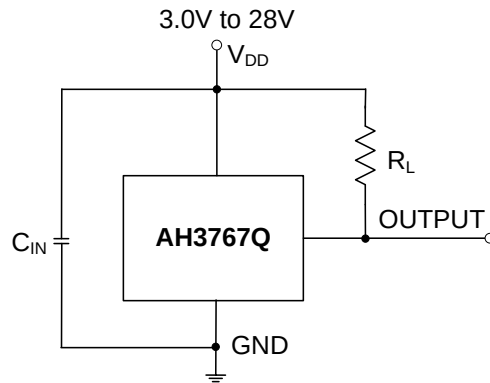


## Typical Applications Circuit



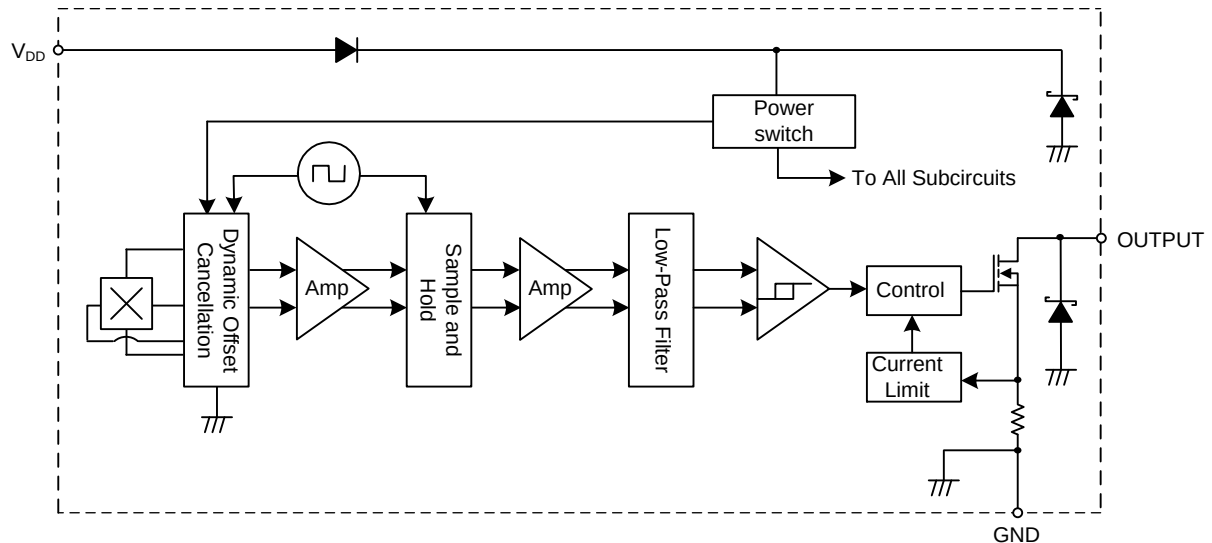
Note: 4.  $C_{IN}$  is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF ~ 100nF.  $R_L$  is the pull-up resistor.

## Pin Descriptions

Package: SOT23 and SIP-3

| Pin Number | Pin Name | Function           |
|------------|----------|--------------------|
| 1          | $V_{DD}$ | Power Supply Input |
| 2          | GND      | Ground             |
| 3          | OUTPUT   | Output Pin         |

## Functional Block Diagram



## Absolute Maximum Ratings (Notes 5 & 6) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol               | Characteristic                                                 | Value       | Unit |
|----------------------|----------------------------------------------------------------|-------------|------|
| V <sub>DD</sub>      | Supply Voltage (Note 6)                                        | 32          | V    |
| V <sub>DDR</sub>     | Reverse Supply Voltage (Note 6)                                | -32         | V    |
| V <sub>OUT_MAX</sub> | Output Off Voltage (Note 6)                                    | 32          | V    |
| I <sub>OUT</sub>     | Continuous Output Current                                      | 60          | mA   |
| I <sub>OUT_R</sub>   | Reverse Output Current                                         | -50         | mA   |
| B                    | Magnetic Flux Density                                          | Unlimited   |      |
| P <sub>D</sub>       | Package Power Dissipation                                      | SIP-3       | mW   |
|                      |                                                                | SOT23       |      |
| T <sub>S</sub>       | Storage Temperature Range                                      | -65 to +165 | °C   |
| T <sub>J</sub>       | Maximum Junction Temperature                                   | +150        | °C   |
| ESD HBM              | Electrostatic Discharge Withstand - Human Body Model (HBM)     | 8           | kV   |
| ESD MM               | Electrostatic Discharge Withstand - Machine Model (MM)         | 800         | V    |
| ESD CDM              | Electrostatic Discharge Withstand - Charged Device Model (CDM) | 2           | kV   |

- Notes:
- Stresses greater than the 'Absolute Maximum Ratings' specified above may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions exceeding those indicated in this specification is not implied. Device reliability may be affected by exposure to absolute maximum rating conditions for extended periods of time.
  - The absolute maximum V<sub>DD</sub> of 32V is a transient stress rating and is not meant as a functional operating condition. It is not recommended to operate the device at the absolute maximum rated conditions for any period of time.

