

### Features

- One-chip solution
- Built-in Hall sensor input amplifier
- Lock detection and automatic self-restart
- Built-in reverse voltage protection diode
- Built-in Zener protection for output driver
- Power efficient COMS and Power MOSFET Technology
- Operating voltage: 2.5V~15V
- SIP-4L: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/RoHS Compliant (Note 1)

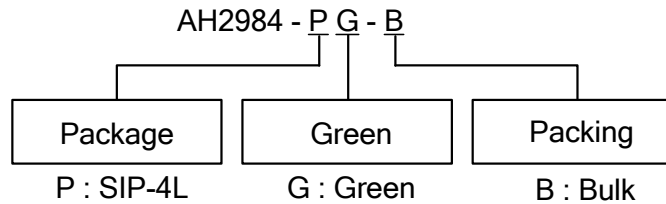
### General Description

The AH2984 is a one-chip solution for driving two-coil brushless DC motors and fans. It contains two complementary open-drain drivers for motor's coil driving, automatic lock shutdown and restart function relatively. Specially designed for driving large fans, the device is optimized for low start-up voltage.

Based on the advanced CMOS process, the IC contains a Hall-effect sensor, dynamic offset correction and powerful output drivers with 800mA peak output current capability.

To avoid coil burning, rotor-lock shutdown detection circuit shut down the output driver if the rotor is blocked and then the automatic recovery circuit will try to restart the motor. This function repeats while rotor is blocked. Until the blocking is removed, the motor recovers running normally.

### Ordering Information



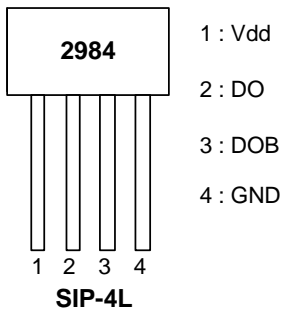
Device	Package Code	Packaging (Note 2)	Bulk	
			Quantity	Part Number Suffix
AH2984-PG-B	P	SIP-4L	1000	-B



Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*.  
 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

### Pin Assignment

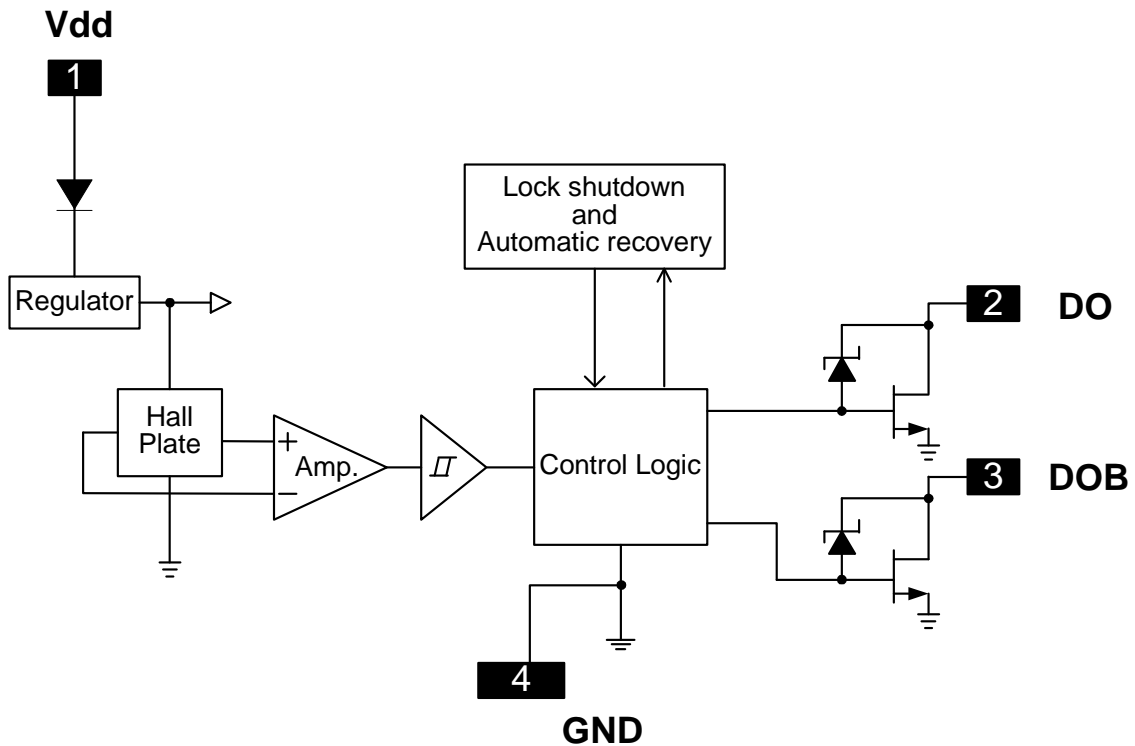
( Top View )



