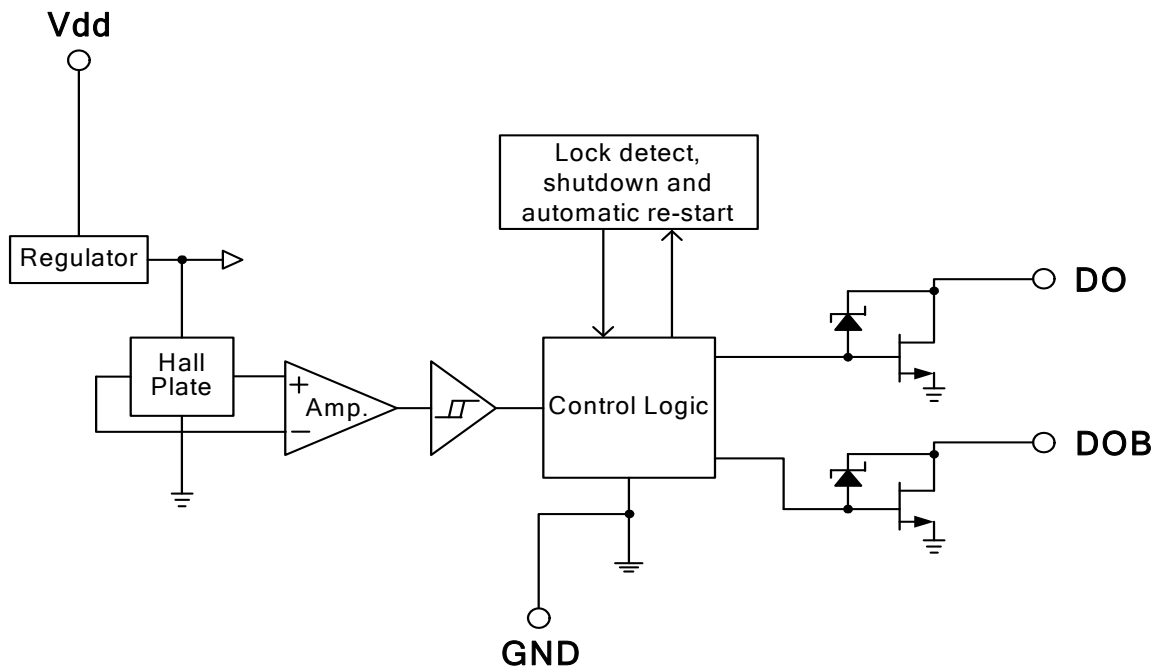




**Pin Descriptions**

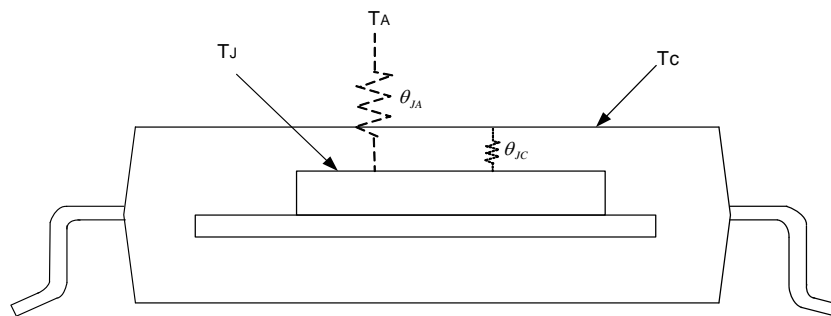
| Pin Name | Description   |
|----------|---------------|
| Vdd      | Input Power   |
| DO       | Output Pin    |
| DOB      | Output Pin    |
| GND      | Ground        |
| NC       | Not Connected |

