

Charge Amplifier for On-board applications (Champion-6B for Accelerometers)

Revision 2 – March 6th, 2014

Description

The charge amplifier is designed for monitoring accelerometer signals, especially in those applications where compactness is required (i.e. on-board vehicle and racing use).

The amplifier gain is selectable in 4 step by means of a rotary switch on the side of the unit. A dedicated software or interface is not needed.

The maximum range of the amplifier is 5000pC with output range $\pm 10V$ or $\pm 5V$.

The amplifier circuit is designed to minimize distortion and non-linearity while having a high signal bandwidth and low noise.

The amplifier nominal accuracy is $\pm 1\%$. Precise calibration constants are provided for each channel giving allowing for $\pm 0.1\%$ accuracy.

The amplifier housing is made of machined steel, designed to guarantee a reliable operation over time.

The sensor connectors and signal outputs are BNC type, dedicated or exotic cables are not required.

The power supply connector is a Switchcraft/Conxall Micro-Con-X (p/n 17282-3SG-300). The mating part is 1628x-3PG-3xx.

The device is conforming to EC according to the EC directive 2004/108/CE.

Absolute maximum ratings

	Min	Typical	Max
Supply voltage (low noise)	4.5Vdc	5Vdc/12Vdc	16Vdc
Temperature operating	-40°C	25°C	85°C
Temperature storage	-40°C	25°C	70°C
Power consumption		1.25W@5Vdc 3W@12Vdc	6W



Dimensions

110x100x30mm

Weight

340g

Technical data

Characteristic	Conditions		Value
Nominal measuring range	Full scale output	Range 1	5000pC ($\pm 5V$ output)
		Range 2	5000pC
		Range 3	2500pC
		Range 4	1250pC
Nominal sensitivity		Range 1	1mV/pC
		Range 2	2mV/pC
		Range 3	4mV/pC
		Range 4	8mV/pC
Output voltage range			$\pm 10V$ (Range 2,3,4) $\pm 5V$ (Range 1)
Output impedance			$\approx 20\Omega$
Time constant		25°C	0.5s
Small signal frequency response	100pC peak-to-peak input		180kHz
Large signal frequency response	1000pC peak-to-peak	Range 1	180kHz
		Range 2	170kHz
		Range 3	110kHz
		Range 4	60kHz
Group delay			3 μ s
Output noise	1Hz->400kHz		<1mV RMS
Equivalent output noise	1Hz->400kHz	Range 1	<0.5pC RMS typ.
		Range 2	<0.3pC RMS typ.
		Range 3	<0.2pC RMS typ.
		Range 4	<0.15pC RMS typ.
Accuracy	Nominal sensitivity		$\pm 1\%$
	Calibrated sensitivity		$\pm 0.1\%$

Frequency response

