HIGH VOLTAGE HALL EFFECT LATCH AH266

General Description

The AH266 is an integrated Hall sensor with output driver designed for electronic commutation of brushless DC motor applications. The device includes an on-chip Hall sensor for magnetic sensing, an amplifier that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis for noise rejection and two complementary darlington open-collector drivers for sinking large load current. It also includes an internal band-gap regulator which is used to provide bias voltage for internal circuits and allows a wide operating supply voltage ranges.

Placing the device in a variable magnetic field, if the magnetic flux density is larger than threshold B_{OP}, the pin DO will be turned low (on) and pin DOB will be turned high (off). This output state is held until the magnetic flux density reverses and falls below $B_{RP,}$ then causes DO to be turned high (off) and DOB turned low (on).

AH266 is available in TO-94 (SIP-4L) package.

Features

- On-Chip Hall Sensor
- 4V to 30V Supply Voltage
- 400mA (avg) Output Sink Current
- Build in Protection Diode for Reverse Power Connecting
- -20^{o}C to 85^{o}C Operating Temperature
- Low Profile TO-94 (SIP-4L) Package
- Build in Over Temperature Protection Function
- ESD Rating: 300V(Machine Model)

Applications

- 12V/24V Dual-Coil Brushless DC Motor/Fan
- Power Supply and Switchboard
- Communications Facilities
- Industrial Equipment

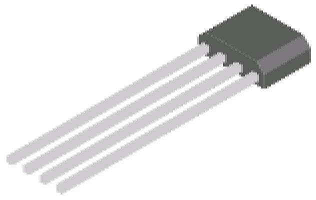


Figure 1. Package Type of AH266

Pin Configuration

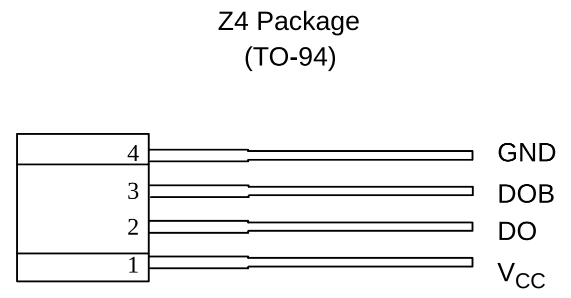


Figure 2. Pin Configuration of AH266 (Top View)

Pin Description

Pin Number	Pin Name	Function
1	V_{CC}	Supply voltage
2	DO	Output 1
3	DOB	Output 2
4	GND	Ground

Functional Block Diagram

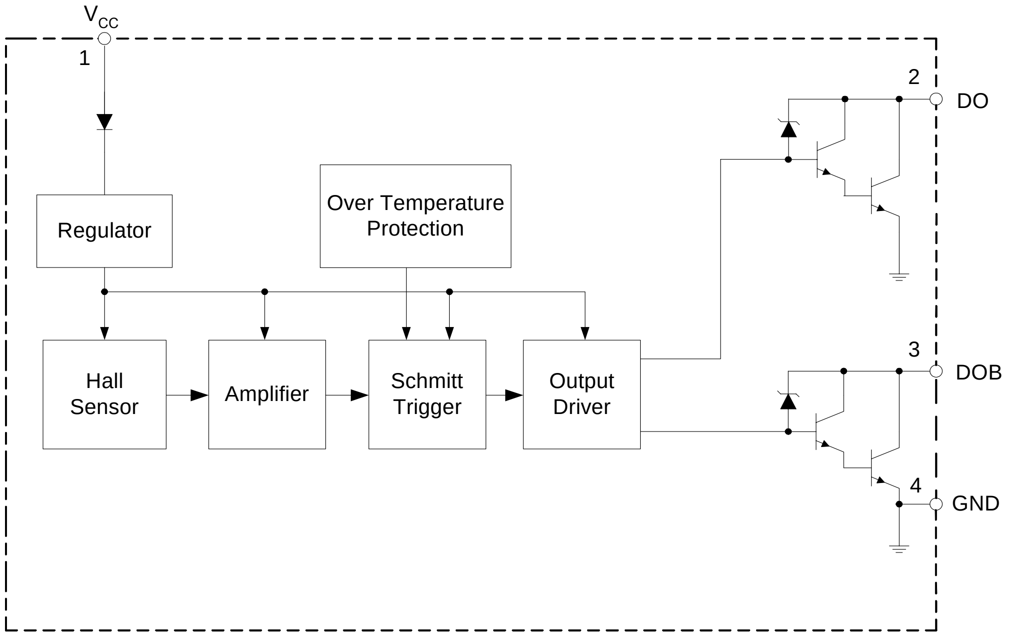
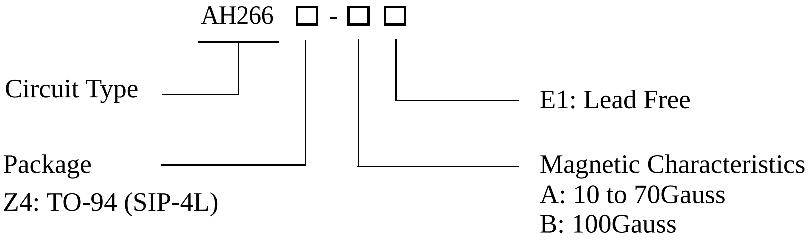