**Functional Block Diagram**



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

| Symbol          | Characteristics                              |                       | Rating    | Unit |    |
|-----------------|----------------------------------------------|-----------------------|-----------|------|----|
| V <sub>dd</sub> | Supply Voltage                               |                       | 24        | V    |    |
| I <sub>O</sub>  | Output Current                               | I <sub>O (AVE)</sub>  | SIP-4L    | 500  | mA |
|                 |                                              |                       | SOT89-5L  | 500  | mA |
|                 |                                              | I <sub>O (PEAK)</sub> |           | 700  | mA |
| P <sub>D</sub>  | Power Dissipation                            | SIP-4L                | 550       | mW   |    |
|                 |                                              | SOT89-5L              | 800       | mW   |    |
| T <sub>ST</sub> | Storage Temperature                          |                       | -55 ~ 150 | °C   |    |
| T <sub>J</sub>  | Maximum Junction Temperature                 |                       | 150       | °C   |    |
| θ <sub>JA</sub> | Thermal Resistance Junction to Case (Note 2) | SIP-4L                | 227       | °C/W |    |
|                 |                                              | SOT89-5L              | 156       | °C/W |    |



Notes: 2. θ<sub>JA</sub> should be confirmed with heat sink thermal resistance. If there is no heat sink contact, θ<sub>JA</sub> will almost be the same as θ<sub>JC</sub>.

**Recommended Operating Conditions**

| Symbol          | Characteristic                | Conditions | Min | Max | Unit |
|-----------------|-------------------------------|------------|-----|-----|------|
| V <sub>dd</sub> | Supply Voltage                | Operating  | 3.8 | 20  | V    |
| T <sub>A</sub>  | Operating Ambient Temperature | Operating  | -40 | 100 | °C   |

**Electrical Characteristics ( $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{DD} = 12\text{V}$ , unless otherwise specified)**

| Symbol         | Characteristics                | Conditions             | Min | Typ.  | Max  | Unit          |
|----------------|--------------------------------|------------------------|-----|-------|------|---------------|
| $I_{DD}$       | Supply Current                 | Operating              | -   | 2.0   | 4.0  | mA            |
| $I_{OFF}$      | Output Leakage Current         | $V_{OUT} = 24\text{V}$ | -   | < 0.1 | 10   | $\mu\text{A}$ |
| $T_{RLP-ON}$   | Rotor Lock Protection On Time  |                        | 0.4 | 0.5   | 0.6  | Sec           |
| $T_{RLP-OFF}$  | Rotor Lock Protection Off Time |                        | 2.4 | 3     | 3.6  | Sec           |
| $V_{OUT(SAT)}$ | Output Saturation Voltage      | $I_O = 300\text{mA}$   | -   | 375   | 500  | mV            |
|                |                                | $I_O = 500\text{mA}$   | -   | 625   | 900  |               |
| $R_{DS(ON)}$   | Output On Resistance           | $I_O = 300\text{mA}$   | -   | 1.25  | 1.67 | ohm           |
| $V_Z$          | Output Zener-Breakdown Voltage |                        | 35  | 42    | 60   | V             |

**Truth Table**

| IN- | IN+ | CT | OUT1 | OUT2 | Mode                        |
|-----|-----|----|------|------|-----------------------------|
| H   | L   | L  | H    | L    | Rotating                    |
| L   | H   | L  | L    | H    | Rotating                    |
| -   | -   | H  | off  | off  | Lockup protection activated |

