HALL-EFFECT SMART FAN MOTOR CONTROLLER

Features

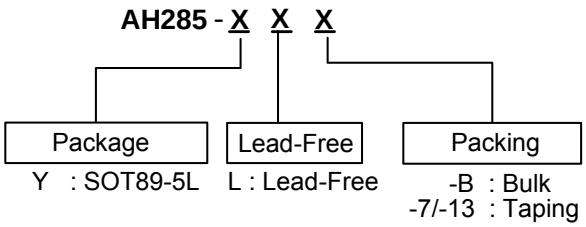
- On Chip Hall Sensor
- Rotor-Locked Shutdown
- Automatically Restart
- Frequency Generator (FG) Output
- Built-in Zener Protection for Output Driver
- Operating Voltage: 3.8V~20V
- Output Current: $I_{O(AVE)}$ = 500mA for SOT89-5
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)
- Package: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

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



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
AH285-Y	Y	SOT89-5	NA	NA	2500/Tape & Reel	-7

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.

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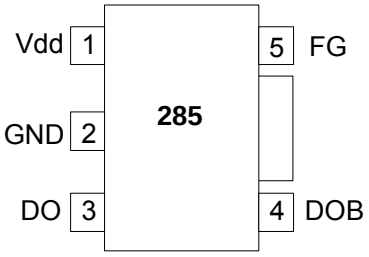
Pin Assignment

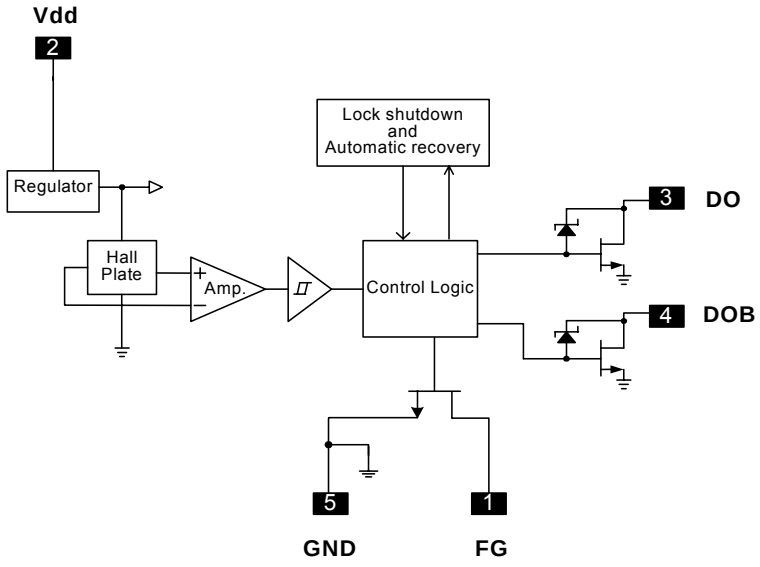


SOT89-5L

Pin Descriptions

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

Block Diagram



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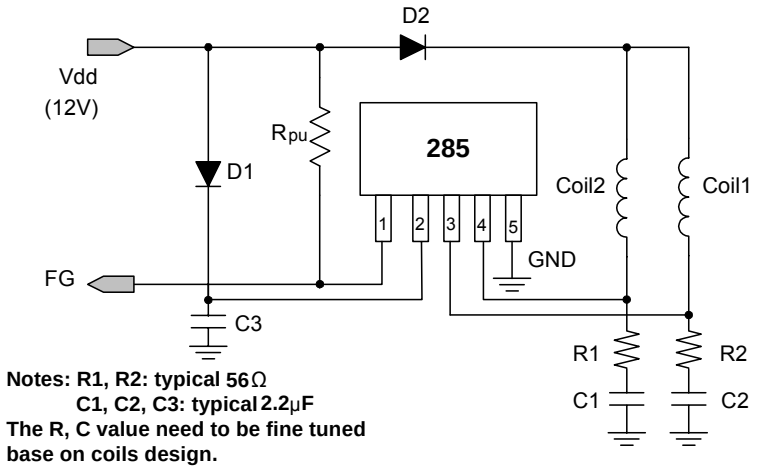
Typical Application Circuit

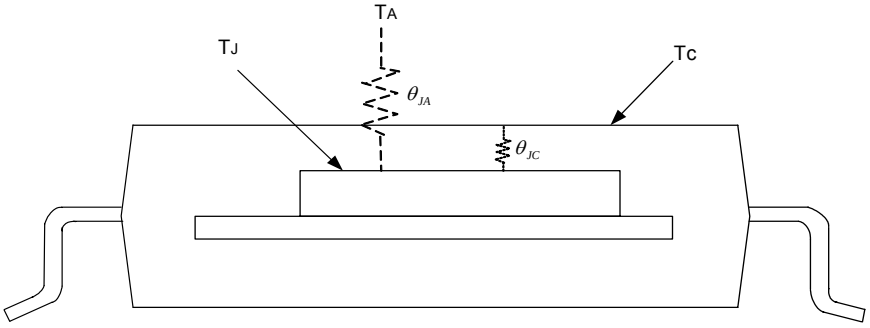


Notes: R1, R2: typical 56Ω
C1, C2, C3: typical 2.2μF
The R, C value need to be fine tuned base on coils design.

