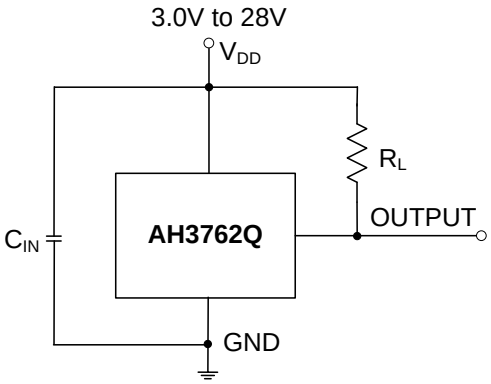
Typical Applications Circuit (Note 4)



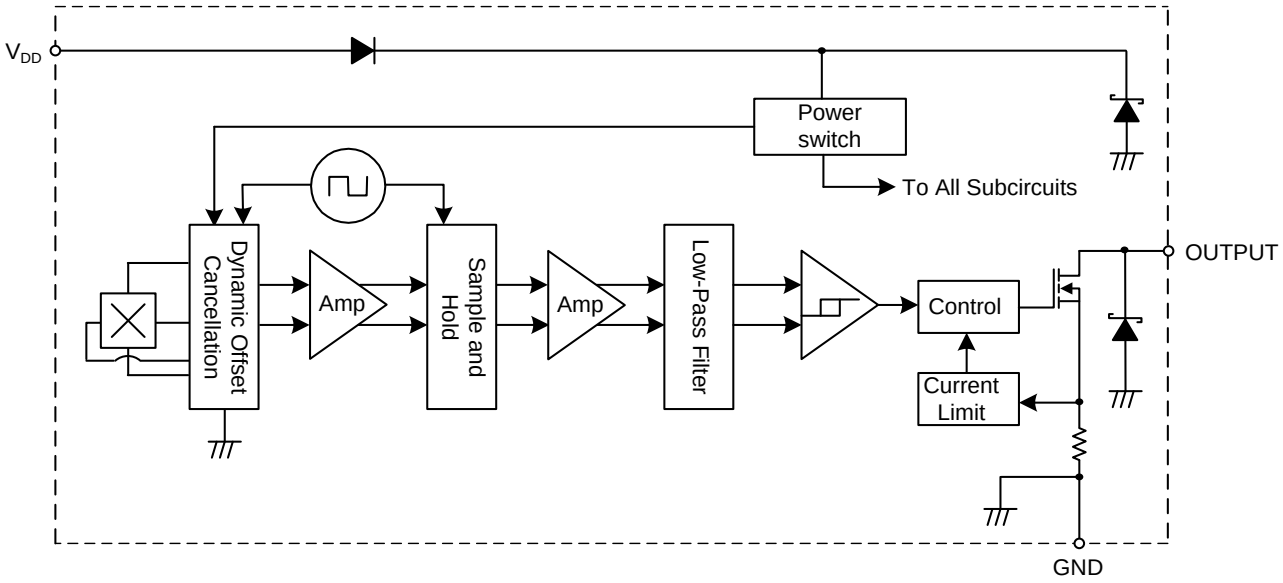
Note: 4. C_{IN} is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF to 100nF. R_L is the pull-up resistor.

Pin Descriptions

Package: SC59, SOT23 and SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)

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 and 6) (@T_A = +25°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 (Ammo Pack), SIP-3 (Bulk Pack)	550	mW
		SC59 and SOT23	230	
T_S	Storage Temperature Range		-65 to +165	°C
T_J	Maximum Junction Temperature		+150	°C
ESD HBM	Electros Static Discharge Withstand – Human Body Model (HBM)		8	kV
ESD MM	Electros Static Discharge Withstand - Machine Model (MM)		800	V
ESD CDM	Electros Static Discharge Withstand - Charged Device Model (CDM)		2	kV

