

# 400 MHz Photoreceiver with Si PIN Photodiode



The picture shows the HCA-S-400M-SI-FS with free space input. The photoreceiver will be delivered without post holder and post.

<p>Features</p>	<ul style="list-style-type: none"> <li>• <b>Si PIN Detector, 0.8 mm Active Diameter</b></li> <li>• <b>Spectral Range 320 ... 1000 nm</b></li> <li>• <b>Bandwidth DC ... 400 MHz</b></li> <li>• <b>Amplifier Transimpedance (Gain) <math>5.0 \times 10^3</math> V/A</b></li> <li>• <b>Max. Conversion Gain <math>2.7 \times 10^3</math> V/W @ 800 nm</b></li> </ul>																																								
<p>Applications</p>	<ul style="list-style-type: none"> <li>• <b>Spectroscopy</b></li> <li>• <b>Fast Pulse and Transient Measurements</b></li> <li>• <b>Optical Triggering</b></li> <li>• <b>Optical Front-End for Oscilloscopes and A/D Converters</b></li> </ul>																																								
<p>Specifications</p>	<table border="0" style="width: 100%;"> <tr> <td colspan="2" style="text-align: left;"><i>Test Conditions</i></td> <td style="text-align: right;"><i>V<sub>s</sub> = ± 15 V, T<sub>a</sub> = 25°C</i></td> </tr> <tr> <td style="vertical-align: top;">Gain</td> <td>Transimpedance</td> <td style="text-align: right;"><math>5.0 \times 10^3</math> V/A (@ 50 Ω load)</td> </tr> <tr> <td></td> <td>Max. Conversion Gain</td> <td style="text-align: right;"><math>2.7 \times 10^3</math> V/W (@ 800 nm)</td> </tr> <tr> <td style="vertical-align: top;">Frequency Response</td> <td>Lower Cut-Off Frequency</td> <td style="text-align: right;">DC</td> </tr> <tr> <td></td> <td>Upper Cut-Off Frequency (- 3 dB)</td> <td style="text-align: right;">400 MHz (± 10 %)</td> </tr> <tr> <td></td> <td>Rise/Fall Time (10% - 90%)</td> <td style="text-align: right;">1.0 ns</td> </tr> <tr> <td></td> <td>Gain Flatness</td> <td style="text-align: right;">± 1 dB</td> </tr> <tr> <td style="vertical-align: top;">Detector</td> <td>Detector Material</td> <td style="text-align: right;">Si PIN photodiode</td> </tr> <tr> <td></td> <td>Active Area</td> <td style="text-align: right;">Ø 0.8 mm</td> </tr> <tr> <td></td> <td>Spectral Response</td> <td style="text-align: right;">320 ... 1000 nm</td> </tr> <tr> <td style="vertical-align: top;">Input</td> <td>Input Offset Compensation Range</td> <td style="text-align: right;">± 200 µA adjustable by offset trimpot</td> </tr> <tr> <td></td> <td>Optical Saturation Power</td> <td style="text-align: right;">400 µW (for linear amplification, @ 800 nm)</td> </tr> <tr> <td></td> <td>Min. NEP</td> <td style="text-align: right;">40 pW/√Hz (@ 800 nm, 100 MHz)</td> </tr> </table>		<i>Test Conditions</i>		<i>V<sub>s</sub> = ± 15 V, T<sub>a</sub> = 25°C</i>	Gain	Transimpedance	$5.0 \times 10^3$ V/A (@ 50 Ω load)		Max. Conversion Gain	$2.7 \times 10^3$ V/W (@ 800 nm)	Frequency Response	Lower Cut-Off Frequency	DC		Upper Cut-Off Frequency (- 3 dB)	400 MHz (± 10 %)		Rise/Fall Time (10% - 90%)	1.0 ns		Gain Flatness	± 1 dB	Detector	Detector Material	Si PIN photodiode		Active Area	Ø 0.8 mm		Spectral Response	320 ... 1000 nm	Input	Input Offset Compensation Range	± 200 µA adjustable by offset trimpot		Optical Saturation Power	400 µW (for linear amplification, @ 800 nm)		Min. NEP	40 pW/√Hz (@ 800 nm, 100 MHz)
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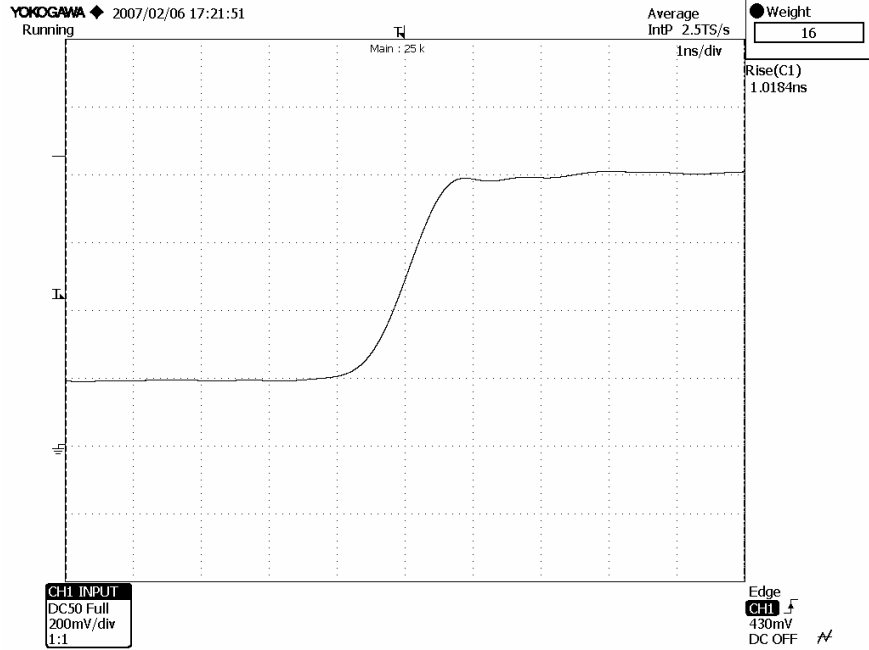




