

Features

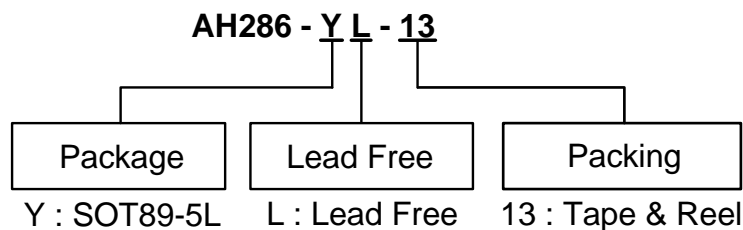
- On chip Hall sensor
- Rotor-locked shutdown
- Automatically restart
- Rotor-state detection (RD) output
- Built-in Zener protection for output driver
- Operating voltage: 3.8V~20 V
- Output current: $I_{O(AVE)} = 500\text{mA}$ for SOT89-5L
- Lead Free Package: SOT89-5L
- Lead Free Finish/RoHS Compliant (Note 1)

General Description

AH286 is a monolithic fan motor controller with Hall sensor's capability. It contains two complementary open-drain 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.

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.

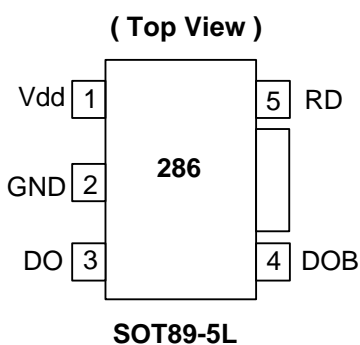
Ordering Information



Device	Package Code	Packaging (Note 2)	13" Tape and Reel	
			Quantity	Part Number Suffix
AH286-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>.