Notes: 5. Stresses greater than the '*Absolute Maximum Ratings*' specified above can 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 can 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°C to +150°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 and 8) (@T_A = -40°C to +150°C, V_{DD} = 3V to 28V, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{OUT_ON}	Output ON Voltage	I_{OUT} = 20mA, B > Bop	—	0.2	0.4	V
I_{LKG}	Output Leakage Current (When Output is Off)	V_{OUT} = 28V, B < Brp, Output Off	—	<0.1	10	μA
I_{DD}	Supply Current	Output Open, T_A = +25°C	—	3	3.5	mA
		Output Open, T_A = -40 to +150°C	—	—	4	mA
I_{DD_R}	Reverse Supply Current	V_{DD} = -18V, T_A = +25°C	—	0.6	—	μA
		V_{DD} = -18V, T_A = -40 to +150°C	—	0.6	1,500	μA
		V_{DD} = -28V, T_A = +25°C	—	1.6	—	μA
		V_{DD} = -28V, T_A = -40 to +150°C	—	1.6	2,500	μA
t_{P_ON}	Device Power-On Time (Start-Up Time)	V_{DD} >= 3V, B > Bop (Note 8)	—	10	—	μs
f_c	Chopping Frequency	V_{DD} >= 3V	—	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 = 1kΩ, C_L = 20pF	—	0.2	1	μs
t_f	Output Falling Time (Internal Switch Resistance and load capacitance dependent)	R_L = 1kΩ, C_L = 20pF	—	0.1	1	μs
I_{OCL}	Output Current Limit	B > Bop (Note 10)	30	—	55	mA
V_Z	Zener Clamp Voltage	I_{DD} = 5mA	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°C, V_{DD} = 12V. Maximum and minimum values over the operating temperature range are not tested in production but guaranteed by design, process control and characterization.

9. Guaranteed by design, process control and characterization. Not tested in production.

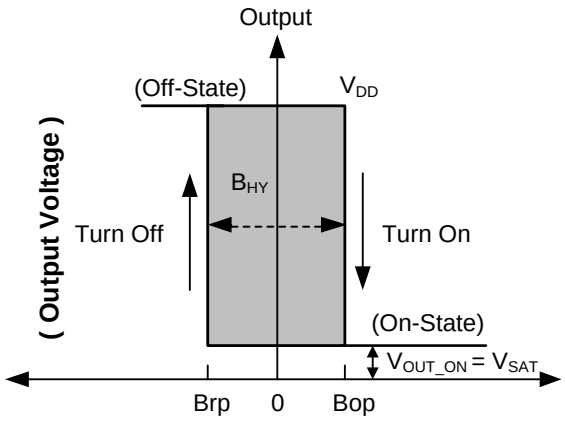
10. The device will limit the output current I_{OUT} to current limit of I_{OCL}.

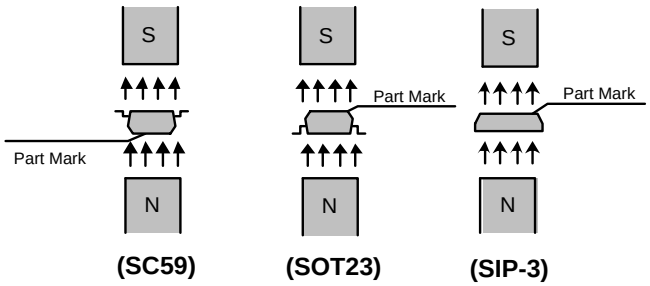
Magnetic Characteristics (Notes 11 and 12) (T_A = -40°C to +150°C, V_{DD} = 3.0V to 28V, unless otherwise specified.)

(1mT=10 Gauss)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Bop (South pole to part marking side for SOT23 and SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) packages; South pole to the non-part marking side for SC59 package. See diagram below)	Operation Point	V_{DD} = 12V, T_A = +25°C	—	25	—	Gauss
		T_A = -40°C to +150°C	10	25	40	
Brp (North pole to part marking side for SOT23 and SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) packages; North pole to the non-part marking side for SC59 package. See diagram below)	Release Point	V_{DD} = 12V, T_A = +25°C	—	-25	—	
		T_A = -40°C to +150°C	-40	-25	-10	
B_{HY} (|Bopx|-|Brpx|)	Hysteresis (Note 13)	V_{DD} = 12V, T_A = +25°C	—	50	—	
		T_A = -40°C to +150°C	20	50	80	

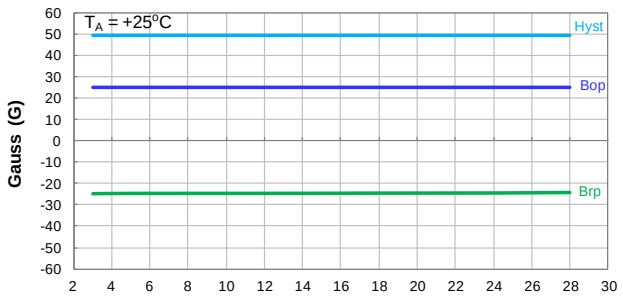
Notes:
11. When power is initially turned on, V_{DD} must be within its correct operating range (3.0V to 28V) to guarantee the output sampling. The output state is valid after the start-up time of 10µs typical from the operating voltage reaching 3V.
12. Typical values are defined at T_A = +25°C, V_{DD} = 12V. 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.