## Recommended Operating Conditions (@T<sub>A</sub> = -40°C to +150°C, unless otherwise specified.)

| Symbol          | Parameter                   | Conditions | Rating      | Unit |
|-----------------|-----------------------------|------------|-------------|------|
| V <sub>DD</sub> | Supply Voltage              | Operating  | 3.0 to 28   | V    |
| T <sub>A</sub>  | Operating Temperature Range | Operating  | -40 to +150 | °C   |

## Electrical Characteristics (Notes 7 & 8) (@T<sub>A</sub> = -40°C to +150°C, V<sub>DD</sub> = 3V to 28V, unless otherwise specified.)

| Symbol              | Parameter                                                                                          | Conditions                                               | Min | Typ  | Max   | Unit |
|---------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----|------|-------|------|
| V <sub>OUT_ON</sub> | Output On Voltage                                                                                  | I <sub>OUT</sub> = 20mA, B > B <sub>op</sub>             | -   | 0.2  | 0.4   | V    |
| I <sub>LKG</sub>    | Output Leakage Current (when output is off)                                                        | V <sub>OUT</sub> = 28V, B < B <sub>rp</sub> , Output off | -   | <0.1 | 10    | μA   |
| I <sub>DD</sub>     | Supply Current                                                                                     | Output open, T <sub>A</sub> = +25°C                      | -   | 3    | 3.5   | mA   |
|                     |                                                                                                    | Output open, T <sub>A</sub> = -40°C to +150°C            | -   | -    | 4     | mA   |
| I <sub>DD_R</sub>   | Reverse Supply Current                                                                             | V <sub>DD</sub> = -18V, T <sub>A</sub> = +25°C           | -   | 0.6  | -     | μA   |
|                     |                                                                                                    | V <sub>DD</sub> = -18V, T <sub>A</sub> = -40°C to +150°C | -   | 0.6  | 1,500 | μA   |
|                     |                                                                                                    | V <sub>DD</sub> = -28V, T <sub>A</sub> = +25°C           | -   | 1.6  | -     | μA   |
|                     |                                                                                                    | V <sub>DD</sub> = -28V, T <sub>A</sub> = -40°C to +150°C | -   | 1.6  | 2,500 | μA   |
| t <sub>P_ON</sub>   | Device Power-On Time (start-up time)                                                               | V <sub>DD</sub> ≥ 3V, B > B <sub>op</sub> (Note 7)       | -   | 10   | -     | μs   |
| f <sub>c</sub>      | Chopping Frequency                                                                                 | V <sub>DD</sub> ≥ 3V                                     | -   | 800  | -     | kHz  |
| t <sub>d</sub>      | Response Time Delay (time from magnetic threshold reached to the start of the output rise or fall) | (Note 9)                                                 | -   | 3.75 | -     | μs   |
| t <sub>r</sub>      | Output Rising Time (external pull-up resistor R <sub>L</sub> and load capacitance dependent)       | R <sub>L</sub> = 1kΩ, C <sub>L</sub> = 20pF              | -   | 0.2  | 1     | μs   |
| t <sub>f</sub>      | Output Falling Time (Internal switch resistance and load capacitance dependent)                    | R <sub>L</sub> = 1kΩ, C <sub>L</sub> = 20pF              | -   | 0.1  | 1     | μs   |
| I <sub>OCL</sub>    | Output Current Limit                                                                               | B > B <sub>op</sub> , (Note 10)                          | 30  | -    | 55    | mA   |
| V <sub>Z</sub>      | Zener Clamp Voltage                                                                                | I <sub>DD</sub> = 5mA                                    | 28  | -    | -     | V    |

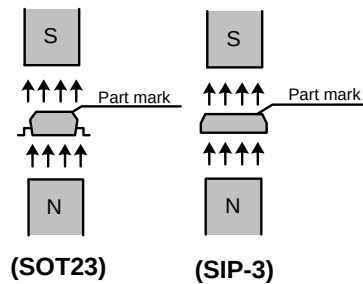
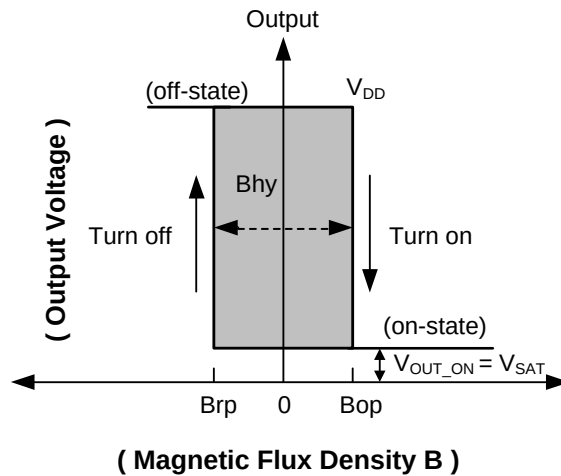
- Notes:
- When power is initially turned on, V<sub>DD</sub> must be within its correct operating range (3.0V to 28V) to guarantee the output sampling. The output state is valid after the start-up time of 10μs typical from the operating voltage reaching 3V.
  - Typical values are defined at T<sub>A</sub> = +25°C, V<sub>DD</sub> = 12V. Maximum and minimum values over the operating temperature range is not tested in production but guaranteed by design, process control and characterization.
  - Guaranteed by design, process control and characterization. Not tested in production.
  - The device will limit the output current I<sub>OUT</sub> to current limit of I<sub>OCL</sub>.

