

MH382 provides a one-chip solution for 3-wire fans with two unipolar coil windings. The chip contains the Hall-effect sensor, dynamic offset correction, power drivers and a pair of complementary open-drain outputs (DO, DOB). The output drivers pins are fully protected against switching transients.

While the magnetic flux density (B) is larger than operate point (B<sub>op</sub>), DO will turn on (low), and meanwhile DOB will turn off (high). Each output is latched until B is lower than release point (B<sub>rp</sub>), and then DO, DOB transfer each state.

For DC fan application, sometimes need to test power reverse connection condition. Internal diode only protects chip-side but not for coil-side. If necessary, add one external diode to block the reverse current from coil-side

MH382 is rated for operation between the ambient temperatures  $-40^{\circ}\text{C}$  and  $125^{\circ}\text{C}$  for the K temperature range. The package is available provided magnetically optimized solutions for most applications. Package VK is a four-lead ultra mini SIP for through-hole mounting. SF is a standard Sot-89,5 pin packages at the E spec ( $-40^{\circ}\text{C}$  and  $85^{\circ}\text{C}$ ). also the Thermal shut-down function is integrated as well for better protection.

The package type is in a Halogen Free version has been verified by third party Lab.

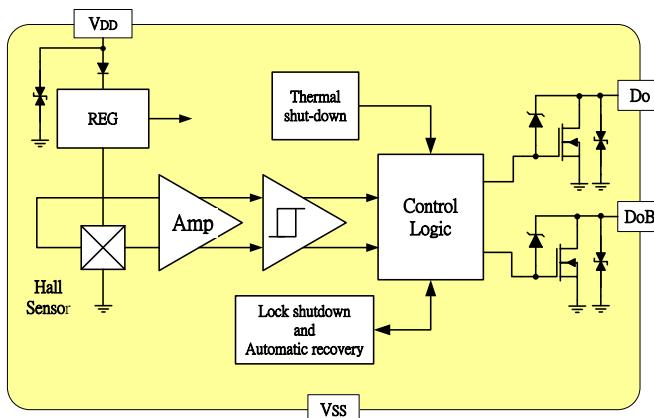
## Features and Benefits

- One Chip Hall sensor solution
- High sensitivity Hall sensor
- Locked rotor shutdown and auto-restart
- Power-efficient CMOS and power MOSFETs.
- Built-in Zener diodes protect outputs
- 4.5V to 30V operating voltage
- Peak currents up to 600mA
- Thermal shut-down
- RoHS compliant 2011/65/EU and Halogen Free

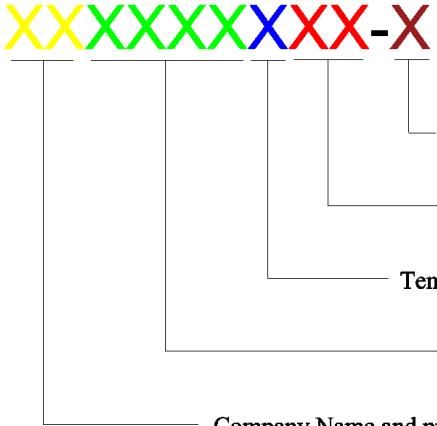
## Applications

- Dual-coil Brush-less DC Motor
- Dual-coil Brush-less DC Fan
- Revolution Counting
- Speed Measurement

## Function Diagram



**Ordering Information**

	<b>Company Name and Product Category</b> <b>MH:MST Hall Effect/MP:MST Power IC</b> <b>Part number</b> <b>181,182,183,184,185,248,249,276,477,381,381F,381R,382.....</b> <b>If part # is just 3 digits, the forth digit will be omitted.</b> <b>Temperature range</b> <b>E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</b> <b>Package type</b> <b>UA:TO-92S,VK:TO-92S(4pin),VF:TO-92S(5pin),SO:SOT-23, SQ:QFN-3,ST:TSOT-23,SN:SOT-553,SF:SOT-89(5pin), SS:TSOT-26,SD:DFN-6</b> <b>Sorting</b> <b>α,β,Blank.....</b>
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<b>Part No.</b>	<b>Temperature Suffix</b>	<b>Package Type</b>
MH382KVK	K (-40°C to + 125°C)	VK (4-pin TO-92S)
MH382EVK	E (-30°C to + 85°C)	VK (4-pin TO-92S)
MH382FESF	E (-30°C to + 85°C)	SF (5-pin SOT-89)
MH382RESF	E (-30°C to + 85°C)	SF (5-pin SOT-89)

