

### Features

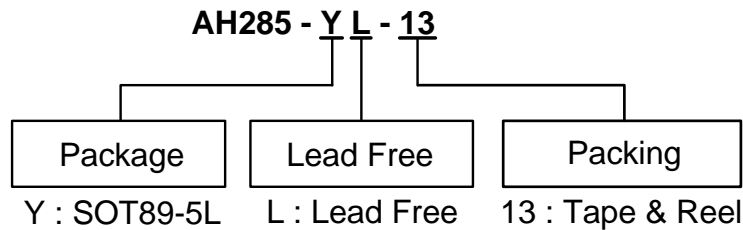
- On Chip Hall Sensor
- Rotor-Locked Shutdown
- Automatically Restart
- Frequency Generator (FG) Output
- Built-in Zener Protection for Output Driver
- Operating Voltage: 3.8V~20V
- Output Current:  $I_{O(AVE)} = 500\text{mA}$  for SOT89-5L
- Lead Free Package: SOT89-5L
- Lead Free Finish/RoHS Compliant (Note 1)


### General Description

AH285 is a monolithic fan motor controller with Hall sensor's capability. It contains two complementary open-drain transistors as motor coil drivers, automatic lock current shutdown, and recovery protections. Additional, frequency generator (FG) output is for speed detection 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.

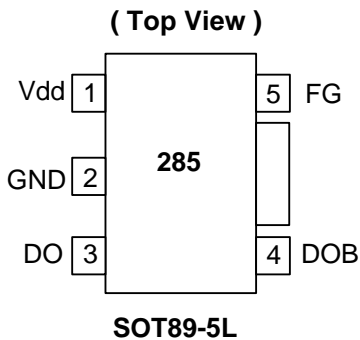
### Ordering Information



Device	Package Code	Packaging (Note 2)	13" Tape and Reel	
			Quantity	Part Number Suffix
 AH285-YL-13	Y	SOT89-5L	2500/Tape & Reel	-13

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>.

