

### ■ Features

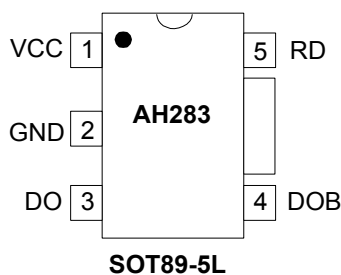
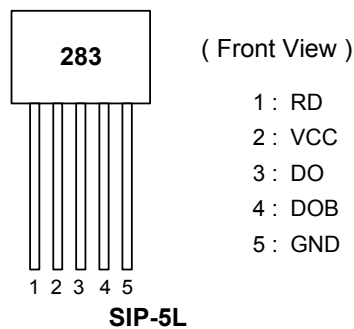
- On chip Hall sensor
- Rotor-locked shutdown
- Automatically restart
- Rotor-state detection (RD) output
- Built-in Zener protection for output driver
- Operating voltage: 10V~20 V, driver start up: 8V (minimum)
- Output current:  $I_{O(AVE)} = 300 \text{ mA}$
- Package: SIP-5L, SOT89-5L

### ■ General Description

AH283 is a monolithic fan motor controller with Hall sensor's capability. It contains two complementary open-collector transistors for motor's coil driving, automatic lock current shutdown, and recovery protections. In addition, rotor-state detection (RD) output is for Rotor-state detection.

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 the rotor is blocked. Until the blocking is removed, the motor recovers running normally.

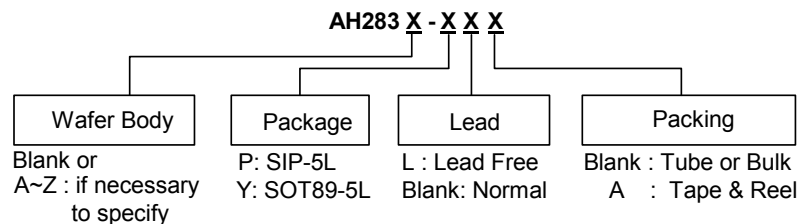
### ■ Pin Configuration



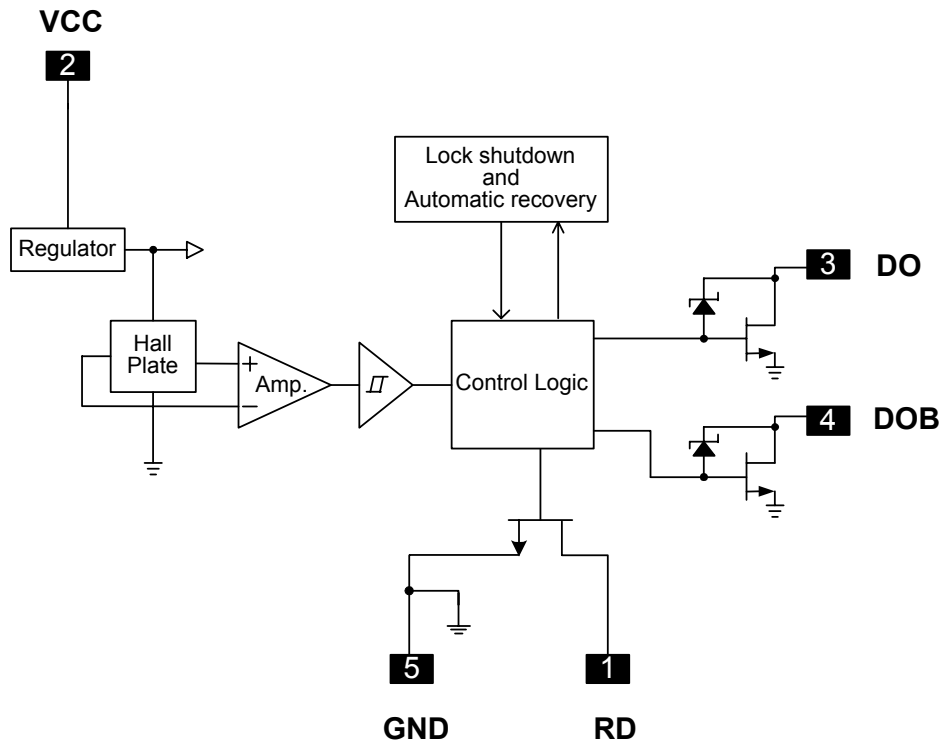
### ■ Pin Descriptions

| Symbol | Description           |
|--------|-----------------------|
| RD     | Rotor-state detection |
| VCC    | Input power           |
| DO     | Output pin            |
| DOB    | Output pin            |
| GND    | Ground                |