Figure 3. Functional Block Diagram of AH266

Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing Type
TO-94	-20 to 85 °C	AH266Z4-AE1	AH266Z4-E1	Bulk
		AH266Z4-BE1	AH266Z4-E1	Bulk

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

Absolute Maximum Ratings (Note 1)

(T_A=25^{o}C)

Parameter		Symbol	Value	Unit
Supply Voltage		V_{CC}	30	V
Reverse Protection Voltage		V_{RCC}	-30	V
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	I_O	400 (Note 2)	mA
	Hold		600	mA
	Peak (Start up)		800	mA
Power Dissipation		P_D	550	mW
Thermal Resistance	Die to atmosphere	θJA	227	^{o}C/W
	Die to package case	θJC	49	^{o}C/W
Storage Temperature		T_{STG}	-50 to 150	^{o}C
ESD (Machine Model)			300	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. "Absolute Maximum Ratings" for extended period may affect device reliability.

Note 2: Continuos output current is 200mA at 85^{o}C.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	5	28	V
Operating Ambient Temperature	T_A	-20	85	^{o}C

Electrical Characteristics

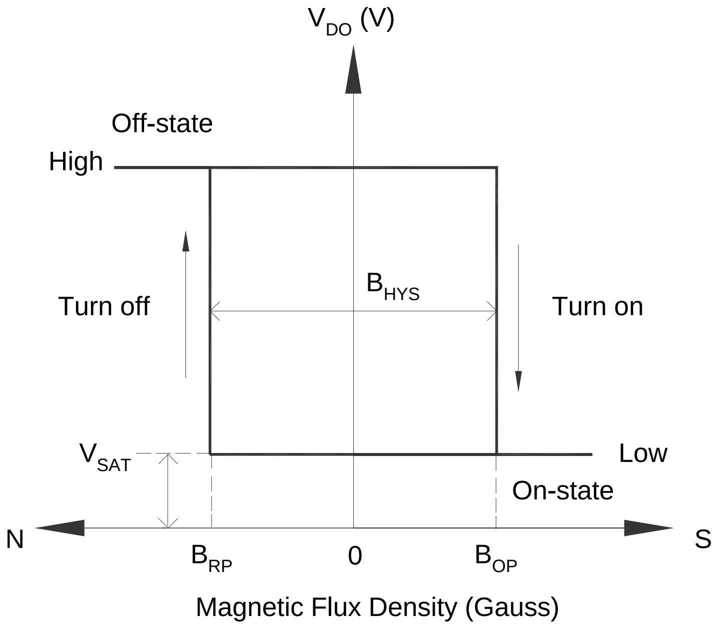
(T_A=25^{o}C, V_{CC}=24V, unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Low Supply Voltage	V_{CE}	V_{CC}=5V, I_O=100mA		0.8	1.1	V
Output Saturation Voltage	$V_{SAT}1$	I_O=500mA		1.1	1.5	V
Output Saturation Voltage	$V_{SAT}2$	I_O=300mA		0.9	1.25	V
Output Leakage Current	I_{OL}	V_{DO}, V_{DOB}=24V		0.1	10	μA
Supply Current	I_{CC}	V_{CC}=24V, Output Open		3.5	6	mA
Output Rise Time	tr	R_L=820Ω, C_L=20pF		3.0	10	μs
Output Fall Time	tf	R_L=820Ω, C_L=20pF		0.3	1.5	μs
Switch Time Differential	Δt	R_L=820Ω, C_L=20pF		3.0	10	μs
Output Zener Breakdown Voltage	V_{ZO}			61		V

