

## Features

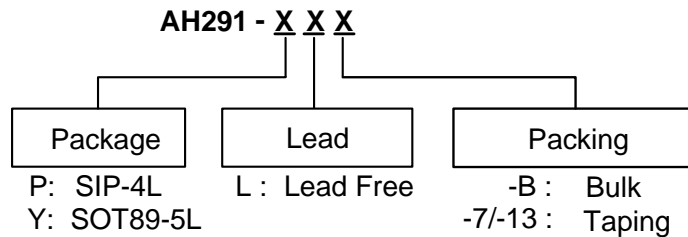
- On Chip Hall Sensor
- Rotor-Locked Shutdown
- Automatically Restart
- Built-in Zener Protection for Output Driver
- Operating Voltage: 1.8V~5.75 V
- Output Current:  $I_{O(AVE)} = 400 \text{ mA}$
- Lead Free Packages: SIP-4L and SOT89-5L

## General Description

AH291 is a monolithic fan motor controller with Hall sensor's capability. It contains two complementary open-collector drivers for motor's coil driving, automatic lock shutdown and restart function relatively.

Rotor-lock shutdown detection circuit turns off the output driver when the rotor is blocked to avoid coil overheat. Then, the automatic recovery circuit will restart the motor. These protected actions are repeated and periodic during the blocked period. Until the blocking is removed, the motor recovers and runs normally.

## Ordering Information

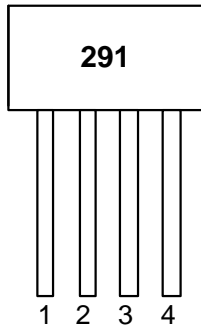


Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

Device	Package Code	Packaging (Note 2)	Tube/Bulk		7" Tape and Reel	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH291-P	P	SIP-4L	1000	-B	NA	NA
AH291-Y	Y	SOT89-5L	NA	NA	2500/Tape & Reel	-13

Note: 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>.

