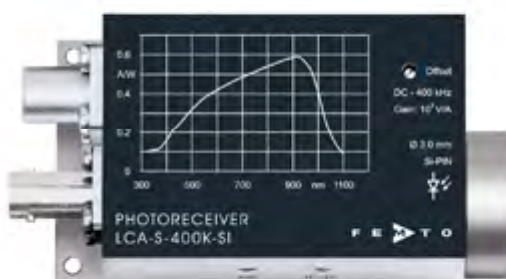




**Datasheet**

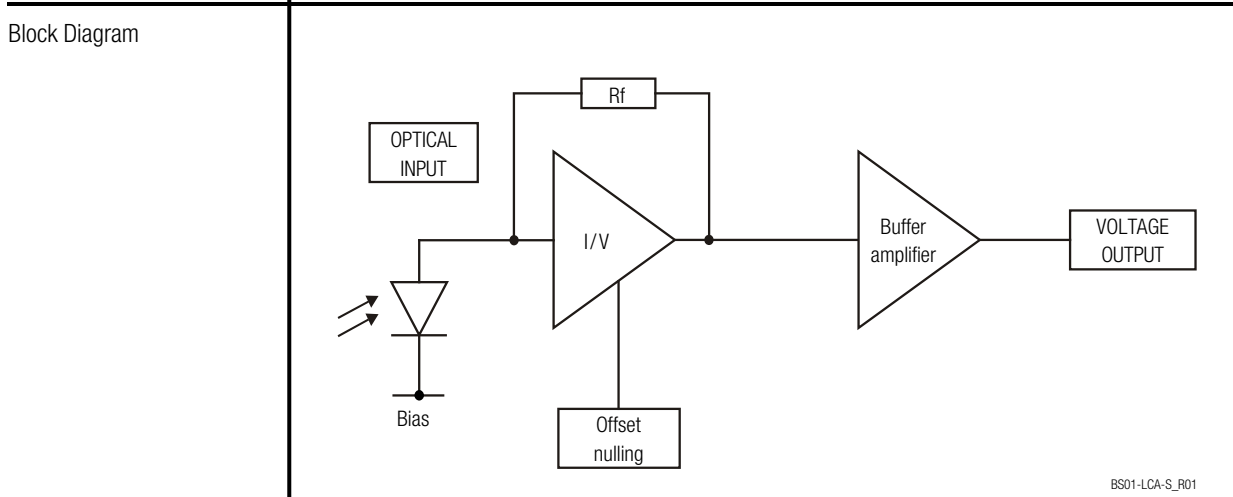
**LCA-S-400K-SI**

**Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode**







Features	<ul style="list-style-type: none"> <li>• <b>Large area Si-PIN photodiode, 3.0 mm active diameter</b></li> <li>• <b>Bandwidth DC – 400 kHz</b></li> <li>• <b>Amplifier transimpedance gain <math>1.0 \times 10^7</math> V/A</b></li> <li>• <b>Max. conversion gain <math>5.9 \times 10^6</math> V/W @ 920 nm</b></li> <li>• <b>Spectral range 320 – 1060 nm</b></li> <li>• <b>Free-space input 1.035"-40 threaded, easily convertible to fiber optic input (FC and FSMA) with optionally available screw-on adapters</b></li> <li>• <b>UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread</b></li> </ul>
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Applications	<ul style="list-style-type: none"> <li>• <b>Spectroscopy</b></li> <li>• <b>General purpose opto-electronic measurements</b></li> <li>• <b>Optical front-end for oscilloscopes, A/D converters and lock-in amplifiers</b></li> </ul>
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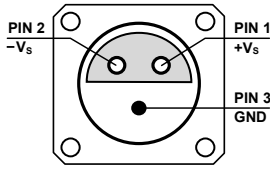


Intended Use	<p>The LCA-S-400K-SI photoreceiver consists of an Si-PIN photodiode and a subsequent low-noise fixed gain transimpedance amplifier. It is designed for fast conversion of small optical signals into equivalent output voltages. Operation is mostly self-explanatory. If in doubt, consult this document or contact <a href="mailto:support@femto.de">support@femto.de</a>.</p> <p>For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and "Power Supply" sections of this document.</p> <p>The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.</p>
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## Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode

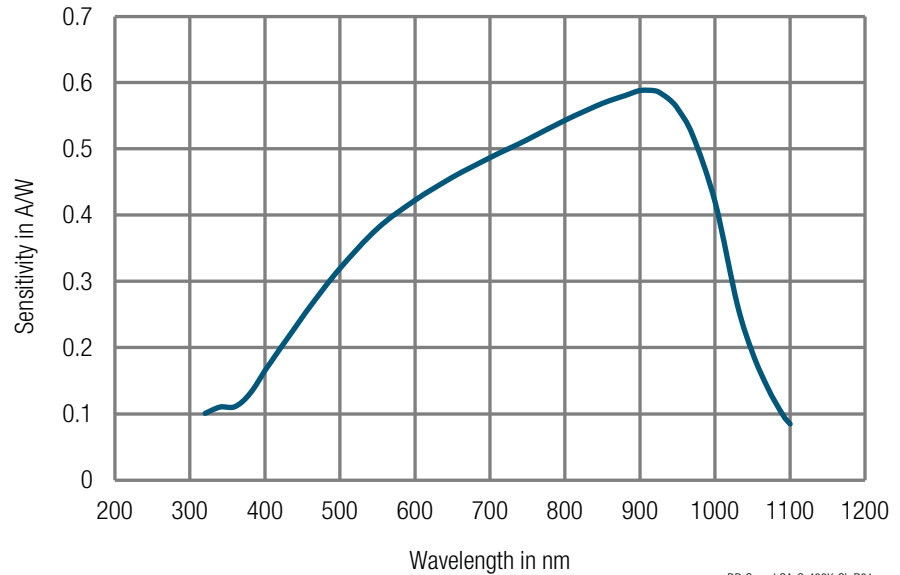
<p>Available Version</p>	<p>LCA-S-400K-SI-FST</p>  <p>1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm) for free space applications, compatible with many optical standard accessories</p> <p>Optionally available: Fiber adapters PRA-FC, PRA-FCA and PRA-FSMA, with the relative large 3.0 mm dia. photodiode installed in the LCA-S-400K-SI input coupling is not critical, however, standard SM 9/125 fibers (PC or APC) with low numerical aperture (NA) are recommended for ensuring near 100% coupling efficiency</p>												
<p>Related Model</p>	<p>LCA-S-400K-IN-FST</p> <p>InGaAs-PIN, <math>\varnothing</math> 0.5 mm, 900 - 1700 nm free space input, 1.035"-40 threaded flange</p>												
<p>Available Accessories</p>	<p>PRA-FC PRA-FCA PRA-FSMA</p>  <p>Fiber-adapter with external 1.035"-40 thread (suitable for FST models only)</p> <p>PRA-PAP</p>  <p>Alternative mounting option: post adapter plate, easy to mount on FEMTO photoreceiver series OE, FWPR, PWPR, HCA-S and LCA-S</p> <p>PS-15-25-L</p>  <p>Power Supply input: 100 – 240 VAC output: <math>\pm</math>15 VDC</p>												
<p>Specifications</p>	<table border="0"> <tr> <td>Test conditions</td> <td><math>V_s = \pm 15</math> V, <math>T_A = 25</math> °C, output load impedance 1 M<math>\Omega</math>, warm-up 20 minutes (min. 10 minutes recommended)</td> </tr> <tr> <td>Gain</td> <td> <p>Transimpedance gain: <math>1.0 \times 10^7</math> V/A (@ output load <math>\geq</math> 100 k<math>\Omega</math>)</p> <p>Gain accuracy: <math>\pm 1</math> % (electrical)</p> <p>Conversion gain: <math>5.9 \times 10^6</math> V/W typ. (@ 920 nm, output load <math>\geq</math> 100 k<math>\Omega</math>)</p> </td> </tr> <tr> <td>Frequency Response</td> <td> <p>Lower cut-off frequency: DC</p> <p>Upper cut-off frequency (-3 dB): 400 kHz</p> <p>Gain flatness: <math>\pm 0.5</math> dB</p> </td> </tr> <tr> <td>Time Response</td> <td>Rise/fall time (10 % – 90 %): 900 ns</td> </tr> <tr> <td>Input</td> <td> <p>Noise equivalent power (NEP): 120 fW/<math>\sqrt</math>Hz (@ 920 nm, 10 kHz)</p> <p>Optical saturation power: 1.6 <math>\mu</math>W (for linear amplification, @ 920 nm)</p> <p>Input offset compensation range: <math>\pm 300</math> nA, adjustable by offset potentiometer</p> </td> </tr> <tr> <td>Detector</td> <td> <p>Detector: Si-PIN photodiode</p> <p>Active area: <math>\varnothing</math> 3.0 mm</p> <p>Spectral range: 320 – 1060 nm</p> <p>Max. sensitivity: 0.59 A/W typ. (@ 920 nm)</p> </td> </tr> </table>	Test conditions	$V_s = \pm 15$ V, $T_A = 25$ °C, output load impedance 1 M $\Omega$ , warm-up 20 minutes (min. 10 minutes recommended)	Gain	<p>Transimpedance gain: <math>1.0 \times 10^7</math> V/A (@ output load <math>\geq</math> 100 k<math>\Omega</math>)</p> <p>Gain accuracy: <math>\pm 1</math> % (electrical)</p> <p>Conversion gain: <math>5.9 \times 10^6</math> V/W typ. (@ 920 nm, output load <math>\geq</math> 100 k<math>\Omega</math>)</p>	Frequency Response	<p>Lower cut-off frequency: DC</p> <p>Upper cut-off frequency (-3 dB): 400 kHz</p> <p>Gain flatness: <math>\pm 0.5</math> dB</p>	Time Response	Rise/fall time (10 % – 90 %): 900 ns	Input	<p>Noise equivalent power (NEP): 120 fW/<math>\sqrt</math>Hz (@ 920 nm, 10 kHz)</p> <p>Optical saturation power: 1.6 <math>\mu</math>W (for linear amplification, @ 920 nm)</p> <p>Input offset compensation range: <math>\pm 300</math> nA, adjustable by offset potentiometer</p>	Detector	<p>Detector: Si-PIN photodiode</p> <p>Active area: <math>\varnothing</math> 3.0 mm</p> <p>Spectral range: 320 – 1060 nm</p> <p>Max. sensitivity: 0.59 A/W typ. (@ 920 nm)</p>
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## Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode

