Sensitivity, ultra low current Hall effect position and proximity sensing
Hall sensor IC - AN488xx series

Overview
Panasonic hall effect position and proximity sensor ICs “AN488xx series” achieve industry leading sensitivity / power consumption performance. The average supply current can be kept as low as 3 μA by using intermittent sensing and CMOS output latch. The high sensitivity of the AN488xx series sensors allow the use of reasonable ferrite magnets. Omnipolar switch (AN48836) and bipolar latch (AN48841/AN48846) variants support a variety of applications including open / close detection, proximity detection, position detection of rotating objects.

Features and benefits
- Very high sensitivity, supports reasonable magnet
- Industry leading low power consumption down to 3 μA
- CMOS latch output.
- Space saving SMINI-5DE package 2.0 × 2.1 × 0.7mm³
- RoHS compliant.

Applications
Open/close detection,
Proximity detection,
Position detection of rotating parts,
Battery powered electronic devices,
Power tools, white goods.

AN488xx principle of operation

Open-close and proximity detection

AN48836

Rotation detection

AN48841/46
AN488xx series - overview of line up

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Function</th>
<th>Voltage</th>
<th>Flux sensitivity</th>
<th>Temperature</th>
<th>Current (average)</th>
<th>Package</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN48841B-NL</td>
<td>Bipolar latch</td>
<td>2.5～5.25V</td>
<td>±8mT</td>
<td>-25～75°C</td>
<td>56μA</td>
<td>SMINI-5DE</td>
<td>MP</td>
</tr>
<tr>
<td>AN48848B-NL</td>
<td>Bipolar latch</td>
<td>1.65～3.8V</td>
<td>±4mT</td>
<td>-40～85°C</td>
<td>55μA</td>
<td>SMINI-5DE</td>
<td>MP</td>
</tr>
<tr>
<td>AN48836B-NL</td>
<td>Omnipolar switch</td>
<td>1.65～3.8V</td>
<td>±6mT</td>
<td>-40～85°C</td>
<td>3μA</td>
<td>SMINI-5DE</td>
<td>MP</td>
</tr>
</tbody>
</table>

AN488xx series - package

Enquiries and detailed information
- For detailed information and data sheets, please visit the product’s web page:

- Please contact your nearest Panasonic sales office for enquiries and latest product status.

Contact
+ Exhibition Special Website

+ Direct access EU sales site:
  Europe Sales Office
  Panasonic Industrial Devices Sales Europe GmbH [PIDSEU] /
  Semiconductor Sales and Marketing
  Tel: 49-89-46159-119 Fax: 49-89-46159-195

+ Global access information:
**Low current consumption**

**Hall IC series AN812xx for automotive**

- **Overview**
  AN812xx Series is a hall IC using Bi-CMOS Technology for the magnetic detection.
  Operation with supply voltages of 3.8 V to 24 V. (for automotive)
  Hall Element, Offset Cancel Circuit, Amplifier, Sample and hold circuits, Schmitt Buffer, and Output – FET are integrated on 1 chip.

- **Features**
  - Power Supply: (3.8 V to 24 V)
  - Ta: (−40°C to 125°C)
  - High sensitivity due to offset cancel circuit and sample and hold circuit
  - Small current by using intermittent action (In the case of the function deployment)
  - Package Wmini8

- **Applications**
  Automotive

- **Line-up**
  - Pulse excitation type Normal sensitivity Unipolar Low sensitivity Unipolar
  - Continuous excitation type High sensitivity Bipolar

- **Schedule**
  Engineering Sample (ES) : 1st ES available

- **Block diagram**
  ex) Only in the case of the Pulse excitation
Absolute maximum ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>V_{CC}</td>
<td>-0.3 to 38</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>V_{O}</td>
<td>-0.3 to 38</td>
<td>V</td>
</tr>
<tr>
<td>Supply Current</td>
<td>I_{O}</td>
<td>30</td>
<td>mA</td>
</tr>
<tr>
<td>Power dissipation *</td>
<td>P_{D}</td>
<td>80</td>
<td>mW</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>T_{opt}</td>
<td>-40 to +125</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>T_{stg}</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

*: The power dissipation shown is the value at Ta = 125°C for the independent (unmounted) IC package.

