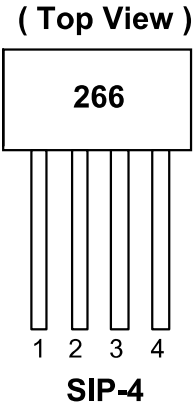


Description

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°C to +85°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



Features

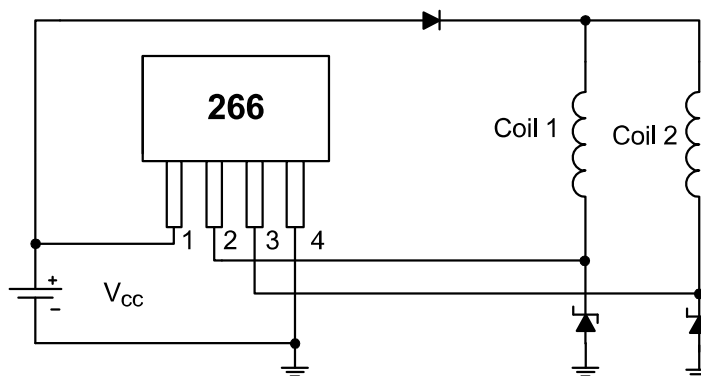
- On-Chip Hall Plate
- Operating Voltage: 4V to 28V
- Output Current: 400mA (Continuous, +25°C)
- Reverse Protection Diode Only for Chip Reverse Power Connecting (Note 1)
- Output Protection Zener Breakdown $V_Z = 62V$ (Typ.)
- Lead Free package: SIP-4
 - SIP-4: Available in "Green" Molding Compound (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 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.

Typical Applications Circuit

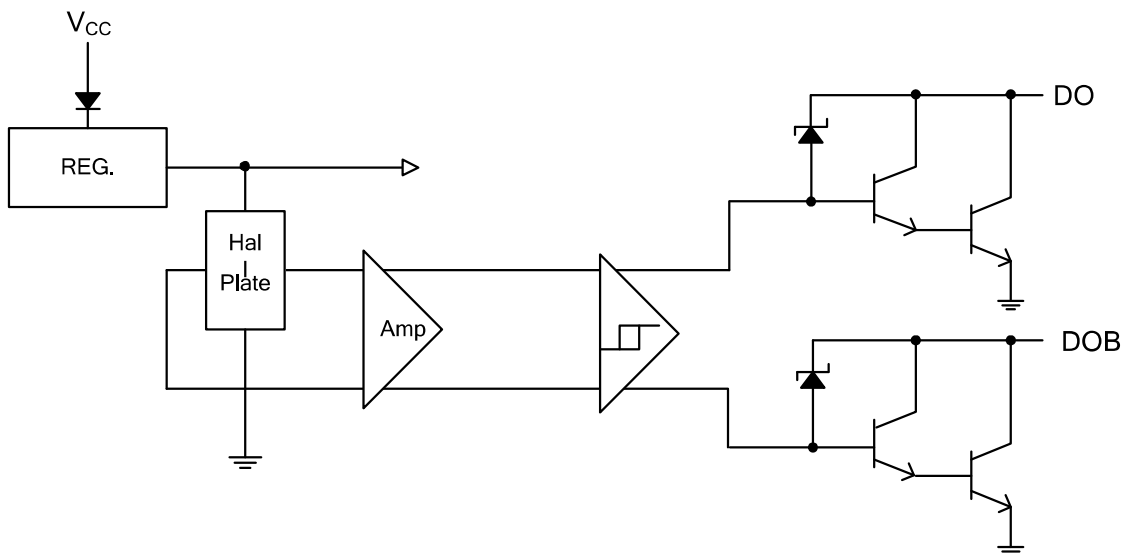


Brush-Less DC Fan

Pin Descriptions

| Pin Name | P/I/O | Pin # | Description |
|-----------------|-------|-------|--------------------|
| V _{CC} | 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_A = +25°C, unless otherwise specified.)