**Magnetic Characteristics** (Notes 11 &12) ( $T_A = -40^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ ,  $V_{DD} = 3.0\text{V}$  to  $28\text{V}$ , unless otherwise specified)

(1mT=10 Gauss)

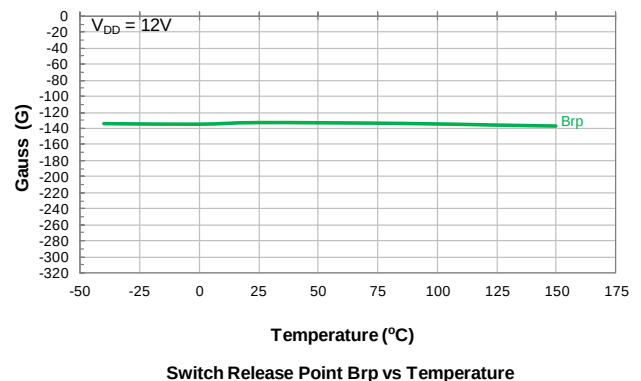
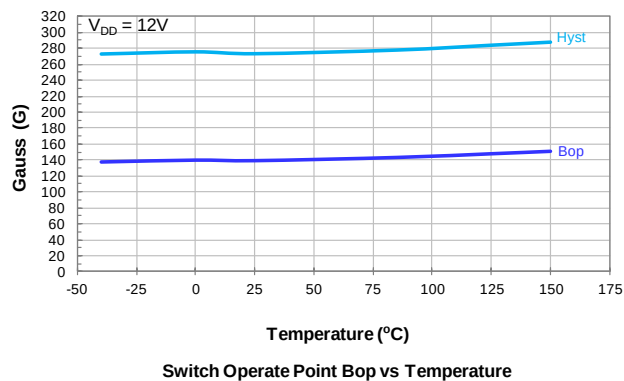
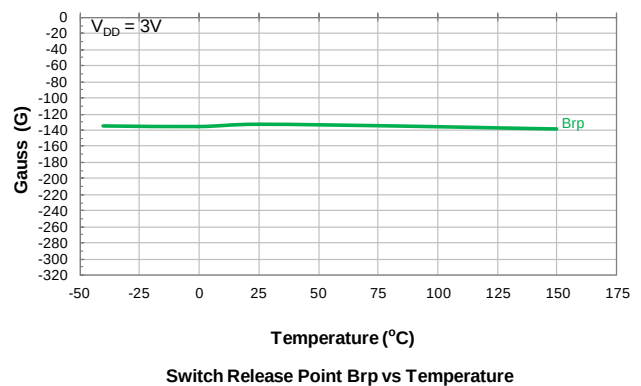
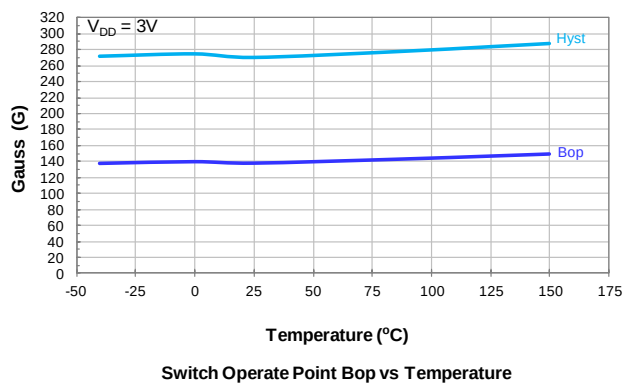
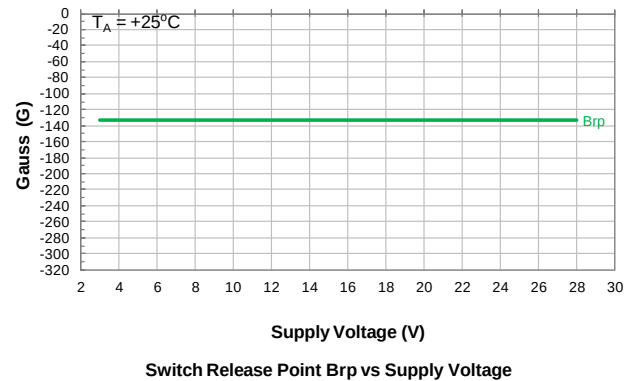
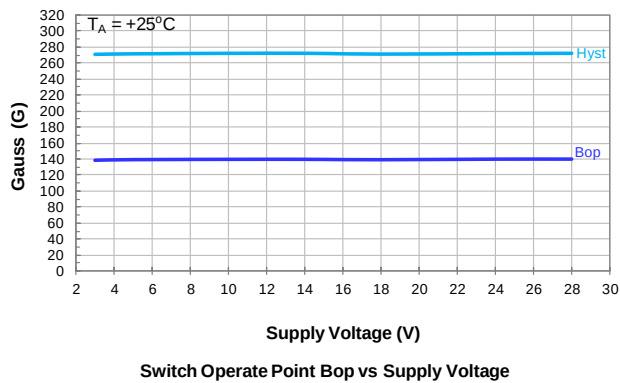
| Symbol                                                                   | Parameter            | Conditions                                            | Min  | Typ  | Max  | Unit  |
|--------------------------------------------------------------------------|----------------------|-------------------------------------------------------|------|------|------|-------|
| $B_{ops}$ (South pole to part marking side for SOT23 and SIP-3 packages) | Operation Point      | $V_{DD} = 12\text{V}$ , $T_A = +25^{\circ}\text{C}$   | -    | 140  | -    | Gauss |
|                                                                          |                      | $T_A = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$ | 110  | 140  | 170  |       |
| $B_{rps}$ (North pole to part marking side for SOT23 and SIP-3 packages) | Release Point        | $V_{DD} = 12\text{V}$ , $T_A = +25^{\circ}\text{C}$   | -    | -140 | -    |       |
|                                                                          |                      | $T_A = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$ | -170 | -140 | -110 |       |
| $B_{hy}$ ( $ B_{opx}  -  B_{rpx} $ )                                     | Hysteresis (Note 13) | $V_{DD} = 12\text{V}$ , $T_A = +25^{\circ}\text{C}$   | -    | 280  | -    |       |
|                                                                          |                      | $T_A = -40^{\circ}\text{C}$ to $+150^{\circ}\text{C}$ | 220  | 280  | 340  |       |

