

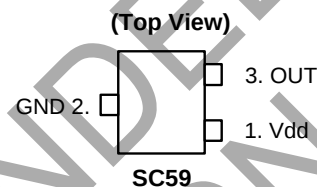
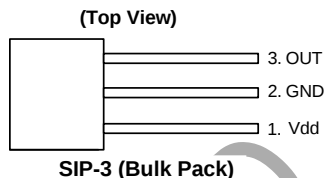
## Description

AH337 is a unipolar Hall-Effect sensor for contactless switching applications. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis for noise rejection, and an open-collector output. The band-gap regulator allows a wide operating voltage range.

When the magnetic flux density (**B**) is larger than operate point (**Bop**), output is switched on (OUT pin is pulled low). The output state is held on until a magnetic flux density falls below Brp. When **B** is less than Brp, the output is switched off.

The AH337 is available in SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) and SC59 packages.

## Pin Assignments



## Features

- Unipolar Hall-Effect Sensor
- 4.2V to 28V DC Operating Voltage
- Temperature Compensation
- Open Drain Pre-Driver
- 25mA Maximum Output Sink Current
- Operating Temperature: -40°C to +125°C
- SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) and SC59 Packages (SC59 Is Commonly Known as SOT23 in Asia)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

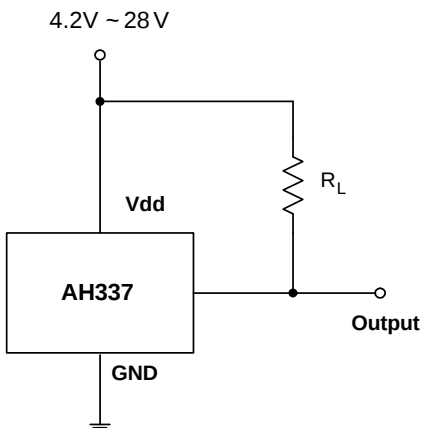
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Applications

- VCD/DVD Loader, CD/DVD ROM
- Cover Detector
- Speed Measurement
- Home Appliances
- Home Safety

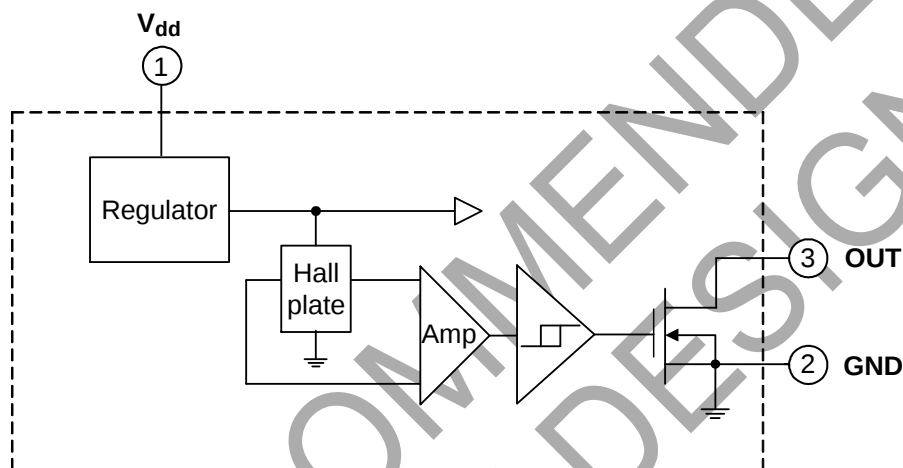
## Typical Applications Circuit



## Pin Descriptions

| Pin Name | P/I/O | Pin # | Description           |
|----------|-------|-------|-----------------------|
| Vdd      | P     | 1     | Positive Power Supply |
| GND      | P     | 2     | Ground                |
| OUT      | O     | 3     | Output Pin            |