| Symbol | Parameter | Rating | Unit |
|------------------------|--|--------------|-------|
| V _{CC} | Supply Voltage | 28 | V |
| V _{out (off)} | Output "OFF" Voltage | 28 | V |
| I _{O (con)} | Output "ON" Current | 400 (Note 5) | mA |
| I _{O (hold)} | | 500 | mA |
| I _{O (peak)} | | 700 | mA |
| B | Magnetic Flux Density | Unlimited | Gauss |
| T _{ST} | Storage Temperature Range | -65 to +150 | °C |
| P _D | Power Dissipation (Note 6) | 550 | mW |
| θ _{JA} | Thermal Resistance Junction-to-Ambient (SIP-4) | 227 | °C/W |
| θ _{JC} | Thermal Resistance Junction-to-Case (SIP-4) | 49 | °C/W |

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

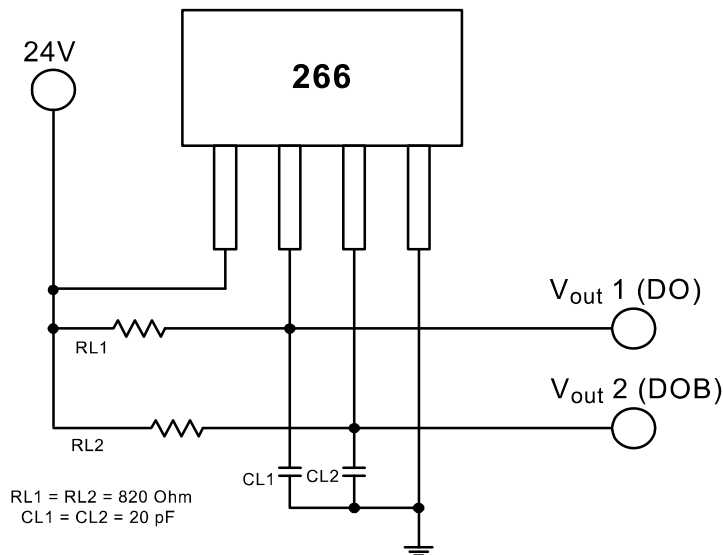
| Symbol | Characteristic | Conditions | Min | Max | Unit |
|----------|--|------------|-----|-----|--------------------|
| V_{CC} | Supply Voltage | Operating | 4 | 28 | V |
| T_A | Operating Ambient Temperature (Note 7) | Operating | -20 | 85 | $^{\circ}\text{C}$ |

- Notes:
- 4. This application circuit can't protect reverse coil current if power is connecting reverse.
 - 5. $I_{O(\text{con})}$ is 150 mA at $+85^{\circ}\text{C}$.
 - 6. See Performance Characteristics for other conditions.
 - 7. 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 | μA |
| 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 | μs |
| t_f | Output Falling Time | $V_{CC} = 24\text{V}$, $R_L = 820\Omega$, $C_L = 20\text{pF}$ | — | 1.0 | 1.5 | μs |
| Δt | Switch Time Differential | $V_{CC} = 24\text{V}$, $R_L = 820\Omega$, $C_L = 20\text{pF}$ | — | 3.0 | 10 | μs |

Test Circuit



Magnetic Characteristics

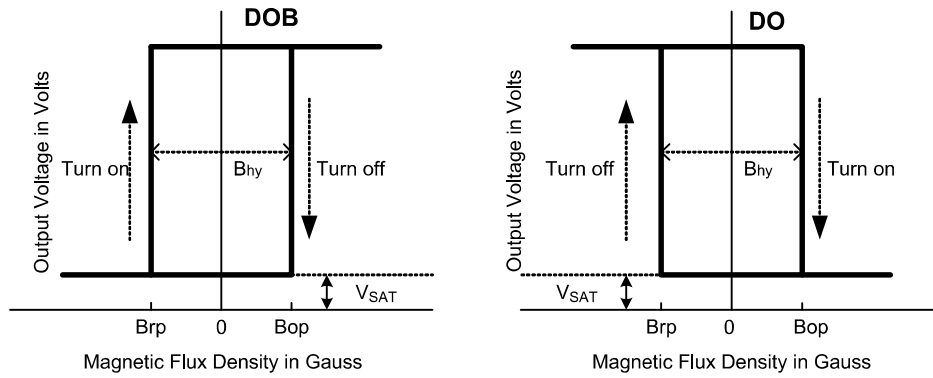
A grade

(1mT = 10 Gauss)

