

High Voltage Hall-Effect Smart Fan Motor Controller

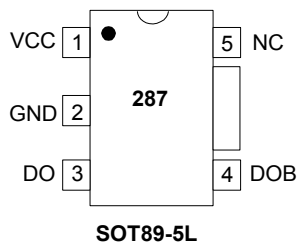
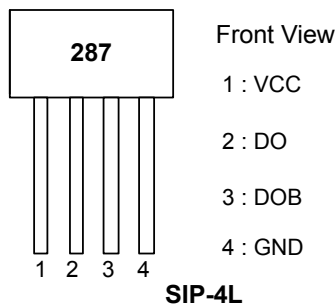
■ Features

- On chip Hall sensor
- Rotor-locked shutdown
- Automatically restart
- Built-in Zener protection for output driver
- Operating voltage: 3.8V~28V
- Output current: $I_{O(AVE)} = 400\text{mA}$
- Package: SIP-4L, SOT89-5L

■ General Description

AH287 is a monolithic fan motor controller with Hall sensor's capability. It contains two complementary open-drain drivers for motor's coil driving, automatic lock shutdown and restart function relatively. To avoid coil burning, rotor-lock shutdown detection circuit shut down the output driver if the rotor is blocked and then the automatic recovery circuit will try to restart the motor. This function repeats while rotor is blocked. Until the blocking is removed, the motor recovers running normally.

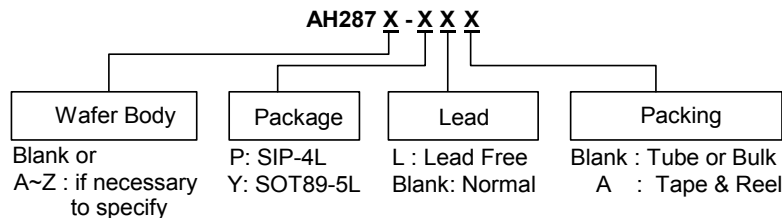
■ Pin Assignment



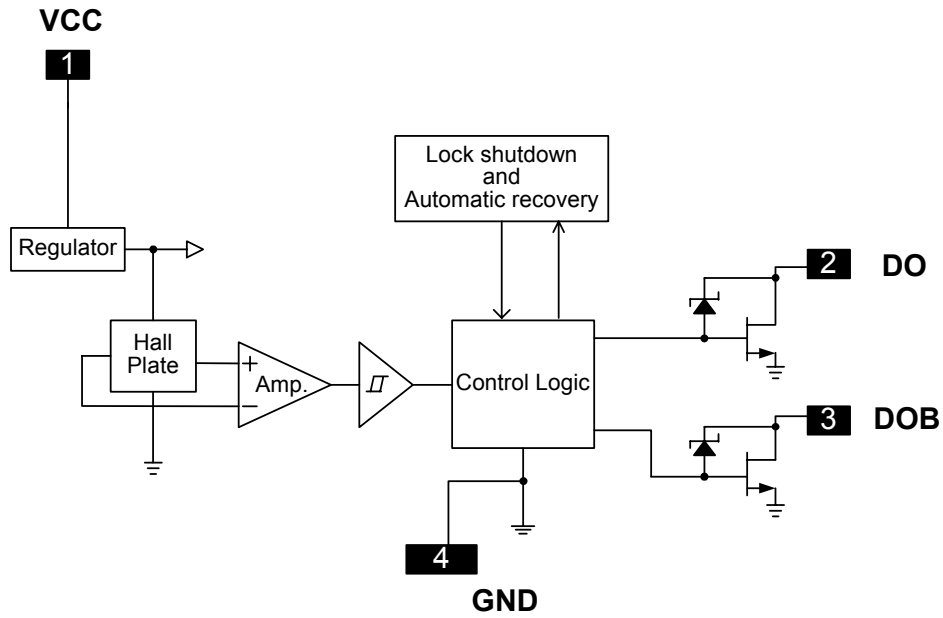
■ Pin Descriptions

Name	Description
VCC	Input power
DO	Output pin
DOB	Output pin
GND	Ground
NC	Not connected