12V DC Brush-less Fan with FG output function

Absolute Maximum Ratings (T_A = 25°C)

Characteristics	Symbol	Rating	Unit
Supply Voltage	V_{dd}	24	V
Output Current	$I_{O(AVE)}$	500	mA
	$I_{O(PEAK)}$	700	
Power Dissipation	P_D	800	mW
Operating Temperature	T_{opr}	-40 ~ 100	°C
Storage Temperature	T_{stg}	-55 ~ 150	°C
Maximum Junction Temp.	Tj	150	°C
Thermal Resistance	θ_{JA}	156	°C/W



Note: θ_{JA} should be confirmed with what heat sink thermal resistance. If no heat sink contacting, θ_{JA} is almost the same as θ_{JC}.

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Electrical Characteristics (T_A = 25°C, Vdd =12V, unless otherwise specified)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{dd}	Operating	3.8	-	20	V
Supply Current	I_{dd}	Operating	-	2	4	mA
Output Leakage Current	I_{off}	V_{OUT}=24V	-	< 0.1	10	μA
Locked Protection On	T_{lrp-on}		0.4	0.5	0.6	Sec
Locked Protection Off	$T_{lrp-off}$		2.4	3	3.6	Sec
Output Saturation Voltage	$V_{OUT(sat)}$	I_O=300mA	-	375	500	mV
		I_O=500mA	-	625	900	
Output On Resistance	$R_{ds(on)}$	I_O=300mA	-	1.25	1.67	ohm
FG Output Vds	V_{ol}	I_O=10mA	-	0.5	-	V
Output Zener-Breakdown Voltage	V_Z		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_A = 25°C, Vdd = 12V, unless otherwise specified)

(1mT=10 Gauss)

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operation Point	Bop	10	30	60	Gauss
Release Point	Brp	-60	-30	-10	Gauss
Hysteresis	Bhy	-	60	-	Gauss

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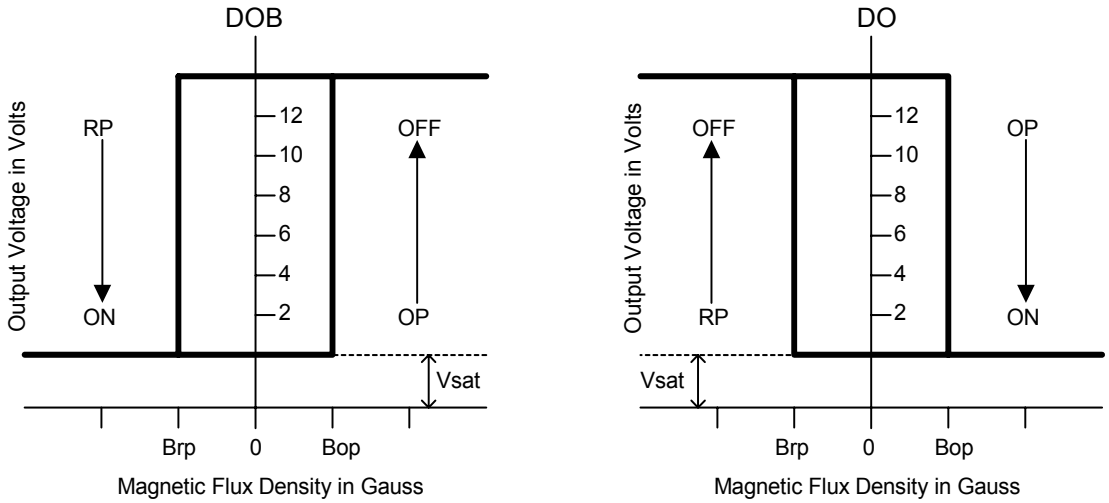
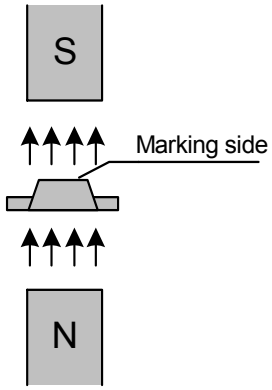
Operating Characteristics





(SOT89-5)