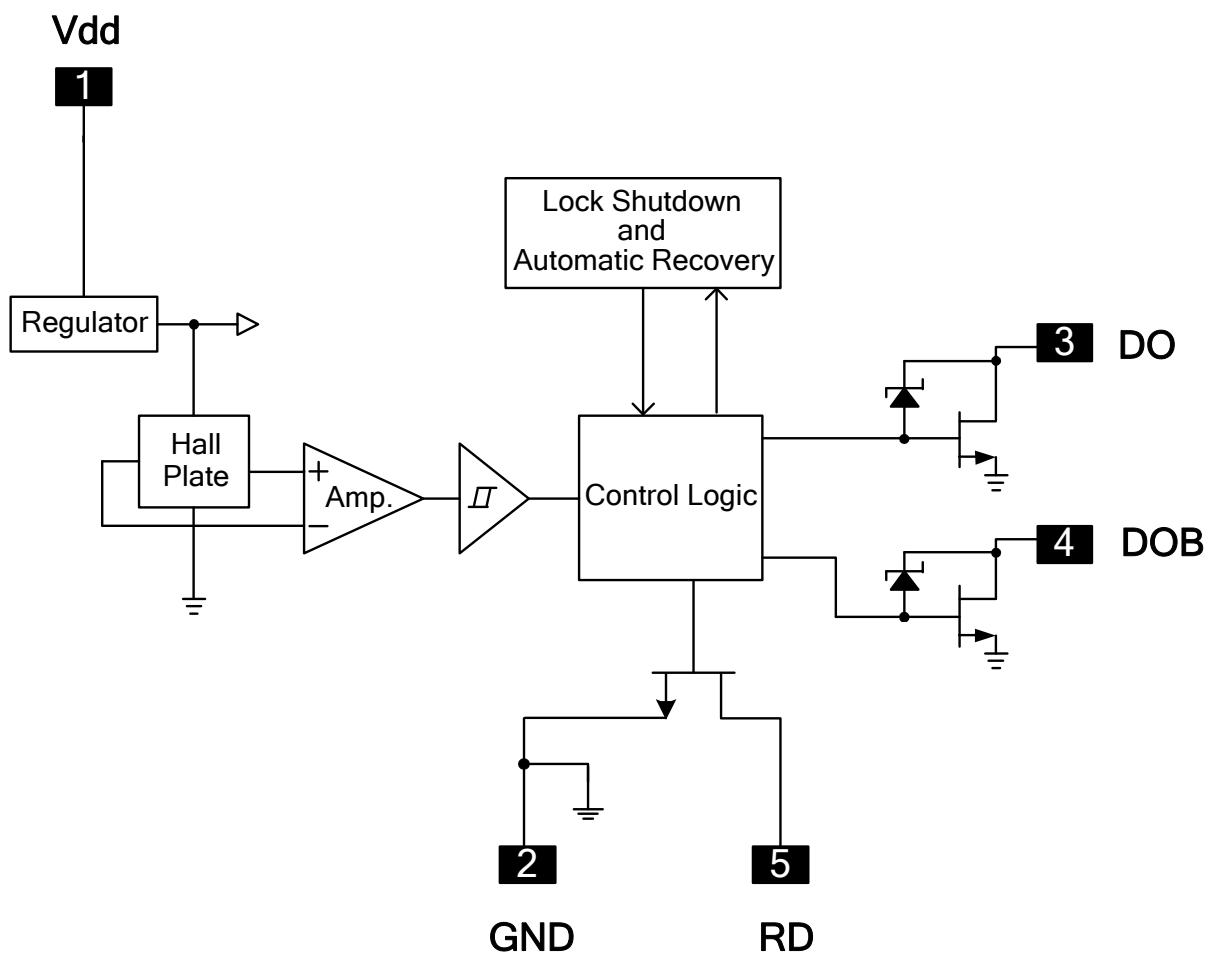
Pin Assignment



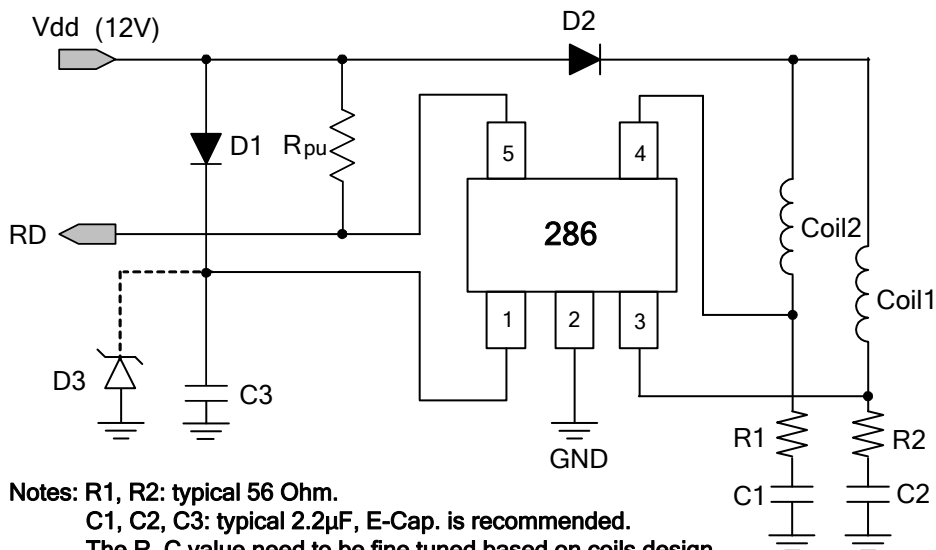
Pin Descriptions

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

Block Diagram



Typical Application Circuit

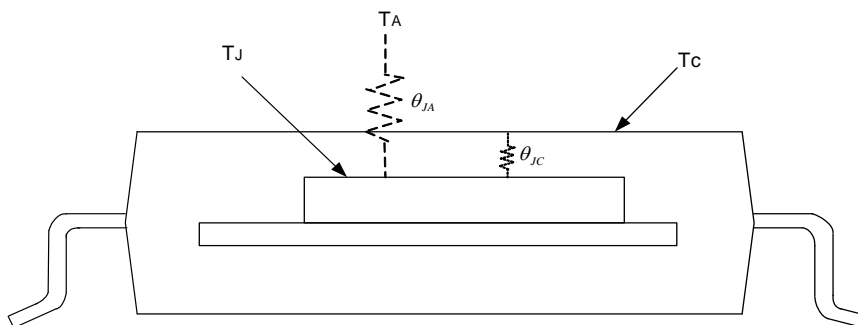


Notes: R1, R2: typical 56 Ohm.
 C1, C2, C3: typical 2.2μF, E-Cap. is recommended.
 The R, C value need to be fine tuned based on coils design.
 D3 is a Zener diode, not to exceed the absolute maximum rating voltage.

12V DC Brush-Less Fan with RD 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 $I_{O(PEAK)}$	500 700	mA
P_D	Power Dissipation	SOT89-5L	800	mW
T_{OP}	Operating Temperature		-40 ~ 100	$^\circ\text{C}$
T_{ST}	Storage Temperature		-55 ~ 150	$^\circ\text{C}$
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
θ_{JA} (Note 3)	Thermal Resistance Junction-to-Case	SOT89-5L	156	$^\circ\text{C/W}$



Notes: 3. 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} .