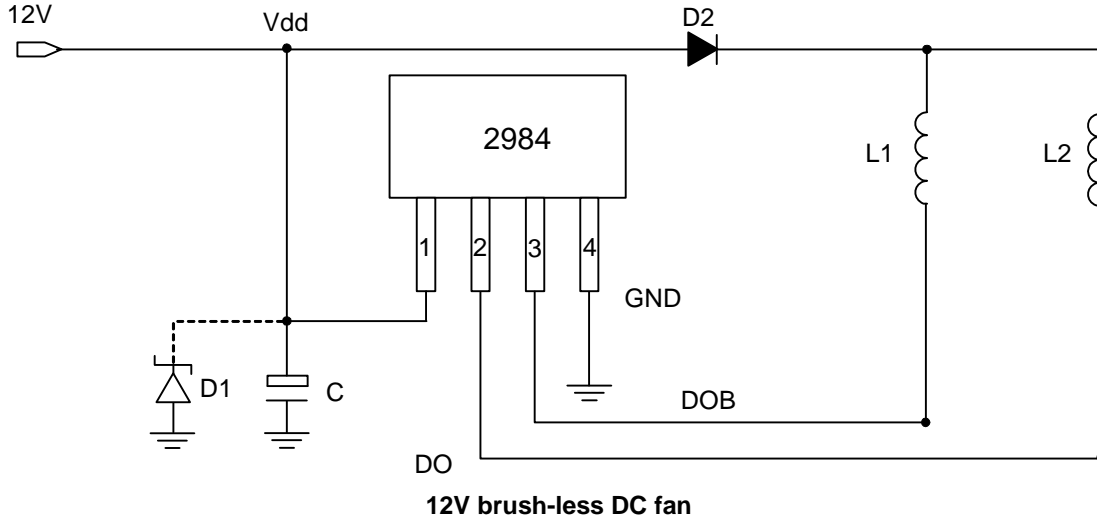
### Pin Description

Name	Description
Vdd	Input power
DO	Output pin
DOB	Output pin
GND	Ground

### Block Diagram



### Typical Application Circuit (Note 3)



Notes: 3. D1 (Zener Diode) and Capacitor C are for power stabilization, which C is recommended to be 1uF/ 50V (E-Cap.). The diode D2 protects the chip and fan coils for reverse power condition.

### Absolute Maximum Ratings (T<sub>A</sub> = 25°C)

Symbol	Conditions	Rating	Unit	
V <sub>dd</sub>	Supply Voltage	18	V	
V <sub>rdd</sub>	Reverse Vdd Polarity Voltage	-15	V	
I <sub>O(AVE)</sub>	Output Current (Note 4)	500	mA	
I <sub>O(peak as hold)</sub>		800		
P <sub>D</sub>	Power Dissipation	SIP-4L	550	mW
T <sub>ST</sub>	Storage Temperature		-55 ~ 150	°C
T <sub>J</sub>	Maximum Junction Temperature		150	°C
θ <sub>JA</sub>	Thermal Resistance (Note 5)	SIP-4L	227	°C/W

### Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>dd</sub>	Supply Voltage	Operating	2.5	15	V
T <sub>A</sub>	Operating Ambient Temperature (Note 4)	Operating	-40	105	°C

Notes: 4. Shall not exceed P<sub>D</sub> and Safety Operation Area.  
5. No heatsink, no air flow

### Electrical Characteristics (T<sub>A</sub> = 25 °C, V<sub>dd</sub> = 12V, unless otherwise specified)

Symbol	Characteristics	Conditions	Min	Typ.	Max	Unit
I <sub>dd</sub>	Supply Current	Operating, V <sub>dd</sub> =12V	2.0	3.5	5.0	mA
T <sub>on</sub>	Locked Protection On Time		-	0.25	-	Sec
T <sub>off</sub>	Locked Protection Off Time		-	3.25	-	Sec
R <sub>duty</sub>	Locked Protection Duty Ratio	T <sub>off</sub> /T <sub>on</sub>	-	13	-	-
R <sub>ds(on)</sub>	Output On Resistance	I <sub>o</sub> = 300mA	-	1	1.67	ohm
		I <sub>o</sub> = 500mA	-	1.25	1.8	
V <sub>z</sub>	Output Zener-Breakdown Voltage (Note 6)		24	33	42	V

