

Features

- On-chip Hall sensor with two different sensitivity and hysteresis settings for AH276
- Built-in protecting diode only for chip reverse power connecting
- -20°C to 85°C operating temperature
- Lead Free Package: SIP-4L
- SIP-4L: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/RoHS Compliant (Note 1)

General Description

AH276 are integrated Hall sensors with output drivers, mainly designed for electronic commutation of brush-less DC Fan. This IC internally includes the regulator, protecting diode, Hall plate, amplifier, comparator, and a pair of complementary open-collector outputs (**DO**, **DOB**).

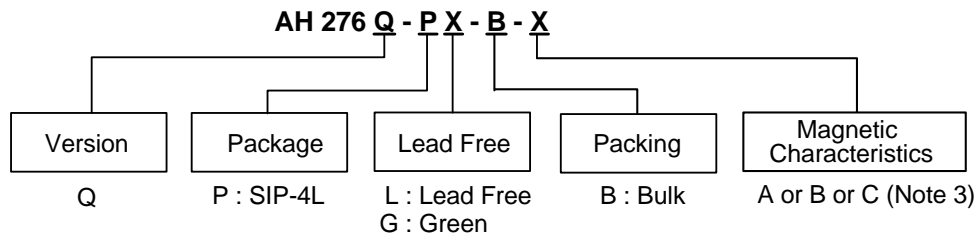
While the magnetic flux density (**B**) is larger than operate point (**Bop**), **DO** will turn on (low), and meanwhile **DOB** will turn off (high). Each output is latched until **B** is lower than release point (**Brp**), and then **DO**, **DOB** transfer each state.

For DC fan application, sometimes need to test power reverse connection condition. Internal diode only protects chip-side but not for coil-side. If necessary, add one external diode to block the reverse current from coil-side.

Applications

- Dual-coil Brush-less DC Motor
- Dual-coil Brush-less DC Fan
- Revolution Counting
- Speed Measurement

Ordering Information

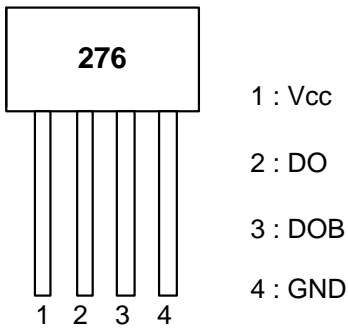


| Device | Package Code | Packaging (Note 2) | Bulk | | Magnetic Characteristics |
|---------------|--------------|--------------------|----------|--------------------|--------------------------|
| | | | Quantity | Part Number Suffix | |
| AH276Q-PL-B-A | P | SIP-4L | 1000 | -B | A |
| AH276Q-PL-B-B | P | SIP-4L | 1000 | -B | B |
| AH276Q-PL-B-C | P | SIP-4L | 1000 | -B | C |
| AH276Q-PG-B-A | P | SIP-4L | 1000 | -B | A |
| AH276Q-PG-B-B | P | SIP-4L | 1000 | -B | B |
| AH276Q-PG-B-C | P | SIP-4L | 1000 | -B | C |

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html
 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 3. Please refer to page 4 (Magnetic Characteristics table).

Pin Assignment

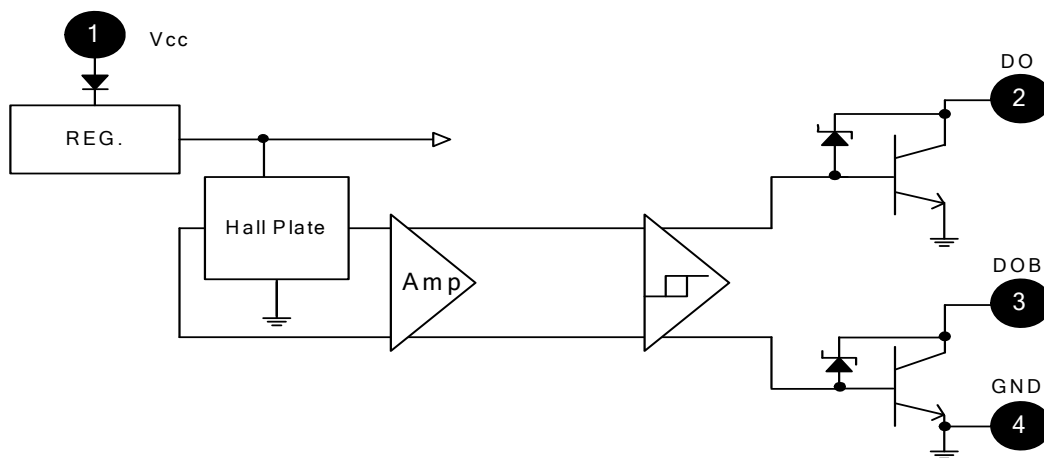
(Top View)