## Functional Block Diagram



## Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol              | Characteristics              |                   | Values      | Unit |
|---------------------|------------------------------|-------------------|-------------|------|
| V <sub>dd</sub>     | Supply Voltage               |                   | 30          | V    |
| B                   | Magnetic Flux Density        |                   | Unlimited   |      |
| V <sub>DS</sub>     | Output OFF Voltage           |                   | 30          | V    |
| I <sub>d</sub>      | Output "ON" Current          | Continuous        | 25          | mA   |
| T <sub>S</sub>      | Storage Temperature Range    |                   | -65 to +150 | °C   |
| T <sub>J(MAX)</sub> | Maximum Junction Temperature |                   | +150        | °C   |
| P <sub>D</sub>      | Package Power Dissipation    | SIP-3 (Ammo Pack) | 550         | mW   |
|                     |                              | SIP-3 (Bulk Pack) | 550         | mW   |
|                     |                              | SC59              | 230         | mW   |

## Recommended Operating Conditions (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol         | Parameter                     | Conditions | Min | Max  | Unit |
|----------------|-------------------------------|------------|-----|------|------|
| Vdd            | Supply Voltage (Note 4)       | Operating  | 4.2 | 28   | V    |
| T <sub>A</sub> | Operating Ambient Temperature | Operating  | -40 | +125 | °C   |

Notes: 4. The output of IC will be switched after the supply voltage is over 4.2V, but the magnetic characteristics won't be normal until the supply is over 4.5V.

## Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ , $V_{dd} = 12\text{V}$ , unless otherwise specified.)

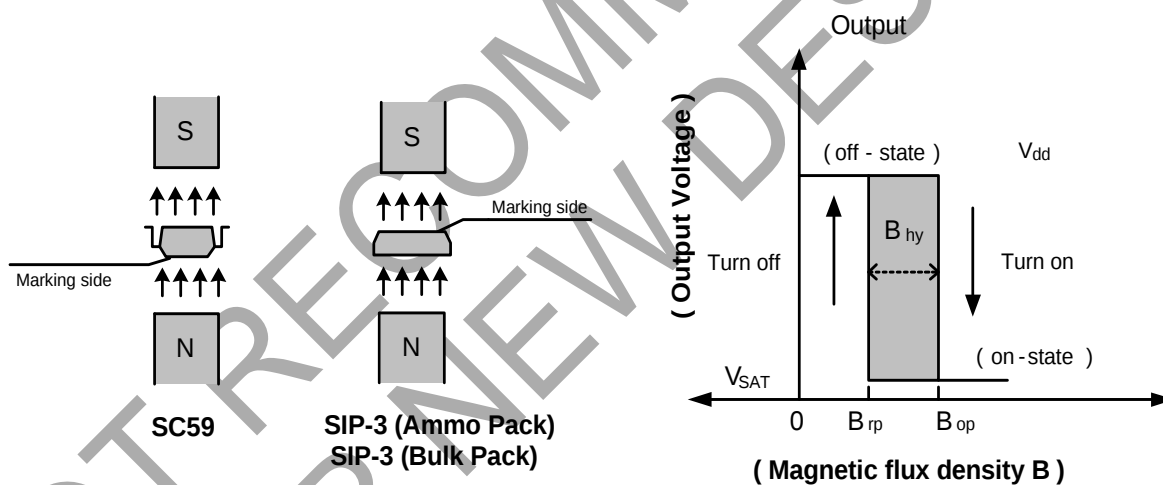
| Symbol        | Characteristic            | Test Conditions                        | Min | Typ   | Max | Unit          |
|---------------|---------------------------|----------------------------------------|-----|-------|-----|---------------|
| $V_{DS(SAT)}$ | Output Saturation Voltage | $I_{OUT} = 10\text{mA}$ , $B > B_{op}$ | -   | 300   | 400 | mV            |
| $I_{off}$     | Output Leakage Current    | $B < B_{rp}$                           | -   | < 0.1 | 10  | $\mu\text{A}$ |
| $I_{dd}$      | Supply Current            | Output Open                            | -   | 2     | 4   | mA            |

