

## Single Phase Hall Effect Fan Driver

### ❖ GENERAL DESCRIPTION

The MA477M is an integrated Hall sensor with H-Bridged output driver designed for brushless DC motor applications. The device is using HV BCD process includes an on-chip Hall sensor for magnetic sensing, an amplifier that amplifies the Hall voltage, a comparator to provide switching hysteresis for noise rejection, a bi-directional drivers for sinking and driving large current load.

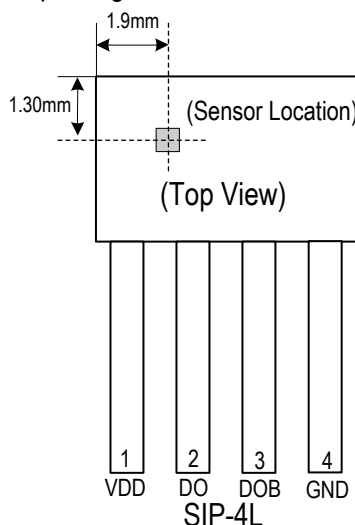
Placing the device in a variable magnetic field, if the magnetic flux density is larger than threshold BOP, the DO is turned to sink and DOB is turned to drive. This output state is held until the magnetic flux density reverses and falls below BRP, then causes DO to be turned to drive and DOB turned to sink.

### ❖ FEATURES

- On-Chip High sensitivity Hall-effect Sensor
- Operating Voltage: 3.5V to 20V
- H-Bridge Output Drivers for Single Coil
- Built-in Reverse Protection Diode
- Thermal Shutdown Protection
- Low Output Switching Current Noise
- -40°C to 125°C Operating Temperature
- Low Profile SIP-4L Package

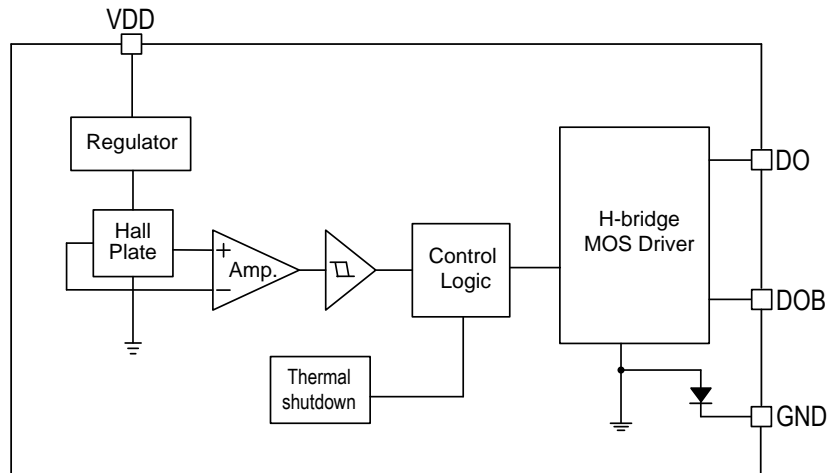
### ❖ PIN ASSIGNMENT

The package of MA477M is SIP-4L; the pin assignment is given by:



Name	Description
VDD	Supply Voltage
DO	Output 1
DOB	Output 2
GND	Ground.

## ❖ BLOCK DIAGRAM



## ❖ RDER/MARKING INFORMATION

Order Information	Top Marking
<p><b>MA477MXXX</b></p> <p>Package Type    Packing P4: SIP-4L      Blank: Tube                           A : Taping</p>	<p><b>477M</b> → Part number</p> <p><b>Y Y W W X</b> → ID code:internal</p> <p>                          → WW:01~52</p> <p>                          → Year:17=2017</p>

## ❖ ABSOLUTE MAXIMUM RATINGS (at $T_A=25^\circ\text{C}$ )

Characteristics	Symbol	Rating	Unit
Supply Voltage	$V_{CC}$	22	V
Magnetic Flux Density	B	Unlimited	Gauss
Output Current	$I_o$	Continuous	200
		Hold	300
		Peak (start up)	500
Power Dissipation	$P_D$	550	mW
Storage Temperature Range	$T_{STG}$	-50 to +150	$^\circ\text{C}$
Junction temperature	$T_J$	150	$^\circ\text{C}$
Thermal Resistance from Junction to case	$\theta_{JC}$	49	$^\circ\text{C/W}$
Thermal Resistance from Junction to ambient	$\theta_{JA}$	227	$^\circ\text{C/W}$
<b>Recommended Operating Conditions (<math>T_A=25^\circ\text{C}</math>)</b>			
Supply Voltage	$V_{CC}$	3.5 to 20	V
Operating Temperature	$T_A$	-40 to 125	$^\circ\text{C}$

## ❖ ELECTRICAL CHARACTERISTICS

( $V_{DD} = 12V$ ,  $T_A = +25^\circ C$ , unless otherwise noted.)