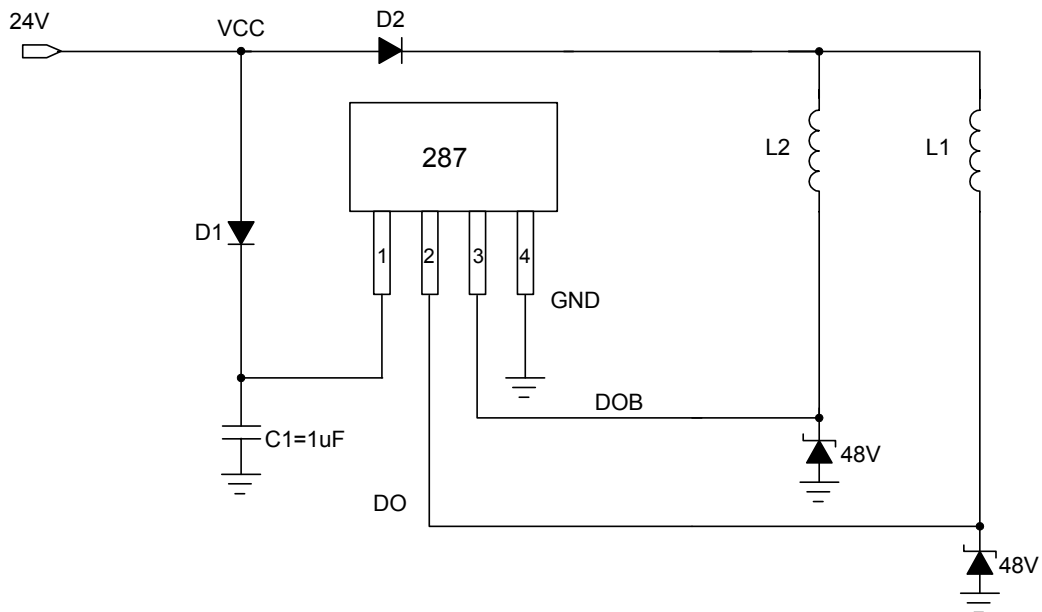
■ Ordering Information



■ Block Diagram (SIP4)



■ Typical Application Circuit (SIP4)



24V brush-less DC fan

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■ Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply Voltage	V _{CC}	30	V
Output Current	I _{O(AVE)}	SIP4/SOT89-5	mA
	I _{O(PEAK)}	700	
Power Dissipation	P _D	SIP4	550
		SOT89-5	800
Operating Temperature	T _{opr}	-40 ~ 100	°C
Storage Temperature	T _{stg}	-55 ~ 150	°C
Maximum Junction Temp.	T _j	150	°C
Thermal Resistance	θ _{jc}	SIP4	227
		SOT89-5	156

■ Electrical Characteristics (Ta = 25 °C, V_{CC} =24V, unless otherwise specified)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V _{cc}	Operating	3.8	-	28*	V
Supply current	I _{cc}	Operating	-	2.0	4.0	mA
Output Leakage Current	I _{off}	V _{OUT} =24V	-	< 0.1	10	μA
Locked Protection On	T _{lrp-on}		0.4	0.46	0.6	Sec
Locked Protection Off	T _{lrp-off}		2.4	2.76	3.6	Sec
Output saturation voltage	V _{OUT(sat)}	I _O =200mA	-	450	700	mV
		I _O =300mA	-	680	800	
Output On resistance	R _{ds(on)}	I _O =200mA	-	2.25	3.5	ohm
Output Zener-breakdown Voltage	V _z		42	55	65	V