## Magnetic Characteristics ( $T_A = +25^\circ\text{C}$ , $V_{dd} = 4.5\text{V}$ to $28\text{V}$ , Note 5)

| Symbol                          | Parameter       | Min | Typ | Max | Unit  |
|---------------------------------|-----------------|-----|-----|-----|-------|
| Bops (South Pole to Brand Side) | Operation Point | 90  | 120 | 150 | Gauss |
| Brps (South Pole to Brand Side) | Release Point   | 30  | 60  | 90  | Gauss |
| Bhy ( $ B_{opx}  -  B_{rpx} $ ) | Hysteresis      | -   | 60  | -   | Gauss |

Notes: 5. Magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

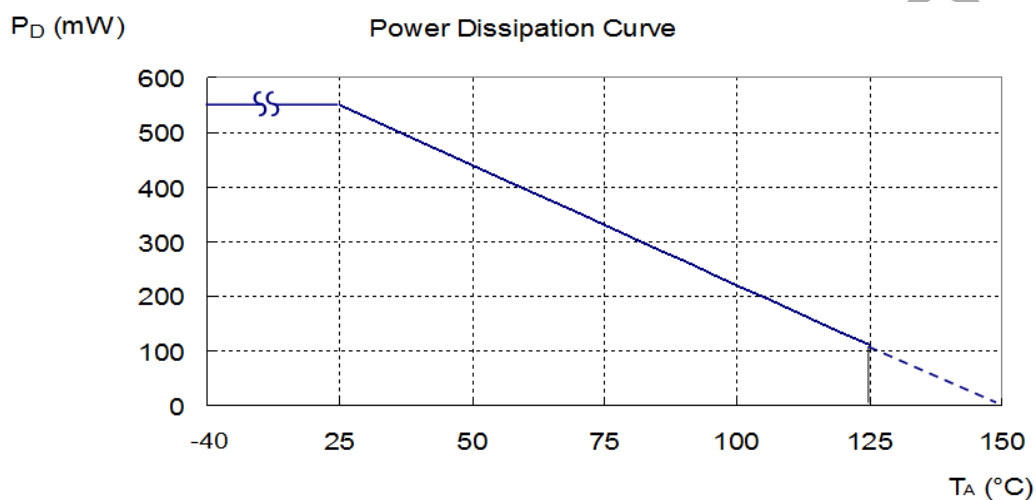
## Performance Characteristics



## Performance Characteristics

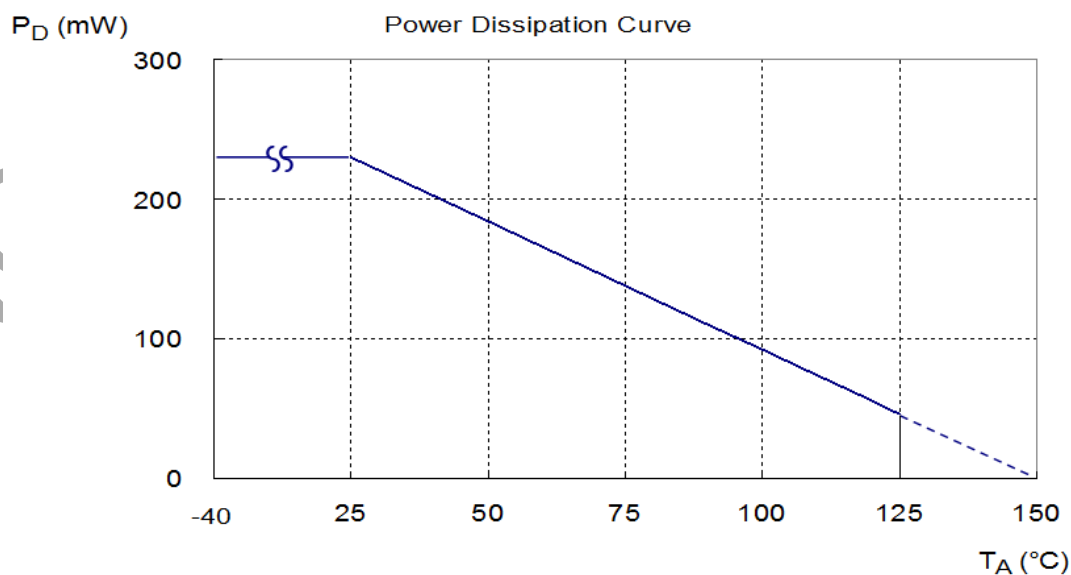
### (1) SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)

