

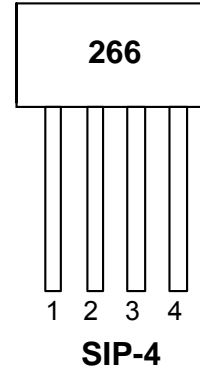
## Description

AH266 is an integrated Hall sensor with output drivers designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis for noise rejection, and complementary Darlington open-collector drivers for sinking large current loads. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density (B) is larger than operation point (Bop), DO will turn on (low) and DOB will turn off (high). The output state is latched prior to reaching release point (Brp). If  $B < Brp$ , DO will turn off and DOB will turn on. AH266 is rated for operation over temperature range from  $-20^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  and voltage range from 4V to 28V. The devices are available in low cost die forms or rugged 4 pin SIP packages.

## Pin Assignments

( Top View )



## Features

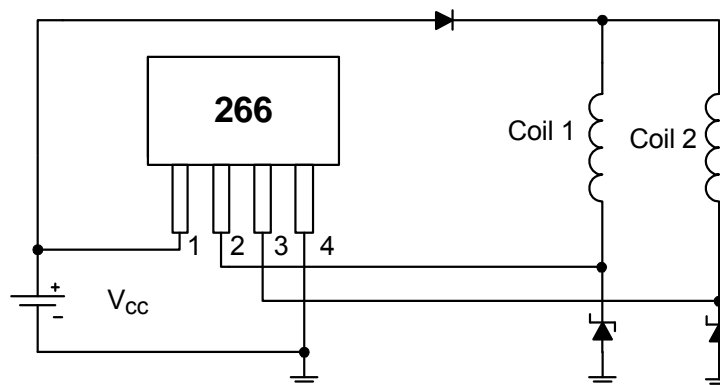
- On-Chip Hall Plate
- Operating Voltage: 4V to 28V
- Output Current: 400mA (Continuous,  $+25^{\circ}\text{C}$ )
- Reverse Protection Diode Only for Chip Reverse Power Connecting (Note 1)
- Output Protection Zener Breakdown  $V_Z = 62\text{V}$  (Typ.)
- Lead Free package: SIP-4
- SIP-4: Available in "Green" Molding Compound (No Br, Sb)
- RoHS Compliant (Note 2)
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Applications

- Dual-Coil Brushless DC Motor
- Dual-Coil Brushless DC Fan
- Revolution Counting
- Speed Measurement

- 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  $<900\text{ppm}$  bromine,  $<900\text{ppm}$  chlorine ( $<1500\text{ppm}$  total Br + Cl) and  $<1000\text{ppm}$  antimony compounds.

