

Complementary Output Hall Effect Latch

■ Features

- On-chip Hall sensor with two different sensitivity and hysteresis settings for AH276
- 400mA (avg) output sink current
- Built-in protecting diode only for chip reverse power connecting
- -20°C to 85°C operating temperature
- Low profile 4 pin SIP package

■ Applications

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

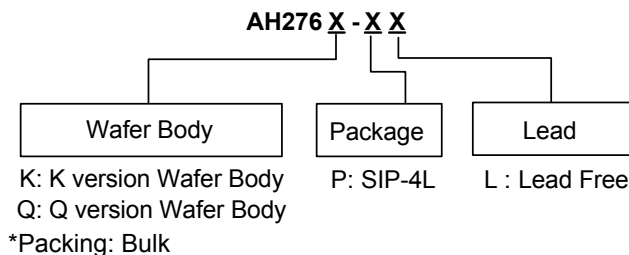
■ General Description

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**).

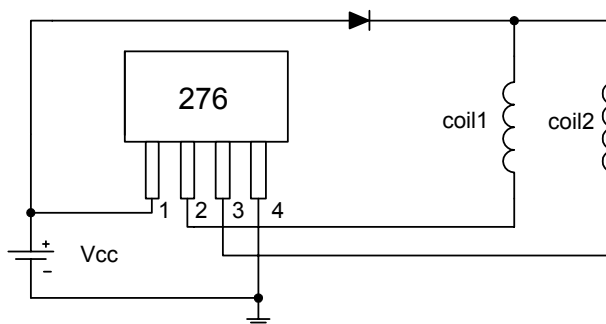
While the magnetic flux density (**B**) is larger than operate point (**Bop**), **DO** will turn on (low), and meanwhile **DOB** will turn off (high). Each output is latched until **B** is lower than release point (**Brp**), and then **DO**、**DOB** transfer each state.

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.

■ Ordering Information



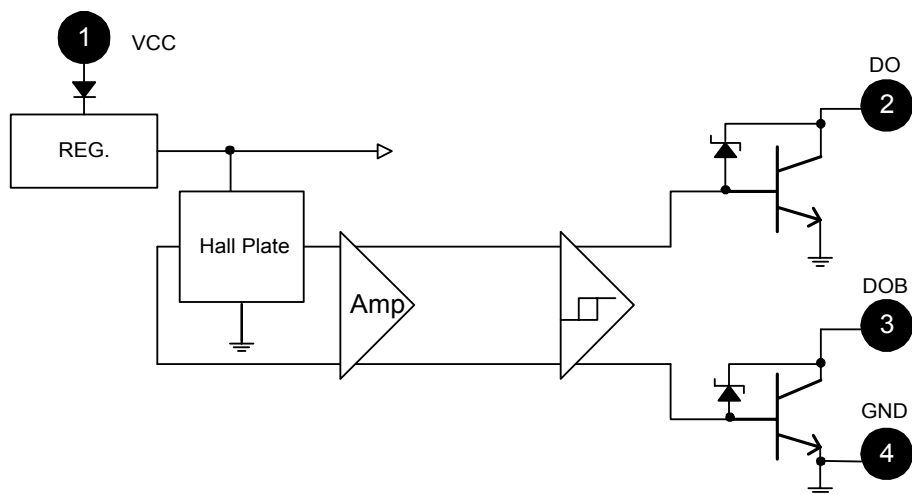
■ Typical Application Circuit



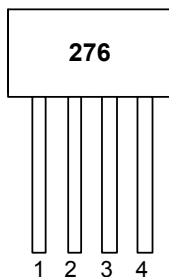
Brush-less DC Fan

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■ Block Diagram



■ Pin Assignment



Front View

1 : VCC

2 : DO

3 : DOB

4 : GND

| 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 |

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■ Absolute Maximum Ratings (at Ta=25°C)

