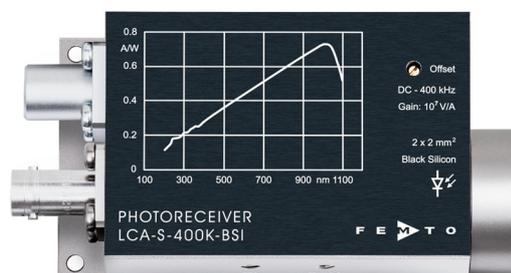


Low Noise 400 kHz Photoreceiver with Black Silicon Photodiode



<p>Features</p>	<ul style="list-style-type: none"> • Large area black silicon photodiode, 2 × 2 mm active diameter • Quantum efficiency approx. 90 % from 240 nm to 1000 nm • Bandwidth DC – 400 kHz • Amplifier transimpedance gain 1.0×10^7 V/A • Max. conversion gain 7.3×10^6 V/W @ 1010 nm • Spectral range 200 – 1100 nm • Free-space input 1.035"-40 threaded • UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread
<p>Applications</p>	<ul style="list-style-type: none"> • Spectroscopy • General purpose opto-electronic measurements • Optical front-end for oscilloscopes, A/D converters and lock-in amplifiers
<p>Block Diagram</p>	<p style="text-align: right; font-size: small;">BS01-LCA-S_R01</p>
<p>Intended Use</p>	<p>The LCA-S-400K-BSI photoreceiver consists of a black silicon 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 support@femto.de.</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>

Low Noise 400 kHz Photoreceiver with Black Silicon Photodiode

<p>Available Version</p>	<p>LCA-S-400K-BSI-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>Related Models</p>	<p>LCA-S-400K-SI-FST Si-PIN, Ø 3 mm, 320 - 1060 nm free space input, 1.035"-40 threaded flange</p> <p>LCA-S-400K-IN-FST InGaAs-PIN, Ø 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</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: ±15 VDC</p>										
<p>Specifications</p>	<table border="0"> <tr> <td>Test conditions</td> <td>$V_s = \pm 15 \text{ V}$, $T_A = 25 \text{ }^\circ\text{C}$, output load impedance 1 MΩ, warm-up 20 minutes (min. 10 minutes recommended)</td> </tr> <tr> <td>Gain</td> <td> <p>Transimpedance gain $1.0 \times 10^7 \text{ V/A}$ (@ output load $\geq 100 \text{ k}\Omega$)</p> <p>Gain accuracy $\pm 1 \%$ (electrical)</p> <p>Conversion gain $7.3 \times 10^6 \text{ V/W typ.}$ (@ 1010 nm, output load $\geq 100 \text{ k}\Omega$)</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 $\pm 0.5 \text{ dB}$</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) 110 fW/$\sqrt{\text{Hz}}$ (@ 1010 nm, 10 kHz)</p> <p>Optical saturation power 1.37 μW (for linear amplification, @ 1010 nm)</p> <p>Input offset compensation range $\pm 300 \text{ nA}$, adjustable by offset potentiometer</p> </td> </tr> </table>	Test conditions	$V_s = \pm 15 \text{ V}$, $T_A = 25 \text{ }^\circ\text{C}$, output load impedance 1 M Ω , warm-up 20 minutes (min. 10 minutes recommended)	Gain	<p>Transimpedance gain $1.0 \times 10^7 \text{ V/A}$ (@ output load $\geq 100 \text{ k}\Omega$)</p> <p>Gain accuracy $\pm 1 \%$ (electrical)</p> <p>Conversion gain $7.3 \times 10^6 \text{ V/W typ.}$ (@ 1010 nm, output load $\geq 100 \text{ k}\Omega$)</p>	Frequency Response	<p>Lower cut-off frequency DC</p> <p>Upper cut-off frequency (-3 dB) 400 kHz</p> <p>Gain flatness $\pm 0.5 \text{ dB}$</p>	Time Response	Rise/fall time (10 % – 90 %) 900 ns	Input	<p>Noise equivalent power (NEP) 110 fW/$\sqrt{\text{Hz}}$ (@ 1010 nm, 10 kHz)</p> <p>Optical saturation power 1.37 μW (for linear amplification, @ 1010 nm)</p> <p>Input offset compensation range $\pm 300 \text{ nA}$, adjustable by offset potentiometer</p>
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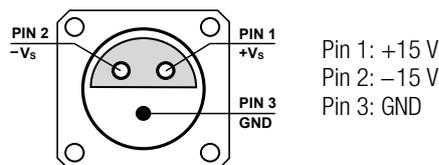
Low Noise 400 kHz Photoreceiver with Black Silicon Photodiode

Specifications (continued)

Detector	Detector Active area Spectral range Max. sensitivity	Black silicon photodiode 2 × 2 mm 200 – 1100 nm 0.73 A/W typ. (@ 1010 nm)
Output	Output voltage range Output impedance Max. output current Output noise	-3 V ... +10 V (@ ≥ 100 kΩ output load) 50 Ω (terminate with ≥ 100 kΩ load) 30 mA (short-circuit proof) 2.0 mV RMS (18 mV peak-peak) typ. (@ ≥ 100 kΩ load, no signal on detector, measurement bandwidth 20 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	±15 V (±14.5 V ... ±16.5 V) ±40 mA (depends on operating conditions, recommended power supply capability min. ±150 mA)
Case	Weight Material	212 g (0.47 lbs) incl. coupler ring AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	-30 °C ... +85 °C 0 °C ... +60 °C