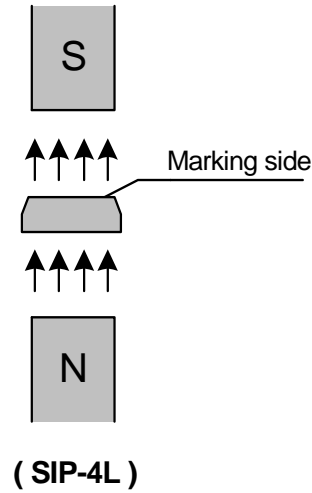
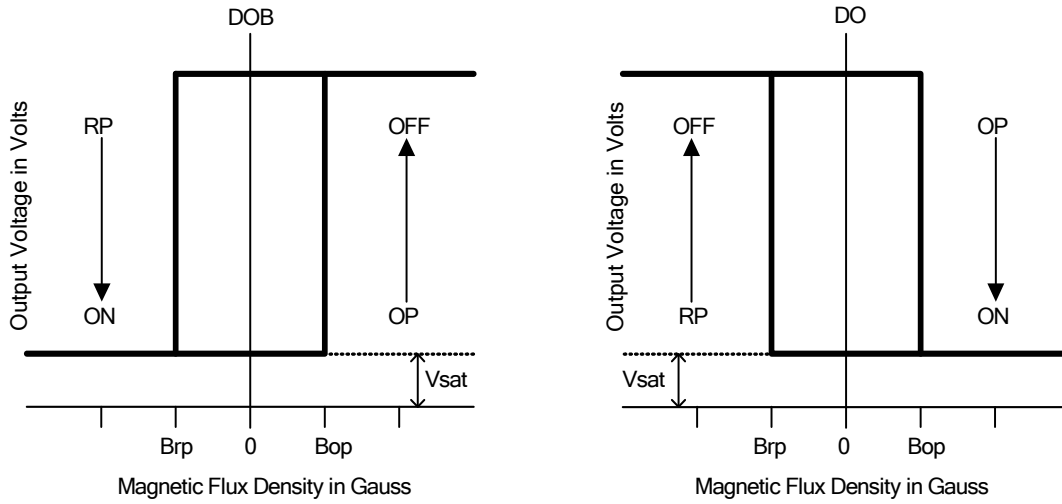
Notes: 6. The V<sub>z</sub> value is in D.C voltage measurement. The V<sub>z</sub> may vary with coils in the A.C. voltage measurement.

### Magnetic Characteristics (T<sub>A</sub> = 25 °C, V<sub>dd</sub> = 2.5V~15V)

(1mT=10 Gauss)

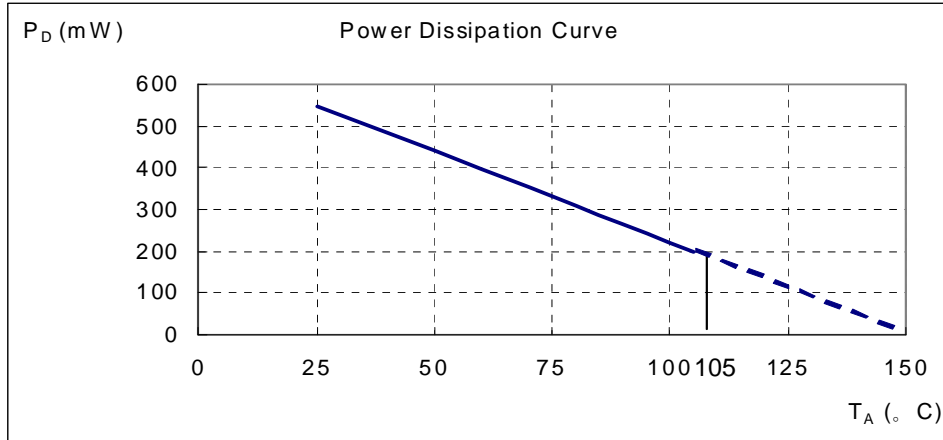
Symbol	Characteristics	Min	Typ.	Max	Unit
B <sub>op</sub>	Operate Point	5	30	60	Gauss
B <sub>rp</sub>	Release Point	-60	-30	-5	Gauss
B <sub>hy</sub>	Hysteresis	20	60	120	Gauss

