

MH284 provides a one-chip solution for 3-wire fan 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

MH284KVK is rated for operation between the ambient temperatures -40°C and 125°C for the K temperature range. MH284EVK is rated for operation between the ambient temperatures -40°C and 85°C for the E 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. 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.

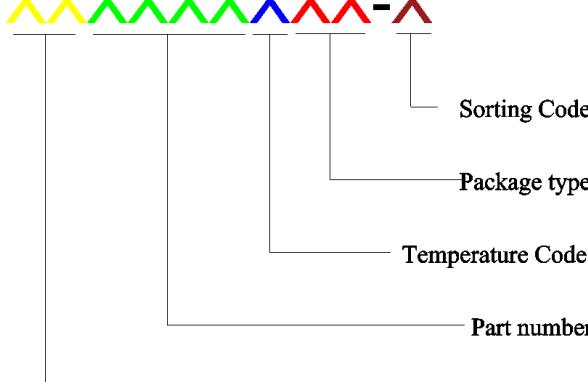
Features and Benefits

- 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
- 2.5V to 20V operating voltage
- Peak currents up to 1200mA
- Thermal shutdown
- 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

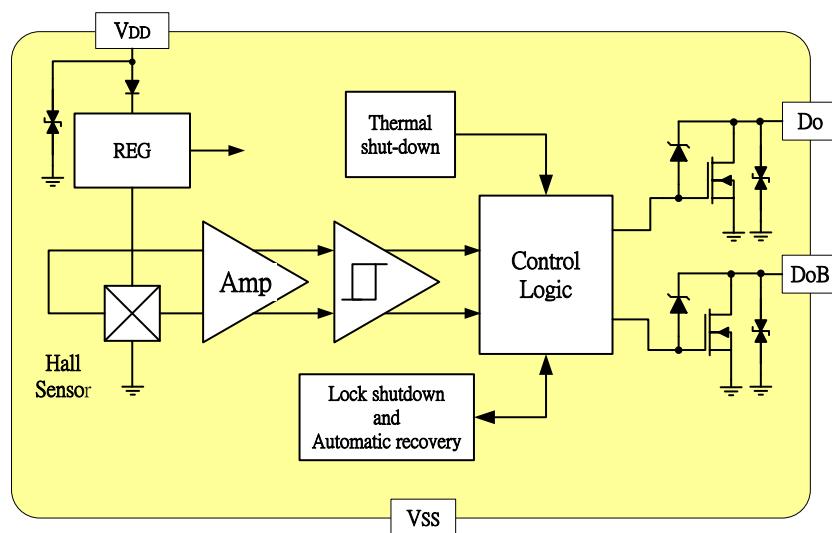
Ordering Information

XXXXXXXXXX-X 	Company Name and Product Category MH:MST Hall Effect/MP:MST Power IC Part number 181,182,183,184,185,248,249,276,477,381,381F,381R,382..... If part # is just 3 digits, the forth digit will be omitted. Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C Package type 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 Sorting α, β ,Blank.....
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Part No.	Temperature Suffix	Package Type
MH284KVK	K(-40°C to + 125°C)	VK (4-pin TO-92S)
MH284EVK	E (-40°C to + 85°C)	VK (4-pin TO-92S)

