

General Description

The SDC266 is an integrated circuit which includes Hall sensor and output drive circuits. It's widely used in 2-phase brushless DC motor and fan. It's composed of power reverse protection circuit, high stable voltage regulator, Hall voltage generator, a differential amplifier, Schmitt trigger and open collector output (DO, DOB).

In the case of power supply reverse connecting, the internal protection diode can protect IC but not protect coil, a protection diode can be added if necessary.

Features

- Wide operating voltage range: 3.5V~24V
- 250mA(AVG) output sink current
- Building-in protection diode
- Operating temperature range: -20°C~85°C
- Package: TO-94

Applications

- Brushless DC motor
- Brushless DC fan
- Revolution counting
- Speed measurement

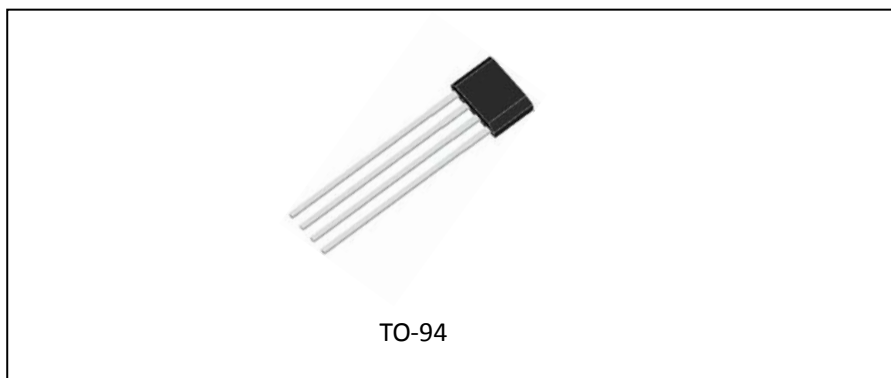


Figure 1. Package Type

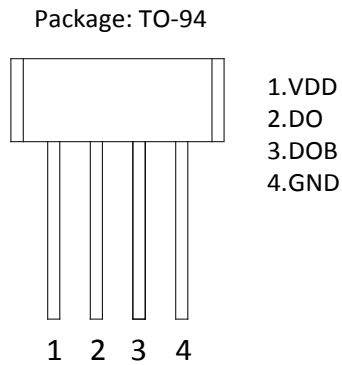
Pin Configuration


Figure 2. Pin Configuration

| Pin Number | Pin Name | Function |
|------------|----------|--------------------|
| 1 | VCC | Supply voltage pin |
| 2 | DO | Output 2 pin |
| 3 | DOB | Output 3 pin |
| 4 | GND | Ground pin |

Table 1. Pin Description

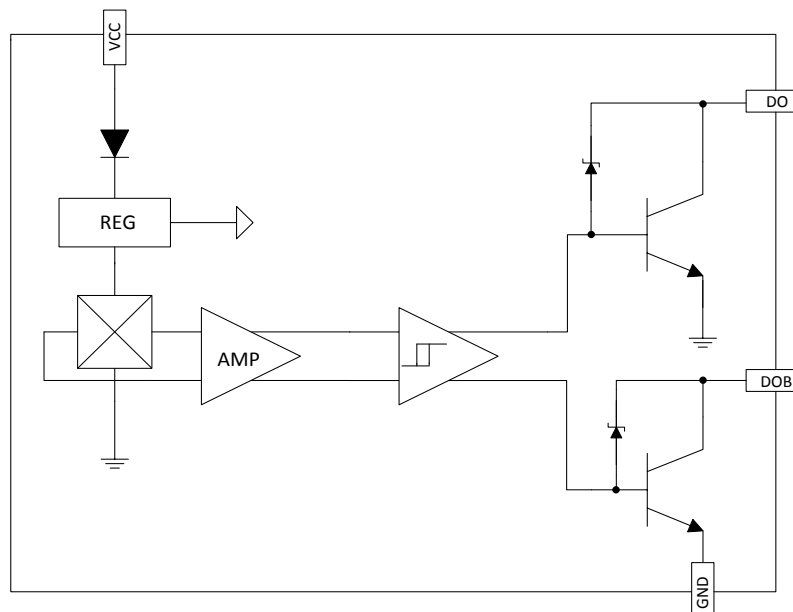
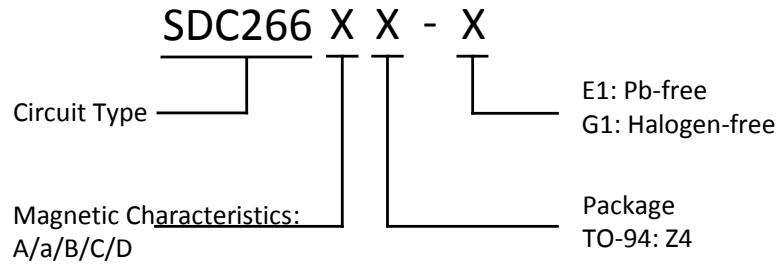
Functional Block Diagram


