MH178 Hall-effect latch is a temperature stable, stress-resistant, mini-power IC. 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.

MH178 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.

MH178 is rated for operation between the ambient temperatures –40℃ and +85℃, and –40℃ to 125℃ for the K temperature range. for the E 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.

The package type is in a lead Halogen Free version was verified by third party Lab.

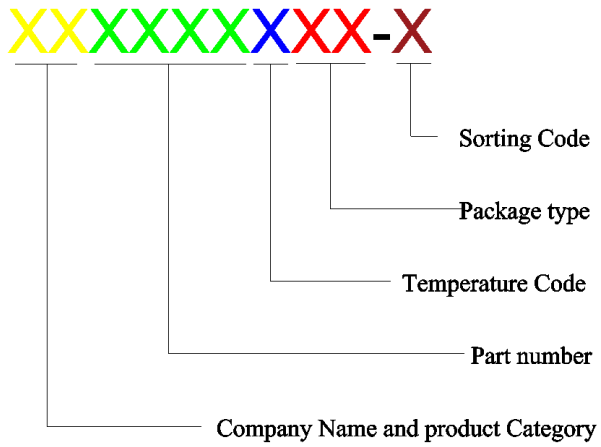
Features and Benefits

- CMOS Hall IC Technology
- Strong RF noise protection
- 2.0 to 5.5V for battery-powered applications
- Operation down to 2.0V, Micro power consumption
- 100% tested at 125℃ for K
- Low sensitivity drift in crossing of Temp range
- Ultra Low power consumption at 9uA (Avg)
- High ESD Protection, HBM > ±4KV(min)
- Open Drain output
- RoHS compliant 2011/65/EU and Halogen Free

Applications

- Speed sensing
- Position sensing
- Revolution counting
- Solid-State Switch
- Current sensing
- Revolution counting
- Solid-State Switch

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,SG:SOT-89(3pin)

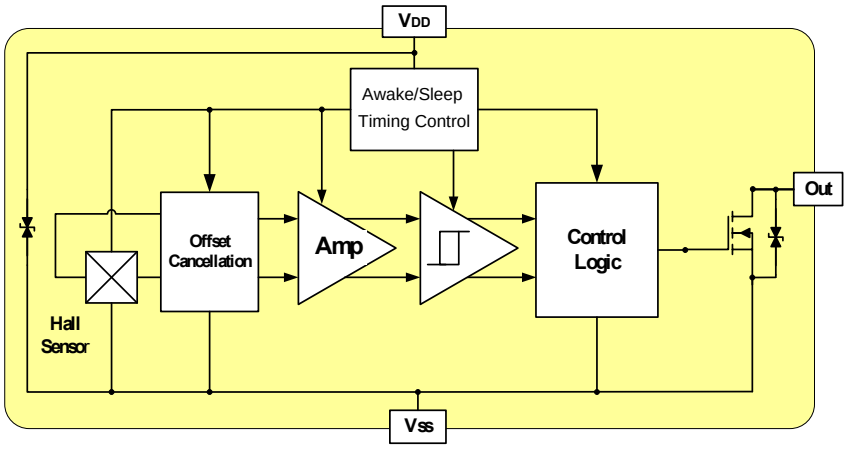
Sorting

α,β,Blank…..

Part No.	Temperature Suffix	Package Type
MH178KUA	K (-40°C to + 125°C)	UA (TO-92S)
MH178EUA	E (-40°C to + 85°C)	UA (TO-92S)
MH178ESO	E (-40°C to + 85°C)	SO (SOT-23)

Custom sensitivity selection is available by MST sorting technology

Functional Diagram



***Note**: Static sensitive device; please observe ESD precautions. Reverse V_{DD} protection is not included. For reverse voltage protection, a 100Ω resistor in series with V_{DD} is recommended.*

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

Characteristics		Values	Unit
Supply voltage,(V_{DD})		6	V
Output Voltage,(V_{out})		6	V
Reverse voltage, (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current,(I_{OUT})		10	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

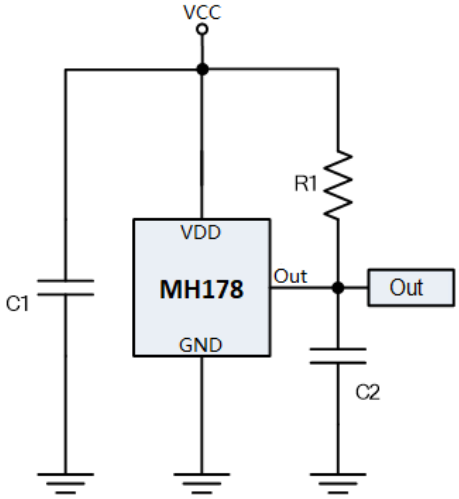
Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=3.0V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})	Operating	2.0		5.5	V
Supply Current,(I_{DD})	Awake State		2.0	5.0	mA
	Sleep State		7.0	10.0	uA
	Average		9.0	15.0	uA
Output Saturation Voltage,	Iout=5mA,B>BOP			200	mV
Output Leakage Current,($Ioff$)	IOFF B<BRP, VOUT = 5.5V			1.0	uA
Awake mode time,(Taw)	Operating		40	80	uS
Sleep mode time,(T_{SL})	Operating		40	80	mS
Duty Cycle,(D,C)			0.1		%
Response Time,(T_{RES})				5	Hz
Output Rise Time, (T_R)	R_L=1KΩ, CL =20pF		0.18	0.45	uS
Output Fall Time, (T_F)	R_L=1KΩ; CL =20pF		0.18	0.45	uS
Electro-Static Discharge	HBM	4			KV
Operating Point (B_{OP})	S pole to branded side, B > BOP, Vout On	5		40	Gauss
Release Point (B_{RP})	N pole to branded side, B < BRP, Vout	-40		-5	Gauss
Hysteresis (B_{HYS})	|BOP - BRP|		40		Gauss