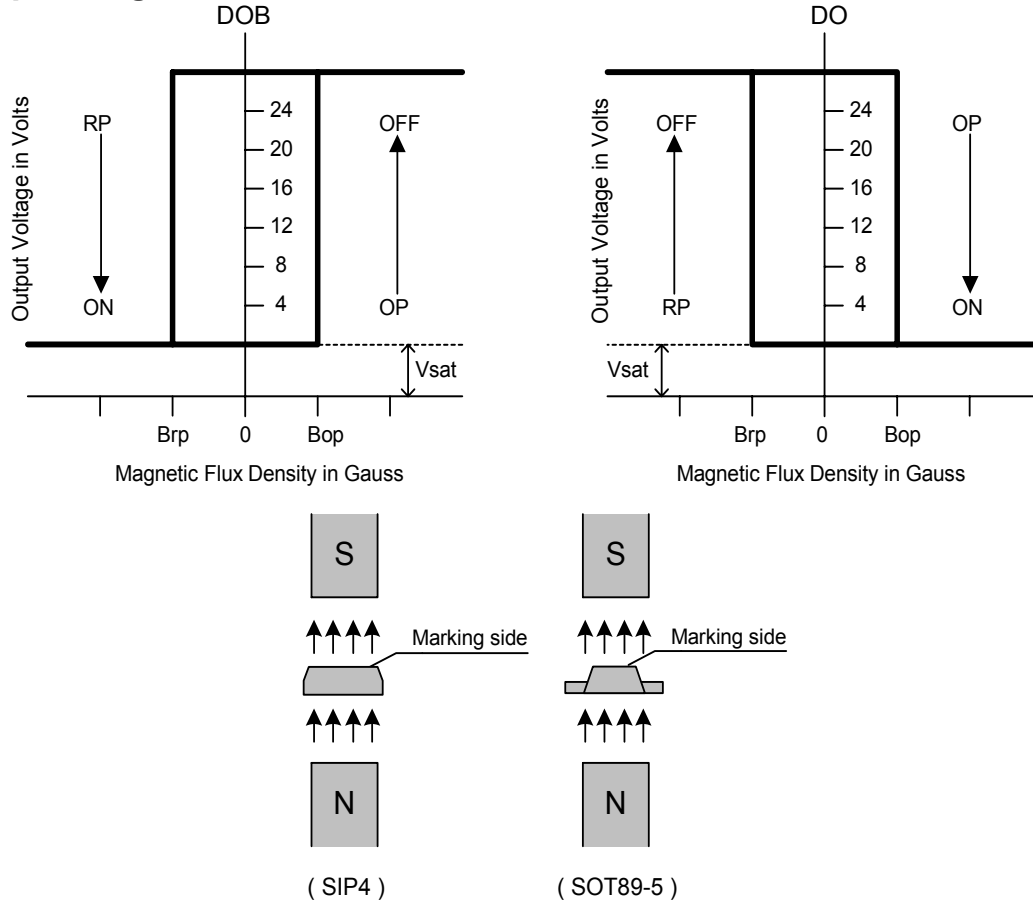
*Note: Please watch out the current limit issue when the operation voltage is over 26.4V, because of the different efficiency in the coil.

■ Magnetic Characteristics (Ta = 25 °C, V_{CC} = 24V, unless otherwise specified)

(1mT=10 Gauss)

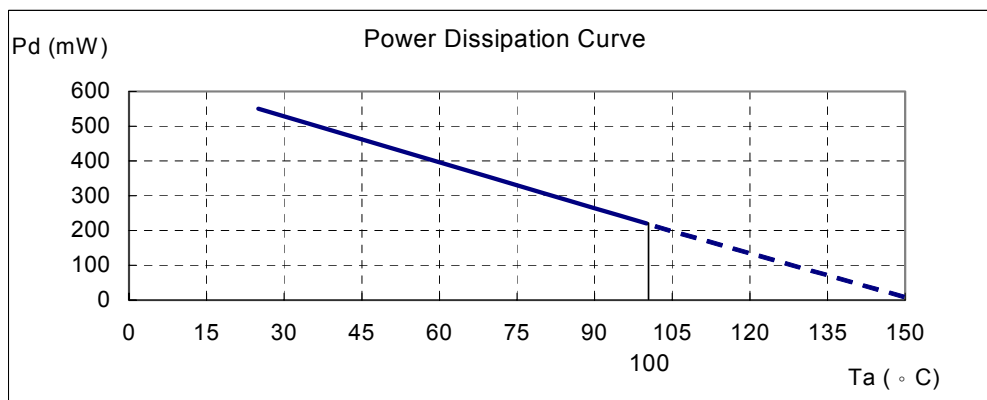
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operate Point	B _{op}	10	30	60	Gauss
Release Point	B _{rp}	-60	-30	-10	Gauss
Hysteresis	B _{hy}	--	60	--	Gauss