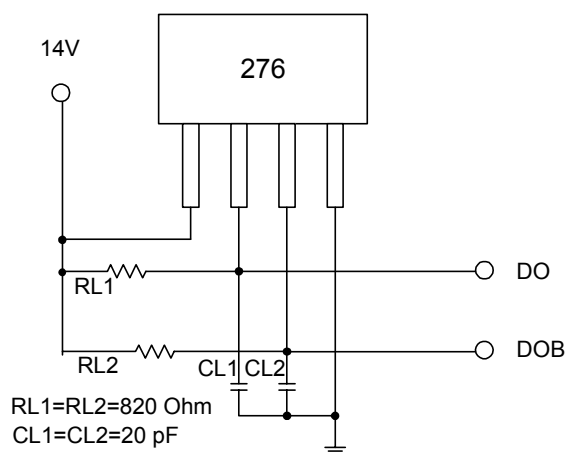
| Characteristics | | Symbol | Values | Unit |
|-----------------------------------|-----------------|-----------|-----------|------|
| Supply voltage | | V_{CC} | 20 | V |
| Reverse V_{CC} Polarity Voltage | | V_{RCC} | -20 | V |
| Magnetic flux density | | B | Unlimited | |
| Output “on” current | Continuous | I_c | 0.4 | A |
| | Hold | | 0.5 | |
| | Peak (Start Up) | | 0.7 | |
| Operating temperature range | | T_a | -20~+85 | °C |
| Storage temperature range | | T_s | -65~+150 | °C |
| Package Power Dissipation | | PD | 550 | mW |
| Maximum Junction Temp | | T_j | 150 | °C |

■ Electrical Characteristics (T=+25°C)

| Characteristic | Symbol | Conditions | Min | Typ | Max | Units |
|---------------------------|----------|---|------|------|-----|-------|
| Low Supply Voltage | Vce | Vcc=3.5V, I _L =100mA | - | 0.4 | - | V |
| Supply Voltage | Vcc | K version | 3.5 | - | 20 | V |
| | | Q version | 2.5* | - | 20 | |
| Output Zener Breakdown | Vz | K version | - | 46 | - | V |
| | | Q version | - | 35 | - | |
| Output Saturation Voltage | Vce(sat) | Vcc=14V, I _L =300mA | - | 0.7 | 0.8 | V |
| Output Leakage Current | Icex | Vce=14V, Vcc=14V | - | <0.1 | 10 | μA |
| Supply Current | Icc | Vcc=20V, Output Open | - | 16 | 25 | mA |
| Output Rise Time | tr | Vcc=14V, R _L =820Ω, C _L =20pF | - | 3.0 | 10 | μs |
| Output Falling Time | tf | Vcc=14V, R _L =820Ω, C _L =20pF | - | 0.3 | 1.5 | μs |
| Switch Time Differential | Δt | Vcc=14V, R _L =820Ω, C _L =20pF | - | 3.0 | 10 | μs |

*The output of DO/DOB will be switched on/off after supply voltage reaching the 2.5V.

■ Test Circuit



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■ Magnetic Characteristics ($T_a=+25^{\circ}\text{C}$, $V_{CC}=12\text{V}$)

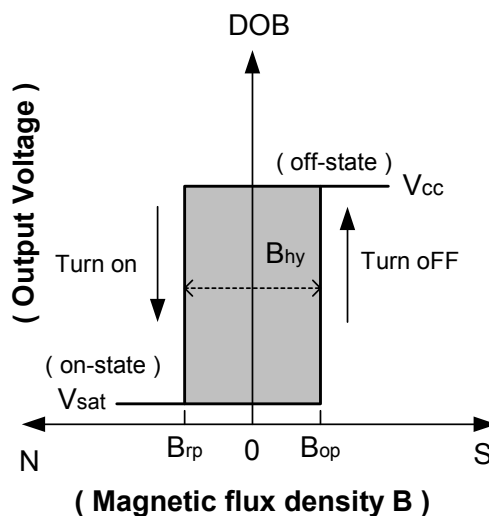
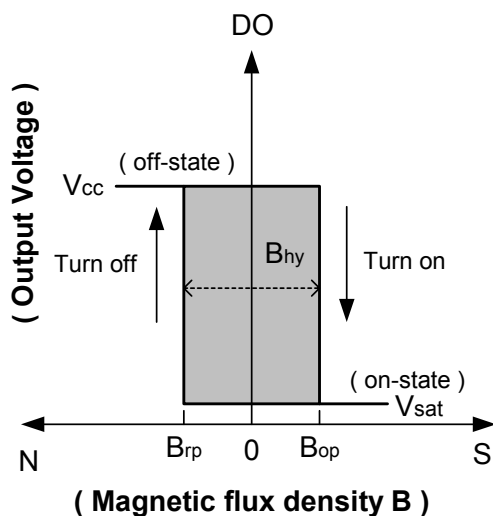
K version

