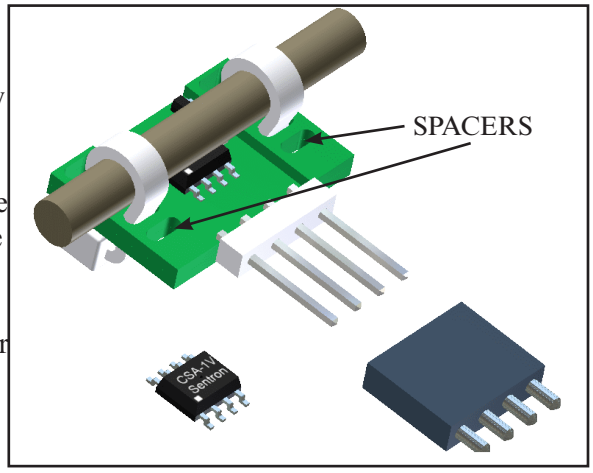
GMW

Clamp On Current Sensor, AN_119BKIT

The AN_119BKIT provides an easy method of evaluating the Sentron CSA-1VG current sensor IC in a configuration that can be strapped to conductors for medium to high current range measurements. The sensor measures the magnetic field created by the current flowing in the conductor and converts it to a voltage proportional to the current. The current measurement is sensitive to the position of the wire with respect to the conductor, therefore this kit configuration provides for two tie wraps to secure the wire to the PCB in a stable and consistent position. There are two sets of slots in the PCB to accommodate various conductor sizes.

The conductor can be mounted on top of the CSA-1VG sensor or on the bottom of the PCB. The latter will have less sensitivity and is suitable for higher currents.

The output voltage is dependant on the size of the conductor as well as the current flowing in the conductor and can be approximated by the following equation for a cylindrical conductor above the IC or below the PCB respectively.



AN_119BKIT with additional CSA-1V and mating connector

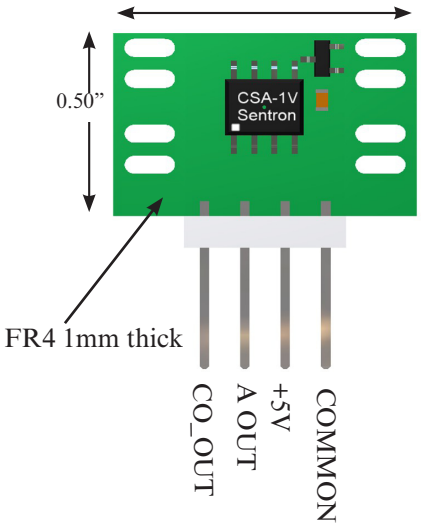
V_{out} ≈ 0.056 *I /(d+0.3mm) for wire mounted above the IC
V_{out} ≈ 0.056 *I /(d-0.3mm) for wire mounted below the PCB
Where d = distance between the top of the IC to the center of the wire in mm, I = current in conductor in A

The kit includes a mating connector to facilitate easy interfacing with the PCB board, an extra CSA-1VG IC to be used in the customers own layout if desired, and two tie wraps. See the CSA-1VG-SO specification at *http://www.gmw.com* for the specific details of the IC.