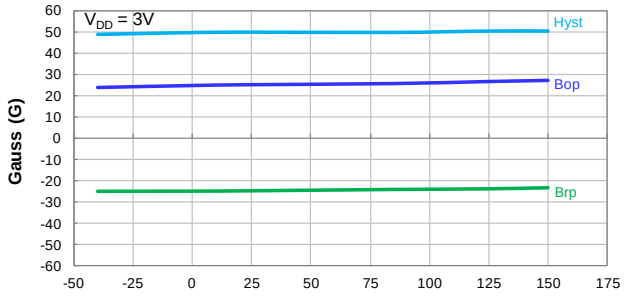


Typical Operating Characteristics

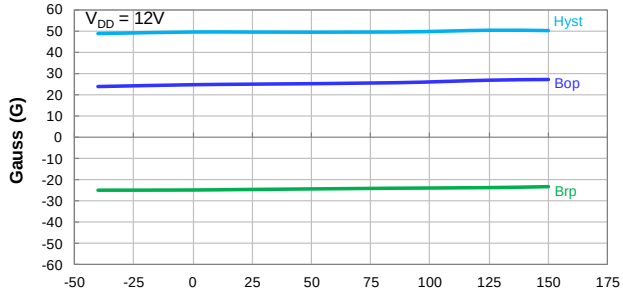
Output Switch Operate and Release Points (Magnetic Thresholds) – Bop and Brp



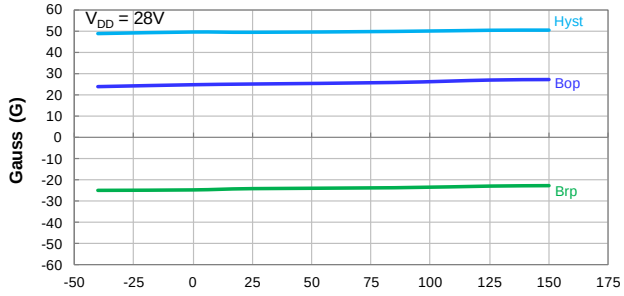
Switch Points Bop and Brp vs Supply Voltage



