

## 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.

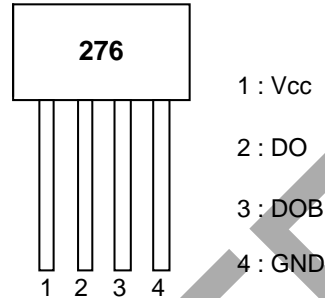
## Features

- 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 (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Pin Assignments

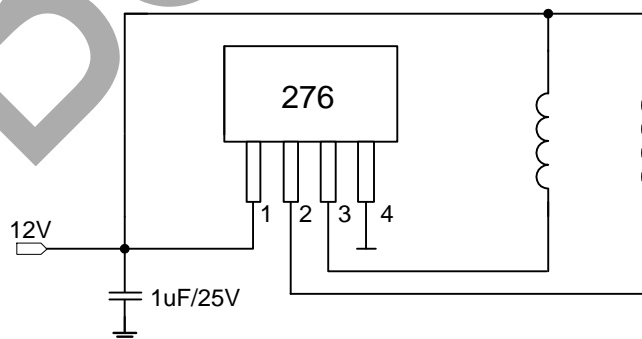
( Top View )



## Applications

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

## Typical Applications Circuit



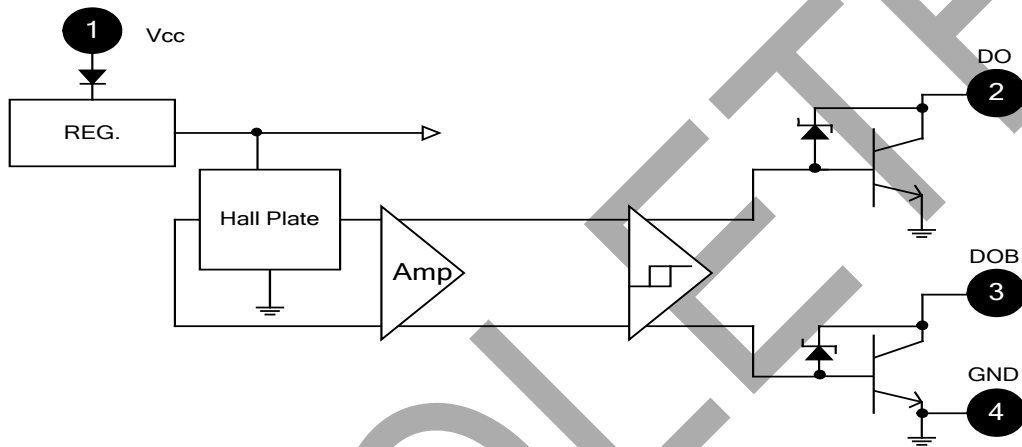
**Brush-less DC Fan**

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**Pin Descriptions**

Pin Name	P/I/O	Pin #	Function
V <sub>CC</sub>	P	1	Power Supply Input
DO	O	2	Output Pin
DOB	O	3	Output Pin
GND	P	4	Ground