- Notes:
- When power is initially turned on,  $V_{DD}$  must be within its correct operating range ( $3.0\text{V}$  to  $28\text{V}$ ) to guarantee the output sampling. The output state is valid after the start-up time of  $10\mu\text{s}$  typical from the operating voltage reaching  $3\text{V}$ .
  - Typical values are defined at  $T_A = +25^{\circ}\text{C}$ ,  $V_{DD} = 12\text{V}$ . Maximum and minimum values over the operating temperature range is not tested in production but guaranteed by design, process control and characterization.
  - Maximum and minimum hysteresis is guaranteed by design, process control and characterization.



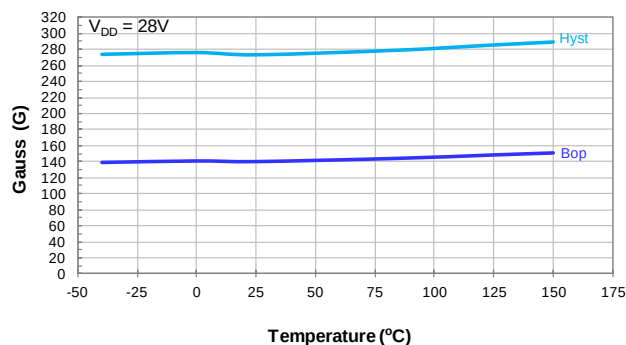
## Typical Operating Characteristics

### Output Switch Operate and Release Points (Magnetic Thresholds) – $B_{op}$ and $B_{rp}$

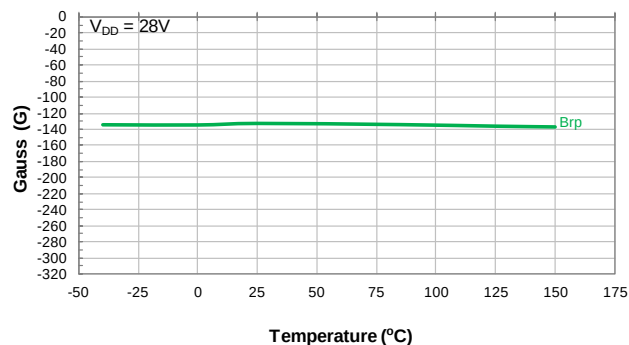


