## General Description

The SDC141H is a latching switch hall IC .It's composed of power reverse protection circuit, high stable voltage regulator, hall voltage generator, a differential amplifier, Schmitt trigger and open collector output. Change of magnetic field can be converted into digital signal. It can be used for brushless DC three-phase motors, brushless DC fans, and speed measurement occasions.

## Features

ÿ 4V to 24 V operating voltage

ÿ Built-in temperature compensation circuit

ÿ Built-in power reverse protection

ÿ Operating temperature: -55°C~150°C

ÿ Open collector output

ÿ 20mA(MAX) output sink current ÿ Operating Speed: 0~100kHz above

## Applications

ÿ Three-phase brushless DC motor

ÿ Brushless DC fan

ÿ Tachometer

ÿ Speed measurement

## Pin Configuration

TO-92S

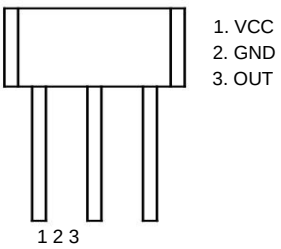



Figure 1. Pin Configuration

| PinNumber | Pin Name | Function |
|---|---|---|
| 1 | VCC | Supply voltage pin |
| 2 | GND | Ground pin |
| 3 | VOUT | Output pin |

Table 1. Pin Description

## Functional Block Diagram

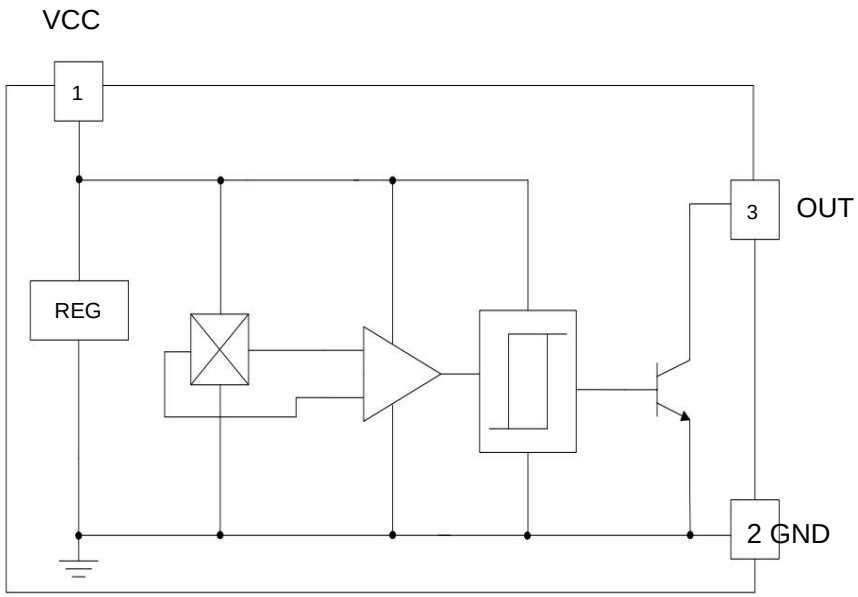
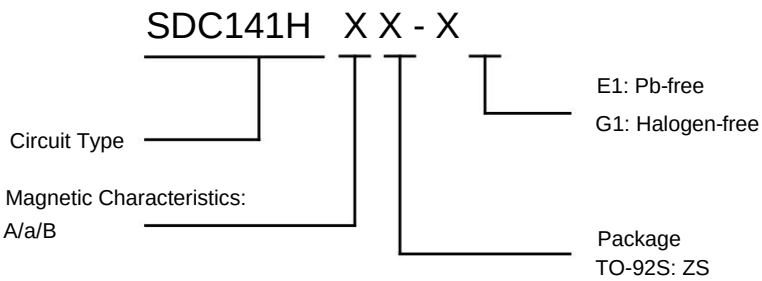



Figure 2. Functional Block Diagram

## Ordering Information




| Package | Temperature Range | Part Number | | Marking ID | | Packing Type |
|---|---|---|---|---|---|---|
| | | Pb-free | Halogen-free | Pb-free | Halogen-free | |
| TO-92S | -55°C~150°C | SDC141HAZS-E1 | SDC141HAZS-G1 | S41 | S41G | Bulk |
| | | SDC141HaZS-E1 | SDC141HaZS-G1 | S41 | S41G | Bulk |
| | | SDC141HBZS-E1 | SDC141HBZS-G1 | S41 | S41G | Bulk |



