

Description

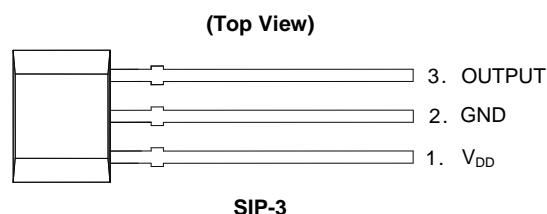
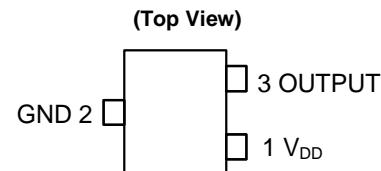
The AH3767Q is an AEC-Q100 qualified high-voltage, low-sensitivity Hall-Effect latch IC designed for brushless DC-motor commutation, speed measurement, angular or linear encoders and position sensors in automotive applications. To support a wide range of demanding applications, the design is optimized to operate over the supply range of 3.0V to 28V. With chopper stabilized architecture and an internal bandgap regulator to provide temperature compensated supply for internal circuits, the AH3767Q provides a reliable solution over the whole operating range. For robustness and protection, the device has a reverse blocking diode with a Zener clamp on the supply. The output has an over current limit and a Zener clamp.

The single, open-drain output can be switched on with South pole of sufficient strength and switched off with North pole of sufficient strength. When the magnetic flux density (B) perpendicular to the package is larger than the operate point (B_{op}) the output is switched on (pulled low). The output is held latched until magnetic flux density reverses and becomes lower than the release point (B_{rp}).

Features

- Bipolar Latch Operation (South Pole: On, North Pole: off)
- High Sensitivity: B_{op} and B_{rp} of +140G and -140G Typical
- Single Open-Drain Output with Overcurrent Limit
- 3.0V to 28V Operating Voltage Range
- Chopper Stabilized Design Provides
 - Superior Temperature Stability
 - Minimal Switch Point Drift
 - Enhanced Immunity to Stress
- Good RF Noise Immunity
- Reverse Blocking Diode
- Zener Clamp on Supply and Output Pins
- -40°C to +150°C Operating Temperature
- ESD: HBM >8kV, CDM: >2kV
- AEC-Q100 Grade 0 Qualified
- Industry Standard SOT23 and SIP-3 Packages
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Pin Assignments



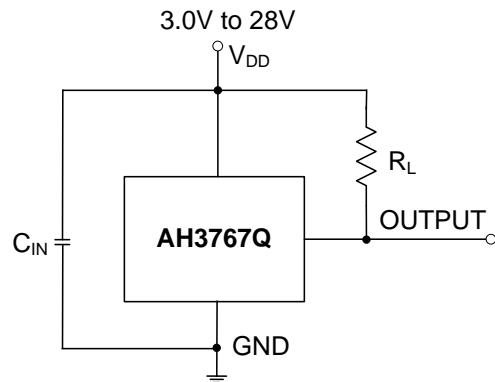
Applications

- Brushless DC-Motor Commutation
- Revolution Per Minute (RPM) Measurement
- Angular and Linear Encoder and Position Sensing and Indexing
- Flow Meters
- Contactless Commutation, Speed Measurement and Angular Position Sensing/Indexing in Automotive Applications

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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.

Typical Applications Circuit



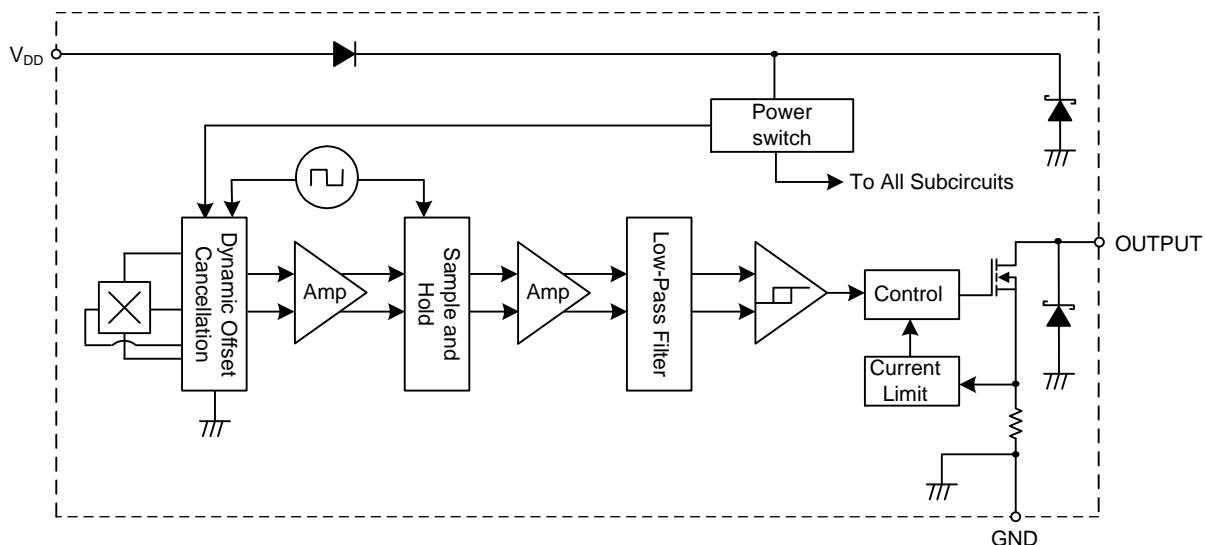
Note: 4. C_{IN} is for power stabilization and to strengthen the noise immunity, the recommended capacitance is $10nF \sim 100nF$. R_L is the pull-up resistor.