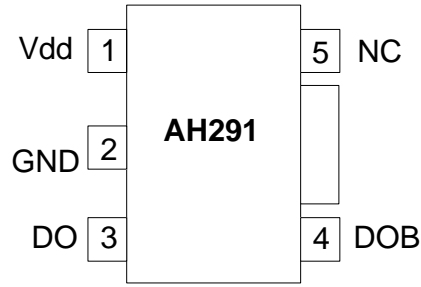
## Pin Assignment



**SIP-4L**

Front View

- 1 : V<sub>dd</sub>
- 2 : DO
- 3 : DOB
- 4 : GND

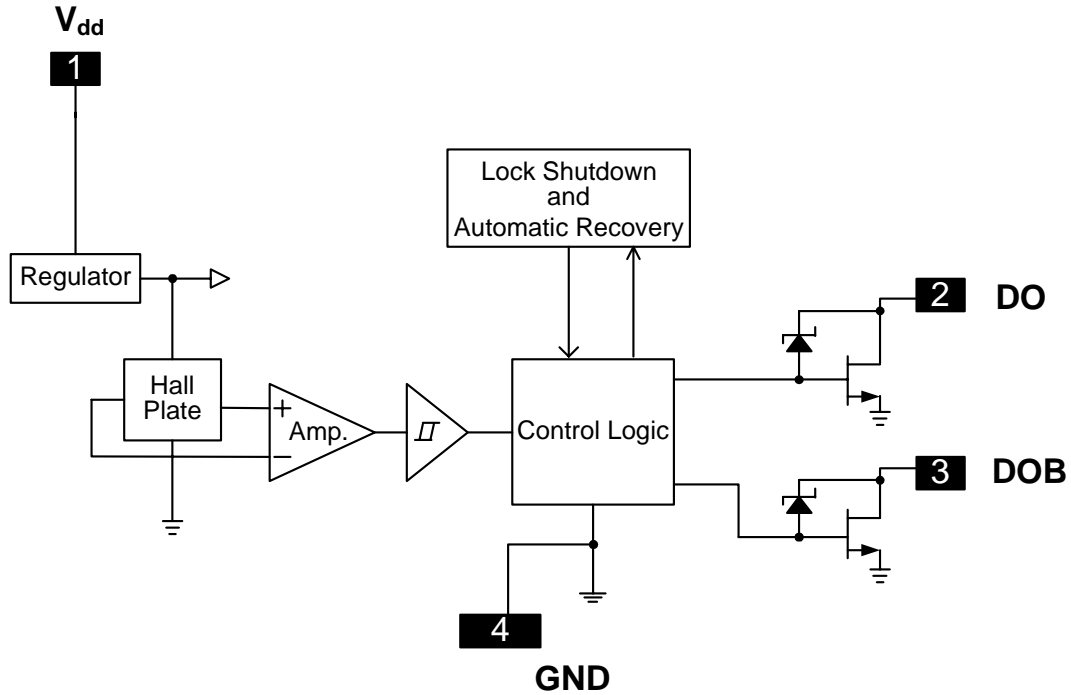


**SOT89-5L**

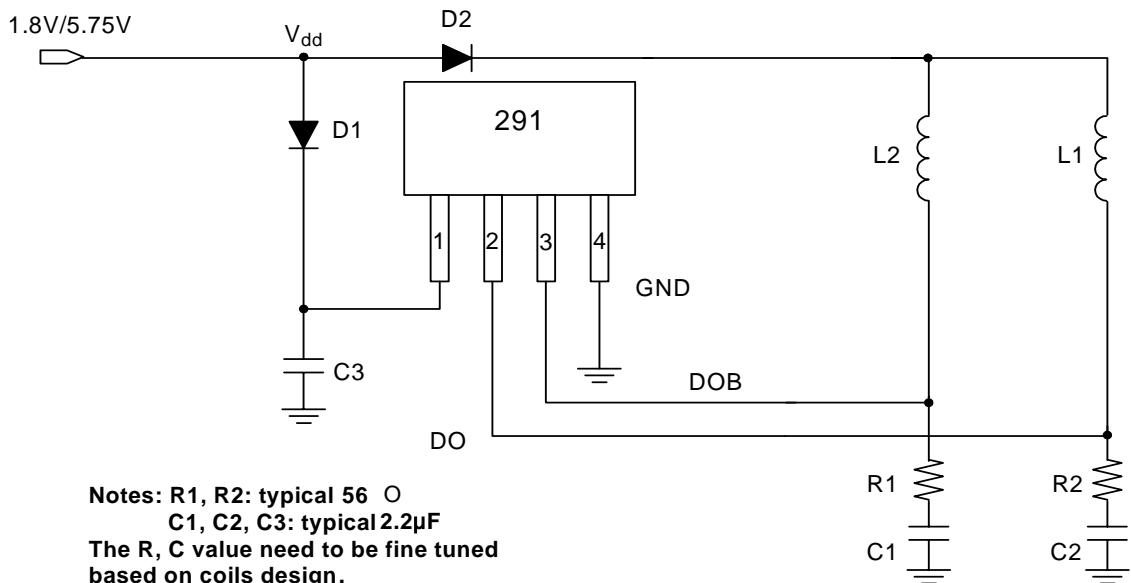
## Pin Descriptions

Name	Description
V <sub>dd</sub>	Input Power
DO	Output Pin
DOB	Output Pin
GND	Ground
NC	Not Connected

**Block Diagram (SIP-4L)**



**Typical Application Circuit**



**1.8V/5.75V Brush-Less DC Fan**

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit	
Operating Supply Voltage	$V_{dd}$	8	V	
Output Current	$I_{O(AVE)}$	400	mA	
	$I_{O(PEAK)}$	700		
Power Dissipation	$P_D$	SIP-4L	550	mW
		SOT89-5L	800	
Operating Temperature	$T_{opr}$	-20 ~ 100	$^\circ\text{C}$	
Storage Temperature	$T_{stg}$	-55 ~ 150	$^\circ\text{C}$	
Maximum Junction Temperature	$T_j$	150	$^\circ\text{C}$	

### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ , $V_{dd} = 5\text{V}$ , unless otherwise specified )

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	$V_{dd}$	Operating	1.8*	-	5.75	V
Supply Current	$I_{dd}$	Operating	-	2.6	4.0	mA
Lock Protection On	$T_{Irp-on}$		-	0.4	-	Sec
Lock Protection Off	$T_{Irp-off}$		2.4	3	3.6	Sec
Output Saturation Voltage	$V_{OUT(SAT)}$	$I_O = 180\text{mA}$	-	300	-	mV
		$I_O = 350\text{mA}$	-	600	-	
Output On Resistance	$R_{ds(on)}$		-	1.75	-	ohm
Output Zener-Breakdown Voltage	$V_Z$		-	15	-	V

\*Note: The output of IC will be switched after the supply voltage is over 1.8V, but the magnetic characteristics won't be normal until the supply is over 2.0V.

