

Two-Coil Smart Fan Driver

❖ GENERAL DESCRIPTION

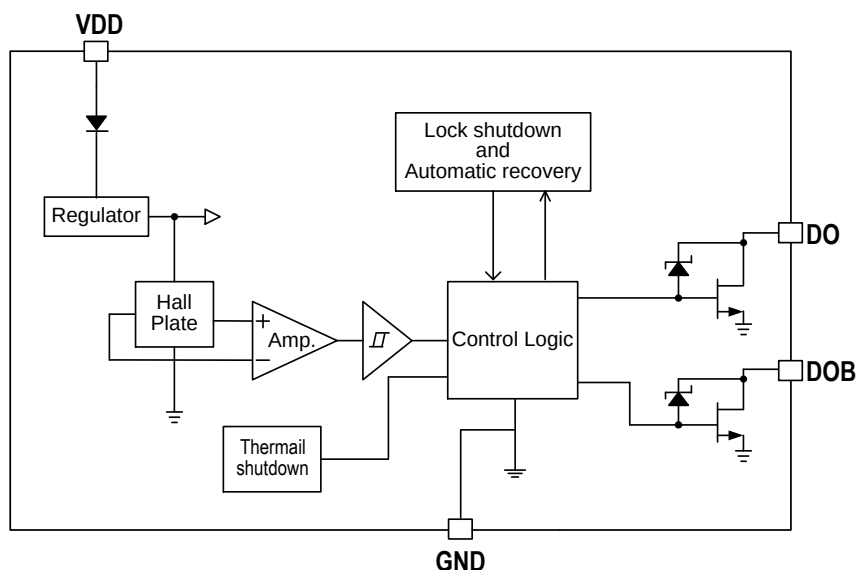
AX8220 is a one-chip solution for two-coil brushless direct current (BLDC) motors and fans. It contains two complementary open-drain drivers for motor's coil driving, automatic lock shutdown and restart function relatively.

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.

❖ FEATURES

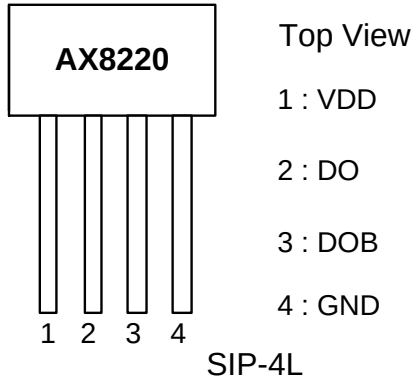
- On-chip solution
- Rotor-locked shutdown
- Automatically restart
- Built-in protection clamping diode for output driver
- Operating voltage: 4.5V~30V
- Output current: $I_{O(AVE)} = 300\text{mA}$
- Peak output current up to 600mA
- Thermal shutdown
- Package: SIP-4L

❖ BLOCK DIAGRAM



❖ PIN ASSIGNMENT

The packages of AX8220 are SIP-4L; the pin assignment is given by:



Name	Pin No. SIP-4L	Description
VDD	1	Input power
DO	2	Output pin
DOB	3	Output pin
GND	4	Ground

❖ ORDER/MARKING INFORMATION

Order Information	Top Marking
AX8220 XX X Package Type Packing I4: SIP-4L Blank : Tube A : Taping	3 8 2 X X X ↓ ↓ Year Week EX : 2013 Year_8 Week → 308

❖ ABSOLUTE MAXIMUM RATINGS (at T_A=25°C)

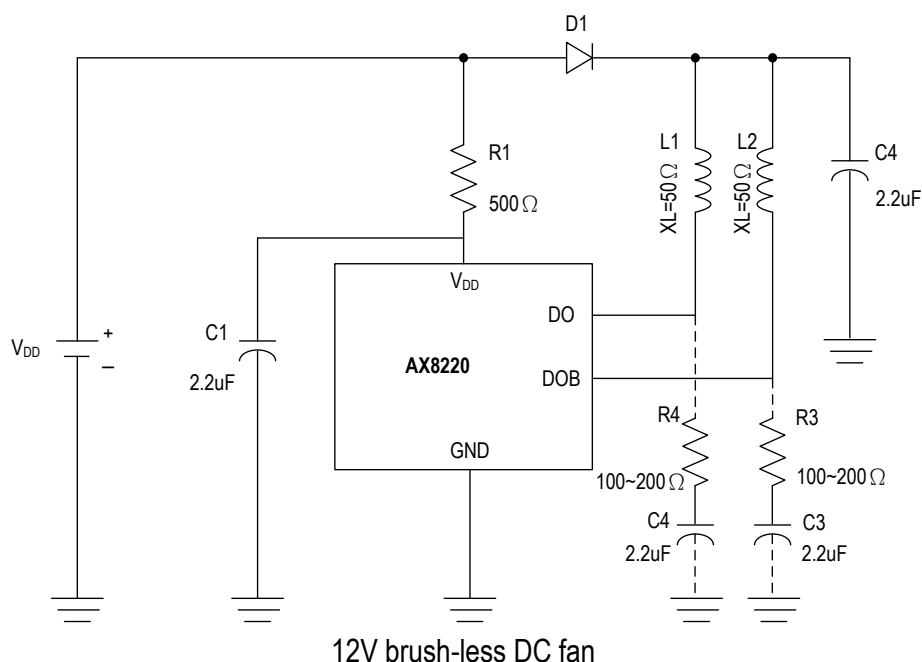
Characteristics	Symbol	Rating	Unit
Supply Voltage	V _{DD}	32	V
Output Current	I _{O(AVE)}	300	mA
	I _{O(PEAK)}	600	
Power Dissipation	P _D	550	mW
Operating Temperature	T _{opr}	-40 ~ 125	°C
Storage Temperature	T _{stg}	-55 ~ 150	°C
Maximum Junction Temp.	T _J	150	°C