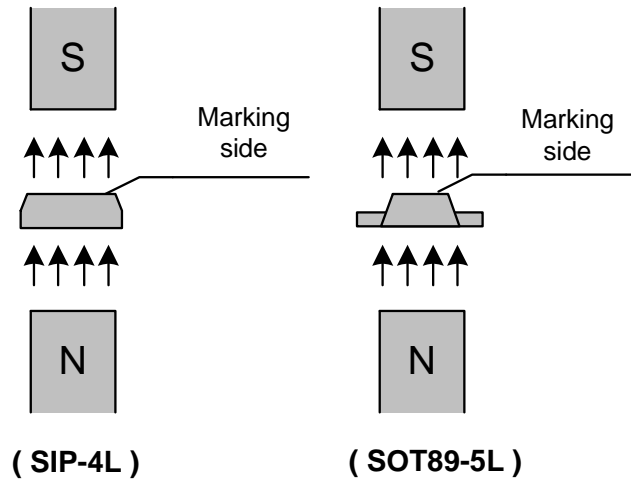
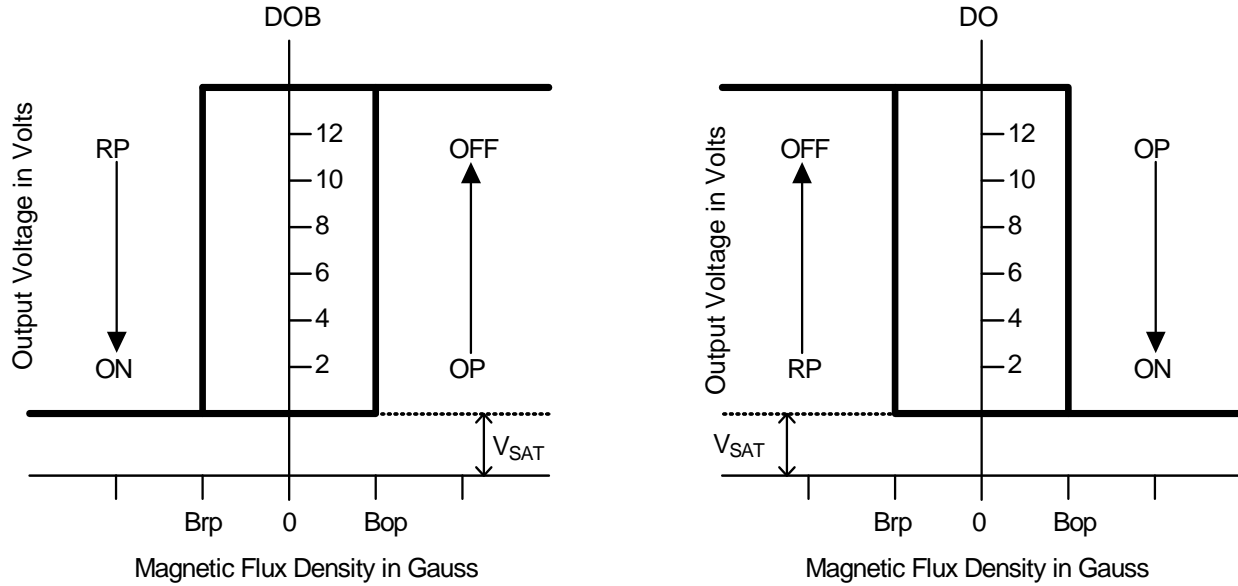
**Magnetic Characteristics ( $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{DD} = 12\text{V}$ , unless otherwise specified, Note 3)**

(1mT = 10 Gauss)

| Symbol | Characteristics | Min | Typ. | Max | Unit  |
|--------|-----------------|-----|------|-----|-------|
| Bop    | Operation Point | 10  | 30   | 60  | Gauss |
| Brp    | Release Point   | -60 | -30  | -10 | Gauss |
| Bhy    | Hysteresis      | -   | 60   | -   | Gauss |