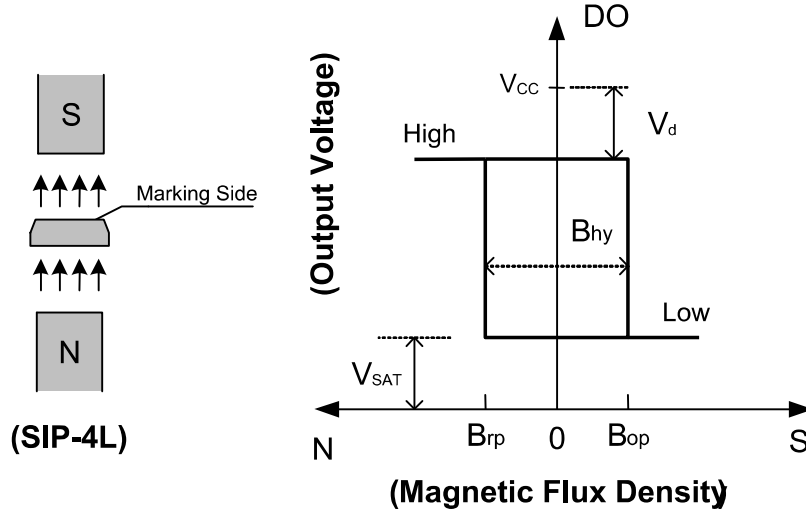
| Symbol | Characteristic | Min | Typ. | Max | Unit |
|--------|-----------------|-----|------|-----|-------|
| Bop | Operation Point | 10 | — | 70 | Gauss |
| Brp | Release Point | -70 | — | -10 | Gauss |
| Bhy | Hysteresis | — | 80 | — | Gauss |

B grade

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

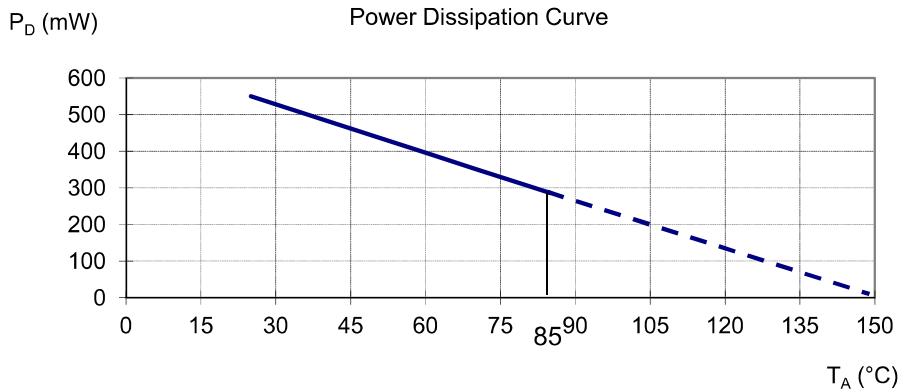


Operation Characteristics

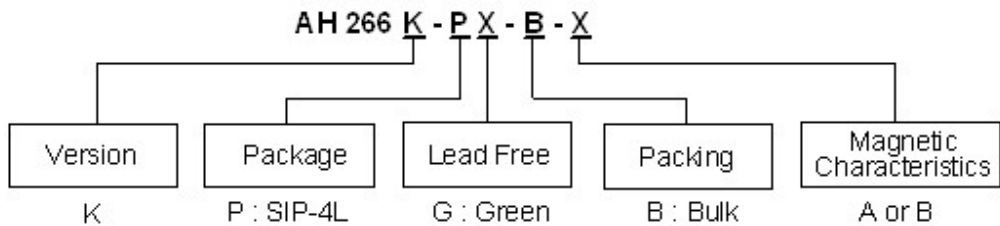


Performance Characteristics

| | | | | | | | | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| T _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 |