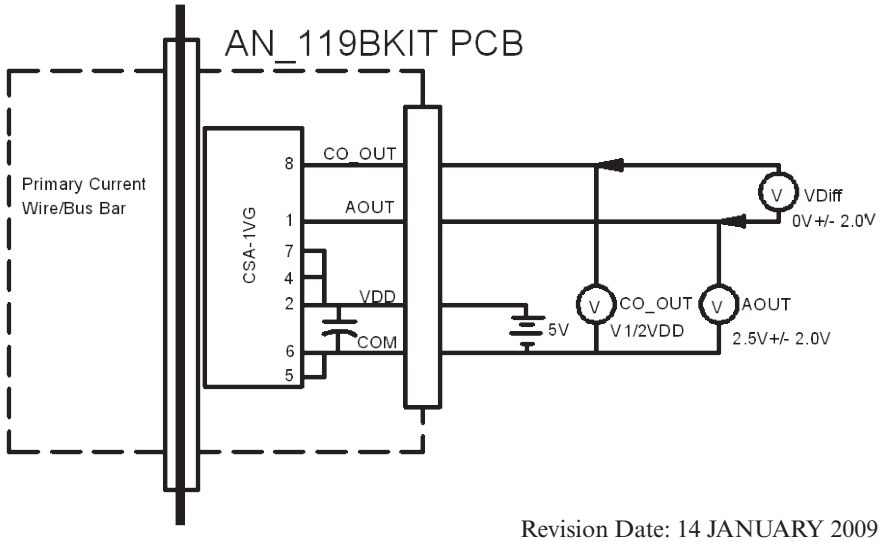
Features

- Measures AC or bidirectional DC currents in an external conductor
- Full scale linear output linear 2.5V± 2.0V instantaneously proportional to the conductor current
- Supply Voltage of 5V± 10%
- Galvanic Isolation between Primary Conductor and Sensor output
- Interface Connector - 4 Pin 0.100” centers (Mating connector included)

Top View



AN_119BKIT Electrical Connection Diagram



Revision Date: 14 JANUARY 2009

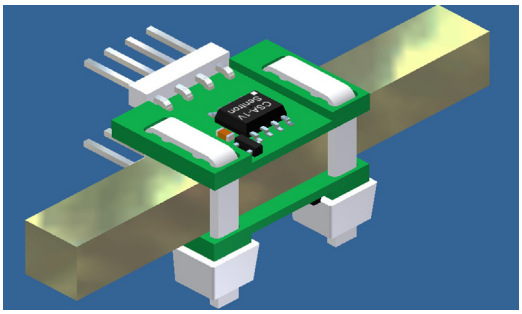
North American Distributor:
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA
Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

Dual Differential Sensor Operation

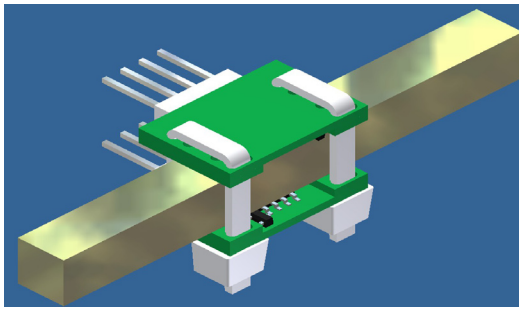
By using two AN_119BKITs mounted on opposite sides of the conductor in a differential mode, the Signal/Noise ratio is significantly increased. The signal is doubled and the effect from any stray magnetic field (such as Earth's magnetic field) is reduced by a factor of five or more. The PCB's can be mounted with the face of the IC away from the conductor or mounted with the face of the IC directly touching the conductor. With the face of the IC away, the signal level will be less which may be the desired configuration if the signal is too high due to large currents in the conductor. Below are some views of the two mounting options and also a schematic of the connection diagram to monitor the two outputs in a differential mode. The differential output voltage can be approximated with the following equations:

I = conductor current in amps D = diameter of conductor in mm

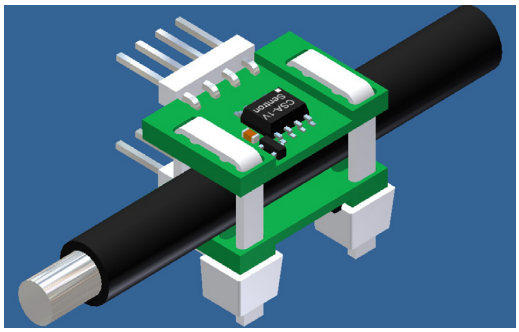
$V_{out\text{-}diff} \approx 0.224*I / (D + 4.4mm)$ see Table 2



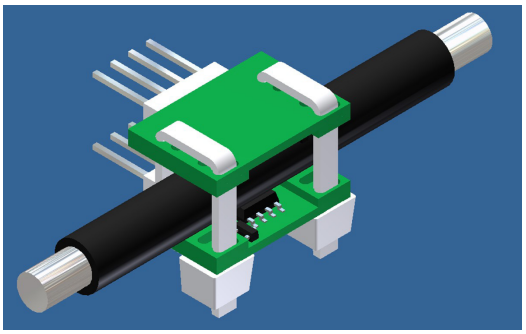
$V_{out\text{-}diff} \approx 0.222*I / (D + 0.6mm)$ see Table 2



