MH189 Hall-effect sensor is a temperature stable, stress-resistant sensor. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

MH189 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, Open drain output. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

This device requires the presence of both south and north polarity magnetic fields for operation. In the presence of a south polarity field of sufficient strength, the device output sensor on, and only switches off when a north polarity field of sufficient strength is present.

MH189 is rated for operation between the ambient temperatures –40℃ and 85℃ for the E temperature range, and –40℃ to 125℃ for the K temperature range. The two package styles available provide magnetically optimized solutions for most applications. Package SO is an SOT-23, a miniature low-profile surface-mount package, while package UA is a three-lead ultra mini SIP for through-hole mounting.

Packages is Halogen Free standard and which have been verified by third party lab.

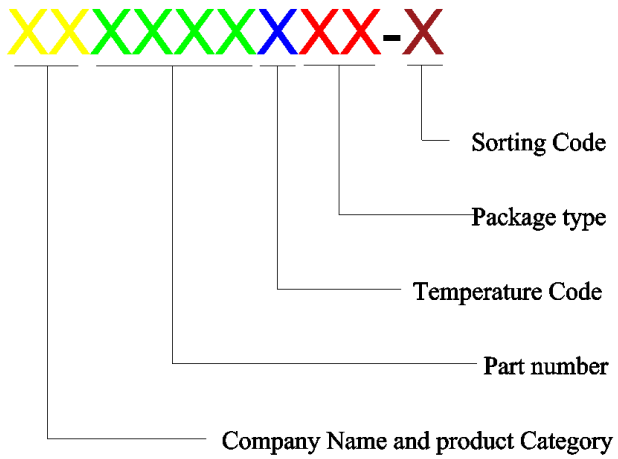
Features and Benefits

- DMOS Hall IC Technology
- AECQ qualified
- Reverse bias protection on power supply pin.
- Chopper stabilized amplifier stage
- Optimized for BLDC motor applications
- Reliable and low shifting on high Temp condition
- Good ESD Protection
- 100% tested at 125 ℃ for K.
- Custom sensitivity / Temperature selection are available.
- RoHS compliant 2011/65/EU and Halogen Free

Applications

- High temperature Fan motor
- 3 phase BLDC motor application
- Speed sensing
- Position sensing
- Current sensing
- Revolution counting
- Solid-State Switch
- Linear Position Detection
- Angular Position Detection
- Proximity Detection
- High ESD Capability

Ordering Information



Company Name and Product Category

MH:MST Hall Effect/MP:MST Power MOSFET

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 ℃, I: 105 ℃, K: 125 ℃, L: 150 ℃

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),SH:D

FN2*2-6L, SR:SOT-26L

Sorting

α,β,Blank…..

Part No.	Temperature Suffix	Package Type
MH189KUA	K (-40°C to + 125°C)	UA (TO-92S)
MH189KSO	K (-40°C to + 125°C)	SO (SOT-23)
MH189EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH189ESO	E (-40°C to + 85°C)	SO (SOT-23)

KUA spec is using in industrial and automotive application. Special Hot Testing is utilized.

Functional Diagram

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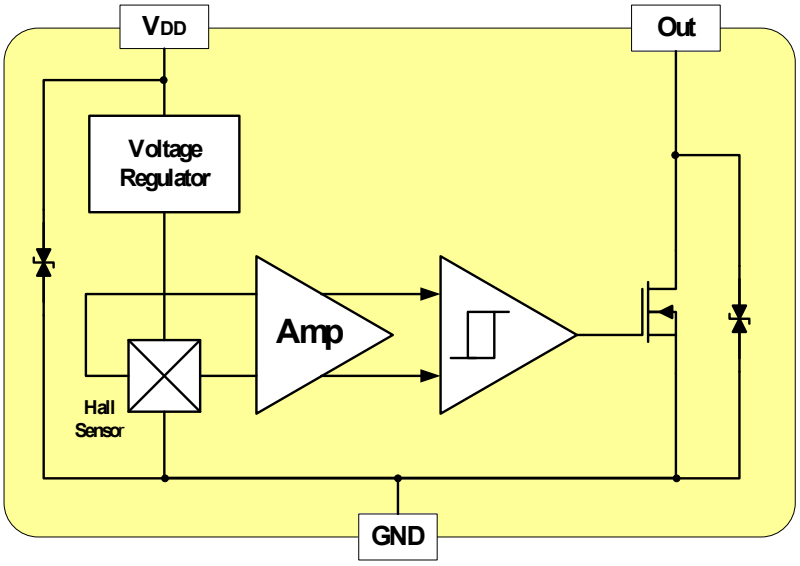


Absolute Maximum Ratings *At (Ta=25℃)*

Characteristics		Values	Unit
Supply voltage, (V_{DD})		28	V
Output Voltage,(*Vout*)		28	V
Reverse voltage, (V_{DD}) (V_{OUT})		-0.3	V
Output current, (I_{SINK})		50	mA
Operating Temperature Range, (*Ta*)	"E" version	-40 to +85	℃
	"K" version	-40 to +125	℃
Storage temperature range, (*Ts*)		-65 to +150	℃
Maximum Junction Temp,(*Tj*)		150	℃
Thermal Resistance	(θja) UA / SO	206 / 543	℃/W
	(θjc) UA / SO	148 / 410	℃/W
Package Power Dissipation, (P_D) UA / SO		606 / 230	mW

