

Features

- Bipolar Hall Effect Latch Sensor
- 3.5V to 20V DC Operation Voltage
- Open Collector Pre-Driver
- 50mA Output Sink Current
- Chip Power Reverse-Connection Protection
- Operating Temperature: -40°C~125°C
- SIP3, SC59 and SC59R (Commonly known as SOT23 in Asia): Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

General Description

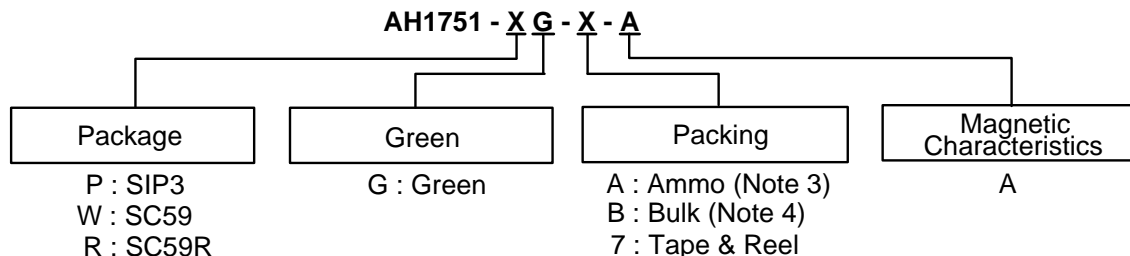
AH1751 is a single-digital-output Hall-effect sensor for high temperature operation. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier to amplify Hall voltage, and a comparator to provide switching hysteresis for noise rejection, and an open-collector output pre-driver. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

While the magnetic flux density (B) is larger than threshold Bop, the OUT pin turns on (low). If B removed toward Brp, the OUT pin is latched "on" state prior to B < Brp. When B < Brp, the OUT pin goes into "off" state.

Applications

- Rotor Position Sensing
- Current Switch
- Encoder
- RPM Detection

Ordering Information

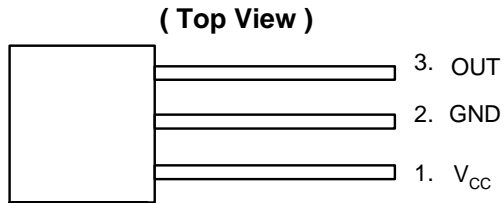


| Device | Package Code | Packaging (Note 2) | Tube/Bulk | | 7" Tape and Reel | | Ammo Box | | Magnetic Characteristics |
|---------------|--------------|--------------------|-----------|--------------------|------------------|--------------------|----------|--------------------|--------------------------|
| | | | Quantity | Part Number Suffix | Quantity | Part Number Suffix | Quantity | Part Number Suffix | |
| AH1751-PG-A-A | P | SIP3 | NA | NA | NA | NA | 4000/Box | -A | A |
| AH1751-PG-B-A | P | SIP3 | 1000 | -B | NA | NA | NA | NA | A |
| AH1751-WG-7-A | W | SC59 | NA | NA | 3000/Tape & Reel | -7 | NA | NA | A |
| AH1751-RG-7-A | R | SC59R | NA | NA | 3000/Tape & Reel | -7 | NA | NA | A |

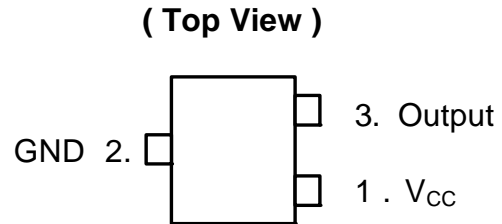
- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html
 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 3. Ammo Box is for SIP3 Spread Lead.
 4. Bulk is for SIP3 Straight Lead.