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) (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Symbol	Characteristic		Value	Unit
V_{DD}	Supply Voltage (Note 6)		32	V
V_{DDR}	Reverse Supply Voltage (Note 6)		-32	V
V_{OUT_MAX}	Output Off Voltage (Note 6)		32	V
I_{OUT}	Continuous Output Current		60	mA
I_{OUT_R}	Reverse Output Current		-50	mA
B	Magnetic Flux Density		Unlimited	
P_D	Package Power Dissipation	SIP-3	550	mW
		SOT23	230	
T_S	Storage Temperature Range		-65 to +165	°C
T_J	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:
- 5. 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.
 - 6. The absolute maximum V_{DD} 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 (@ $T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$, unless otherwise specified.)

Symbol	Parameter	Conditions	Rating	Unit
V_{DD}	Supply Voltage	Operating	3.0 to 28	V
T_A	Operating Temperature Range	Operating	-40 to +150	°C

Electrical Characteristics (Notes 7 & 8) (@ $T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$, $V_{DD} = 3\text{V}$ to 28V , unless otherwise specified.)

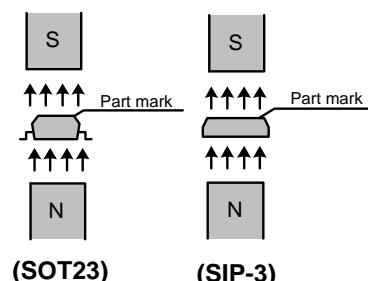
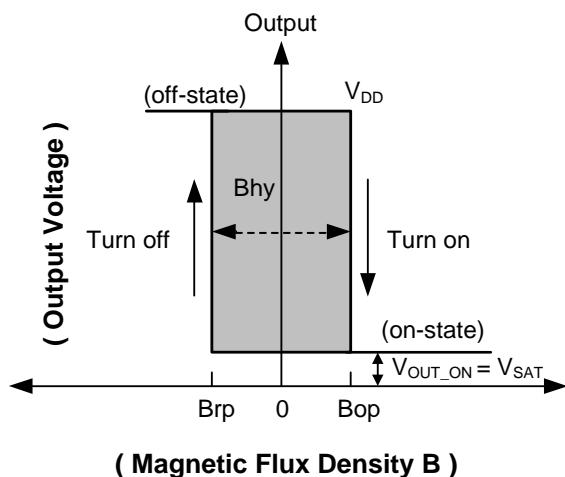
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT_ON}	Output On Voltage	$I_{OUT} = 20\text{mA}$, $B > B_{op}$	-	0.2	0.4	V
I_{LKG}	Output Leakage Current (when output is off)	$V_{OUT} = 28\text{V}$, $B < B_{rp}$, Output off	-	<0.1	10	µA
I_{DD}	Supply Current	Output open, $T_A = +25^\circ\text{C}$	-	3	3.5	mA
		Output open, $T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$	-	-	4	mA
I_{DD_R}	Reverse Supply Current	$V_{DD} = -18\text{V}$, $T_A = +25^\circ\text{C}$	-	0.6	-	µA
		$V_{DD} = -18\text{V}$, $T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$	-	0.6	1,500	µA
		$V_{DD} = -28\text{V}$, $T_A = +25^\circ\text{C}$	-	1.6	-	µA
		$V_{DD} = -28\text{V}$, $T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$	-	1.6	2,500	µA
t_{P_ON}	Device Power-On Time (start-up time)	$V_{DD} \geq 3\text{V}$, $B > B_{op}$ (Note 7)	-	10	-	µs
f_c	Chopping Frequency	$V_{DD} \geq 3\text{V}$	-	800	-	kHz
t_d	Response Time Delay (time from magnetic threshold reached to the start of the output rise or fall)	(Note 9)	-	3.75	-	µs
t_r	Output Rising Time (external pull-up resistor R_L and load capacitance dependent)	$R_L = 1\text{k}\Omega$, $C_L = 20\text{pF}$	-	0.2	1	µs
t_f	Output Falling Time (internal switch resistance and load capacitance dependent)	$R_L = 1\text{k}\Omega$, $C_L = 20\text{pF}$	-	0.1	1	µs
I_{OLCL}	Output Current Limit	$B > B_{op}$, (Note 10)	30	-	55	mA
V_Z	Zener Clamp Voltage	$I_{DD} = 5\text{mA}$	28	-	-	V

- Notes:
- 7. When power is initially turned on, V_{DD} 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.
 - 8. 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.
 - 9. Guaranteed by design, process control and characterization. Not tested in production.
 - 10. The device will limit the output current I_{OUT} to current limit of I_{OLCL} .