**Absolute Maximum Ratings** (NOTE: Stresses greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device.)

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Supply voltage | VCC | 3.5 | 30 | V |
| Magnetic flux density | B | · | · | GS |
| Pin breakdown voltage of VCC to GND | V1 | · | 85 | V |
| Pin breakdown voltage of GND to VCC | V2 | · | 80 | V |
| Pin breakdown voltage of OUT to VCC | V3 | · | 90 | V |
| Output current | IOL | · | 40 | mA |
| Operating temperature range | Facing | -55 | 150 | °C |
| Storage temperature range | TS | -55 | 150 | °C |

Table2. Absolute Maximum Ratings

**Recommended Operating Conditions**

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Power supply | VCC | 4.0 | 24 | V |
| Operation temperature | Facing | -55 | 150 | °C |

Table 3 Recommended Operating Conditions

**Electrical Characteristics** (Ta=25°C, VCC=4.5V, unless otherwise specified.)

| Parameter | Symbol | Conditions | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| Supply voltage | VCC | · | 4.0 | · | 24 | V |
| Output saturation voltage | VOUT | IOUT=20mAÿB>BOP | · | · | 500 | mV |
| Output leakage current | IOFF | VCE=30VÿB< BRP | · | 0.1 | 10 | uA |
| Supply current | ICC1 | VCC=4.5V, output open | · | 1.5 | 4 | mA |
| | ICC2 | VCC=24V, output open | · | 2.5 | 5 | |
| Output rise time | tr | RL to VCC, CL to GND<br>RL=820ÿ,CL=20pF | · | 0.15 | 1.5 | us |
| Output fall time | tf | RL to VCC, CL to GND<br>RL=820ÿ, CL=20 pF | · | 0.15 | 1.5 | us |

Table 4. Electrical Characteristics

**Magnetic Characteristics(VCC=4.5V,** unless otherwise specified.)

| Parameter | Symbol | Conditions | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| Operating point | BOP | Ta=120°C | 15 | 65 | 110 | GS |
| | | Ta=25°C | 10 | 50 | 90 | GS |
| Release point | BRP | Ta=120°C | -110 | -65 | -15 | GS |
| | | Ta=25°C | -90 | -50 | -10 | GS |
| Hysteresis | BH | Ta=120°C | 120 | 130 | 140 | GS |
| | | Ta=25°C | 90 | 100 | 110 | GS |

Table 4. Magnetic Characteristics

Note: when S pole of magnetic is faced to the marked side of IC, the magnetic field is positive.

**Grade A**

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Operate point | BOP | 35 | 75 | GS |
| Release point | BRP | -140 | -15 | GS |

**Grade a**

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Operate point | BOP | 75 | 140 | GS |
| Release point | BRP | -140 | -15 | GS |

**Grade B**

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Operate point | BOP | 15 | 35 | GS |
| Release point | BRP | -140 | -15 | GS |