Switch Points Bop and Brp vs Temperature

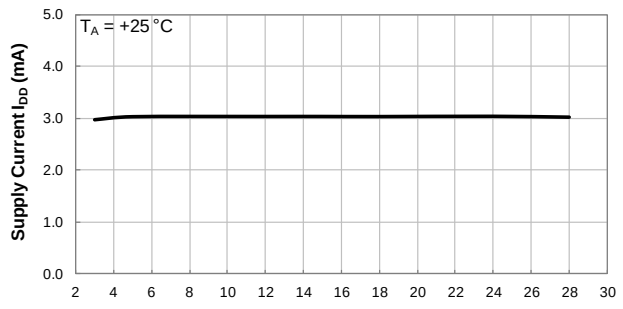


Switch Points Bop and Brp vs Temperature

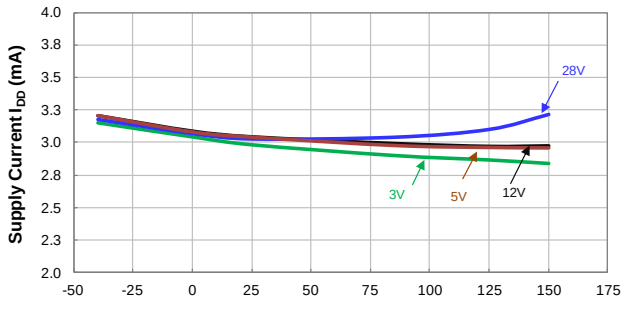


Switch Points Bop and Brp vs Temperature

Supply Current



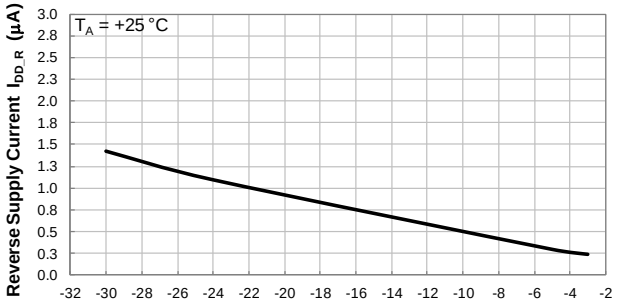
Supply Current vs Supply Voltage



Supply Current vs Temperature

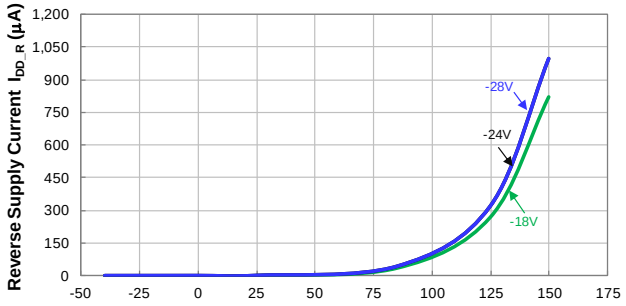
Typical Operating Characteristics (continued)

Reverse Supply Current



Supply Voltage (V)

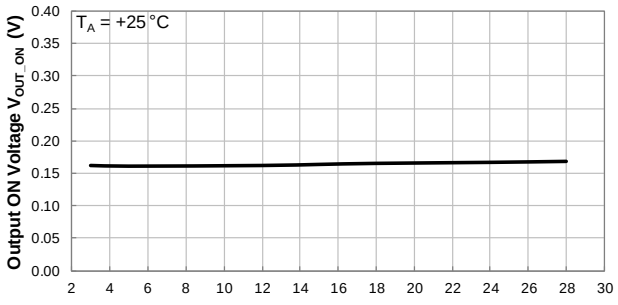
Reverse Supply Current vs Supply Voltage



Temperature (°C)

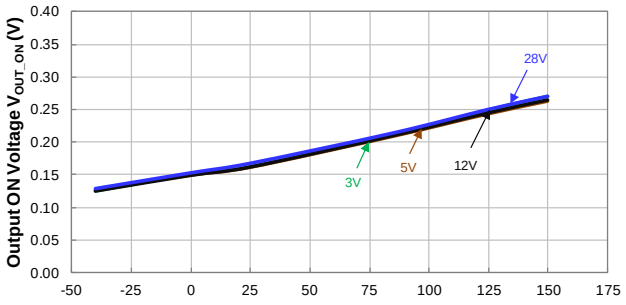
Reverse Supply Current vs Temperature

Output Switch On Voltage



Supply Voltage (V)

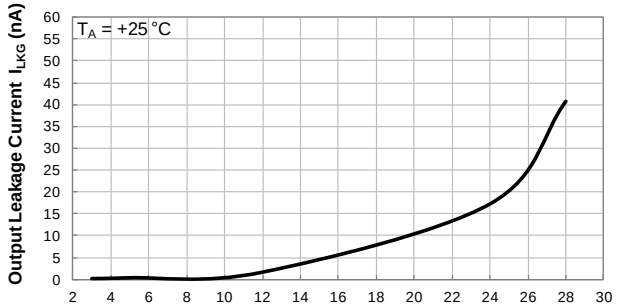
Output ON Voltage vs Supply Voltage



Temperature (°C)

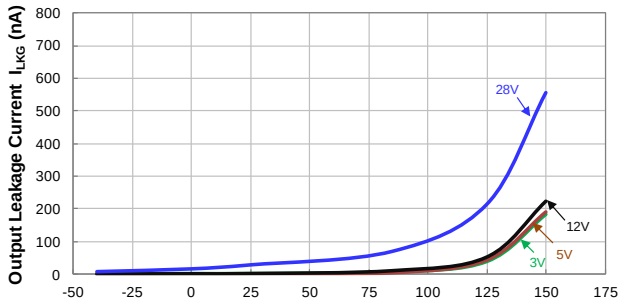
Output ON Voltage vs Temperature

Output Switch Leakage Current



Supply Voltage (V)

Output Leakage Current vs Supply Voltage

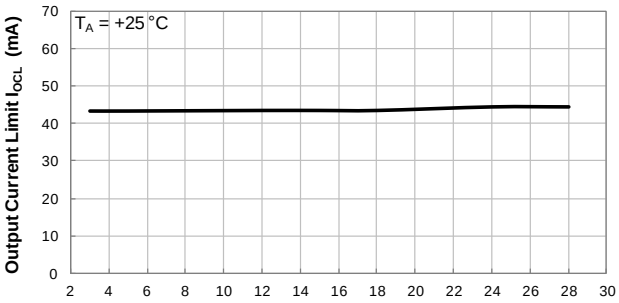


Temperature (°C)