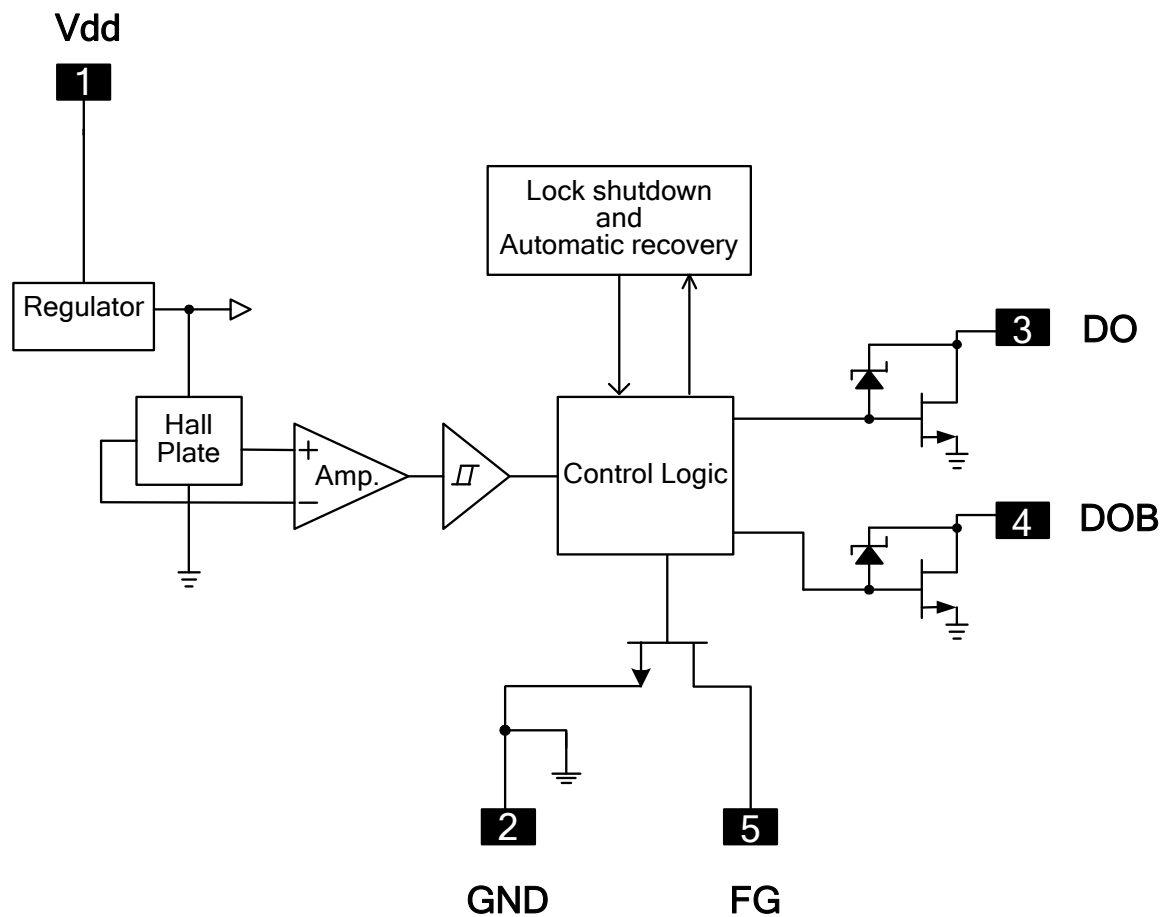
### Pin Assignment



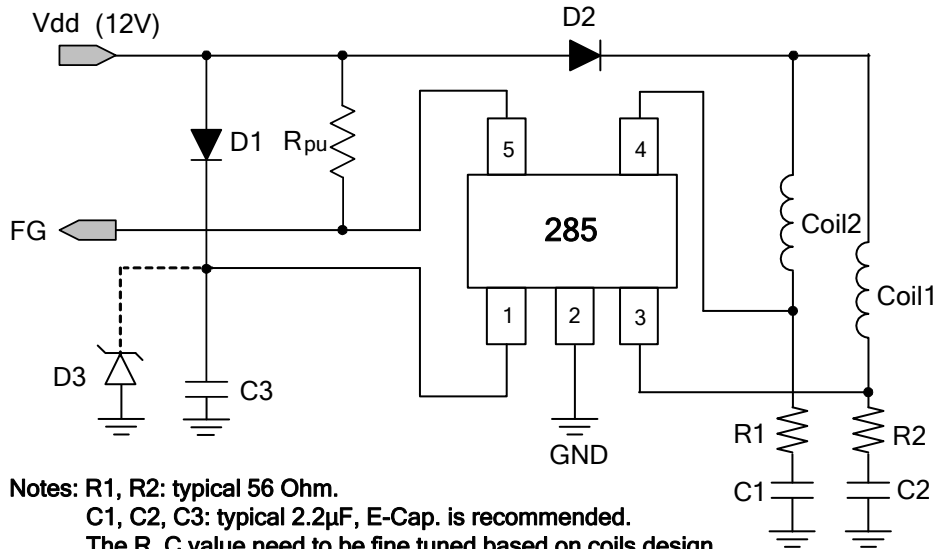
**Pin Descriptions**

Symbol	Description
FG	Frequency Generation
Vdd	Input Power
DO	Output Pin
DOB	Output Pin
GND	Ground

**Block Diagram**



**Typical Application Circuit**

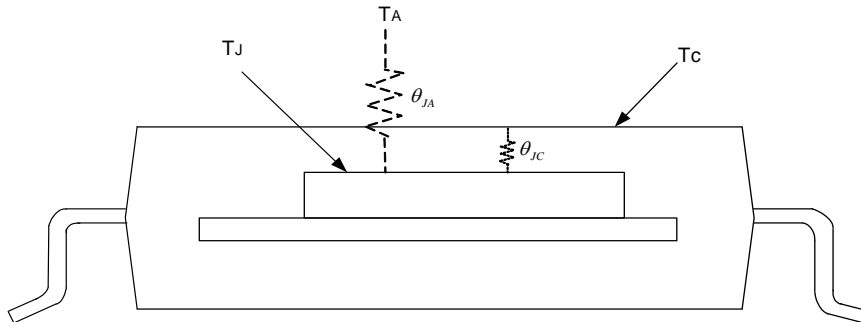


Notes: R1, R2: typical 56 Ohm.  
C1, C2, C3: typical 2.2μF, E-Cap. is recommended.  
The R, C value need to be fine tuned based on coils design.  
D3 is a Zener diode, not to exceed the absolute maximum rating voltage.

12V DC Brush-less Fan with FG output function

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

Symbol	Characteristics	Rating	Unit
$V_{dd}$	Supply Voltage	24	V
$I_{O(AVE)}$ $I_{O(PEAK)}$	Output Current	SOT89-5L 500 $I_{O(PEAK)}$ 700	mA
$P_D$	Power Dissipation	SOT89-5L 800	mW
$T_{OP}$	Operating Temperature	-40 ~ 100	°C
$T_{ST}$	Storage Temperature	-55 ~ 150	°C
$T_J$	Maximum Junction Temperature	150	°C
$\theta_{JA}$ (Note 3)	Thermal Resistance Junction-to-Case	SOT89-5L 156	°C/W



Notes: 3.  $\theta_{JA}$  should be confirmed with what heat sink thermal resistance. If no heat sink contacting,  $\theta_{JA}$  is almost the same as  $\theta_{JC}$ .