| $T_A$ (°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   |

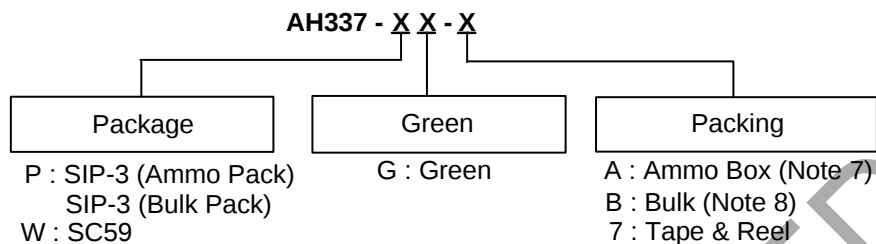


### (2) SC59 (Commonly Known as SOT23 in Asia)

| $T_A$ (°C) | 25  | 50  | 60  | 70  | 80  | 85  | 90  | 100 | 110 | 120 | 130 | 140 | 150 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| $P_D$ (mW) | 230 | 184 | 166 | 147 | 129 | 120 | 110 | 92  | 74  | 55  | 37  | 18  | 0   |



## Ordering Information



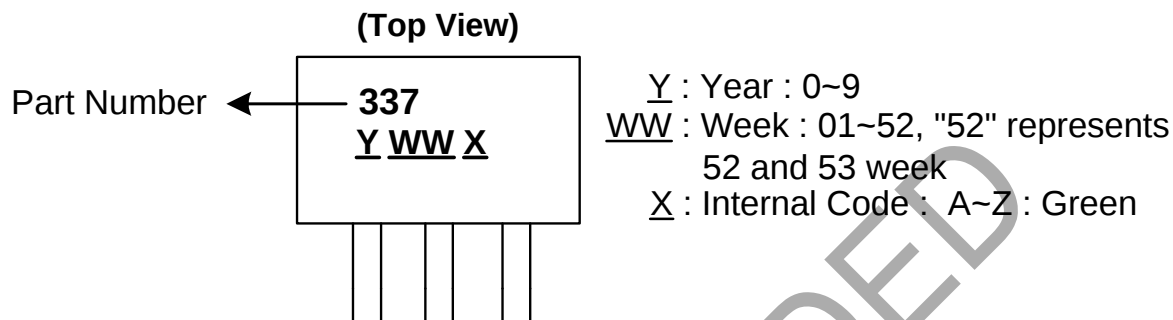
| Part Number | Status<br>(Note 9) | Package<br>Code | Packaging<br>(Note 6) | Bulk     |                          | 7" Tape and Reel |                       | Ammo Box |                          |
|-------------|--------------------|-----------------|-----------------------|----------|--------------------------|------------------|-----------------------|----------|--------------------------|
|             |                    |                 |                       | Quantity | Part<br>Number<br>Suffix | Quantity         | Part Number<br>Suffix | Quantity | Part<br>Number<br>Suffix |
| AH337-PG-A  | NRND               | P               | SIP-3<br>(Ammo Pack)  | NA       | NA                       | NA               | NA                    | 4000/Box | -A                       |
| AH337-PG-B  | NRND               | P               | SIP-3<br>(Bulk Pack)  | 1000     | -B                       | NA               | NA                    | NA       | NA                       |
| AH337-WG-7  | NRND               | W               | SC59                  | NA       | NA                       | 3000/Tape & Reel | -7                    | NA       | NA                       |

Notes:

- 6. Pad layout as shown on Diodes Incorporated's suggested pad layout document, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
- 7. Ammo Box is for SIP-3 Spread Lead.
- 8. Bulk is for SIP-3 Straight Lead.
- 9. NRND = Not Recommended for New Design

## Marking Information

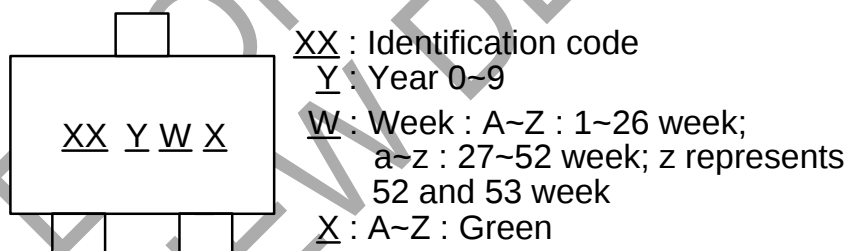
(1) Package Type: SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)



| Part Number | Package           | Identification Code |
|-------------|-------------------|---------------------|
| AH337       | SIP-3 (Ammo Pack) | 337                 |
| AH337       | SIP-3 (Bulk Pack) | 337                 |

(2) Package Type: SC59

**(Top View)**

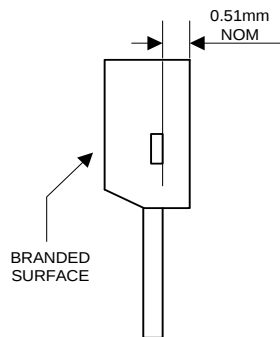


| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH337       | SC59    | P1                  |

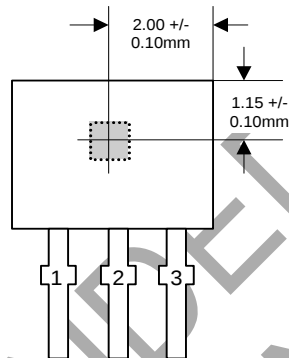
## Package Outline Dimensions (All Dimensions in mm)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### (1) Package Type: SIP-3 (Bulk Pack)

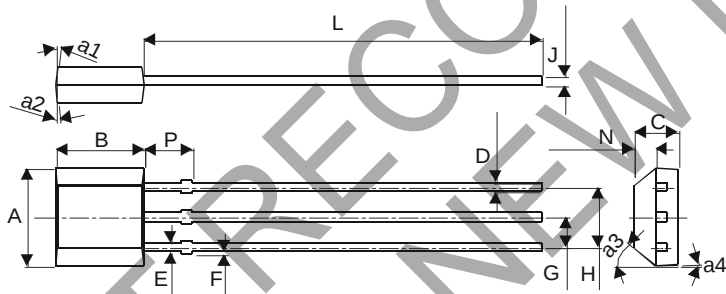


Active Area Depth



Sensor Location

### Package Dimensions

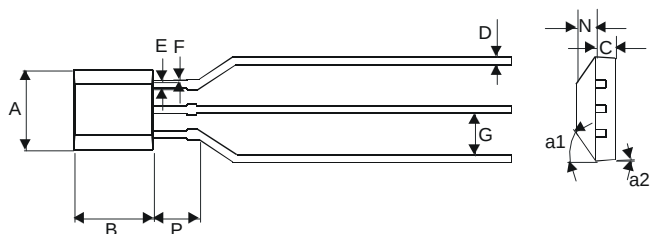


| SIP-3<br>(Bulk Pack) |         |       |
|----------------------|---------|-------|
| Dim                  | Min     | Max   |
| A                    | 3.9     | 4.3   |
| a1                   | 5° Typ  |       |
| a2                   | 5° Typ  |       |
| a3                   | 45° Typ |       |
| a4                   | 3° Typ  |       |
| B                    | 2.8     | 3.2   |
| C                    | 1.40    | 1.60  |
| D                    | 0.33    | 0.432 |
| E                    | 0.40    | 0.508 |
| F                    | 0       | 0.2   |
| G                    | 1.24    | 1.30  |
| H                    | 2.51    | 2.57  |
| J                    | 0.35    | 0.43  |
| L                    | 14.0    | 15.0  |
| N                    | 0.63    | 0.84  |
| P                    | 1.55    | -     |
| All Dimensions in mm |         |       |