■ Operating Characteristics



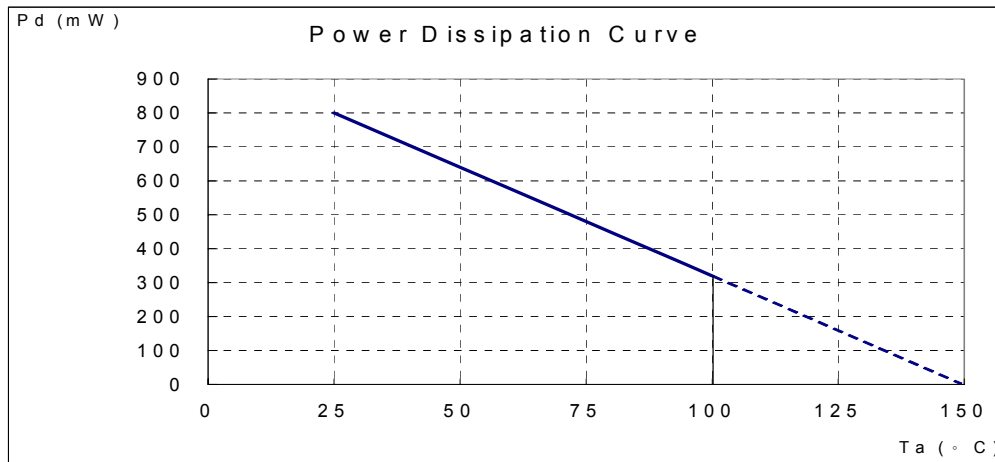
■ Performance Characteristics (SIP4)

Ta (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	550	440	396	352	308	286	264	242	220
Ta (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0



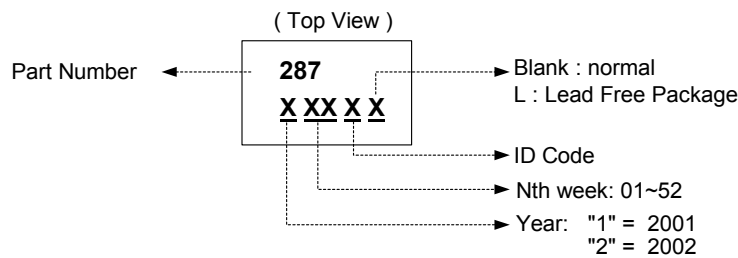
■ Performance Characteristics (SOT89-5)

