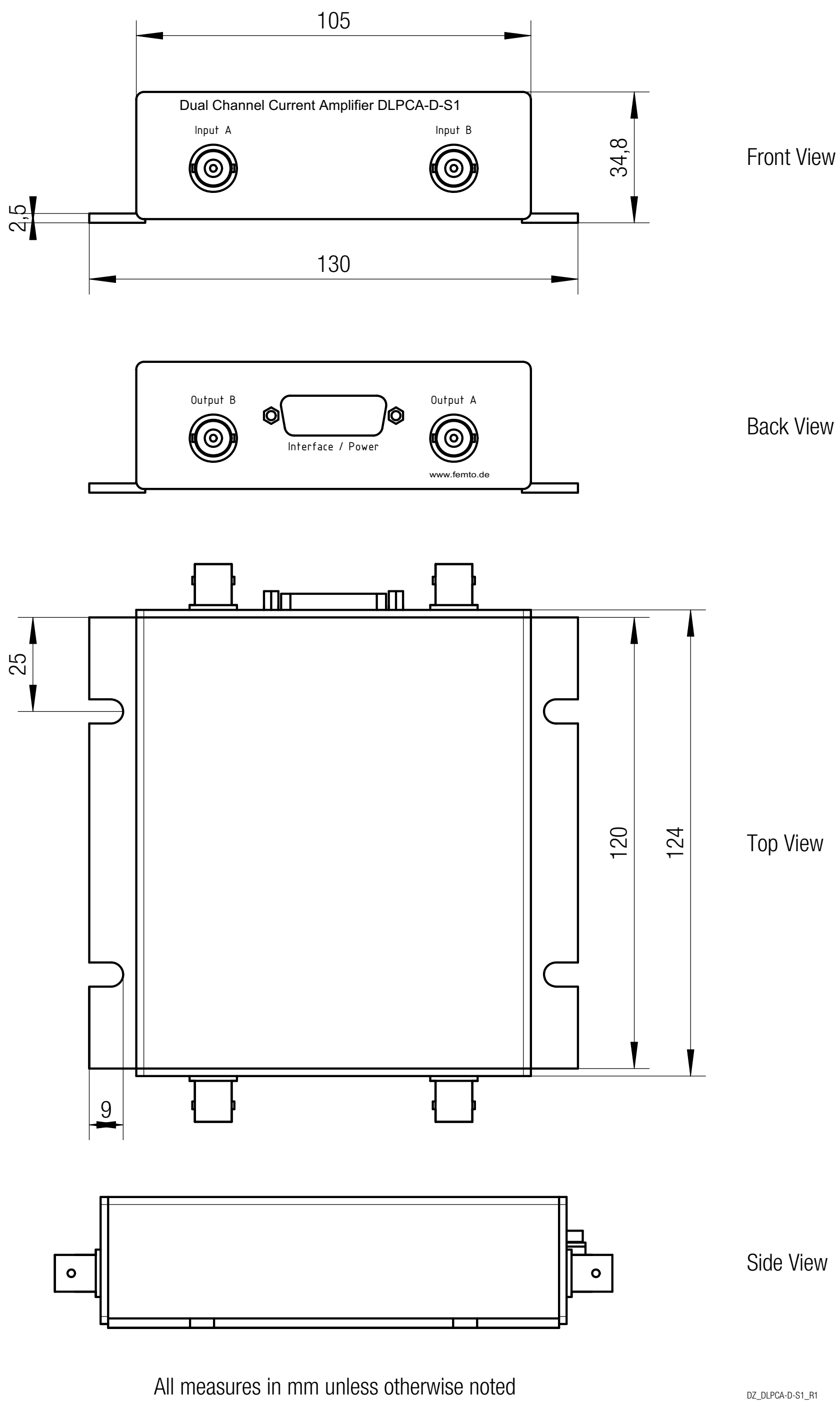
Dimensions



All measures in mm unless otherwise noted

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