## Typical Applications Circuit

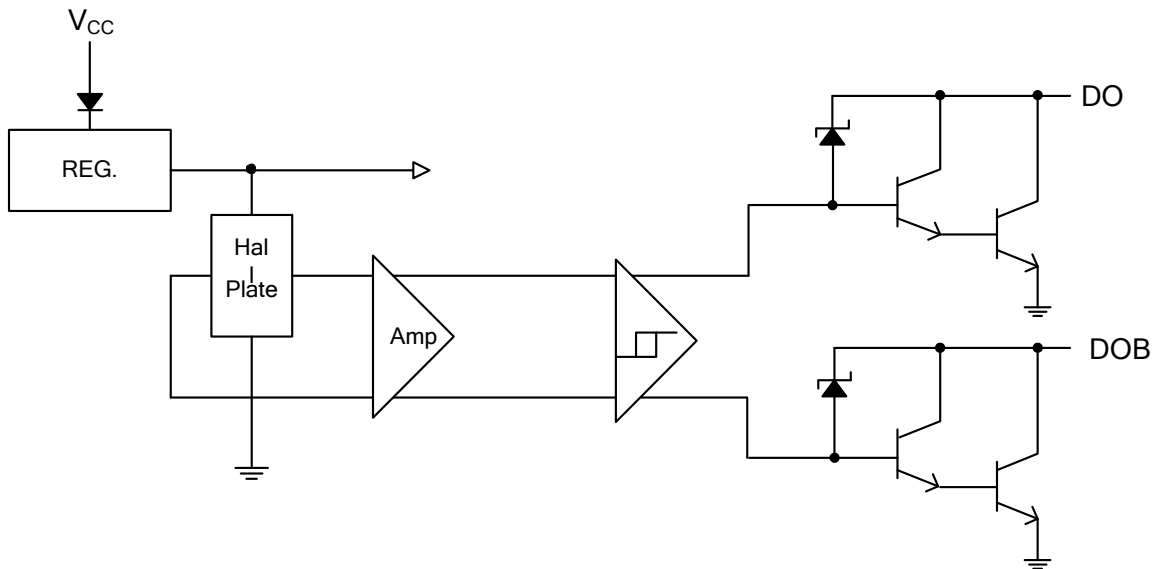


**Brush-Less DC Fan**

## Pin Descriptions

Pin Name	P/I/O	Pin #	Description
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	28	V
V <sub>out (off)</sub>	Output "OFF" Voltage	28	V
I <sub>O (con)</sub>	Output "ON" Current	400 (Note 5)	mA
I <sub>O (hold)</sub>		500	mA
I <sub>O (peak)</sub>		700	mA
B	Magnetic Flux Density	Unlimited	Gauss
T <sub>ST</sub>	Storage Temperature Range	-65 to +150	°C
P <sub>D</sub>	Power Dissipation (Note 6)	550	mW
θ <sub>JA</sub>	Thermal Resistance Junction-to-Ambient (SIP-4)	227	°C/W
θ <sub>JC</sub>	Thermal Resistance Junction-to-Case (SIP-4)	49	°C/W

**Recommended Operating Conditions** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

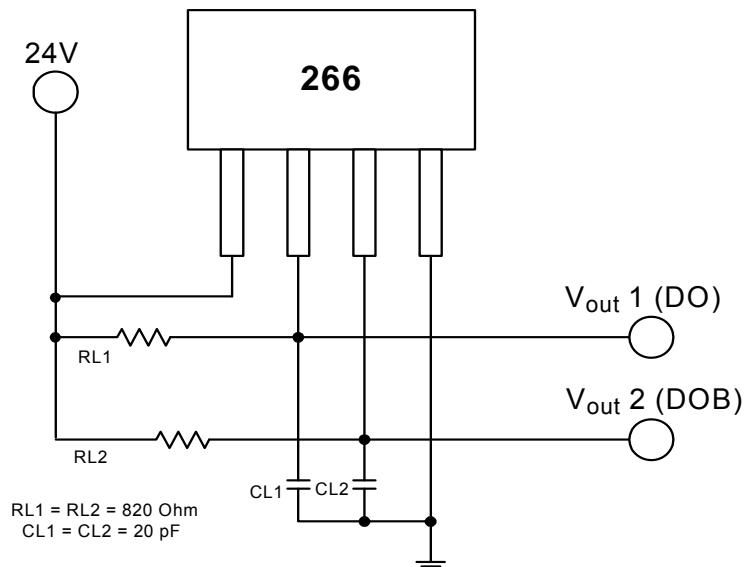
Symbol	Characteristic	Conditions	Min	Max	Unit
$V_{CC}$	Supply Voltage	Operating	4	28	V
$T_A$	Operating Ambient Temperature (Note 7)	Operating	-20	85	$^\circ\text{C}$

- Notes:
- This application circuit can't protect reverse coil current if power is connecting reverse.
  - $I_{O(\text{con})}$  is 150 mA at  $+85^\circ\text{C}$ .
  - See Performance Characteristics for other conditions.
  - Shall not exceed  $P_D$  and Safety Operation Area.

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
$V_Z$	Output Zener Breakdown	Output Turn off	54	62	70	V
$V_{CE(\text{SAT})}$	Output Saturation Voltage	$V_{CC} = 24\text{V}$ , $I_C = 400\text{mA}$	—	1.1	1.5	V
$I_{CEX}$	Output Leakage Current	$V_{CE} = 24\text{V}$ , $V_{CC} = 24\text{V}$	—	< 0.1	10	$\mu\text{A}$
$I_{CC}$	Supply Current	$V_{CC} = 24\text{V}$ , Output Open	—	5	10	mA
$t_r$	Output Rise Time	$V_{CC} = 24\text{V}$ , $R_L = 820\Omega$ , $C_L = 20\text{pF}$	—	1.0	5	$\mu\text{s}$
$t_f$	Output Falling Time	$V_{CC} = 24\text{V}$ , $R_L = 820\Omega$ , $C_L = 20\text{pF}$	—	1.0	1.5	$\mu\text{s}$
$\Delta t$	Switch Time Differential	$V_{CC} = 24\text{V}$ , $R_L = 820\Omega$ , $C_L = 20\text{pF}$	—	3.0	10	$\mu\text{s}$

