

AH293

LOW VOLTAGE HALL-EFFECT SMART FAN MOTOR CONTROLLER

Features

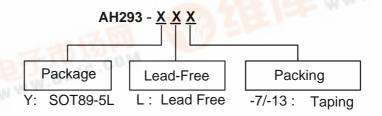
- On Chip Hall Sensor
- Rotor-Locked Shutdown
- Automatically Restart
- Rotor-State Detection (RD) Output
- Built-in Zener Protection for Output Driver
- Operating Voltage: 1.8V~5.75 V
- Output Current: I_{O(AVE)} = 400 mA
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)
- Packages: SOT89-5L

General Description

AH293 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. Also, rotor-state detection (RD) output is for speed detection.

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	Packaging	7" Tape and Reel			
	Device	Code	(Note 2)	Quantity	Part Number Suffix		
<u>(Pb)</u>	AH293-Y	Υ	SOT89-5L	2500/Tape & Reel	-13		

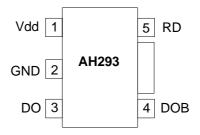
Note: 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.





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Pin Assignment



SOT89-5L

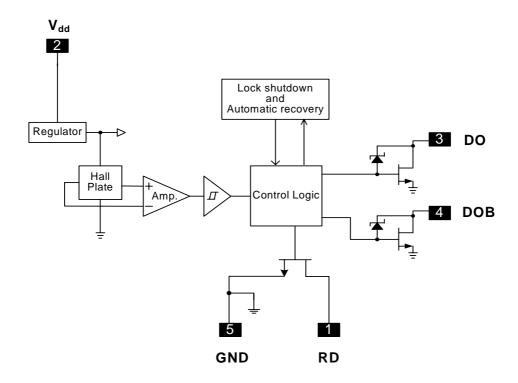
Pin Descriptions

Symbol	Description			
RD	Rotor-State Detection			
V_{dd}	Input Power			
DO	Output Pin			
DOB	Output Pin			
GND	Ground			

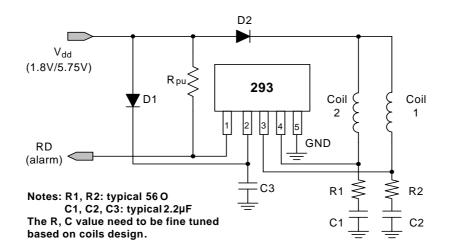


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Block Diagram



Typical Application Circuit



1.8V/5.75V DC Brush-Less Fan with RD Output Function



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Absolute Maximum Ratings $(TA = 25^{\circ}C)$

Characteristics	Symbol	Rating	Unit	
Operating Supply Voltage	V_{dd}	8	V	
Output Current	I _{O (AVE)}	400	mA	
Output Current	I _{O (PEAK)}	700		
Power Dissipaton	P_{D}	800	mW	
Operating Temperature	T _{op}	-20 ~ 100	°C	
Storage Temperature	T _{st}	-55 ~ 150	°C	
Maximum Junction Temperature	Tj	150	°C	

Electrical Characteristics (TA = 25 °C, $V_{dd} = 5V$, unless otherwise specified)

Characteristics	Symbol	Conditions	Min.	Тур.	Max.	Unit	
Supply Voltage		Operating	1.8*	-	5.75	V	
Supply Current	I _{dd}	Operating	-	2.6	4.0	mA	
Locked Protection On	T _{Irp-on}		1	0.4	-	Sec	
Locked Protection Off	T _{Irp-off}		2.4	3	3.6	Sec	
Output Saturation Voltage	V	$I_0 = 180 \text{mA}$	ı	300	-	mV	
Output Saturation voltage	V _{OUT(sat)}	$I_0 = 350 \text{mA}$	-	600	-	1117	
Output On Resistance	R _{ds(on)}		-	1.75	-	ohm	
RD Output Vds	V _{ol}	$I_O = 10mA$	-	0.5	-	V	
Output Zener-Breakdown Voltage	Vz		-	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+	СТ	OUT1	OUT2	RD	Mode
Н	L	L	Н	L	L	Rotating
L	Н	L	L	Н	L	Rotating
-	-	Н	off	off	off	Lockup protection activated

Latch-type RD output is low during rotation and high during stop



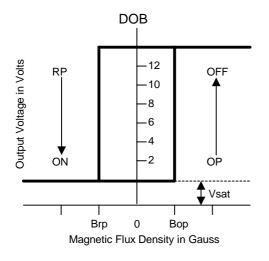
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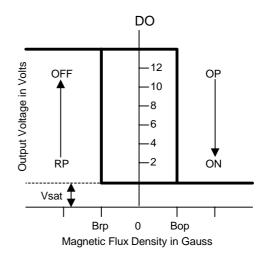
Magnetic Characteristics ($TA = 25 \, ^{\circ}\text{C}$, $V_{dd} = 5V$, unless otherwise specified)

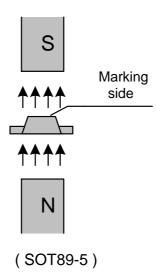
(1mT = 10 Gauss)

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

Operating Characteristics







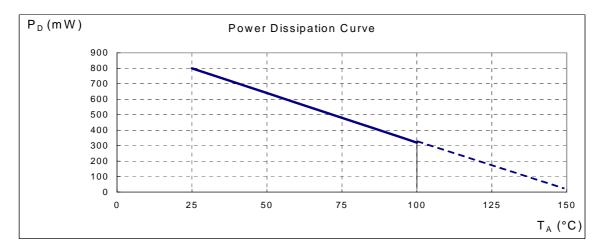


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Performance Characteristics

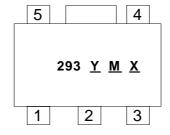
(1) SOT89-5L

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



<u>Y</u>: Year: 0-9 <u>M</u>: Month: A~L

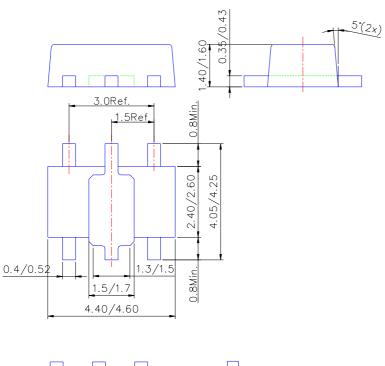
X: Internal code a~z: Lead Free

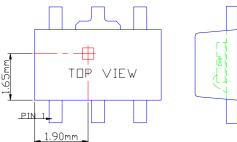


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Package Information (unit:mm)

(1) SOT89-5L





Sensor Location

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