

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 (Bop), DO will turn on (low), and meanwhile DOB will turn off (high). Each output is latched until B is lower than release point (Brp), 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 in a Halogen Free version has been verified by third party Lab.

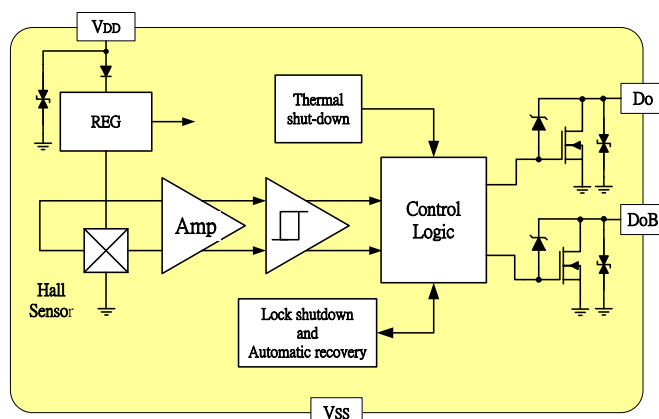
### ***Features and Benefits***

- 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

 <p>Sorting Code</p> <p>Package type</p> <p>Temperature Code</p> <p>Part number</p> <p>Company Name and product Category</p>	<p><b>Company Name and Product Category</b></p> <p>MH:MST Hall Effect/MP:MST Power IC</p> <p><b>Part number</b></p> <p>181,182,183,184,185,248,249,276,477,381,381F,381R,382.....</p> <p>If part # is just 3 digits, the forth digit will be omitted.</p> <p><b>Temperature range</b></p> <p>E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p><b>Package type</b></p> <p>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</p> <p><b>Sorting</b></p> <p><math>\alpha</math>, <math>\beta</math>, Blank.....</p>
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Part No.	Temperature Suffix	Package Type
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 ( $T_a=25^\circ\text{C}$ )

Characteristics		Values	Unit
Supply voltage, ( $V_{DD}$ )		32	V
Do, DoB Voltage, ( $V_z$ )		64	V
Reverse voltage, ( $V_{DD}$ )		-32	V
Magnetic flux density		Unlimited	Gauss
Output “on” current	Average	300(Average)	mA
	Peak (Start Up)	700	
Operating Temperature Range, ( $T_a$ )	“E” version	-40 to +85	°C
	“K” version	-40 to +125	°C
Storage temperature range, ( $T_s$ )		-55 to +150	°C
Maximum Junction Temp, ( $T_j$ )		150	°C
Thermal Resistance	( $\theta_{JA}$ ) VK / SF	227 / 156	°C/W
	( $\theta_{JC}$ ) VK / SF	49 / 34	°C/W
Package Power Dissipation, ( $P_D$ ) 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.

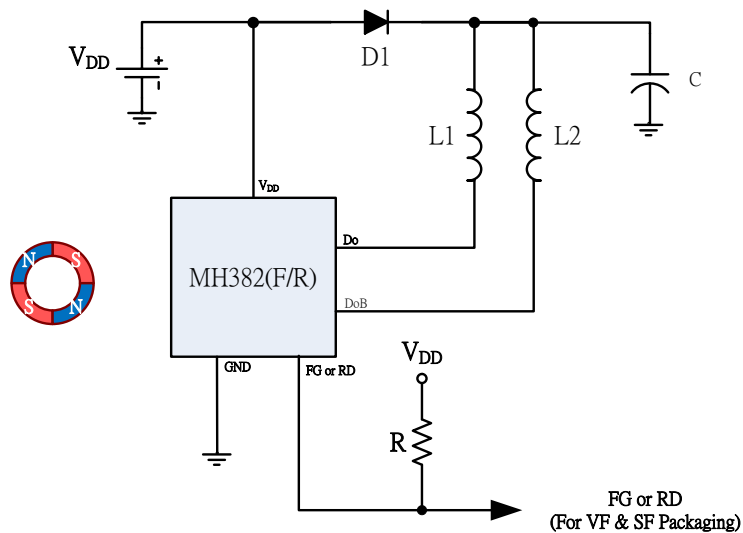


### Electrical Specifications

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

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, ( $I_{off}$ )	$V_{OUT} = 32\text{V}$		< 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, ( $T_R$ )	$R_L = 820\Omega$ , $C_L = 20\text{pF}$		7	20	$\mu\text{s}$
Output Fall Time, ( $T_F$ )	$R_L = 820\Omega$ ; $C_L = 20\text{pF}$		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