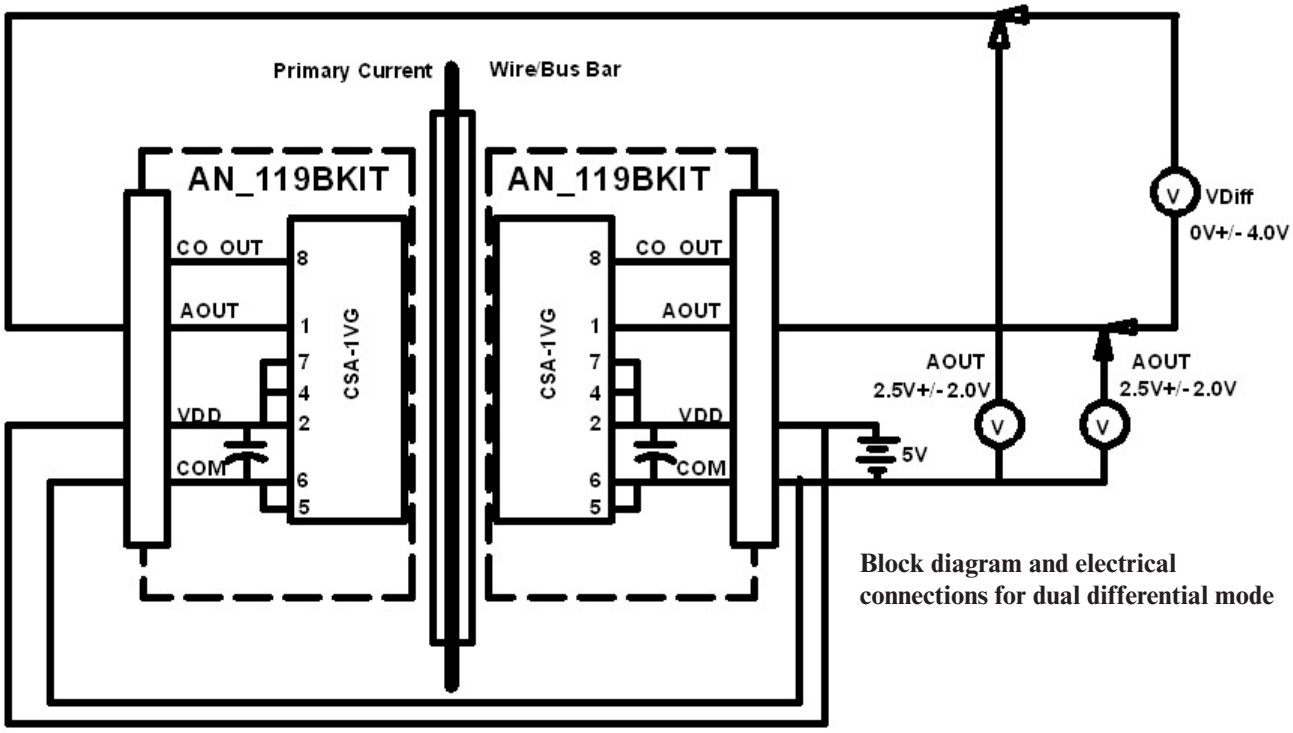
$V_{out\text{-}diff} \approx 0.224*I / (D + 4.4mm)$ see Table 3



