

Features

- Micropower operation
- 2.5V to 5.5V battery operation
- Offset Canceling Technology
- Superior temperature stability
- Extremely Low Switch-Point Drift
- Insensitive to Physical Stress
- -40°C to 85°C operating temperature
- SIP-3L/SC59 package
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)

General Description

AH182/AH183 is a three-terminal Hall effect sensor device with an output driver, mainly designed for battery-operation, hand-held equipment (such as cellular and cordless phones, and PDA's) The total operation power is down to 15uW in the 2.75V supply.

The south pole of sufficient strength will turn the output on in SIP-3L but the north pole of sufficient strength will turn the output on in SC59 package. The output will be turned off under no magnetic field.

While the magnetic flux density (**B**) is larger than operation point (**Bop**), the output will be turned on (low), the output is held until **B** is lower than the release point (**Brp**), then turned off. The difference between AH182 and AH183 is that the former consumes less power than that of the latter in the Hall sensor operation.

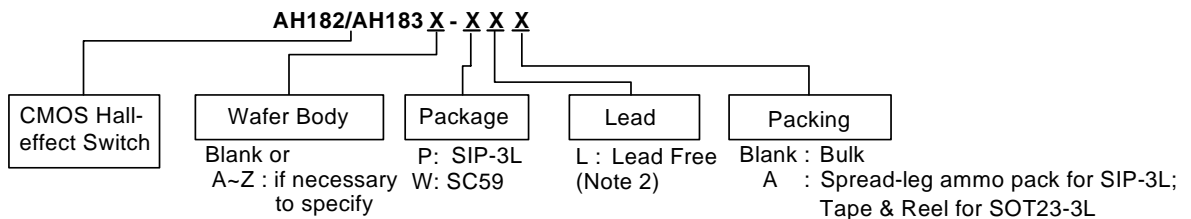
Applications

- Cover detector
- Speed measurement
- Home safety

Pin Descriptions

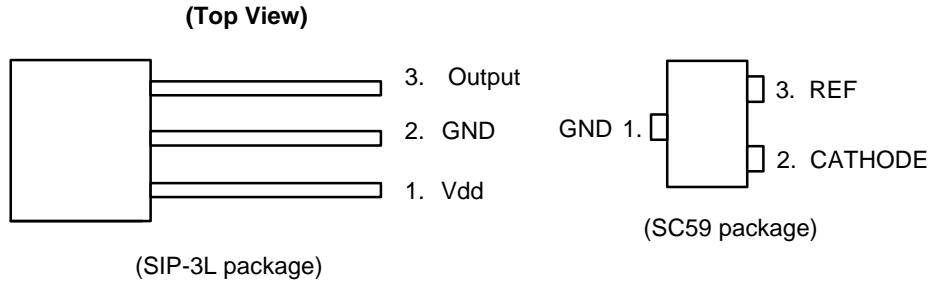
| Name | P/I/O | Pin # | Description |
|--------|-------|-------|--------------------|
| Vdd | P/I | 1 | Power Supply Input |
| GND | P | 2 | Ground |
| Output | O | 3 | Output Pin |

Ordering Information

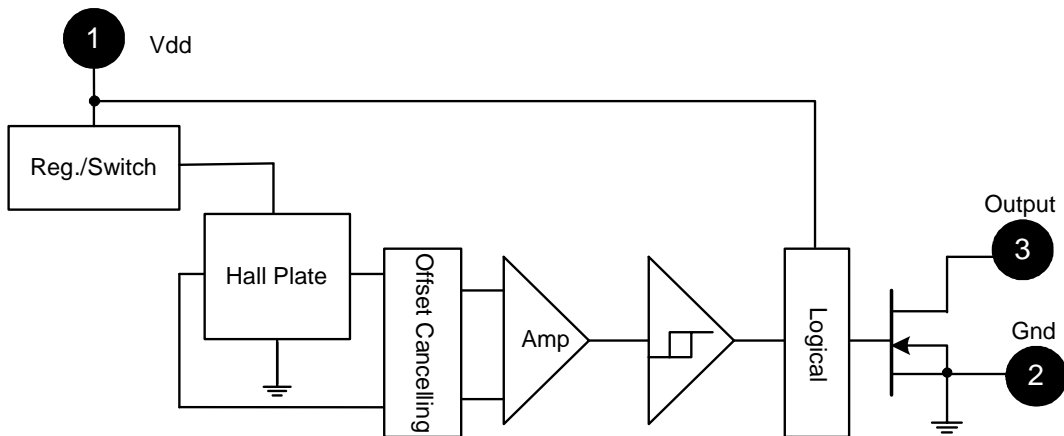


Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.
2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