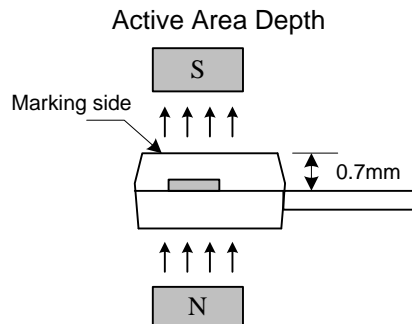
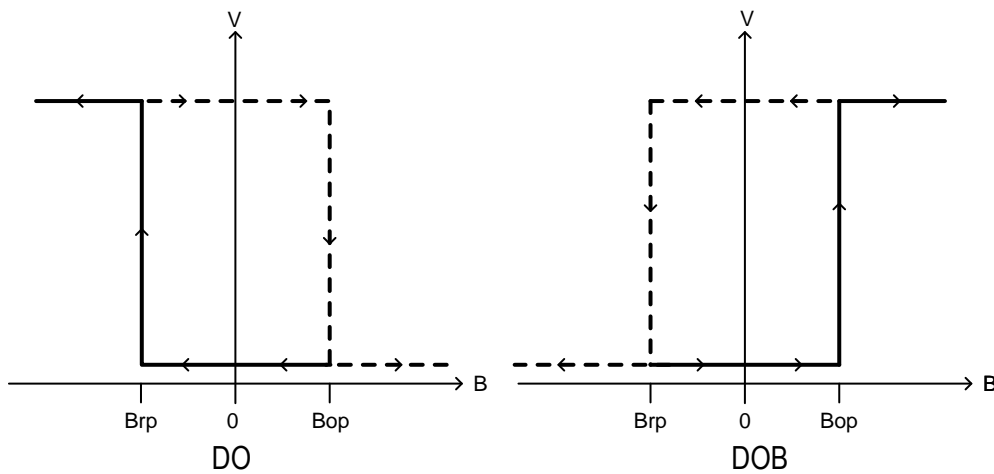
Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Average Supply Current	$I_{DD}$	no load	-	3	5	mA
On resistance(RPMOS+RN MOS)	$R_{DS(ON)}$	300mA	-	3.2	-	$\Omega$
Thermal Shutdown Threshold	$T_{SHUT}$		150	-	-	$^\circ C$
Operating Point	$B_{OP}$		5	20	35	Gauss
Releasing Point	$B_{RP}$		-35	-20	-5	Gauss
Hysteresis	$B_{HYS}$		-	40	-	Gauss

Note: Guaranteed by design.

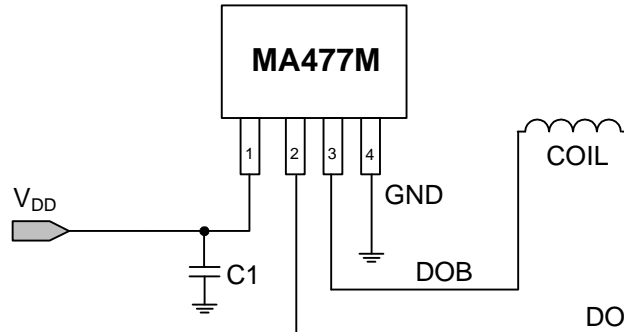
Driver output vs. magnetic pole

Characteristics	Test Conditions	DO	DOB
North pole	$B < B_{rp}$	High	Low
South pole	$B > B_{op}$	Low	High

Note: The magnetic pole is applied facing the branded side of the package



## ❖ APPLICATION CIRCUIT

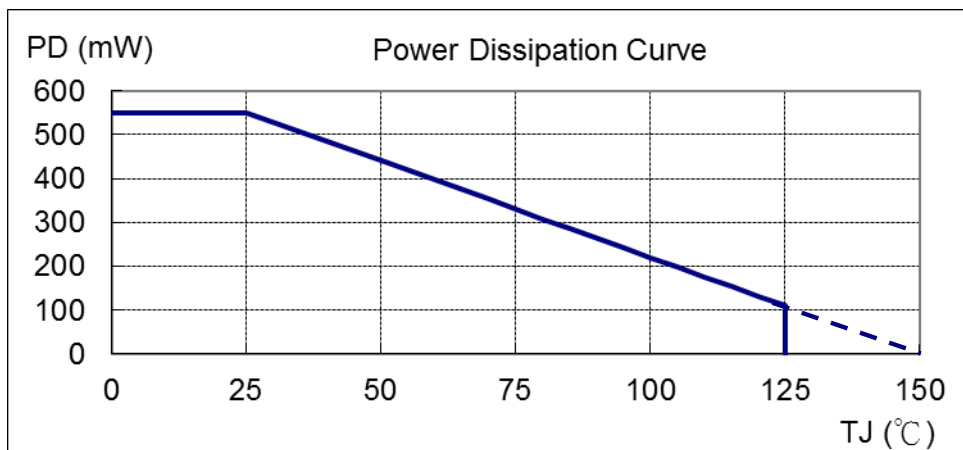


### NOTE

1.  $C1 \geq 1\mu\text{F}$  (Option), Enhance the reliability during hot swap.

## ❖ 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