**Test Circuit**



**Magnetic Characteristics**

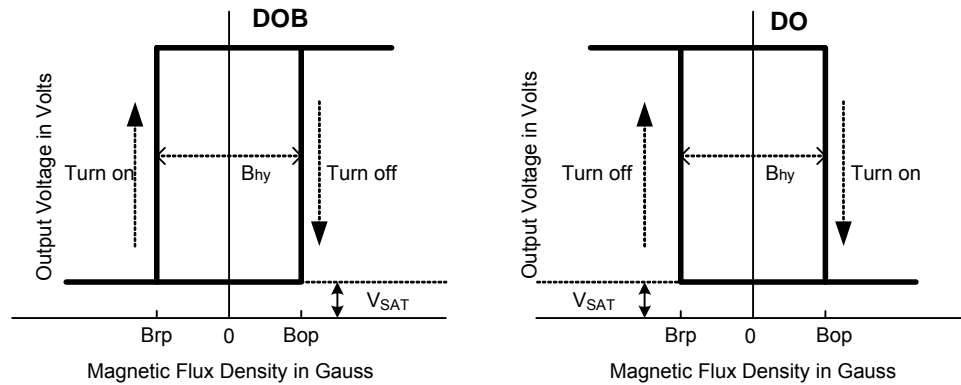
**A grade**

(1mT = 10 Gauss)

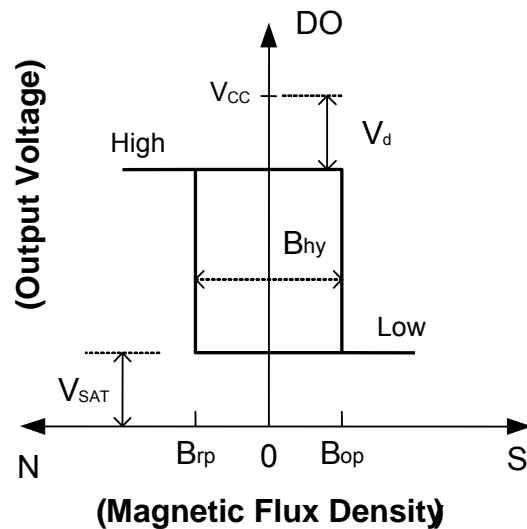
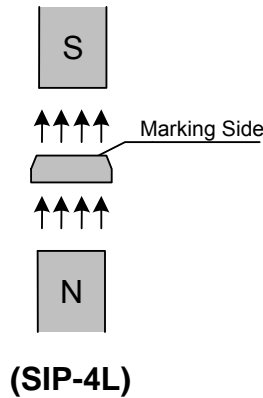
Symbol	Characteristic	Min	Typ.	Max	Unit
Bop	Operation Point	10	—	70	Gauss
Brp	Release Point	-70	—	-10	Gauss
Bhy	Hysteresis	—	80	—	Gauss

**B grade**

Symbol	Characteristic	Min	Typ.	Max	Unit
Bop	Operation Point	—	—	100	Gauss
Brp	Release Point	-100	—	—	Gauss
Bhy	Hysteresis	—	80	—	Gauss