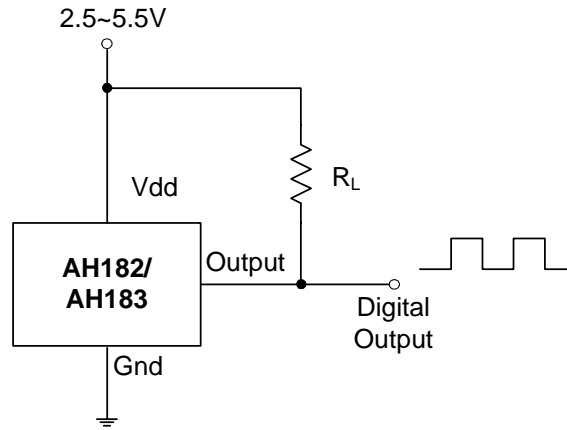
Pin Assignments



Block Diagram



Typical Circuit



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

| Characteristics | Symbol | Values | Unit | |
|-----------------------------|----------|-------------|------------------|----|
| Supply Voltage | V_{dd} | 7 | V | |
| Magnetic Flux Density | B | Unlimited | | |
| Operating Temperature Range | T_a | -40 to +85 | $^\circ\text{C}$ | |
| Storage Temperature Range | T_s | -65 to +150 | $^\circ\text{C}$ | |
| Package Power Dissipation | P_D | SIP-3L | 550 | mW |
| | | SC59 | 230 | mW |
| Maximum Junction Temp | T_{jc} | 150 | $^\circ\text{C}$ | |
| Output current | I_o | 10 | mA | |

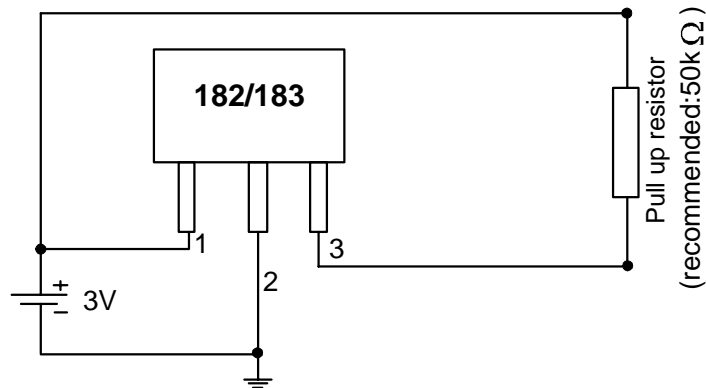
Recommended Operating Conditions ($T_a = 25^\circ\text{C}$)

| Parameter | Symbol | Conditions | Rating | Unit |
|----------------|--------|------------|---------|------|
| Supply Voltage | Vdd | Operating | 2.5-5.5 | V |

Electrical Characteristics ($T_a = +25^{\circ}\text{C}$, $V_{dd} = 3\text{V}$)

| Characteristic | Symbol | Conditions | Min | Typ | Max | Unit |
|------------------------|---------------|--|-----|------|-----|---------------|
| Output On Voltage | V_{out} | $I_{out} = 1\text{mA}$ | - | 0.1 | 0.3 | V |
| Output Leakage Current | I_{off} | $V_{out} = 5.5\text{V}$, $B < B_{rp}$ | - | <0.1 | 1 | μA |
| Supply Current | $I_{dd(en)}$ | Chip enable | - | - | 2.0 | mA |
| | $I_{dd(dis)}$ | Chip disable | - | - | 8.0 | μA |
| | $I_{dd(ave)}$ | AH182: average supply current | - | 5 | 10 | μA |
| | $I_{dd(ave)}$ | AH183: average supply current | - | 280 | 500 | μA |
| Awake Time | T_{awake} | | - | 50 | 100 | μs |
| Period | T_{period} | AH182 | - | 50 | 100 | ms |
| | | AH183 | - | 200 | 400 | μs |
| Duty Cycle | D.C. | AH182 | - | 0.1 | - | % |
| | | AH183 | - | 25 | - | % |

