

# Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode



The picture shows model LCA-S-400K-SI-FS.  
The photoreceiver will be delivered without post holder and post.

<p>Features</p>	<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, alternatively 25 mm diameter unthreaded</b></li> <li>• <b>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>
<p>Applications</p>	<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>
<p>Block Diagram</p>	<p>The block diagram illustrates the internal circuitry. It starts with an 'OPTICAL INPUT' leading to a photodiode. The photodiode is connected to a bias source and an 'I/V' (transimpedance) amplifier. The feedback path of the I/V amplifier includes a feedback resistor 'Rf' and an 'Offset Nulling' block. The output of the I/V amplifier is connected to a 'Buffer Amplifier', which produces the 'VOLTAGE OUTPUT'.</p>

BS01-LCA-S\_R01

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

Available Versions

LCA-S-400K-SI-FST

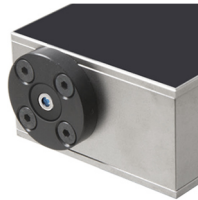


Picture shows 1.035"-40 threaded flange with internally threaded coupler ring (outer diameter 30 mm)

1.035"-40 threaded flange for free space applications, compatible with many optical standard accessories and for use with various types of fiber connector adapters.

Optionally available:  
Fiber adapters PRA-FC, PRA-FCA and PRA-FSMA.  
The coupling efficiency will depend on fiber type.  
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.

LCA-S-400K-SI-FS



Picture shows unthreaded flange with 25 mm diameter

25 mm dia. unthreaded flange for free space applications. Compatible with many optical standard accessories.

Related Models

LCA-S-400K-IN-FST

InGaAs-PIN, Ø 0.5 mm, 900 - 1700 nm free space input, 1.035"-40 threaded flange

LCA-S-400K-IN-FS

InGaAs-PIN, Ø 0.5 mm, 900 - 1700 nm free space input, 25 mm dia. unthreaded flange

Available Accessories

PRA-FC  
PRA-FCA  
PRA-FSMA



Fiber-adapter with external 1.035"-40 thread (suitable for FST models only).

PRA-PAP



Alternative mounting option:  
Post adapter plate, easy to mount on FEMTO photoreceiver series OE, FWPR, PWPR, HCA-S and LCA-S.

PS-15-25-L



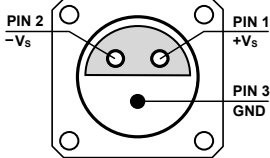
Power supply  
Input: 100 – 240 VAC  
Output: ±15 VDC

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

Specifications	Test conditions	$V_S = \pm 15\text{ V}$ , $T_A = 25\text{ }^\circ\text{C}$ , output load impedance $1\text{ M}\Omega$ , warm-up 20 minutes (min. 10 minutes recommended)
Gain	Transimpedance gain Gain accuracy Conversion gain	$1.0 \times 10^7\text{ V/A}$ (@ output load $\geq 100\text{ k}\Omega$ ) $\pm 1\%$ (electrical) $5.9 \times 10^6\text{ V/W}$ typ. (@ $920\text{ nm}$ , output load $\geq 100\text{ k}\Omega$ )
Frequency Response	Lower cut-off frequency Upper cut-off frequency (-3 dB) Gain flatness	DC 400 kHz $\pm 0.5\text{ dB}$
Time Response	Rise/fall time (10 % – 90 %)	900 ns
Input	Noise equivalent power (NEP) Optical saturation power Input offset compensation range	$120\text{ fW}/\sqrt{\text{Hz}}$ (@ $920\text{ nm}$ , 10 kHz) $1.6\text{ }\mu\text{W}$ (for linear amplification, @ $920\text{ nm}$ ) $\pm 300\text{ nA}$ , adjustable by offset potentiometer
Detector	Detector Active area Spectral range Max. sensitivity	Si-PIN photodiode $\varnothing 3.0\text{ mm}$ 320 – 1060 nm $0.59\text{ A/W}$ typ. (@ $920\text{ nm}$ )
Output	Output voltage range Output impedance Max. output current Output noise	$-3\text{ V} \dots +10\text{ V}$ (@ $\geq 100\text{ k}\Omega$ output load) $50\text{ }\Omega$ (terminate with $\geq 100\text{ k}\Omega$ load) 30 mA (short-circuit proof) $1.6\text{ mV}_{\text{RMS}}$ ( $10\text{ mV}_{\text{PP}}$ ) typ. (@ $\geq 100\text{ k}\Omega$ load, no signal on detector, measurement bandwidth 1 MHz)
Input Flange	Material	1.4305 stainless steel, nickel-plated (FST flange) AlMg4.5Mn, nickel-plated (FS flange)
Coupler Ring (FST version only)	Material	1.4305 stainless steel, glass bead blasted
Power Supply	Supply voltage Supply current	$\pm 15\text{ V}$ ( $\pm 14.5\text{ V} \dots \pm 16.5\text{ V}$ ) $\pm 40\text{ mA}$ (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 195 g (0.43 lbs) LCA-S-400K-SI-FS AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature Operating temperature	$-30\text{ }^\circ\text{C} \dots +85\text{ }^\circ\text{C}$ $0\text{ }^\circ\text{C} \dots +60\text{ }^\circ\text{C}$