## Typical Operating Characteristics

### Output Switch Operate and Release Points (Magnetic Thresholds) – $B_{op}$ and $B_{rp}$ (cont.)

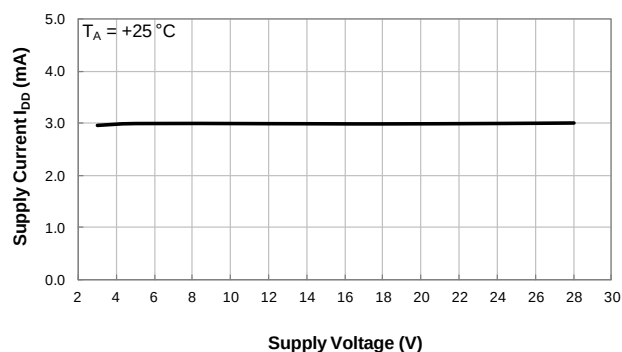


Switch Operate Point  $B_{op}$  vs Temperature

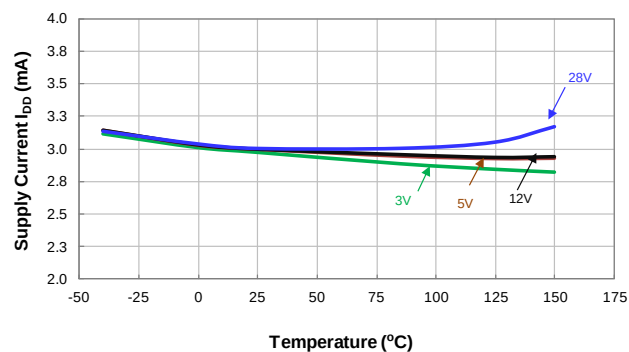


Switch Release Point  $B_{rp}$  vs Temperature

### Supply Current

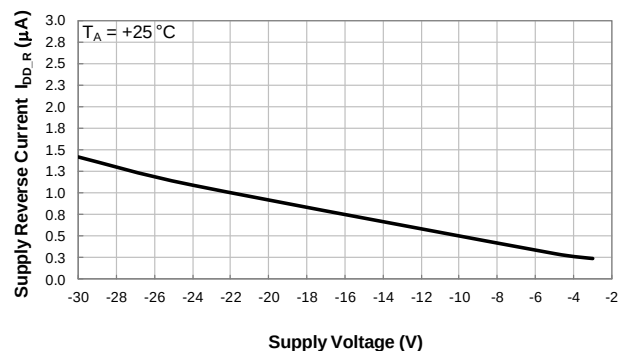


Supply Current vs Supply Voltage

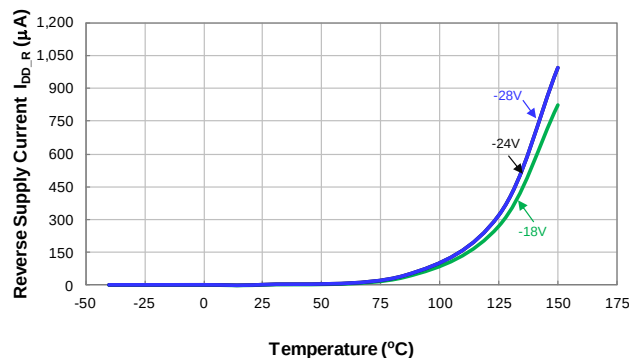


Supply Current vs Temperature

### Reverse Supply Current



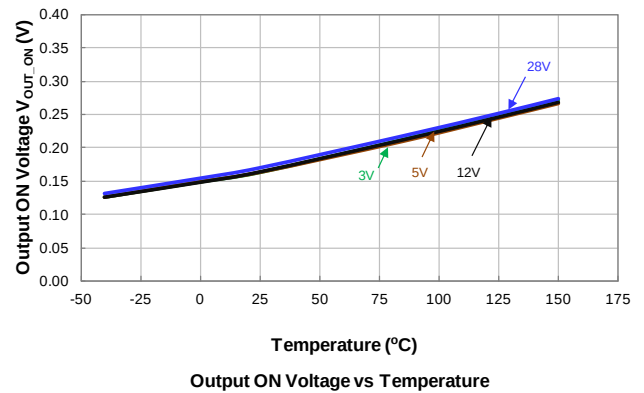
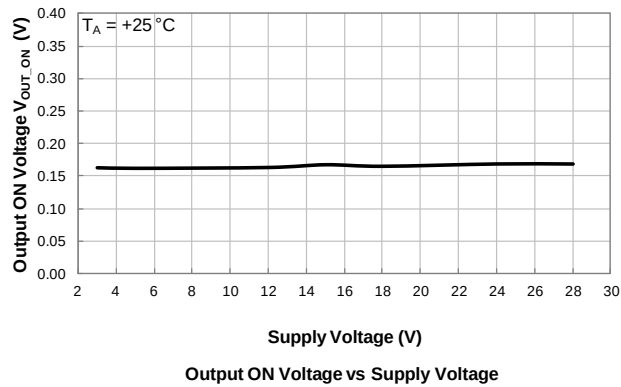
Reverse Supply Current vs Supply Voltage



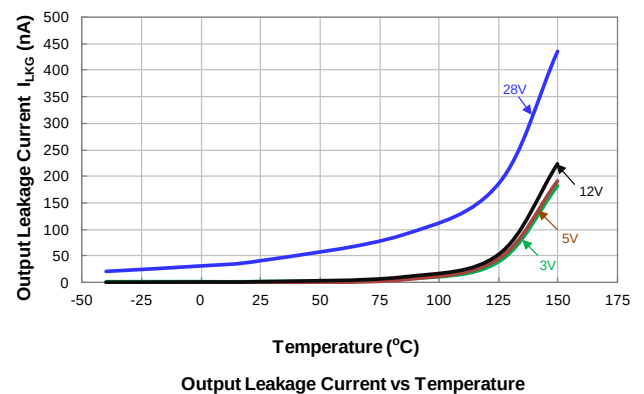
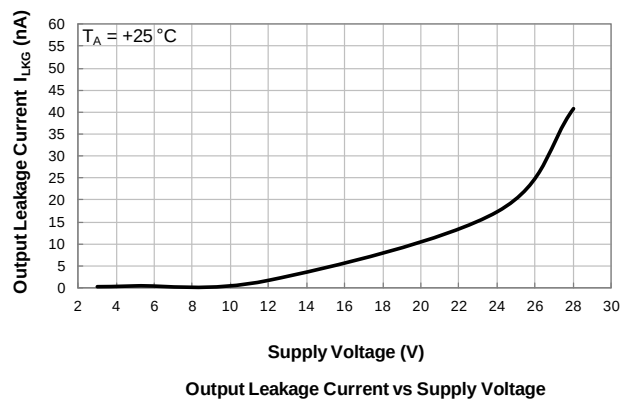
Reverse Supply Current vs Temperature