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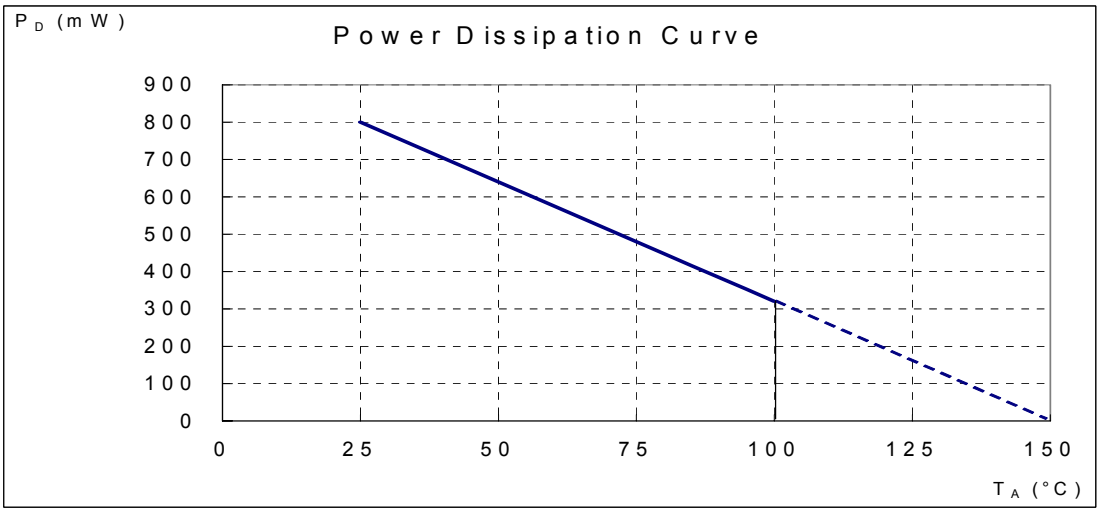
Performance Characteristics (SOT89-5L)

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



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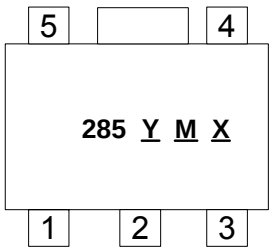
Marking Information

(1) SOT89-5L

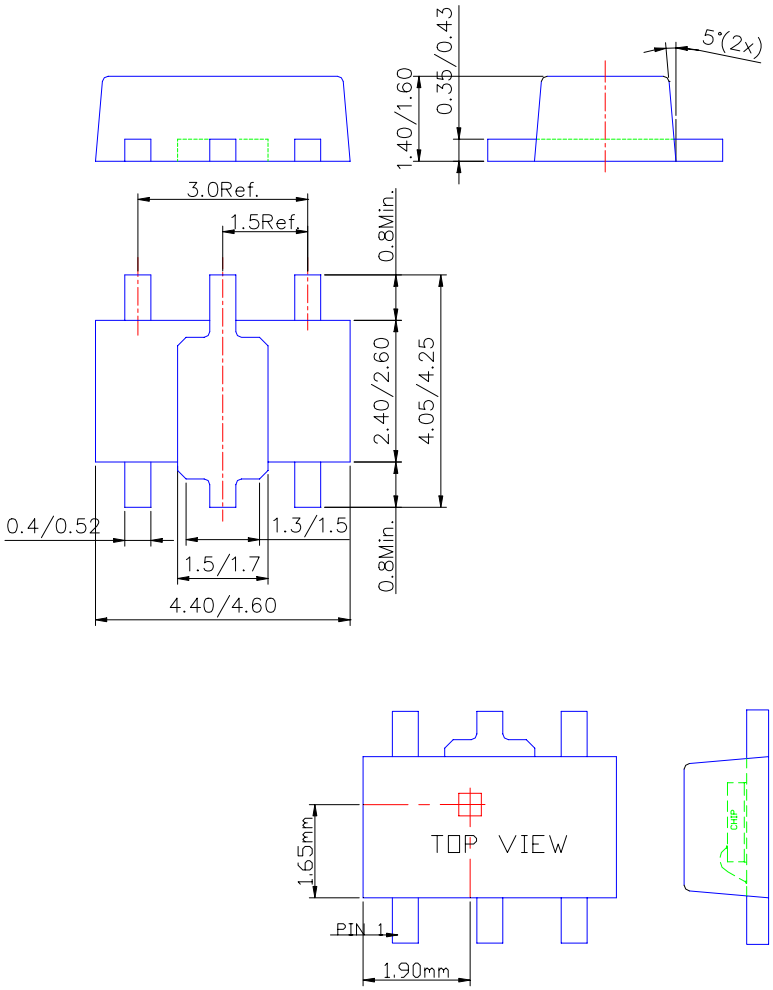


Y : Year 0-9
M : Month A~L

X: Internal code
a~z : Lead Free

Package Information

(1) SOT89-5L



Sensor Location

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