Electrical Characteristics (T_A = 25 °C, V_{dd}=12V, unless otherwise specified)

Symbol	Characteristics	Conditions	Min	Typ.	Max	Unit
V _{dd}	Supply Voltage	Operating	3.8	-	20	V
I _{dd}	Supply current	Operating	-	2.0	4.0	mA
I _{off}	Output Leakage Current	V _{OUT} =24V	-	< 0.1	10	μA
T _{lrp-on}	Locked Protection On		0.4	0.5	0.6	Sec
T _{lrp-off}	Locked Protection Off		2.4	3	3.6	Sec
V _{OUT(sat)}	Output saturation voltage	I _o =300mA	-	375	500	mV
		I _o =500mA	-	625	900	
R _{ds(on)}	Output On resistance	I _o =300mA	-	1.25	1.67	ohm
V _{ol}	RD output V _{ds}	I _o =10mA	-	0.5	-	V
V _z	Output Zener-breakdown Voltage		35	42	60	V

Truth Table

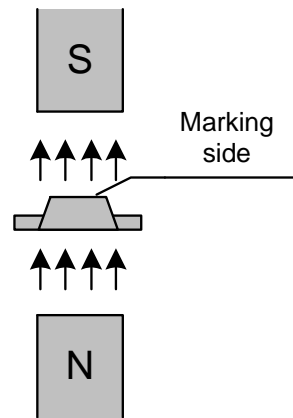
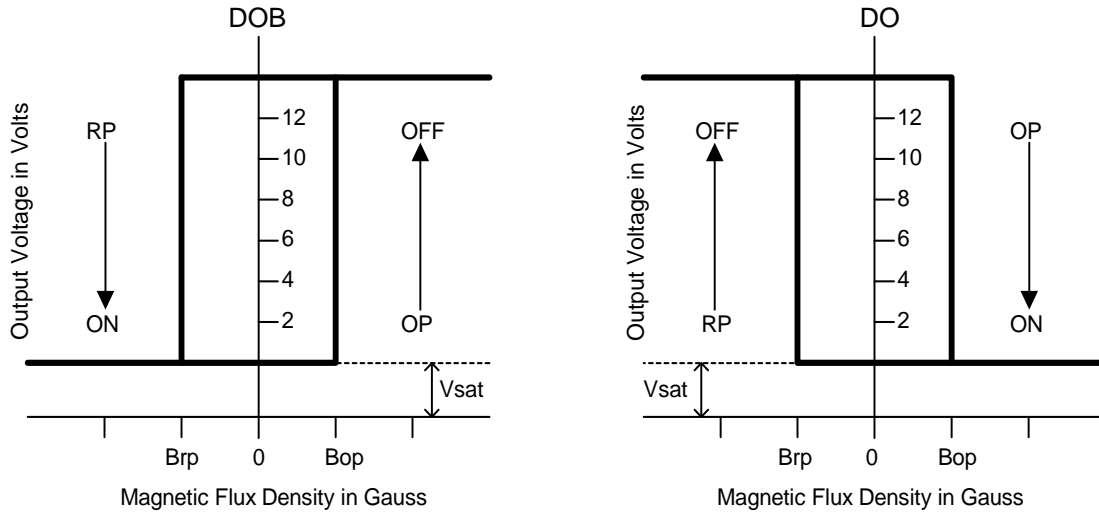
IN-	IN+	CT	OUT1	OUT2	RD	Mode
H	L	L	H	L	L	Rotating
L	H	L	L	H	L	Rotating
-	-	H	off	off	H	Lockup protection activated

Magnetic Characteristics (T_A = 25 °C, V_{dd} = 12V, unless otherwise specified)

(1mT=10 Gauss)

Symbol	Characteristics	Min.	Typ.	Max.	Unit
B _{op}	Operate Point	10	30	60	Gauss
B _{rp}	Release Point	-60	-30	-10	Gauss
B _{hy}	Hysteresis	--	60	--	Gauss