Pin Assignment

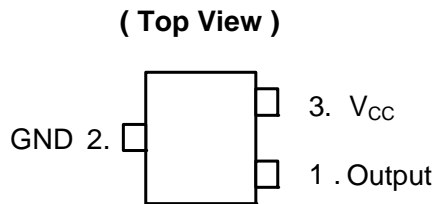
(1) SIP3



(2) SC59



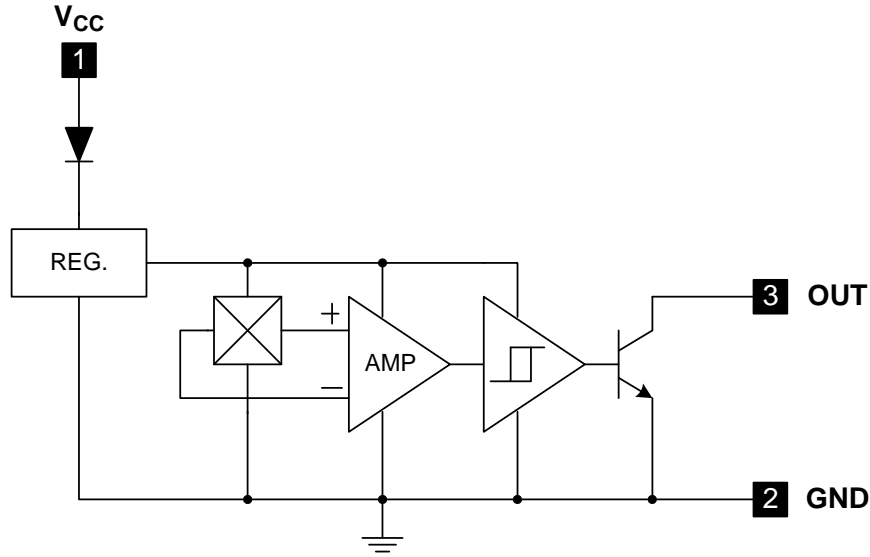
(3) SC59R



Pin Descriptions

| Pin Name | Description |
|-----------------|--------------|
| V _{CC} | Input Power |
| GND | Ground |
| OUT | Output Stage |

Block Diagram



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Rating | Unit | |
|-----------------|------------------------------|----------------|------------------|----|
| V_{CC} | Supply Voltage | 20 | V | |
| $V_{out (off)}$ | Output "OFF" Voltage | 20 | V | |
| $I_o (sink)$ | Output "ON" Current | 100 | mA | |
| T_{ST} | Storage Temperature Range | -65~+150 | $^\circ\text{C}$ | |
| $T_{J(MAX)}$ | Maximum Junction Temperature | +150 | $^\circ\text{C}$ | |
| P_D | Power Dissipation | SIP3 | 550 | mW |
| | | SC59 and SC59R | 230 | mW |

Recommended Operating Conditions

| Symbol | Parameter | Conditions | Min | Max | Unit |
|----------|-----------------------------|--------------------|-----|-----|------------------|
| V_{CC} | Supply Voltage | Operating (Note 5) | 3.5 | 20 | V |
| T_A | Operating Temperature Range | Operating | -40 | 125 | $^\circ\text{C}$ |

Notes: 5. Operating, the output is switching as magnetic field change ($S > 300\text{G}$, $N < -300\text{G}$).

Electrical Characteristics ($T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Conditions | Min | Typ. | Max | Unit |
|----------------|---------------------------|---|-----|------|-----|------|
| $V_{out(SAT)}$ | Output Saturation Voltage | $V_{CC} = 12\text{V}$, OUT "ON" $I_o = 50\text{mA}$ | - | 200 | 300 | mV |
| I_{CC} | Supply Current | $V_{CC} = 12\text{V}$, OUT "OFF" | - | 3.5 | 6 | mA |

