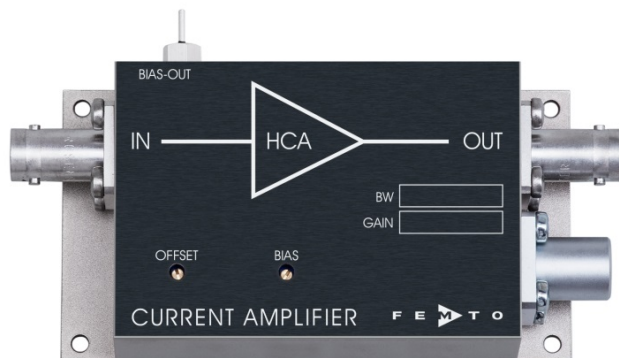


# High-Speed Current Amplifier



Features	<ul style="list-style-type: none"> <li>• <b>Bandwidth DC ... 200 MHz</b></li> <li>• <b>Transimpedance (Gain) <math>2 \times 10^4</math> V/A</b></li> <li>• <b>Suitable for Source Capacitance up to 8 pF</b></li> <li>• <b>Low Equivalent Input Noise Current of 4.9 pA/<math>\sqrt{\text{Hz}}</math></b></li> </ul>	
Applications	<ul style="list-style-type: none"> <li>• <b>Photodiode and Photomultiplier Amplifier</b></li> <li>• <b>Spectroscopy</b></li> <li>• <b>Charge Amplifier</b></li> <li>• <b>Ionisation Detectors</b></li> <li>• <b>Preamplifier for Lock-Ins, A/D Converters, etc.</b></li> </ul>	
Specifications	Test Conditions	$V_s = \pm 15$ V, $T_a = 25^\circ\text{C}$
Gain	Transimpedance	$2 \times 10^4$ V/A (@ 50 $\Omega$ load)
	Gain Accuracy	$\pm 2$ %
Frequency Response	Lower Cut-Off Frequency	DC
	Upper Cut-Off Frequency (- 3 dB)	200 MHz ( $\pm 10$ %, @ $C_{\text{source}}$ 2 to 4 pF)
		170 MHz ( $\pm 10$ %, @ $C_{\text{source}}$ 5 to 8 pF)
	Max. Source Capacitance	8 pF (incl. cable, e.g. typical coax cable 1 pF/cm)
	Rise / Fall Time (10 % - 90 %)	1.9 ns (@ $C_{\text{source}}$ 2 to 4 pF)
		2.2 ns (@ $C_{\text{source}}$ 5 to 8 pF)
	Gain Flatness	$\pm 0.3$ dB
Input	Equ. Input Noise Current	4.9 pA/ $\sqrt{\text{Hz}}$ (@ 10 MHz)
	Equ. Input Noise Voltage	0.9 nV/ $\sqrt{\text{Hz}}$ (@ 10 MHz)
	Equ. Integrated Noise	1.0 $\mu\text{A}$ peak-peak
	Input Bias Current	12 $\mu\text{A}$ typ.
	Input Bias Current Drift	3 nA / $^\circ\text{C}$
	Offset Current Compensation	$\pm 100$ $\mu\text{A}$ adjustable by offset trimpot
	Input Current Range	$\pm 60$ $\mu\text{A}$ (for linear amplification)
	Input Offset Voltage	< 1 mV
	DC Input Impedance	56 $\Omega$ (virtual) // 5 pF
Output	Output Voltage Range	$\pm 1.2$ V (@ 50 $\Omega$ load) for linear operation and low harmonic distortion
	Max. Output Voltage Range	$\pm 1.7$ V (@ 50 $\Omega$ load)
	Output Impedance	50 $\Omega$ (terminate with 50 $\Omega$ load for best performance)
Bias Output	Bias Output Voltage Range	$\pm 12$ V, adjustable by bias trimpot
	Bias Output Impedance	10 k $\Omega$ // 1 $\mu\text{F}$

## High-Speed Current Amplifier

### Specifications (continued)

#### Power Supply

Supply Voltage  $\pm 15\text{ V}$   
 Supply Current  $\pm 50\text{ mA typ.}$   
 (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

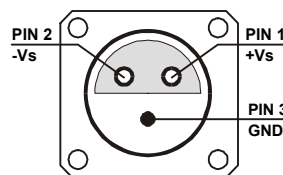
Storage Temperature  $-40 \dots +100\text{ }^{\circ}\text{C}$   
 Operating Temperature  $0 \dots +60\text{ }^{\circ}\text{C}$