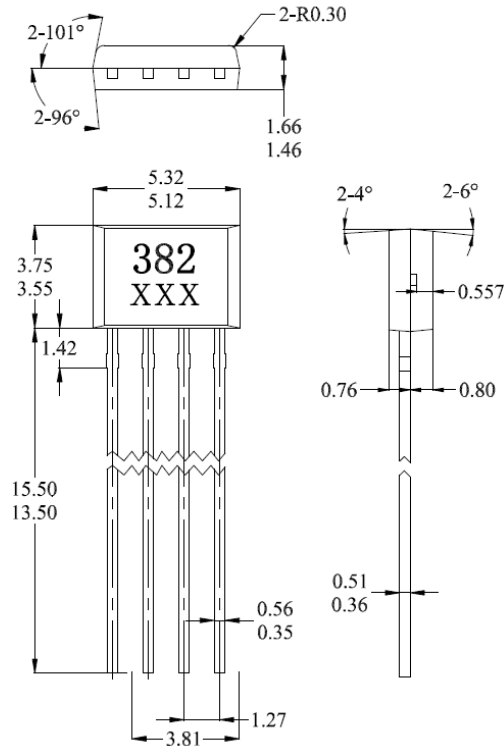
### Typical application circuit



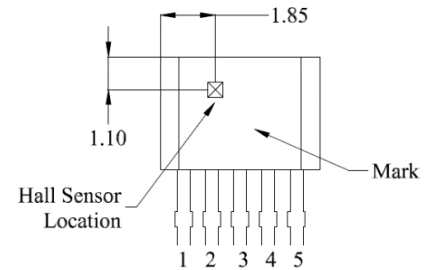


### Sensor Location, package dimension and marking

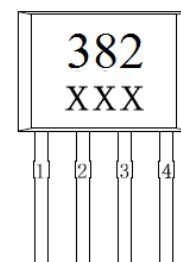
#### VK Package (To-92 4 pins)



#### Hall Chip location



#### Output Pin Assignment



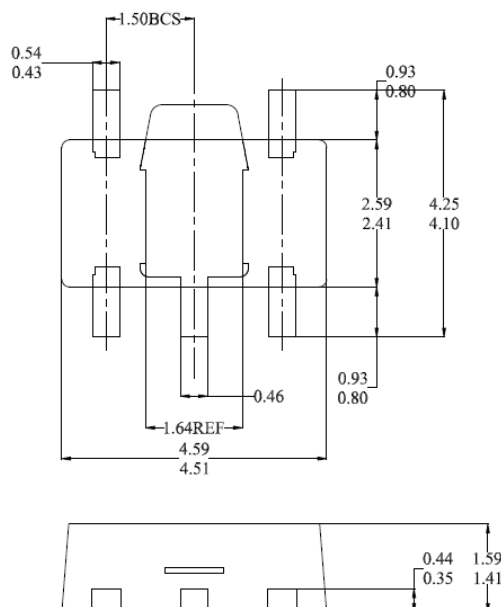
#### NOTES:

- 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:

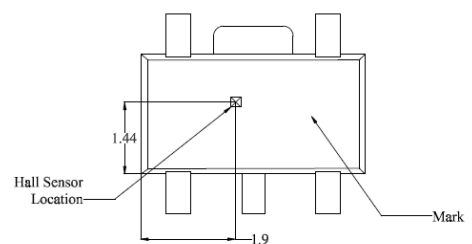
Pin 1	VDD
Pin 2	Do
Pin 3	DoB
Pin 4	GND

#### SF Package (SOT-89 5 pins)

##### (Bottom view)

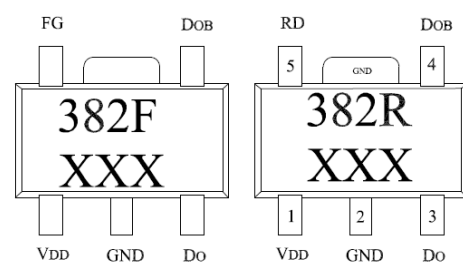


#### Hall Chip location



#### 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 5 FG/RD