

Features

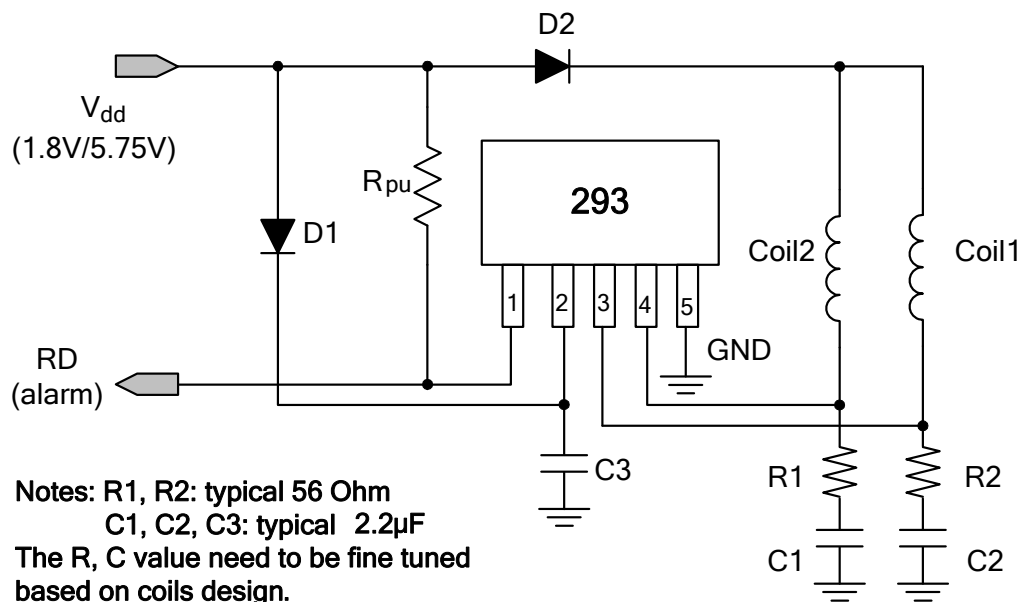
- On Chip Hall Sensor
- Rotor-Locked Shutdown
- Automatically Restart
- Rotor-State Detection (RD) Output
- Built-in Zener Protection for Output Driver
- Operating Voltage: 1.8V~5.75 V
- Output Current: $I_{O(AVE)} = 400 \text{ mA}$
- Lead Free Package: SOT89-5L
- Lead Free Finish/RoHS Compliant (Note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

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.

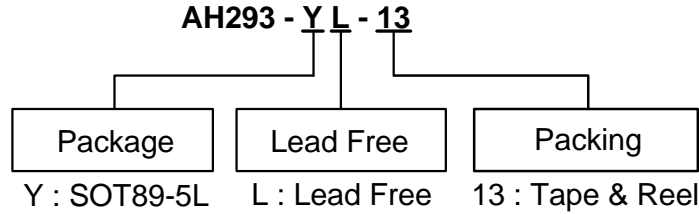
Rotor-lock shutdown detection circuit turns off the output driver when the rotor is blocked to avoid coil overheat. Then, the automatic recovery circuit will restart the motor. These protected actions are repeated and periodic during the blocked period. Until the blocking is removed, the motor recovers and runs normally.

Typical Application Circuit



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

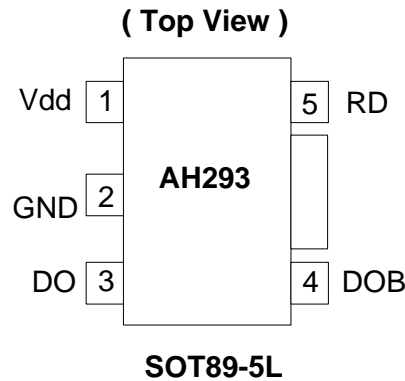
Ordering Information



Device	Package Code	Packaging (Note 2)	13" Tape and Reel	
			Quantity	Part Number Suffix
AH293-YL-13	Y	SOT89-5L	2500/Tape & Reel	-13

