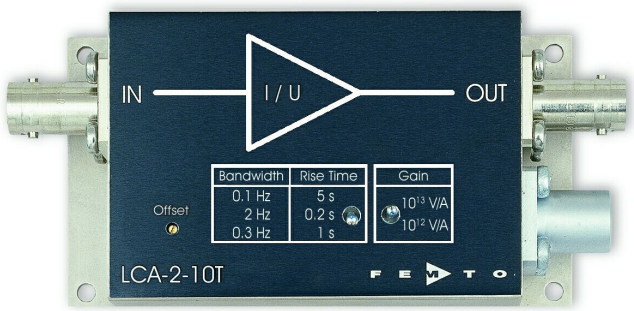
Ultra Low Noise Current Amplifier



Features	• **Switchable Transimpedance (Gain) 1 x 10^{12} V/A and 1 x 10^{13} V/A** • **Extremely Low Input Noise Current of 0.18 fA/√Hz** • **Rise Time 0.2 s** • **Switchable Low Pass Filter 2 Hz, 0.3 Hz and 0.1 Hz** • **Protection against ± 2 kV Transients**
Applications	• **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	*Vs = ± 15 V, Ta = 25°C* *Warm-up 20 minutes (min. 10 minutes recommended)*
Gain	Transimpedance	1 x 10^{12} V/A and 1 x 10^{13} V/A (@ ≥ 1 MΩ load)
	Accuracy	± 2 %
Frequency Response	Lower Cut-Off Frequency	DC
	Upper Cut-Off Frequency (- 3 dB)	2 Hz, 0.3 Hz and 0.1 Hz
	Rise- / Fall-Time (10 % - 90%)	0.2 s, 1 s and 5 s
Input	Equ. Input Noise Current	0.18 fA/√Hz (@ 0.2 Hz)
	Integrated Input Noise	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)
	Input Bias Current	20 fA typ. / 30 fA max.
	Input Bias Current Drift	factor 2 / 10 °C
	Offset Compensation Range	± 50 fA, adjustable by offset trimpot
	Max. Input Current	± 10 pA (for linear amplification @ 1 x 10^{12} V/A gain) ± 1 pA (for linear amplification @ 1 x 10^{13} V/A gain)
	Input Offset Voltage	< 0.5 mV
	DC Input Impedance	1 kΩ (virtual) // 5 pF
Output	Output Voltage	± 10 V (@ ≥ 1 MΩ load)
	Output Impedance	50 Ω (terminate with ≥ 1 MΩ load for best performance)
	Max. Output Current	± 10 mA (for linear amplification)
Power Supply	Supply Voltage	± 15 V
	Supply Current	± 15 mA typ. (depends on operating conditions, recommended power supply capability minimum ± 50 mA)

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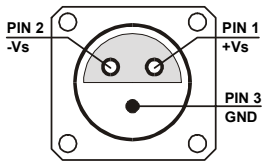
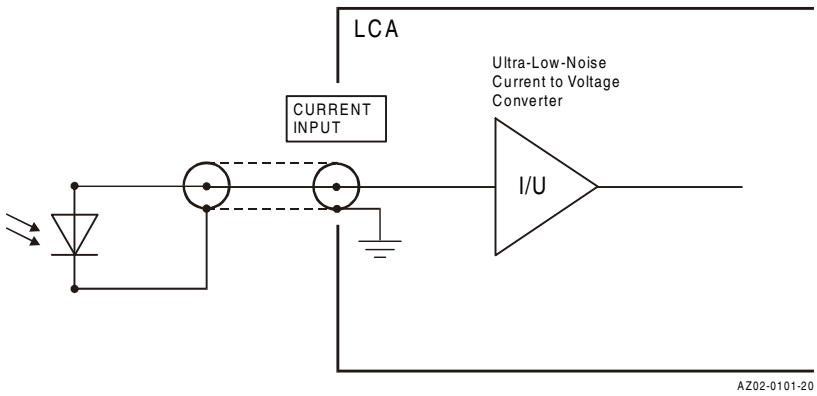
Specifications (continued)		
Case	Weight	210 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	- 40 ... + 100 °C
	Operating Temperature	0 ... + 60 °C
Absolute Maximum Ratings	Input Voltage	± 10 V
	Power Supply Voltage	± 20 V
	Transient Input Voltage	± 2 kV (discharge from 1 nF source)
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND



Application Diagrams

Photo Detector Biasing in Photovoltaic Mode:
Use for Low Speed Applications and Minimum Dark Current.



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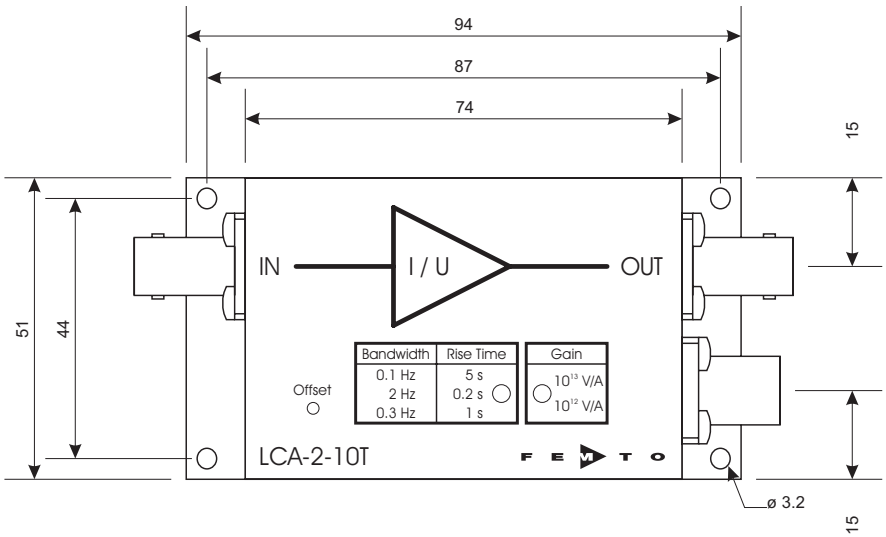
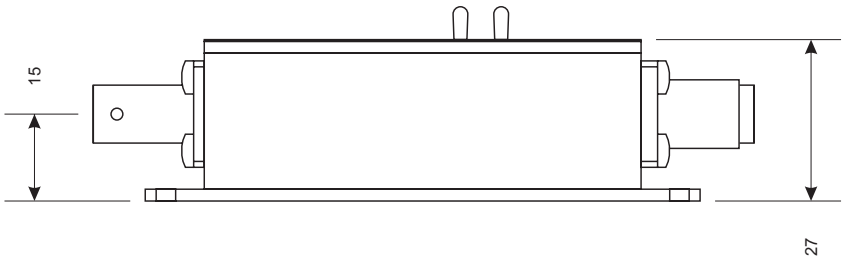
Dimensions





all measures in mm unless otherwise noted

DZ-LCA-2-10T_R2

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