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

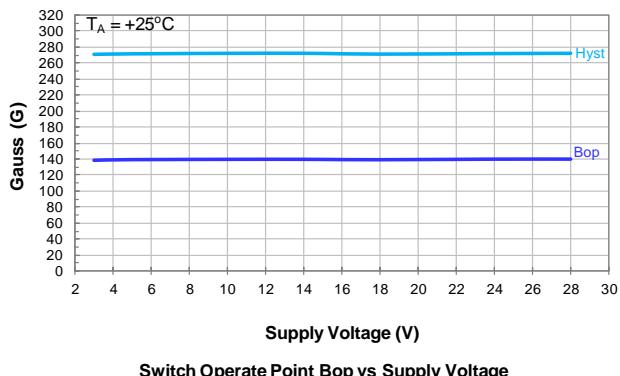
(1mT=10 Gauss)						
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
B_{ops} (South pole to part marking side for SOT23 and SIP-3 packages)	Operation Point	$V_{DD} = 12\text{V}$, $T_A = +25^\circ\text{C}$	-	140	-	Gauss
		$T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$	110	140	170	
B_{rps} (North pole to part marking side for SOT23 and SIP-3 packages)	Release Point	$V_{DD} = 12\text{V}$, $T_A = +25^\circ\text{C}$	-	-140	-	Gauss
		$T_A = -40^\circ\text{C}$ 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	-	Gauss
		$T_A = -40^\circ\text{C}$ to $+150^\circ\text{C}$	220	280	340	

- Notes:
11. When power is initially turned on, V_{DD} 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 10 μs typical from the operating voltage reaching 3V.
 12. 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.
 13. Maximum and minimum hysteresis is guaranteed by design, process control and characterization.

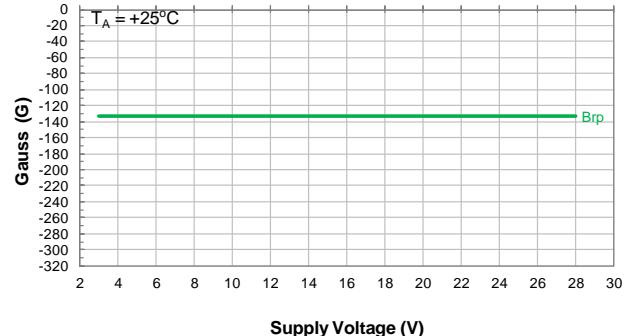


Typical Operating Characteristics

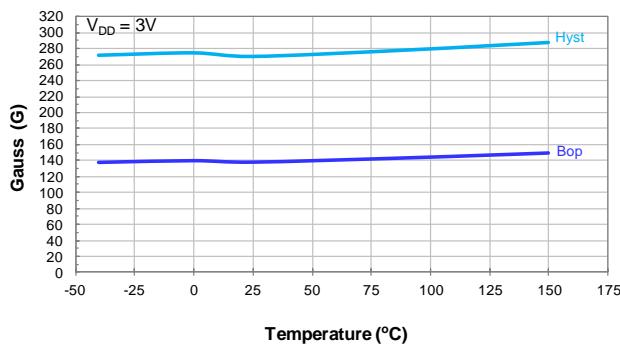
Output Switch Operate and Release Points (Magnetic Thresholds) – B_{op} and B_{rp}



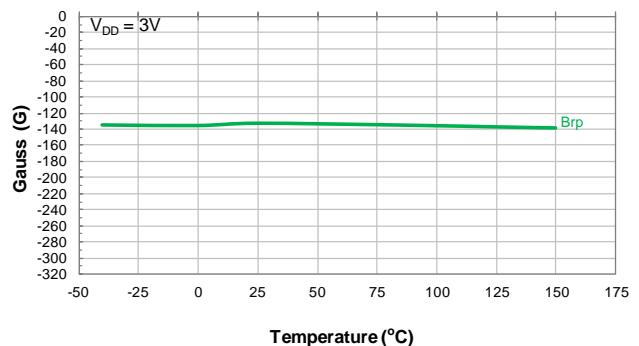
Switch Operate Point B_{op} vs Supply Voltage



