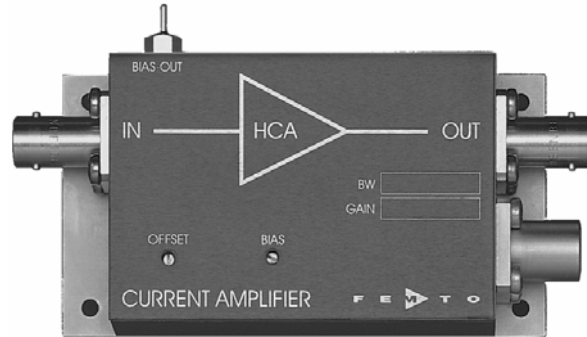




Datasheet

HCA-400M-5K-C

High Speed Current Amplifier



Features	<ul style="list-style-type: none"> • Bandwidth DC ... 400 MHz • Rise / Fall Time 1 ns • Exceptional Low Pulse Distortion – Almost No Overshoot or Ringing will Occur • Approx. Bessel Characteristic Optimized for Accurate Pulse Response • Transimpedance (Gain) 5×10^3 V/A 																																																				
Applications	<ul style="list-style-type: none"> • Photodiode and Photomultiplier Amplifier • Spectroscopy • Ionisation Detectors • Ideal for Analyzing Digital Signals (No Baseline Shift at any Digital Code) • Preamplifier for A/D Converters, Digitizers etc. 																																																				
Specifications	<table border="0"> <tr> <td></td> <td><i>Test Conditions</i></td> <td><i>Vs = ± 15 V, Ta = 25°C</i></td> </tr> <tr> <td rowspan="2">Gain</td> <td>Transimpedance</td> <td>5×10^3 V/A (@ 50 Ω load)</td> </tr> <tr> <td>Gain Accuracy</td> <td>± 2 %</td> </tr> <tr> <td rowspan="5">Frequency Response</td> <td>Lower Cut-Off Frequency</td> <td>DC</td> </tr> <tr> <td>Upper Cut-Off Frequency (- 3 dB)</td> <td>400 MHz (± 10 %, @ Csource 2 to 4 pF)</td> </tr> <tr> <td></td> <td>350 MHz (± 10 %, @ Csource 5 to 10 pF)</td> </tr> <tr> <td>Max. Source Capacitance</td> <td>10 pF (incl. cable, e.g. typical coax cable 1 pF/ cm)</td> </tr> <tr> <td>Rise / Fall Time (10 % - 90 %)</td> <td>1.0 ns (@ Csource 2 to 4 pF)</td> </tr> <tr> <td rowspan="10">Input</td> <td></td> <td>1.3 ns (@ Csource 5 to 10 pF)</td> </tr> <tr> <td>Gain Flatness</td> <td>± 0.3 dB</td> </tr> <tr> <td>Equ. Input Noise Current</td> <td>21 pA/√Hz (@ 100 MHz)</td> </tr> <tr> <td>Equ. Input Noise Voltage</td> <td>3.5 nV/√Hz (@ 100 MHz)</td> </tr> <tr> <td>Equ. Integrated Noise</td> <td>5 μA peak-peak (independent of Csource)</td> </tr> <tr> <td>Input Bias Current</td> <td>2 μA typ.</td> </tr> <tr> <td>Input Bias Current Drift</td> <td>0.07 μA / °C</td> </tr> <tr> <td>Offset Current Compensation</td> <td>± 200 μA, adjustable by offset trimpot</td> </tr> <tr> <td>Input Current Range</td> <td>± 200 μA (for linear amplification)</td> </tr> <tr> <td>Input Offset Voltage</td> <td>< 2 mV</td> </tr> <tr> <td>DC Input Impedance</td> <td>50 Ω (virtual) // 5 pF</td> </tr> <tr> <td rowspan="3">Output</td> <td>Output Voltage Range</td> <td>± 1.0 V (@ 50 Ω load) for linear operation and low harmonic distortion</td> </tr> <tr> <td>Max. Output Voltage Range</td> <td>± 1.5 V (@ 50 Ω load)</td> </tr> <tr> <td>Output Impedance</td> <td>50 Ω (terminate with 50 Ω load for best performance)</td> </tr> <tr> <td>Bias Output</td> <td colspan="2"> SUNSTAR自动化 http://www.sensor-ic.com/ TEL: 0755-83376489 FAX:0755-83376182 E-MAIL:szss20@163.com Bias Output Voltage Range ± 12 V, adjustable by bias trimpot Bias Output Impedance 10 kΩ // 1 μF </td> </tr> </table>		<i>Test Conditions</i>	<i>Vs = ± 15 V, Ta = 25°C</i>	Gain	Transimpedance	5×10^3 V/A (@ 50 Ω load)	Gain Accuracy	± 2 %	Frequency Response	Lower Cut-Off Frequency	DC	Upper Cut-Off Frequency (- 3 dB)	400 MHz (± 10 %, @ Csource 2 to 4 pF)		350 MHz (± 10 %, @ Csource 5 to 10 pF)	Max. Source Capacitance	10 pF (incl. cable, e.g. typical coax cable 1 pF/ cm)	Rise / Fall Time (10 % - 90 %)	1.0 ns (@ Csource 2 to 4 pF)	Input		1.3 ns (@ Csource 5 to 10 pF)	Gain Flatness	± 0.3 dB	Equ. Input Noise Current	21 pA/√Hz (@ 100 MHz)	Equ. Input Noise Voltage	3.5 nV/√Hz (@ 100 MHz)	Equ. Integrated Noise	5 μA peak-peak (independent of Csource)	Input Bias Current	2 μA typ.	Input Bias Current Drift	0.07 μA / °C	Offset Current Compensation	± 200 μA, adjustable by offset trimpot	Input Current Range	± 200 μA (for linear amplification)	Input Offset Voltage	< 2 mV	DC Input Impedance	50 Ω (virtual) // 5 pF	Output	Output Voltage Range	± 1.0 V (@ 50 Ω load) for linear operation and low harmonic distortion	Max. Output Voltage Range	± 1.5 V (@ 50 Ω load)	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)	Bias Output	SUNSTAR自动化 http://www.sensor-ic.com/ TEL: 0755-83376489 FAX:0755-83376182 E-MAIL:szss20@163.com Bias Output Voltage Range ± 12 V, adjustable by bias trimpot Bias Output Impedance 10 kΩ // 1 μF	
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Datasheet