Specifications (continued)		
Output	Output voltage range Output impedance Max. output current Output noise	-3 V ... +10 V (@ $\geq 100\text{ k}\Omega$ output load) 50 $\Omega$ (terminate with $\geq 100\text{ k}\Omega$ load) 30 mA (short-circuit proof) 1.6 mV RMS (10 mV peak-peak) typ. (@ $\geq 100\text{ k}\Omega$ load, no signal on detector, measurement bandwidth 1 MHz)
Input Flange	Material	1.4305 stainless steel, nickel-plated
Coupler Ring	Material	1.4305 stainless steel, glass bead blasted
Power Supply	Supply voltage Supply current	$\pm 15\text{ V}$ ( $\pm 14.5\text{ V}$ ... $\pm 16.5\text{ V}$ ) $\pm 40\text{ mA}$ (depends on operating conditions, recommended power supply capability min. $\pm 150\text{ mA}$ )
Case	Weight Material	212 g (0.47 lbs) LCA-S-400K-SI-FST incl. coupler ring AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	-30 $^{\circ}\text{C}$ ... +85 $^{\circ}\text{C}$ 0 $^{\circ}\text{C}$ ... +60 $^{\circ}\text{C}$
Absolute Maximum Ratings	Optical input power (CW) Power supply voltage	10 mW $\pm 20\text{ V}$
Connectors	Input  Output  Power supply	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories  BNC jack (female)  LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)
		 <p>Pin 1: +15 V Pin 2: -15 V Pin 3: GND</p>
Scope of Delivery	LCA-S-400K-SI, internally threaded coupler ring, LEMO® 3-pin connector, datasheet, transport package	
Ordering Information	LCA-S-400K-SI-FST	1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories

# Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode

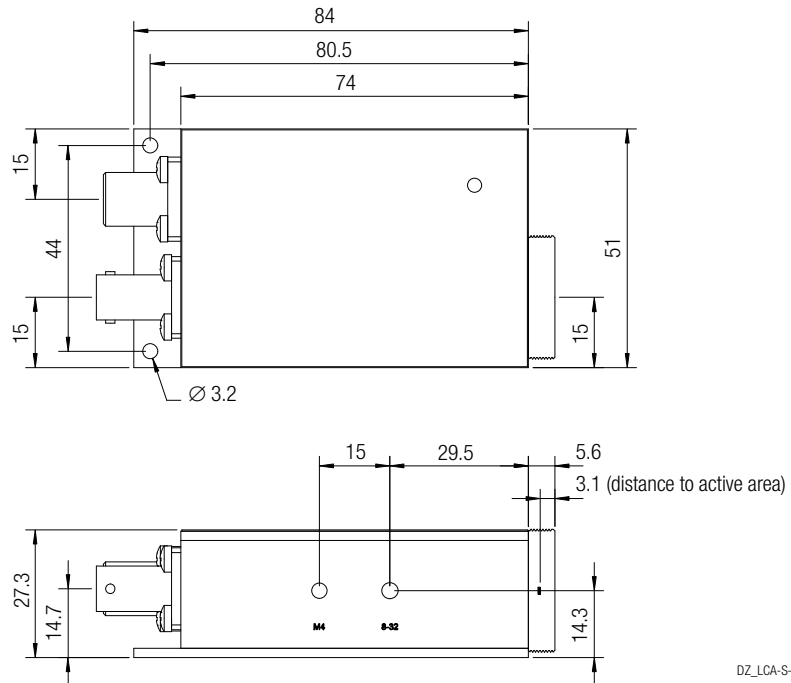
Spectral Responsivity



DB-Sens-LCA-S-400K-SI\_R01

Dimensions

LCA-S-400K-SI-FST (1.035"-40 threaded free space input)



DZ\_LCA-S-400K-SI-FST\_R1

all dimensions in mm unless otherwise noted

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