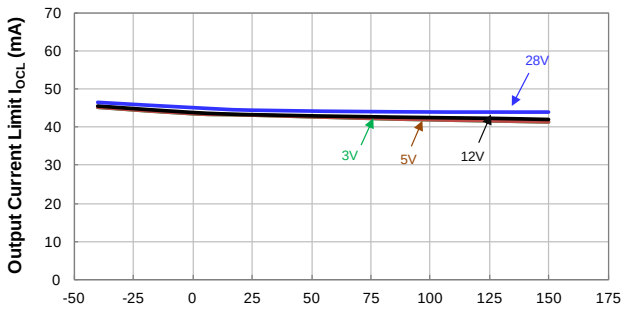
Output Leakage Current vs Temperature

Typical Operating Characteristics (continued)

Output Current Limit



Output Current Limit vs Supply Voltage

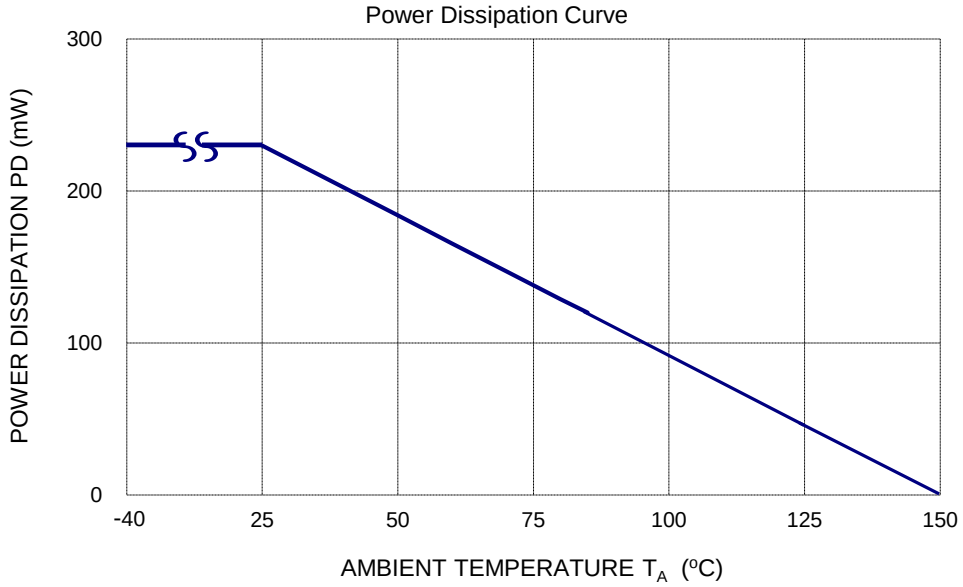


Output Current Limit vs Temperature

Thermal Performance Characteristics

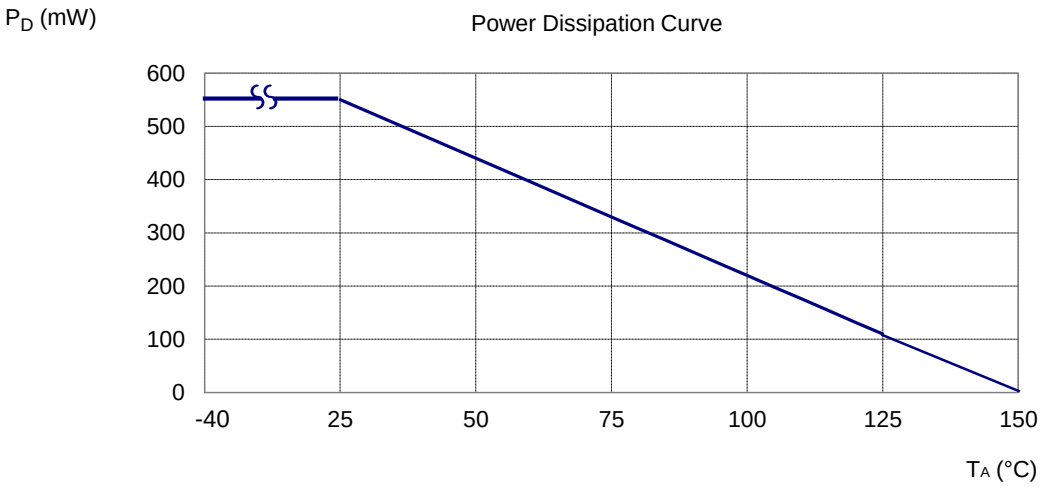
(1) Package Type: SC59 and SOT23

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

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

AH3762Q - XXX - X

Package	Packing
P : SIP-3 SA : SOT23 W : SC59	7 : Tape and Reel A: Ammo Box (Note 14) B: Bulk (Note 15)