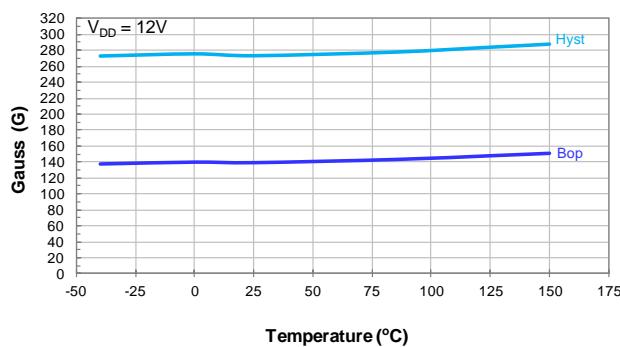
Switch Release Point Brp vs Supply Voltage



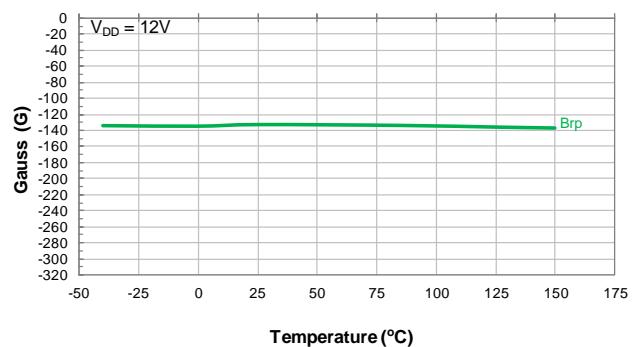
Switch Operate Point B_{op} vs Temperature



Switch Release Point Brp vs Temperature



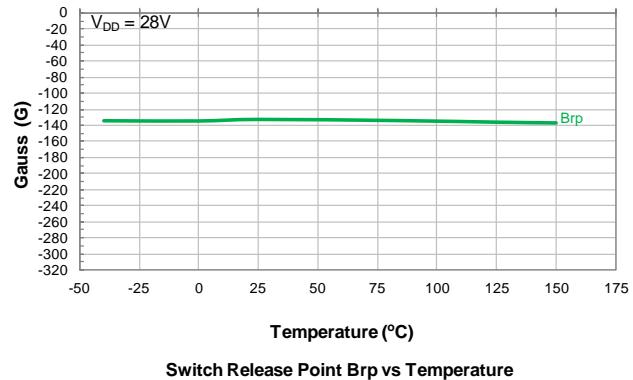
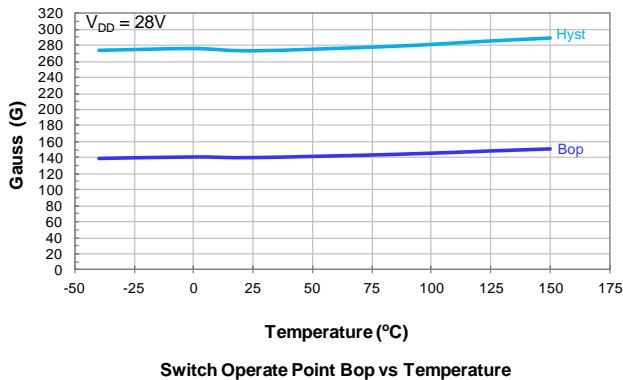
Switch Operate Point B_{op} vs Temperature



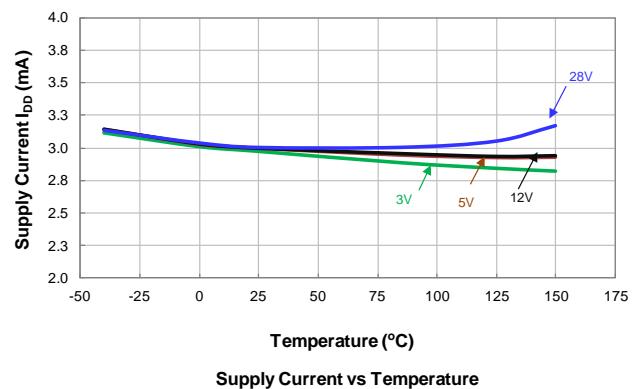
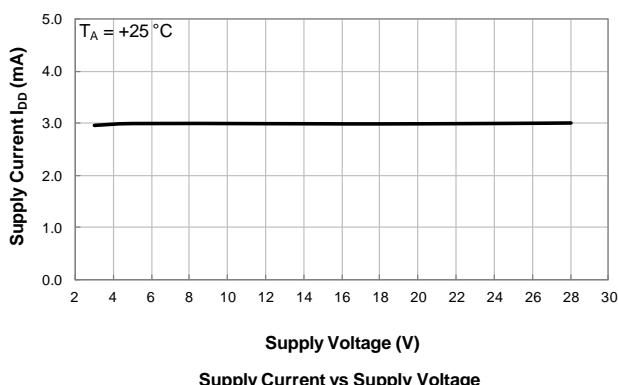
Switch Release Point Brp vs Temperature