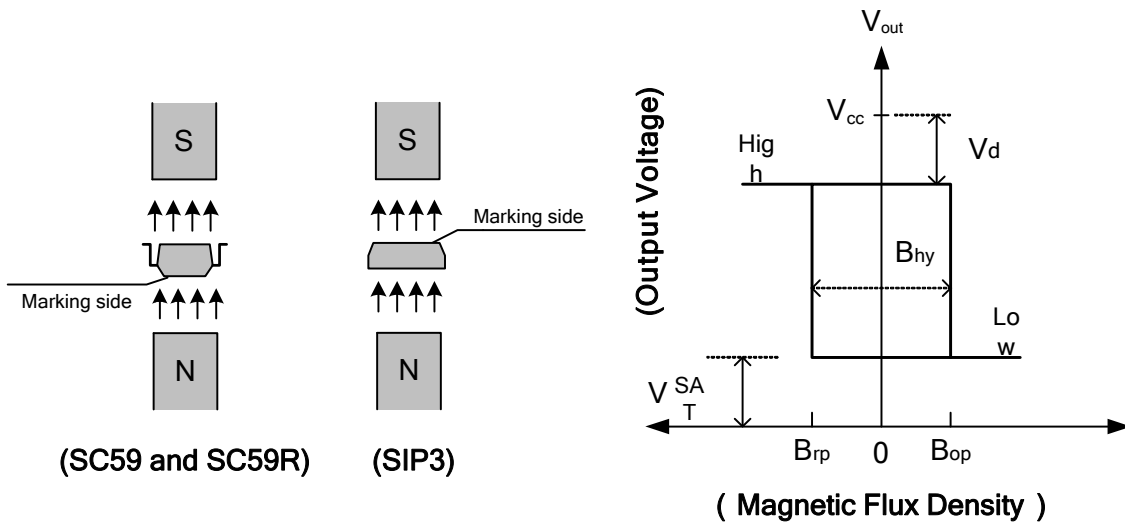
Magnetic Characteristics ($T_A = 25^\circ\text{C}$, $V_{CC} = 4\sim 20\text{V}$, Note 6)

A grade (1mT = 10 Gauss)

| Symbol | Parameter | Min | Typ. | Max | Unit |
|--------------------------------|-----------------|-----|------|-----|-------|
| Bops(south pole to brand side) | Operation Point | 5 | - | 70 | Gauss |
| Brps(south pole to brand side) | Release Point | -70 | - | -5 | Gauss |
| Bhy($ B_{opx} - B_{rpx} $) | Hysteresis | - | 75 | - | Gauss |

Notes: 6. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.

