Features

- Built-in protecting diode for chip reverse power connecting
- Operating voltage range: 3.5V~24V
- Output continuous current up to 0.35A
- On-Chip High sensitivity Hall-effect Sensor
- -40°C to 125°C Operating Temperature
- Rotor-locked shutdown and automatically restart function
- Low Profile SIP-4L Package

Applications

- For 5V / 12V / 24V single coil Fan

General Description

CH901M is integrated Hall sensors with output drivers, mainly designed for electronic commutation ofbrush-less DC Fan. This IC is using HV BCD process internally includes the regulator, protecting dio de,Hall plate, amplifier, comparator, and a pair of complementary open-Drain outputs (DO, DOB).

To avoid coil burning, rotor-lock shutdown detection circuit shut down the output driver if the roto r isblocked and then the automatic recovery circuit will try to restart the motor. This function repeat s whilerotor is blocked. Until the blocking is removed, the motor recovers running normally.

Pin Assignment

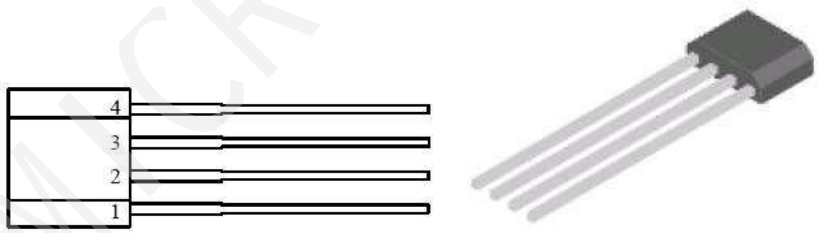


Fig 1TO94

Pin Description

Pin Number	Pin Name	Function
1	VCC	Supply voltage
2	DO	Output 1
3	DOB	Output 2
4	GND	Ground

Block Diagram

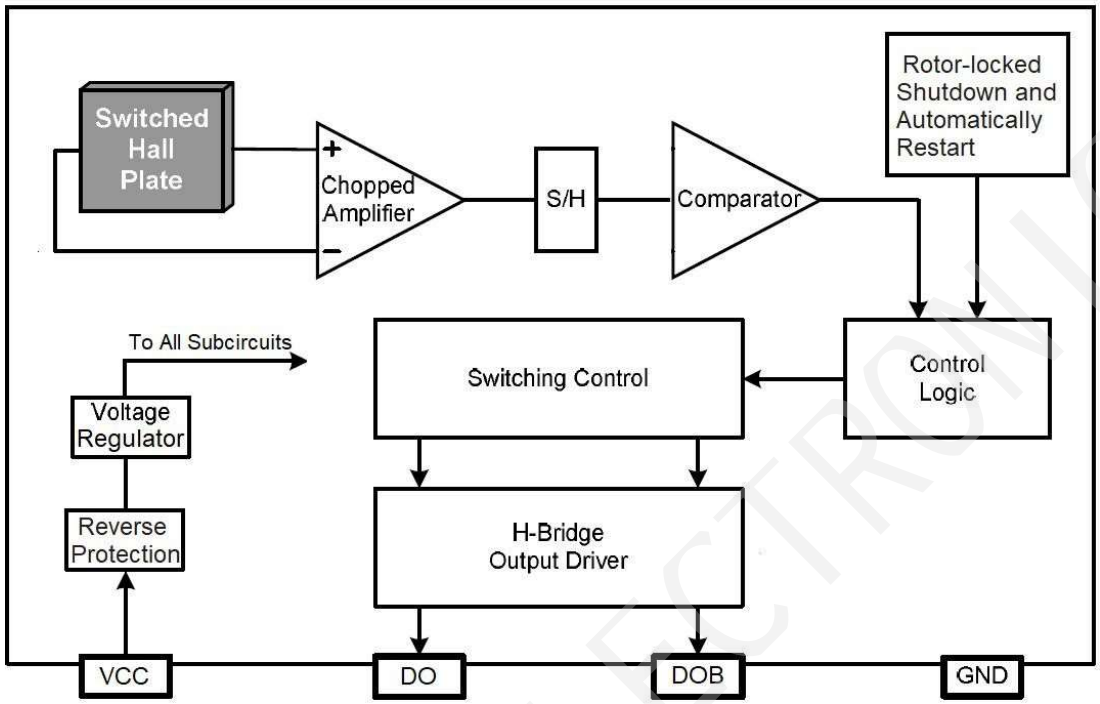


Fig 2

Absolute Maximum Ratings

Table1 (Ta=25℃)