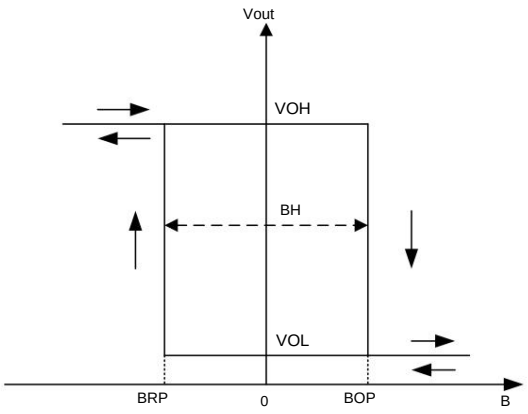



Figure 3. Magnetic Characteristics



**Typical Application**

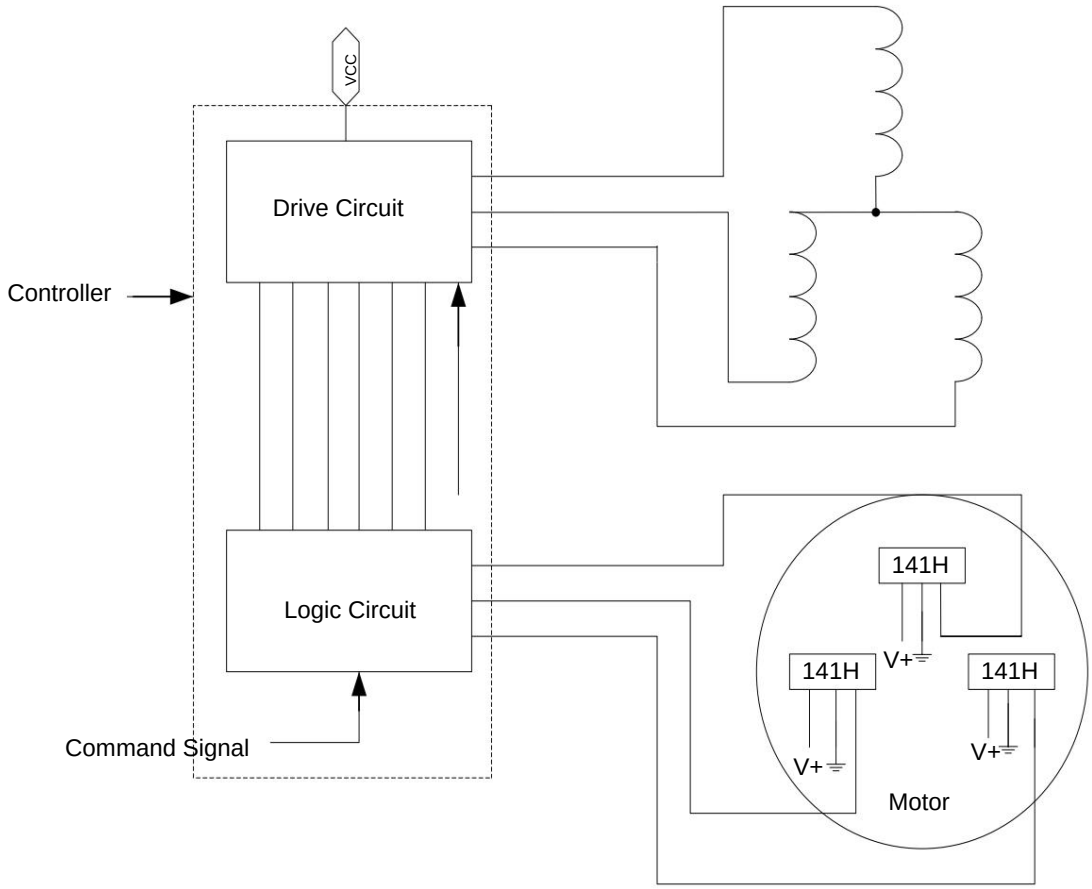
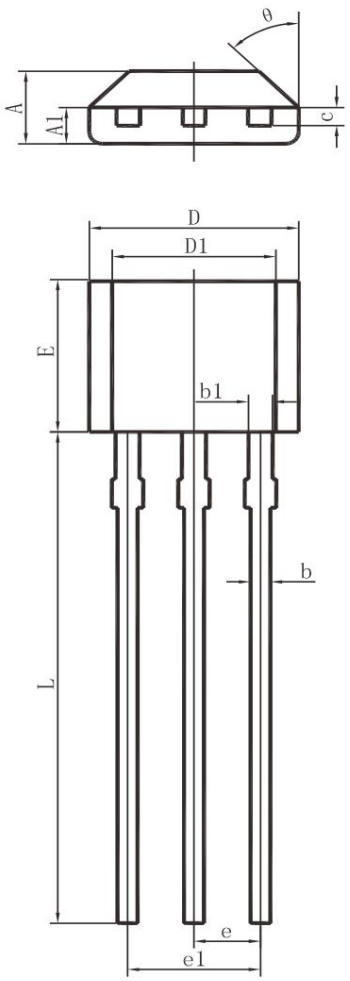



Figure 4. Typical Application

**Package Dimensions**

**TO-92S**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.420 | 1.620 | 0.056 | 0.064 |
| A1 | 0.660 | 0.860 | 0.026 | 0.034 |
| b | 0.350 | 0.480 | 0.014 | 0.019 |
| b1 | 0.380 | 0.530 | 0.015 | 0.021 |
| c | 0.360 | 0.510 | 0.014 | 0.020 |
| D | 3.900 | 4.100 | 0.154 | 0.161 |
| D1 | 2.970 | 3.270 | 0.117 | 0.129 |
| [illegible] | 2.900 | 3.100 | 0.116 | 0.124 |
| [illegible] | 1.270 TYPE. | | 0.050 TYPE. | |
| e1 | 2.440 | 2.640 | 0.096 | 0.104 |
| L | 14.500 | 14.900 | 0.580 | 0.596 |
| i | 45° TYPE. | | 45° TYPE. | |

## Shaoxing Devechip Microelectronics Co., Ltd.

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