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

Symbol	Characteristics	Conditions	Min	Typ.	Max	Unit
V <sub>dd</sub>	Supply Voltage	Operating	3.8	-	20	V
I <sub>dd</sub>	Supply Current	Operating	-	2	4	mA
I <sub>off</sub>	Output Leakage Current	V <sub>OUT</sub> =24V	-	< 0.1	10	μA
T <sub>lrp-on</sub>	Locked Protection On		0.4	0.5	0.6	Sec
T <sub>lrp-off</sub>	Locked Protection Off		2.4	3	3.6	Sec
V <sub>OUT(sat)</sub>	Output Saturation Voltage	I <sub>O</sub> =300mA	-	375	500	mV
		I <sub>O</sub> =500mA	-	625	900	
R <sub>ds(on)</sub>	Output On Resistance	I <sub>O</sub> =300mA	-	1.25	1.67	ohm
V <sub>ol</sub>	FG Output V <sub>ds</sub>	I <sub>O</sub> =10mA	-	0.5	-	V
V <sub>z</sub>	Output Zener-Breakdown Voltage		35	42	60	V

### Truth Table

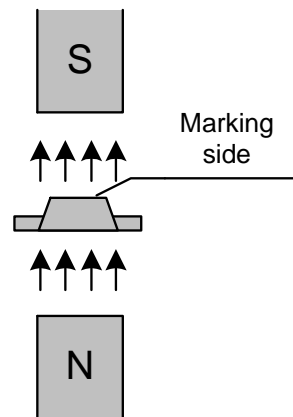
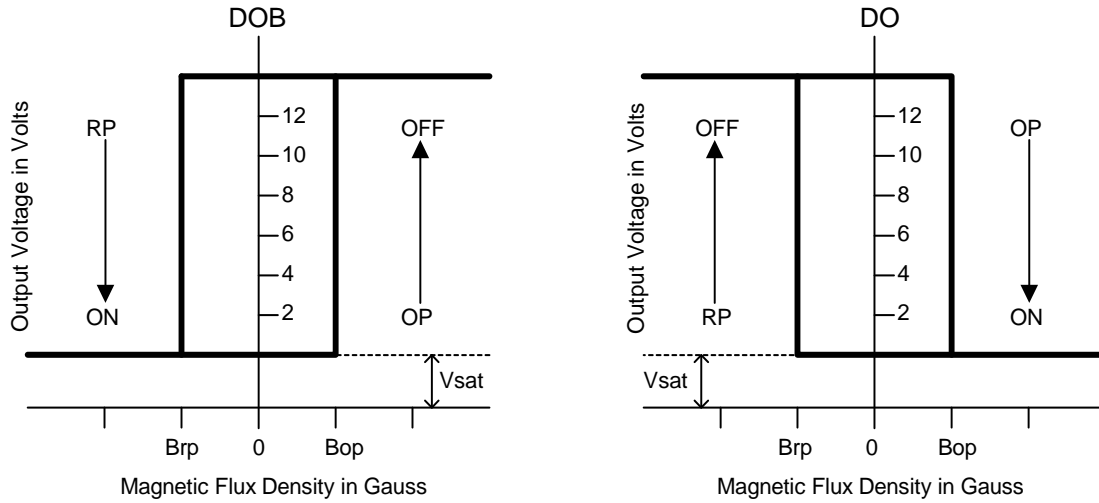
IN-	IN+	CT	OUT1	OUT2	FG	Mode
H	L	L	H	L	H	Rotating
L	H	L	L	H	L	Rotating
-	-	H	off	off	-	Lockup protection activated

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

(1mT=10 Gauss)

Symbol	Characteristics	Min	Typ.	Max	Unit
B <sub>op</sub>	Operation Point	10	30	60	Gauss
B <sub>rp</sub>	Release Point	-60	-30	-10	Gauss
B <sub>hy</sub>	Hysteresis	-	60	-	Gauss