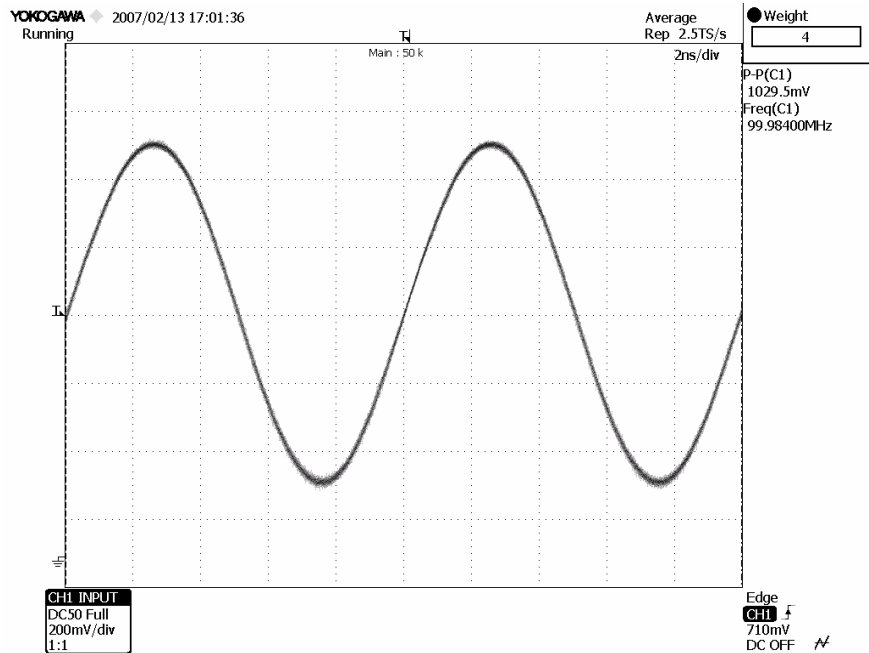
# 400 MHz Photoreceiver with Si PIN Photodiode

Typical Performance Characteristics (continued)

Pulse Response to Square Wave Input Signal (with 16 times averaging)