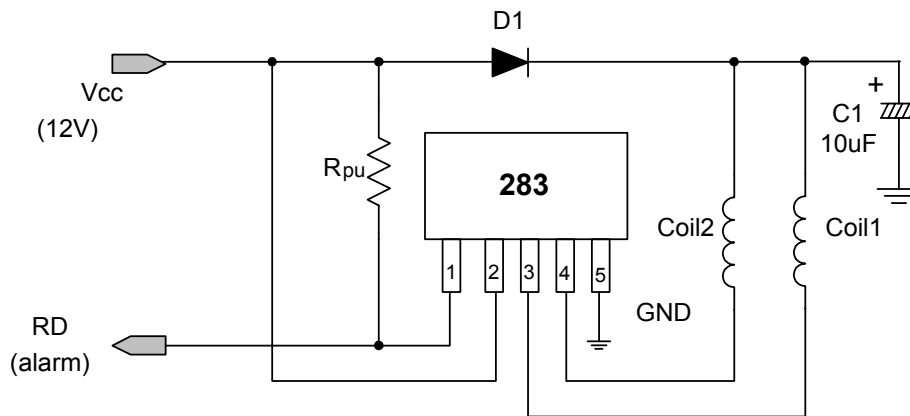
### ■ Ordering Information



### ■ Block Diagram (SIP5)



### ■ Typical Application Circuit



12V DC Brush-less Fan with RD output function

**Hall-Effect Smart Fan Motor Controller**
**■ Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

| Characteristics                | Symbol               | Rating    | Unit |    |
|--------------------------------|----------------------|-----------|------|----|
| Output Zener-breakdown Voltage | V <sub>Z</sub>       | 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>       | SIP5      | 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** ( $T_a = 25^\circ\text{C}$ , V<sub>CC</sub> = 12V, unless otherwise notice)

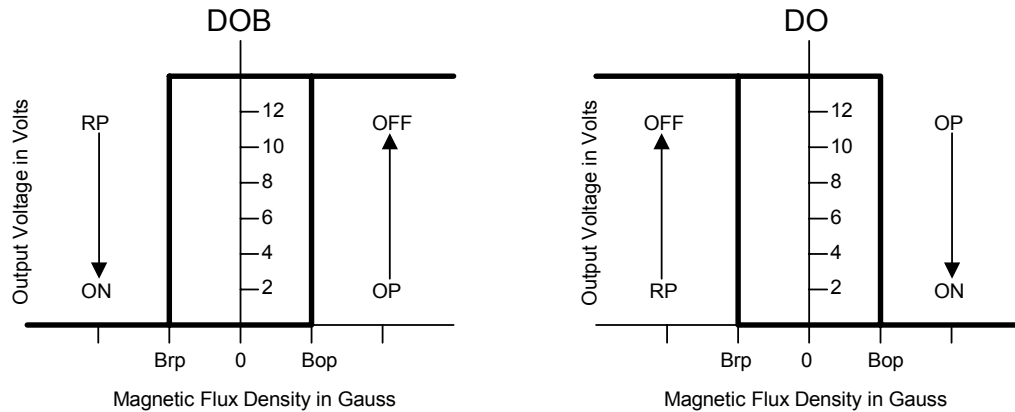
| Characteristics           | Symbol                | Conditions            | Min. | Typ. | Max. | Unit |
|---------------------------|-----------------------|-----------------------|------|------|------|------|
| Supply Voltage            | V <sub>CC</sub>       | Operating             | 10   |      | 20   | V    |
| Supply current            | I <sub>CC</sub>       | Operating             | -    | 2.0  | 4.0  | mA   |
| Locked Protection On      | T <sub>lrp-on</sub>   |                       |      | 0.4  |      | Sec  |
| Locked Protection Off     | T <sub>lrp-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  |
| RD output V <sub>ds</sub> | V <sub>ol</sub>       | I <sub>O</sub> =10mA  |      | 0.5  |      | V    |

**■ Magnetic Characteristics** ( $T_a = 25^\circ\text{C}$ , V<sub>CC</sub> = 12V, unless otherwise specified)

(1mT=10 Gauss)

