



# AH281

## Hall-Effect Smart Fan Motor Controller

### ■ Features

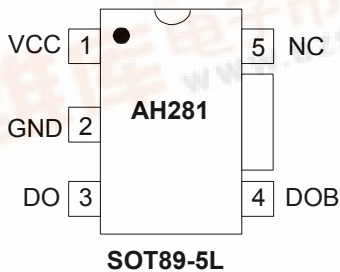
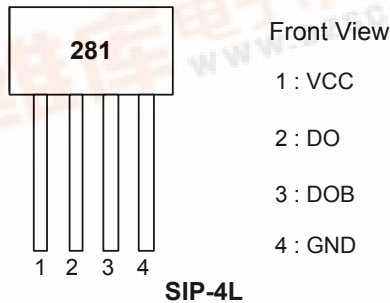
- On chip Hall sensor
- Rotor-locked shutdown
- Automatically restart
- Built-in Zener protection for output driver
- Operating voltage: 10V~20 V, driver start up: 8V (minimum)
- Output current:  $I_{O(AVE)} = 300 \text{ mA}$
- Package: SIP-4L, SOT89-5L

### ■ General Description

AH281 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.

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.

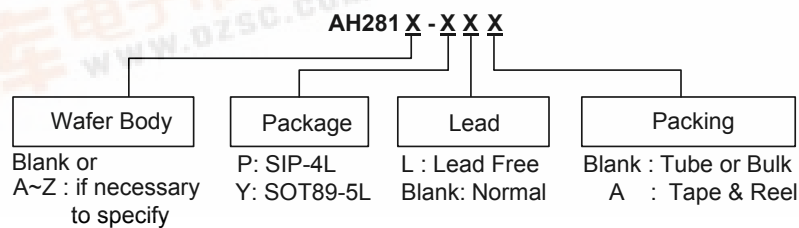
### ■ Pin Assignment



### ■ Pin Descriptions

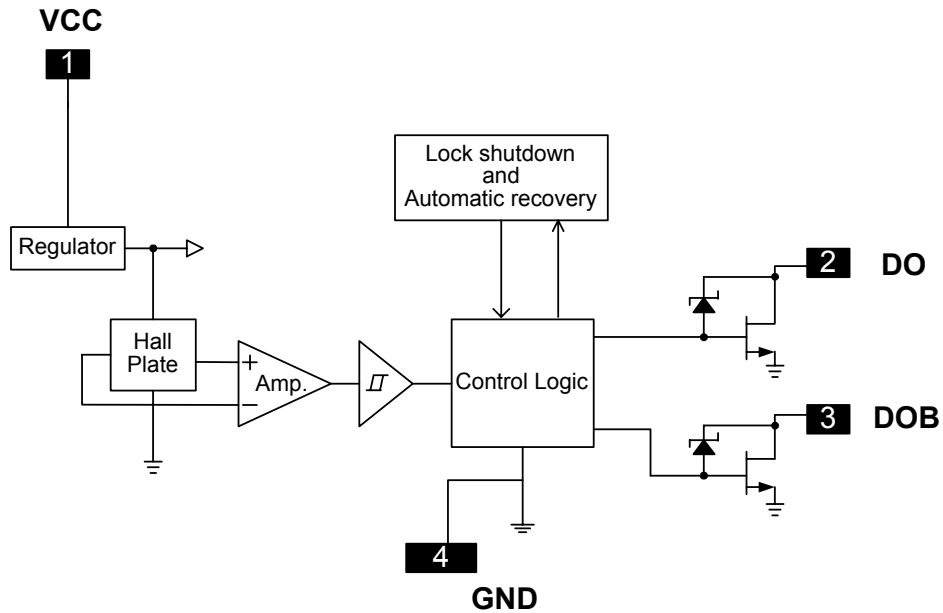
Name	Description
VCC	Input power
DO	Output pin
DOB	Output pin
GND	Ground
NC	Not connected

