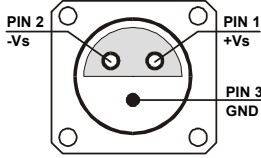



Datasheet
LCA-2-10T
Ultra-Low-Noise Current Amplifier

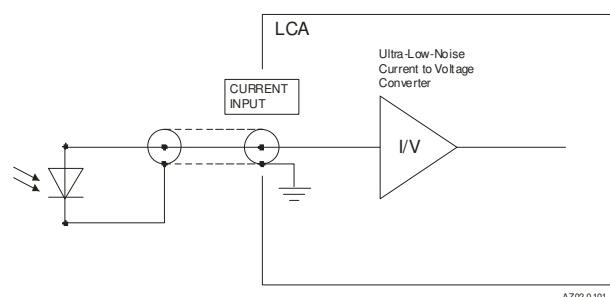

Features	<ul style="list-style-type: none"> • Switchable transimpedance (gain) 1×10^{12} V/A and 1×10^{13} V/A • Extremely low input noise current of $0.18 \text{ fA}/\sqrt{\text{Hz}}$ • Rise time 0.2 s • Switchable low pass filter 2 Hz, 0.3 Hz and 0.1 Hz • Protection against $\pm 2 \text{ kV}$ transients 	
Applications	<ul style="list-style-type: none"> • Very sensitive current and charge measurements • Spectroscopy • Photodiode amplifier • Conductive atomic force microscopy (cAFM) • Amplifier for ionization and charge detectors • Characterization of active electronic components • Preamplifier for oscilloscopes, A/D converters, digital voltmeter etc. 	
Specifications	Test Conditions	$V_s = \pm 15 \text{ V}$, $T_A = 25^\circ\text{C}$ Warm-up 20 minutes (min. 10 minutes recommended)
Gain	Transimpedance Accuracy	1×10^{12} V/A and 1×10^{13} V/A (@ $\geq 1 \text{ M}\Omega$ load) $\pm 2 \%$
Frequency Response	Lower cut-off frequency Upper cut-off frequency (-3 dB) Rise- / Fall-Time (10 % - 90%)	DC 2 Hz , 0.3 Hz and 0.1 Hz 0.2 s , 1 s and 5 s
Input	Equ. input noise current Integrated input noise Input bias current Input bias current drift Offset compensation range Max. input current	$0.18 \text{ fA}/\sqrt{\text{Hz}}$ (@ 0.2 Hz) 0.3 fA peak-peak (@ 0.1 Hz bandwidth setting) 0.6 fA peak-peak (@ 0.3 Hz bandwidth setting) 2 fA peak-peak (@ 2 Hz bandwidth setting) 20 fA typ. / 30 fA max. factor $2 / 10^\circ\text{C}$ $\pm 50 \text{ fA}$, adjustable by offset trimpot $\pm 10 \text{ pA}$ (for linear amplification @ 1×10^{12} V/A gain) $\pm 1 \text{ pA}$ (for linear amplification @ 1×10^{13} V/A gain)
Output	Input offset voltage DC input impedance	$< 0.5 \text{ mV}$ $1 \text{ k}\Omega$ (virtual) // 5 pF
Power Supply	Output voltage Output impedance Max. output current	$\pm 10 \text{ V}$ (@ $\geq 1 \text{ M}\Omega$ load) 50Ω (terminate with $\geq 1 \text{ M}\Omega$ load for best performance) $\pm 10 \text{ mA}$ (for linear amplification)
	Supply voltage Supply current	$\pm 15 \text{ V}$ $\pm 15 \text{ mA}$ typ. (depends on operating conditions, recommended power supply capability minimum $\pm 50 \text{ mA}$)

Ultra-Low-Noise Current Amplifier

Specifications (continued)	<p>Case</p> <p>Weight 210 g (0.5 lbs)</p> <p>Material AlMg4.5Mn, nickel-plated</p> <p>Temperature Range</p> <p>Storage temperature -40 ... +100 °C</p> <p>Operating temperature 0 ... +60 °C</p>
Absolute Maximum Ratings	<p>Input voltage ±10 V</p> <p>Power supply voltage ±20 V</p> <p>Transient input voltage ±2 kV human body model (HBM)</p>
Connectors	<p>Input BNC</p> <p>Output BNC</p> <p>Power supply Lemo® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)</p> <p>Pin 1: +15V</p> <p>Pin 2: -15V</p> <p>Pin 3: GND</p> 

Application Diagrams

Photo detector biasing in photovoltaic mode:
Use for low speed applications and minimum dark current.



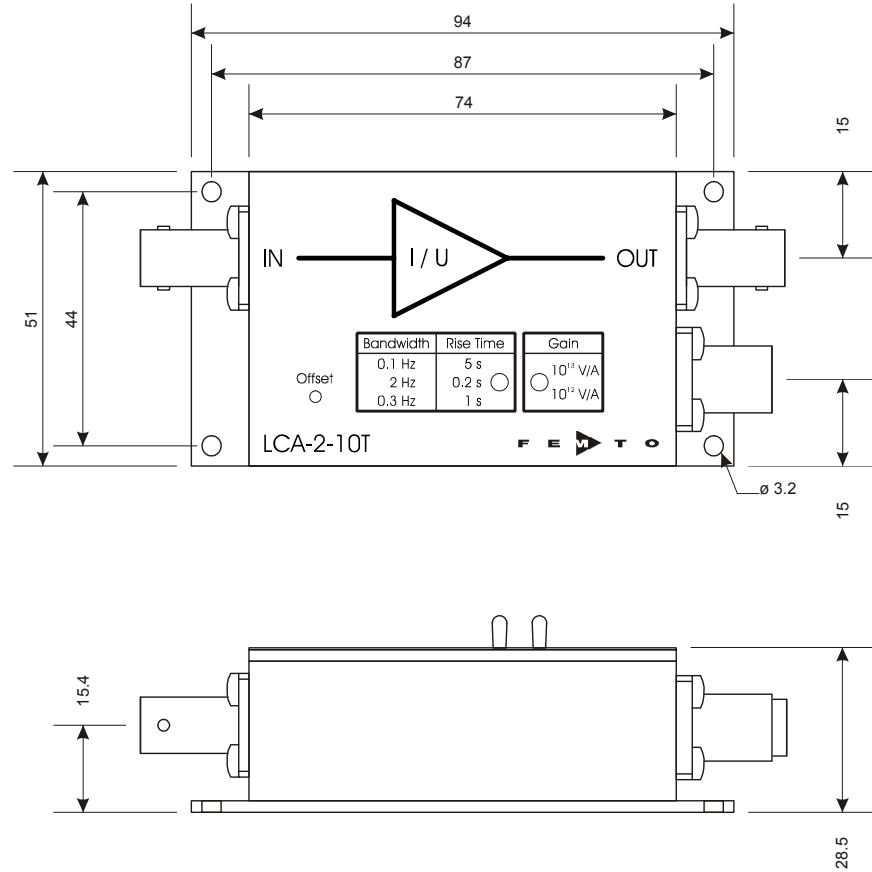


Datasheet

LCA-2-10T

Ultra-Low-Noise Current Amplifier

Dimensions



all measures in mm unless otherwise noted

DZ-LCA-2-10T_R3

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

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