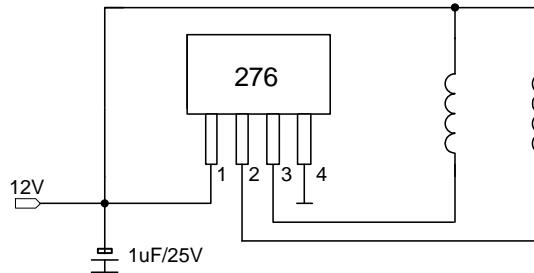
Pin Descriptions

| Pin Name | P/I/O | Pin # | Description |
|----------|-------|-------|--------------------|
| Vcc | P | 1 | Power Supply Input |
| DO | O | 2 | Output Pin |
| DOB | O | 3 | Output Pin |
| GND | P | 4 | Ground |

Block Diagram



Typical Application Circuit

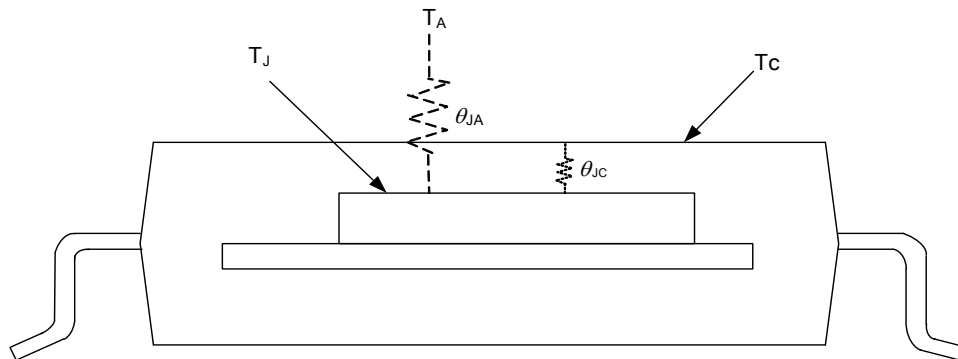


Brush-less DC Fan

Absolute Maximum Ratings (@ T_A=25°C)

| Symbol | Characteristics | Rating | Unit | |
|------------------|--|-----------------|------|---|
| V _{CC} | Supply Voltage | 20 | V | |
| V _{RCC} | Reverse V _{CC} Polarity Voltage | -20 | V | |
| B | Magnetic Flux Density | Unlimited | | |
| I _O | Output "on" current (Note 4) | Continuous | 0.4 | A |
| | | Hold | 0.5 | |
| | | Peak (Start Up) | 0.7 | |
| T _S | Storage Temperature Range | -65~+150 | °C | |
| P _D | Package Power Dissipation (SIP-4L) | 550 | mW | |
| T _J | Maximum Junction Temperature | 150 | °C | |
| θ _{JC} | Thermal Resistance (SIP-4L) | 227 | °C/W | |

Notes: 4. P_D shall be within Safety Operation Area.



Recommended Operating Conditions

| Symbol | Characteristic | Conditions | Min | Max | Unit |
|-----------------|-------------------------------|------------|-----|-----|------|
| V _{CC} | Supply Voltage (Note 5) | Operating | 3.5 | 20 | V |
| T _A | Operating Ambient Temperature | Operating | -20 | 85 | °C |

Notes: 5. The output DO/DOB is switching as magnetic field change (S>300G, N<-300G).

Electrical Characteristics (T_A=+25°C)

| Symbol | Characteristic | Conditions | Min | Typ. | Max | Unit |
|----------------------|---------------------------|---|-----|------|-----|------|
| V _Z | Output Zener Breakdown | (Note 6) | - | 35 | - | V |
| V _{ce(sat)} | Output Saturation Voltage | V _{CC} =14V, I _L =400mA | - | 0.6 | 0.9 | V |
| I _{ceX} | Output Leakage Current | V _{ce} =14V, V _{CC} =14V | - | <0.1 | 10 | μA |
| I _{CC} | Supply Current | V _{CC} =20V, Output Open | 7 | 16 | 25 | mA |

Notes: 6. V_Z is a typical value for design reference. V_Z will vary with different coils design.

