MH186 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.

MH186 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger. Advanced DMOS 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.

MH186 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-3 for through-hole mounting.

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

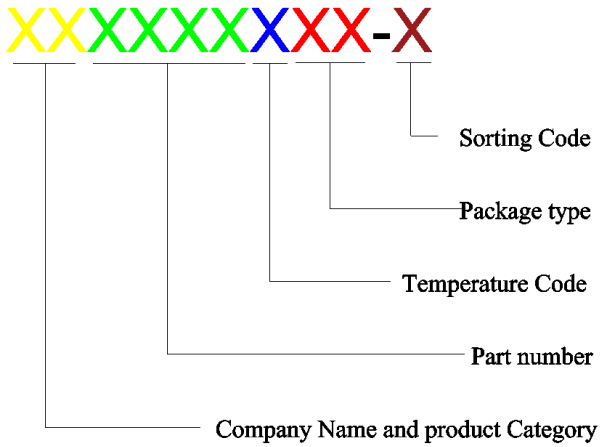
Features and Benefits

- DMOS Hall IC Technology.
- 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 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 ℃, 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),
SS:TSOT-26,SD:DFN-6

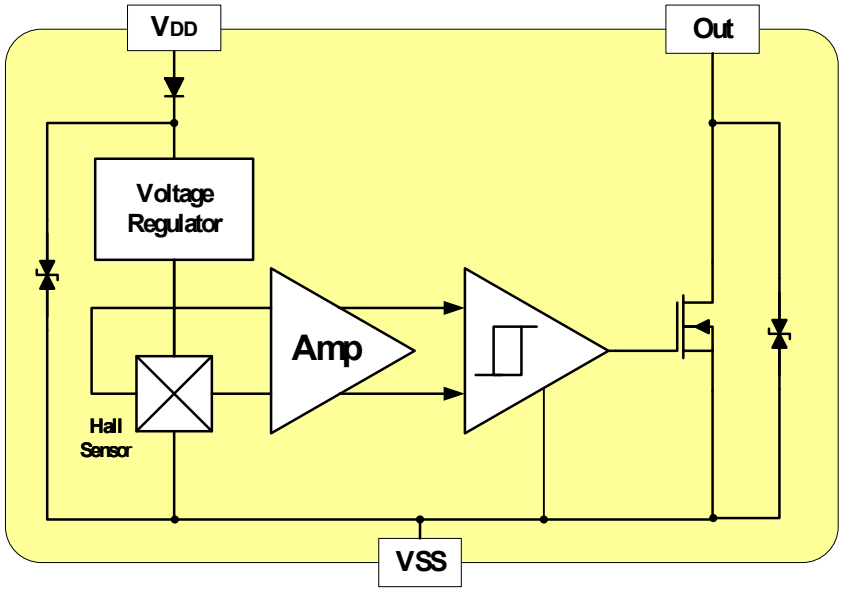
Sorting

α,β,Blank…..

Part No.	Temperature Suffix	Package Type
MH186KUA	K (-40°C to + 125°C)	UA (TO-92S)
MH186KSO	K (-40°C to + 125°C)	SO (SOT-23)
MH186EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH186ESO	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



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

Characteristics		Values	Unit
Supply voltage,(V_{DD})		28	V
Output Voltage,(V_{out})		28	V
Reverse Voltage , (V_{DD}) (V_{OUT})		-28/-0.3	V
Output current , (I_{OUT})		25	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	(θ_{ja}) UA / SO	206 / 543	℃/W
	(θ_{jc}) UA / SO	148 / 410	℃/W
Package Power Dissipation, (P_D) UA / SO		606 / 230	mW

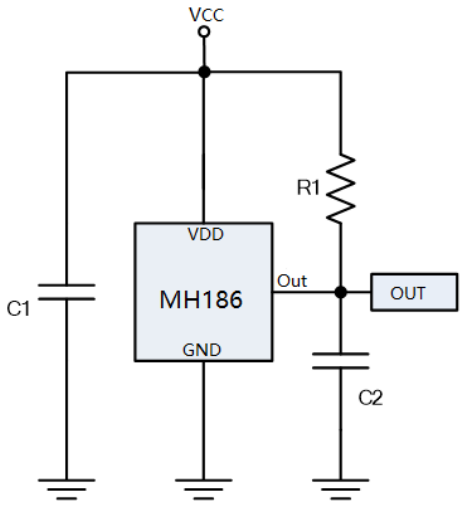
***Note**: Do not apply reverse voltage to* V_{DD} *and* V_{OUT} *Pin, It may be caused for Miss function or damaged device.*