(1mT = 10 Gauss)

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|----------------|--------|------|------|------|-------|
| Operate Point | Bop | - | - | 110 | Gauss |
| Release Point | Brp | -110 | - | - | Gauss |
| Hysteresis | Bhy | - | 110 | - | Gauss |

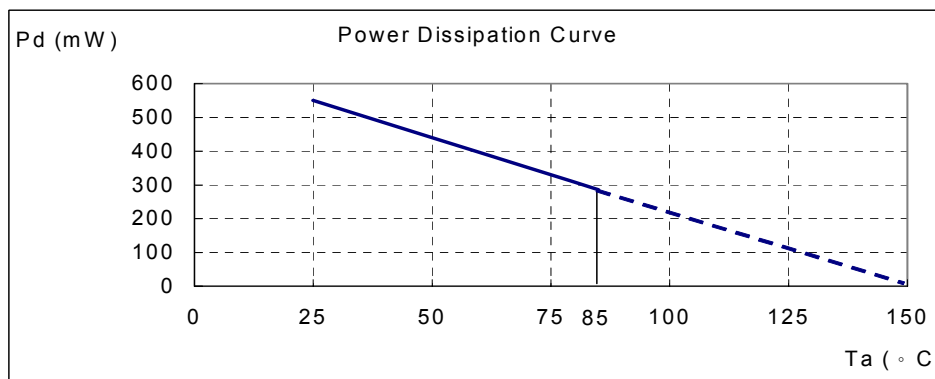
Q version

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



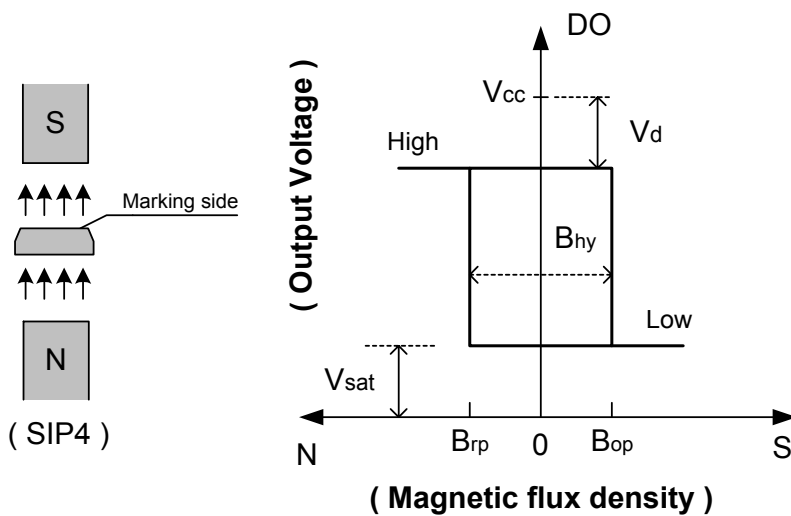
■ Performance Characteristics (SIP-4)

| T_a ($^{\circ}\text{C}$) | 25 | 50 | 60 | 70 | 80 | 85 | 90 | 95 | 100 |
|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pd (mW) | 550 | 440 | 396 | 352 | 308 | 286 | 264 | 242 | 220 |
| T_a ($^{\circ}\text{C}$) | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 150 |
| Pd (mW) | 198 | 176 | 154 | 132 | 110 | 88 | 66 | 44 | 0 |

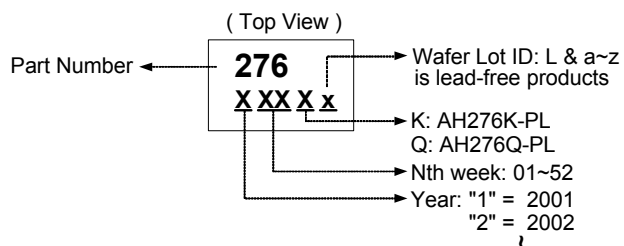


Complementary Output Hall Effect Latch

■ Operating Characteristics



■ Marking Information



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■ Package Information