Magnetic Characteristics

(T_A=25^{o}C)

Parameter	Symbol	Grade	Min	Typ	Max	Unit
Operating Point	B_{OP}	A	10		70	Gauss
		B			100	Gauss
Releasing Point	B_{RP}	A	-70		-10	Gauss
		B	-100			Gauss
Hysteresis	B_{HYS}			80		Gauss



Magnetic Characteristics (Continued)

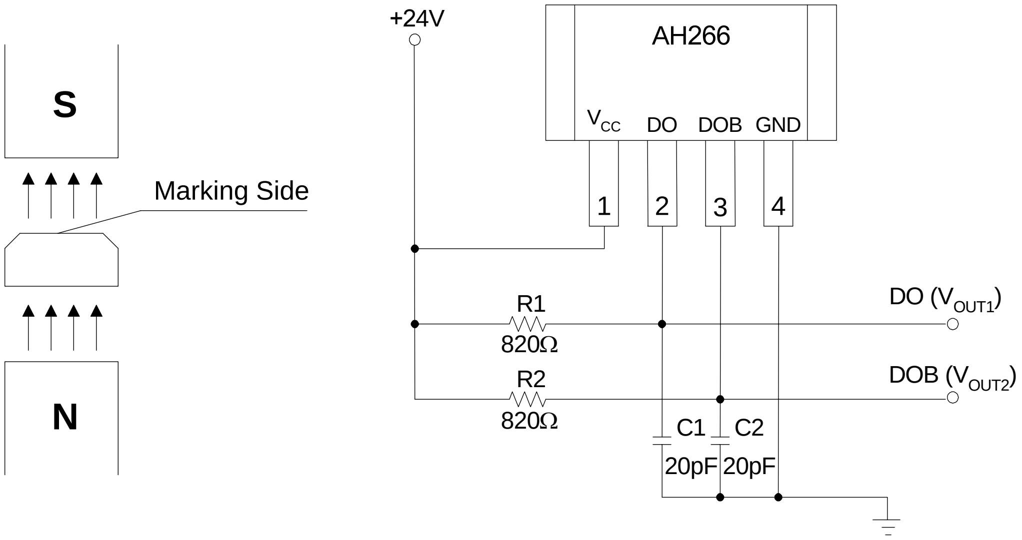


Figure 4. Basic Test Circuit

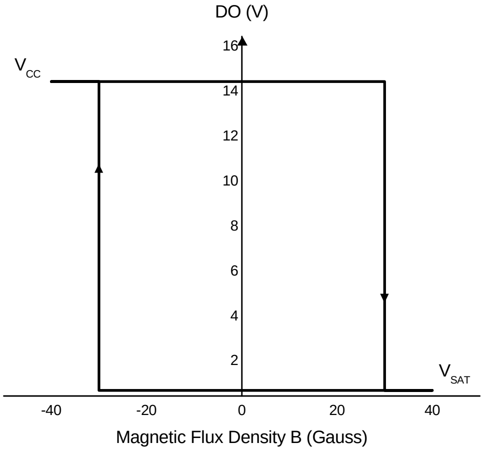


Figure 5. V_{DO} vs. Magnetic Flux Density

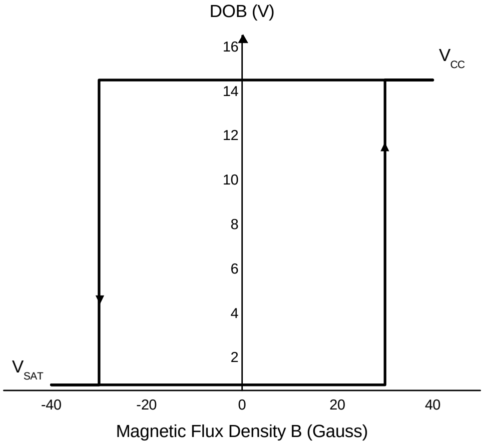