❖ ELECTRICAL CHARACTERISTICS

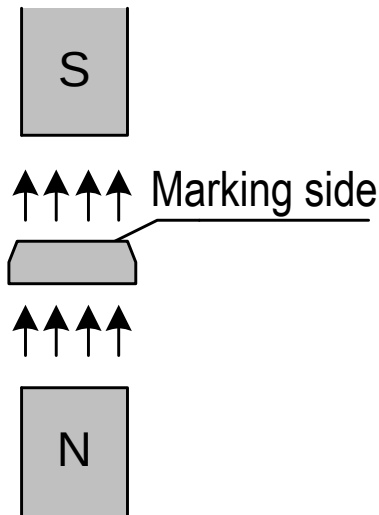
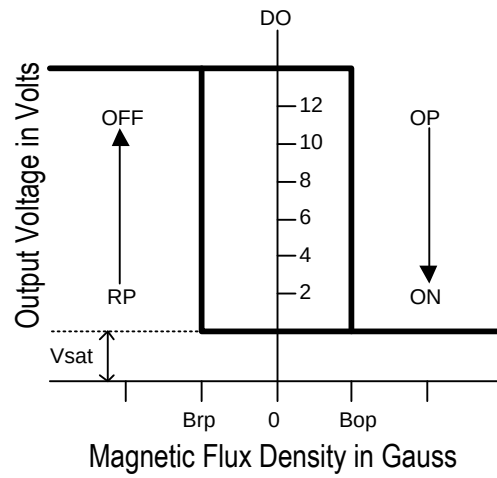
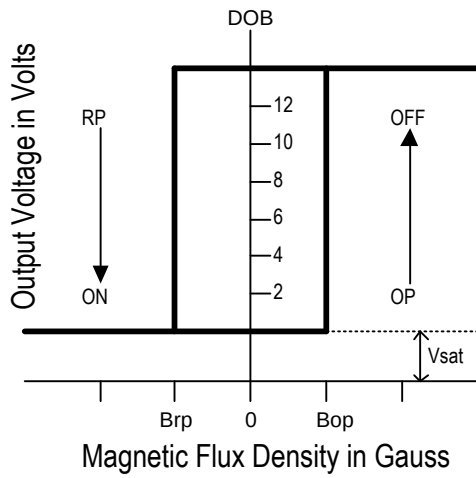
($T_A = 25\text{ }^{\circ}\text{C}$, $V_{DD}=24\text{V}$, unless otherwise specified)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}	Operating	4.5	-	30	V
Supply current	I_{DD}	Operating	-	2.0	5	mA
Output Leakage Current	I_{off}	$V_{OUT}=60\text{V}$	-	< 0.1	10	μA
Locked Protection On	Tlrp-on		-	0.40	-	Sec
Locked Protection Off	Tlrp-off		-	2.4	-	Sec
Output On resistance	$R_{ds(on)}$	$I_{OUT}=300\text{mA}$	-	2	3	Ω
Output Clamping Voltage	V_Z	DO, DOB	-	60	-	V
FG/RD Output Voltage,	V_{OL}	$I_{OUT}=5\text{mA}$	-	-	0.5	V
FG/RD Pull-UP Voltage	V_{OH}		-	-	30	V
FG/RD Output Current	I_{FR}		-	-	50	mA
Output Switching delay		"dead time" when both drivers are off	-	20	-	μs
Thermal shutdown Temp	T_{SD}		-	145	-	$^{\circ}\text{C}$
Thermal Shutdown Hysteresis	T_{SH}		-	30	-	$^{\circ}\text{C}$
Electro-Static Discharge	HBM		4	-	-	KV
Magnetic (1mT=10 Gauss)						
Operate Point	Bop		5	20	40	Gauss
Release Point	Brp		-40	-20	-5	Gauss
Hysteresis	Bhy		-	40	-	Gauss