$V_{out\text{-}diff} \approx 0.222*I / (D + 0.6mm)$ see Table 3

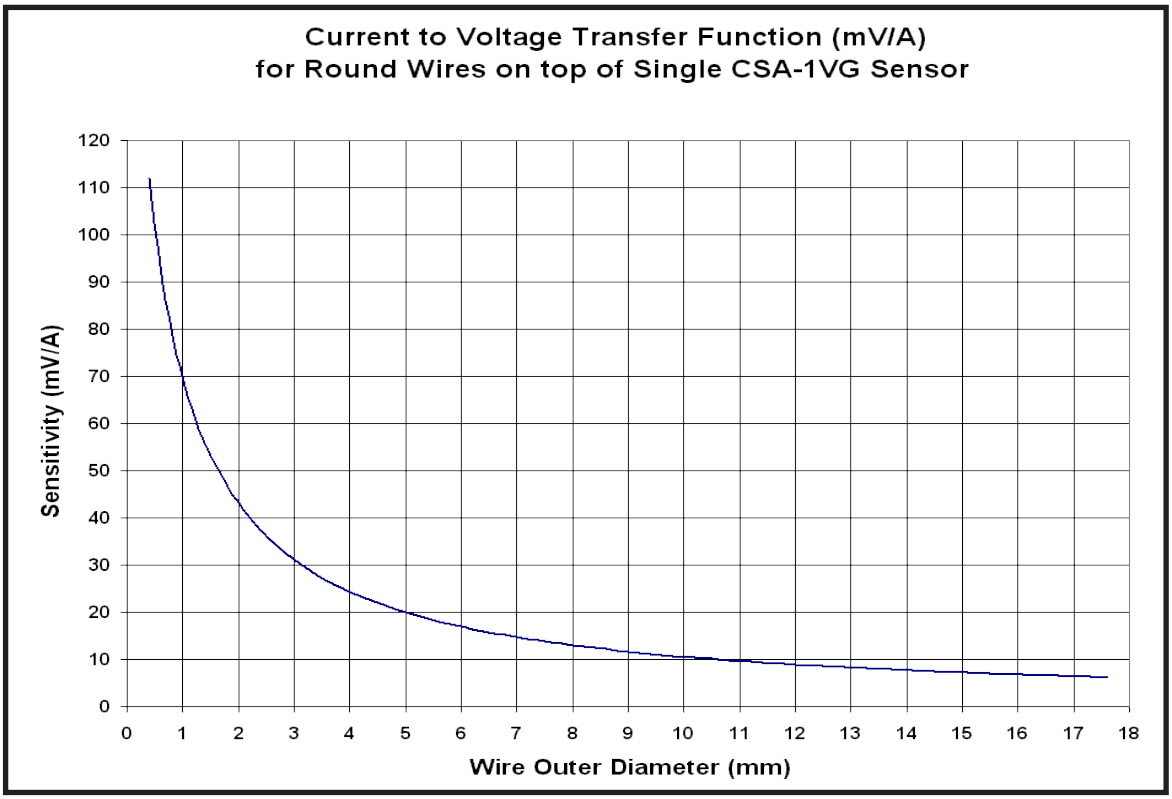


North American Distributor:
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA
Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com



Block diagram and electrical connections for dual differential mode

Table 1



Revision Date: 14 JANUARY 2009

North American Distributor:
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA
Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

