

Unipolar Hall Effect Switch CYD1102G

The CYD1102G is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

A north pole of sufficient strength will turn the output ON. In the absence of a magnetic field, the output is OFF.

Features

| | |
|--|-------------------------------|
| ♦ Wide operating voltage range 3V to 28V | ♦ Reverse polarity protection |
| ♦ Maximum output sink current 50mA | ♦ Package : SIP-3L |
| ♦ Open collector pre-driver | |

Block Diagram

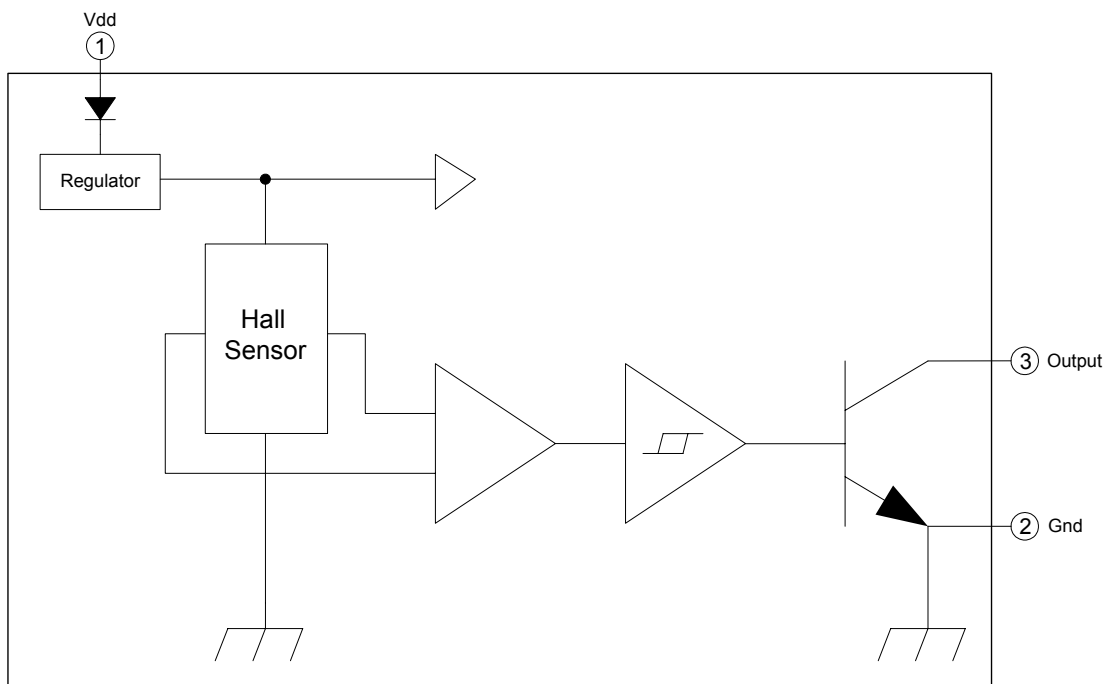
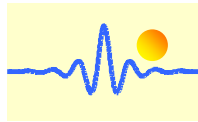


Figure.1

Recommended Operating Conditions

| Parameter | Symbol | Conditions | Values | | | Unit |
|-----------------------------|----------|------------|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| Supply Voltage | V_{DD} | - | 3.0 | | 28 | V |
| Operating Temperature Range | T_A | - | -40 | | 150 | °C |



Absolute Maximum Ratings

| Parameter | Symbol | Conditions | Values | | | Unit |
|-----------------------|----------------------|------------|--------|------|------|-------|
| | | | Min. | Typ. | Max. | |
| Operating Temperature | T _{OP} | - | -40 | | 150 | °C |
| Storage Temperature | T _{ST} | - | -65 | | 150 | °C |
| DC Supply Voltage | V _{DD} | - | 3.0 | | 28 | V |
| Supply Current | I _{DD} | - | | | 10 | mA |
| Continuous Current | I _{O(CONT)} | | | | 50 | mA |
| Junction temperature | T _J | | | | 160 | °C |
| Power Dissipation | P _D | SIP-3L | | | 500 | mW |
| Thermal Resistance | θ _{JC} | SIP-3L | | 0.27 | | °C/mW |
| Lead Temperature | | 10sec | | | 260 | °C |

