NVE CORPORATION

Sensor and Isolator NEWS

February 2018

Electrifying News From NVE

In This Issue

Current-Over-Trace Sensor

Current Sensor Eval Kit

Reference Design

Embedded World

Current Sensing Demo

Web App

Happy e-Day

Quick Links

Sensor Selector Guide

Isolator Selector Guide

Online Store

Contact Us

Twitter

YouTube

New on YouTube

AAL024 New Noncontact Current Sensor

Noncontact AC Current Sensing

A Digital Power Monitor IC and GMR Current Sensor.

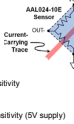
Arduino Noncontact GMR Current Sensing

Open in February

NVE is operating normally during Super Bowl week, and **open** on President's Day, Monday, February 19.

AAL024 TDFN Current-Over-Trace Sensor

The new AAL024-10E combines small size, high sensitivity, and cross-axis sensitivity for an ideal current-over-trace sensor.



Key AAL024 features include:

- Wheatstone bridge analog output
- 3.6 mV/V/Oe typ. magnetic sensitivity
- 1.5 – 10.5 Oe linear range
- Up to 300 mV/A typ. current sensitivity (5V supply)
- Omnipolar for AC or DC measurements
- <4% nonlinearity
- <2% hysteresis
- 2.2 kΩ typ. bridge resistance
- Operation to near-zero voltage
- Ultraminiature 2.5 mm x 2.5 mm x 0.8 mm TDFN6

Download datasheet >

Buy Online $9.95 shipping

Evaluation Kit

The AAL024 Evaluation Board includes four AAL024 sensors in four different circuit board configurations.

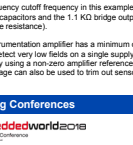
Board specifications include:

- 2" x 2" (50 mm x 50 mm) PCB with four different current-trace configurations
- Screw terminals for 14 to 30 AWG wires
- Current sensitivity to 60 mV/V/A typ. (300 mV/A with a 5V supply)
- Up to 5 amp AC or DC noncontact current measurement

Buy Online $9.95 shipping

Reference Circuit: Simple Bridge Sensor Amplifier

GMR sensors have high output signals without amplification, but if single-ended signals require higher amplitude are needed, instrumentation amplifiers can minimize parts count:



AAL024 with an instrumentation amplifier.

The INA826 is an inexpensive instrumentation amplifier. The gain is limited to 20 to avoid saturating the amplifier.

The high-frequency cutoff frequency in this example is 1.5 kHz, set by the 0.1 µF capacitors and the 1.1 KΩ bridge output resistance (half the bridge resistance).

Since the instrumentation amplifier has a minimum output of 0.1 volts, to detect very low fields on a single supply, an offset can be provided by using a non-zero amplifier reference voltage. The reference voltage can also be used to trim out sensor offset voltage.

Upcoming Conferences

embeddedworld2018 Exhibition&Conference

Distributor Hy-Line Power will display NVE products at ***Embedded World***, February 27 to March 1, at Halle 1/Stand 170, Messe Nürnberg, Germany.

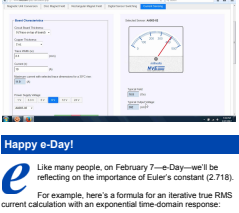
Featured new products will include the iL3685-1E 40 Mbps Ultrahigh Speed QSOP Transceiver and iL2985E Low-Power Transceiver.

Applications Corner

Current Sensing with an AAL024 Sensor

The new AAL024 analog magnetic sensor is designed for sensing current through a circuit-board trace. This type of current sensing is accurate, virtually lossless, provides inherent electrical isolation, and can be used for AC or DC.

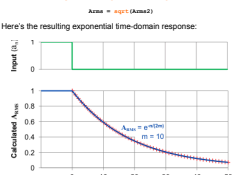
This video demonstrates:



Web App

NVE's current sensing Web application lets you simulate AAL024 sensor output with different current-carrying traces at various distances.

The handy app accommodates a variety of current-carrying traces and does the complex math for you:



Happy e-Day!

Like many people, on February 7—e-Day—we'll be reflecting on the importance of Euler's constant (2.718).

For example, here's a formula for an iterative true RMS current calculation with an exponential time-domain response:

$$A_{rms} = \sqrt{\frac{1}{m} a_n^2 + \frac{m-1}{m} A_{rms}^2}$$

Where:

a_n is the sampled instantaneous current;
n is the sample or iteration number;
m is the averaging constant; and
A_{rms} is calculated RMS current.

The calculation is easily implemented in microcontrollers with noncontact current sensor inputs:

```
Arms2 = Arms2+(sq(float(analogRead(A1)-analogRead(A0)))-Arms2)/m

Arms = sqrt(Arms2)
```

Here's the resulting exponential time-domain response:

Click here for a video demonstration.