## Typical Operating Characteristics (cont.)

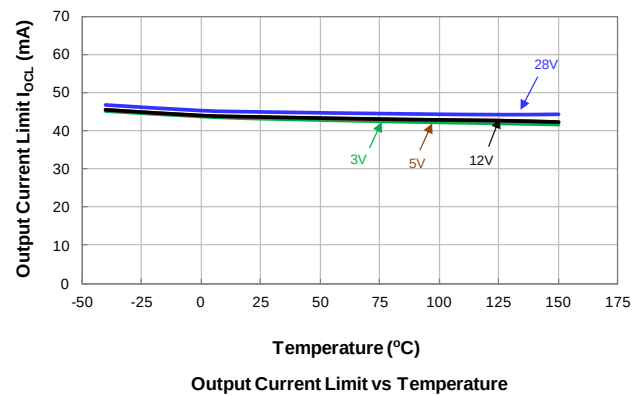
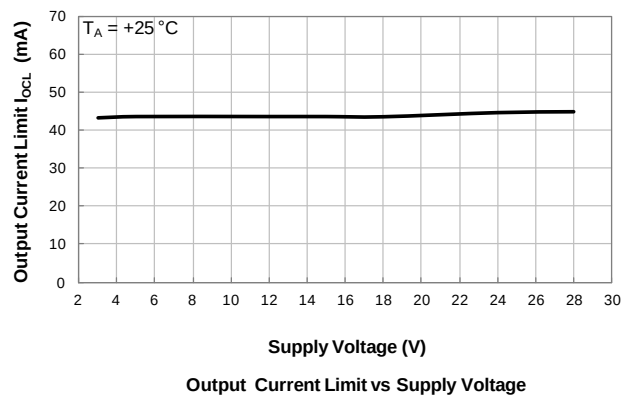
### Output Switch On Voltage



### Output Switch Leakage Current



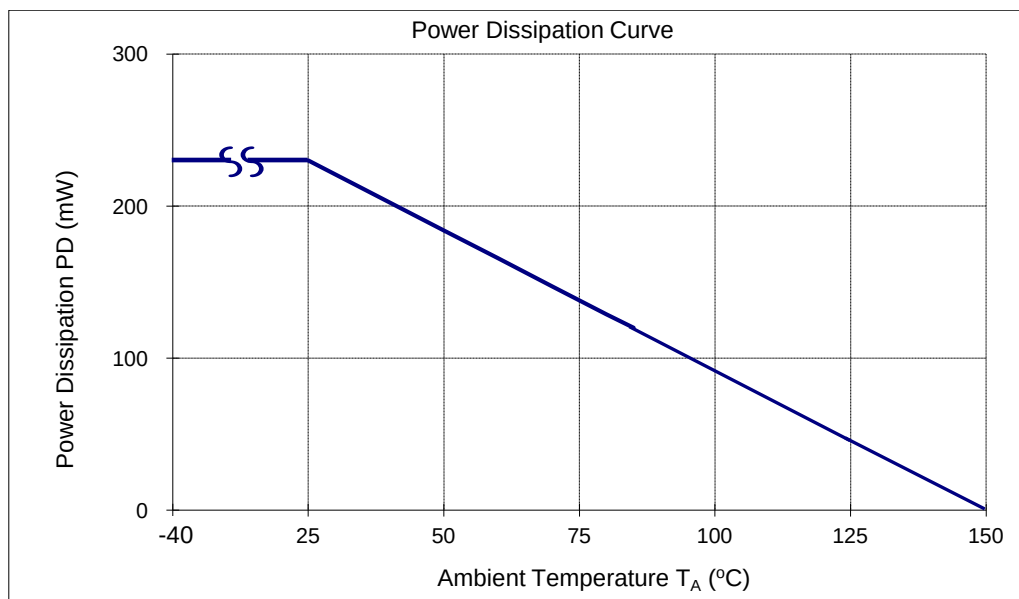
### Output Current Limit



## Thermal Performance Characteristics

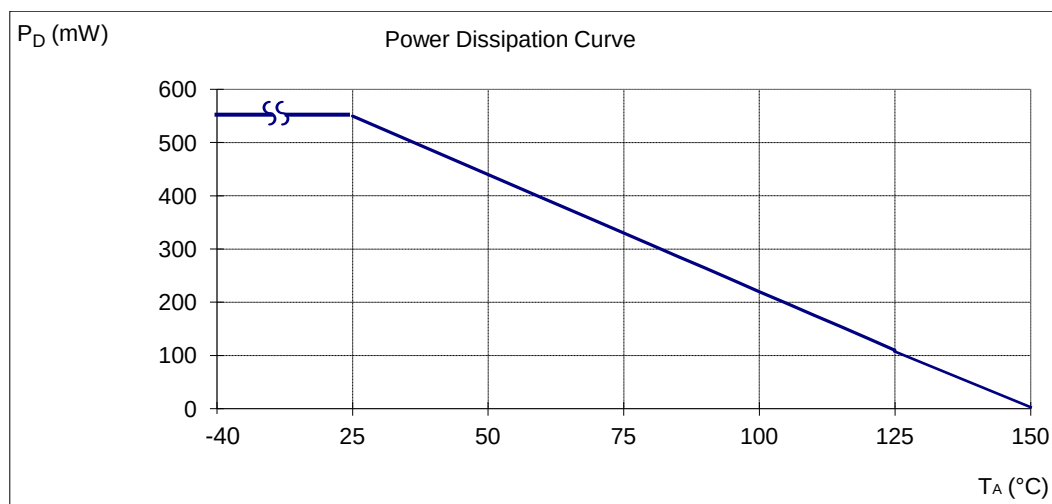
### (1) Package type: SOT23

| T <sub>A</sub> (°C) | 25  | 50  | 60  | 70  | 80  | 85  | 90  | 100 | 105 | 110 | 120 | 125 | 130 | 140 | 150 |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| P <sub>D</sub> (mW) | 230 | 184 | 166 | 147 | 129 | 120 | 110 | 92  | 83  | 74  | 55  | 46  | 37  | 18  | 0   |