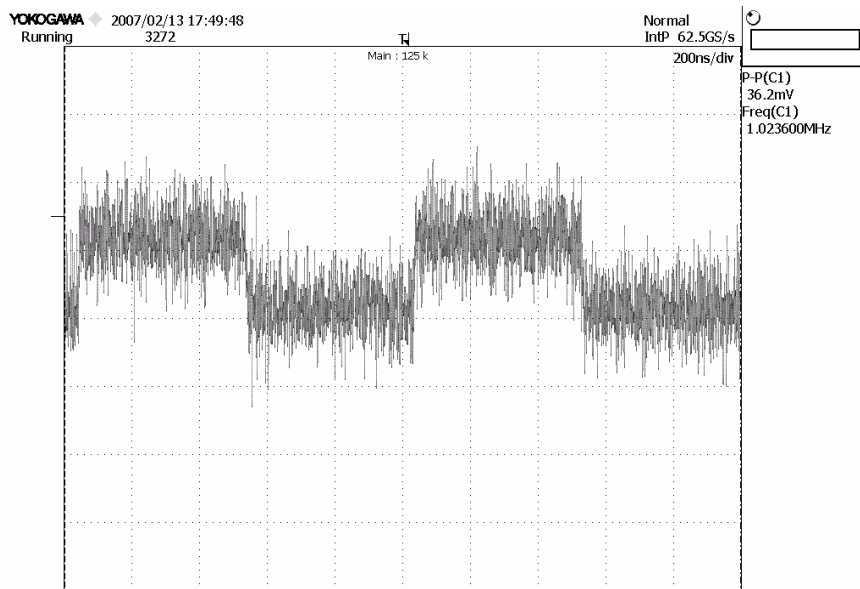
Large Signal Response  
output signal for 100 MHz, 370  $\mu$ W modulated optical input signal (with 4 times averaging)



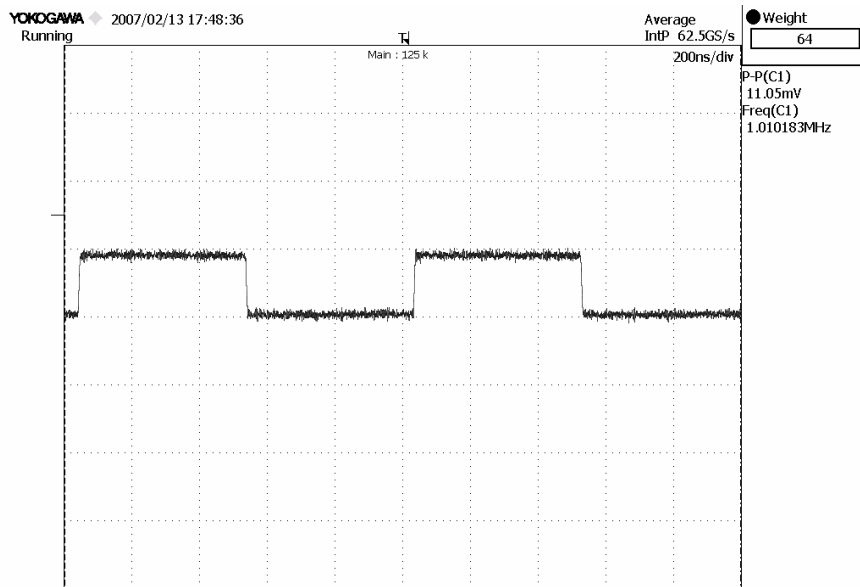
# 400 MHz Photoreceiver with Si PIN Photodiode

Typical Performance Characteristics (continued)

Small Signal Response  
output signal for 3.7  $\mu$ W modulated optical input signal, 1 MHz square wave (without (top) and with 64 times averaging (bottom))