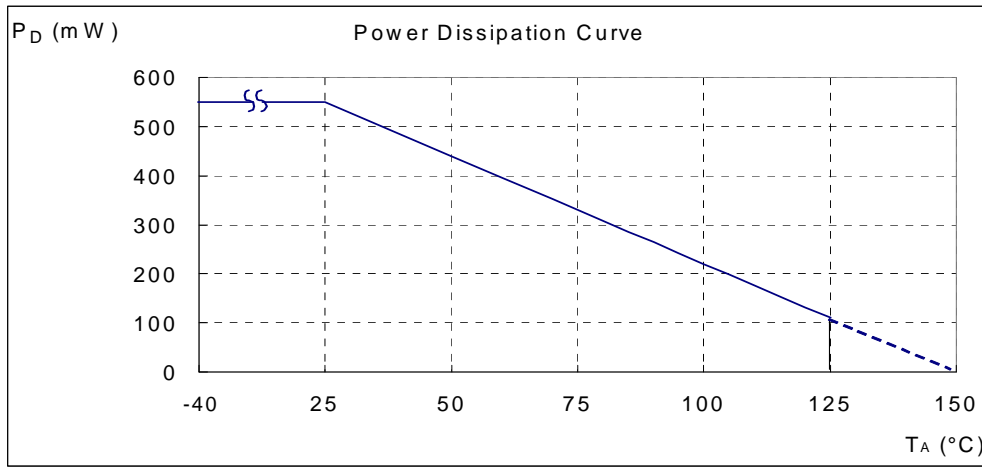
Operating Characteristics



Performance Characteristics

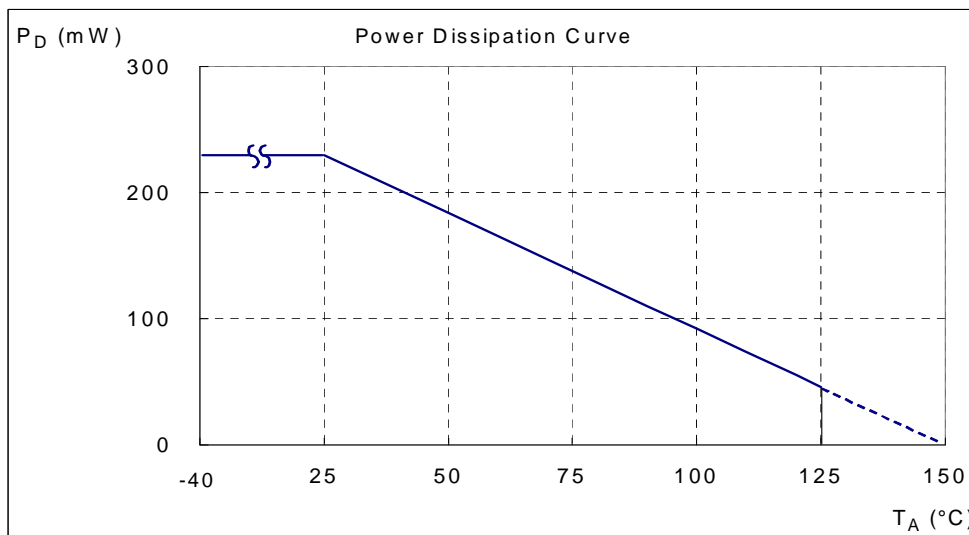
(1) SIP3

| | | | | | | | | | |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| T_A (°C) | 25 | 50 | 60 | 70 | 80 | 85 | 90 | 95 | 100 |
| P_D (mW) | 550 | 440 | 396 | 352 | 308 | 286 | 264 | 242 | 220 |
| T_A (°C) | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 150 |
| P_D (mW) | 198 | 176 | 154 | 132 | 110 | 88 | 66 | 44 | 0 |



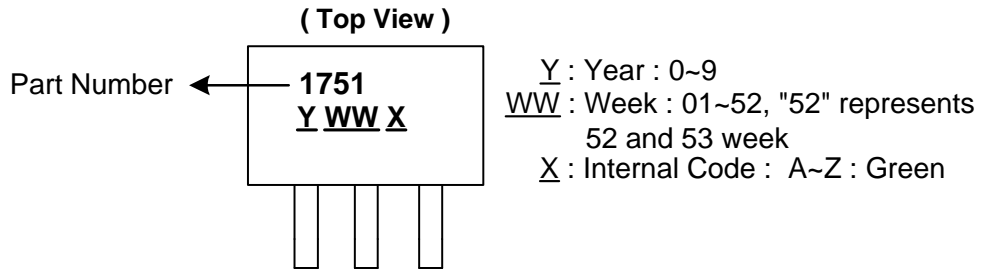
(2) SC59 and SC59R (Commonly known as SOT23 in Asia)

| | | | | | | | | | | | | | |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| T_A (°C) | 25 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 125 | 130 | 140 | 150 |
| P_D (mW) | 230 | 184 | 166 | 147 | 129 | 110 | 92 | 74 | 55 | 46 | 37 | 18 | 0 |