Notes: 3. The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

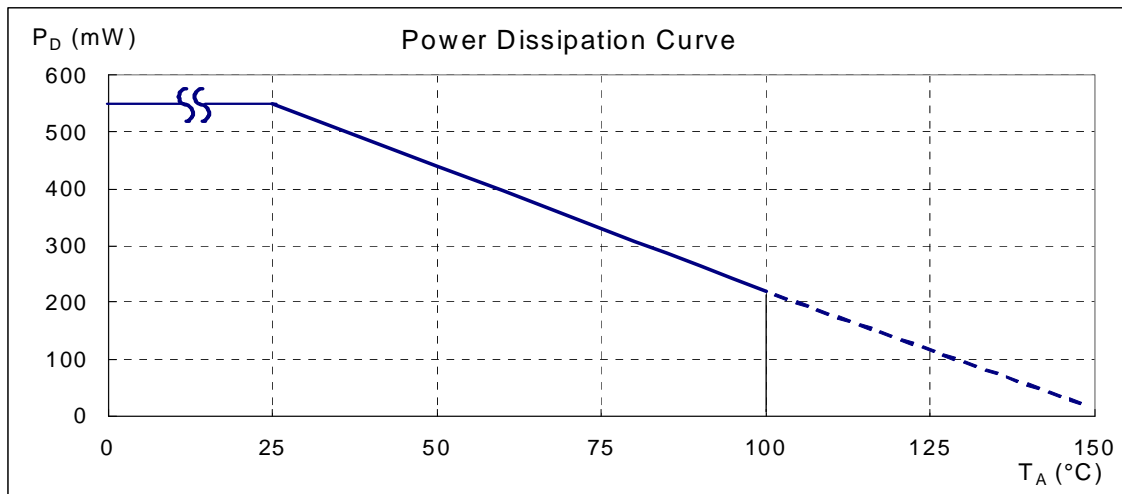
**Operating Characteristics**



**Performance Characteristics**

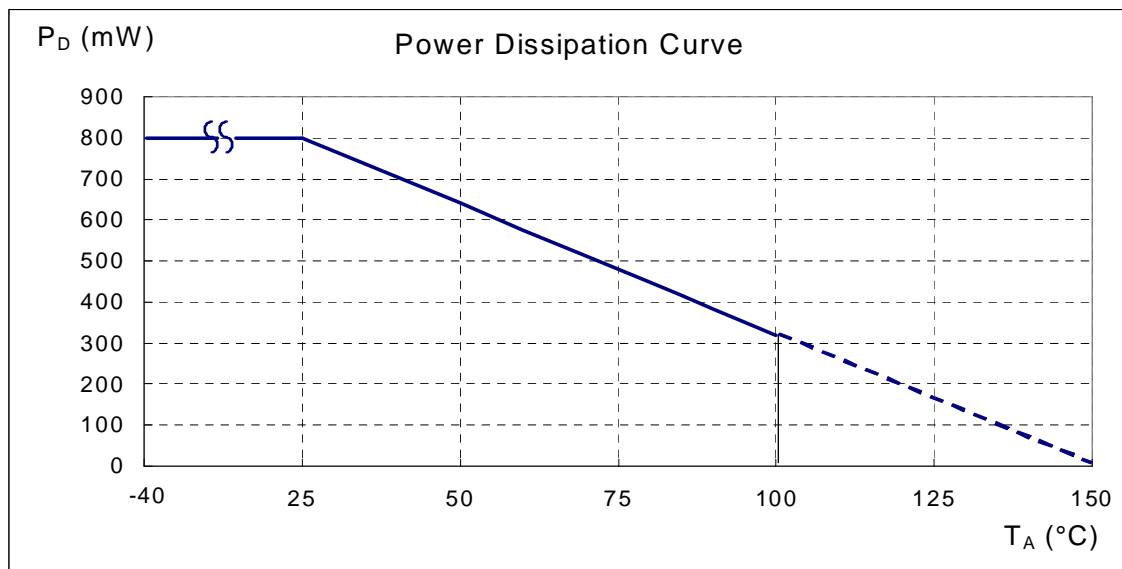
**(1) SIP-4L**

|                           |            |            |            |            |            |            |            |            |            |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>T<sub>A</sub> (°C)</b> | <b>25</b>  | <b>50</b>  | <b>60</b>  | <b>70</b>  | <b>80</b>  | <b>85</b>  | <b>90</b>  | <b>95</b>  | <b>100</b> |
| P <sub>D</sub> (mW)       | 550        | 440        | 396        | 352        | 308        | 286        | 264        | 242        | 220        |
| <b>T<sub>A</sub> (°C)</b> | <b>105</b> | <b>110</b> | <b>115</b> | <b>120</b> | <b>125</b> | <b>130</b> | <b>135</b> | <b>140</b> | <b>150</b> |
| P <sub>D</sub> (mW)       | 198        | 176        | 154        | 132        | 110        | 88         | 66         | 44         | 0          |