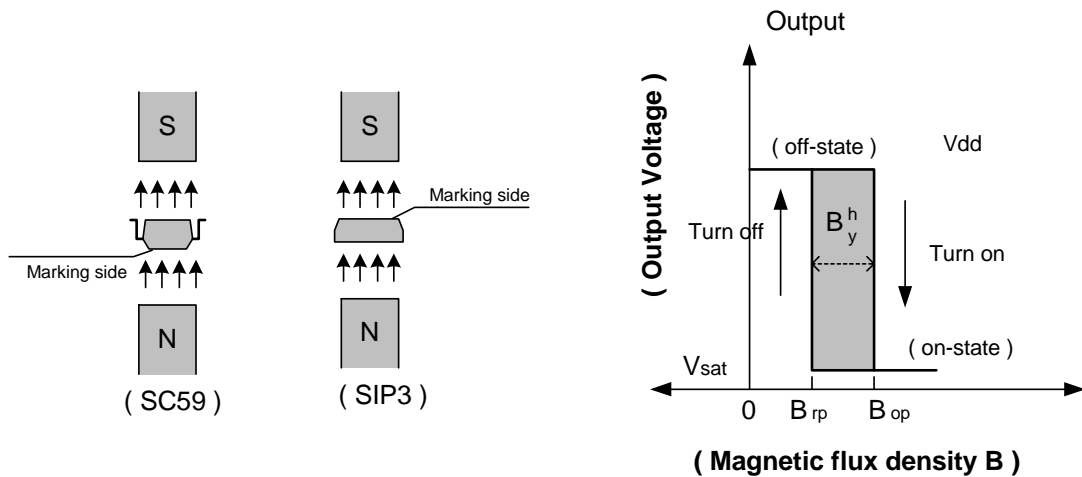
Test Circuit



Magnetic Characteristics ($T_a = +25^\circ\text{C}$, $V_{dd} = 3\text{V}$)

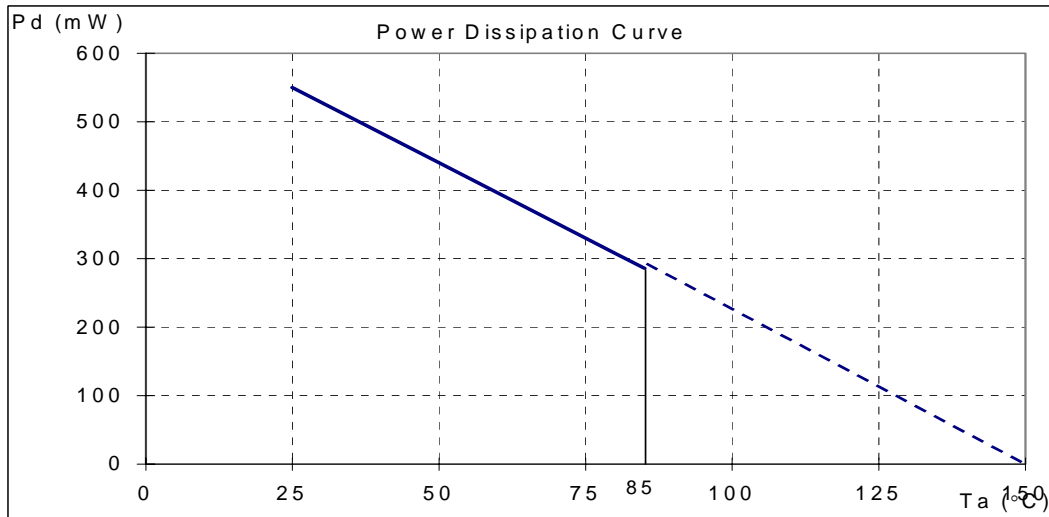
(1mT = 10 Gauss)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|-----------------|---------------|-----|-----|-----|-------|
| Operation Point | Bop | -- | 40 | 60 | Gauss |
| Release Point | Brp | 10 | 30 | -- | |
| Hysteresis | Bhy (Bop-Brp) | -- | 10 | -- | |