### ■ Ordering Information

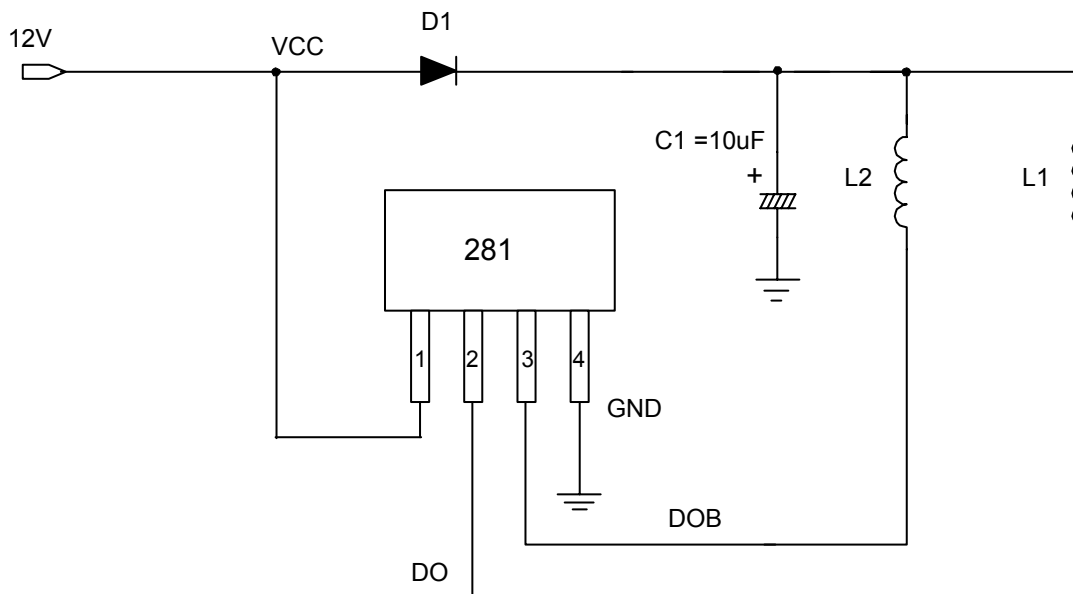


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### ■ Block Diagram (SIP4)



### ■ Application Circuit



12V brush-less DC fan



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### ■ Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit	
Output Zener-breakdown Voltage	Vz	38	V	
Operating Supply Voltage	V <sub>CC</sub>	28	V	
Output Current	I <sub>O(AVE)</sub>	300	mA	
	I <sub>O(PEAK)</sub>	400		
Power Dissipation	P <sub>D</sub>	SIP4	550	mW
		SOT89-5	800	
Operating Temperature	T <sub>opr</sub>	-20 ~ 100	°C	
Storage Temperature	T <sub>stg</sub>	-55 ~ 150	°C	
Maximum Junction Temp.	T <sub>j</sub>	150	°C	

### ■ Electrical Characteristics (Ta = 25 °C, V<sub>CC</sub> = 12V, unless otherwise specified)

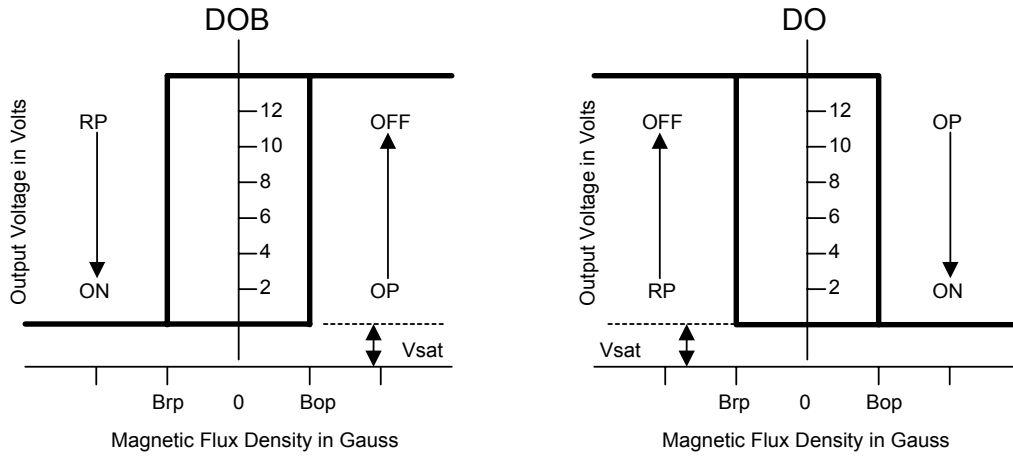
Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V <sub>CC</sub>	Operating	10		20	V
Supply current	I <sub>CC</sub>	Operating	-	2.0	4.0	mA
Locked Protection On	Tl <sub>rp-on</sub>			0.4		Sec
Locked Protection Off	Tl <sub>rp-off</sub>			2.4		Sec
Output saturation voltage	V <sub>OUT(sat)</sub>	I <sub>O</sub> =150mA	-	375		mV
		I <sub>O</sub> =250mA	-	625		
Output On resistance	R <sub>ds(on)</sub>			2.6		ohm