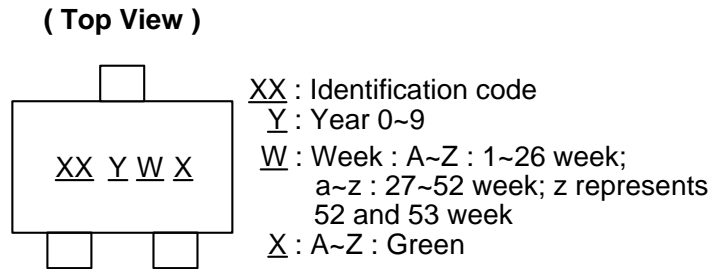


Marking Information

(1) SIP3



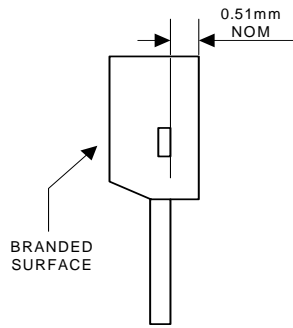
(2) SC59 and SC59R (Commonly known as SOT23 in Asia)



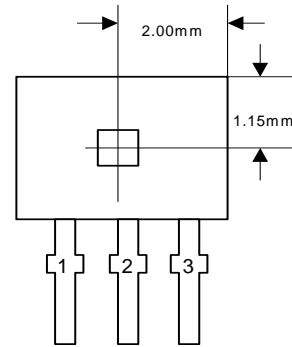
| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH1751 | SC59 | RK |
| AH1751 | SC59R | SK |

Package Information (All Dimensions in mm)