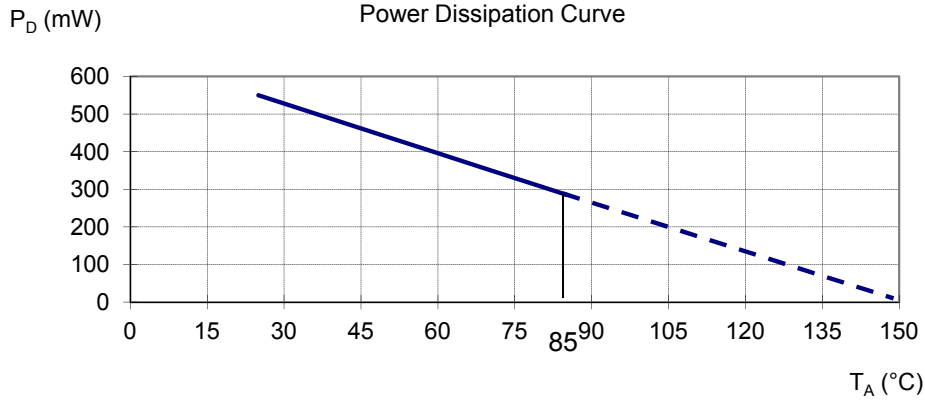


**Operation Characteristics**

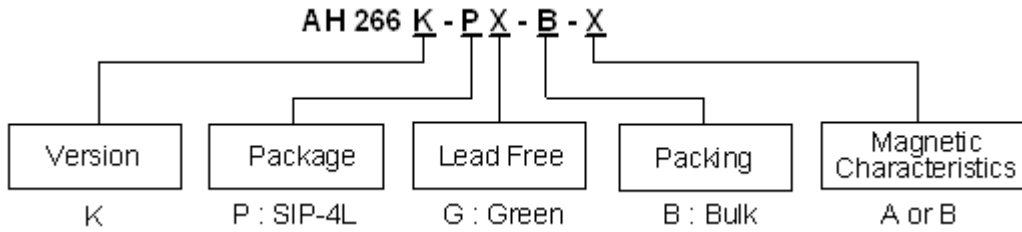


**Performance Characteristics**

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



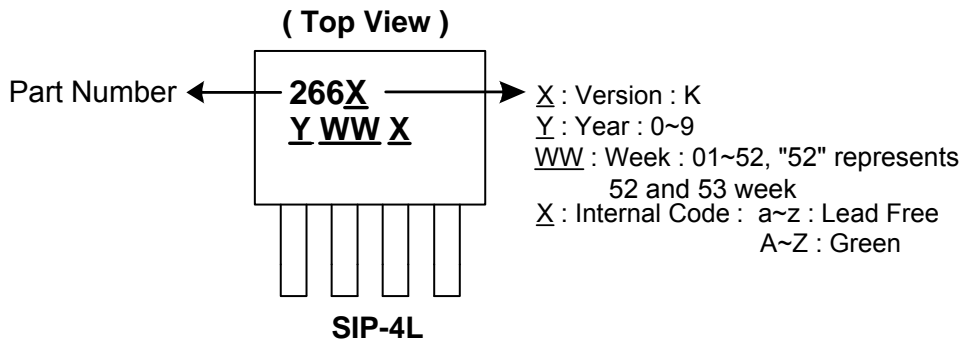
**Ordering Information**



Device	Package Code	Packaging (Note 8)	Bulk		Magnetic Characteristics
			Quantity	Part Number Suffix	
AH266K-PG-B-A	P	SIP-4	1000	-B	A
AH266K-PG-B-B	P	SIP-4	1000	-B	B

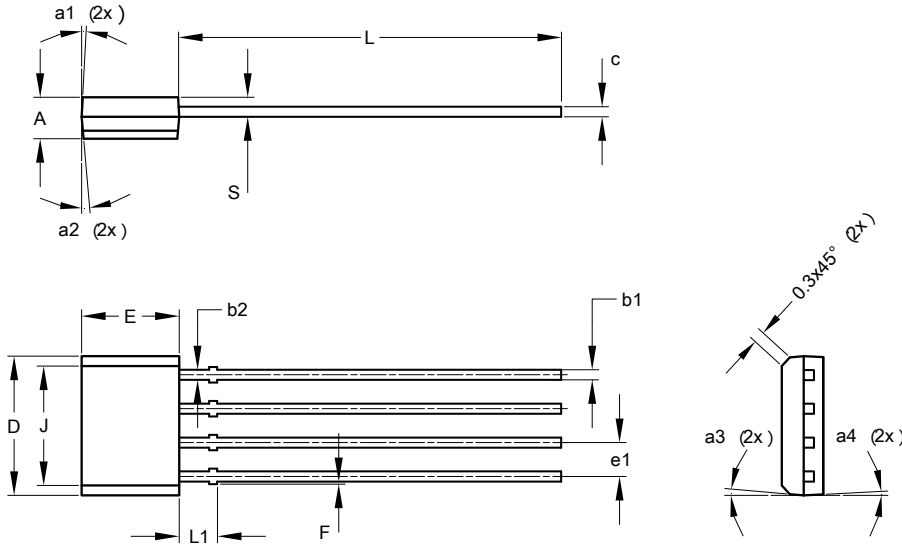
Note: 8. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

**Marking Information**



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

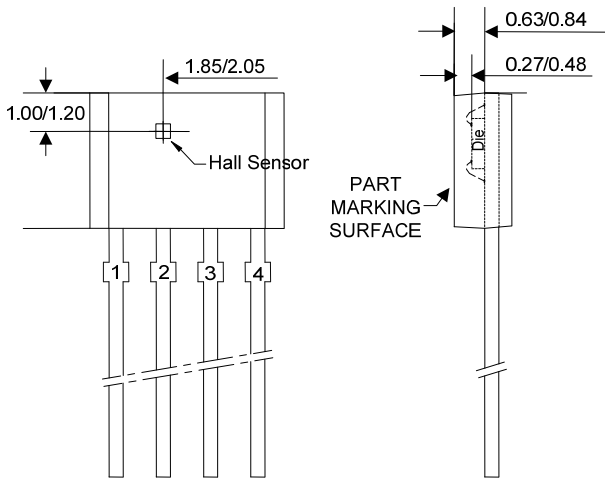
**(1) Package type: SIP-4L**



SIP-4			
Dim	Min	Max	Typ
A	1.45	1.65	1.55
b1	0.38	0.44	0.40
b2	-	-	0.48
c	0.35	0.45	0.40
D	5.12	5.32	5.22
e1	1.24	1.30	1.27
E	3.55	3.75	3.65
F	0.00	0.20	-
J	4.10	4.30	4.20
L	14.00	14.60	14.30
L1	1.32	1.52	1.42
S	0.63	0.83	0.73
a1	-	5°	3°
a2	4°	7°	5°
a3	4°	7°	5°
a4	-	5°	3°

**All Dimensions in mm**

Min/Max (in mm)



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