Operating supply voltage range

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>V_{CC}</td>
<td>3.8 to 24</td>
<td>V</td>
</tr>
</tbody>
</table>

Electrical characteristics

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>AN81260</th>
<th>AN81243</th>
<th>AN81241</th>
<th>AN81242</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>Symbol</td>
<td>Conditions</td>
<td>High sensitivity</td>
<td>Medium sensitivity</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>-------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Operating Point (1)</td>
<td>B_{op}</td>
<td>V_{CC}=12V</td>
<td>1 3 5</td>
<td>6 12 18 6 12 18 15 24 33</td>
</tr>
<tr>
<td>Operating Point (2)</td>
<td>B_{off}</td>
<td>V_{CC}=12V</td>
<td>-5 -3 -1</td>
<td>5 10 15 5 10 15 13 21 29</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>B_{H}</td>
<td>V_{CC}=12V</td>
<td>-6</td>
<td>-2</td>
</tr>
<tr>
<td>Supply Current (1)</td>
<td>I_{CC AVE}</td>
<td>V_{CC}=12V</td>
<td>-</td>
<td>80 150</td>
</tr>
<tr>
<td>Supply Current (2)</td>
<td>I_{CC ON}</td>
<td>V_{CC}=12V</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>Supply Current (3)</td>
<td>I_{CC OFF}</td>
<td>V_{CC}=12V</td>
<td>-</td>
<td>60</td>
</tr>
<tr>
<td>Period</td>
<td>T_{SUM}</td>
<td>V_{CC}=12V</td>
<td>4.0 5.2</td>
<td>0.67 1.0</td>
</tr>
</tbody>
</table>

*: Only in the case of the Pulse excitation

Operation timing diagram

Only in the case of the Pulse excitation

* Please do not hesitate to contact our sales division if there is any specific request for intermittent action, current drain or sensitivity.

Contact

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+ Global access information:
Low current consumption
Hall IC series AN489xx for Industrial

■ Overview
AN489xx Series is a hall IC using Bi-CMOS Technology for the magnetic detection.
Operation with supply voltages of 3.8 V to 24 V.
Hall Element, Offset Cancel Circuit, Amplifier, Sample and hold circuits, Schmitt Buffer, and Output – FET are integrated on 1 chip.

■ Features
• Power Supply: (3.8 V to 24 V)
• Ta: (−40°C to 85°C)
• High sensitivity due to offset cancel circuit and sample and hold circuit
• Small current by using intermittent action (In the case of the function deployment)
• Package Wmini8

■ Applications
Industrial Products, Power tools, Consumer Products

■ Line-up
• Pulse excitation type
  - Normal sensitivity Unipolar
  - Low sensitivity Unipolar
• Continuous excitation type
  - High sensitivity Bipolar

■ Schedule
Engineering Sample (ES): 1st ES available

■ Block diagram
ex) Only in the case of the Pulse excitation
### Absolute maximum ratings

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<th>Rating</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>( V_{CC} )</td>
<td>-0.3 to 28</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>( V_{O} )</td>
<td>-0.3 to 28</td>
<td>V</td>
</tr>
<tr>
<td>Supply Current</td>
<td>( I_{O} )</td>
<td>30</td>
<td>mA</td>
</tr>
<tr>
<td>Power dissipation *</td>
<td>( P_D )</td>
<td>160</td>
<td>mW</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>( T_{opt} )</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>( T_{stg} )</td>
<td>-55 to +150</td>
<td>°C</td>
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</table>

*: The power dissipation shown is the value at \( Ta = 85 \) °C for the independent (unmounted) IC package.

### Operating supply voltage range

<table>
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<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>( V_{cc} )</td>
<td>3.8 to 24</td>
<td>V</td>
</tr>
</tbody>
</table>

### Electrical characteristics

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>AN48940</th>
<th>AN48932</th>
<th>AN48930</th>
<th>AN48931</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>Symbol</td>
<td>Conditions</td>
<td>High sensitivity</td>
<td>Medium sensitivity</td>
<td>Low sensitivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Typ</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>Operating Point (1)</td>
<td>( B_{op} )</td>
<td>( V_{CC}=12V )</td>
<td>-</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Operating Point (2)</td>
<td>( B_{hp} )</td>
<td>( V_{CC}=12V )</td>
<td>-5</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>( B_W )</td>
<td>( V_{CC}=12V )</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Supply Current (1)</td>
<td>( I_{C,AVE} )</td>
<td>( V_{CC}=12V )</td>
<td>80</td>
<td>150</td>
<td>180</td>
</tr>
<tr>
<td>Supply Current (2)</td>
<td>( I_{C,ON} )</td>
<td>( V_{CC}=12V )</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Supply Current (3)</td>
<td>( I_{C,OFF} )</td>
<td>( V_{CC}=12V )</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Period</td>
<td>( T_{SUM} )</td>
<td>( V_{CC}=12V )</td>
<td>4.0</td>
<td>5.2</td>
<td>0.67</td>
</tr>
</tbody>
</table>

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### Operation timing diagram

Only in the case of the Pulse excitation

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