**Absolute Maximum Ratings At (Ta=25°C)**

<b>Characteristics</b>		<b>Values</b>	<b>Unit</b>
Supply voltage, (V <sub>DD</sub> )		32	V
Do, DoB Voltage, (V <sub>Z</sub> )		64	V
Reverse voltage, (V <sub>DD</sub> )		-32	V
Magnetic flux density		Unlimited	Gauss
Output “on” current	Average	300(Average)	mA
	Peak (Start Up)	700	
Operating Temperature Range, (Ta)	“E” version	-40 to +85	°C
	“K” version	-40 to +125	°C
Storage temperature range, (Ts)		-55 to +150	°C
Maximum Junction Temp, (T <sub>j</sub> )		150	°C
Thermal Resistance	(θ <sub>JA</sub> ) VK / SF	227 / 156	°C/W
	(θ <sub>JC</sub> ) VK /SF	49 / 34	°C/W
Package Power Dissipation, (P <sub>D</sub> ) VK /SF		550 / 800	mW

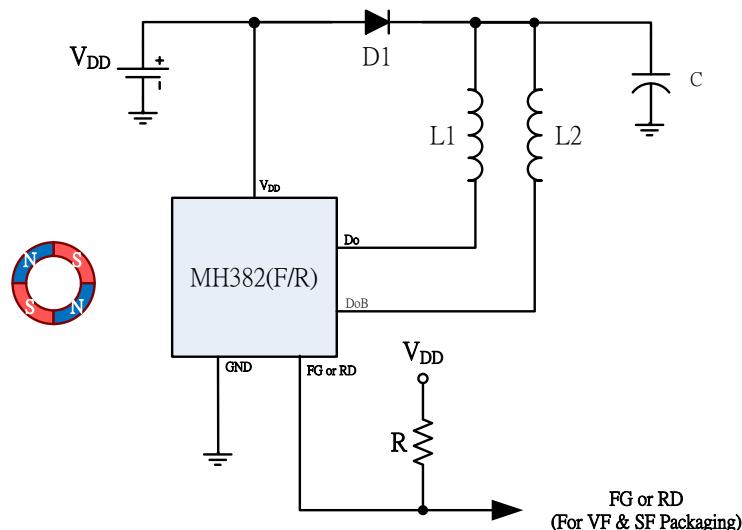
**Note:** Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

### Electrical Specifications

DC Operating Parameters :  $T_A = +25^\circ\text{C}$ ,  $V_{DD} = 24V$

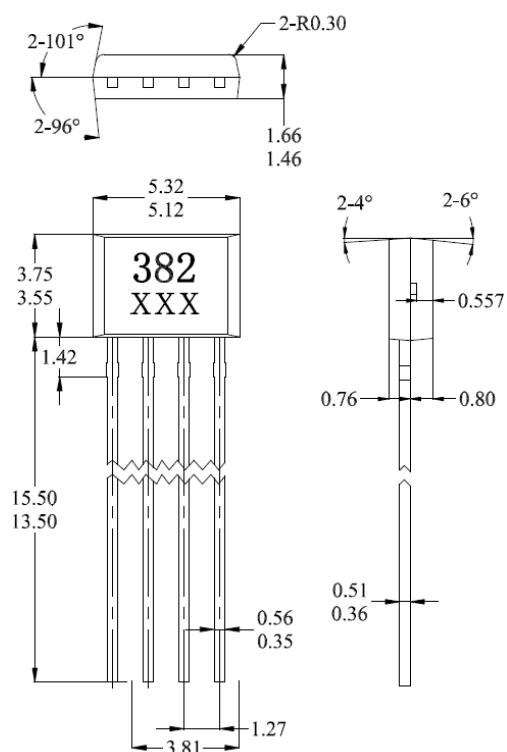
Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, ( $V_{DD}$ )	Operating	4.5		30.0	V
Supply Current, ( $I_{DD}$ )	Operating		3.5	5.0	mA
Output Leakage Current, ( $I_{off}$ )	$V_{OUT} = 32V$		< 0.1	10	$\mu\text{A}$
Output On resistance, ( $R_{DS(ON)}$ )	$I_{OUT} = 300 \text{ mA}$		1.3	1.6	$\Omega$
Output On resistance, ( $V_{DS(ON)}$ )	$I_{OUT} = 300 \text{ mA}$		390		mV
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 Rise Time, ( $T_R$ )	$RL = 820\Omega$ , $CL = 20\text{pF}$		7	20	$\mu\text{s}$
Output Fall Time, ( $T_F$ )	$RL = 820\Omega$ ; $CL = 20\text{pF}$		6	20	$\mu\text{s}$
Locked Protection on, ( $T_{ON}$ )		0.25	0.40	0.55	s
Locked Protection off, ( $T_{OFF}$ )			2.4		s
Thermal shut-down Temp			145		$^\circ\text{C}$
Thermal shut-down Hysteresis			30		$^\circ\text{C}$
Electro-Static Discharge	HBM	4			KV
Operate Point	$B_{OP}$	5	20	40	Gauss
Release Point	$B_{RP}$	-40	-20	-5	Gauss
Hysteresis	$B_{HYS}$		40		Gauss