Symbol	Parameter		Value	Unit
VCC	Supply Voltage		28	V
VRCC	Reverse Protection Voltage		-28	V
B	Magnetic Flux Density		Unlimited	Gauss
IO	Output Current	Continuous	350	mA
		Hold	450	mA
		Peak	700	mA
PD	Power Dissipation		550	mW
θJA	Thermal Resistance	Die to atmosphere	227	℃/W
θJC		Die to package case	49	℃/W
TSTG	Storage Temperature		-50 to 150	℃

Note:Stresses greater than those listed under "Absolut Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. "Absolute Maximum Ratings" for extended period may affect device reliability.

Recommended Operating Conditions

Table 2 (Ta=25℃)

Parameter	Symbol	Min	Max	Unit
Supply Voltage	VCC	3.5	24	V
Ambient Temperature	Ta	-40	12 5	℃

Electrical Characteristics

Table 3 (VCC=12V,Ta=25℃, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
vSAT_sink	Output Saturation	Io=200mA,	-	0.3	-	V
vSAT_source	Voltage	Io=200mA		VCC-0.6	-	V
ICC	Supply Current	VCC=12V,Output Open		4.5	-	mA
T_Dead	Dead Time	RL=820Ω CL=20pF		40		us
tr	Output Rise Time	RL=820Ω CL=20pF	-	0.5	-	us
tf	Output Fall Time	RL=820Ω CL=20pF	-	2.0	-	us
Ton	Locked Rotor Period		-	0.2	-	s
Toff	Locked Rotor Period		-	1.2	-	s

Magnetic Characteristics

Table 4 (Ta=25℃)

Characteristics	Symbol	Min	Typ	Max	Unit
Operating Point	Bop	15	25	50	Gauss
Releasing Point	Brp	-50	-25	-15	Gauss
Hysteresis	Bhys	30	50	100	Gauss

Driver Output vs. Magnetic Pole

Table 5 (Ta=25℃)

Parameter	Test Conditions	DO	DOB
North Pole	B<Brp	High	Low
South Pole	B>Bop	Low	High

Hysteresis Characteristics

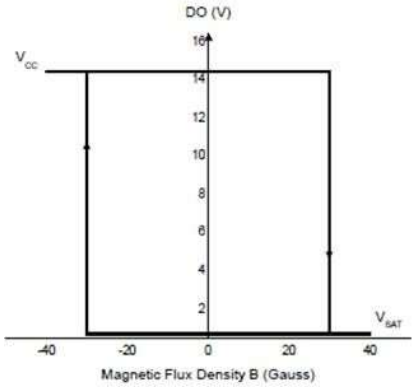


Fig 3 VDO vs. Magnetic Flux Density

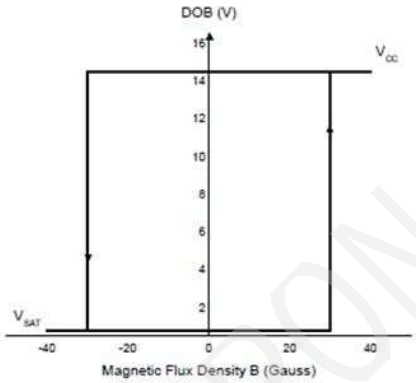
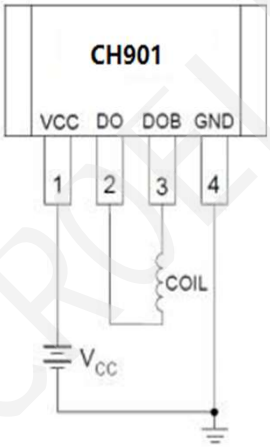