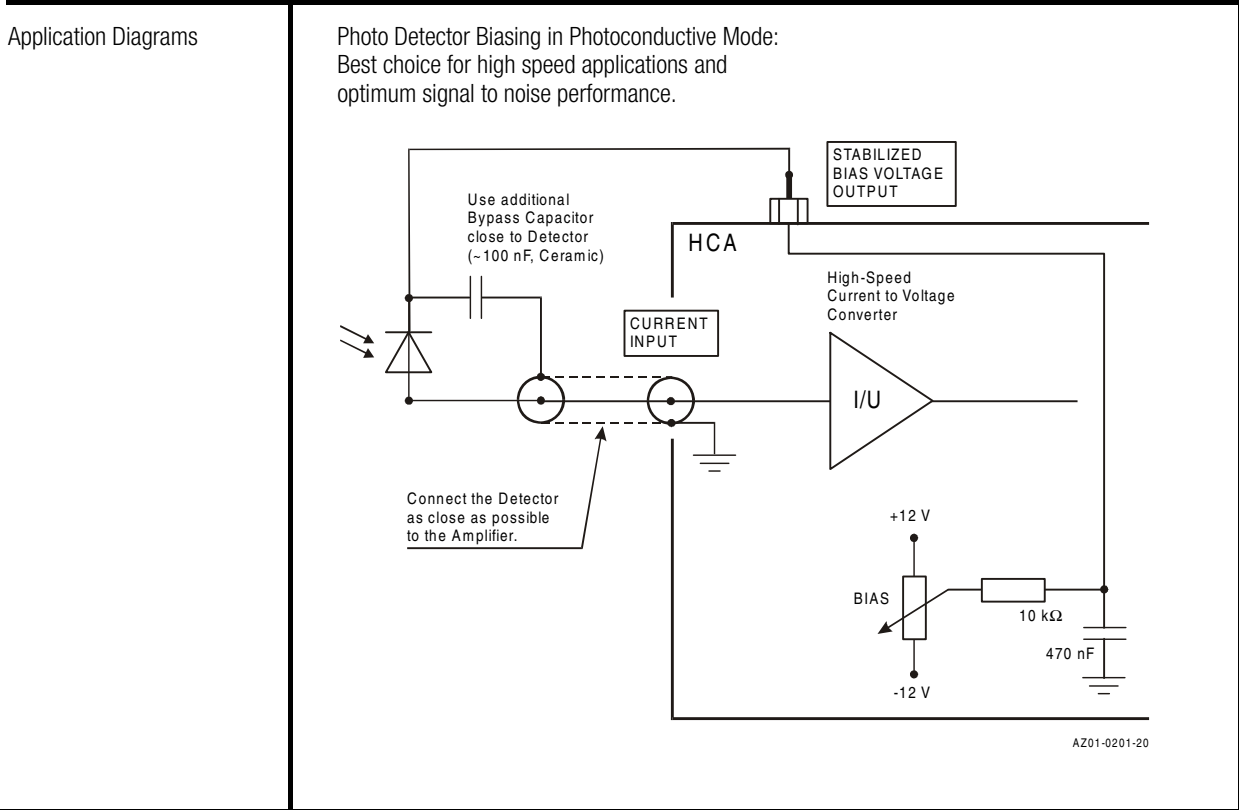
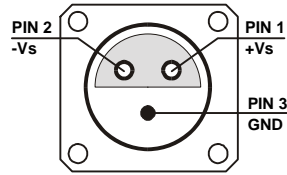
HCA-400M-5K-C

