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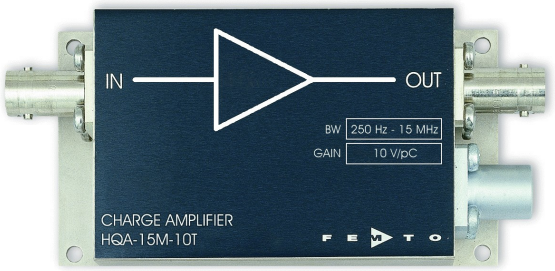
Preliminary Datasheet HQA-15M-10T

High Frequency Charge Amplifier



Features

- **High Gain of 10 V/pC**
- **Wide Operating Range from 250 Hz to 15 MHz**
- **Low Input Noise of 40 x 10^{-21} C/√Hz and 700 pV/√Hz**
- **Optimized for Sinusoidal Signals from AC Coupled Charge Sources**

Applications

- **Pyro- and Piezoelectric Detectors**
- **Tuning Fork Quartz Crystals**
- **Length Extension Resonators**
- **Atomic Force Microscopy**
- **Optical Measurements**
- **Charged Particle Beam Monitoring**

Specifications

	Test Conditions	*Vs = ± 15 V, Ta = 25°C*	
Gain	Charge Gain	10^{13} V/C	
	Equivalent Current Gain	1.6 x 10^{6} V/A	(@ 1 MHz sinusoidal input signal)
	Gain Accuracy	± 3 %	
Bandwidth	Lower Cut-Off Frequency (-3 dB)	250 Hz	
	Upper Cut-Off Frequency (-3 dB)	15 MHz	(with max. 100 pF source capacitance)
Input	Input Impedance	1 GΩ // 10 nF	
	Effective AC Input Impedance	20 Ω @ 1MHz	
	Input Charge Noise	40 x 10^{-21} C/√Hz	(with open input)
		90 x 10^{-21} C/√Hz	(with 100 pF source capacitance)
	Equivalent Input Current Noise	250 fA/√Hz	(with open input)
	(@ 1 MHz sinusoidal input signal)	570 fA/√Hz	(with 100 pF source capacitance)
	Input Voltage Noise	700 pV/√Hz	(@ 1 MHz)
	Max. Input Charge	1 pC peak-peak	
Output	Output Voltage Range	10 V peak-peak	(@ ≥ 1 MΩ load, for linear operation)
	Output Impedance	50 Ω (terminate with ≥ 1 MΩ load for best performance)	
	Integrated Broadband Noise	typ. 20 mV peak-peak or 3.5 mV rms (@ ≥ 1 MΩ load)	
Power Supply	Supply Voltage	± 15 V	
	Supply Current	± 35 mA typ. (depends on operating conditions, recommended power supply capability min. ± 100 mA)	
Case	Weight	200 g (0.44 lb.)	
	Material	AlMg4.5Mn, nickel-plated	

Temperature Range	Storage Temperature	- 40 °C to +100 °C	
	Operating Temperature	+20 °C to +40 °C	

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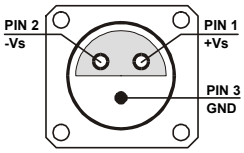
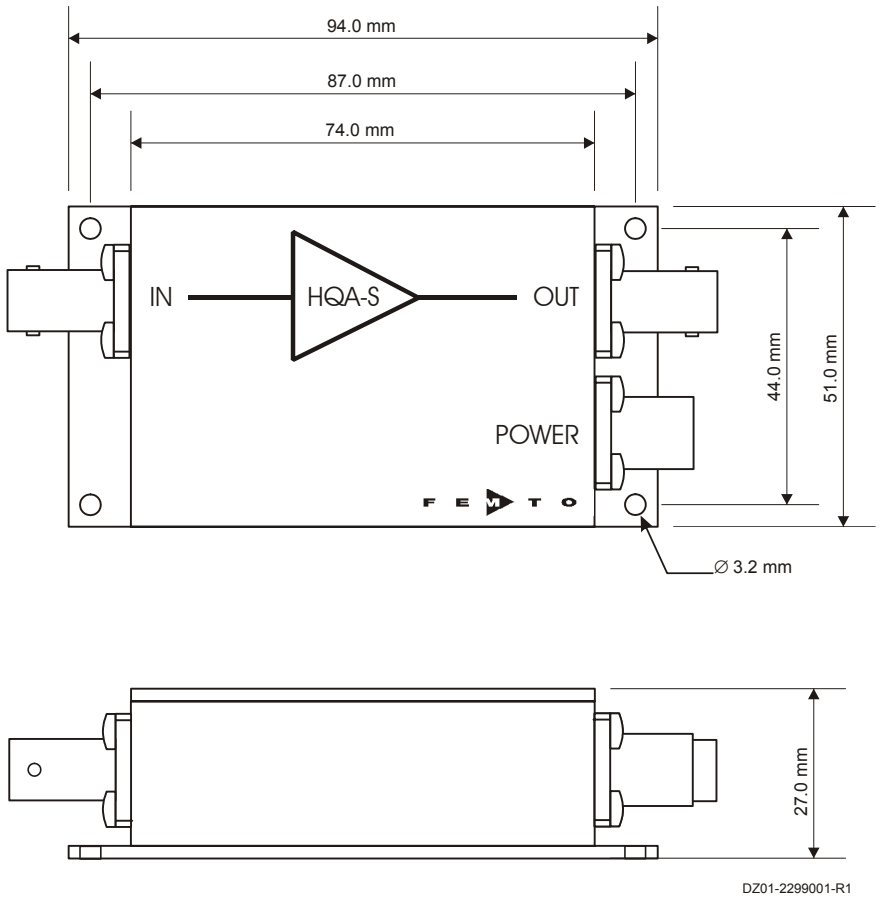
Absolute Maximum Ratings	Input Voltage Power Supply Voltage	20 V peak-peak ± 18 V
Connectors	Input	BNC
	Output	BNC
	Power Supply	LEMO series 1S, 3-pin fixed socket Pin 1: + 15V Pin 2: - 15V Pin 3: GND 
Operation	General: The amplifier is AC coupled for direct use with a charge sensor producing sinusoidal signals with no DC background. A source capacitance of less than 1 nF is recommended for proper operation. If the effective source capacitance (sensor plus cable capacitance) is small relative to the effective input impedance of the amplifier (10 nF) the amplifier acts as a virtual ground and most of the charge flows into the amplifier input. At 1 MHz the amplifier input capacitance of 10 nF corresponds to a complex input impedance of 20 Ω. An input resistor of 1 GΩ is incorporated to prevent buildup of static charge. The amplifier is not suited for sources producing an average DC background current as this would saturate the device.	

High Frequency Charge Amplifier

Dimensions



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