Typical Operating Characteristics

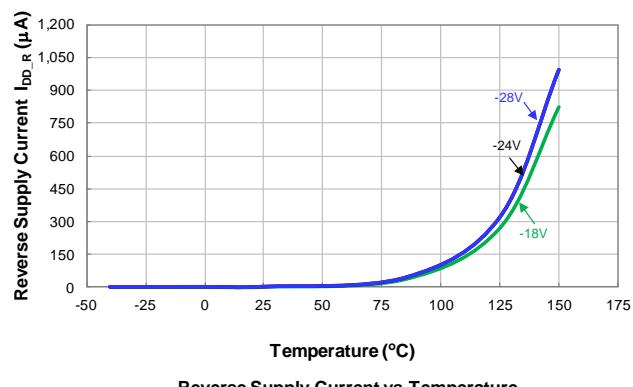
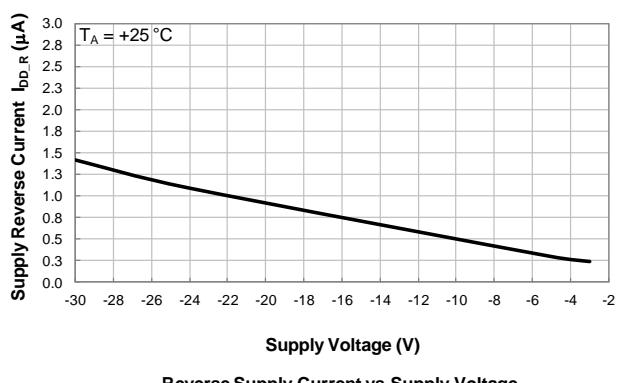
Output Switch Operate and Release Points (Magnetic Thresholds) – B_{op} and B_{rp} (cont.)



Supply Current

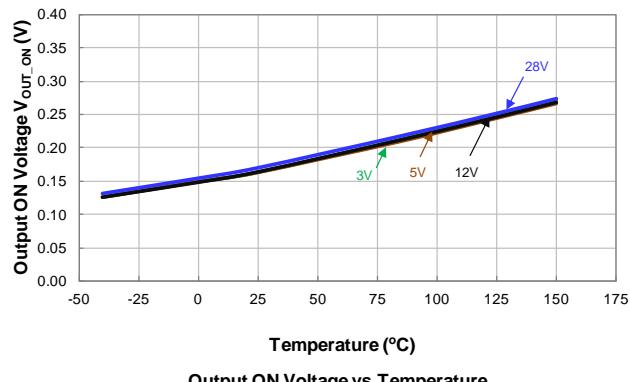
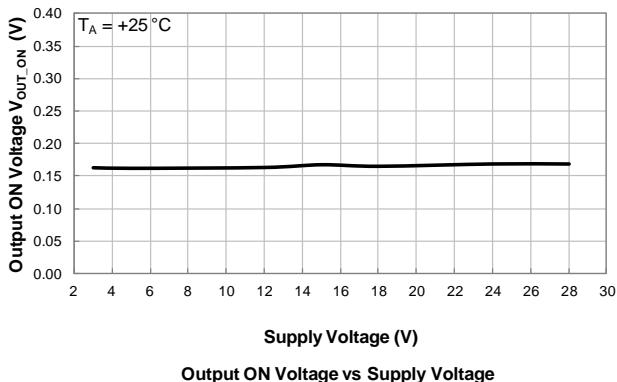


Reverse Supply Current

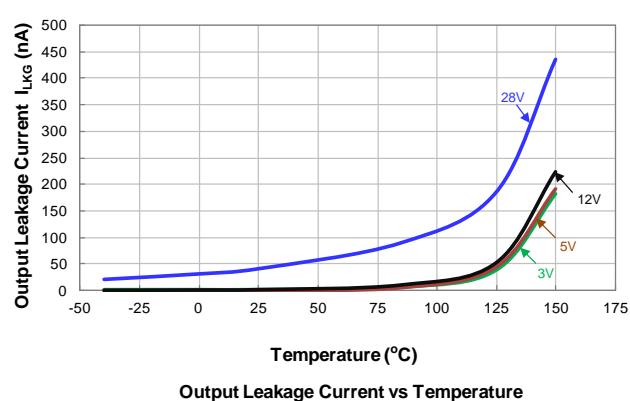
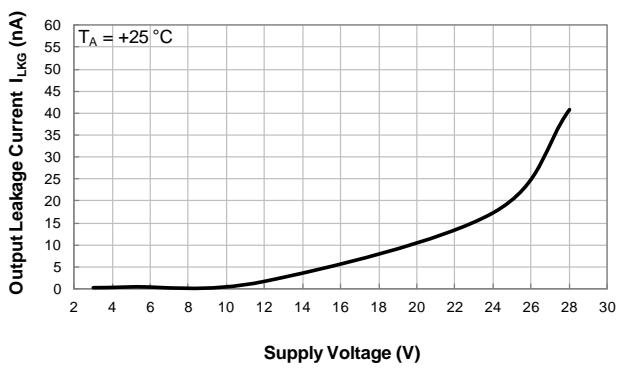


Typical Operating Characteristics (cont.)