#### Truth Table

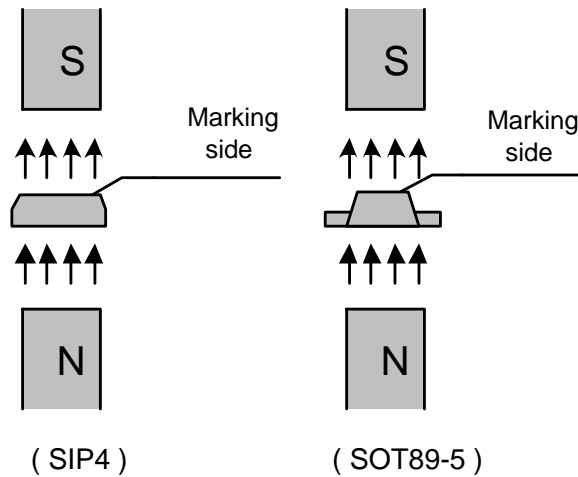
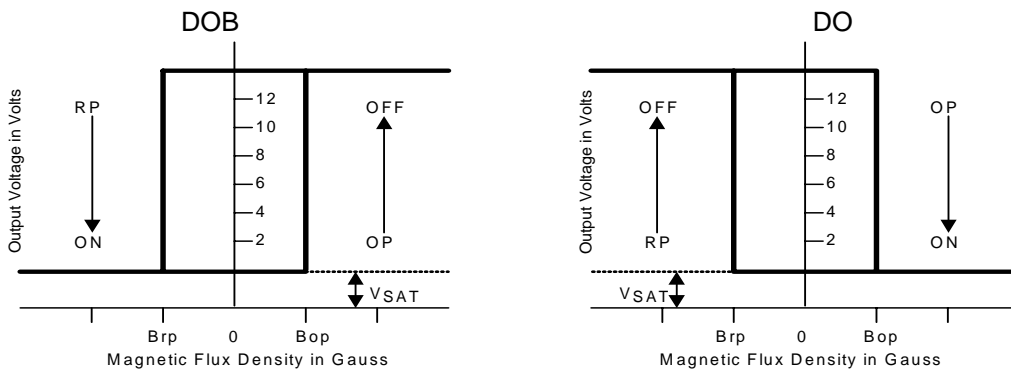
IN-	IN+	CT	OUT1	OUT2	Mode
H	L	L	H	L	Rotating
L	H	L	L	H	Rotating
-	-	H	off	off	Lockup protection activated

**Magnetic Characteristics** (  $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{dd} = 5\text{V}$ , unless otherwise specified )

( 1mT = 10 Gauss )

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operation Point	Bop	--	30	60	Gauss
Release Point	Brp	-60	-30	--	Gauss
Hysteresis	Bhy	--	60	--	Gauss

