

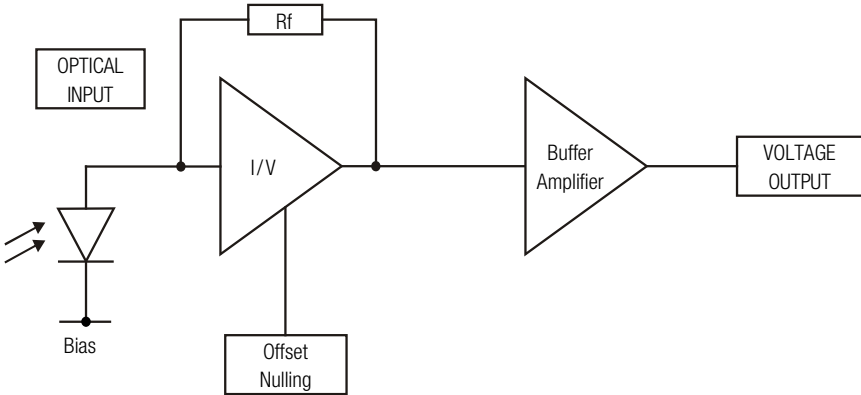
Datasheet

LCA-S-400K-SI

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.

Features	<ul style="list-style-type: none"><li>• Large area Si-PIN photodiode, 3.0 mm active diameter</li><li>• Bandwidth DC – 400 kHz</li><li>• Amplifier transimpedance gain <math>1.0 \times 10^7</math> V/A</li><li>• Max. conversion gain <math>5.9 \times 10^6</math> V/W @ 920 nm</li><li>• Spectral range 320 – 1060 nm</li><li>• Free-space input 1.035"-40 threaded, alternatively 25 mm diameter unthreaded</li><li>• Easily convertible to fiber optic input (FC and FSMA) with optionally available screw-on adapters</li><li>• UNC 8-32 and M4 tapped holes for mounting on standard posts with metric and imperial thread</li></ul>
Applications	<ul style="list-style-type: none"><li>• Spectroscopy</li><li>• General purpose opto-electronic measurements</li><li>• Optical front-end for oscilloscopes, A/D converters and lock-in amplifiers</li></ul>
Block Diagram	<div><p>The block diagram illustrates the internal circuitry of the photoreceiver. It begins with an "OPTICAL INPUT" which is coupled to a photodiode. The photodiode is connected to a biasing circuit labeled "Bias". The output of the photodiode is fed into the inverting input of an "I/V" (transimpedance) amplifier. The feedback path of this amplifier is a resistor labeled "Rf". An "Offset Nulling" input is also connected to the inverting input. The output of the I/V amplifier is then passed through a "Buffer Amplifier" to produce the final "VOLTAGE OUTPUT".</p></div> <div>BS01-LCA-S_R01</div>

## 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.

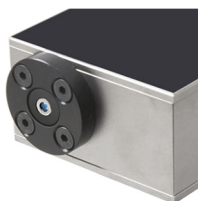
Optionally available:

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

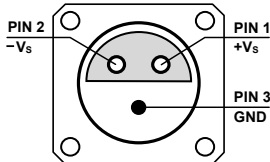
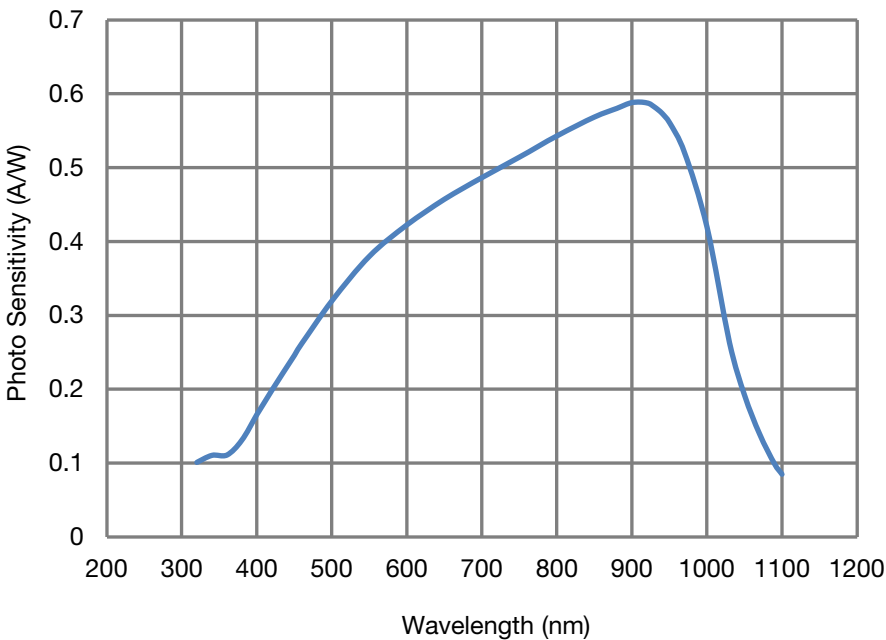


Power supply  
Input: 100 – 240 VAC  
Output: ±15 VDC

## 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 ( $-3\text{ dB}$ ) 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	$120\text{ fW}/\sqrt{\text{Hz}}$ (@ $920\text{ nm}$ , $10\text{ kHz}$ ) $1.6\text{ }\mu\text{W}$ (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 $\varnothing 3.0\text{ mm}$ $320 - 1060\text{ nm}$ $0.59\text{ A/W typ.}$ (@ $920\text{ nm}$ )
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) $30\text{ mA}$ (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 $1\text{ MHz}$ )
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	$212\text{ g}$ ( $0.47\text{ lbs}$ ) LCA-S-400K-SI-FST incl. coupler ring $195\text{ g}$ ( $0.43\text{ lbs}$ ) 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	$10\text{ mW}$ $\pm 20\text{ V}$