Electrical Characteristics V_{DD}=12.0V, T_A=25°C (unless otherwise specified)

| Parameter | Symbol | Conditions | Values | | | Unit |
|---------------------------------|------------------|-------------------------------|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| Average Supply Current(no load) | I _{DD} | - | | 3.5 | 10 | mA |
| Output Saturation Voltage | V _{SAT} | I _{out} = 20mA | | 165 | 200 | mV |
| Output Rise time | t _r | RL=500Ω, CL=20pF(Figure 7) | 0.2 | - | 0.75 | µs |
| Output Fall time | t _f | RL=500Ω, CL=20pF(Figure 7) | 20 | - | 150 | ns |

Magnetic Characteristics

| Parameter | Symbol | Conditions | Values | | | Unit |
|----------------|-------------------|------------|--------|------|------|------|
| | | | Min. | Typ. | Max. | |
| Operate Points | B _{OP} | | +140 | - | - | G |
| Release Points | B _{RP} | | - | - | +60 | G |
| Hysteresis | B _{HYST} | | 30 | - | 120 | G |

Hysteresis Characteristics

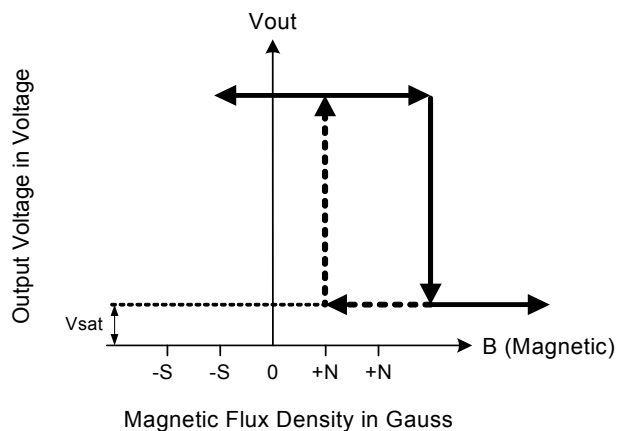


Figure.2

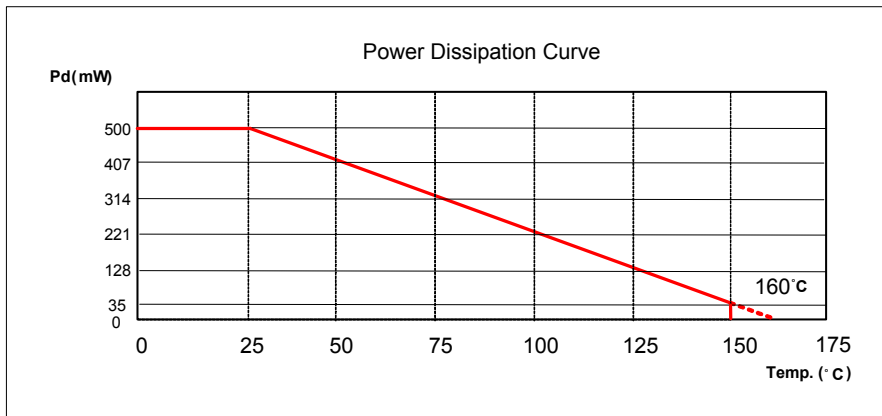
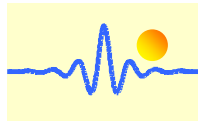


Figure.3

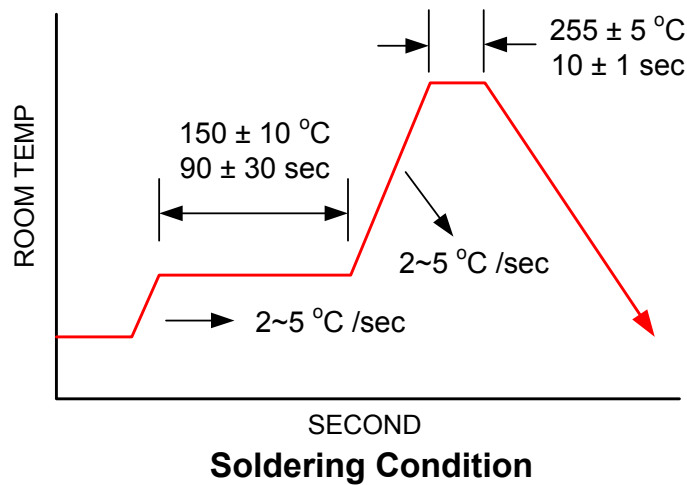


Figure.4

Pin Connection

[Top View]