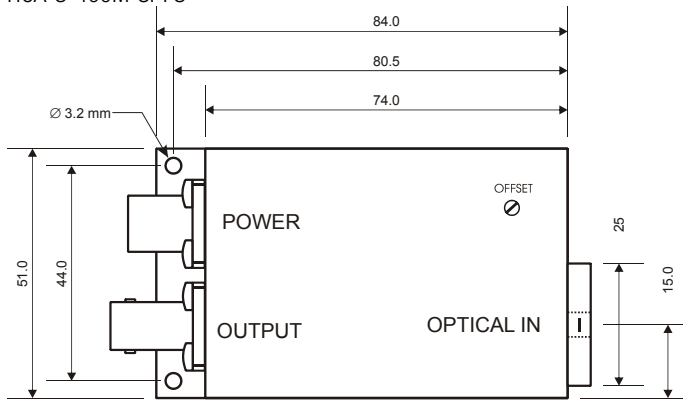
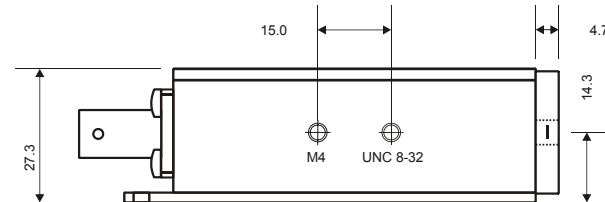
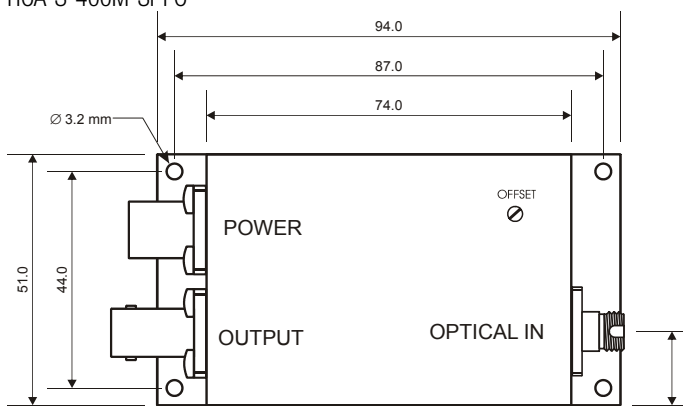
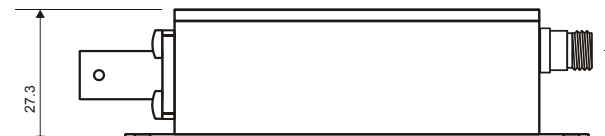
CH1 INPUT  
DC50 Full  
10.0mV/div  
1:1



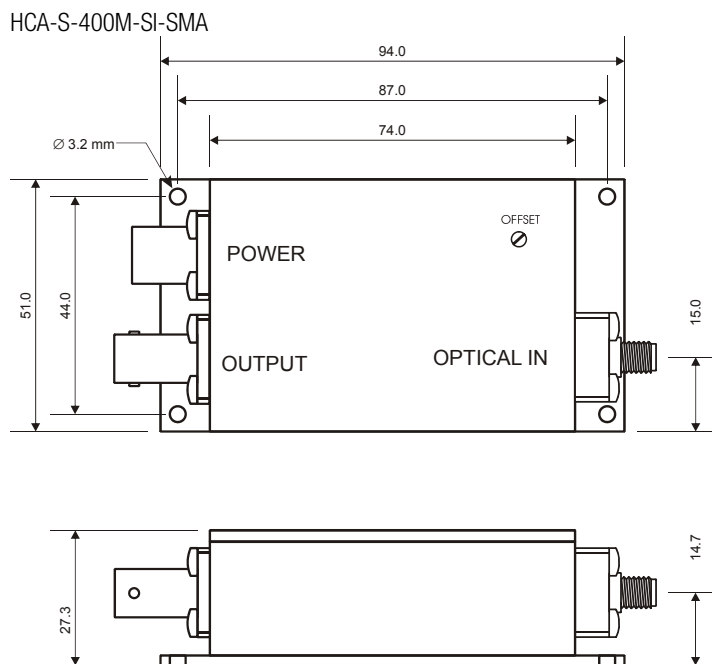
CH1 INPUT  
DC50 Full  
10.0mV/div  
1:1

# 400 MHz Photoreceiver with Si PIN Photodiode

Available Models	HCA-S-400M-SI-FS HCA-S-400M-SI-FC HCA-S-400M-SI-SMA HCA-S	free space input FC fiber optic receptacle SMA fiber optic receptacle customized versions available on request
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Dimensions	<p><b>HCA-S-400M-SI-FS</b></p>   <p>all measures in mm unless otherwise noted      DZ-HCA-S-FS_R2</p> <p><b>HCA-S-400M-SI-FC</b></p>   <p>all measures in mm unless otherwise noted      DZ-HCA-S-FC_R4</p>	
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### 400 MHz Photoreceiver with Si PIN Photodiode



all measures in mm unless otherwise noted

DZ-HCA-S-SMA\_R2

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