MH176 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.

MH176 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger. 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.

MH176 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.

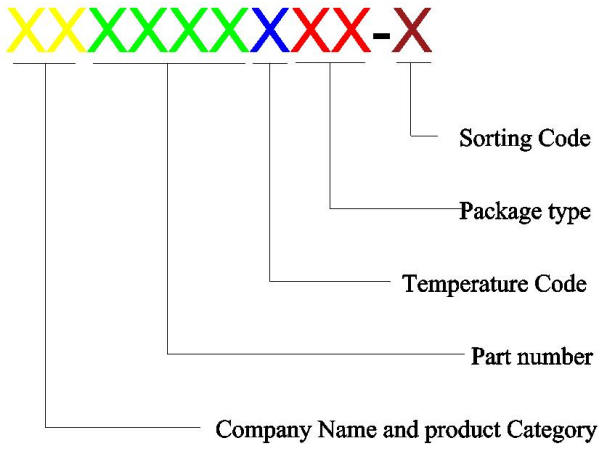
Features and Benefits

- CMOS Hall IC Technology.
- 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.

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

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

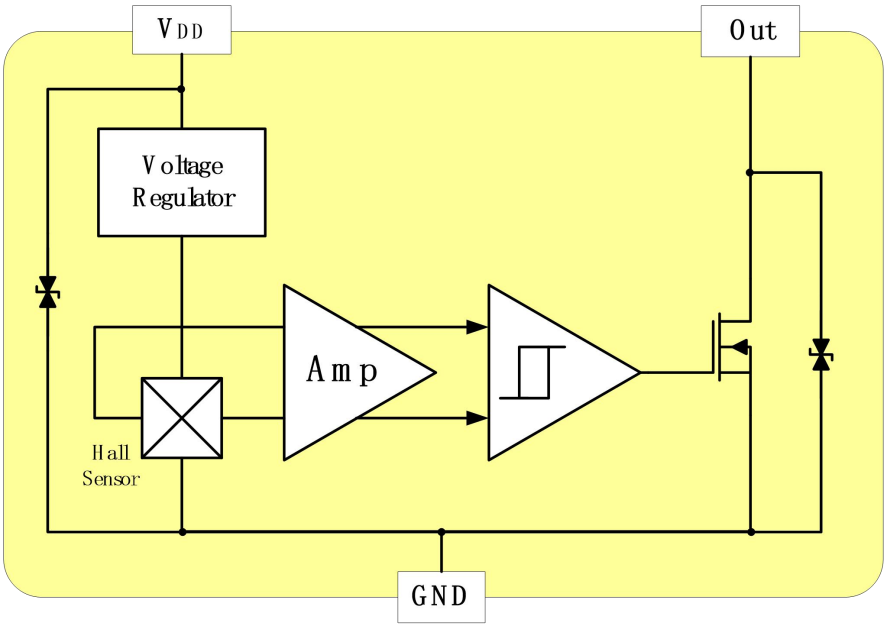
Sorting

α , β ,Blank…..

Part No.	Temperature Suffix	Package Type
MH176KUA	K (-40°C to + 125°C)	UA (TO-92S)
MH176EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH176KSO	K (-40°C to + 125°C)	SO (SOT-23)
MH176ESO	E (-40°C to + 85°C)	SO (SOT-23)
MH176KSD	K (-40°C to + 125°C)	SD (DFN2*2-6L)
MH176ESD	E (-40°C to + 85°C)	SD (DFN2*2-6L)
MH176KSM	K (-40°C to + 125°C)	SM (DFN1.6*1.6-6L)
MH176ESM	E (-40°C to + 85°C)	SM (DFN1.6*1.6-6L))

Custom sensitivity selection is available by MST sorting technology

Functional Diagram



Absolute Maximum Ratings At (Ta=25℃)

Characteristics		Values	Unit
Supply Voltage (V_{DD})		7.0	V
Output Voltage, (V_{OUT})		7.0	V
Reverse Voltage, (V_{DD} / V_{OUT})		-0.3	V
Output Current, (I_{SINK})		10	mA
Operating Temperature Range, (T_A)	"E" Class	-40 ~ +85	℃
	"K" Class	-40 ~ +125	℃
Storage Temperature Range, (T_S)		-65 ~ +150	℃
Maximum Junction Temp, (T_J)		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