Figure 3. Functional Block Diagram

Ordering Information


| Package | Temperature Range | Part Number | | Marking ID | | Packing Type |
|---------|-------------------|--------------|--------------|------------|--------------|--------------|
| | | Pb-free | Halogen-free | Pb-free | Halogen-free | |
| TO-94 | -20°C~85°C | SDC266AZ4-E1 | SDC266AZ4-G1 | 266 | 266G | Bulk |
| | | SDC266BZ4-E1 | SDC266BZ4-G1 | 266 | 266G | Bulk |
| | | SDC266CZ4-E1 | SDC266CZ4-G1 | 266 | 266G | Bulk |
| | | SDC266DZ4-E1 | SDC266DZ4-G1 | 266 | 266G | Bulk |

Absolute Maximum Ratings (Note: Stresses greater than those listed under absolute maximum ratings may cause permanent damage to the device.)

| Parameter | Symbol | Value | Units |
|---|------------|-----------|-------|
| Supply Voltage | V_{CC} | 26.5 | V |
| Output Voltage | V_{OUT} | 26.5 | V |
| Reverse voltage | V_{RCC} | -20 | V |
| Magnetic flux density | B | unlimited | GS |
| Output current | Continuous | 250 | mA |
| | Hold | 400 | |
| | Peak | 700 | |
| Storage temperature range | T_S | -65~150 | °C |
| Package power dissipation | P_D | 550 | mW |
| ESD, HBM model per Mil-Std-883, Method 3015 | HBM | 4000 | V |
| ESD, MM model per JEDEC EIA/JESD22-A115 | MM | 400 | V |
| Latch-up test per JEDEC 78 | - | 200 | mA |
| Maximum junction temperature | T_J | 150 | °C |

Table 2. Absolute Maximum Ratings

Recommended Operating Conditions

| Parameter | Symbol | Min | Max | Unit |
|-----------------------|----------|-----|-----|------|
| Power supply | V_{CC} | 3.5 | 24 | V |
| Operation temperature | T_a | -20 | 85 | °C |

Table 3. Recommended Operating Conditions

Electrical Characteristics ($T_a=25^\circ\text{C}$, $V_{CC}=12\text{V}$, unless otherwise specified)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---------------------------|------------|-------------------------------------|-----|-----|-----|------|
| Supply voltage | V_{CC} | - | 3.5 | - | 24 | V |
| Output zener breakdown | V_Z | - | - | 46 | - | V |
| Output saturation voltage | V_{SAT} | $I_O=300\text{mA}$ | - | 0.3 | 0.6 | V |
| Output leakage current | I_{CEX} | $V_{CC}=V_{CE}$ | - | 0.1 | 10 | uA |
| Supply current | I_{CC} | $V_{CC}=20\text{V}$, output open | - | 12 | 16 | mA |
| Output rise time | t_r | $R_L=820\Omega$, $C_L=20\text{pF}$ | - | 3.0 | 10 | us |
| Output falling time | t_f | $R_L=820\Omega$, $C_L=20\text{pF}$ | - | 0.3 | 1.5 | us |
| Switch time differential | Δt | $R_L=820\Omega$, $C_L=20\text{pF}$ | - | 3.0 | 10 | us |

