
Features

- 3V to 28V DC operation voltage
- Chopper stabilized
- Wide operating voltage range
- Built-in power reverse protection
- Built-in voltage overshoot protection
- Output short circuit protection
- Open drain pre-driver
- SIP3 and SC59 (Commonly known as SOT23 in Asia)
: Available in "Green" Molding Compound (No Br, Sb)
- Lead Free Finish/RoHS Compliant (Note 1)

General Description

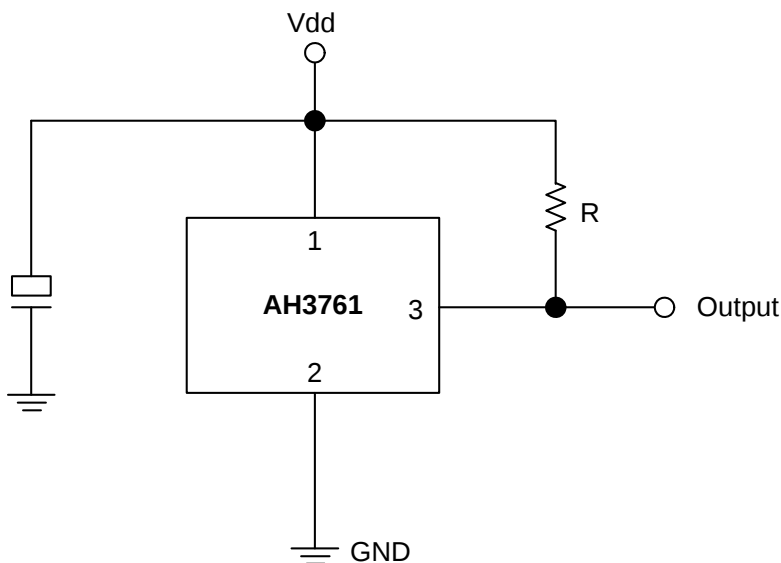
AH3761 is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a schmitt trigger to provide switching hysteresis for noise rejection, and open drain output. An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold B_{op} , DO is turned on (low). The output state is held until a magnetic flux density reversal falls below B_{rp} causing DO to be turned off (high).

Application

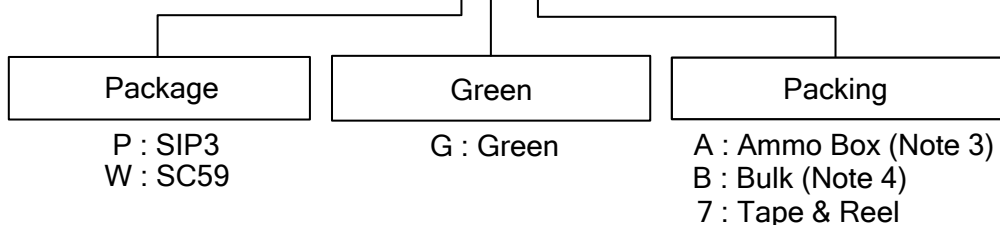
- Brush-less DC Motor Commutation
- RPM Detection
- Consumer and industrial position sensor
- Flow meters

Typical Application Circuit



Ordering Information

AH3761-XG-X



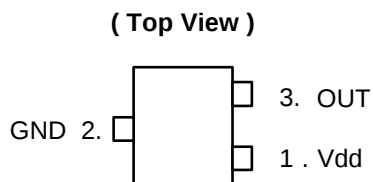
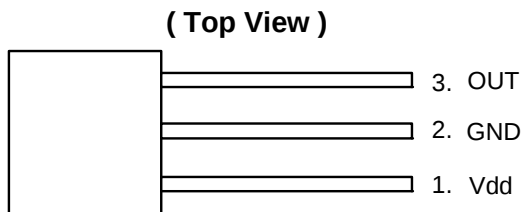
Device	Package Code	Packaging (Note 2)	Bulk		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH3761-PG-A	P	SIP3	NA	NA	NA	NA	4000/Box	-A
AH3761-PG-B	P	SIP3	1000	-B	NA	NA	NA	NA
AH3761-WG-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html
 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>.
 3. Ammo Box is for SIP3 Spread Lead.
 4. Bulk is for SIP3 Straight Lead.