**Operating Characteristics**



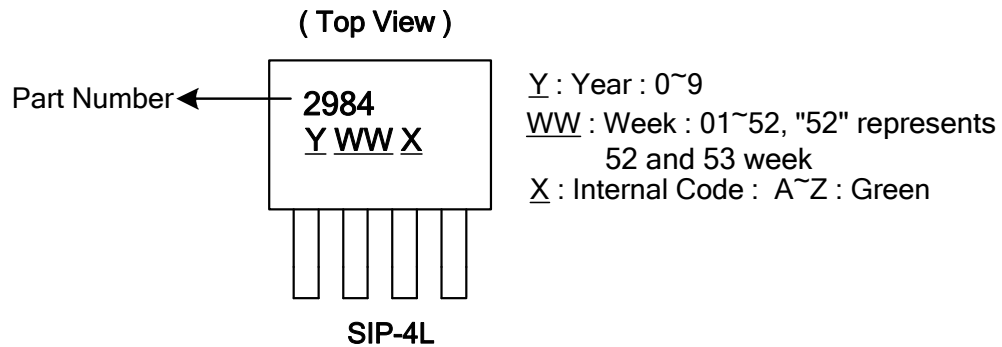
### Performance Characteristics

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



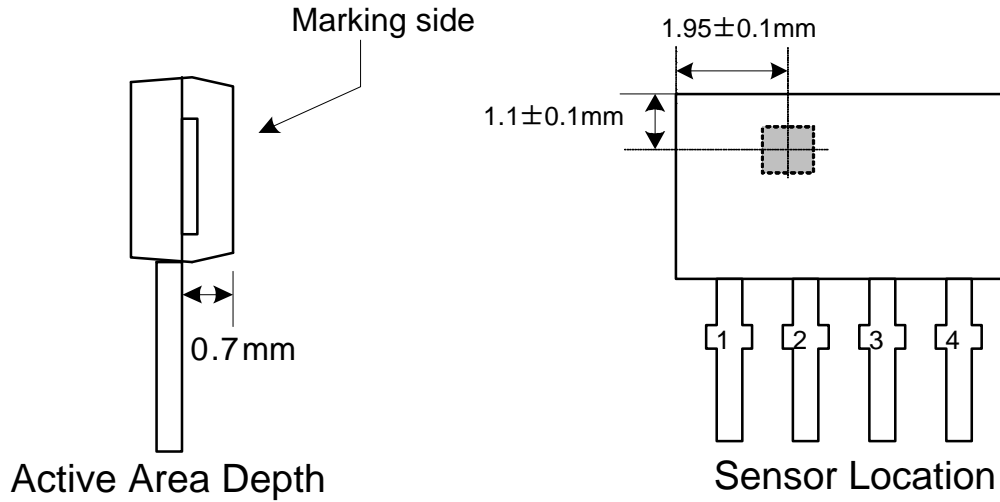
### Marking Information

(1) SIP-4L

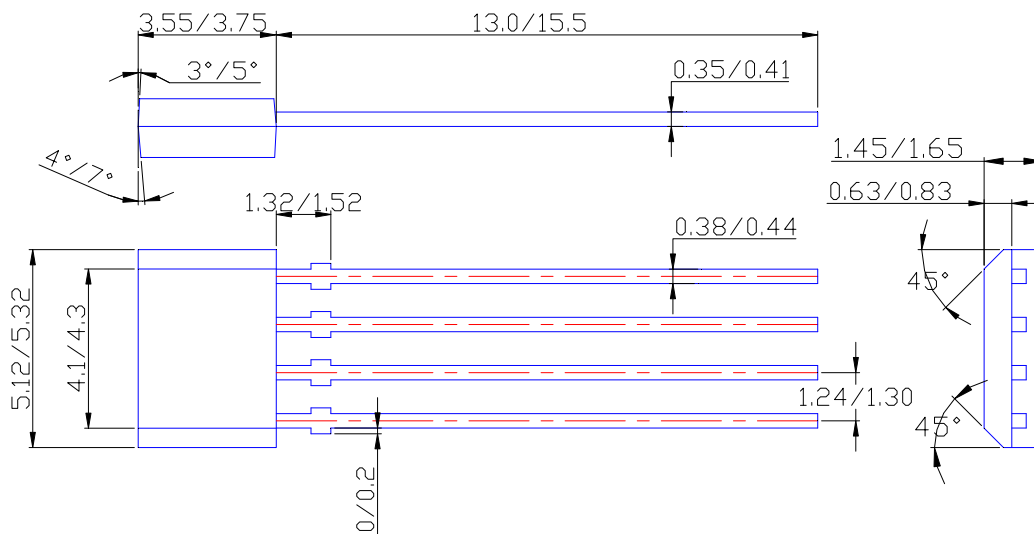


**Package Information**

(1) Package type: SIP-4L



**Package Dimension**



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