### Typical application circuit

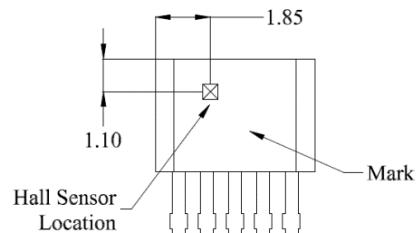


### ***Sensor Location, package dimension and marking***

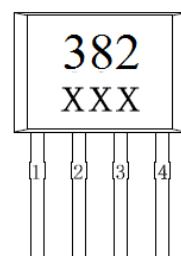
## VK Package (To-92 4 pins)



## Hall Chip location



## Output Pin Assignment



## NOTES:

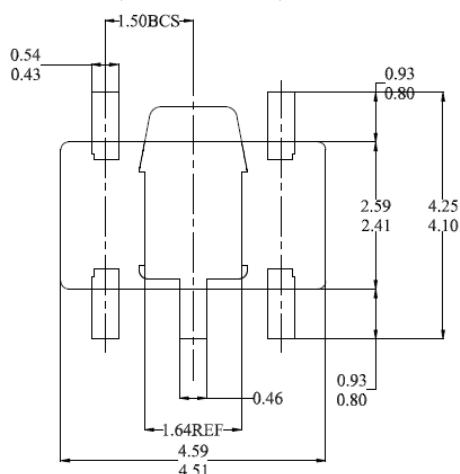
- 1).Controlling dimension: mm
- 2).Leads must be free of flash and plating voids
- 3).Do not bend leads within 1 mm of lead to package interface.

#### 4).PINOUT:

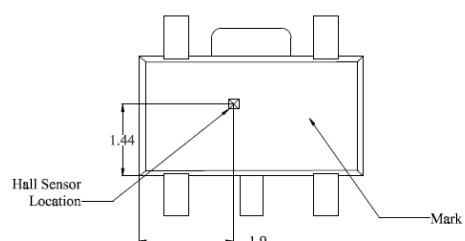
Pin 1	VDD
Pin 2	Do
Pin 3	DoB
Pin 4	GND

## SF Package (SOT-89 5 pins)

(Bottom view)

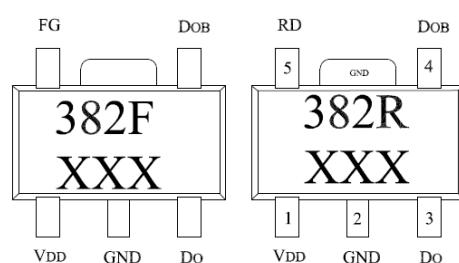


## Hall Chip location



## Output Pin Assignment

(Top view)



## NOTES:

1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:  
Pin 1 VDD; Pin 2 GND; Pin 3 Do; Pin 4 DoB;

Pin 1 VDD; Pin 2 GND; Pin 3 Do; Pin 4 DoB; Pin 5 FG/RD