MH188 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.

MH188 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.

MH188 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 a 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.

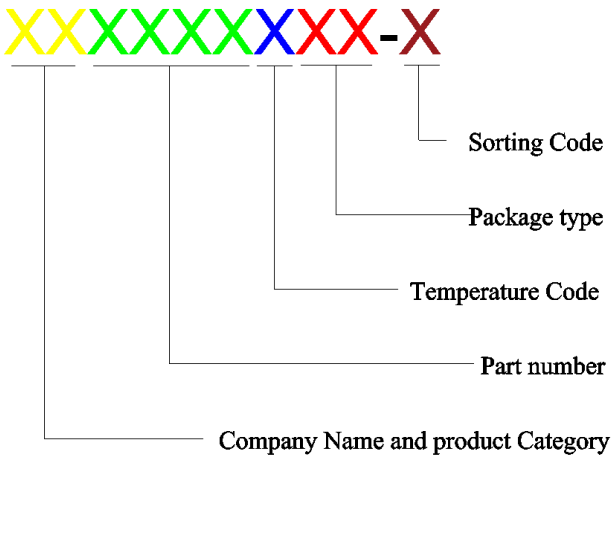
Features and Benefits

- DMOS Hall IC Technology.
- Reverse bias protection on power supply pin.
- Chopper stabilized amplifier stage.
- Optimized for BLDC motor applications.
- Reliable and low shifting on high Temp condition.
- Switching offset compensation at typically 69 kHz.
- 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

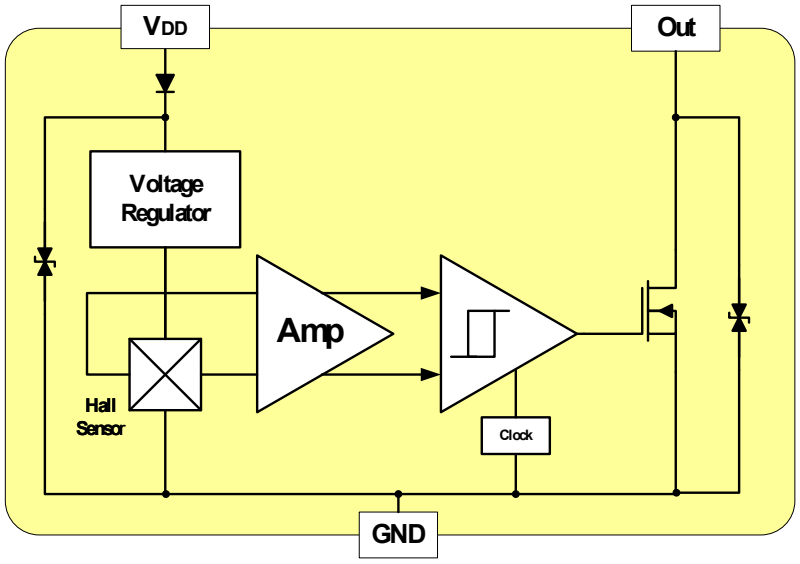
Sorting

α,β,Blank…..

Part No.	Temperature Suffix	Package Type
MH188KUA	K (-40°C to + 125°C)	UA (TO-92S)
MH188KSO	K (-40°C to + 125°C)	SO (SOT-23)
MH188EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH188ESO	E (-40°C to + 85°C)	SO (SOT-23)
MH188ESD	E(-40°C to +85°C)	SD (DFN2*2-6L)
MH188ESM	K(-40°C to +125°C)	SM (DFN1.6*1.6-6L)

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})		-28/-0.3	V
Output current, ($Iout$)		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	(θ_{ja}) UA/SO/SD/SM	206/543/160/250	℃/W
	(θ_{jc}) UA/SO/SD/SM	148/410/35/50	℃/W
Package Power Dissipation, (P_D) UA/SO/SD/SM		606/230/780/500	mW

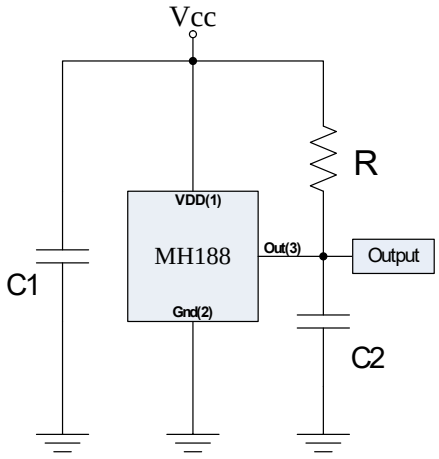
***Note**: Do not apply reverse voltage to* V_{DD} and V_{OUT} *Pin, It may be caused for Miss function or damaged device.*