Fig 4 VDOB vs. Magnetic Flux Density

Application Circuits



Output Waveforms Description

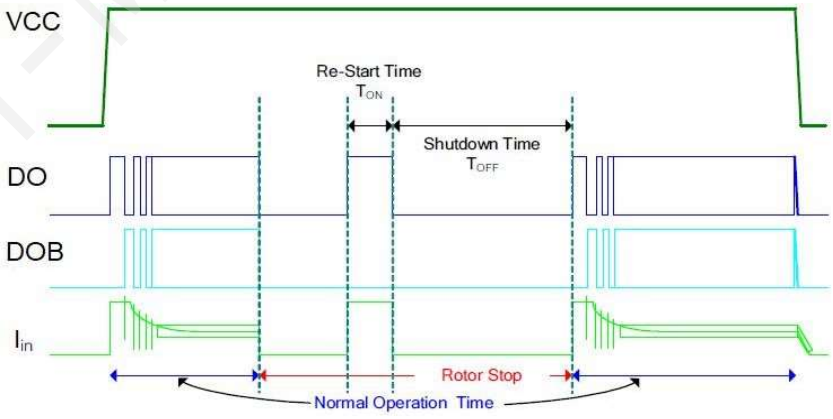


Fig 6

Package Information

TO-94 PACKAGE OUTLINE DIMENSIONS

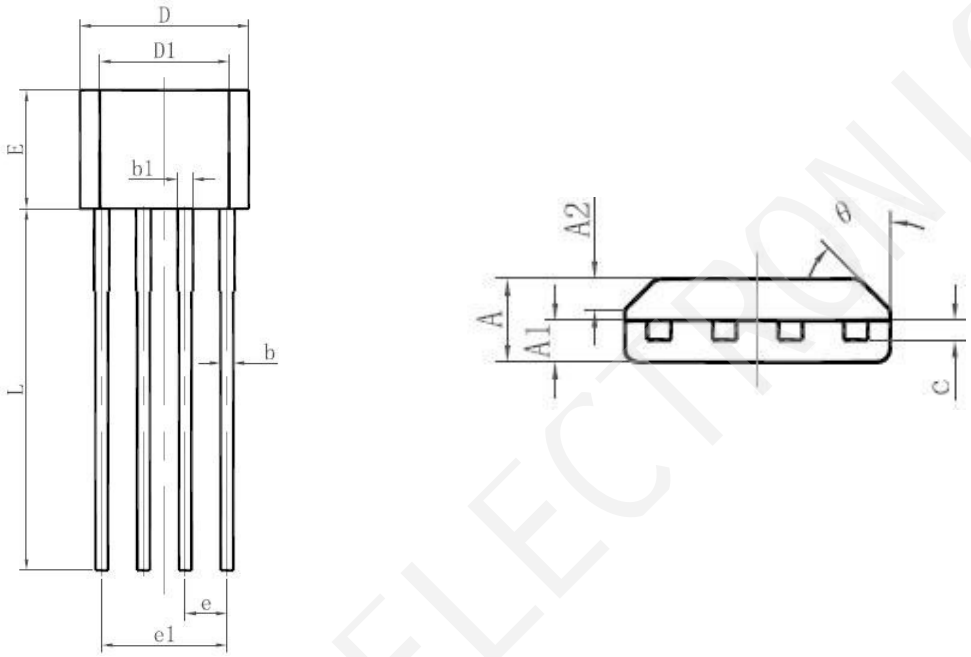


Fig 7

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.800	0.055	0.071
A1	0.700	0.900	0.028	0.035
A2	0.500	0.700	0.020	0.028
b	0.360	0.500	0.014	0.020
b1	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.980	5.280	0.196	0.208
D1	3.780	4.080	0.149	0.161
E	3.450	3.750	0.136	0.148
e	1.270 TYP.		0.050 TYP.	
e1	3.710	3.910	0.146	0.154
L	14.900	15.300	0.587	0.602
θ	45° TYP.		45° TYP.	