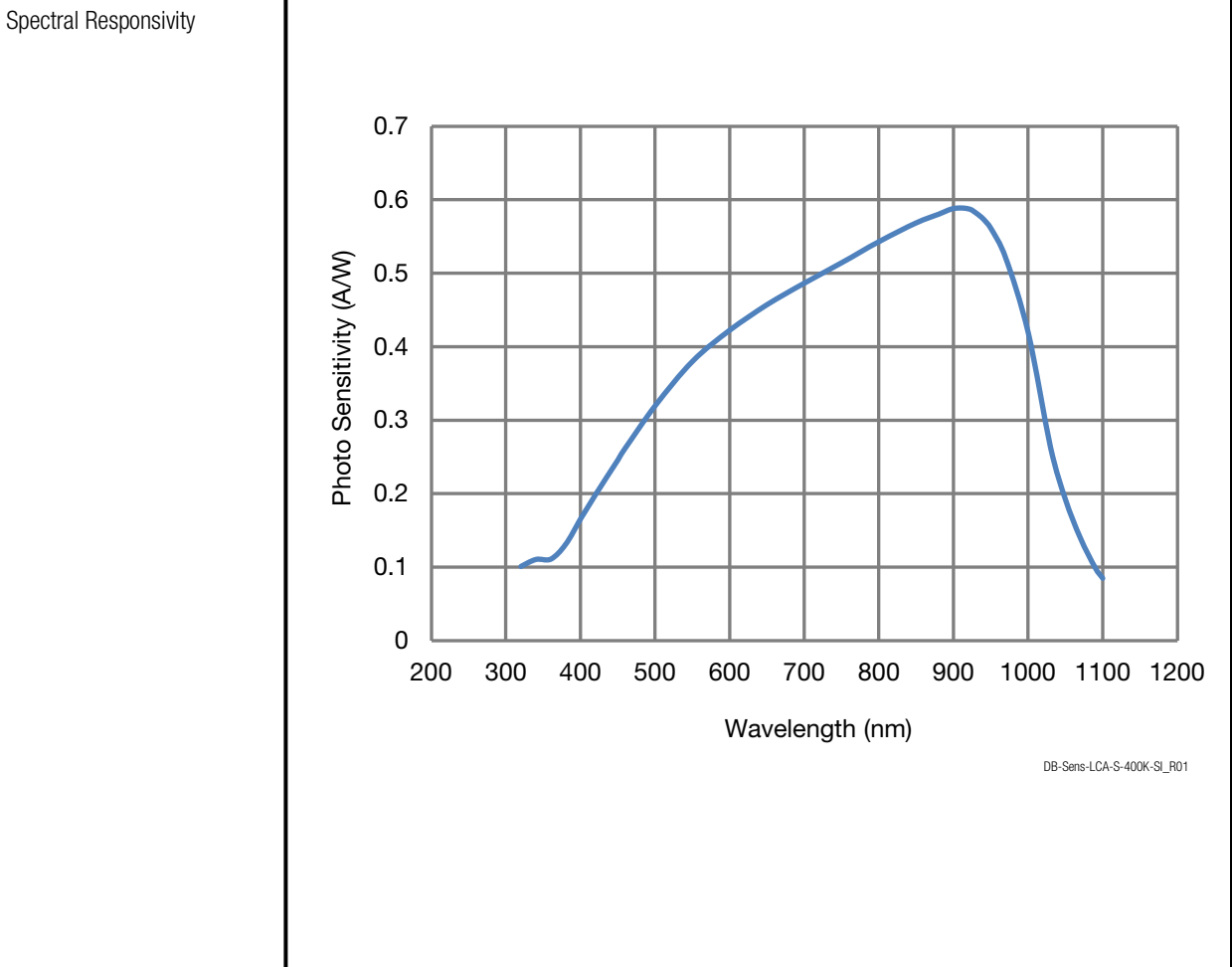
Absolute Maximum Ratings	Optical input power (CW) Power supply voltage	10 mW $\pm 20\text{ V}$
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## Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode

Connectors	<p>Input</p> <p style="margin-left: 40px;">LCA-S-400K-SI-FST      1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories</p> <p style="margin-left: 40px;">LCA-S-400K-SI-FS      25 mm dia. unthreaded flange for free space applications</p> <p>Output</p> <p style="margin-left: 40px;">BNC jack (female)</p> <p>Power supply</p> <p style="margin-left: 40px;">LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)</p>
	
<p style="margin-left: 60px;">Pin 1: +15 V</p> <p style="margin-left: 60px;">Pin 2: -15 V</p> <p style="margin-left: 60px;">Pin 3: GND</p>	

Scope of Delivery	LCA-S-400K-SI, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package
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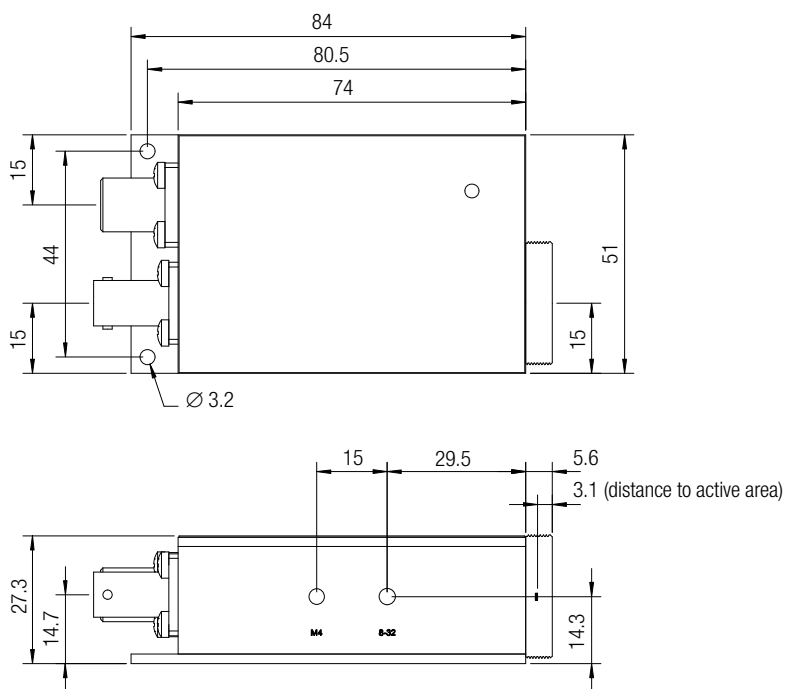
Ordering Information	<p>LCA-S-400K-SI-FST      1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.</p> <p>LCA-S-400K-SI-FS      25 mm dia. unthreaded flange for free space applications.</p>
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# Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode

Dimensions

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



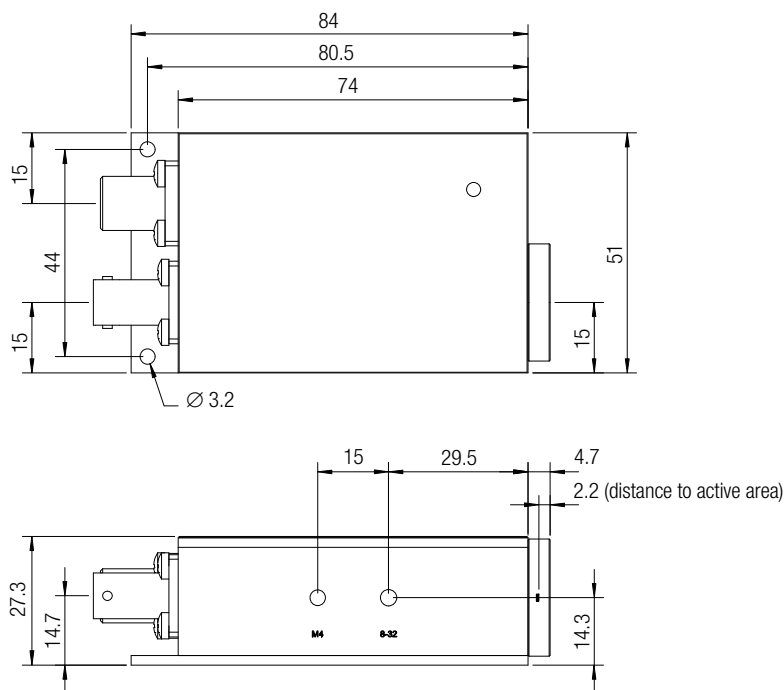
DZ\_LCA-S-400K-SI-FST\_R1

all dimensions in mm unless otherwise noted

# Low Noise 400 kHz Photoreceiver with Si-PIN Photodiode

Dimensions (continued)

LCA-S-400K-SI-FS (25 mm dia. unthreaded free space input)



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

all dimensions in mm unless otherwise noted

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