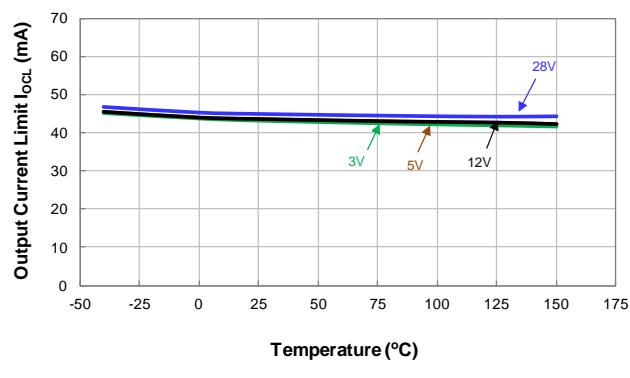
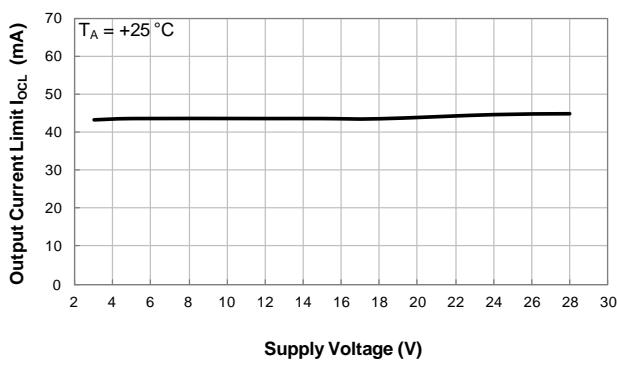
Output Switch On Voltage