**Operating Characteristics**

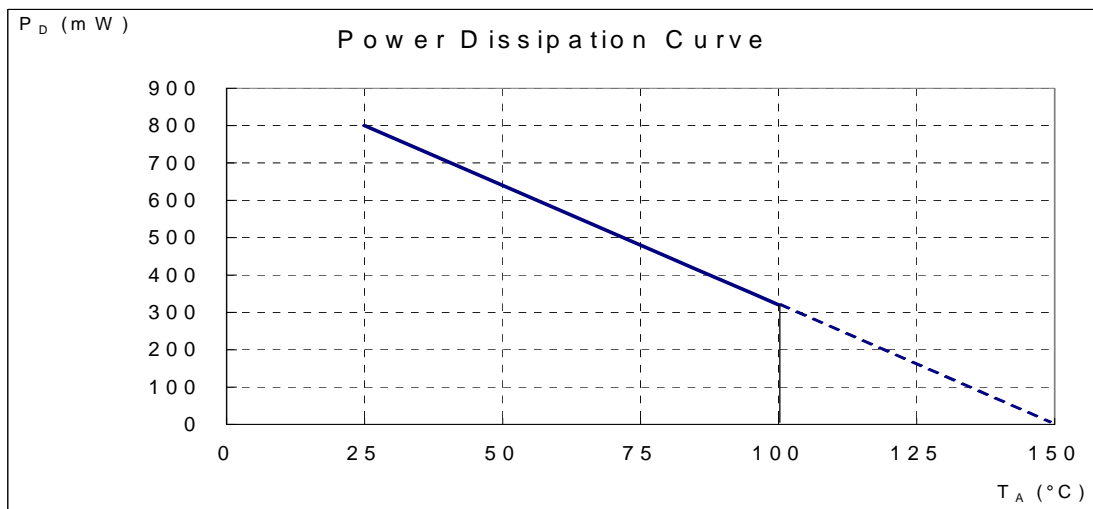


**( SOT89-5L )**

**Performance Characteristics**

(1) SOT89-5L

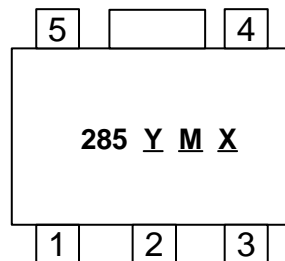
$T_A$ (°C)	25	50	60	70	75	80	85	90	95	100
$P_D$ (mW)	800	640	576	512	480	448	416	384	352	320
$T_A$ (°C)	105	110	115	120	125	130	135	140	145	150
$P_D$ (mW)	288	256	224	192	160	128	96	64	32	0



**Marking Information**

(1) SOT89-5L

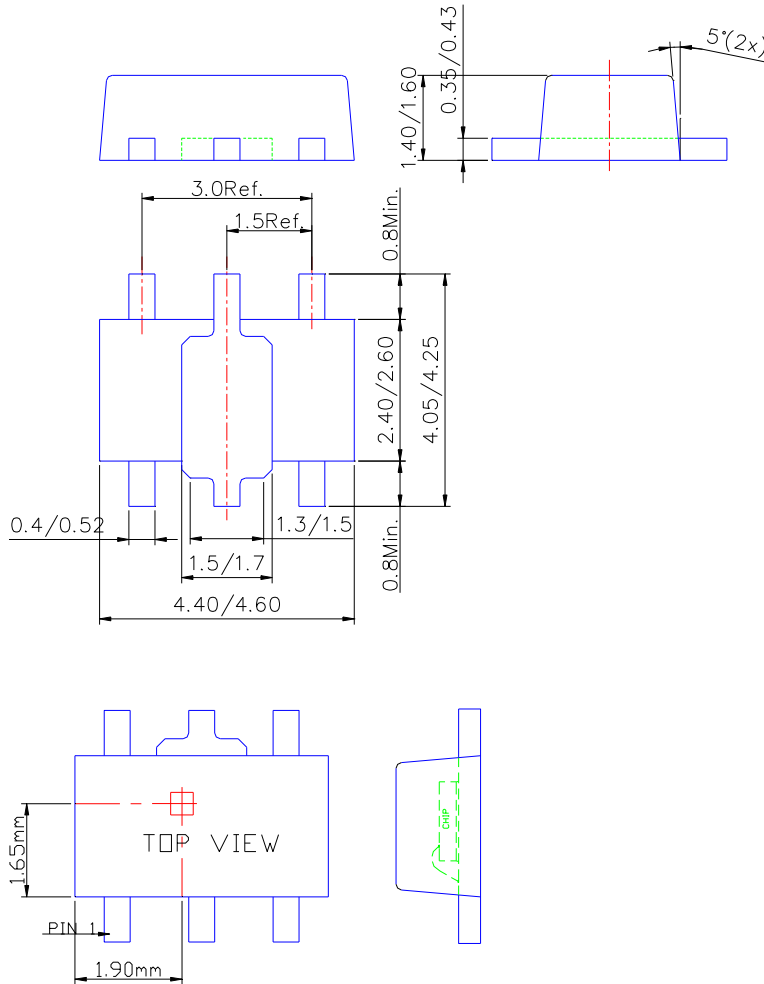
( Top View )



Y : Year : 0~9  
M : Month: A~L  
X : Internal code a~z : Lead Free

**Package Information (All Dimensions in mm)**

**(1) Package type : SOT89-5L**



**Sensor Location**

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