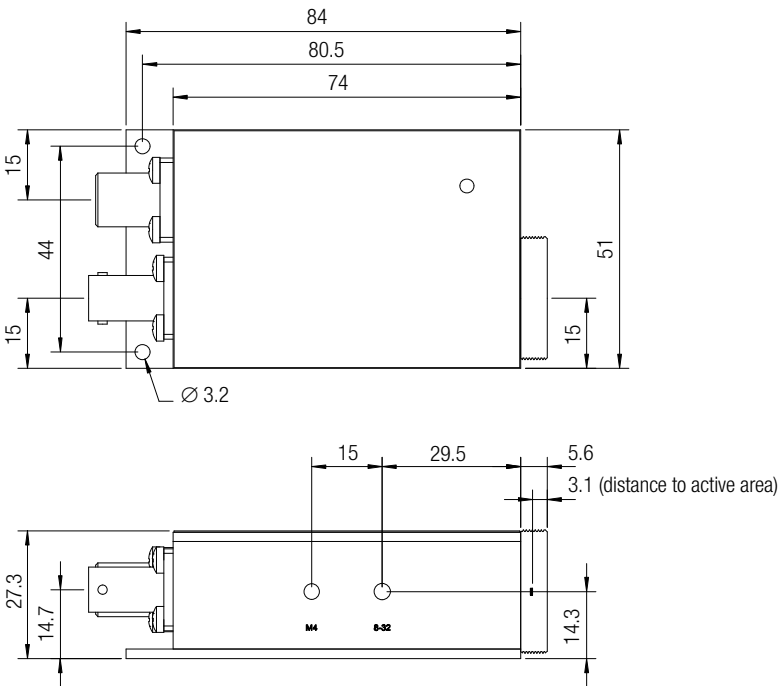
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Connectors	<div>Input</div> <div>LCA-S-400K-SI-FST</div> <div>1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories</div> <div>LCA-S-400K-SI-FS</div> <div>25 mm dia. unthreaded flange for free space applications</div> <div>Output</div> <div>BNC jack (female)</div> <div>Power supply</div> <div>LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)</div> <div><div>Pin 1: +15 V Pin 2: -15 V Pin 3: GND</div></div>																				
Scope of Delivery	LCA-S-400K-SI, internally threaded coupler ring (FST version only), LEMO® 3-pin connector, datasheet, transport package																				
Ordering Information	<div>LCA-S-400K-SI-FST</div> <div>1.035"-40 threaded flange for free space applications and for use with various types of optical standard accessories.</div> <div>LCA-S-400K-SI-FS</div> <div>25 mm dia. unthreaded flange for free space applications.</div>																				
Spectral Responsivity	<div><table border="1"><caption>Photo Sensitivity Data</caption><thead><tr><th>Wavelength (nm)</th><th>Photo Sensitivity (A/W)</th></tr></thead><tbody><tr><td>300</td><td>0.1</td></tr><tr><td>400</td><td>0.15</td></tr><tr><td>500</td><td>0.3</td></tr><tr><td>600</td><td>0.4</td></tr><tr><td>700</td><td>0.48</td></tr><tr><td>800</td><td>0.55</td></tr><tr><td>900</td><td>0.6</td></tr><tr><td>1000</td><td>0.4</td></tr><tr><td>1100</td><td>0.1</td></tr></tbody></table></div> <div>DB-Sens-LCA-S-400K-SI_R01</div>	Wavelength (nm)	Photo Sensitivity (A/W)	300	0.1	400	0.15	500	0.3	600	0.4	700	0.48	800	0.55	900	0.6	1000	0.4	1100	0.1
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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

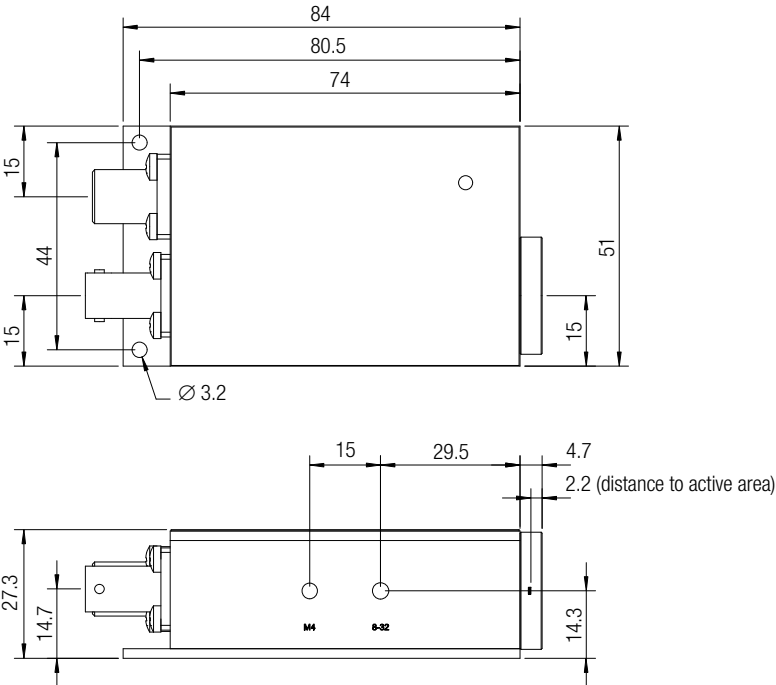
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Dimensions (continued)

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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