Custom sensitivity selection is available by MST sorting technology

Functional Diagram



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

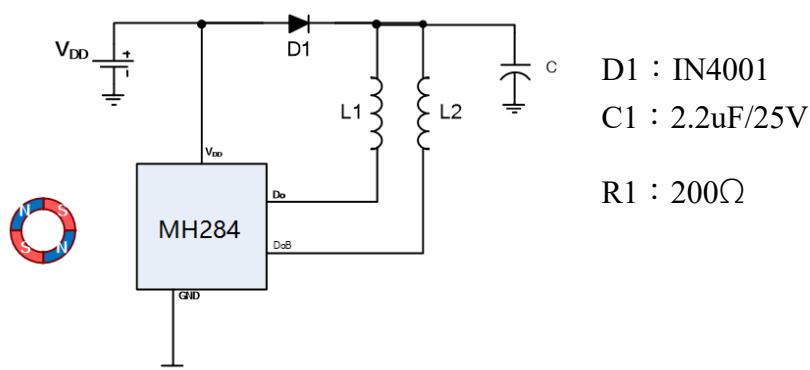
Characteristics		Values	Unit
Supply Voltage, (V_{DD})		24	V
Do, DoB Voltage, (V_Z)		36	V
Reverse Voltage, (V_{DD})		-32	V
Output "on" current, (I_O)		600(Average)	mA
		1200(Peak)	mA
Operating Temperature Range, (T_A)	"E" Class	-40 ~ +85	$^{\circ}\text{C}$
	"K" Class	-40 ~ +125	$^{\circ}\text{C}$
Storage temperature Range, (T_S)		-55 ~ +150	$^{\circ}\text{C}$
Maximum Junction Temp, (T_J)		150	$^{\circ}\text{C}$
Thermal Resistance	(θ_{JA})VK	227	$^{\circ}\text{C}/\text{w}$
	(θ_{JC})VK	49	$^{\circ}\text{C}/\text{w}$
Package Power Dissipation, (PD)		550	mW

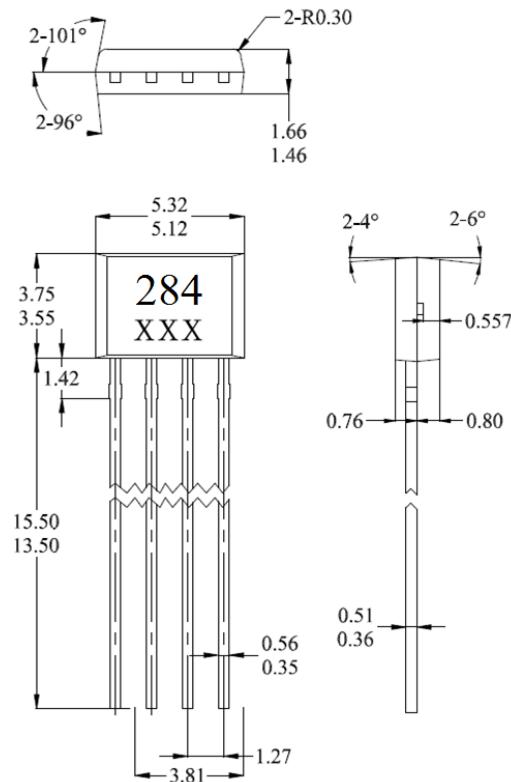
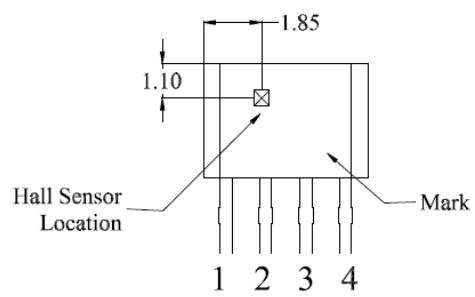
Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Electrical Specifications

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

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (V_{DD})	Operating	2.5		20.0	V
Supply Current, (I_{DD})	Operating		2.5	5.0	mA
Output Leakage Current, (I_{off})	$V_{OUT}=24V$		<0.1	10	uA
Output On resistance, ($R_{DS(ON)}$)	$I_{OUT}=300\text{mA}$		0.8	1.4	Ω
Output Saturation Voltage, ($V_{DS(ON)}$)	$I_{OUT}=300\text{mA}$		240		mV
Output Rise Time, (TR)	$RL=820\Omega$, $CL=20\text{pF}$		7	20	uS
Output Fall Time, (TF)	$RL=820\Omega$; $CL=20\text{pF}$		6	20	uS
Locked Protection on, (T_{ON})		0.25	0.40	0.55	s
Locked Protection off, (T_{OFF})			2.4		s
Output Switching delay	"dead time" when both drivers are off		20		uS
Thermal shut-down Temp		150	155		$^{\circ}\text{C}$
Thermal release temperature			125		$^{\circ}\text{C}$
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})	B_{OP} - B_{RP}		40		Gauss

Typical Application circuit


Sensor Location, package dimension and marking
VK Package (To-92 4 pins)

Hall Chip location

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

Output Pin Assignment