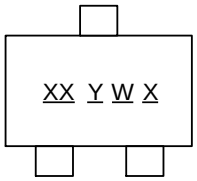
Part Number	Status	Package Code	Packaging	Bulk		7" Tape and Reel		Ammo Box	
				Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH3762Q-P-A	Active	P	SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)	NA	NA	NA	NA	4,000/Box	-A
AH3762Q-P-B	Active	P	SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)	1,000	-B	NA	NA	NA	NA
AH3762Q-SA-7	NRND (Note 16)	SA	SOT23	NA	NA	3,000/Tape & Reel	-7	NA	NA
AH3762Q-W-7	NRND (Note 16)	W	SC59	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.
16. NRND = Not Recommended for New Design.

Marking Information

(1) Package Type: SC59 and SOT23

(Top View)

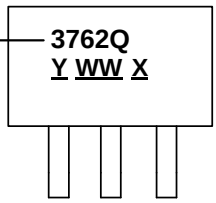


XX : Identification Code
Y : Year 0 to 9
W : Week : A to Z : 1 to 26 week;
a to z : 27 to 52 week; z represents
52 and 53 week
X : Internal Code

Part Number	Package	Identification Code
AH3762Q	SC59	YK
AH3762Q	SOT23	WK

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

(Top View)



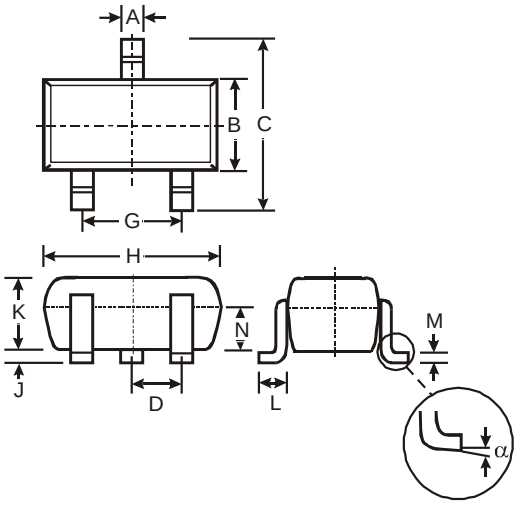
Y : Year : 0~9
WW : Week : 01~52, "52" represents
52 and 53 week
X : Internal Code

Part Number	Package	Identification Code
AH3762Q	SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)	3762Q

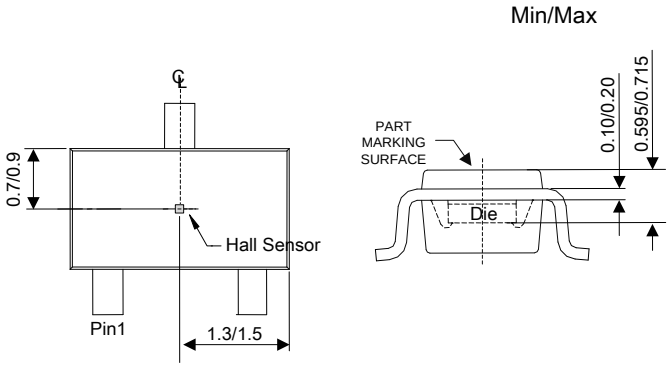
Package Outline Dimensions (All dimensions in mm.)