High Speed Current Amplifier

Specifications (continued)		
Power Supply	Supply Voltage	$\pm 15\text{ V}$
	Supply Current	$\pm 60\text{ mA typ.}$ (depends on operating conditions, recommended power supply capability minimum $\pm 150\text{ mA}$)
Case	Weight	210 g (0.5 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage Temperature	$-40 \dots +100\text{ }^\circ\text{C}$
	Operating Temperature	$0 \dots +60\text{ }^\circ\text{C}$

Absolute Maximum Ratings	Input Voltage	$\pm 5\text{ V}$
	Power Supply Voltage	$\pm 22\text{ V}$

Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket
		Pin 1: $+15\text{ V}$
		Pin 2: -15 V
		Pin 3: GND

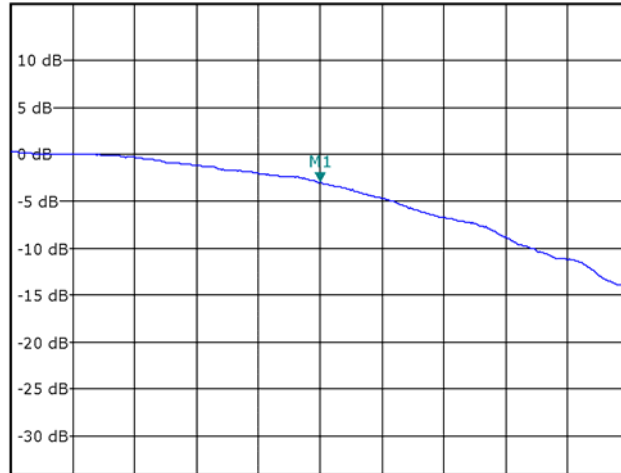


High Speed Current Amplifier

Typical Performance Characteristics

Frequency Response

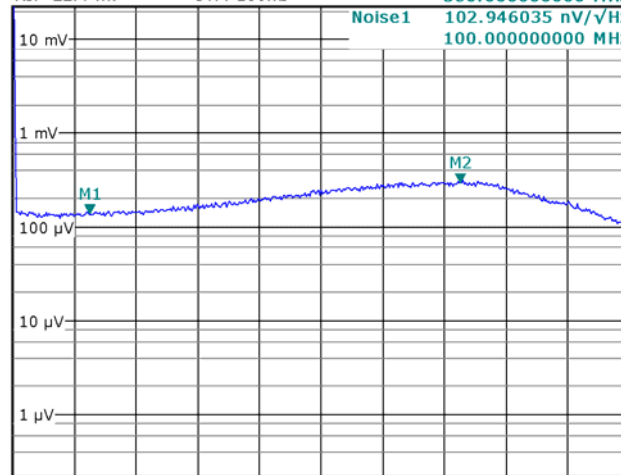
Offs 16.0 dB RBW 3 MHz
 Att 0 dB * VBW 10 kHz M1[1] -2.94 dB
 Ref -4.0 dBm SWT 130ms 410.000000000 MHz