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html.
 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>.
 3. Reverse taping as shown on Diodes Inc. Surface Mount (SMD) Packaging document AP02007, which can be found on our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

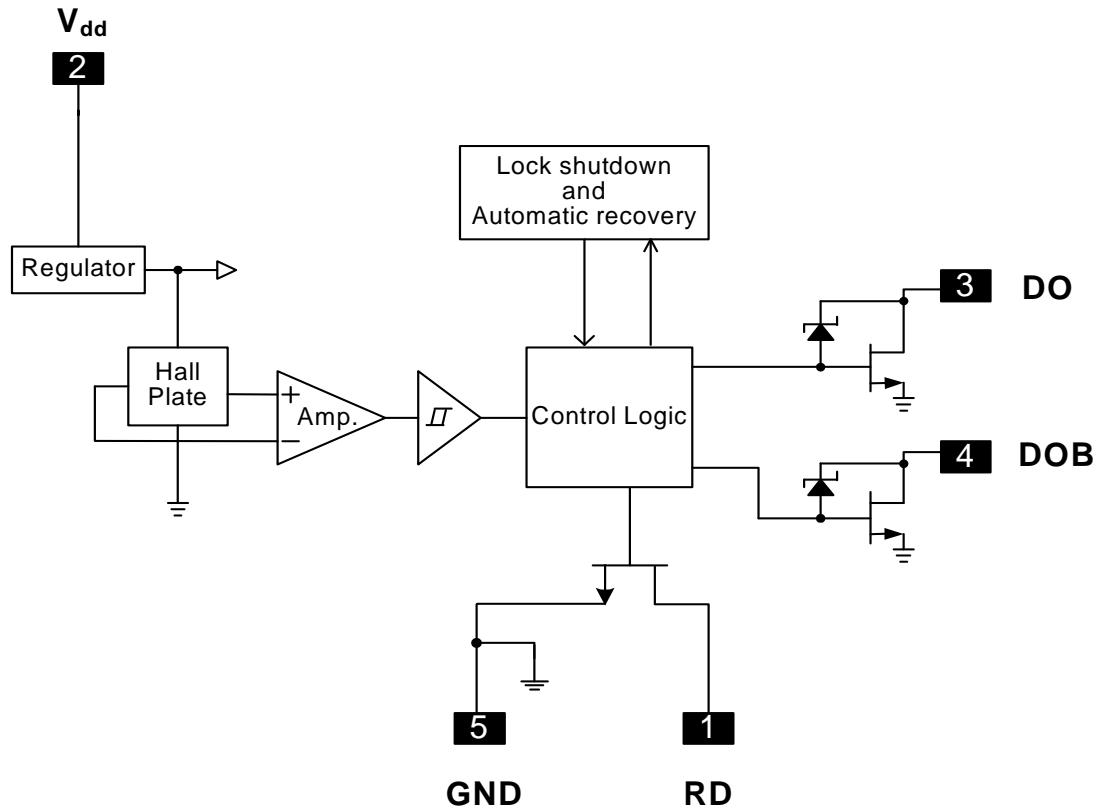
Pin Assignment



Pin Descriptions

Pin Name	Description
RD	Rotor-State Detection
Vdd	Input Power
DO	Output Pin
DOB	Output Pin
GND	Ground

Block Diagram



Absolute Maximum Ratings (TA = 25°C)

Symbol	Characteristics	Rating	Unit
V _{DD}	Operating Supply Voltage	8	V
I _{O(AVE)}	Output Current	400	mA
I _{O(PEAK)}	Output Current	700	mA
P _D	Power Dissipation	800	mW
T _{ST}	Storage Temperature	-55 ~ 150	°C
T _J	Maximum Junction Temperature	150	°C

Recommended Operating Conditions

Symbol	Characteristic	Conditions	Min	Max	Unit
V _{DD}	Supply Voltage (Note 4)	Operating	1.8	5.75	V
T _A	Operating Ambient Temperature	Operating	-20	100	°C

Notes: 4. 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.