### ■ Magnetic Characteristics (Ta = 25 °C, V<sub>CC</sub> = 12V, unless otherwise specified)

(1mT=10 Gauss)

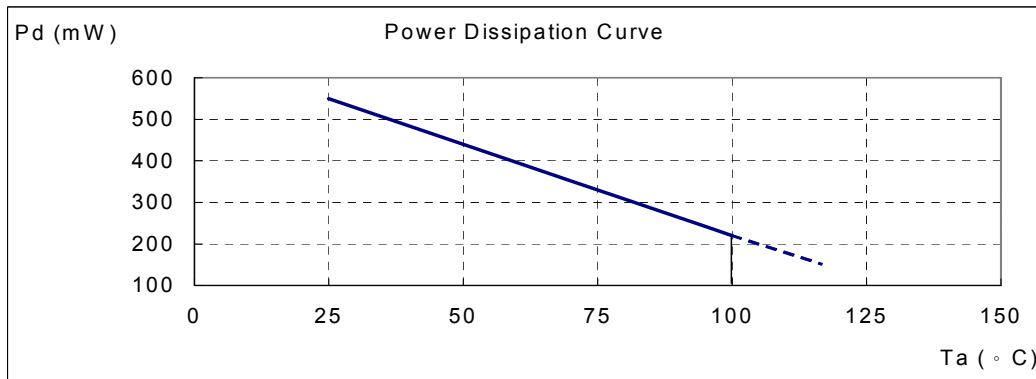
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B <sub>op</sub>	--	30	60	Gauss
Release Point	B <sub>rp</sub>	-60	-30	--	Gauss
Hysteresis	B <sub>hy</sub>	--	60	--	Gauss

### ■ Operating Characteristics



### ■ Performance Characteristics (SIP4)

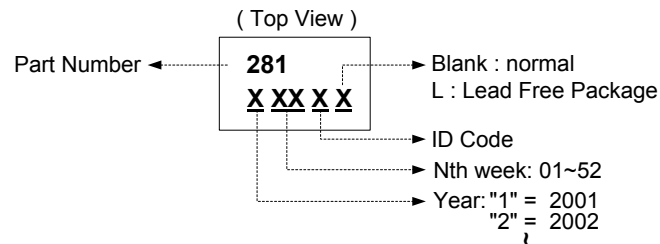
Ta (°C)	25	50	60	70	80	85	90	95	100	105	110	115	120
Pd (mW)	550	440	396	352	308	286	264	242	220	198	176	154	132



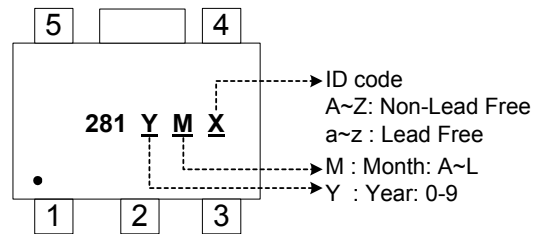
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### ■ Marking Information

#### (1)SIP-4L



#### (2)SOT89-5L

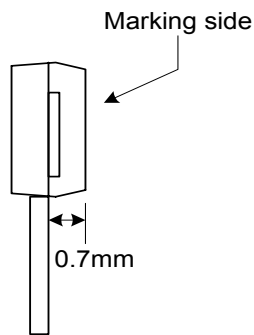


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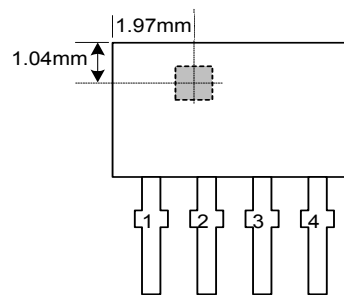
### ■ Package Information