Electrical Specifications

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

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (V_{DD})	Operating	2.5		26.0	V
Supply Current, (I_{DD})	B<BOP			5.0	mA
Output Saturation Voltage, ($Vsat$)	Iout=20mA,B>B_{OP}			400.0	mV
Output Leakage Current, ($Ioff$)	I_{OFF} B<B_{RP}, V_{OUT} = 12V			10.0	uA
Power-On Time, (T_{PO})	Power-On		0.05	0.10	uS
Output Response Time, (T_{RES})	Operating		0.30	0.65	mS
Output Switch Frequency, (F_{SW})	Operating	3			kHz
Output Rise Time, (T_R)	RL=1KΩ, CL =20pF		0.12	0.35	uS
Output Fall Time, (T_F)	RL=1KΩ; CL =20pF		0.05	0.15	uS
Electro-Static Discharge	HBM	4			KV
Operate Point, (B_{OP})	UA/SD/SM (SO)	5(-25)		25(-5)	Gauss
Release Point, (B_{RP})	UA/SD/SM (SO)	-25(5)		-5(25)	Gauss
Hysteresis, (B_{HYS})			30		Gauss

Typical application circuit



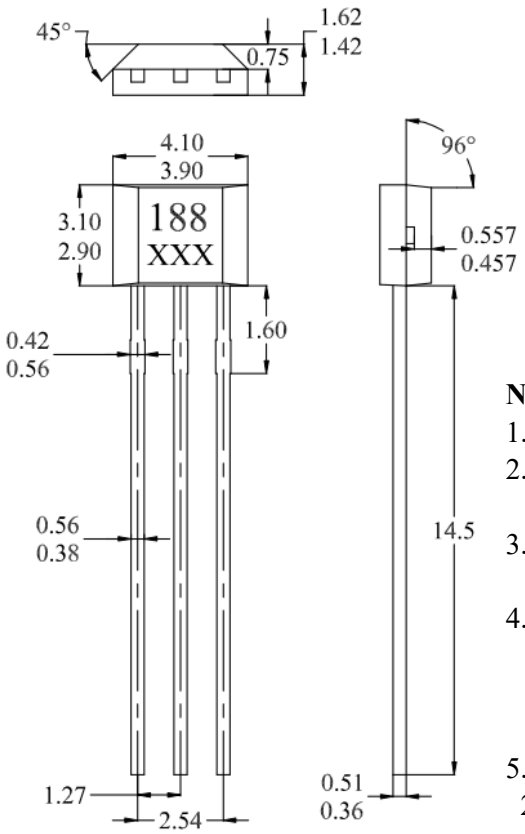
R：1KΩ

C1：10nF

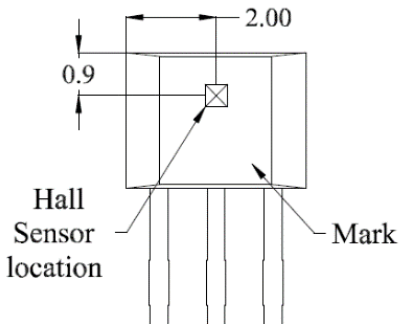
C2：1nF

Sensor Location, Package Dimension and Marking

UA Package



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.

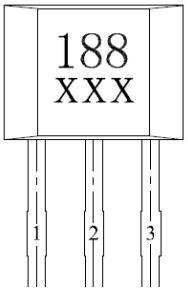
4.PINOUT:

Pin 1	VCC
Pin 2	GND
Pin 3	Output

5. XXX；1st X=Year；2nd and 3rd XX=Week

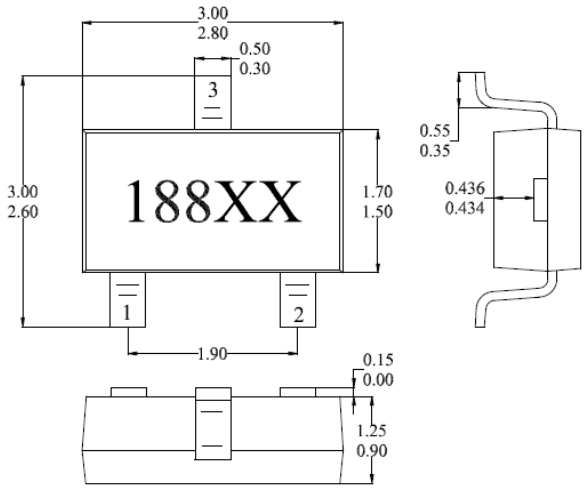
Output Pin Assignment

(Top view)