Magnetic Characteristics ($T_A=+25^{\circ}\text{C}$, $V_{CC}=14\text{V}$, Note 7)

A grade

| Symbol | Characteristic | Min | Typ. | Max | Unit |
|--------|----------------|-----|------|-----|-------|
| Bop | Operate Point | 10 | - | 50 | Gauss |
| Brp | Release Point | -50 | - | -10 | Gauss |
| Bhy | Hysteresis | - | 75 | - | Gauss |

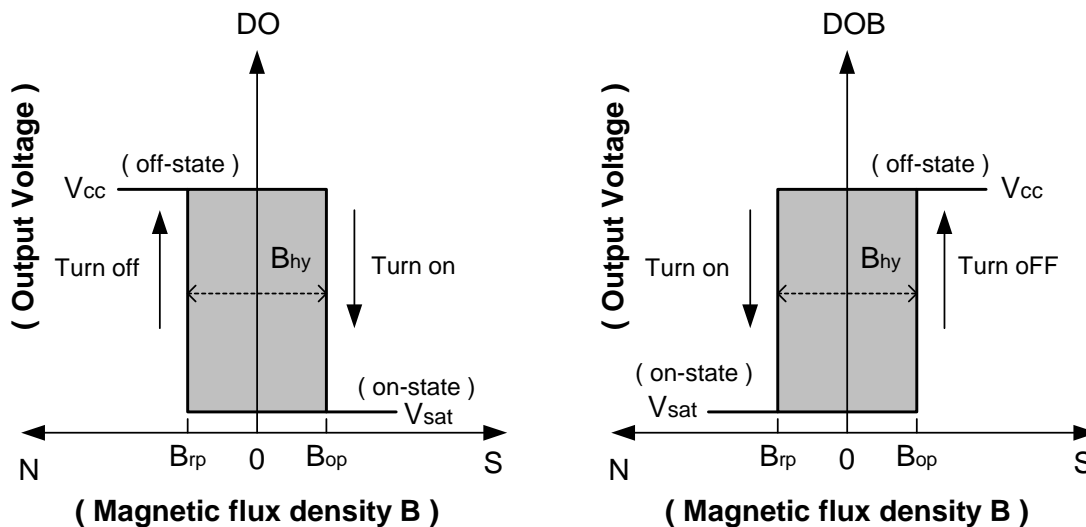
B grade

| Symbol | Characteristic | Min | Typ. | Max | Unit |
|--------|----------------|-----|------|-----|-------|
| Bop | Operate Point | 5 | - | 70 | Gauss |
| Brp | Release Point | -70 | - | -5 | Gauss |
| Bhy | Hysteresis | - | 75 | - | Gauss |

C grade

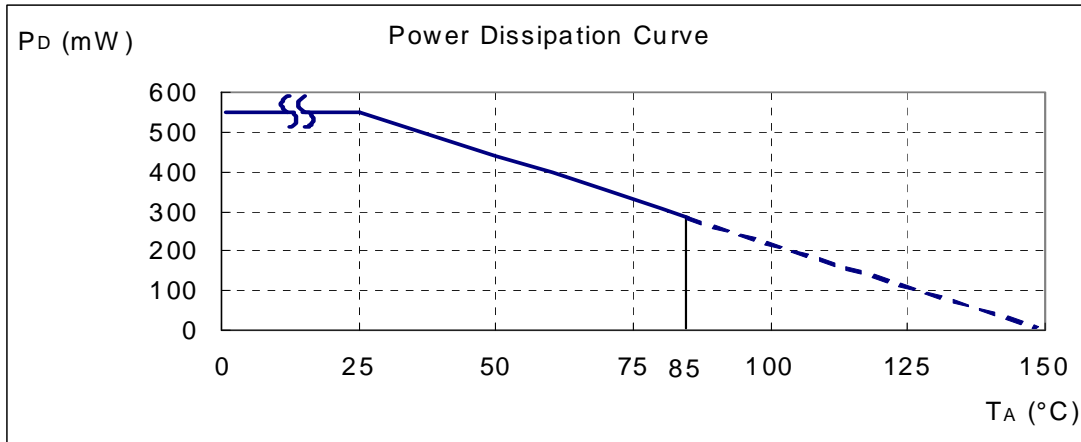
| Symbol | Characteristic | Min | Typ. | Max | Unit |
|--------|----------------|------|------|-----|-------|
| Bop | Operate Point | - | - | 100 | Gauss |
| Brp | Release Point | -100 | - | - | Gauss |
| Bhy | Hysteresis | - | 75 | - | Gauss |

Notes: 7. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.