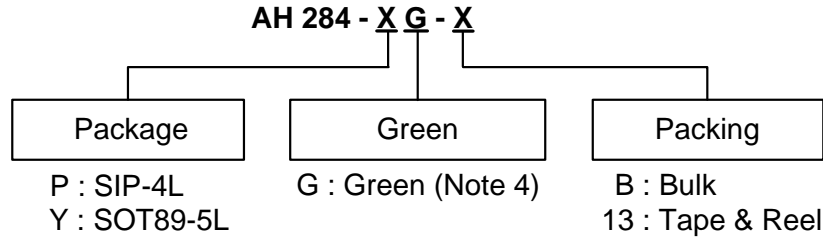


**(2) SOT89-5L**

|                           |            |            |            |            |            |            |            |            |            |            |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>T<sub>A</sub> (°C)</b> | <b>25</b>  | <b>50</b>  | <b>60</b>  | <b>70</b>  | <b>75</b>  | <b>80</b>  | <b>85</b>  | <b>90</b>  | <b>95</b>  | <b>100</b> |
| P <sub>D</sub> (mW)       | 800        | 640        | 576        | 512        | 480        | 448        | 416        | 384        | 352        | 320        |
| <b>T<sub>A</sub> (°C)</b> | <b>105</b> | <b>110</b> | <b>115</b> | <b>120</b> | <b>125</b> | <b>130</b> | <b>135</b> | <b>140</b> | <b>145</b> | <b>150</b> |
| P <sub>D</sub> (mW)       | 288        | 256        | 224        | 192        | 160        | 128        | 96         | 64         | 32         | 0          |



### Ordering Information

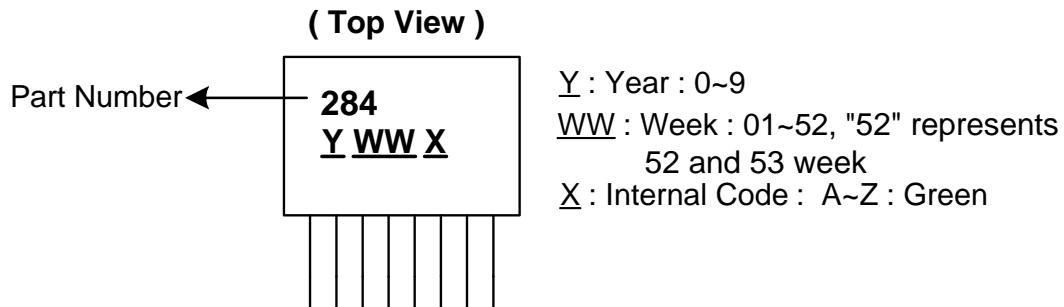


| Device      | Package Code | Packaging (Note 5, 6) | Bulk     |                    | 13" Tape and Reel |                    |
|-------------|--------------|-----------------------|----------|--------------------|-------------------|--------------------|
|             |              |                       | Quantity | Part Number Suffix | Quantity          | Part Number Suffix |
| AH284-PG-B  | P            | SIP-4L                | 1000     | -B                 | NA                | NA                 |
| AH284-YG-13 | Y            | SOT89-5L              | NA       | NA                 | 2500/Tape & Reel  | -13                |

