

The MH361 is an output driver with Hall sensor for single-coil brush-less DC fans and motors. Beside the magnetic sensor, the device includes an amplifier that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis, a bi-direction driver for sinking and driving large current load. It also includes locked rotor protection, auto-restart and thermal protection.

Placing the device in a variable magnetic field, if the magnetic flux density is larger than Bop, pin DO will be turned to sink and pin DOB will be 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 to be turned to sink.

MH361 is rated for operation between the ambient temperatures  $-40\text{ }^{\circ}\text{C}$  and  $125\text{ }^{\circ}\text{C}$  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. 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.

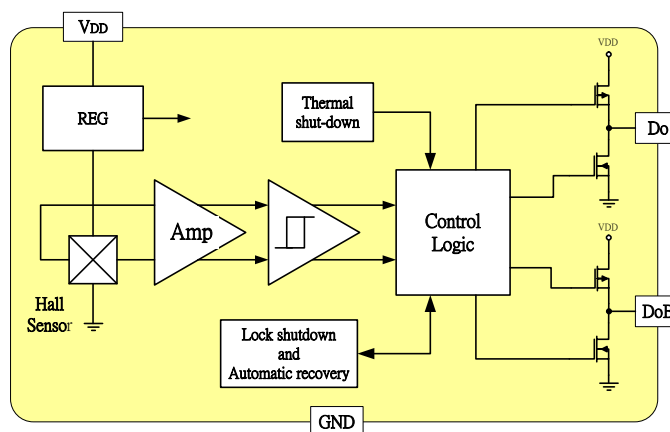
### Features and Benefits

- One Chip Hall sensor solution
- H-Bridge output for single coil
- Locked rotor shutdown and auto-restart
- 2mA operating current
- $-40\text{ }^{\circ}\text{C}$  to  $125\text{ }^{\circ}\text{C}$  operating ambient temperature
- 3.8V to 20V operating voltage
- 300mA (avg.) output sink current
- Thermal shut-down
- RoHS compliant 2011/65/EU and Halogen Free

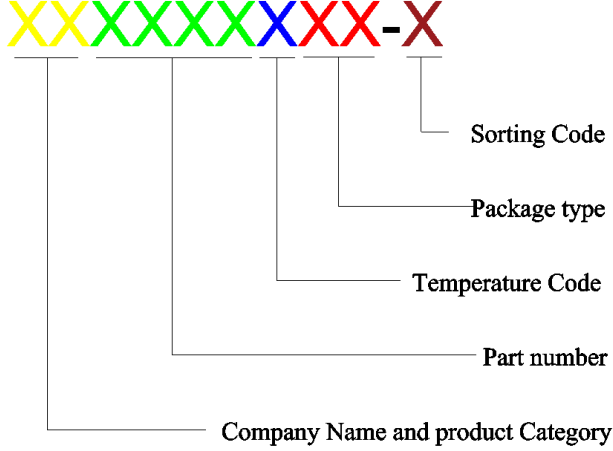
### Applications

- Single-coil Brush-less DC Motor
- Single -coil Brush-less DC Fan

### Function Diagram



### Ordering Information

	<p><b>Company Name and Product Category</b> MH:MST Hall Effect/MP:MST Power MOSFET</p> <p><b>Part number</b> 181,182,183,184,185,248,249,276,477,381,381F,381R,382..... If part # is just 3 digits, the fourth digit will be omitted.</p> <p><b>Temperature range</b> E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p><b>Package type</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), SD:DFN2*2-6L,SR:SOT-26L,SM:DFN1.6*1.6-6L</p> <p><b>Sorting</b> <math>\alpha</math>, <math>\beta</math>, Blank.....</p>
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Part No.	Temperature Suffix	Package Type
MH361KVK	K(-40°C to +125°C)	VK (4-pin TO-92S)
MH361EVK	E(-40°C to +85°C)	VK (4-pin TO-92S)

### Absolute Maximum Ratings At ( $T_a=25\text{ }^\circ\text{C}$ )

Characteristics		Values	Unit
Supply voltage, (VDD)		24	V
Magnetic flux density		Unlimited	Gauss
Output "on" current	Average	400	mA
	Peak (Start Up)	900	
Operating Temperature Range, ( $T_a$ )	"E" version	-40 to +85	°C
	"K" version	-40 to +125	
Storage temperature range, ( $T_s$ )		-65 to +150	°C
Maximum Junction Temp, ( $T_j$ )		150	°C
Thermal Resistance	( $\theta_{JA}$ ) VK	227	°C/W
	( $\theta_{JC}$ ) VK	49	°C/W
Package Power Dissipation, ( $P_D$ ) VK		550	mW