(1) Package Type: SIP3 for Bulk pack

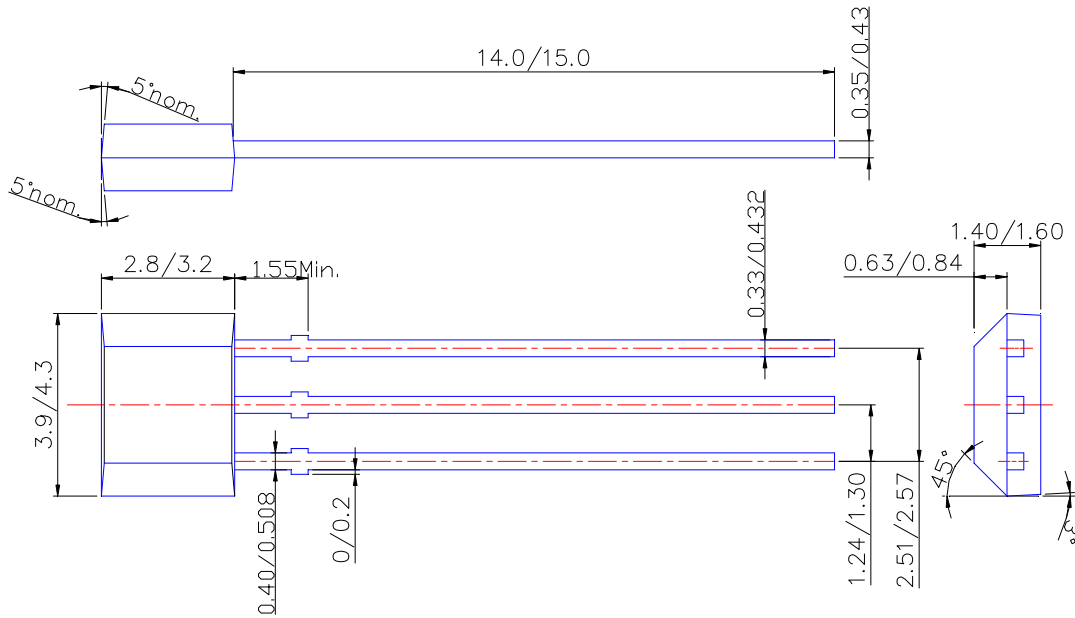


Active Area Depth



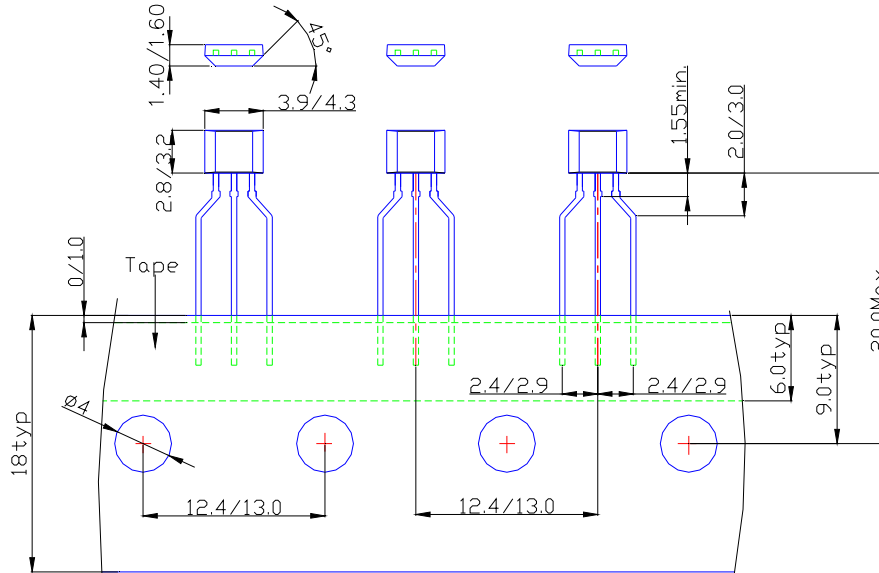
Sensor Location

Package Dimension

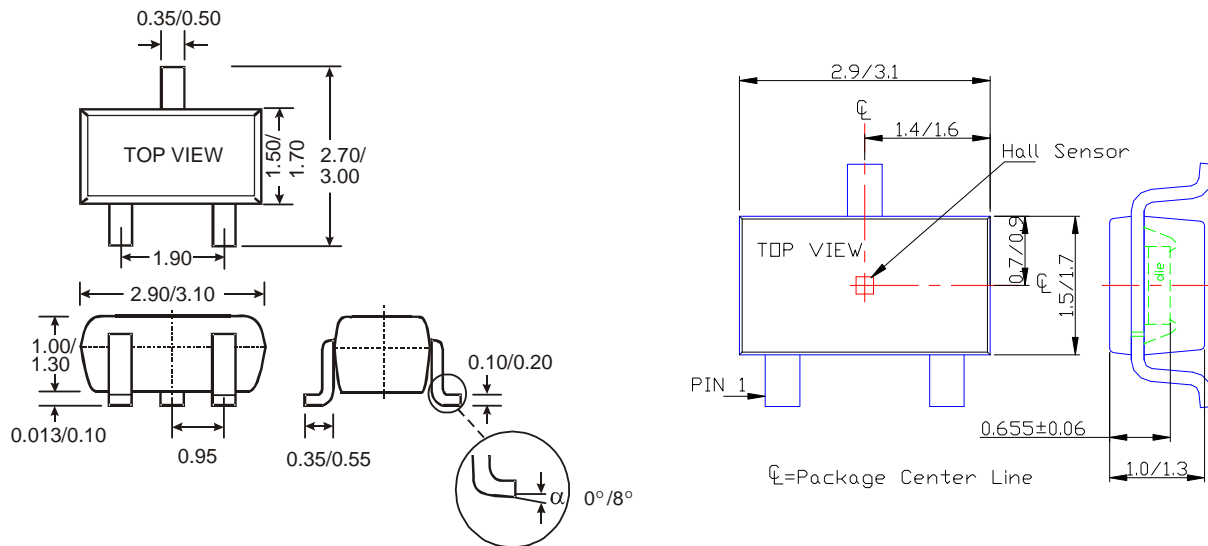


Package Information (Continued)

(2) Package Type: SIP3 for Ammo pack



(3) Package Type: SC59 and SC59R (Commonly known as SOT23 in Asia)



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