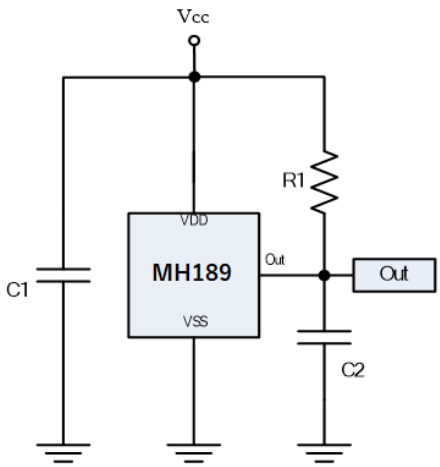
***Note**: Do not apply reverse voltage to* V_{DD} *and* V_{OUT} *Pin, It may be caused for Miss function or damaged device.*

Electrical Specifications

DC Operating Parameters : T_A=+25℃, V_{DD}=12V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})	Operating	3.0		26.0	V
Supply Current,(I_{DD})	B<BOP			5.0	mA
Output Saturation Voltage, (*Vsat*)	I_{OUT} = 10 mA, B>BOP			400.0	mV
Output Leakage Current, (*Ioff*)	I_{OFF} B<BRP, V_{OUT} = 12V			10.0	uA
Power-On Time, (T_P)				50	uS
Output Switch Time, (T_{SW})				150	uS
Output Switch Frequency, (F_{SW})		3			kHz
Output Rise Time, (T_R)	RL=1.1KΩ, CL =20pF			0.45	uS
Output Fall Time, (T_F)	RL=820Ω; CL =20pF			0.45	uS
Electro-Static Discharge	HBM(AEQC-100)	2			KV
Operate Point,(Bop)		5(-25)		25(-5)	Gauss
Release Point,(Brp)		-25(5)		-5(25)	Gauss
Hysteresis,(B_{HYS})			30		Gauss

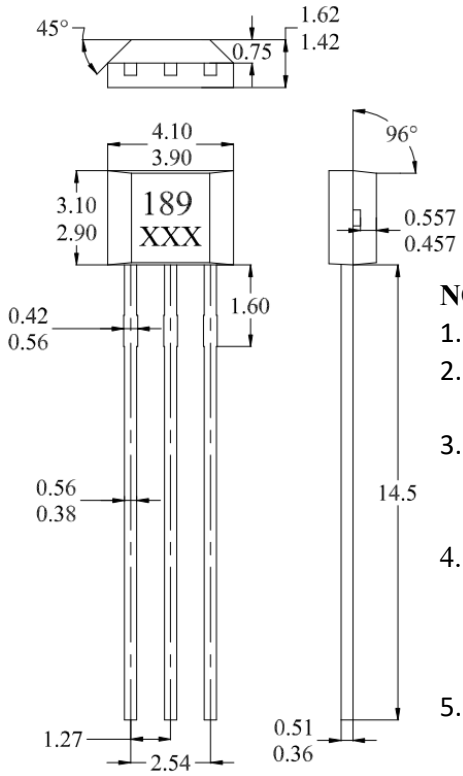
Typical application circuit



C1 : 10nF
C2 : 1nF
R1 : 1KΩ

Sensor Location, Package Dimension and Marking

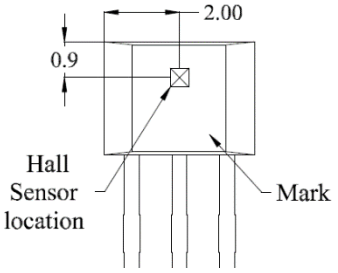
UA Package



NOTES:

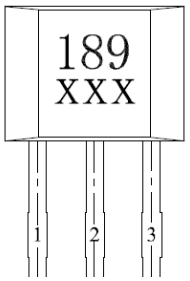
1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:
   Pin 1 VDD
   Pin 2 GND
   Pin 3 Output
5. XXX; 1st X=Year;
   2nd and 3rd XX=Week

Hall Chip location



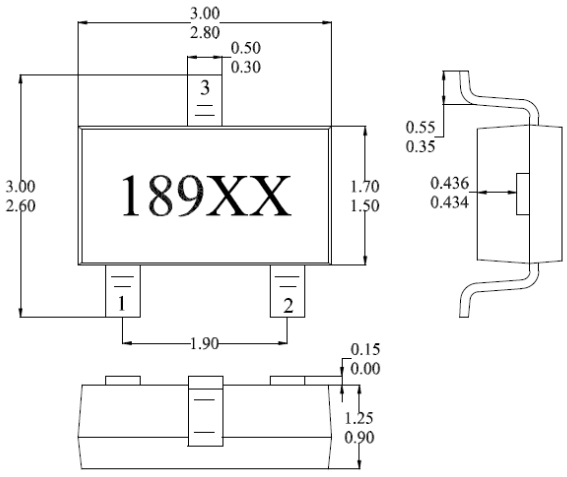
Output Pin Assignment

(Top view)



Package (SOT-23)

(Top View)

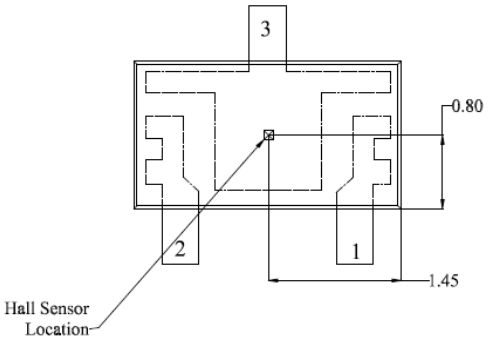


NOTES:

1. PINOUT (See Top View at left :)
   Pin 1 V_{DD}; Pin 2 Output; Pin 3 GND
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum
4. XX: Date Code, Refer to DC table

Hall Plate Chip Location

(Bottom view)



(For reference only) Land Pattern