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

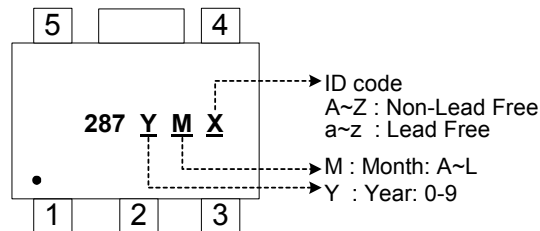


■ Marking Information

(1)SIP-4L



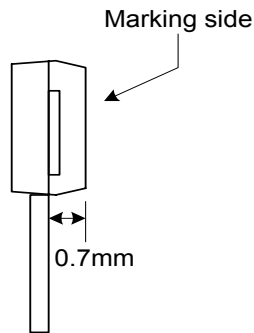
(2)SOT89-5L



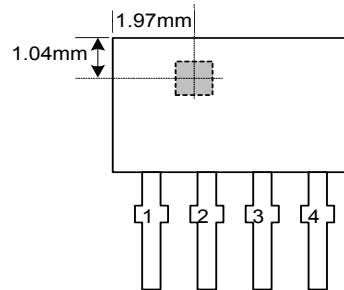
■ Package Information

(1)SIP-4L

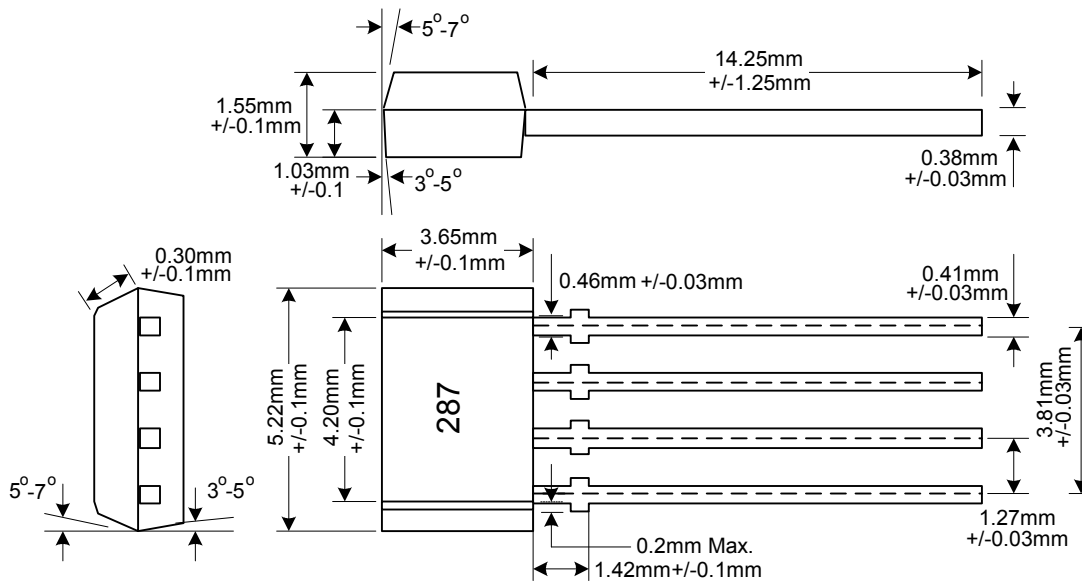
Active Area Depth



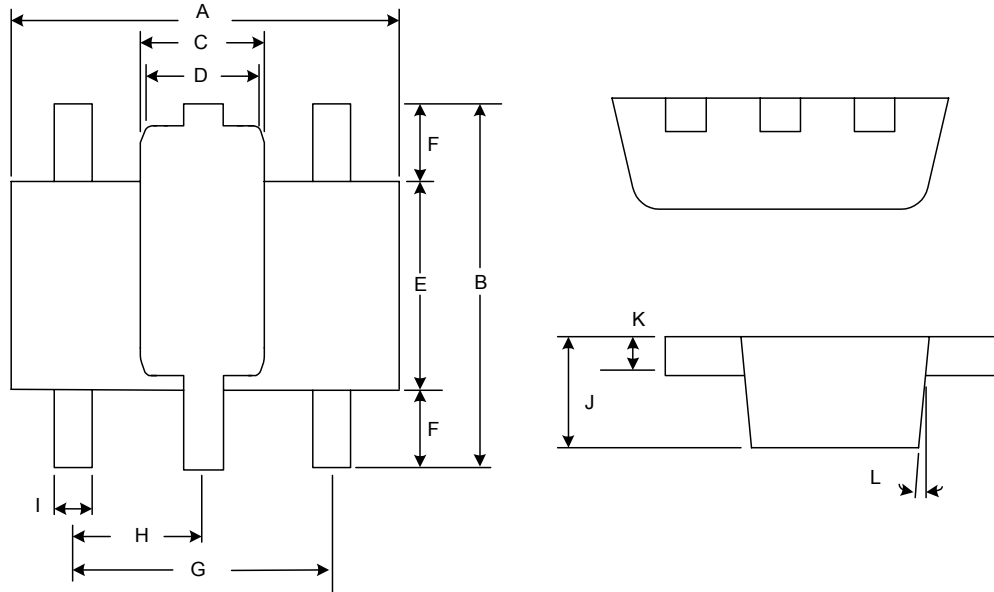
Package Sensor Location



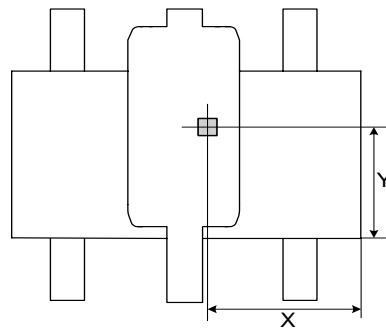
Package Dimension



(2) SOT89-5L



Package Sensor Location



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	4.40	4.50	4.60	0.173	0.177	0.181
B	4.05	4.15	4.25	0.159	0.163	0.167
C	1.50	1.60	1.70	0.059	0.063	0.067
D	1.30	1.40	1.50	0.051	0.055	0.059
E	2.40	2.50	2.60	0.094	0.098	0.102
F	0.80	-	-	0.031	-	-
G	3.00 Ref.			0.118 Ref.		
H	1.50 Ref.			0.059 Ref.		
I	0.40	0.46	0.52	0.016	0.018	0.020
J	1.40	1.50	1.60	0.055	0.059	0.063
K	0.35	0.39	0.43	0.014	0.015	0.017
L	5° Typ.			5° Typ.		
X	-	1.90	-	-	0.075	-
Y	-	1.65	-	-	0.065	-