Typical Application circuit

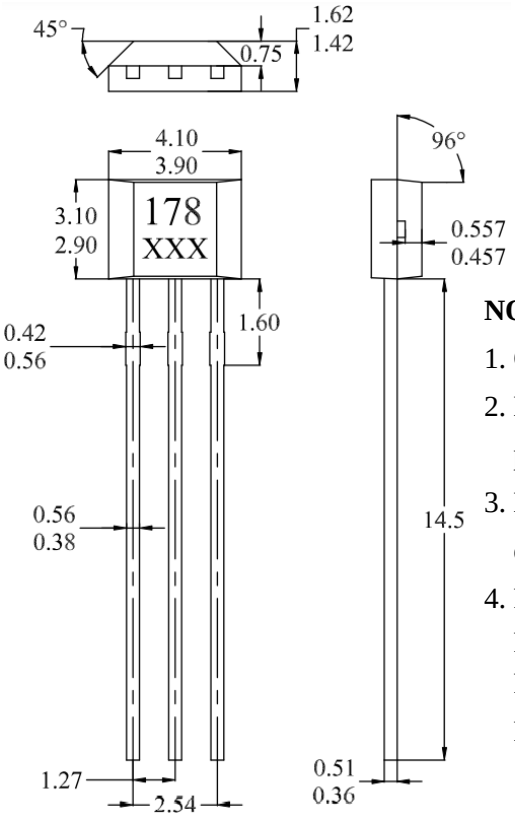


C1 : 10nF
C2 : 100pF

R1 : 100KΩ

Sensor Location, Package Dimension and Marking

UA Package

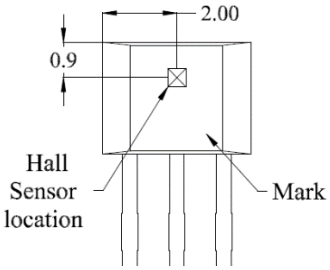


NOTES:

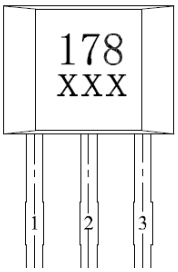
1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:

Pin 1	VDD
Pin 2	GND
Pin 3	Output

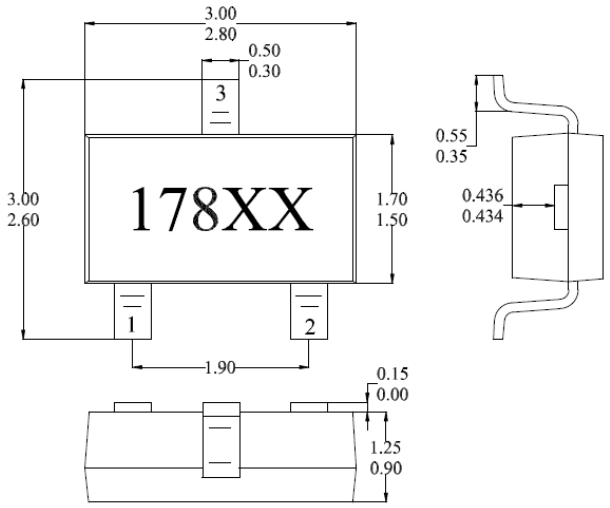
Hall Chip location



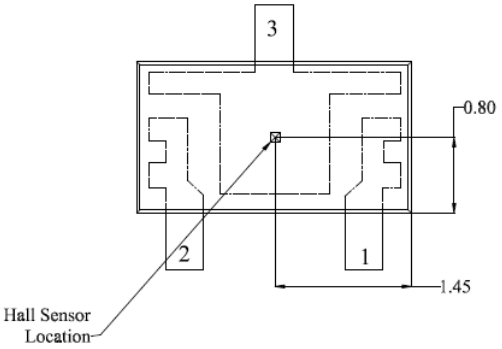
Output Pin Assignment
(Top view)



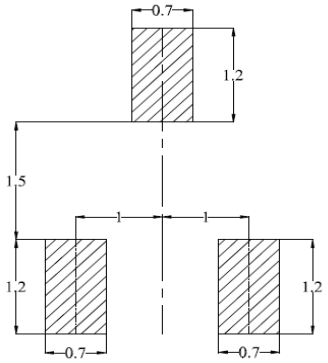
SO Package
(Top View)



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