Table 2

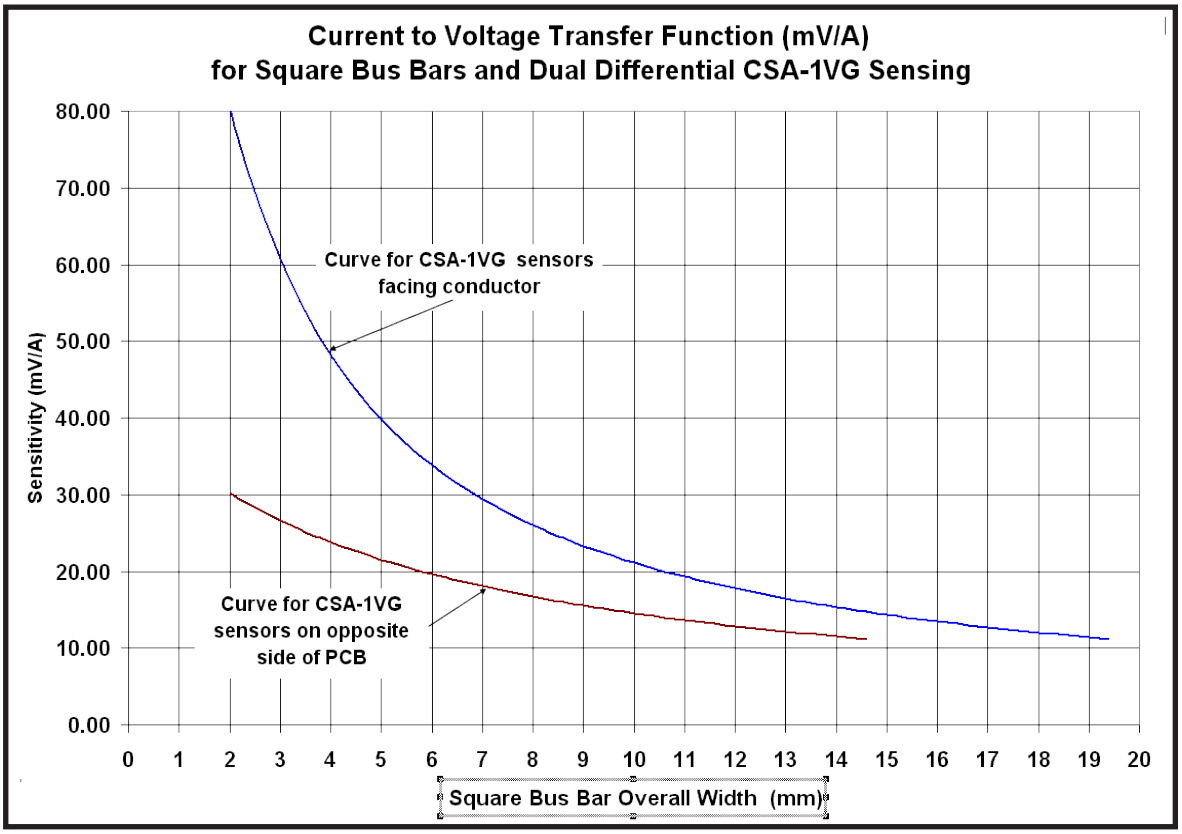
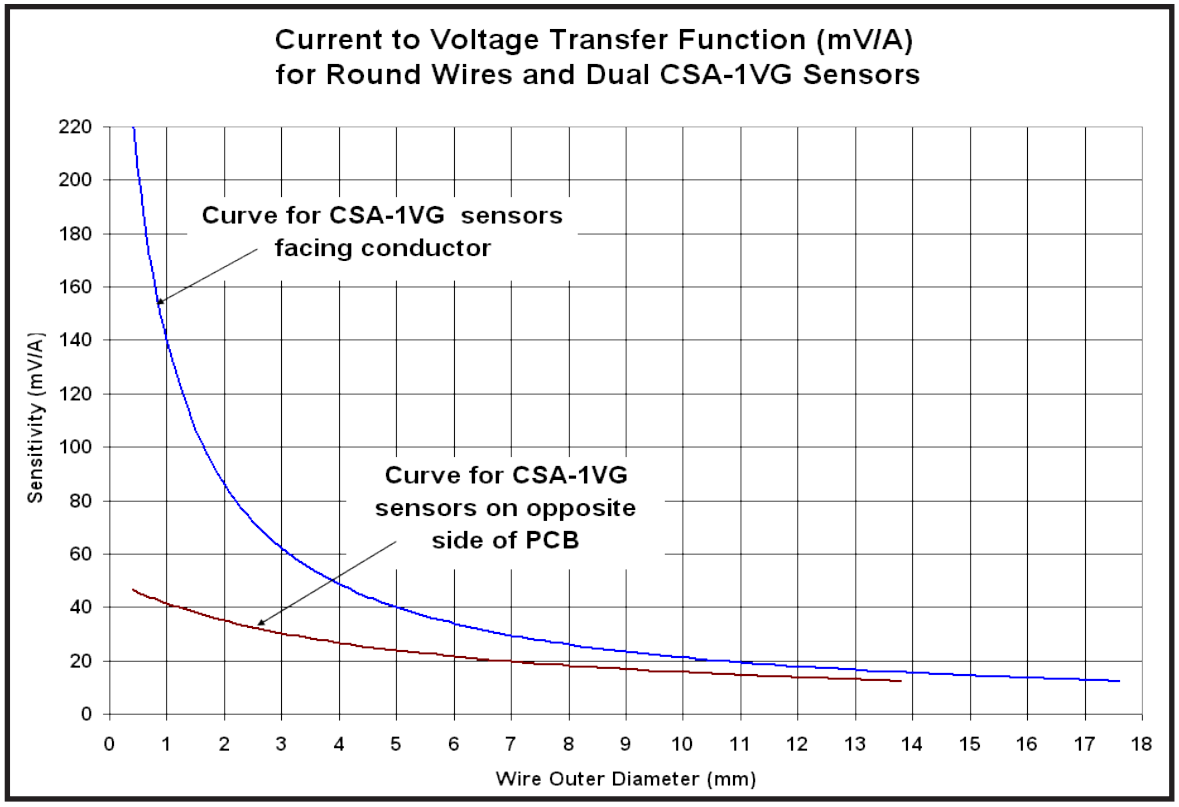


Table 3



Revision Date: 14 JANUARY 2009

North American Distributor:
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA
Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com