



MH190, Hall-Effect sensor, designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall Voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, open collector output. An internal band gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range. The device is identical except for magnetic switch points.

A south pole of sufficient strength will turn the output on. The North Pole is necessary to turn the output off. An on-board regulator permits operation with supply voltages of 4V to 30 V.

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

Features and Benefits

- Optimized for BLDC motor applications
- High Peak Voltage of 65V
- 100% tested at 125 °C for K.
- Temperature compensation function

Applications

- High temperature Fan motor
- 3 phase BLDC motor application
- Fan motor application
- Speed sensing
- Revolution counting
- E-Bike

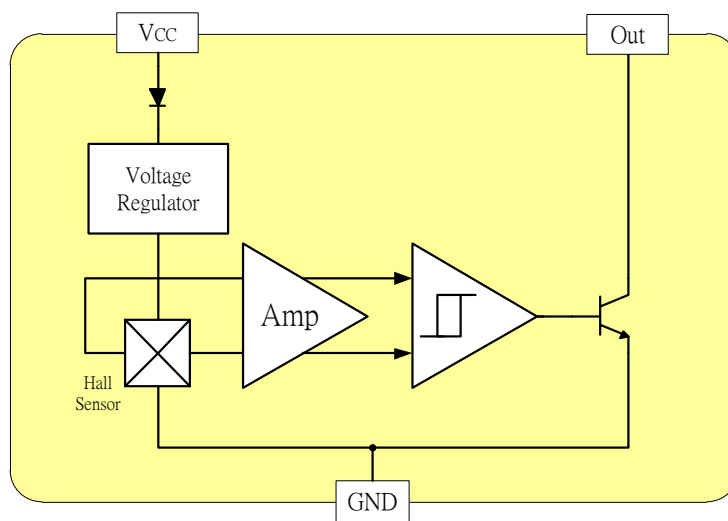
Ordering Information

| | |
|--|--|
| | <p>Company Name and Product Category MH:MST Hall Effect/MP:MST Power MOSFET</p> <p>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.</p> <p>Temperature range E: 85 °C, I: 105 °C, K: 125 °C, L: 150 °C</p> <p>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)</p> <p>Sorting α, β, Blank.....</p> |
|--|--|

| Part No. | Temperature Suffix | Package Type |
|----------|---------------------|--------------|
| MH190KUA | K (-40°C to +125°C) | UA (T0-92S) |
| MH190KSO | K (-40°C to +125°C) | SO (SOT-23) |
| MH190EUA | E (-40°C to +85°C) | UA (T0-92S) |
| MH190ESO | 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 ($T_a=25^\circ\text{C}$)

| Characteristics | | Values | Unit |
|--|---------------------------|-------------|-------|
| Supply voltage, (V_{cc}) | | 65 | V |
| Out voltage, (V_{out}) | | 65 | V |
| Reverse voltage, (V_{cc}) (V_{out}) | | -32 | V |
| Magnetic flux density | | Unlimited | Gauss |
| Output current, (I_{out}) | | 25 | mA |
| Operating Temperature Range, (T_a) | “E” version | -40 to +85 | °C |
| | “K” version | -40 to +125 | °C |
| Storage temperature range, (T_s) | | -65 to +150 | °C |
| Maximum Junction Temp, (T_j) | | 150 | °C |
| Thermal Resistance | (θ_{ja}) UA / SO | 206 / 543 | °C/W |
| | (θ_{jc}) UA / SO | 148 / 410 | °C/W |
| Package Power Dissipation, (P_D) UA / SO | | 606 / 230 | mW |

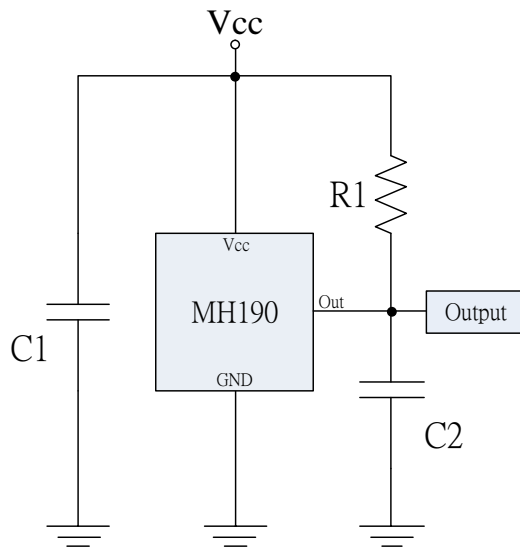
Note: Do not apply reverse voltage to V_{cc} and V_{out} Pin, It may be caused for Miss function or damaged device.