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

(1) Package Type: SC59



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			

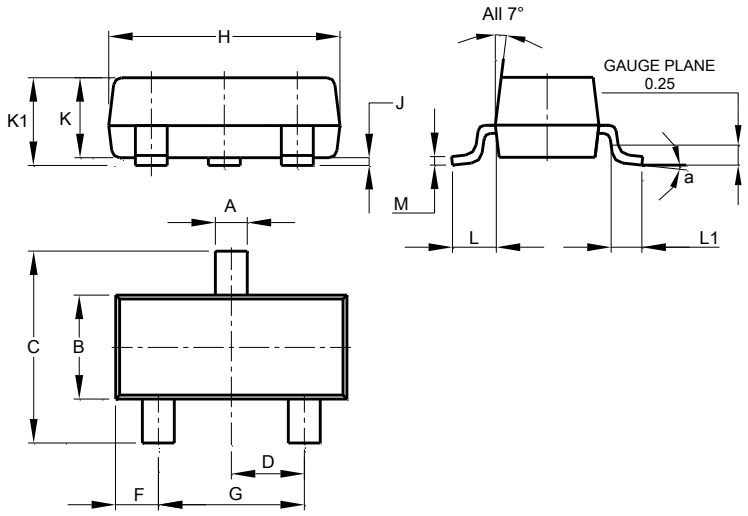


Sensor Location

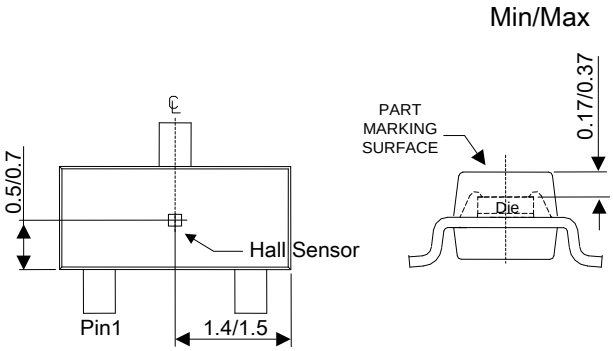
Package Outline Dimensions (continued) (All dimensions in mm.)

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

(2) 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	0°	8°	--
All Dimensions in mm			

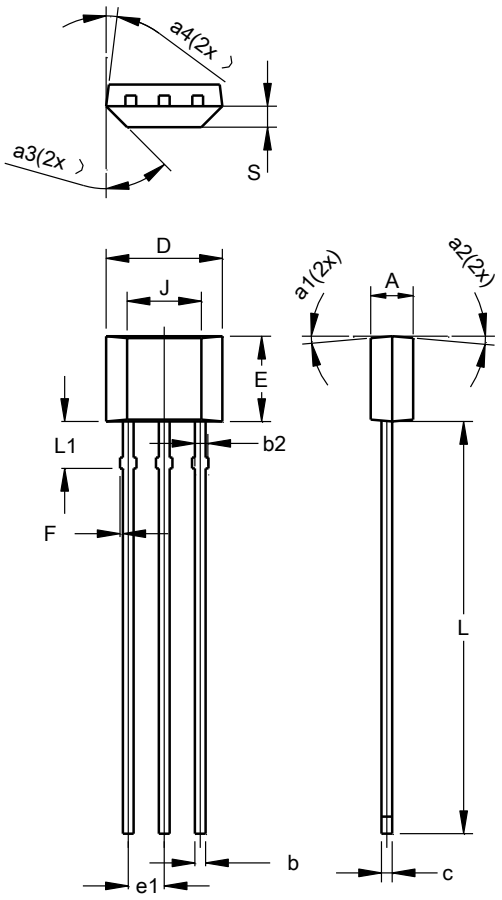


Sensor Location

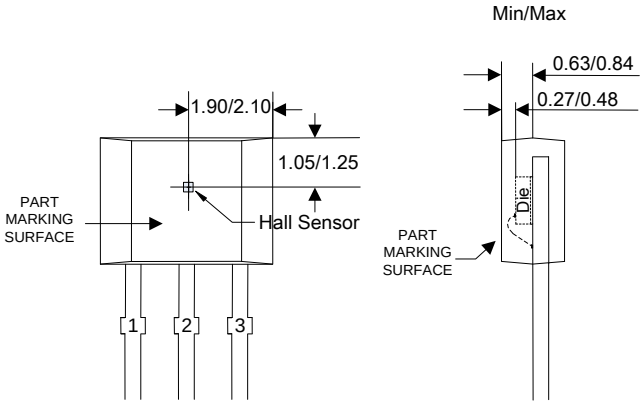
Package Outline Dimensions (continued) (All dimensions in mm.)

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

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



SIP-3 (Bulk Pack)			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
b	0.33	0.43	0.38
b2	0.40	0.508	0.46
c	0.35	0.41	0.38
D	3.90	4.30	4.10
E	2.80	3.20	3.00
e1	1.24	1.30	1.27
F	0.00	0.20	—
J	2.62 REF		
L	14.00	15.00	14.50
L1	1.55	1.75	1.65
S	0.63	0.84	0.74
a1	—	—	5°
a2	—	—	5°
a3	—	—	45°
a4	—	—	3°
All Dimensions in mm			