## Package Outline Dimensions (Continued)

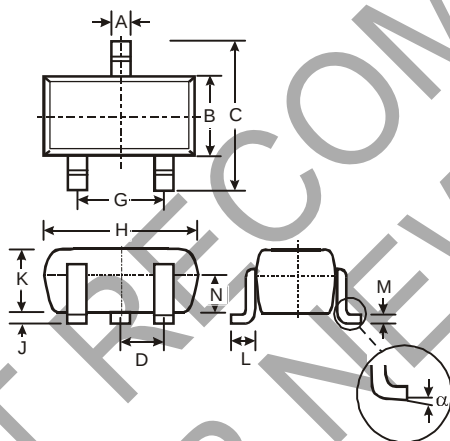
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### (2) Package Type: SIP-3 (Ammo Pack)

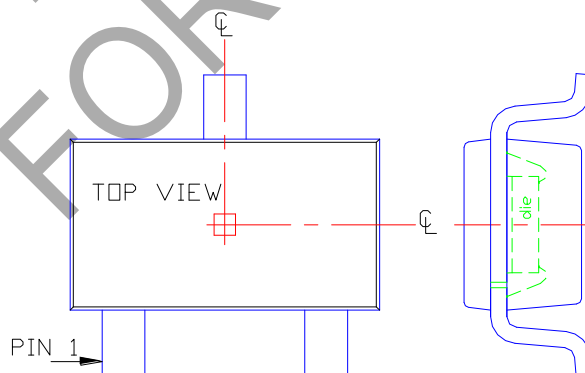


| SIP-3<br>(Ammo Pack) |         |      |
|----------------------|---------|------|
| Dim                  | Min     | Max  |
| A                    | 3.9     | 4.3  |
| a1                   | 45° Typ |      |
| a2                   | 3° Typ  |      |
| B                    | 2.8     | 3.2  |
| C                    | 1.40    | 1.60 |
| D                    | 0.35    | 0.41 |
| E                    | 0.43    | 0.48 |
| F                    | 0       | 0.2  |
| G                    | 2.4     | 2.9  |
| N                    | 0.63    | 0.84 |
| P                    | 1.55    | -    |
| All Dimensions in mm |         |      |

### (3) Package Type: SC59 (Commonly Known as SOT23 in Asia)



| SC59                 |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 0.35  | 0.50 | 0.38 |
| B                    | 1.50  | 1.70 | 1.60 |
| C                    | 2.70  | 3.00 | 2.80 |
| D                    | -     | -    | 0.95 |
| G                    | -     | -    | 1.90 |
| H                    | 2.90  | 3.10 | 3.00 |
| J                    | 0.013 | 0.10 | 0.05 |
| K                    | 1.00  | 1.30 | 1.10 |
| L                    | 0.35  | 0.55 | 0.40 |
| M                    | 0.10  | 0.20 | 0.15 |
| N                    | 0.70  | 0.80 | 0.75 |
| α                    | 0°    | 8°   | -    |
| All Dimensions in mm |       |      |      |

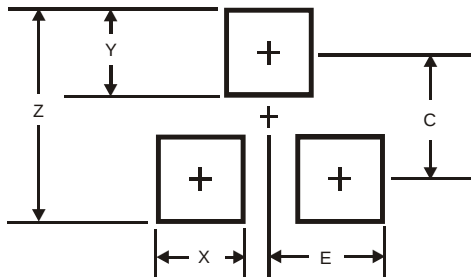


CL = Package Center Line

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### (1) Package Type: SC59 (Commonly Known as SOT23 in Asia)



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| Z          | 3.4              |
| X          | 0.8              |
| Y          | 1.0              |
| C          | 2.4              |
| E          | 1.35             |

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