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

Symbol	Characteristics	Conditions	Min	Typ.	Max	Unit
I _{DD}	Supply current	Operating	-	2.6	4.0	mA
T _{IRP-on}	Locked Protection On		-	0.4	-	Sec
T _{IRP-off}	Locked Protection Off		2.4	3	3.6	Sec
V _{OUT(SAT)}	Output saturation voltage	I _O = 180mA	-	300	-	mV
		I _O = 350mA	-	600	-	mV
R _{ds(on)}	Output On Resistance		-	1.75	-	ohm
V _{OL}	RD Output Vds	I _O = 10mA	-	0.5	-	V
V _Z	Output Zener-breakdown Voltage		-	15	-	V

Truth Table

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

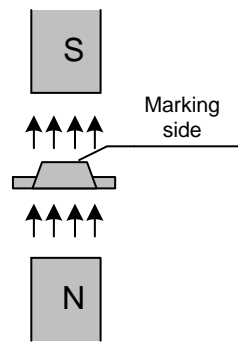
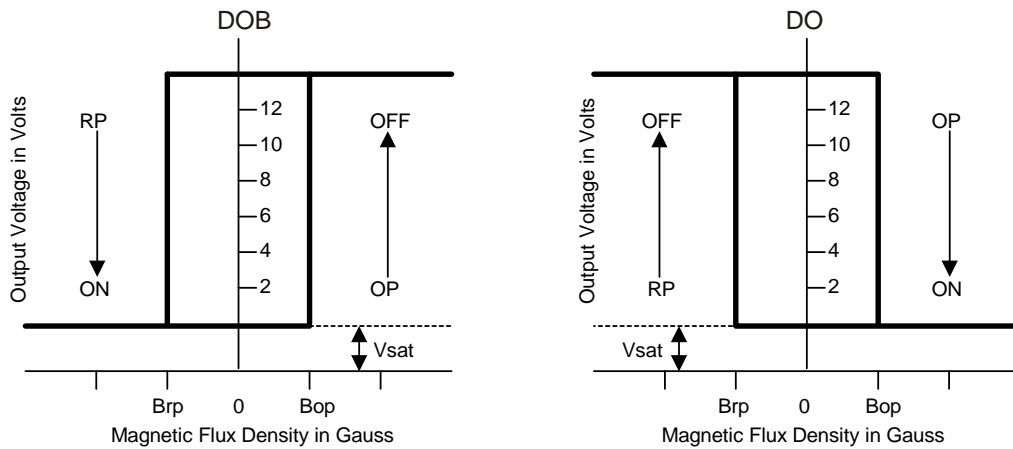
Latch-type RD output is low during rotation and high during stop.

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

(1mT = 10 Gauss)