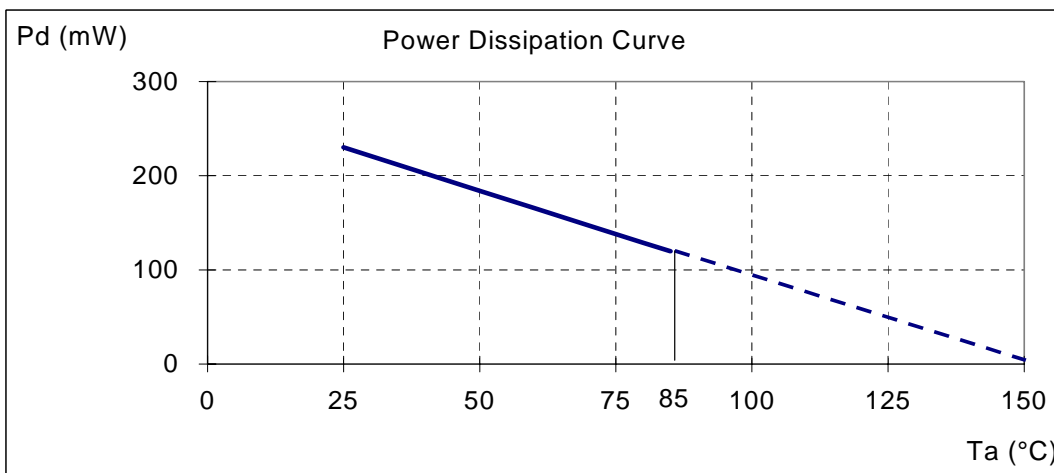
Performance Characteristics (SIP-3L)

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



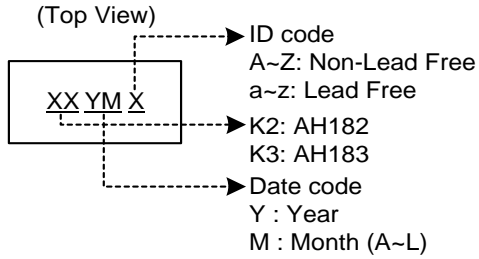
Performance Characteristics (SC59)

| | | | | | | | | | | | | | | |
|----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|
| Ta (°C) | 25 | 50 | 60 | 70 | 80 | 85 | 90 | 100 | 110 | 120 | 125 | 130 | 140 | 150 |
| Pd (mW) | 230 | 184 | 166 | 147 | 129 | 120 | 110 | 92 | 74 | 55 | 46 | 37 | 18 | 0 |