Start 20.0 MHz Stop 800.0 MHz

Noise Spectrum

Att 0 dB RBW 3 MHz
 Ref 22.4 mV * VBW 3 kHz Noise2 219.730591 nV/√Hz
 SWT 180ms Noise1 102.946035 nV/√Hz



Start 0.0 Hz Stop 800.0 MHz

Note: Spectral noise data is measured at the amplifier output with open but shielded input. To determine the spectral input noise divide the measured output noise by the amplifier gain of 5×10^3 V/A, i.e.:

Marker	Frequency	Output Noise	Resulting Input Noise
1	100 MHz	103 nV/√Hz	21 pA√Hz
2	580 MHz	220 nV/√Hz	44 pA√Hz

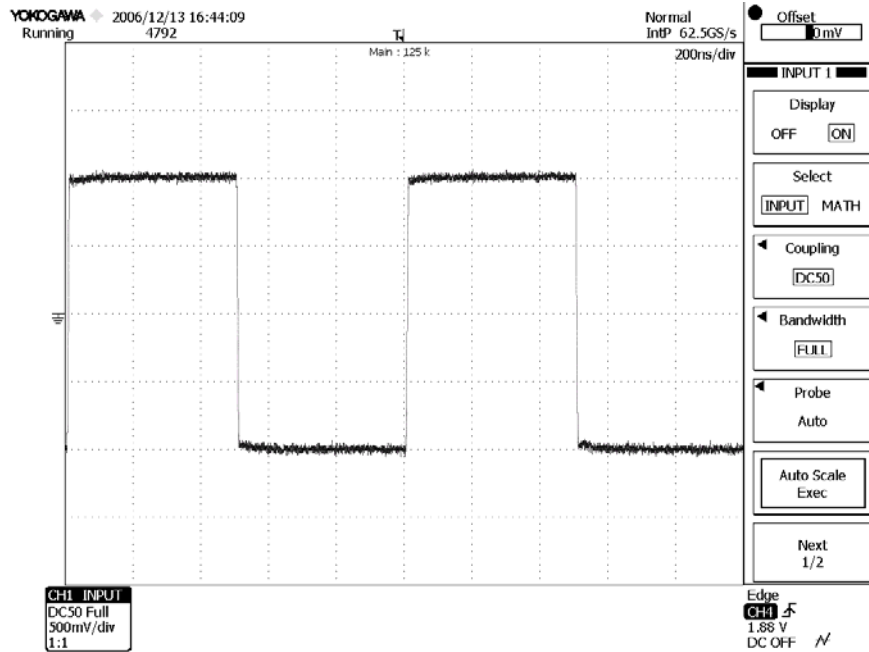
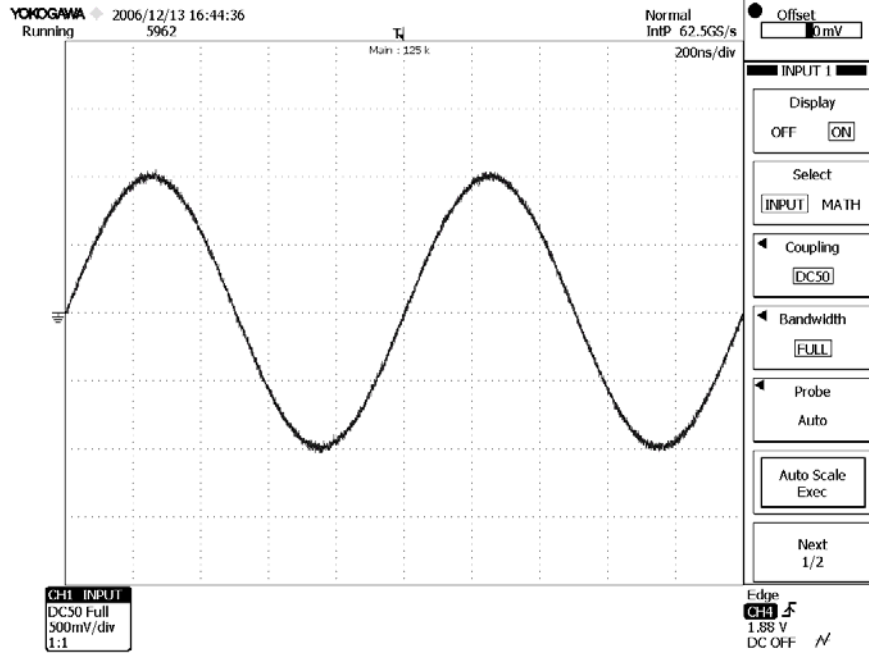
Datasheet

