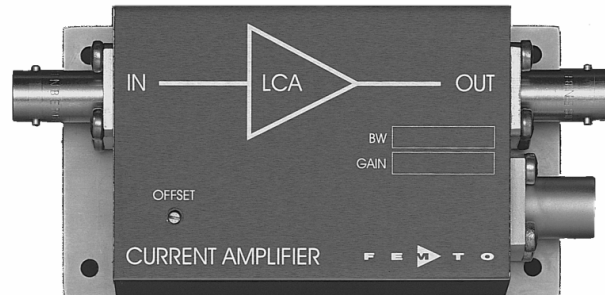


# Datasheet

# LCA-2K-2G

## Ultra-Low-Noise Current Amplifier



<p>Features</p>	<ul style="list-style-type: none"> <li>• <b>Bandwidth and Frequency Response Independent of Detector-Capacitance (up to 10 nF)</b></li> <li>• <b>Extremely Low Noise, 4.5 fA/√Hz Equivalent Input Noise Current</b></li> <li>• <b>Bandwidth DC ... 2 kHz</b></li> <li>• <b>Transimpedance (Gain) 2 x 10<sup>9</sup> V/A</b></li> </ul>																																																																						
<p>Applications</p>	<ul style="list-style-type: none"> <li>• <b>Photodiode- and Photomultiplier-Amplifier</b></li> <li>• <b>Spectroscopy</b></li> <li>• <b>Charge-Amplifier</b></li> <li>• <b>Ionisation Detectors</b></li> <li>• <b>Preamplifier for Lock-Ins, A/D-Converters, etc.</b></li> </ul>																																																																						
<p>Specifications</p>	<p><i>Test Conditions</i> <span style="float: right;"><i>V<sub>s</sub> = ± 15 V, T<sub>a</sub> = 25°C</i></span></p> <table border="0"> <tr> <td style="vertical-align: top;">Gain</td> <td>Transimpedance</td> <td>2 x 10<sup>9</sup> V/A (&gt;10 kΩ Load)</td> </tr> <tr> <td></td> <td>Accuracy</td> <td>± 1%</td> </tr> <tr> <td style="vertical-align: top;">Frequency Response</td> <td>Lower Cut-Off Frequency</td> <td>DC</td> </tr> <tr> <td></td> <td>Upper Cut-Off Frequency</td> <td>2 kHz (- 3 dB)</td> </tr> <tr> <td></td> <td>Rise- / Fall-Time</td> <td>200 μs (10% - 90%)</td> </tr> <tr> <td></td> <td>Gain Flatness</td> <td>± 0.1 dB</td> </tr> <tr> <td style="vertical-align: top;">Input</td> <td>Equ. Input Noise Current</td> <td>4.5 fA/√Hz (@ 300 Hz)</td> </tr> <tr> <td></td> <td>Equ. Input Noise Voltage</td> <td>8 nV/√Hz (@ 300 Hz)</td> </tr> <tr> <td></td> <td>Input Bias Current</td> <td>2 pA typ.</td> </tr> <tr> <td></td> <td>Input Bias Current Drift</td> <td>Factor 2.3 / 10 K</td> </tr> <tr> <td></td> <td>Offset Current Compensation</td> <td>± 1.5 nA, Adjustable by Offset-Trimpot</td> </tr> <tr> <td></td> <td>Max. Input Current</td> <td>± 5 nA (Linear Amplification)</td> </tr> <tr> <td></td> <td>Input Offset Voltage</td> <td>&lt; 1 mV</td> </tr> <tr> <td></td> <td>DC Input Impedance</td> <td>50 Ω (Virtual) // 5 pF</td> </tr> <tr> <td style="vertical-align: top;">Output</td> <td>Output Voltage</td> <td>± 10 V (&gt;10 kΩ Load)</td> </tr> <tr> <td></td> <td>Output Impedance</td> <td>50 Ω (Terminate with &gt;10 kΩ for best Performance)</td> </tr> <tr> <td></td> <td>Max. Output Current</td> <td>± 10 mA (Linear Amplification)</td> </tr> <tr> <td style="vertical-align: top;">Power Supply</td> <td>Supply Voltage</td> <td>± 15 V</td> </tr> <tr> <td></td> <td>Supply Current</td> <td>± 45 mA typ.</td> </tr> <tr> <td style="vertical-align: top;">Case</td> <td>Weight</td> <td>210 gr. (0.5 lbs)</td> </tr> <tr> <td></td> <td>Material</td> <td>AlMg4.5Mn, nickel-plated</td> </tr> <tr> <td></td> <td>Storage Temperature</td> <td>-40 ... +100 °C</td> </tr> <tr> <td></td> <td>Operating Temperature</td> <td>0 ... +60 °C</td> </tr> </table>		Gain	Transimpedance	2 x 10 <sup>9</sup> V/A (>10 kΩ Load)		Accuracy	± 1%	Frequency Response	Lower Cut-Off Frequency	DC		Upper Cut-Off Frequency	2 kHz (- 3 dB)		Rise- / Fall-Time	200 μs (10% - 90%)		Gain Flatness	± 0.1 dB	Input	Equ. Input Noise Current	4.5 fA/√Hz (@ 300 Hz)		Equ. Input Noise Voltage	8 nV/√Hz (@ 300 Hz)		Input Bias Current	2 pA typ.		Input Bias Current Drift	Factor 2.3 / 10 K		Offset Current Compensation	± 1.5 nA, Adjustable by Offset-Trimpot		Max. Input Current	± 5 nA (Linear Amplification)		Input Offset Voltage	< 1 mV		DC Input Impedance	50 Ω (Virtual) // 5 pF	Output	Output Voltage	± 10 V (>10 kΩ Load)		Output Impedance	50 Ω (Terminate with >10 kΩ for best Performance)		Max. Output Current	± 10 mA (Linear Amplification)	Power Supply	Supply Voltage	± 15 V		Supply Current	± 45 mA typ.	Case	Weight	210 gr. (0.5 lbs)		Material	AlMg4.5Mn, nickel-plated		Storage Temperature	-40 ... +100 °C		Operating Temperature	0 ... +60 °C
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# LCA-2K-2G