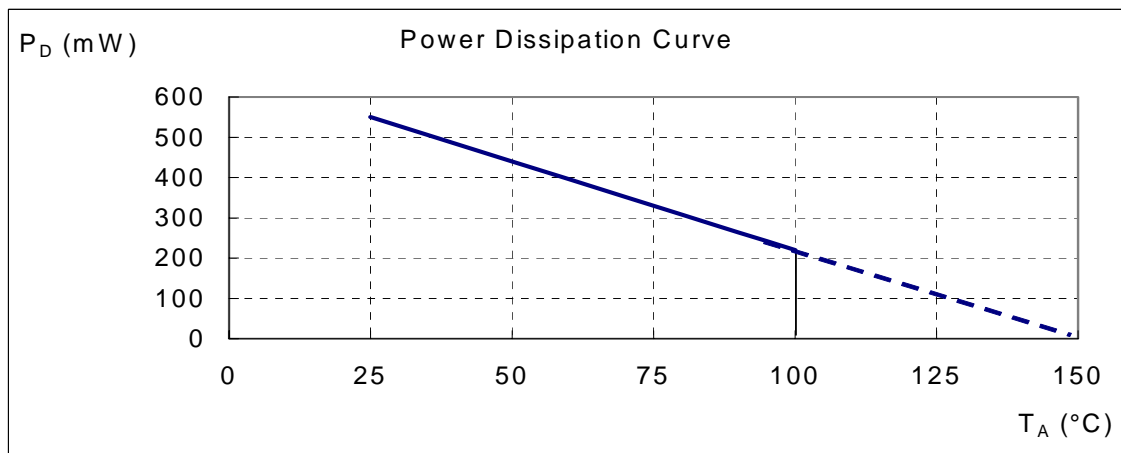
**Operating Characteristics**



**Performance Characteristics**

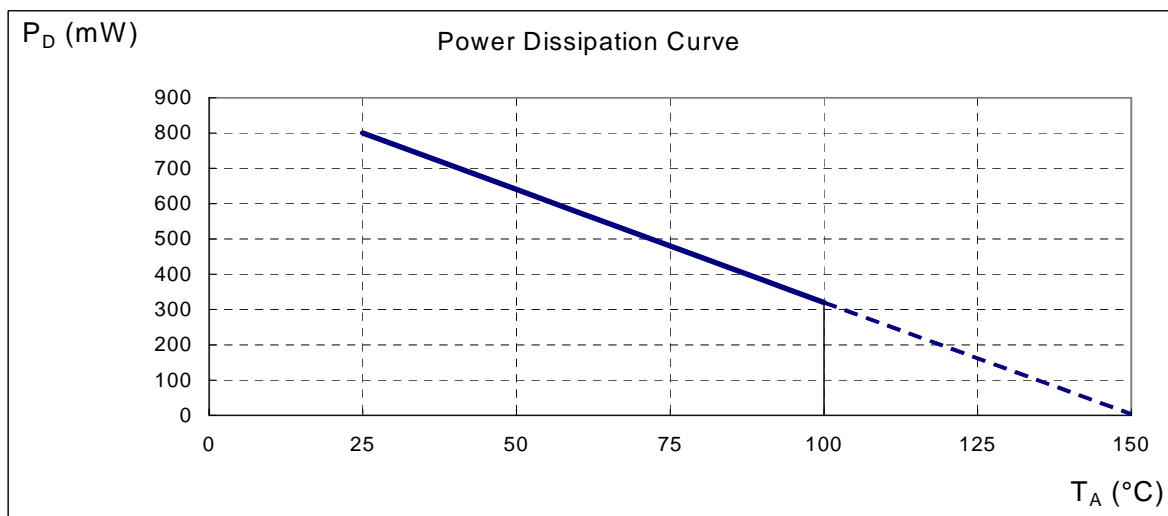
**(1) SIP-4L**

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



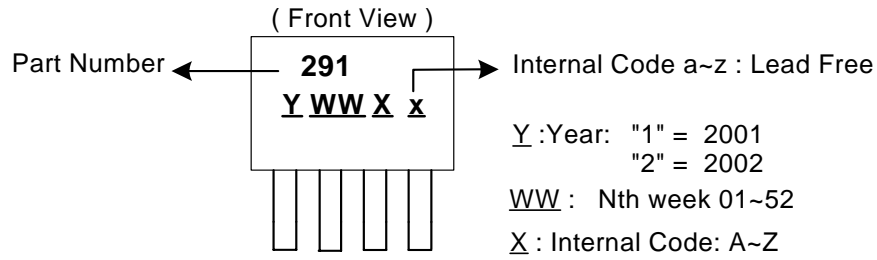
**(2) SOT89-5L**

<b>T<sub>A</sub> (°C)</b>	<b>25</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>75</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>95</b>	<b>100</b>
P <sub>D</sub> (mW)	800	640	576	512	480	448	416	384	352	320
<b>T<sub>A</sub> (°C)</b>	<b>105</b>	<b>110</b>	<b>115</b>	<b>120</b>	<b>125</b>	<b>130</b>	<b>135</b>	<b>140</b>	<b>145</b>	<b>150</b>
P <sub>D</sub> (mW)	288	256	224	192	160	128	96	64	32	0

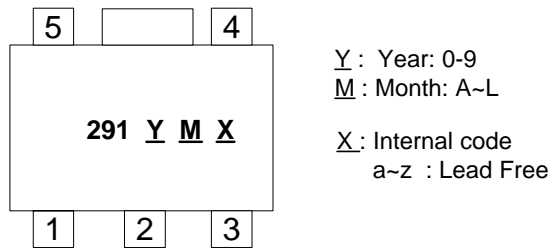


**Marking Information**

(1) SIP-4L



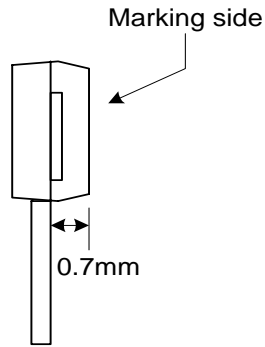
(2) SOT89-5L



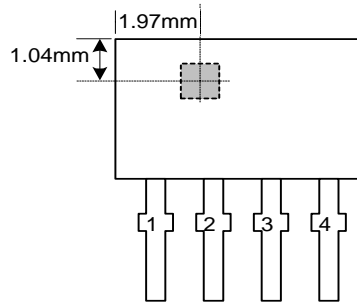
**Package Information** (unit: mm)