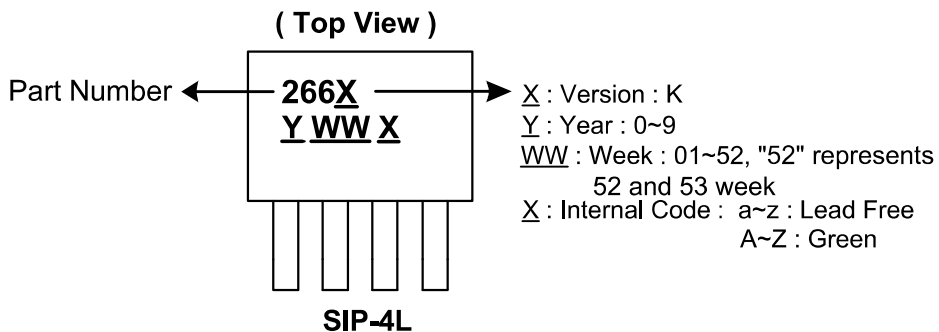
Ordering Information



| 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 |

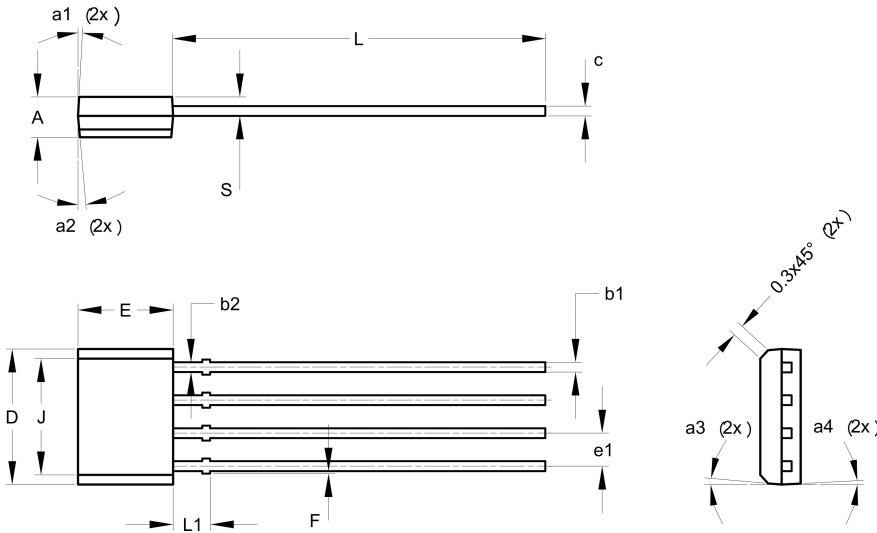
Note: 8. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

Marking Information



Package Outline Dimensions (All dimensions in mm.)

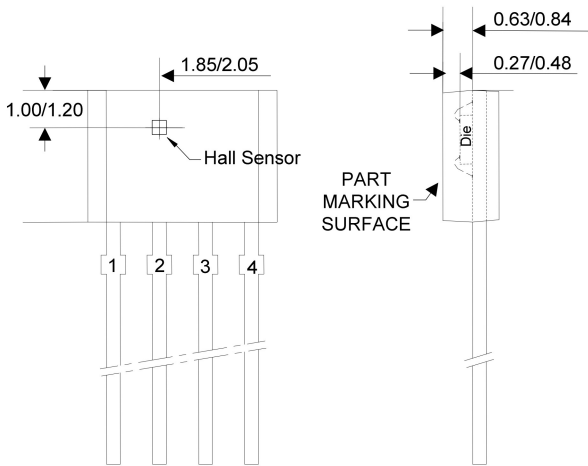
(1) Package type: SIP-4L



| 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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