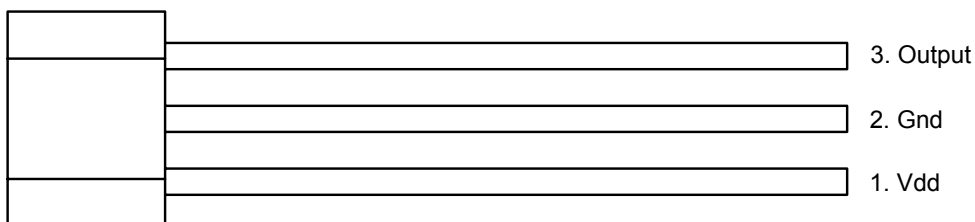
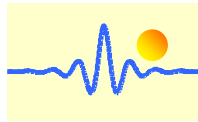


Figure.5



Pin Description

| Name | I/O | Pin No. | Description |
|--------|-----|---------|-----------------------|
| Vdd | P | 1 | Positive power supply |
| Gnd | G | 2 | Ground |
| Output | O | 3 | Driver output |

Legend: I=input, O=output, I/O=input/output, P=power supply, G=ground

Marking Information

[Top View]

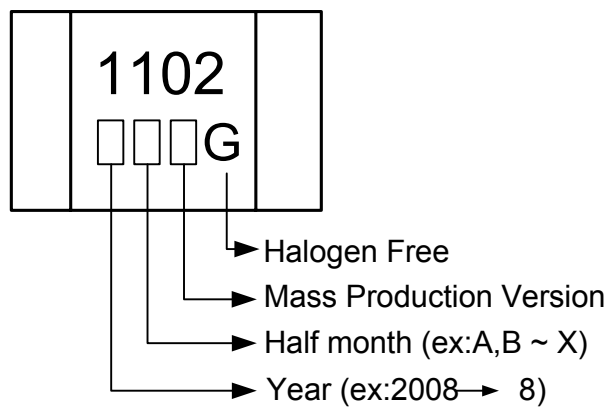
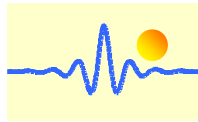


Figure.6

Order Information

| Part Number | Operating Temperature | Package | MOQ |
|-------------|-----------------------|---------|--------|
| CYD1102G | -40 °C to +150 °C | SIP-3L | 1000ea |



Package Dimension (Unit: mm)
SIP-3L(Halogen Free)

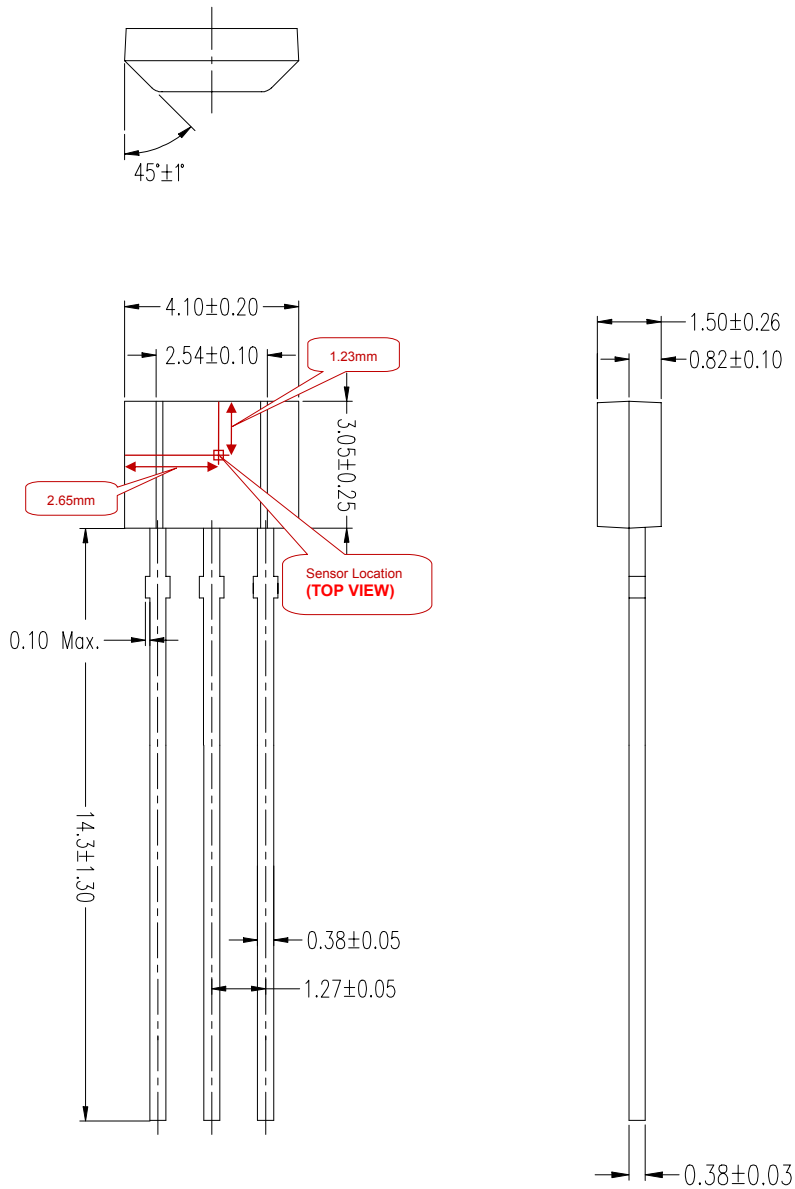
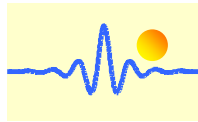