HCA-400M-5K-C

High Speed Current Amplifier

Typical Performance Characteristics
(continued)

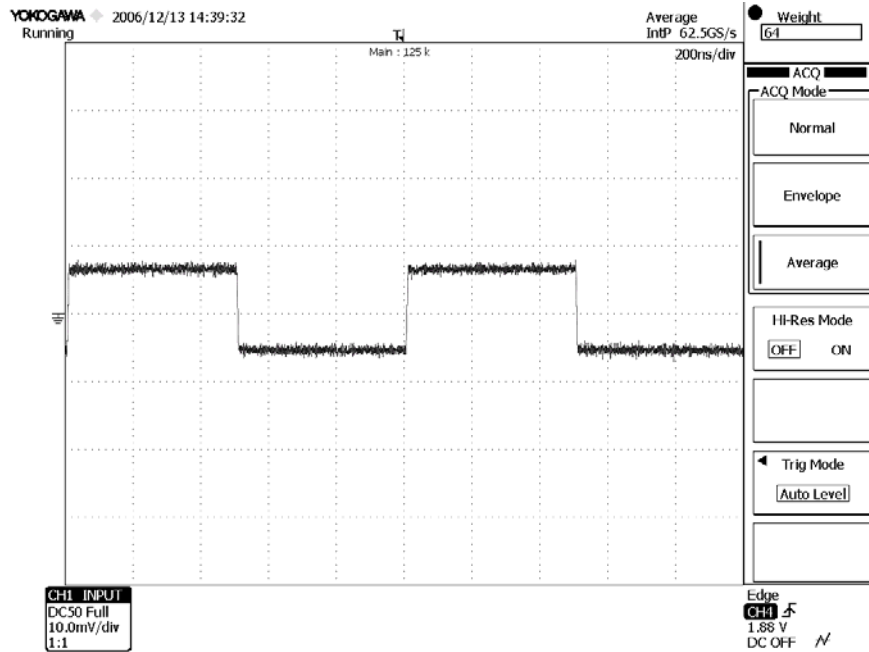
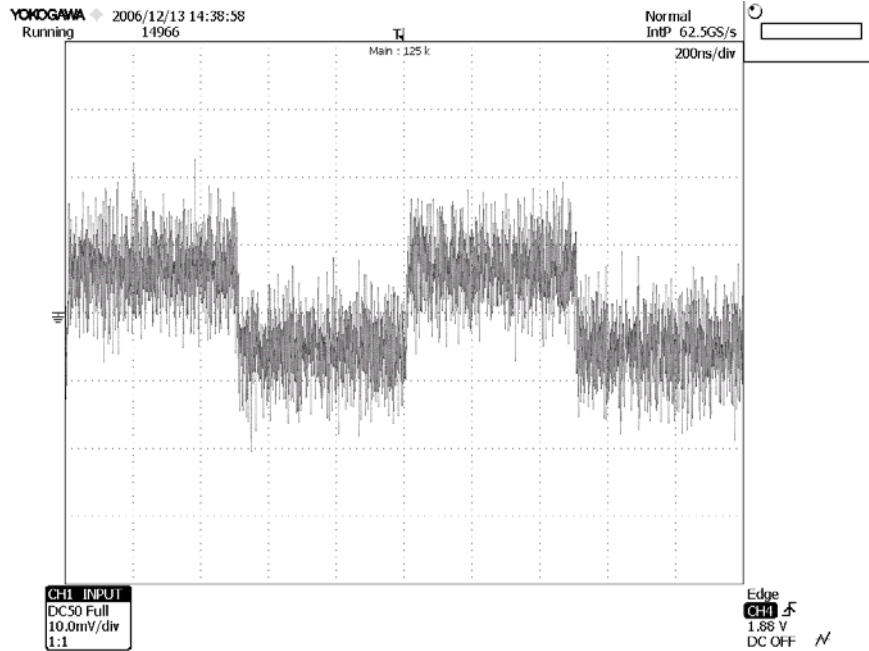
Output signal for 1 MHz, 400 μ A peak-peak input signal (sinusoidal and square wave)



