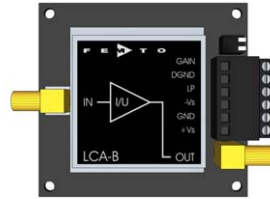


Preliminary Datasheet

LCA-B

Ultra-Low-Noise Current Amplifier  
Low Cost OEM-Serie



Features

- Transimpedance (Gain) Switchable from  $1 \times 10^{10}$  to  $1 \times 10^6$  V/A
- Bandwidth DC ... 2 MHz (With Additional Switchable Low Pass Filter)
- Input Noise Current down to 7 fA/√Hz
- OEM Design – Ready for Integration in Industrial Measurement Systems

Applications

- Sensitive Current Measurements for Example Photodiode- or STM-Preamplifier
- Amplifier for Ionization and Charge Detectors
- Preamplifier for Oscilloscopes, A/D-Converters, Digital Voltmeter etc.

Specifications

Test Conditions:  $V_s = \pm 15$  V,  $T_a = 25^\circ$ C

Product-Code LCA-B-	Full-Bandwidth (-3dB) <sup>1</sup> DC ...	Gain <sup>2</sup> (Transimpedance)	Input Current Range	Input Noise Current <sup>3</sup>	Integrated Input Noise Current <sup>4</sup>	Max. Source Capacitance
5K-1G	5 kHz	$1 \times 10^9$ V/A	$\pm 10$ nA	7 fA/√Hz	1.1 pA <sub>RMS</sub>	5 nF
		$1 \times 10^{10}$ V/A	$\pm 1$ nA	7 fA/√Hz	0.9 pA <sub>RMS</sub>	5 nF
50K-100M	50 kHz	$1 \times 10^8$ V/A	$\pm 0.1$ μA	20 fA/√Hz	9.2 pA <sub>RMS</sub>	5 nF
		$1 \times 10^9$ V/A	$\pm 10$ nA	20 fA/√Hz	8.2 pA <sub>RMS</sub>	5 nF
500K-10M	500 kHz	$1 \times 10^7$ V/A	$\pm 1$ μA	53 fA/√Hz	210 pA <sub>RMS</sub>	3 nF
		$1 \times 10^8$ V/A	$\pm 0.1$ μA	53 fA/√Hz	200 pA <sub>RMS</sub>	3 nF
3M-1M	3 MHz	$1 \times 10^6$ V/A	$\pm 10$ μA	190 fA/√Hz	3.6 nA <sub>RMS</sub>	3 nF
		$1 \times 10^7$ V/A	$\pm 1$ μA	190 fA/√Hz	2.2 nA <sub>RMS</sub>	3 nF

<sup>1</sup> Accuracy:  $\pm 5$  % and independent of input detector capacitance up to about 1 nF

<sup>2</sup> @  $\geq 10$  kΩ load, Accuracy:  $\pm 1$  %

<sup>3</sup> measured @ 1 kHz

<sup>4</sup> The integrated input noise is measured with an open but shielded amplifier input in the full bandwidth (FBW) setting. The input referred peak-peak noise can be calculated from the RMS noise as follows:  
The output noise is given by:

$$I_{\text{peak-peak}} = I_{\text{RMS}} \times 6$$

$$U_{\text{peak-peak}} = I_{\text{peak-peak}} \times \text{Gain}$$

Input

Equ. Input Noise Voltage 5 nV/√Hz (@ 5 kHz)  
Input Bias Current 2 pA  
Input Bias Current Drift Factor 2 / 10 °C  
Input/Output Polarity non inverting  
Input Offset Voltage < 1 mV  
DC Input Impedance 50 Ω || 5 pF

Output

Output Voltage Swing  $\pm 10$  V (@  $\geq 10$  kΩ load)  
Linearity < 1 %  
Output Impedance 50 Ω (@  $\geq 10$  kΩ load for best performance)  
Max. Output Current  $\pm 30$  mA (for linear amplification)  
Output Offset < 3 mV (for low gain setting)

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



DE-LCA-B\_R1/MB/R1/11May2012

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Digital Control	Control Input Voltage Range	LOW bit: - 0.8 ... + 1.2 V HIGH bit: +2.3 ... +12 V
	Control Input Current:	0 mA @ 0 V 1.6 mA @ 5 V
	Remote Control Operation	General Remote control input bits are opto-isolated and connected by logical OR function to local switch settings. For remote control do not set the corresponding local switches, "Gain" and "LP" (Low Pass) and select the wanted setting via a bit code at the corresponding digital inputs.
	Gain Setting	Transimpedance Gain (TIA) Pin 6 <hr/> Low Gain = TIA x 1      LOW High Gain = TIA x 10      HIGH
Bandwidth Setting	Low Pass	Pin 4
	Full Bandwidth (FBW) Low Pass = FBW / 10	LOW HIGH
Power Supply	Supply Voltage Supply Current	± 14 ... 22 VDC ± 35 mA typ. (recommended power supply capability min. ± 60 mA)
Temperature Range	Operating Temperature Storage Temperature	0 ... + 70 °C - 40 ... + 100 °C
Absolute Maximum Ratings	Input Voltage Power Supply Voltage Operating Temperature	± 5 V ± 24 V +5 °C ... +70 °C
Connectors	Input	SMA (right angle female jack)
	Output	SMA (right angle female jack)
	Accessory Kit (included)	2 pc. SMA-BNC adapters, straight
	Power Supply and Remote Control	board connector with locking mechanism pluggable screw type terminal block (type 169 RIACON)  Pin 1: positive supply voltage, + Vs Pin 2: ground for power supply, GND Pin 3: negative supply voltage, - Vs Pin 4: digital control input, LP (low pass) Pin 5: ground for digital control pins, DGND Pin 6: digital control input, GAIN (gain switch)
Connected Wire Range	AWG 26-18 (UL) 0,3-1,4mm (VDE)	
General	Construction Design Material Weight RoHS conform	assembled board with four mounting holes FR4 circuit board, tinplate 40 g (0.09 lb.) yes

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

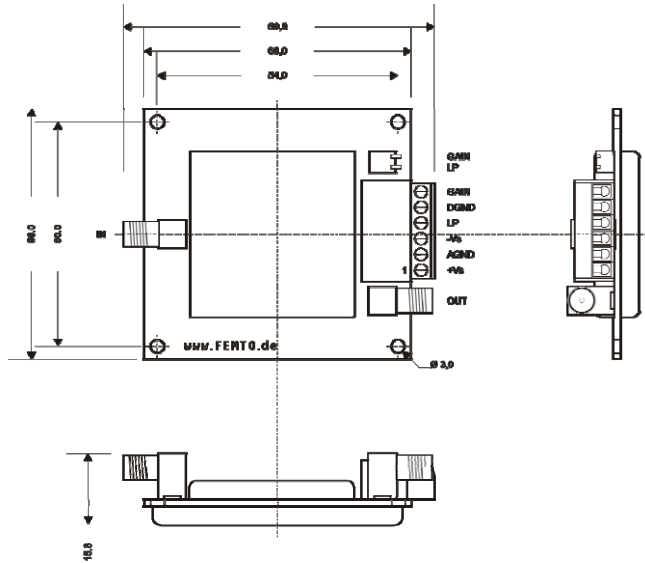


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Dimensions



All dimensions in mm

OEM-Information

For further information and pricing please contact us.

Scope of Delivery

LCA-B, datasheet, 2 pc. SMA-BNC adapters straight, transport package

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