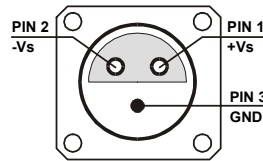
## Ultra-Low-Noise Current Amplifier

### Absolute Maximum Ratings

Input Voltage	$\pm 7\text{ V}$
Power Supply Voltage	$\pm 22\text{ V}$

### 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.

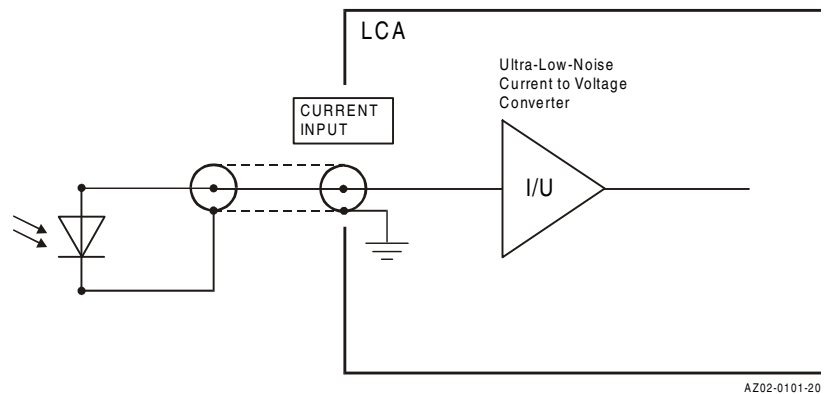
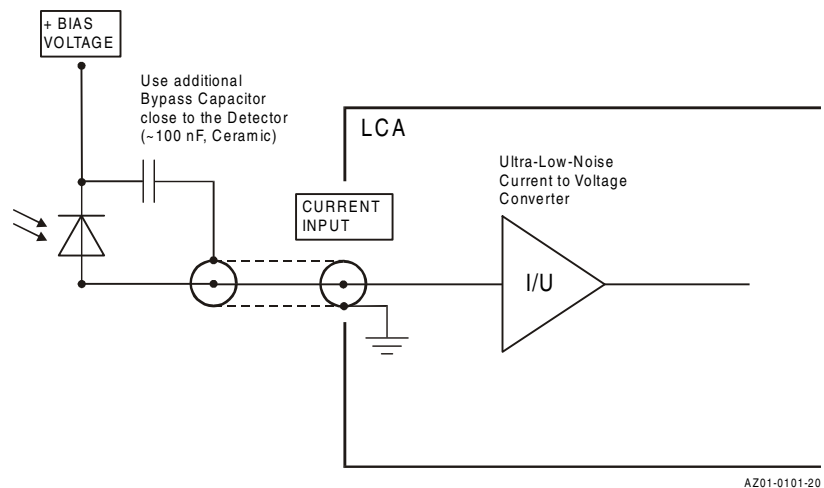