Figure 6. V_{DOB} vs. Magnetic Flux Density

Typical Performance Characteristics

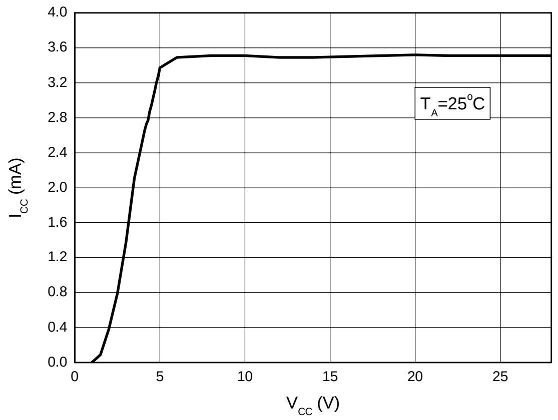


Figure 7. I_{CC} vs. V_{CC}

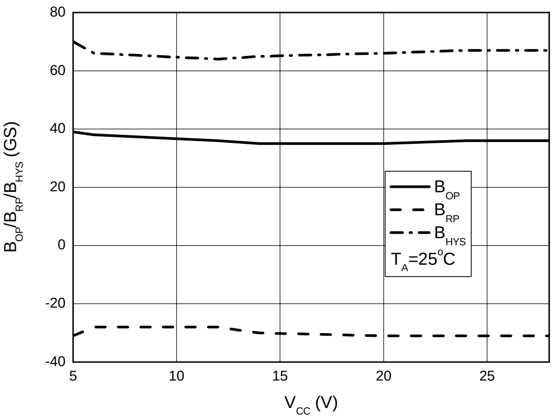


Figure 8. $B_{OP}/B_{RP}/B_{HYS}$ vs. V_{CC}

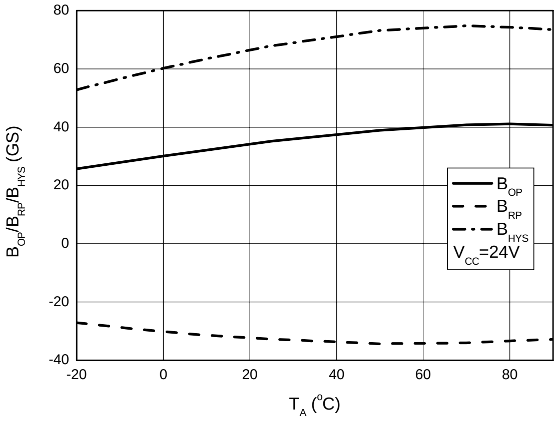


Figure 9. $B_{OP}/B_{RP}/B_{HYS}$ vs. Ambient Temperature

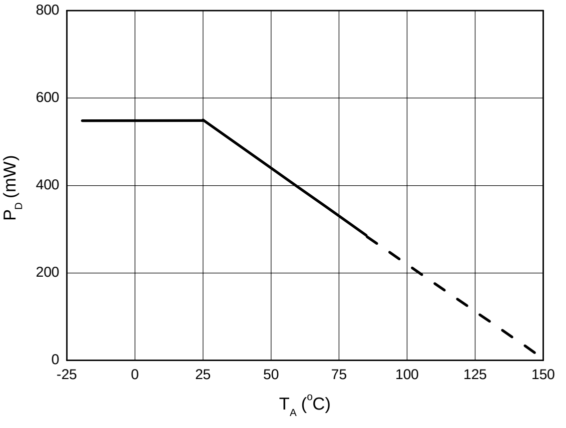


Figure 10. P_D vs. Ambient Temperature

Typical Performance Characteristics (Continued)