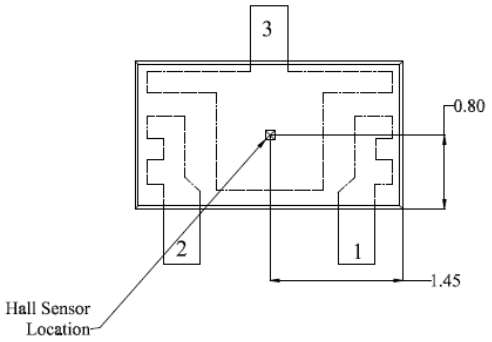
Package (SOT-23)

(Top View)

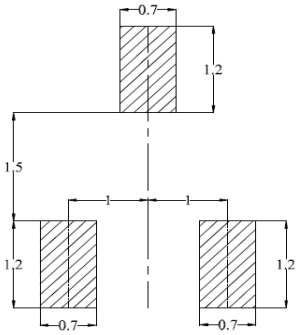


Hall Plate Chip Location

(Bottom view)



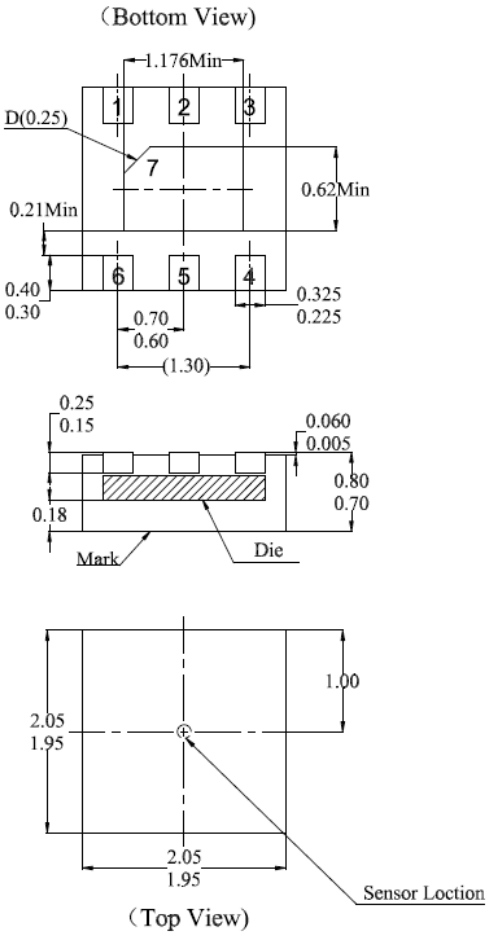
(For reference only) Land Pattern



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

SD Package

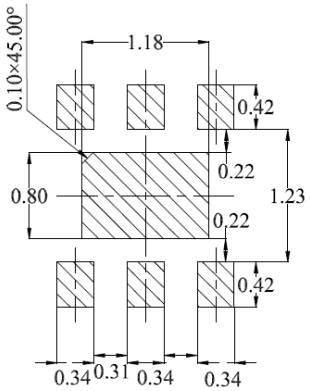


NOTES:

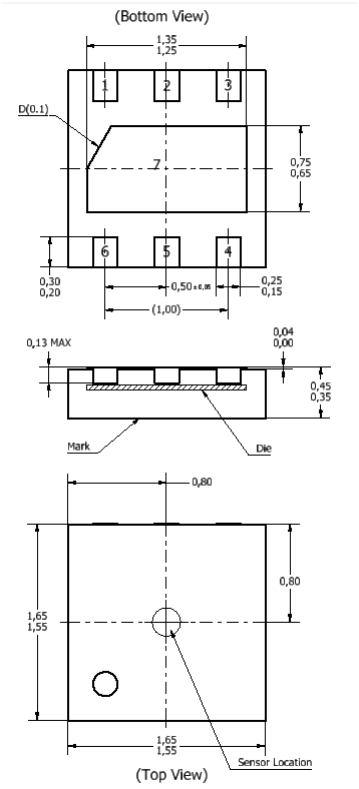
1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Lead thickness after solder plating will be 0.254mm maximum
4. PINOUT:

Pin No.	Pin Name	Function
1	V_{DD}	Power Supply
2	N.C	N.C
3	V_{OUT}	Output
4	N.C	N.C
5	V_{SS}	Ground
6	N.C	N.C
7	N.C	N.C

5. （For reference only）Land pattern



SM Package



NOTES:

1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Lead thickness after solder plating will be 0.254mm maximum
4. Marking:A3X; X: Date Code, Refer to DC table
5. PINOUT:

Pin No.	Pin Name	Function
1	V_{DD}	Power Supply
2	NC	NC
3	OUT	Output
4	NC	NC
5	V_{SS}	Ground
6	NC	NC
7	PAD	NC

6. (For reference only) Land Pattern