(1)SIP-4L

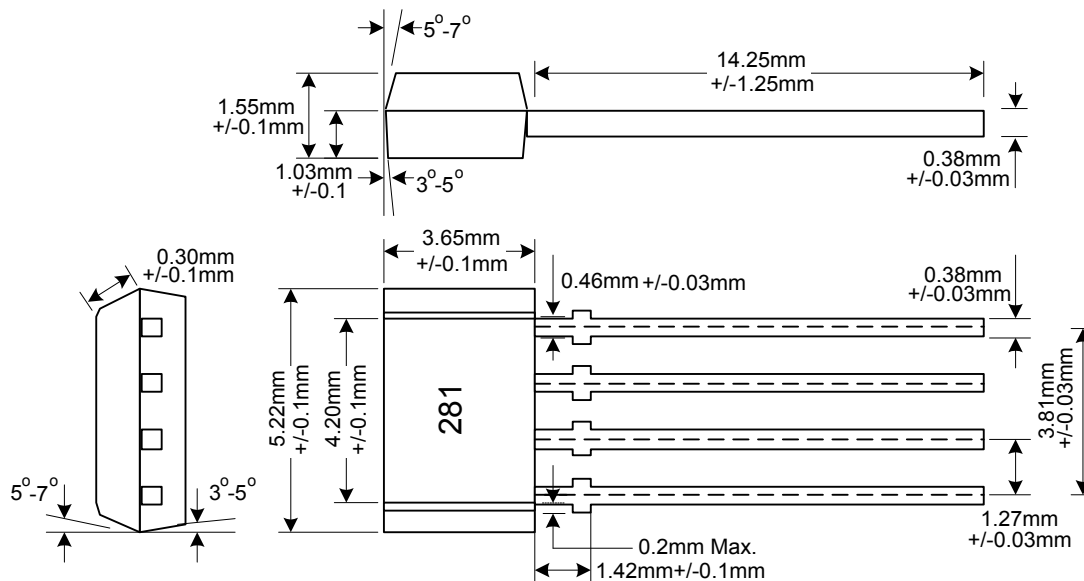
Active Area Depth



Package Sensor Location

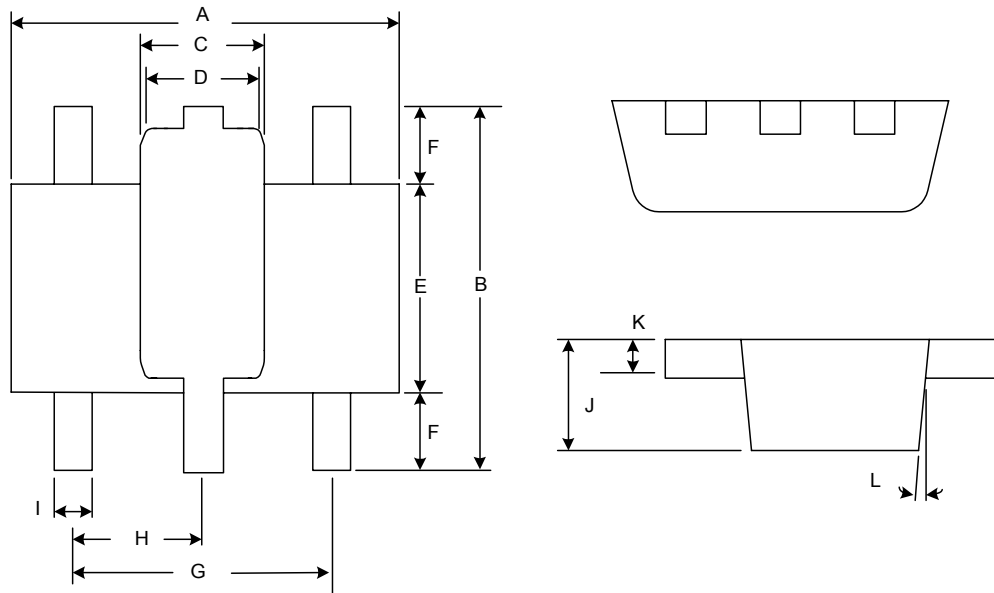


Package Dimension

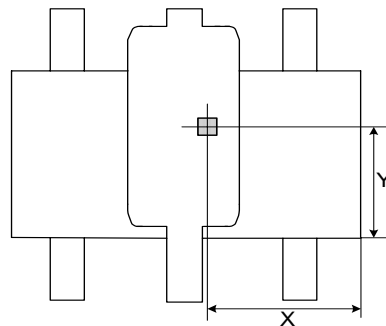


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(2)SOT89-5L



### Package Sensor Location



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	4.05	4.15	4.25	0.159	0.163	0.167
C	1.50	1.60	1.70	0.059	0.063	0.067
D	1.30	1.40	1.50	0.051	0.055	0.059
E	2.40	2.50	2.60	0.094	0.098	0.102
F	0.80	-	-	0.031	-	-
G	3.00 Ref.			0.118 Ref.		
H	1.50 Ref.			0.059 Ref.		
I	0.40	0.46	0.52	0.016	0.018	0.020
J	1.40	1.50	1.60	0.055	0.059	0.063
K	0.35	0.39	0.43	0.014	0.015	0.017
L	5° Typ.			5° Typ.		
X	-	1.90	-	-	0.075	-
Y	-	1.65	-	-	0.065	-