❖ APPLICATION CIRCUIT

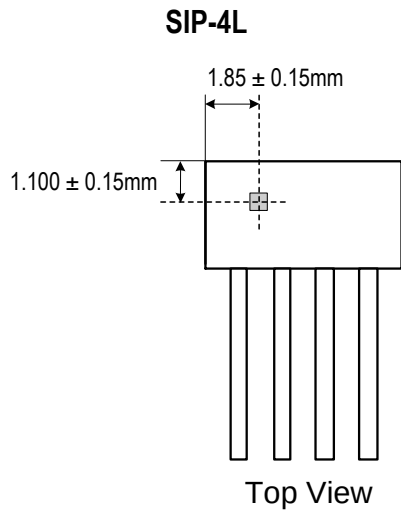


❖ **OPERATING CHARACTERISTICS**



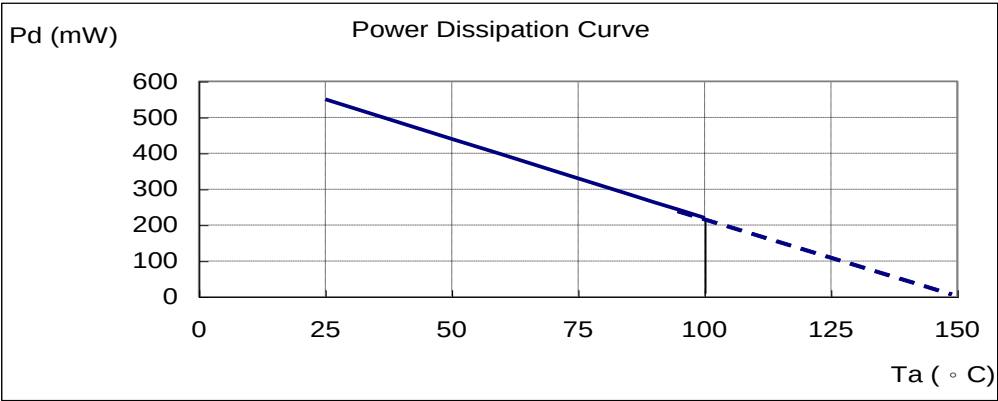
(SIP-4L)

❖ SENSOR LOCATION

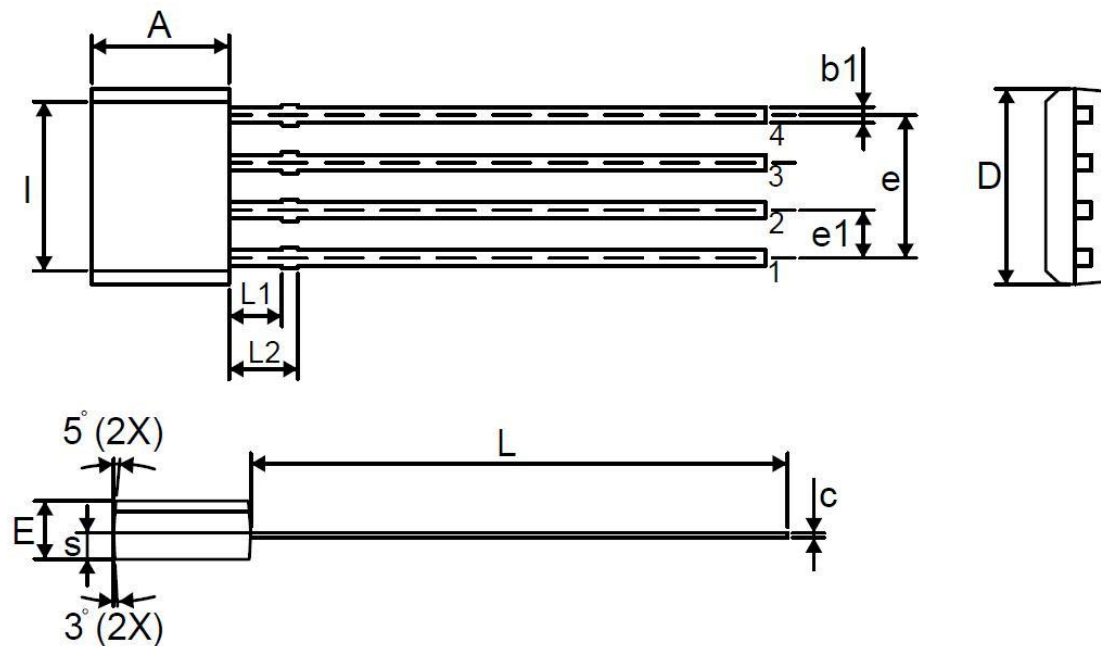


❖ PERFORMANCE CHARACTERISTICS

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



❖ PACKAGE OUTLINES



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	3.60	3.65	3.70	0.142	0.144	0.146
b1	0.35	0.38	0.41	0.014	0.015	0.016
C	0.351	0.381	0.411	0.014	0.015	0.016
D	5.11	5.22	5.27	0.201	0.206	0.207
e	3.78	3.81	3.84	0.149	0.150	0.151
e1	1.24	1.27	1.3	0.049	0.050	0.051
E	1.50	1.55	1.60	0.059	0.061	0.063
I	4.04	4.20	4.34	0.159	0.165	0.171
L	13.80	14.30	14.80	0.543	0.563	0.583
L1	0.814	0.914	1.014	0.032	0.036	0.040
L2	1.342	1.442	1.542	0.053	0.057	0.061
s	0.7	0.73	0.76	0.028	0.029	0.030