Figure.7



Test Circuit

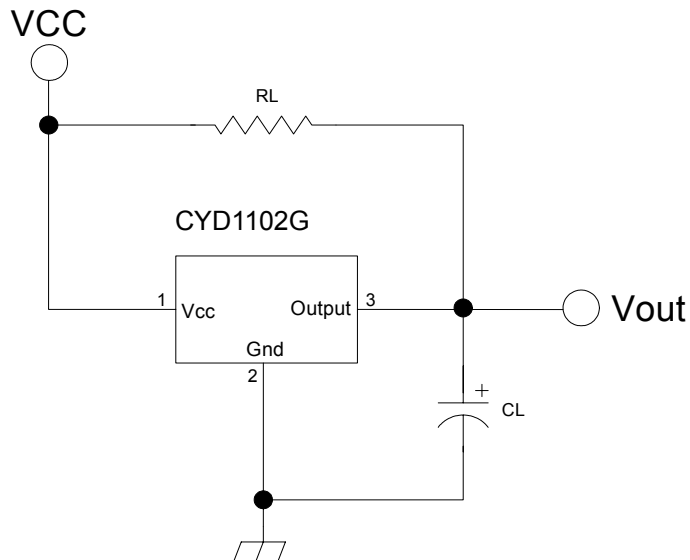


Figure.8

Functional Application Circuit

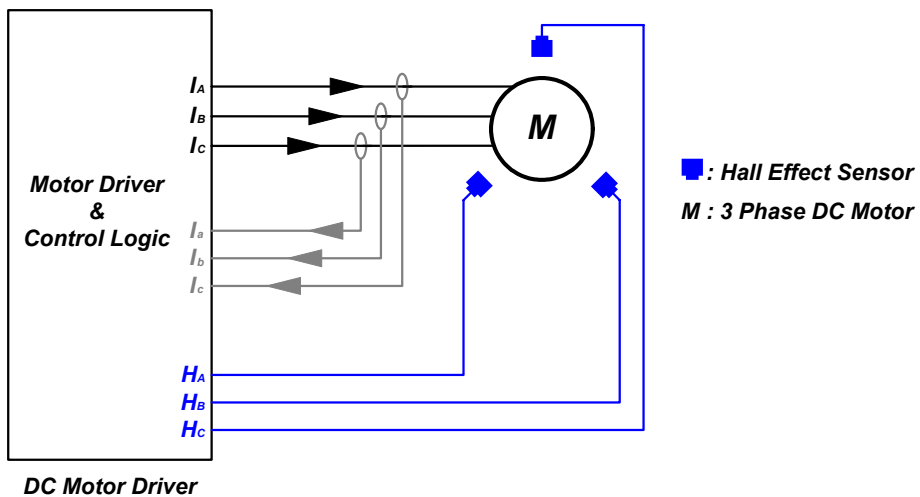


Figure.9