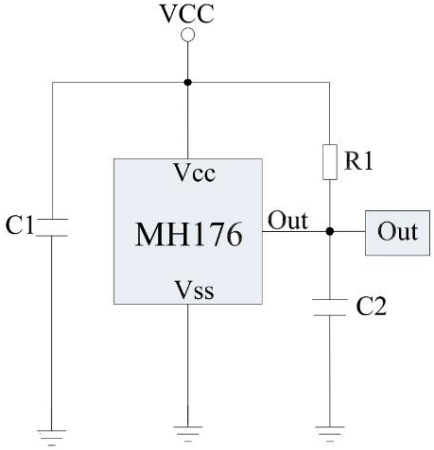
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=5.0V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage, (V_{DD})	Operating	1.8		6.0	V
Supply Current, (I_{DD})	B<B_{OP}		5.0	7.0	mA
Output Saturation Voltage, (V_{DSON})	I_{OUT}=5mA, B>B_{OP}			400.0	mV
Output Leakage Current, (I_{OFF})	I_{OFF} B<B_{RP}, V_{OUT} = 5.0V			10.0	uA
Power-On Time, (T_{PO})	Power-On			0.10	us
Output Response Time, (T_{RES})	Operating			0.50	ms
Output Switch Frequency, (F_{SW})	Operating	3			kHz
Output Rise Time, (T_R)	R_L=1kΩ, C_L=20pF			2.00	us
Output Fall Time, (T_F)	RL=1kΩ; C_L=20pF			0.15	us
Electro-Static Discharge	HBM	4			kV
Operate Point,(Bop)	UA/SD/SM/SO	5(-25)		25(-5)	Gauss
Release Point,(Brp)	UA/SD/SM/SO	-25(5)		-5(25)	Gauss
Hysteresis,(B_{HYS})			30		Gauss

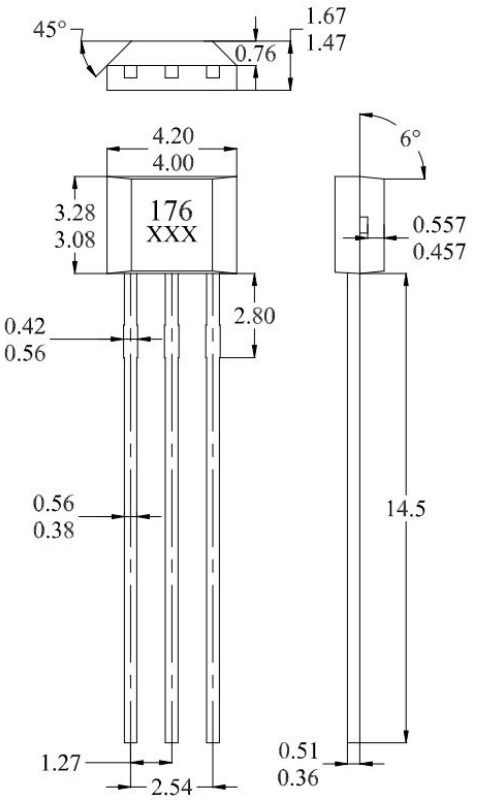
Typical Application circuit



C1：10nF
C2：1nF
R1：1KΩ

Sensor Location, Package Dimension and Marking

UA Package

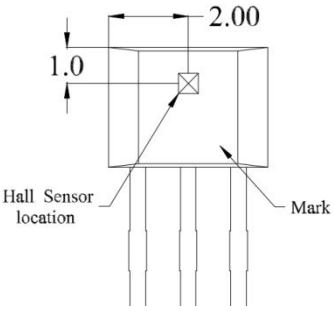


NOTES:

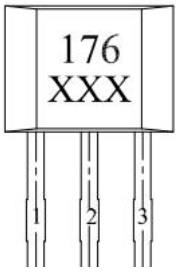
1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:

Pin 1	VDD
Pin 2	GND
Pin 3	Output

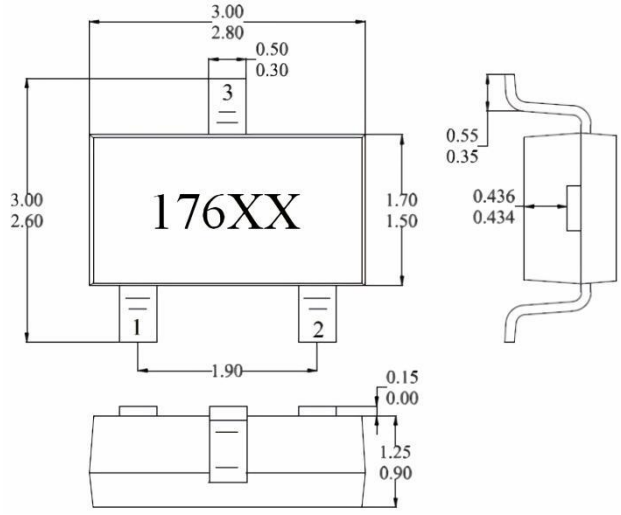
Hall Chip location



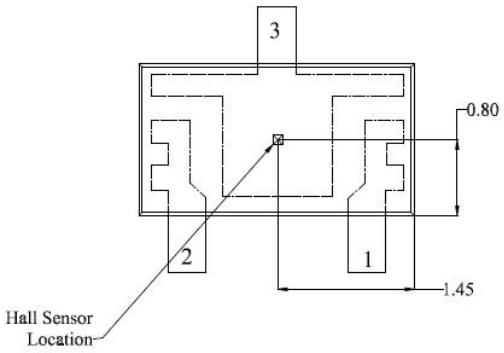
Output Pin Assignment (Top view)