### Absolute Maximum Ratings

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

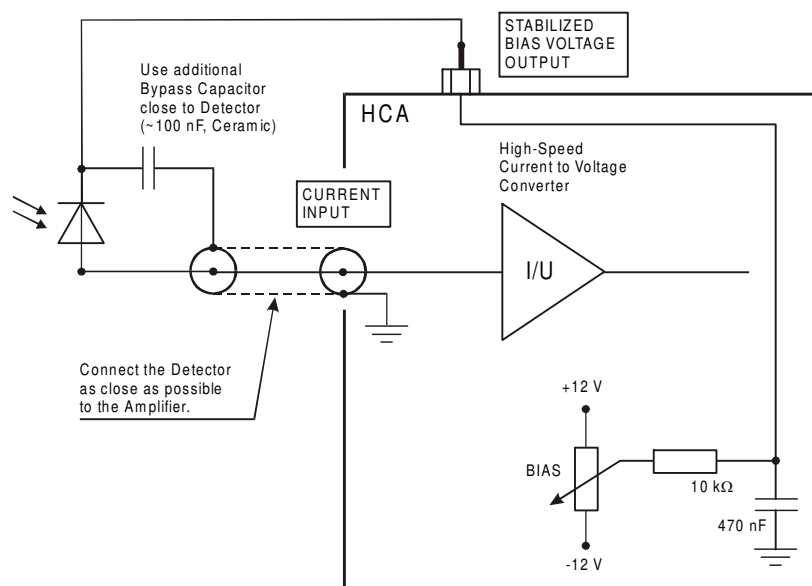
### Connectors

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



### Application Diagrams

Photo Detector Biasing in Photoconductive Mode:  
 Best choice for high speed applications and optimum signal to noise performance.

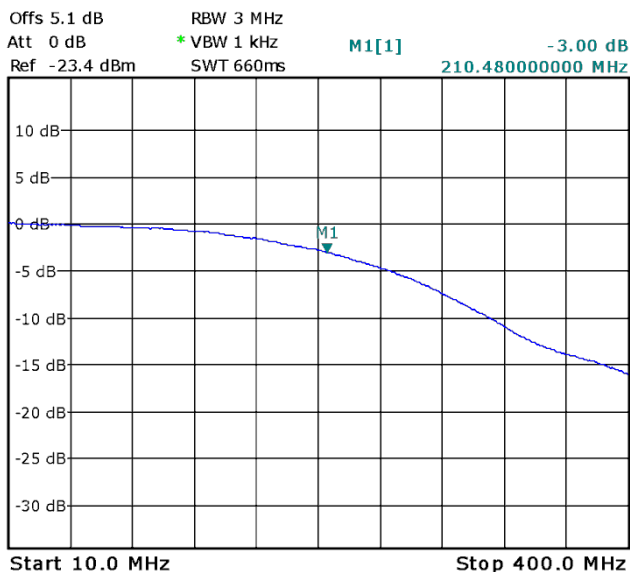


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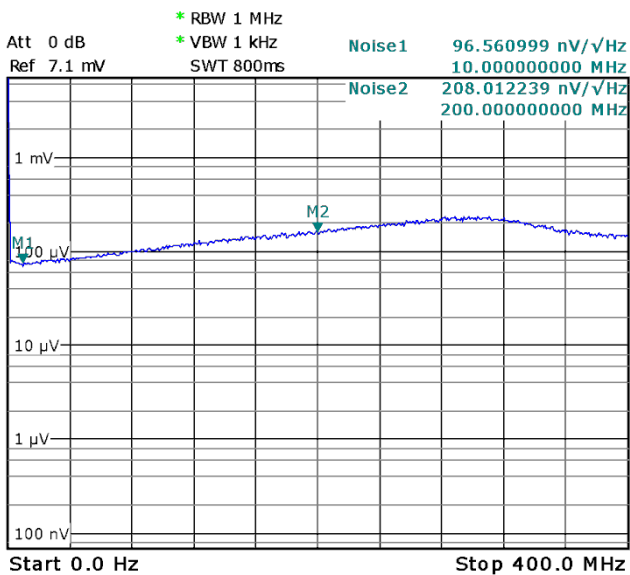
# High-Speed Current Amplifier