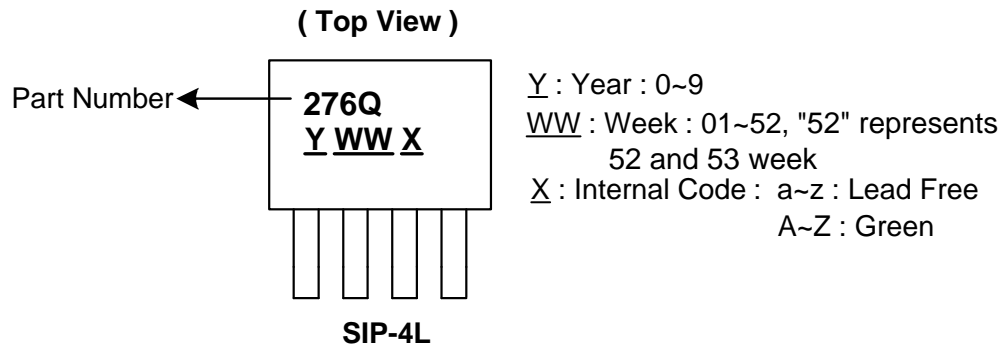


Performance Characteristics

| | | | | | | | | | |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| T_A (°C) | 25 | 50 | 60 | 70 | 80 | 85 | 90 | 95 | 100 |
| P_D (mW) | 550 | 440 | 396 | 352 | 308 | 286 | 264 | 242 | 220 |
| T_A (°C) | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 150 |
| P_D (mW) | 198 | 176 | 154 | 132 | 110 | 88 | 66 | 44 | 0 |

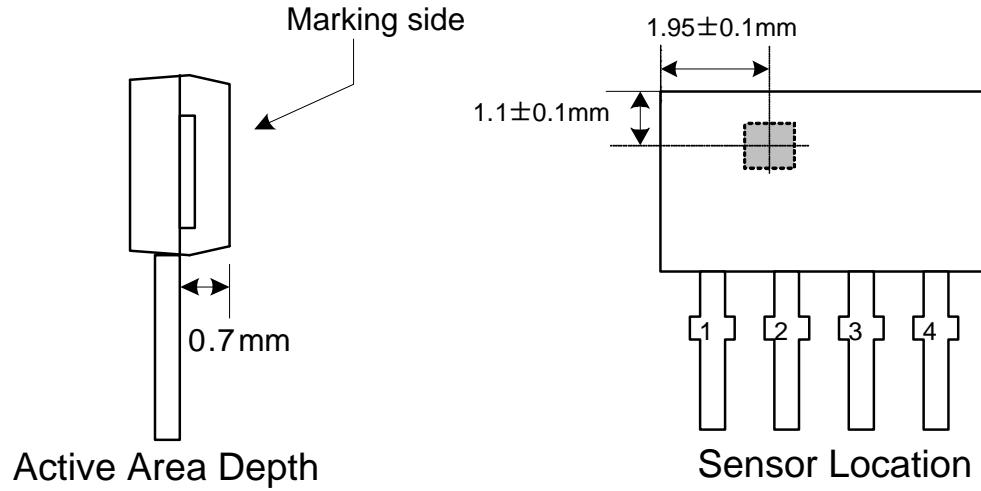


Marking Information

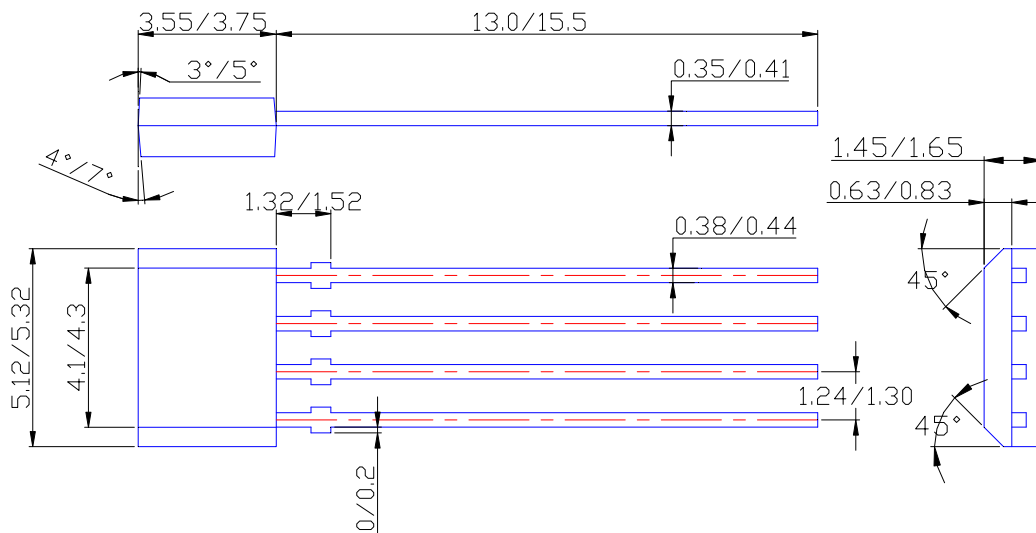


Package Information (All Dimensions in mm)

(1) Package type: SIP-4L



Package Dimension



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