Table 4. Electrical Characteristics

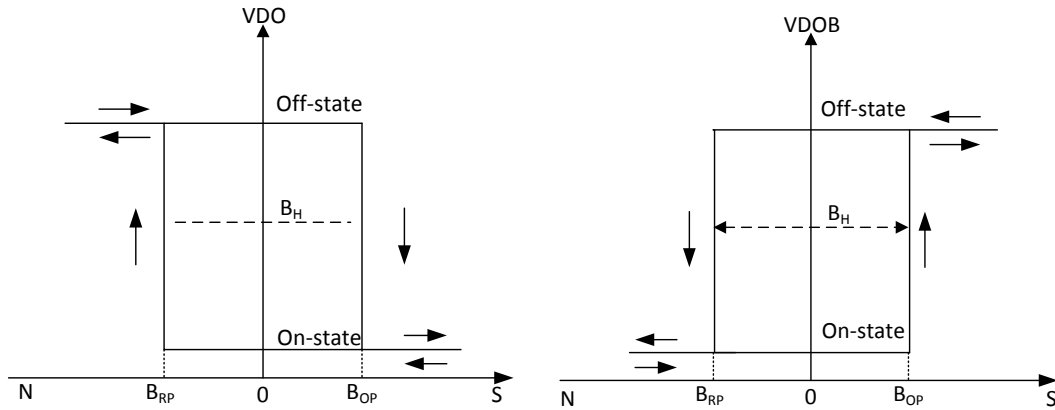
Magnetic Characteristics ($T_a=25^\circ\text{C}$, $V_{CC}=24\text{V}$, unless otherwise specified)


Figure 4. Magnetic Characteristics

Grade A

| Parameter | Symbol | Min | Max | Unit |
|---------------|----------|-----|-----|------|
| Operate point | B_{OP} | 10 | 50 | GS |
| Release point | B_{RP} | -50 | -10 | GS |

Grade B

| Parameter | Symbol | Min | Max | Unit |
|---------------|----------|-----|-----|------|
| Operate point | B_{OP} | 5 | 70 | GS |
| Release point | B_{RP} | -70 | -5 | GS |

Grade C

| Parameter | Symbol | Min | Max | Unit |
|---------------|----------|-----|-----|------|
| Operate point | B_{OP} | - | 90 | GS |
| Release point | B_{RP} | -90 | - | GS |

Grade D

| Parameter | Symbol | Min | Max | Unit |
|---------------|----------|------|-----|------|
| Operate point | B_{OP} | - | 125 | GS |
| Release point | B_{RP} | -125 | - | GS |