Photo Detector Biasing in Photoconductive Mode:  
Use for Fast Applications and if More Dark Current is Tolerable.  
Bias Voltage Decreases Detector Capacitance.

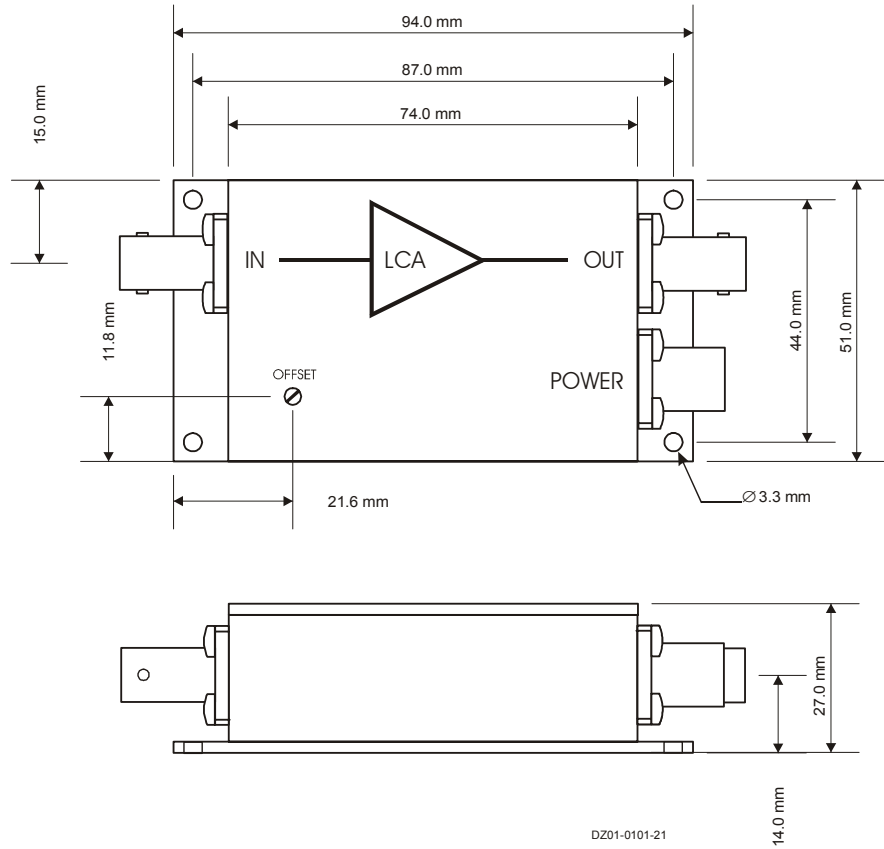


# Datasheet

# LCA-2K-2G

## Ultra-Low-Noise Current Amplifier

Dimensions



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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