Electrical Specifications

DC Operating Parameters : $T_A = +25\text{ }^\circ\text{C}$, $V_{CC} = 12\text{V}$

| Parameters | Test Conditions | Min | Typ | Max | Units |
|--|---|------|-----|-------|---------------|
| Supply Voltage, (V_{CC}) | Operating | 4.0 | | 30.0 | V |
| Supply Current, (I_{CC}) | $B < B_{OP}$ | | 3.0 | 8.0 | mA |
| Output Saturation Voltage, (V_{sat}) | $I_{OUT} = 5\text{ mA}$, $B > B_{OP}$ | | | 500.0 | mV |
| Output Leakage Current, (I_{off}) | I_{OFF} $B < B_{RP}$, $V_{OUT} = 24\text{V}$ | | | 10.0 | μA |
| Output Rise Time, (T_R) | $R_L = 820\ \Omega$, $C_L = 20\text{pF}$ | | 1.5 | | μS |
| Output Fall Time, (T_F) | $R_L = 820\ \Omega$; $C_L = 20\text{pF}$ | | 1.5 | | μS |
| Operate Point, (B_{OP}) | | 10 | | 110 | Gauss |
| Release Point, (B_{RP}) | | -110 | | -10 | Gauss |
| Hysteresis, (B_{HYS}) | | | 100 | | Gauss |

Typical application circuit

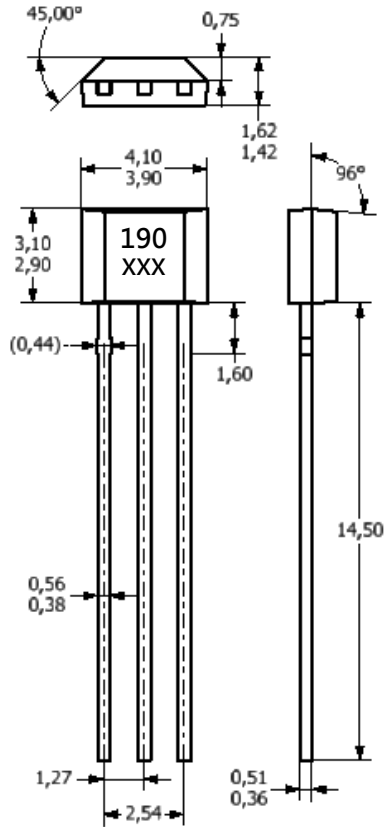


C1 : 1000PF
 C2 : 15PF
 R1 : 10K Ω

Sensor Location, Package Dimension and Marking

MH190 Package

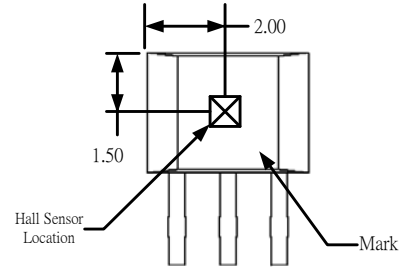
UA Package



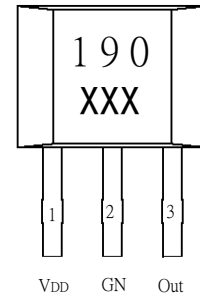
NOTES:

- 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 | Vcc |
| Pin 2 | GND |
| Pin 3 | Output |

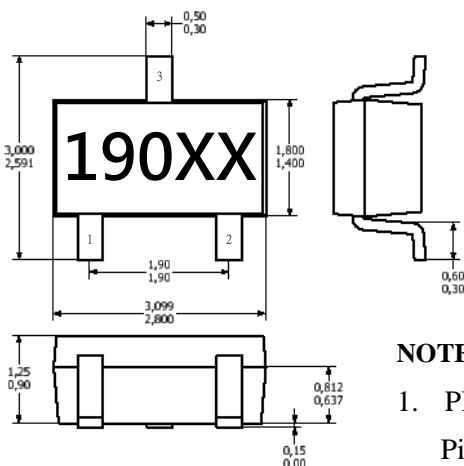
Hall Chip location



Output Pin Assignment (Top view)



Package (SOT-23) (Top View)



NOTES:

1. PINOUT (See Top View at left :)
- | | |
|-------|-----------------|
| Pin 1 | V _{CC} |
| Pin 2 | Output |
| Pin 3 | GND |
2. Controlling dimension: mm
 3. Lead thickness after solder plating will be 0.254mm maximum

Hall Plate Chip Location (Bottom view)