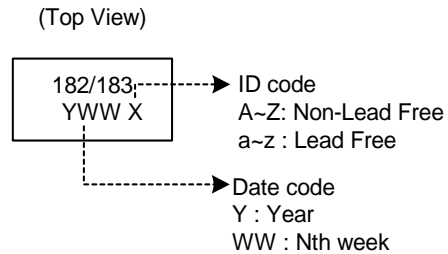


Marking Information

(1) SC59

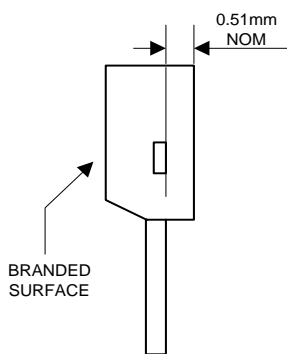


(2) SIP-3L

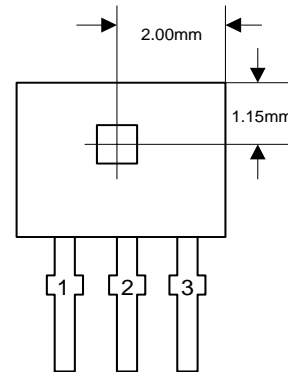


Package Information

(1) Package Type: SIP-3L for Bulk Pack

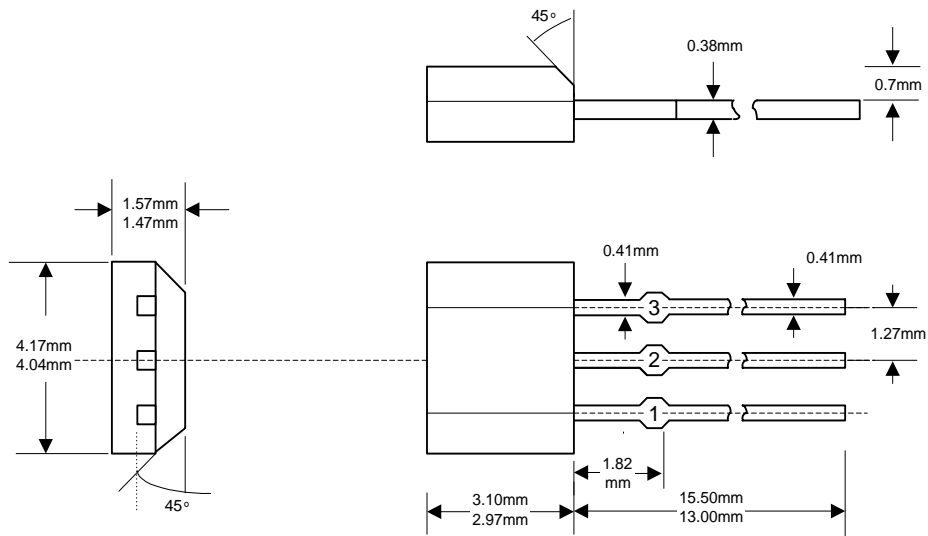


Active Area Depth



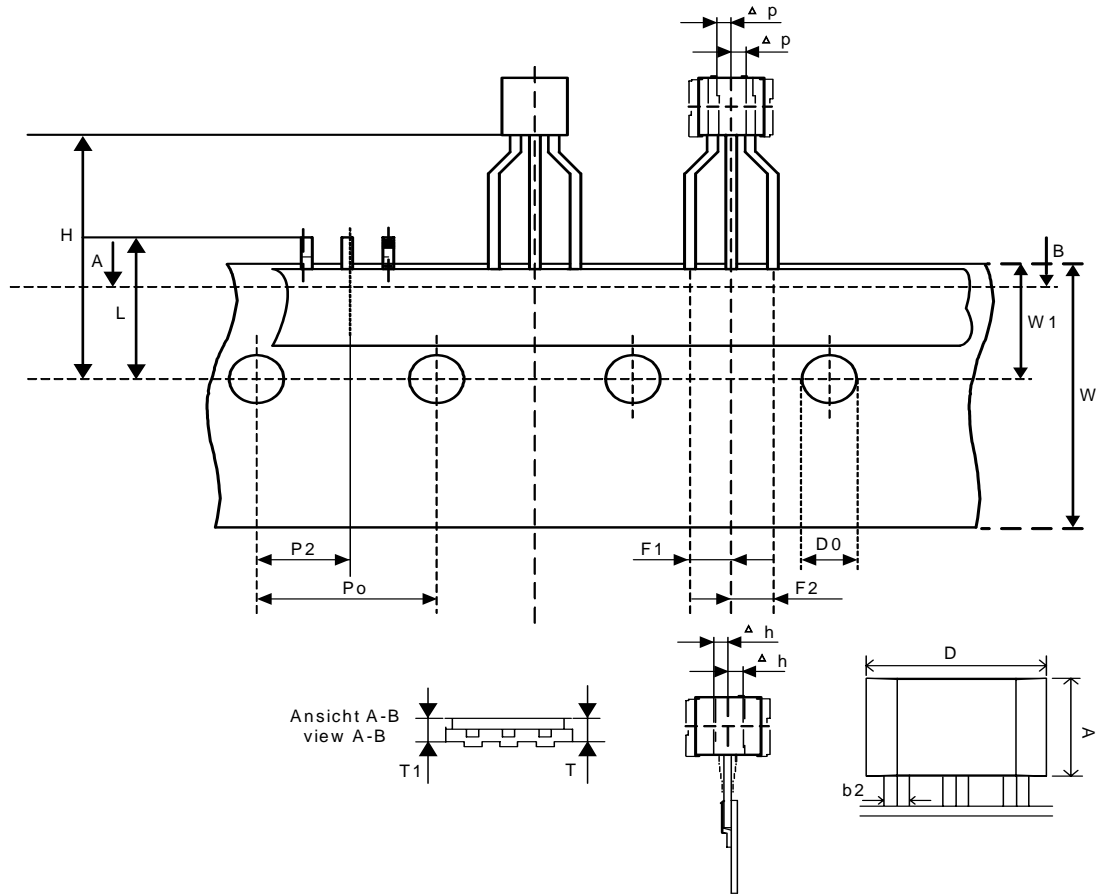
Sensor Location

Package Dimension



Package Information (Continued)

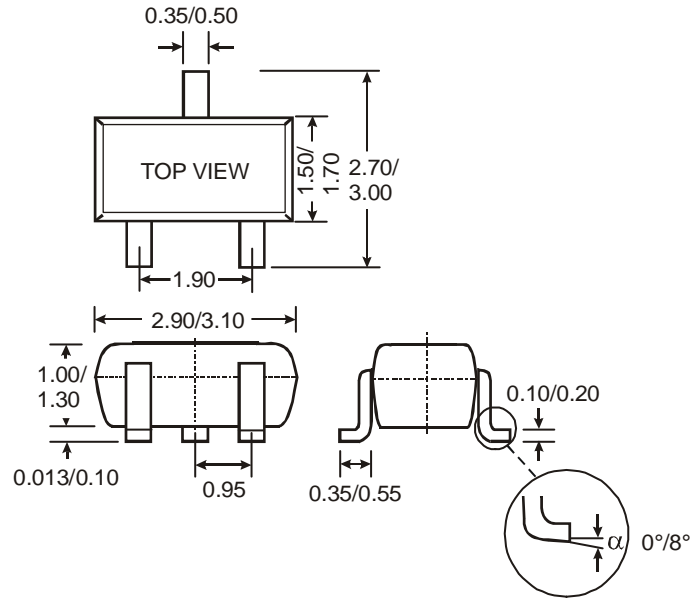
(2) Package Type: Spread leg SIP-3L for Ammo-Pack only



| Symbol | Dimensions in Millimeters | | | Dimensions in Inches | | |
|--------|---------------------------|------|------|----------------------|-------|-------|
| | Min. | Nom. | Max. | Min. | Nom. | Max. |
| A | 2.80 | 3.00 | 3.20 | 0.110 | 0.118 | 0.125 |