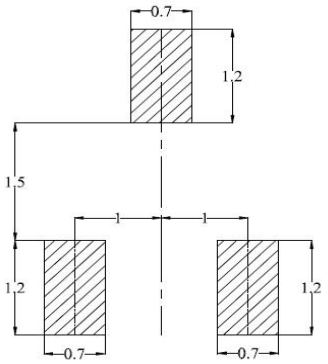
SO Package (Top View)



Hall Plate Chip Location (Bottom view)



(For reference only)Land Pattern



NOTES:

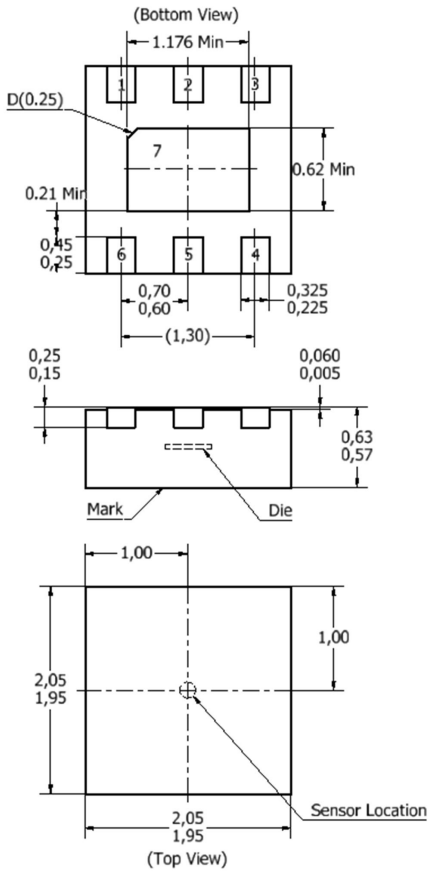
1. PINOUT (See Top View at left :)

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

*SD package (DFN2*2-6L)*

(Bottom View)

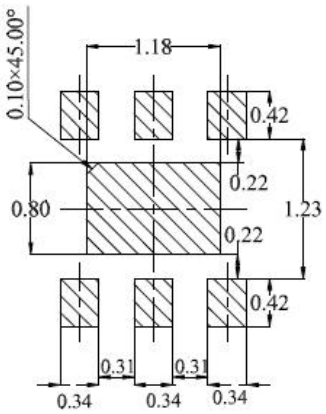


NOTES:

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:

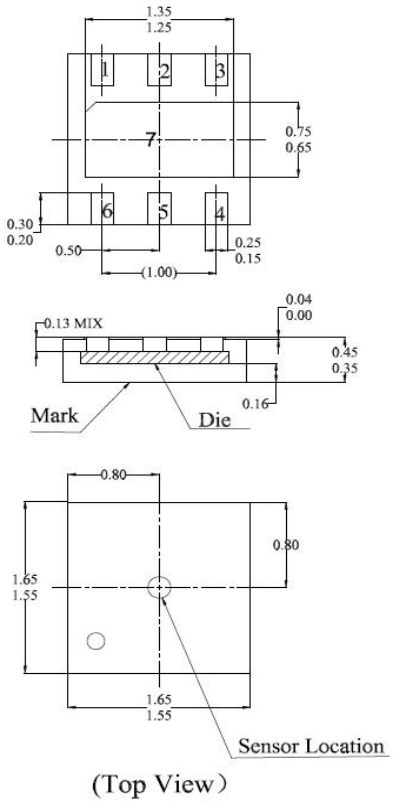
Pin No.	Pin Name	Function
1	V_{DD}	Power Supply
2	N.C	N.C
3	V_{OUT}	Output
4,6,7	N.C	N.C
5	V_{SS}	Ground

5. （For reference only）Land pattern



*SM Package(DFN1.6*1.6-6L)*

(Bottom View)



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	VDD	Power Supply
2	N.C	N.C
3	VOUT	Output
4,6,7	N.C	N.C
5	VSS	Ground

5. （For reference only）Land pattern