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<B_{OP}		3.0	5.0	mA
Output Saturation Voltage, (V_{sat})	I_{OUT} = 20 mA, B>B_{OP}			400.0	mV
Output Leakage Current, (I_{off})	I_{OFF} B<B_{RP}, V_{OUT} = 12V			10.0	uA
Output Rise Time, (T_R)	R_L=1.1KΩ, CL =20pF			0.45	uS
Output Fall Time, (T_F)	R_L=820Ω; CL =20pF			0.45	uS
Electro-Static Discharge	HBM	4			KV
Operate Point, (BOP)	UA(SO)	5(-60)		60(-5)	Gauss
Release Point, (BRP)	UA(SO)	-60(5)		-5(60)	Gauss
Hysteresis,(BHYS)	|BOP - BRP|		60		Gauss

Typical application circuit



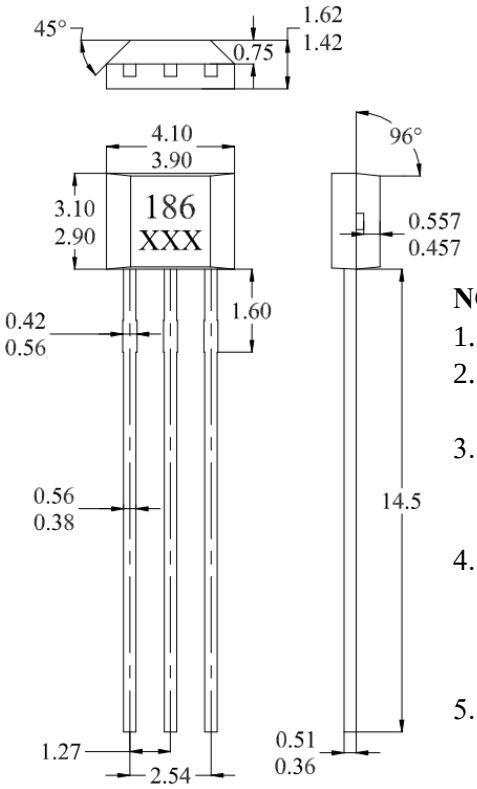
C1 : 10nF

C2 : 1nF

R1 : 1KΩ

Sensor Location, Package Dimension and Marking

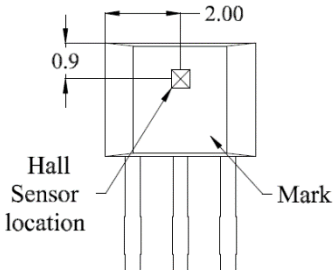
UA Package



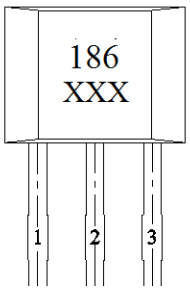
NOTES:

1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1mm 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

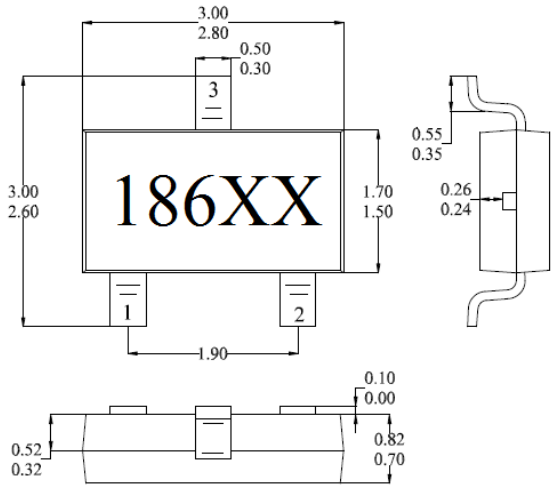
Hall Chip location



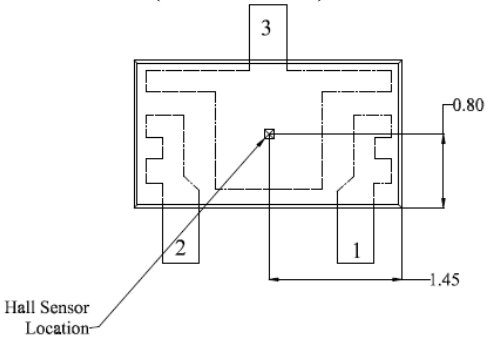
Output Pin Assignment (Top view)



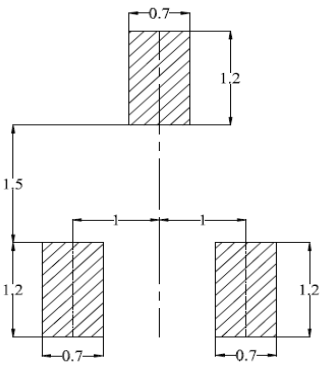
Package (SOT-23) (Top View)



Hall Plate Chip Location (Bottom view)



(For reference only) Land Pattern



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