| D | 3.90 | 4.10 | 4.30 | 0.153 | 0.161 | 0.169 |
| b2 | 0.33 | 0.38 | 0.42 | 0.012 | 0.014 | 0.016 |
| D0 | 3.80 | 4.00 | 4.20 | 0.149 | 0.157 | 0.165 |
| F1 | 2.35 | 2.55 | 2.75 | 0.092 | 0.100 | 0.108 |
| F2 | 2.45 | 2.55 | 2.85 | 0.096 | 0.100 | 0.112 |
| H | - | - | 20 | - | - | 0.787 |
| Δh | - | - | 1 | - | - | 0.039 |
| L | - | - | 11 | - | - | 0.433 |
| P0 | 12.2 | 12.7 | 13.2 | 0.480 | 0.5 | 0.519 |
| P2 | 5.95 | 6.35 | 6.75 | 0.234 | 0.25 | 0.265 |
| Δp | - | - | 1 | - | - | 0.039 |
| T | - | - | 0.55 | - | - | 0.021 |
| T1 | - | - | 1.42 | - | - | 0.055 |
| W | 17.5 | 18.0 | 18.5 | 0.688 | 0.708 | 0.728 |
| W1 | 5.5 | 6.0 | 6.5 | 0.216 | 0.236 | 0.255 |

Package Information (Continued)

(3) Package Type: SC59



IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.