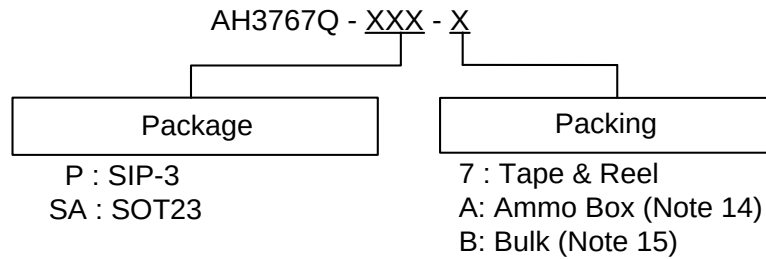


### (2) Package type: SIP-3

| T <sub>A</sub> (°C) | 25  | 50  | 60  | 70  | 80  | 85  | 90  | 100 | 105 | 110 | 120 | 125 | 130 | 140 | 150 |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| P <sub>D</sub> (mW) | 550 | 440 | 396 | 362 | 308 | 286 | 264 | 220 | 198 | 176 | 132 | 110 | 88  | 44  | 0   |



## Ordering Information

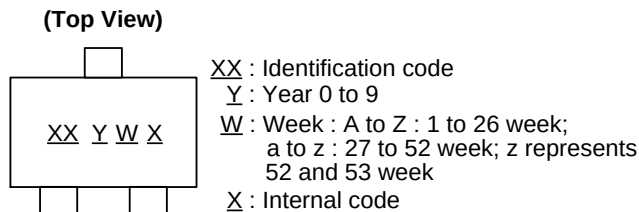


| Part Number  | Package Code | Packaging | Bulk     |                    | 7" Tape and Reel  |                    | Ammo Box  |                    |
|--------------|--------------|-----------|----------|--------------------|-------------------|--------------------|-----------|--------------------|
|              |              |           | Quantity | Part Number Suffix | Quantity          | Part Number Suffix | Quantity  | Part Number Suffix |
| AH3767Q-P-A  | P            | SIP-3     | NA       | NA                 | NA                | NA                 | 4,000/Box | -A                 |
| AH3767Q-P-B  | P            | SIP-3     | 1,000    | -B                 | NA                | NA                 | NA        | NA                 |
| AH3767Q-SA-7 | SA           | SOT23     | NA       | NA                 | 3,000/Tape & Reel | -7                 | NA        | NA                 |

Notes: 14. Ammo Box is for SIP-3 Spread Lead.  
15. Bulk is for SIP-3 Straight Lead.

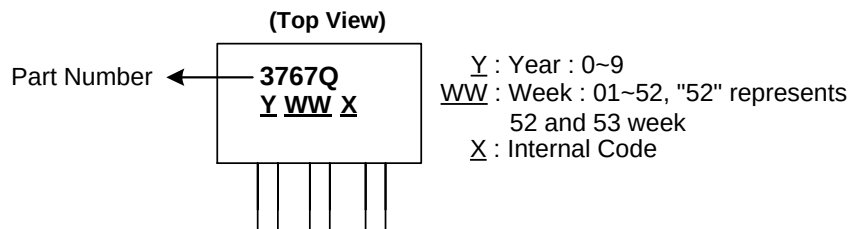
## Marking Information

### (1) Package Type: SOT23



| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH3767Q     | SOT23   | WS                  |

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



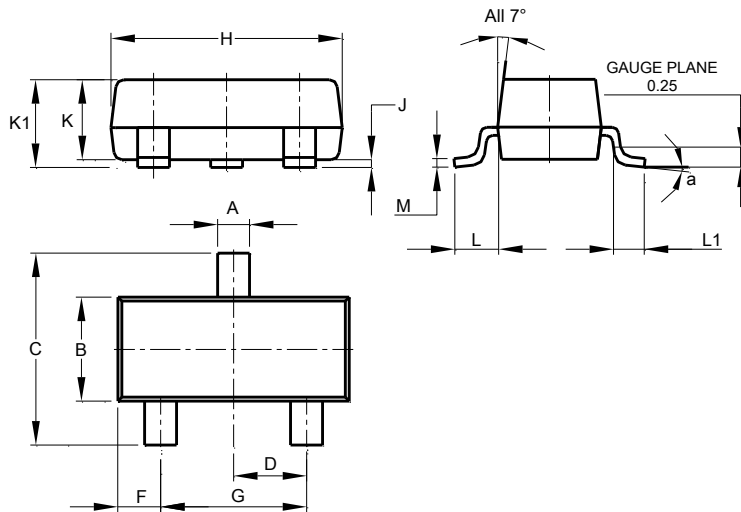
| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| AH3767Q     | SIP-3   | 3767Q               |



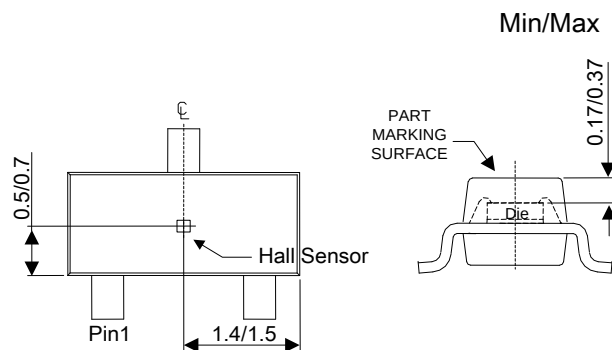
## Package Outline Dimensions (All dimensions in mm.)