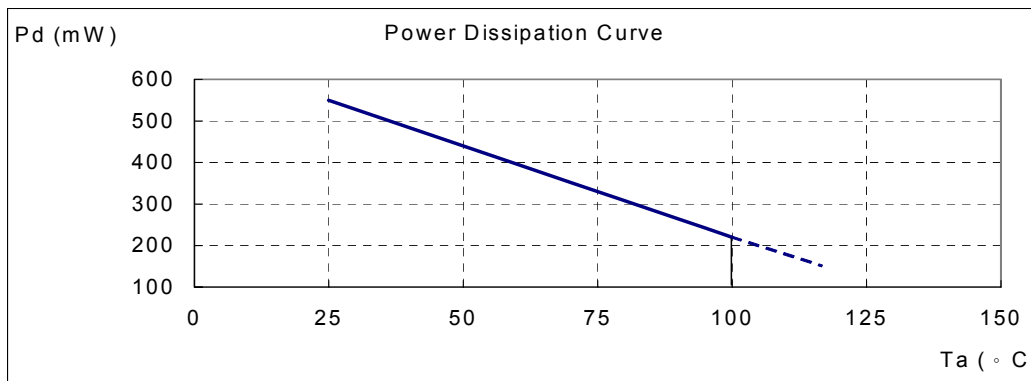
| Characteristics | Symbol          | Min. | Typ. | Max. | Unit  |
|-----------------|-----------------|------|------|------|-------|
| Operate Point   | B <sub>op</sub> | --   | 30   | 60   | Gauss |
| Release Point   | B <sub>rp</sub> | -60  | -30  | --   | Gauss |
| Hysteresis      | B <sub>hy</sub>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

### ■ Operating Characteristics



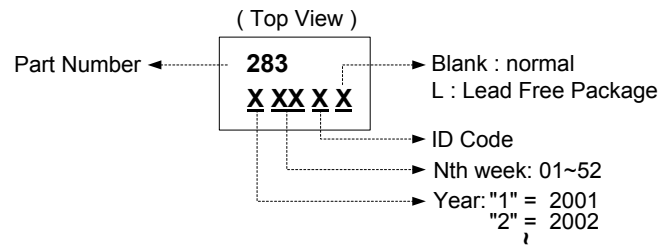
### ■ Performance Characteristics (SIP5)