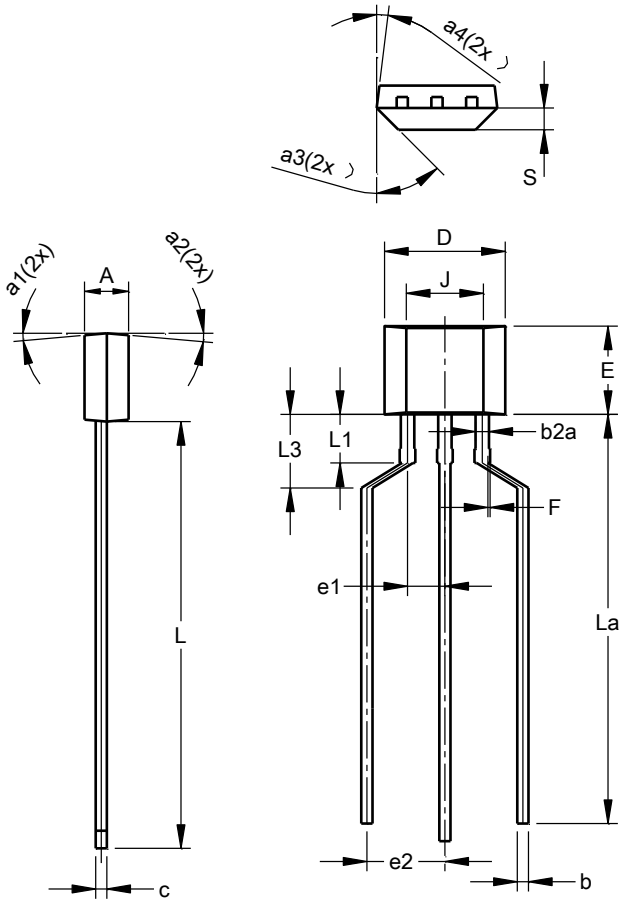


Sensor Location

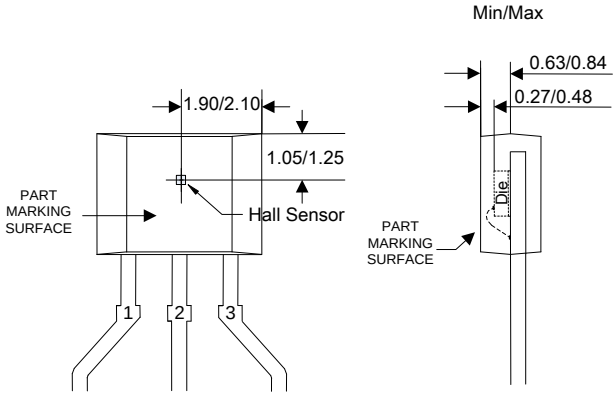
Package Outline Dimensions (continued) (All dimensions in mm.)

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

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



SIP-3 (Ammo Pack)			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
b	0.33	0.43	0.38
b2a	0.40	0.52	0.46
c	0.35	0.41	0.38
D	3.90	4.30	4.10
E	2.80	3.20	3.00
e1	1.24	1.30	1.27
e2	2.40	2.90	2.65
F	0.00	0.20	—
J	2.62 REF		
L	14.00	15.00	14.50
La	12.90	14.90	13.90
L1	1.55	1.75	1.65
L3	2.00	3.00	2.50
S	0.63	0.84	0.74
a1	—	—	5°
a2	—	—	5°
a3	—	—	45°
a4	—	—	3°
All Dimensions in mm			

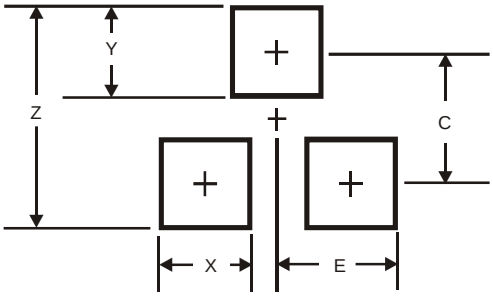


Sensor Location

Suggested Pad Layout

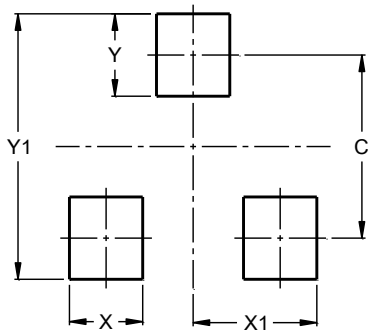
Please see http://www.diodes.com/package-outlines.html for the latest version.

(1) Package Type: SC59



Dimensions	Value (in mm)
Z	3.4
X	0.8
Y	1.0
C	2.4
E	1.35

(2) Package Type: SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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