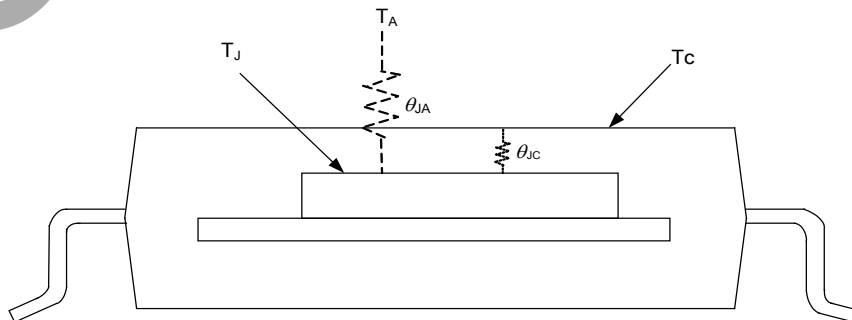
**Functional Block Diagram**



**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	Rating	Unit
V <sub>CC</sub>	Supply Voltage	20	V
V <sub>RCC</sub>	Reverse VCC Polarity Voltage	-20	V
B	Magnetic Flux Density	Unlimited	
I <sub>o</sub>	Output "on" Current (Note 3)	Continuous	0.4
		Hold	0.5
		Peak (Start Up)	0.7
T <sub>s</sub>	Storage Temperature Range	-65 ~ +150	°C
PD	Package Power Dissipation (SIP-4L)	550	mW
T <sub>J</sub>	Maximum Junction Temperature	+150	°C
θ <sub>JA</sub>	Thermal Resistance Junction-to-Ambient (SIP-4L)	227	°C/W
θ <sub>JC</sub>	Thermal Resistance Junction-to-Case (SIP-4L)	49	°C/W

Note: 3. P<sub>o</sub> shall be within Safety Operation Area.



**Recommended Operating Conditions** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	Supply Voltage (Note 4)	Operating	3.5	20	V
T <sub>A</sub>	Operating Ambient Temperature	Operating	-20	+85	°C

Note: 4. The output DO/DOB is switching as magnetic field change (S>300G, N<-300G).

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>Z</sub>	Output Zener Breakdown		—	35	—	V
V <sub>CE(SAT)</sub>	Output Saturation Voltage	V <sub>CC</sub> = 14V, I <sub>L</sub> = 400mA	—	0.6	0.9	V
I <sub>CEX</sub>	Output Leakage Current	V <sub>CE</sub> = 14V, V <sub>CC</sub> = 14V	—	<0.1	10	µA
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = 20V, Output Open	7	16	25	mA

**Magnetic Characteristics** (Note 5) (@T<sub>A</sub> = +25°C, V<sub>CC</sub> = 14V, unless otherwise specified.)

**A grade**

Symbol	Characteristic	Min	Typ	Max	Unit
B <sub>op</sub>	Operate Point	10	—	50	Gauss
B <sub>rp</sub>	Release Point	-50	—	-10	Gauss
B <sub>hy</sub>	Hysteresis	—	75	—	Gauss

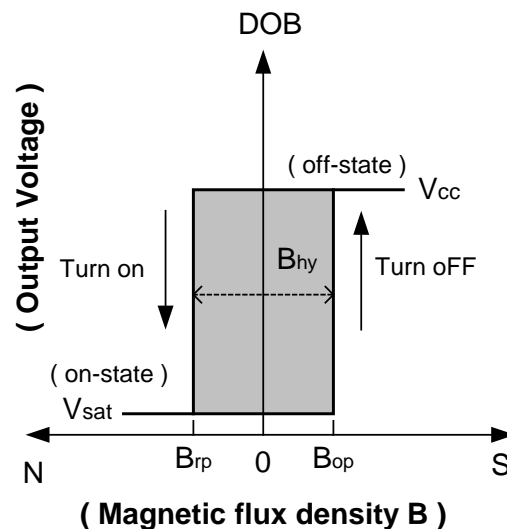
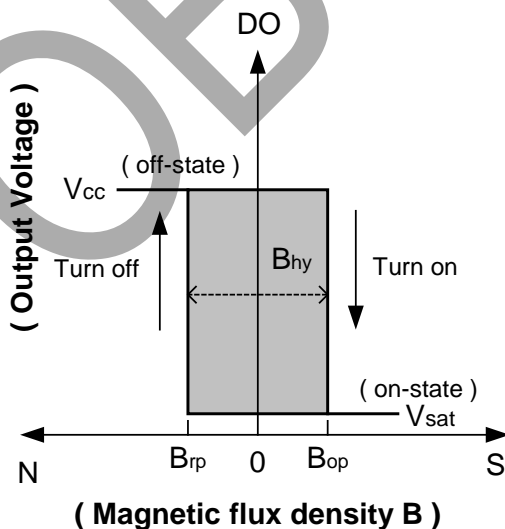
**B grade**