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

Operating Characteristics

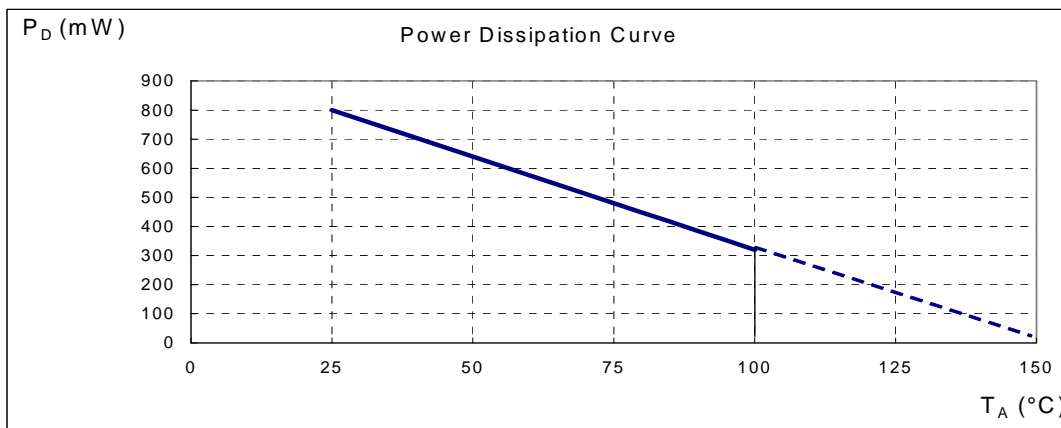


(SOT89-5L)

Performance Characteristics

(1) SOT89-5L

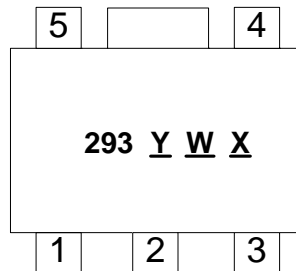
T_A (°C)	25	50	60	70	75	80	85	90	95	100
P_D (mW)	800	640	576	512	480	448	416	384	352	320
T_A (°C)	105	110	115	120	125	130	135	140	145	150
P_D (mW)	288	256	224	192	160	128	96	64	32	0



Marking Information

(1) SOT89-5L

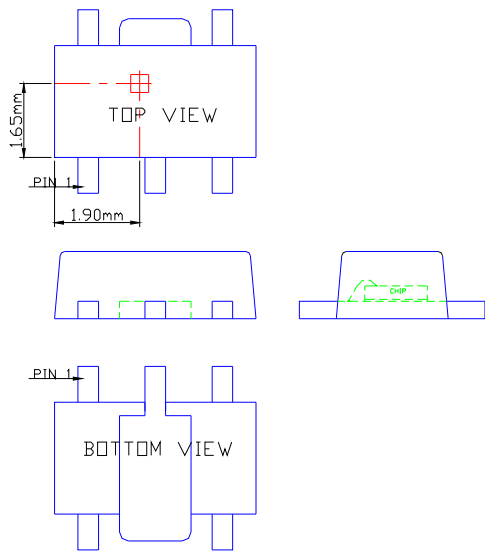
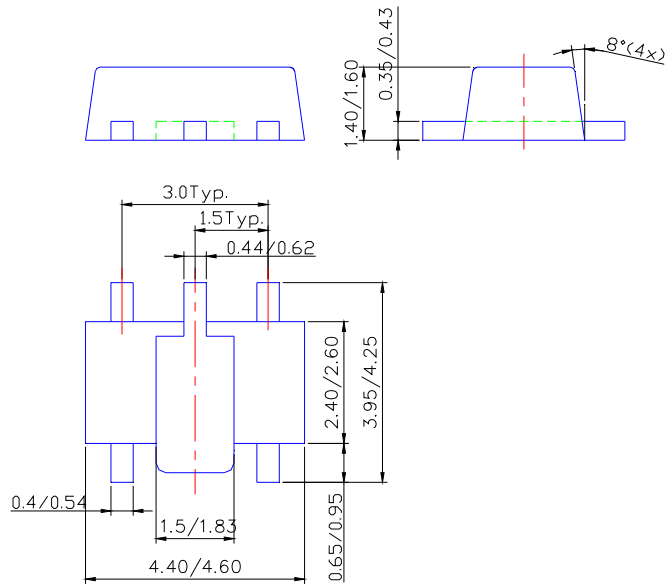
(Top View)



Y : Year : 0~9
W : Week : A~Z : 1~26 week;
 a~z : 27~52 week;
 z represents 52 and 53 week
X : Internal code
 a~z : Lead Free

Package Information (All Dimensions in mm)

(1) Package type: SOT89-5L



Sensor Location

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