General Description

The AN_131KIT provides an easy method of evaluating the Asahi EQ-731L Linear Hall sensor IC in a "gapped core" current sensor application. The AN_131KIT includes the Asahi EQ-731L linear IC mounted in the nominal 1.25mm wide gap cut into a 10mm x 6 mm x 4mm Ferrite core. This configuration produces a nominal output sensitivity of 60mV/A. The full scale current range is 25Arms or 35A peak. The kit includes a +5V regulator, however the circuit will work down to 2.7VDC. With the input voltage below 5V, the Hall IC supply is no longer regulated and the sensitivity, supply current and full scale output range will reduce by an amount directly proportional to the supply voltage. For example; at 3V, the sensitivity is 3/5 of 60mV/A will be equal to 36mV/A.

The Asahi EQ-731L has a very fast response time, < 5uS, thereby making it very useful for over current applications. The Asahi EQ-731L broadband output noise characteristic is low, < 5mVpp, to give an operating range of about 2000mV/2.5mV or about 800:1.

Included in the kit is a mating connector.

Features

- Measures AC or DC currents in wires up to 12AWG
- Nominal Sensitivity: 63 ±20 mV/A for 5V Supply and 36 ±12 mV/A for 3V Supply
  
  (EQ-731L Magnetic Sensitivity of 65 ±15 mV/mT)
- Nominal Quiescent Output Voltage: 2.5V+/− 0.15V @ Iprimary = 0A
- Fast response time: <5uS
- Wide bandwidth: DC to 300kHz (-3dB)
- Low noise:< 5mVpp
- Large Dynamic range > 800:1
- Full scale output linear of 2.5V+/− 2.0V (With input supply voltage of 5.0 to 15VDC)
- Supply current: ≈ 8mA
- Supply voltage range of 2.7V to 15V (Below 5.0V, the voltage to the EQ-731L is unregulated)
- Galvanic isolation between primary conductor and sensor
- Interface Connector - 4 Pin 0.100” centers (Mating connector included)
- Bi-directional sensing
- Regulated Voltage Output (+5V) Pin (available for external use- up to 20mA)

AN_131KIT Electrical Block Diagram

References:

- Hall IC Specification  EQ-731L
- Ferrite Core Specification  T 22G 10 06 04-02

AN_131KIT Outline Drawing (all dimensions in mm)

GMW Associates: 955 Industrial Road, San Carlos, CA 94070, USA. www.gmw.com. +1 (650) 802-8292
AN_131KIT - Asahi EQ-731L Hall Sensor
Gapped Core, Open Loop, Current Sensor Application

Schematic, AN_131KIT

Parts List, AN_131KIT

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
<th>P/N</th>
<th>Title</th>
<th>Reference(s)</th>
<th>Vendor</th>
<th>Vendor P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>12900-2427-0</td>
<td>IC, Linear Hall Effect, +/- 86mV/mT, EQ-711L</td>
<td>IC1</td>
<td>GMW Associates</td>
<td>EQ-711L</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>12900-2413-0</td>
<td>IC REG LDO MICROPW SOT23-5</td>
<td>IC2</td>
<td>Digi-Key Corporation</td>
<td>LP2980IM5-5.0CT-ND</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>12900-2201-0</td>
<td>CAP .1UF 50V CERAMIC XTR 0805</td>
<td>C1</td>
<td>Digi-Key Corporation</td>
<td>PCC1840TR-ND</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>12900-2302-0</td>
<td>Diode, Zener, 5.6V, SMD</td>
<td>D1/D2</td>
<td>Digi-Key Corporation</td>
<td>AZ23C5V6-FD/FR-ND</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>12900-2213-0</td>
<td>CAP TANTALUM 10UF 6.3V 10% SMD</td>
<td>C2</td>
<td>Digi-Key Corporation</td>
<td>495-2180-1-ND</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>12900-2709-0</td>
<td>Conn Header 4POS 0.100 R/A Tin</td>
<td>J1</td>
<td>Digi-Key Corporation</td>
<td>VM6004-ND</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>12900-2812-0</td>
<td>Core, Ferite, 10mm x 6 mm x 4mm 1.25mm Gap</td>
<td>T1</td>
<td>Ceramic Magnetics, Inc.</td>
<td>T22G 10 06 04-02</td>
</tr>
</tbody>
</table>

Revision Date: Feb 17, 2011

GMW Associates: 955 Industrial Road, San Carlos, CA 94070, USA. www.gmw.com. +1 (650) 802-8292