Symbol	Characteristic	Min	Typ	Max	Unit
B <sub>op</sub>	Operate Point	5	—	70	Gauss
B <sub>rp</sub>	Release Point	-70	—	-5	Gauss
B <sub>hy</sub>	Hysteresis	—	75	—	Gauss

**C grade**

Symbol	Characteristic	Min	Typ	Max	Unit
B <sub>op</sub>	Operate Point	—	—	100	Gauss
B <sub>rp</sub>	Release Point	-100	—	—	Gauss
B <sub>hy</sub>	Hysteresis	—	75	—	Gauss

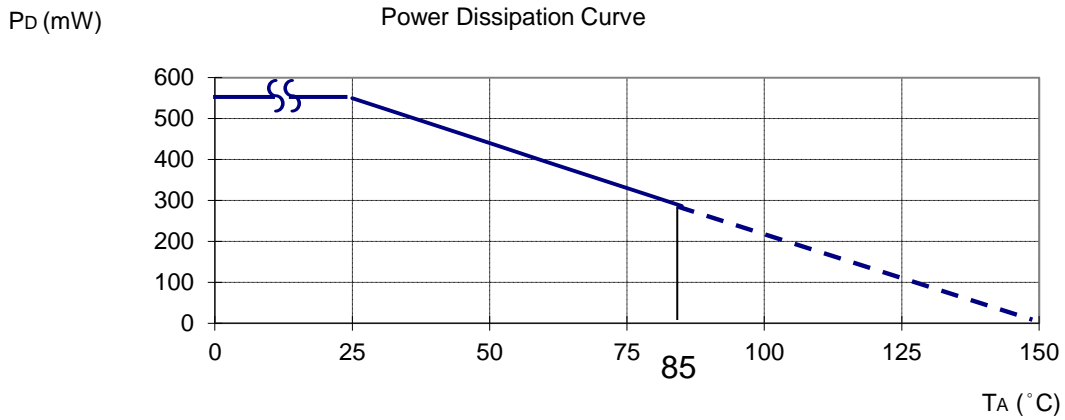
Note: 5. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.



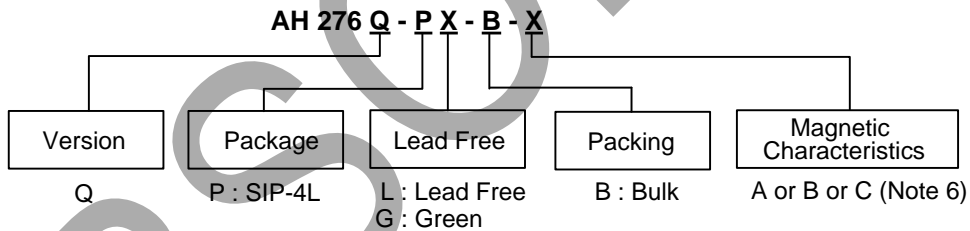
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**Performance Characteristics**

<b>T<sub>A</sub> (°C)</b>	25	50	60	70	80	85	90	95	100
<b>P<sub>D</sub> (mW)</b>	550	440	396	352	308	286	264	242	220
<b>T<sub>A</sub> (°C)</b>	105	110	115	120	125	130	135	140	150
<b>P<sub>D</sub> (mW)</b>	198	176	154	132	110	88	66	44	0