| 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 |

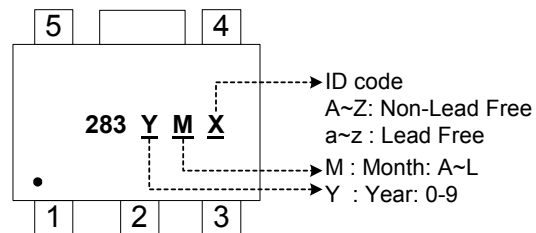


### ■ Marking Information

#### (1)SIP-5L

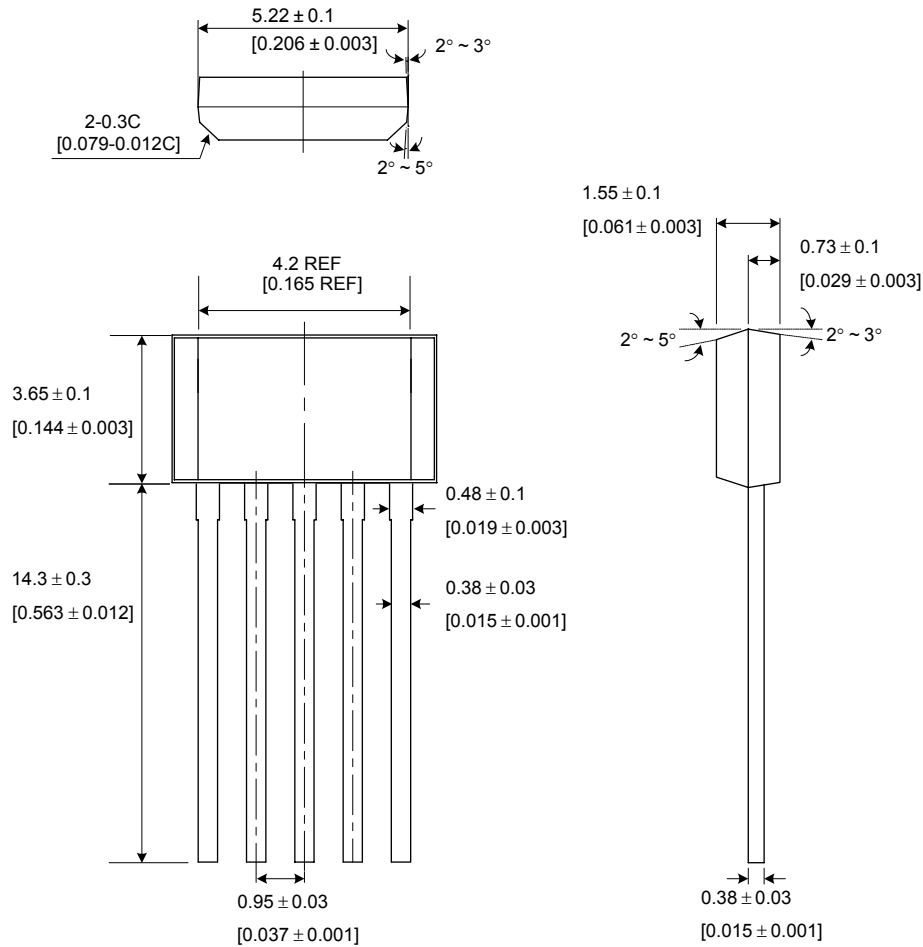


#### (2)SOT89-5L

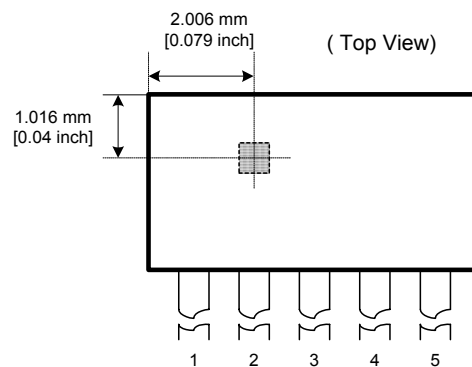


### ■ Package Information

(1) Package type: SIP-5L (unit: mm / [inch])

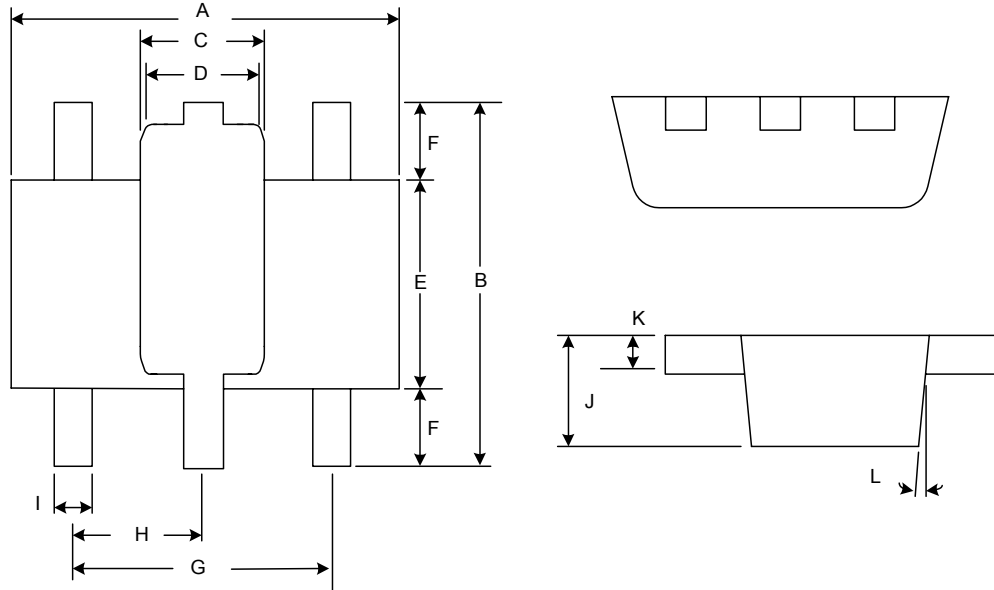


### ■ Location of Sensing Point

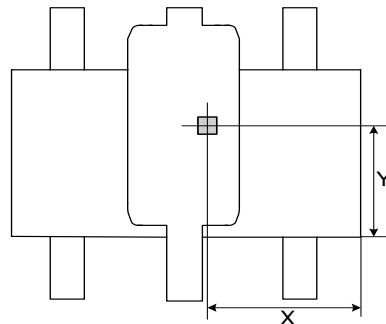


## Hall-Effect Smart Fan Motor Controller

### (2) Package type: 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 | -     |