## Typical Performance Characteristics

### Frequency Response



### Noise Spectrum



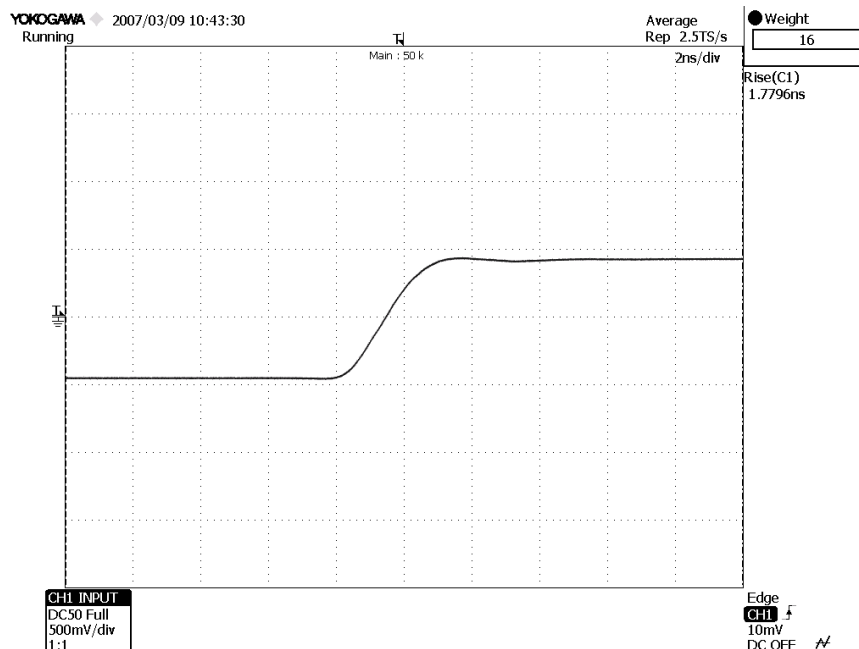
Note: Spectral noise data is measured at the amplifier output with open but shielded input. To determine the spectral input noise divide the measured output noise by the amplifier gain of  $2 \times 10^4$  V/A, i.e.:

Marker	Frequency	Output Noise	Resulting Input Noise
1	10 MHz	97 nV/√Hz	4.9 pA/√Hz
2	200 MHz	208 nV/√Hz	10.4 pA/√Hz

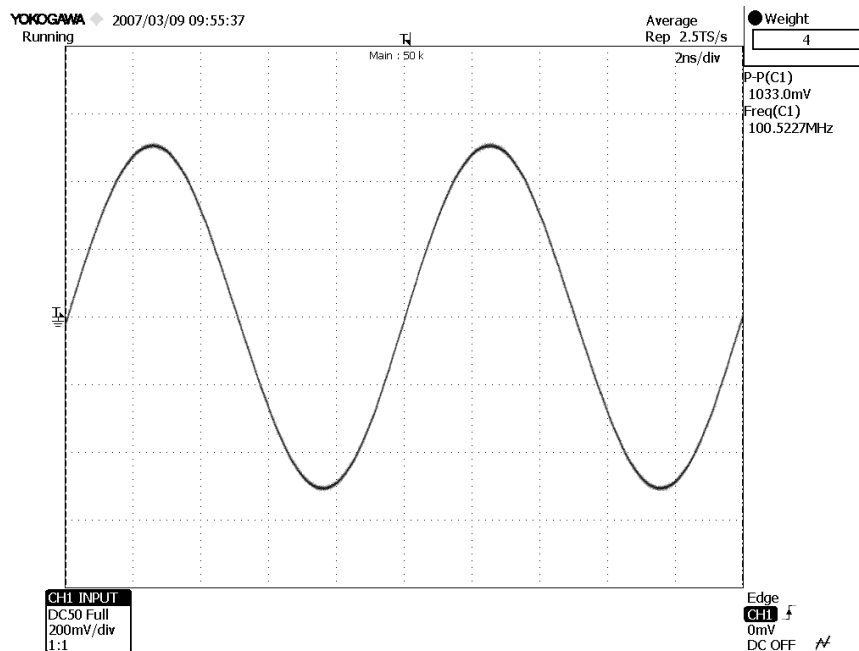
## High-Speed Current Amplifier

Typical Performance  
Characteristics  
(continued)