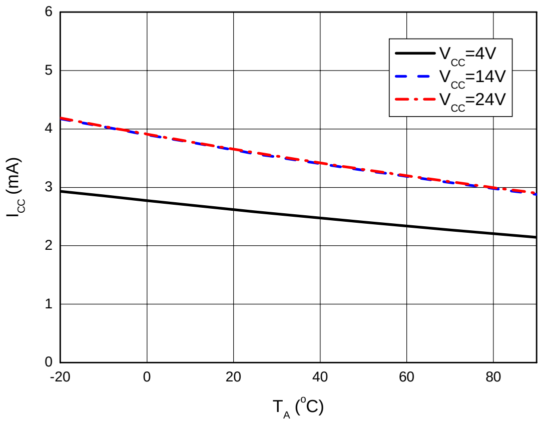


Figure 11. I_{CC} vs. Ambient Temperature

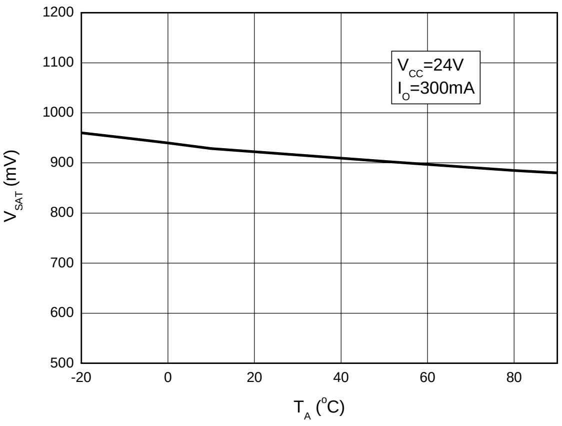


Figure 12. V_{SAT} vs. Ambient Temperature

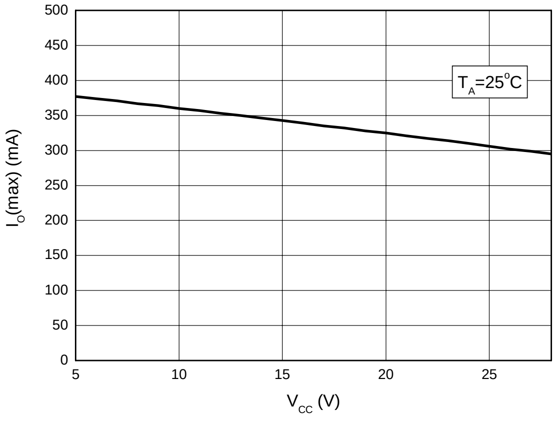
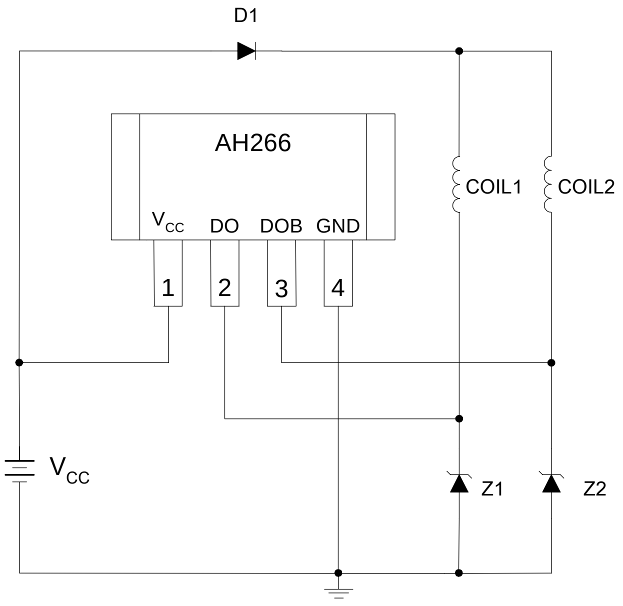