Typical Performance Characteristics

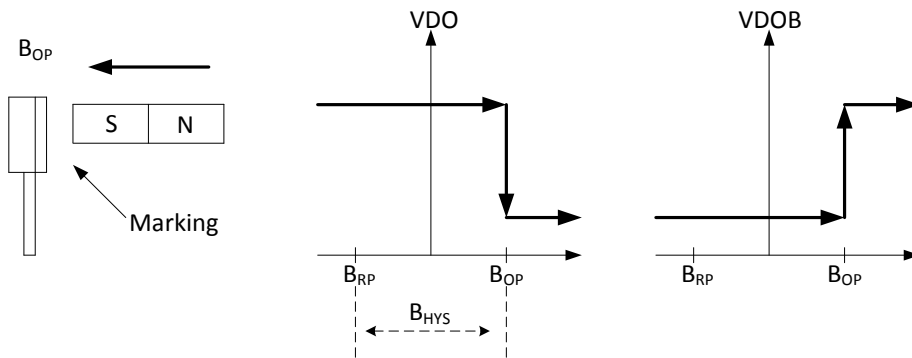


Figure 5. Magnetic Characteristics

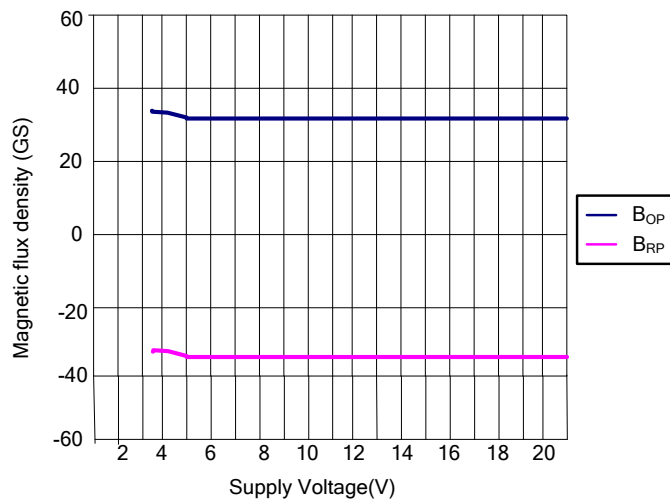


Figure 5. Typical Magnetic Switch Point vs. Supply Voltage

Typical Application

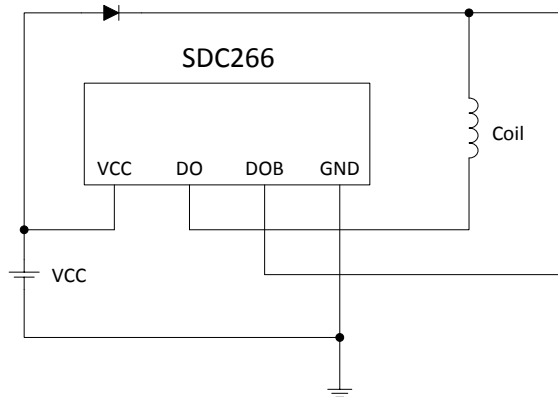
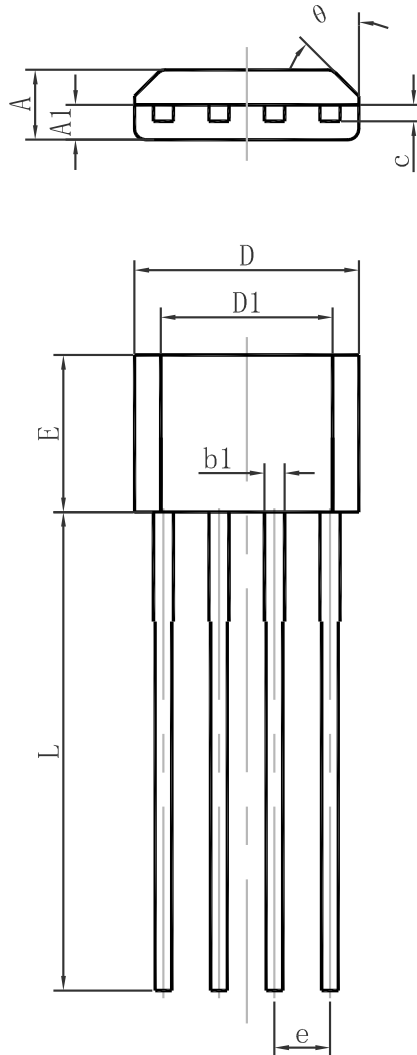


Figure 6. Typical Application

Package Dimension
TO-94


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.400 | 1.800 | 0.055 | 0.071 |
| A1 | 0.700 | 0.900 | 0.028 | 0.035 |
| b1 | 0.380 | 0.550 | 0.015 | 0.022 |
| C | 0.360 | 0.510 | 0.014 | 0.020 |
| D | 5.050 | 5.350 | 0.202 | 0.214 |
| D1 | 4.550 | 4.850 | 0.128 | 0.194 |
| E | 3.450 | 3.750 | 0.136 | 0.148 |
| e | 1.270 TYP. | | 0.050 TYP. | |
| L | 14.300 | 14.700 | 0.572 | 0.588 |
| θ | 10°TYP. | | 10°TYP. | |



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