(1) SIP-4L

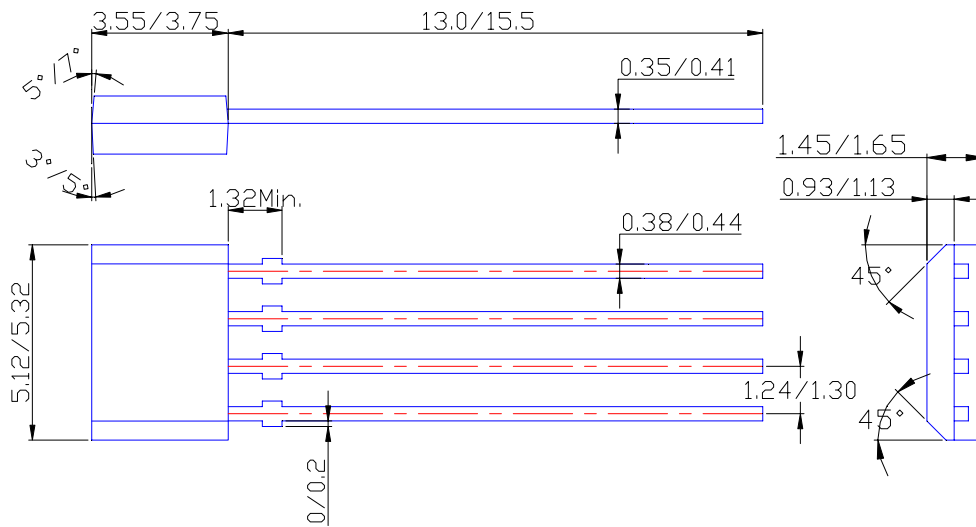
Active Area Depth



Package Sensor Location



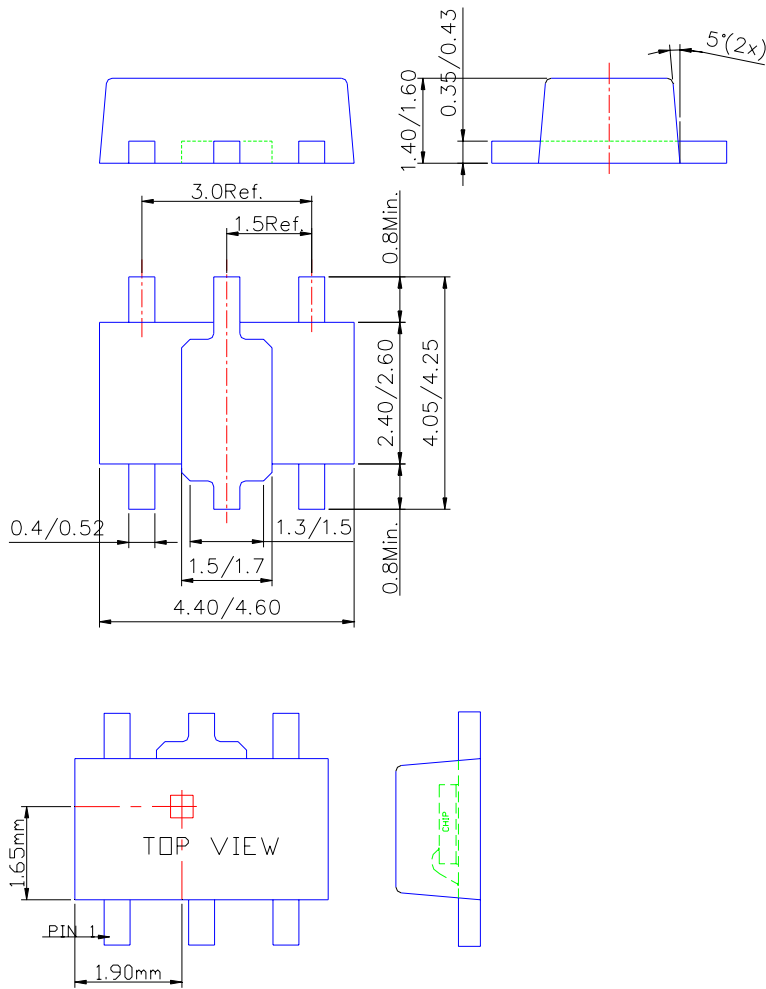
**Package Dimension**





**Package Information** (Continued)

(2) SOT89-5L



Sensor Location

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