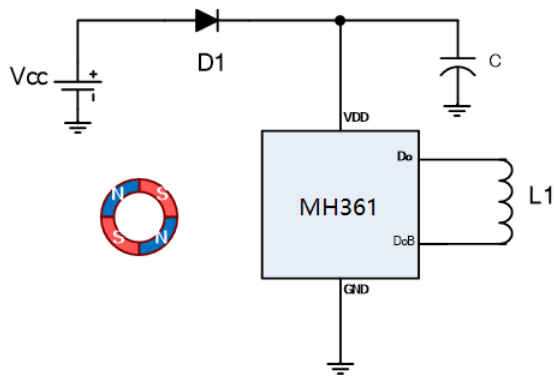
*Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

#### Electrical Specifications

DC Operating Parameters :  $T_a = 25\text{ }^\circ\text{C}$ ,  $V_{DD} = 12\text{V}$

Parameters	Test Conditions	Min	Typ	Max	Units	
Supply Voltage,(VDD)	Operating	3.5		20.0	V	
Supply Current,(IDD)	Operating		3.0	5.0	mA	
Output Saturation Voltage,(VRDSON)	(Sink)	VDD=12V, IO=200mA		350	500	mV
	(Drive)		VDD-0.5	VDD-0.35		V
Output Rise Time,(TR)	RL=820Ω,CL=20pF		7	20	μs	
Output Falling Time,(TF)	RL=820Ω,CL=20pF		6	20	μs	
Switch Time Differential,(TS)	RL=820Ω,CL=20pF		20	70	μs	
Locked Protection on,(TON)		0.2	0.4	0.7	S	
Locked Protection off,(TOFF)			2.4		S	
Thermal shut-down Temp			175		°C	
Thermal shut-down release Temp			145		°C	
Operate Point,(BOP)		5	25	50	Gauss	
Release Point,(BRP)		-50	-25	-5	Gauss	
Hysteresis,(BHYS)			50		Gauss	

#### Typical application circuit

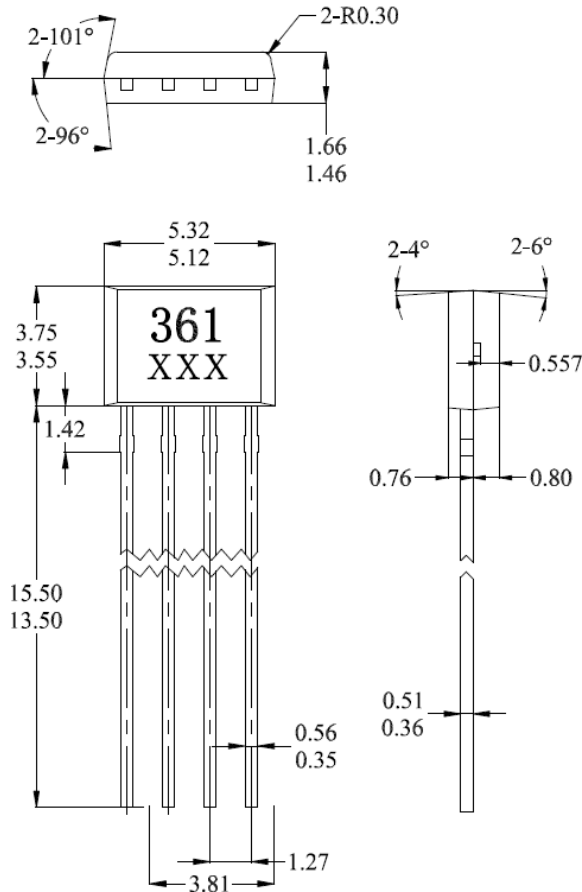


C1 : 2.2uF/25V

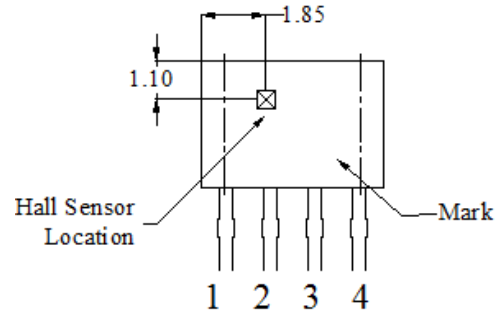
D1 : 1N4001

**Sensor Location, package dimension and marking**

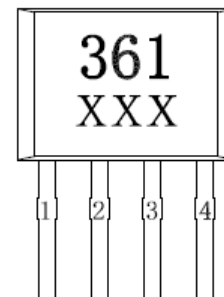
**VK Package (To-94 4 pins)**



**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