**Ordering Information**

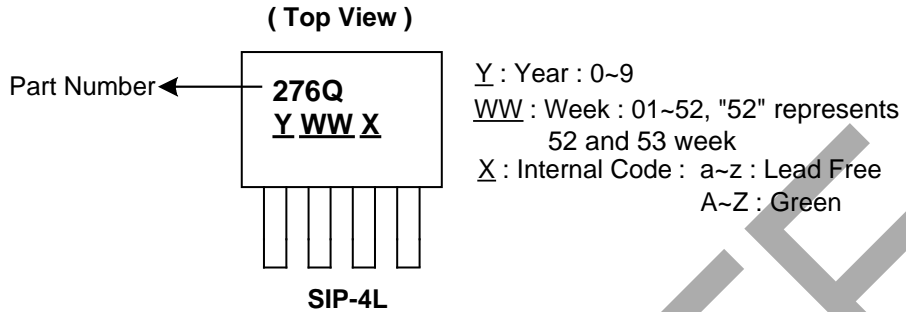


Part Number	Package Code	Packaging	Bulk		Magnetic Characteristics
			Quantity	Part Number Suffix	
AH276Q-PL-B-A	P	SIP-4L	1000	-B	A
AH276Q-PL-B-B	P	SIP-4L	1000	-B	B
AH276Q-PL-B-C	P	SIP-4L	1000	-B	C
AH276Q-PG-B-A	P	SIP-4L	1000	-B	A
AH276Q-PG-B-B	P	SIP-4L	1000	-B	B
AH276Q-PG-B-C	P	SIP-4L	1000	-B	C

Note: 6. Please refer to page 3 (Magnetic Characteristics table).

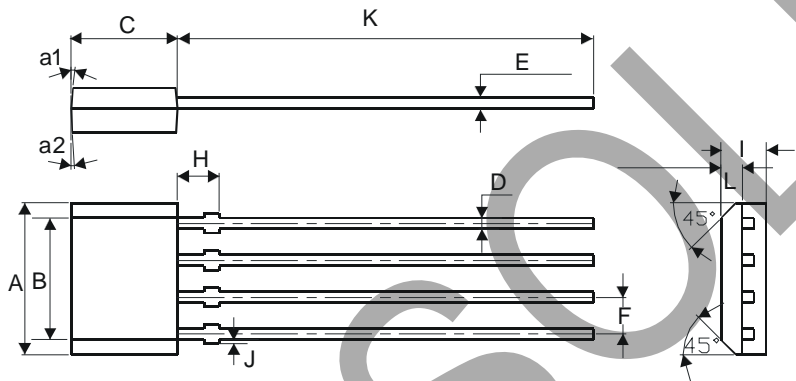
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**Marking Information**

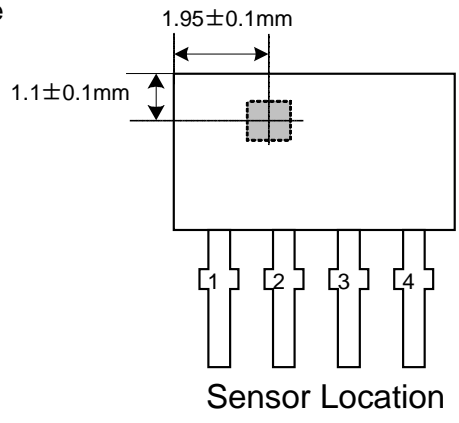
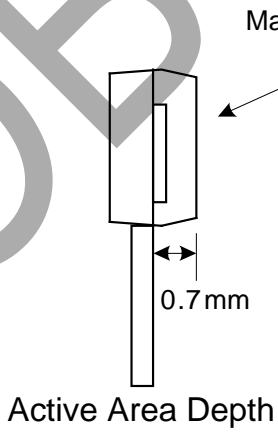


**Package Outline Dimensions** (All dimensions in mm.)

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SIP-4		
Dim	Min	Max
A	5.12	5.32
B	4.10	4.30
C	3.55	3.75
D	0.38	0.44
E	0.35	0.41
F	1.24	1.30
H	1.32	1.52
I	1.45	1.65
J	0.00	0.2
K	13.00	15.5
L	0.63	0.83
a1	3°	5°
a2	4°	7°
All Dimensions in mm		



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