Operating Characteristics

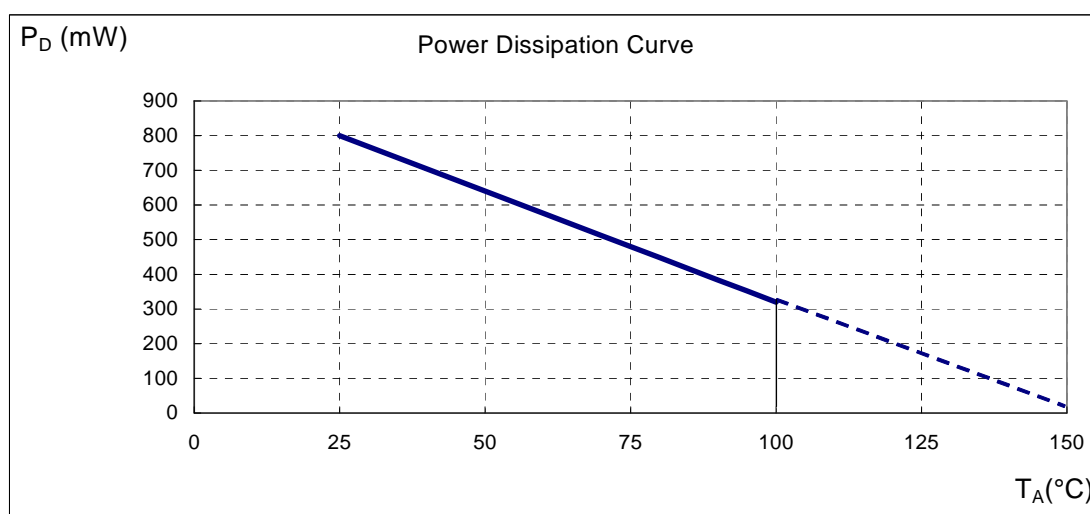


(SOT89-5L)

Performance Characteristics

(1) SOT89-5L

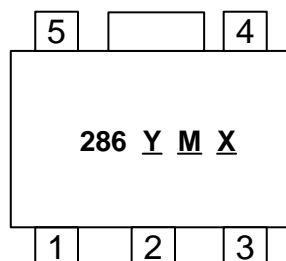
T_A (°C)	25	50	60	70	75	80	85	90	95	100
P_D (mW)	800	640	576	512	480	448	416	384	352	320
T_A (°C)	105	110	115	120	125	130	135	140	145	150
P_D (mW)	288	256	224	192	160	128	96	64	32	0



Marking Information

(1) SOT89-5L

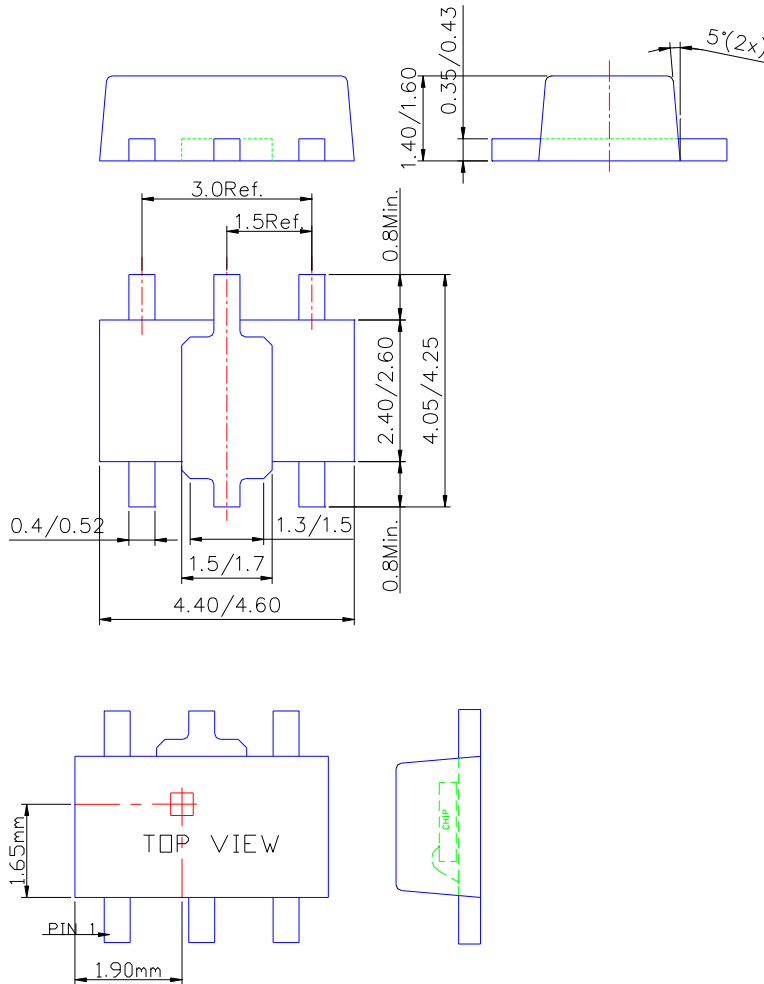
(Top View)



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

Package Information (All Dimensions in mm)

(1) SOT89-5L



Sensor Location

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