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



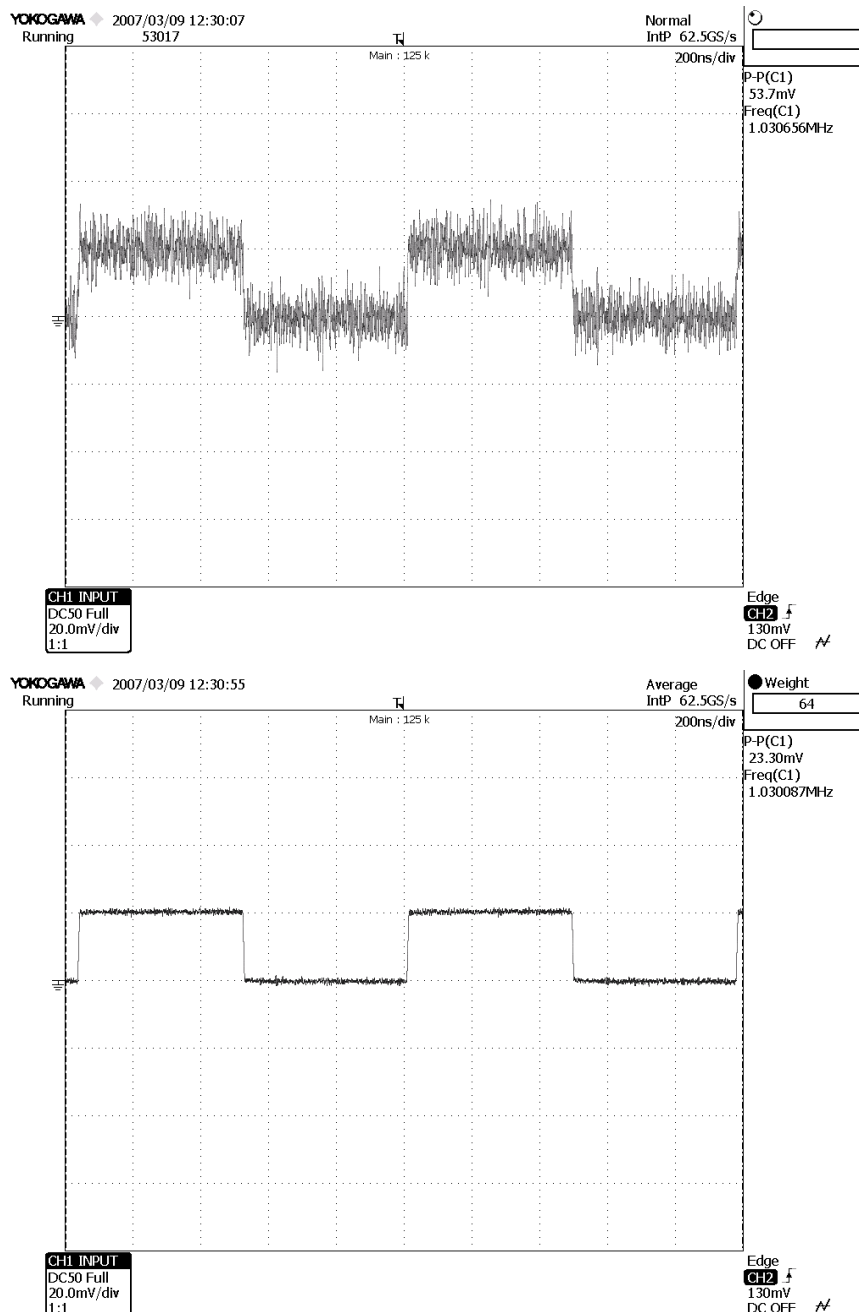
Large Signal Response  
output signal for 100 MHz, 50  $\mu$ A peak-peak input signal  
(with 4 times averaging)



# High-Speed Current Amplifier

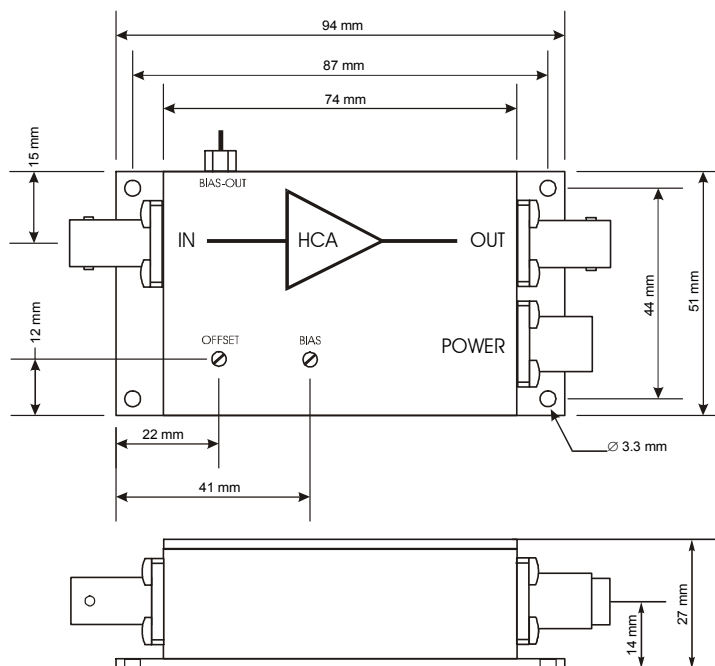
Typical Performance  
Characteristics  
(continued)

Small Signal Response  
output signal for 1 MHz, 1  $\mu$ A peak-peak square wave input signal  
(without (top) and with 64 times averaging (bottom))



# High-Speed Current Amplifier

## Dimensions



DZ01-0201-22

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