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

### (1) Package Type: SOT23



| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| a                    | 8°    |       |       |
| All Dimensions in mm |       |       |       |



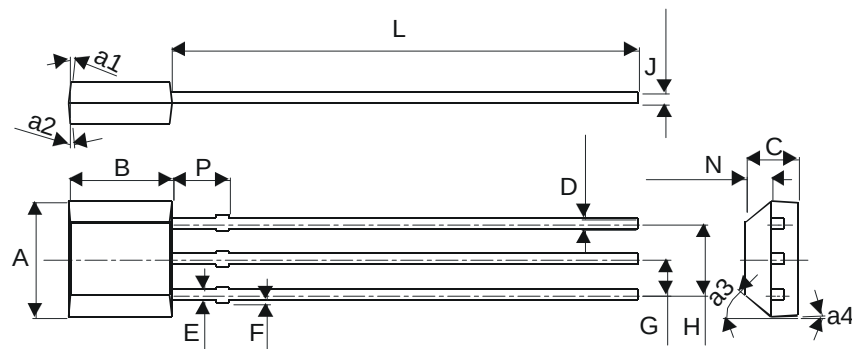
Sensor Location – To be updated

## Package Outline Dimensions (cont.) (All dimensions in mm.)

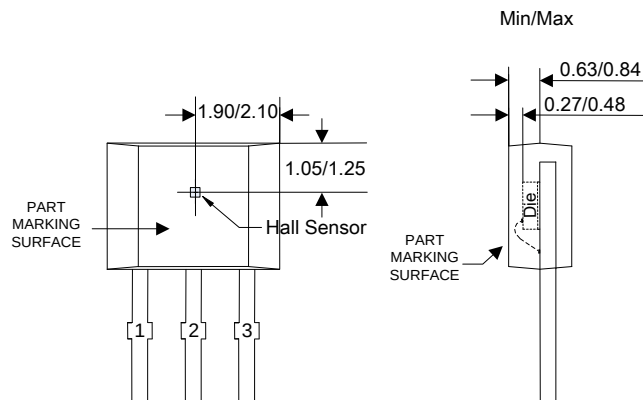
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

### (2) Package Type: SIP-3 Bulk

Sensor location to be added



| SIP-3 (Bulk)         |         |       |
|----------------------|---------|-------|
| 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 |         |       |

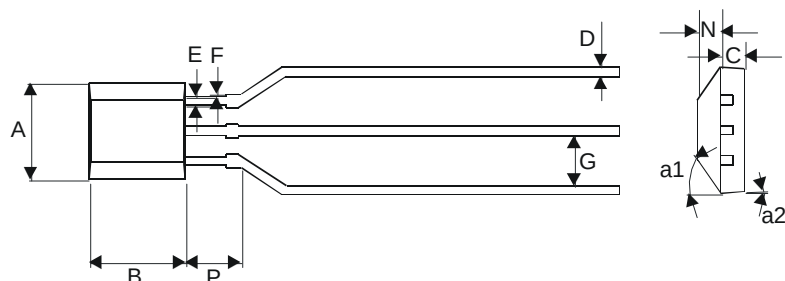


Sensor Location – To be updated

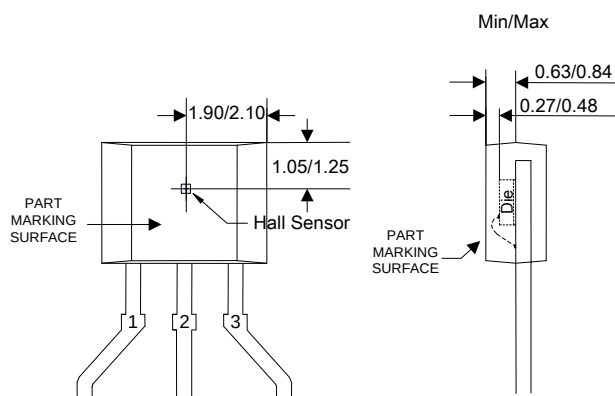
## Package Outline Dimensions (cont.) (All dimensions in mm.)

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

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



| SIP-3 (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 |         |      |

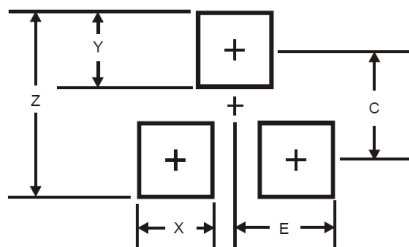


Sensor Location – To be updated

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

### (1) Package Type: SOT23



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

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