Output Switch Leakage Current



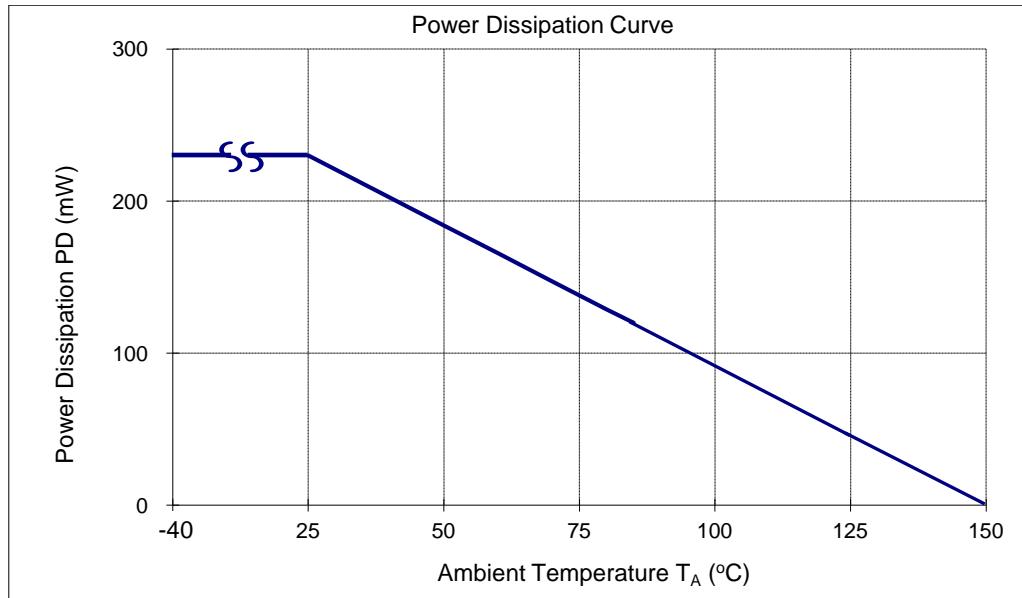
Output Current Limit



Thermal Performance Characteristics

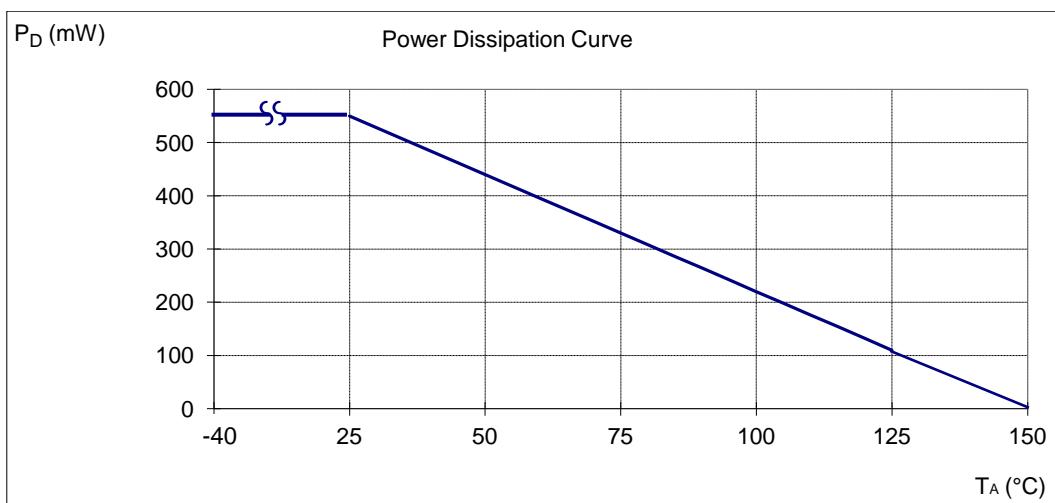
(1) Package type: SOT23

T _A (°C)	25	50	60	70	80	85	90	100	105	110	120	125	130	140	150
P _D (mW)	230	184	166	147	129	120	110	92	83	74	55	46	37	18	0

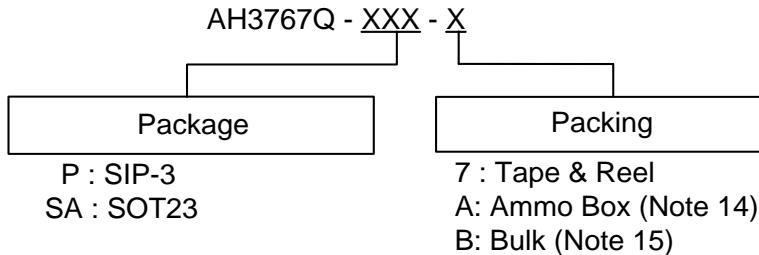


(2) Package type: SIP-3

T _A (°C)	25	50	60	70	80	85	90	100	105	110	120	125	130	140	150
P _D (mW)	550	440	396	362	308	286	264	220	198	176	132	110	88	44	0



Ordering Information



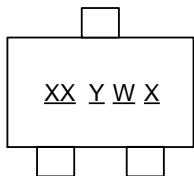
Part Number	Package Code	Packaging	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH3767Q-P-A	P	SIP-3	NA	NA	NA	NA	4,000/Box	-A
AH3767Q-P-B	P	SIP-3	1,000	-B	NA	NA	NA	NA
AH3767Q-SA-7	SA	SOT23	NA	NA	3,000/Tape & Reel	-7	NA	NA

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

Marking Information

(1) Package Type: SOT23

(Top View)

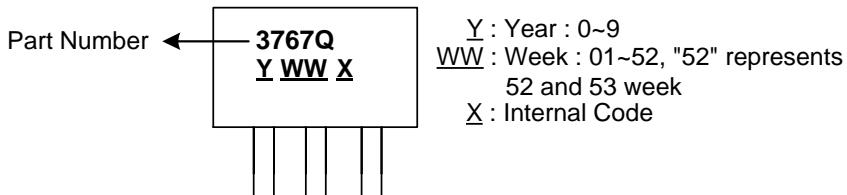


XX : Identification code
Y : Year 0 to 9
W : Week : A to Z : 1 to 26 week;
a to z : 27 to 52 week; z represents
52 and 53 week
X : Internal code

Part Number	Package	Identification Code
AH3767Q	SOT23	WS

(2) Package Type: SIP-3

(Top View)

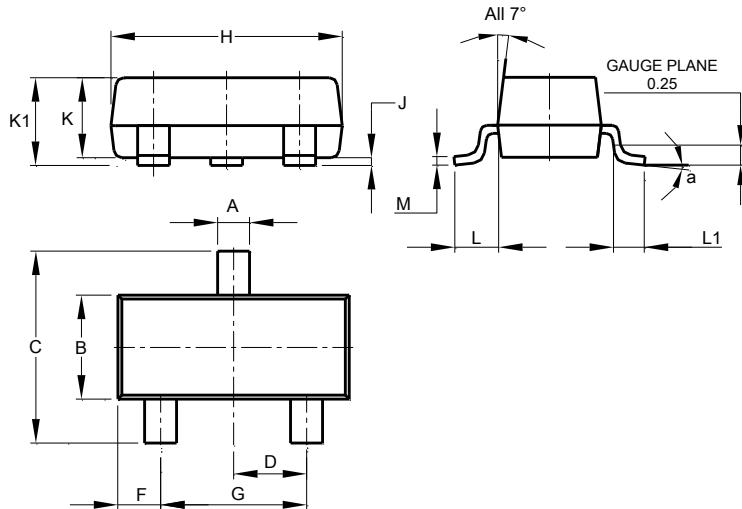


Part Number	Package	Identification Code
AH3767Q	SIP-3	3767Q

Package Outline Dimensions (All dimensions in mm.)