High Speed Current Amplifier

Typical Performance Characteristics (continued)

Output signal for 1MHz, 2.4 μ A peak-peak square wave input signal (without and with 64 times averaging)



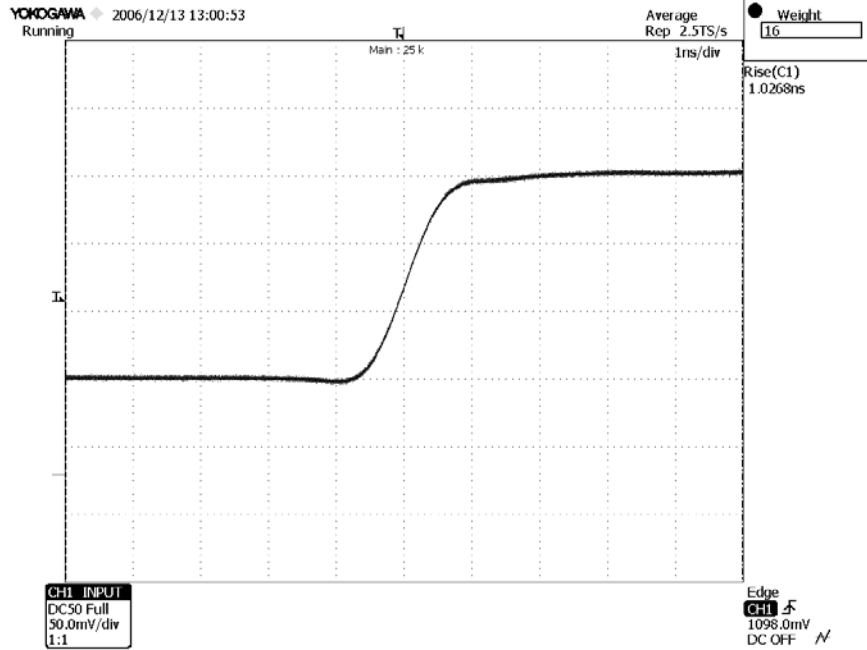
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HCA-400M-5K-C

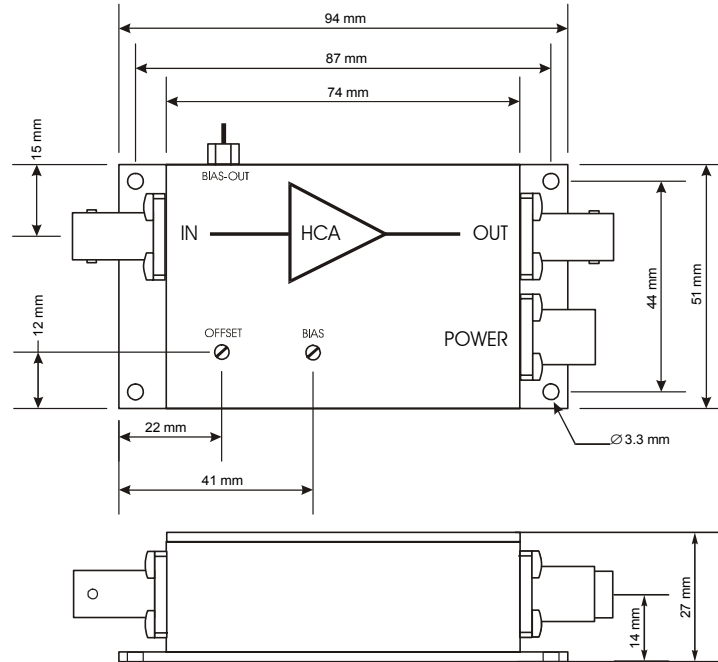
High Speed Current Amplifier

Typical Performance Characteristics (continued)

Pulse response for square wave input signal (16 times averaged)



Dimensions



D201-0201-22

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SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