Figure 13. I_O(max) vs. VCC

Typical Applications

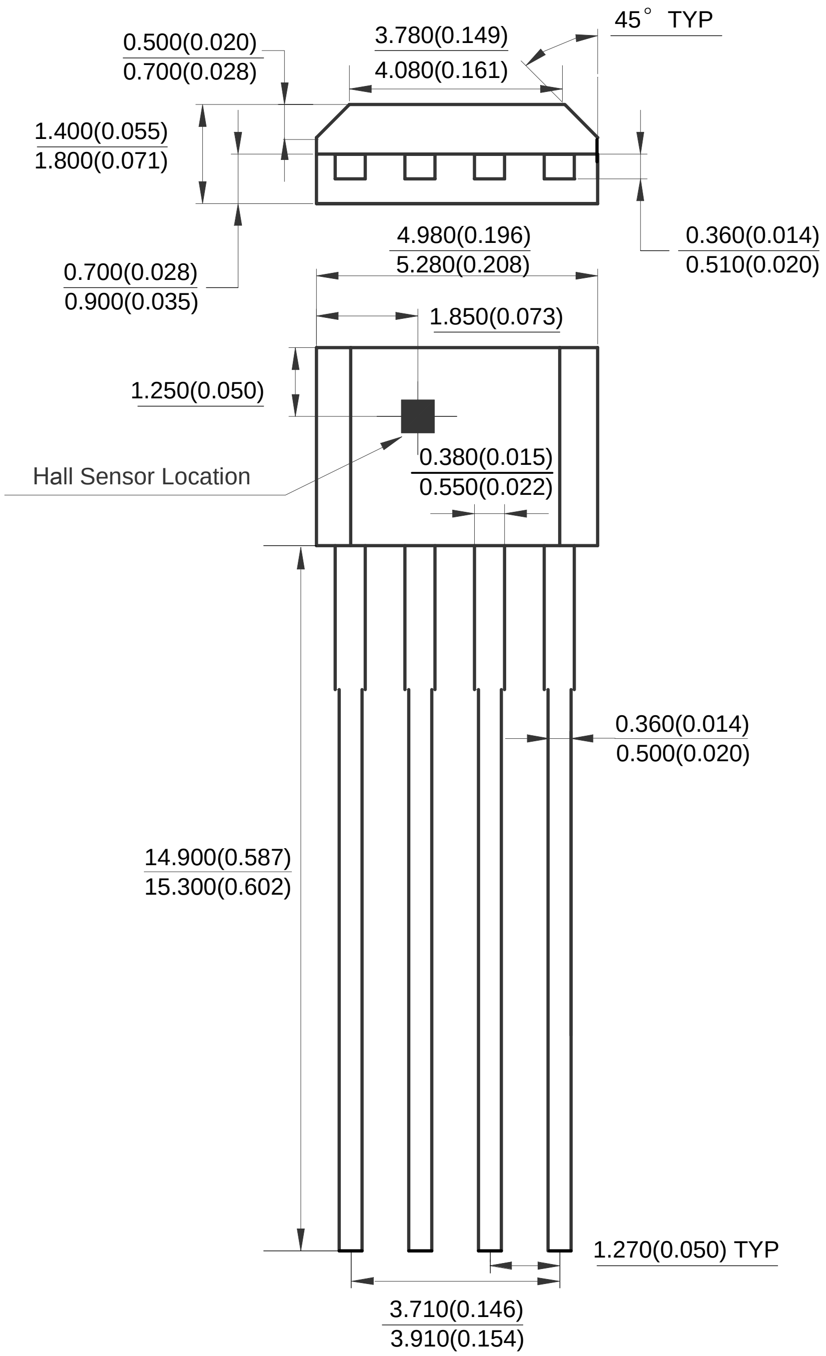


Z1, Z2: Zener diode, $2*V_{CC} \leq V_Z \leq 60V$

Figure 14. Typical Application Circuit with D1

Mechanical Dimensions

TO-94 **Unit: mm(inch)**



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