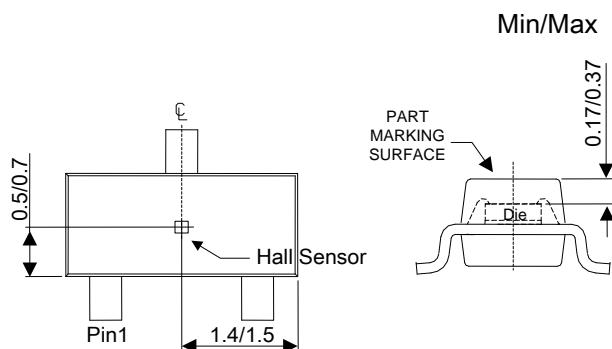
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

(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



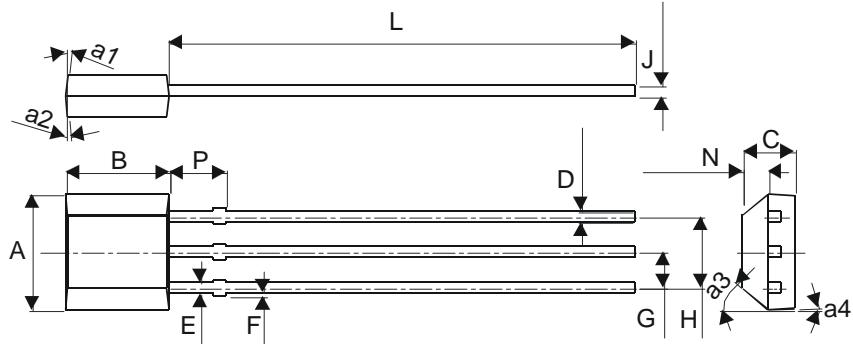
Sensor Location – To be updated

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

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

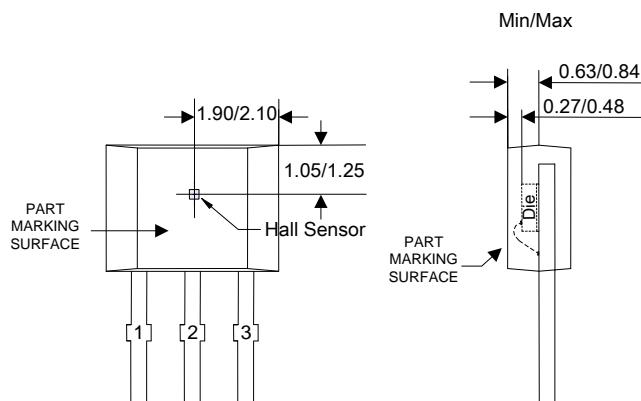
(2) Package Type: SIP-3 Bulk

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

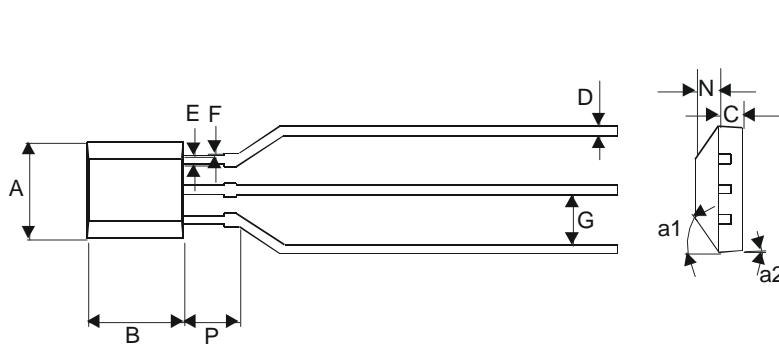


Sensor Location – To be updated

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

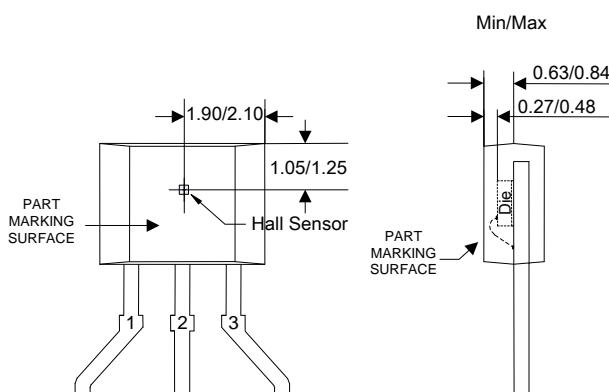
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

(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

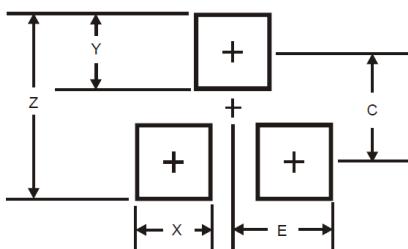


Sensor Location – To be updated

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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A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
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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ООО "ЛайфЭлектроникс"

"LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибуторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибуторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помочь разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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