Absolute Maximum Ratings	Optical input power (CW) Power supply voltage	10 mW ±20 V
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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)
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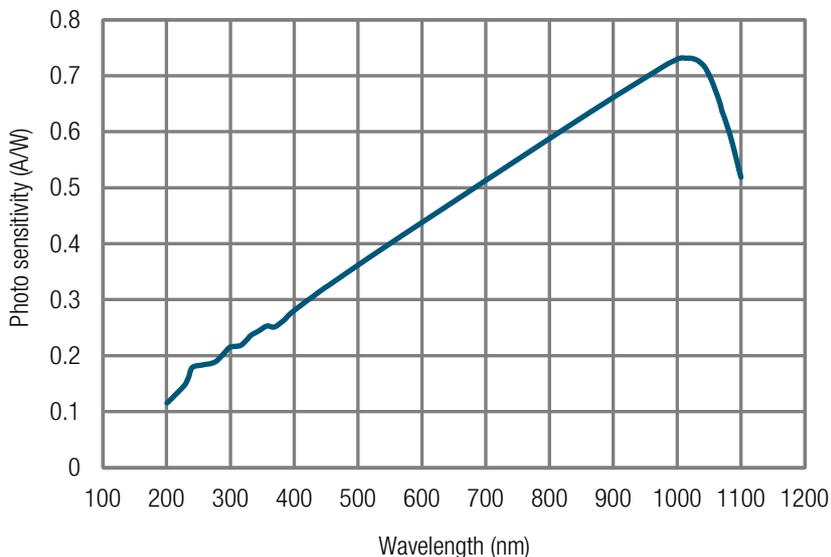


Scope of Delivery	LCA-S-400K-BSI, internally threaded coupler ring, LEMO® 3-pin connector, datasheet, transport package	
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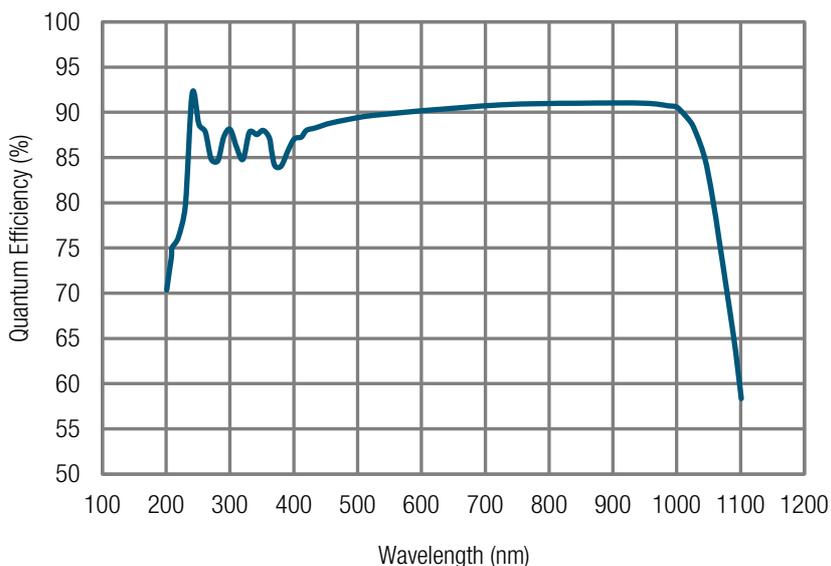
Ordering Information	LCA-S-400K-BSI-FST	Black silicon photodiode, 2 × 2 mm, 200 – 1100 nm free space input, 1.035"-40 threaded flange
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Low Noise 400 kHz Photoreceiver with Black Silicon Photodiode

Spectral Responsivity



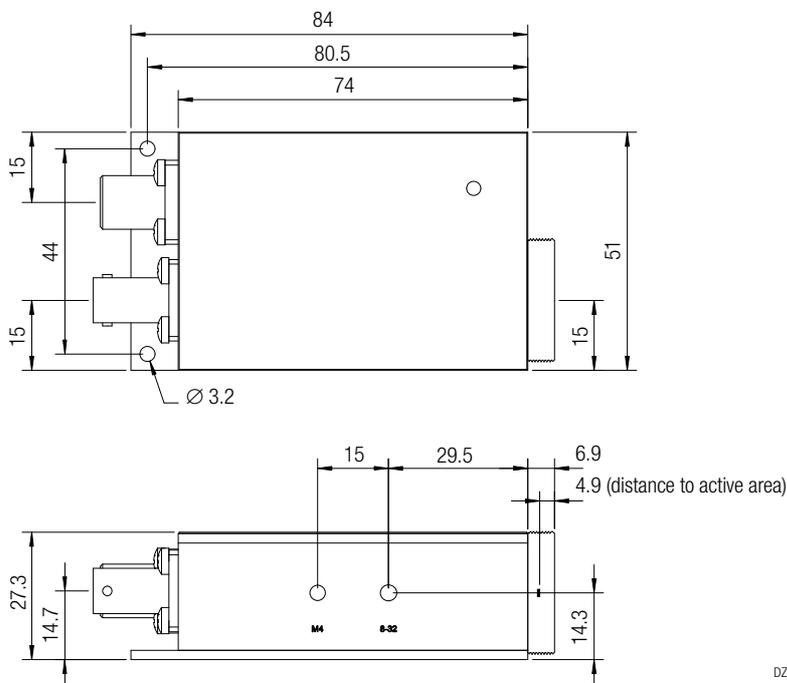
Spectral Quantum Efficiency



Low Noise 400 kHz Photoreceiver with Black Silicon Photodiode

Dimensions

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



DZ_LCA-S-400K_R1

all dimensions in mm unless otherwise noted

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