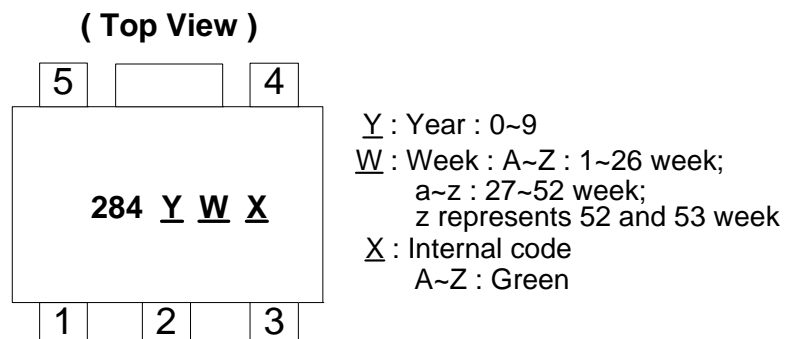
- Notes:
4. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/products/lead\\_free.html](http://www.diodes.com/products/lead_free.html).
  5. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  6. Reverse taping as shown on Diodes Inc. Surface Mount (SMD) Packaging document AP02007, which can be found on our website <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information

#### (1) SIP-4L



#### (2) SOT89-5L

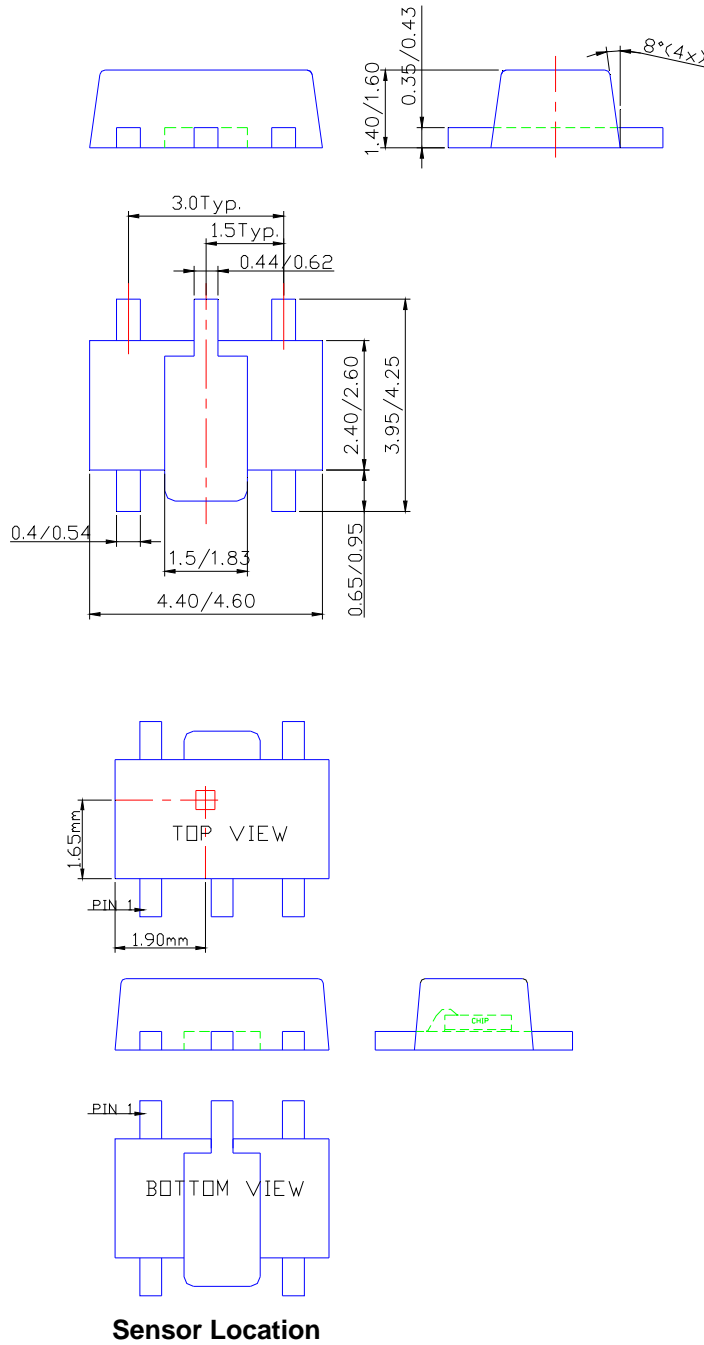






**Package Outline Dimensions (Continued)**

**(2) Package type: SOT89-5L**



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