Pin Assignments

(1) SIP3

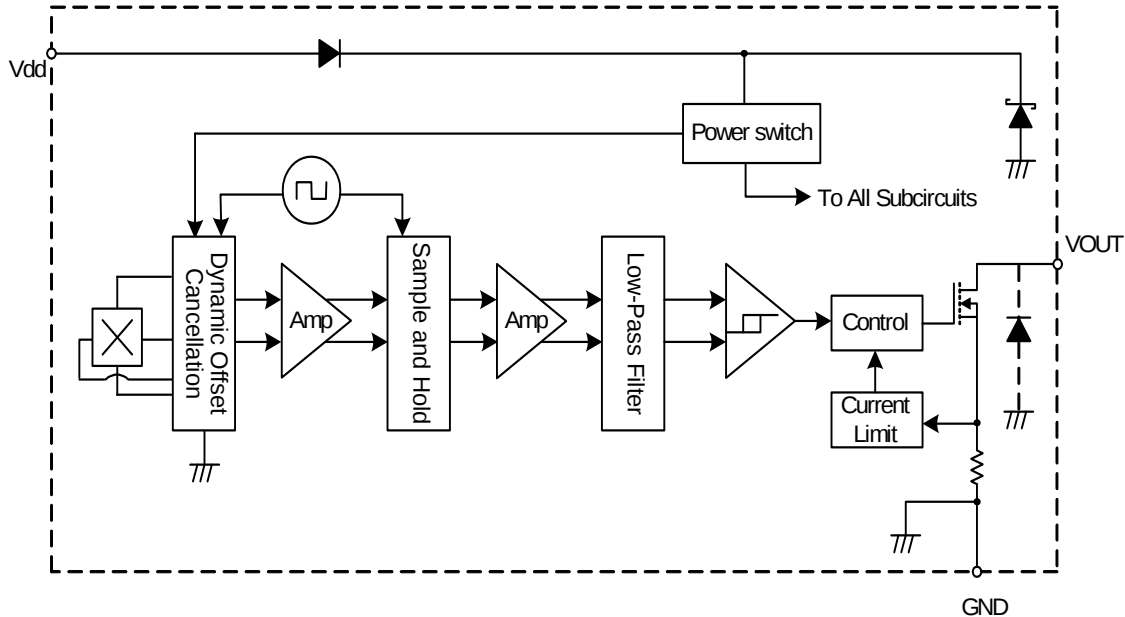
(2) SC59



Pin Descriptions

Pin Name	P/I/O	Pin #	Description
Vdd	P	1	Positive Power Supply
GND	P	2	Ground
OUT	O	3	Output Pin

Block Diagram



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

Symbol	Characteristics	Values	Unit
Vdd	Supply Voltage	30	V
Vrdd	Reverse Battery Voltage	-30	V
B	Magnetic Flux Density	Unlimited	
V _{DS}	Output OFF Voltage	30	V
I _{O(peak)}	Output "On" Current (Peak)	100	mA
T _{ST}	Storage Temperature Range	-65~+150	°C
T _{J(MAX)}	Maximum Junction Temperature	150	°C
P _D	Package Power Dissipation	SIP3	550 mW
		SC59	230 mW
θ_{JC}	Thermal Resistance Junction to case	SIP3	227 °C/W
		SC59	543 °C/W

Recommended Operating Conditions

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
Vdd	Supply Voltage	Operating	3	24	28	V
T _A	Operating Ambient Temperature	Operating	-40	-	125	°C

Electrical Characteristics ($T_A = +25^\circ\text{C}$, $V_{DD} = 24\text{V}$, Note 7)

Symbol	Characteristic	Test Conditions	Min	Typ.	Max	Unit
$V_{O(sat)}$	Output Saturation Voltage	$I_{out} = 20\text{mA}$, $B > B_{op}$	-	300	500	mV
I_{off}	Output Leakage Current	$V_O = 24\text{V}$, $B < B_{op}$	-	< 0.1	10	μA
I_{DD}	Supply Current	Output Open	-	4	6	mA
t_r	Output Rising Time	$R_L = 10\text{K}\Omega$, $C_L = 16\text{pF}$	-	340	-	ns
t_f	Output Falling Time	$R_L = 10\text{K}\Omega$, $C_L = 16\text{pF}$	-	20	-	ns
f_c	Chopping Frequency		-	300	-	KHz
I_{OM}	Output Current Limit	$B > B_{op}$ (Note 5)	50	70	90	mA
t_{ST}	Start-up time of IC	$V_{DD} > 3\text{V}$, $B > B_{op}$ (Note 6)	-	47	-	μs

Notes: 5. The device will shut down operating after the output current I_O is over the output current limit I_{OM} for 160 μs (typically). The device will re-start up operating after resetting the supply voltage V_{DD} .

6. I_{in} initial power on time, the output state is kept in "High" in this start-up time of IC.

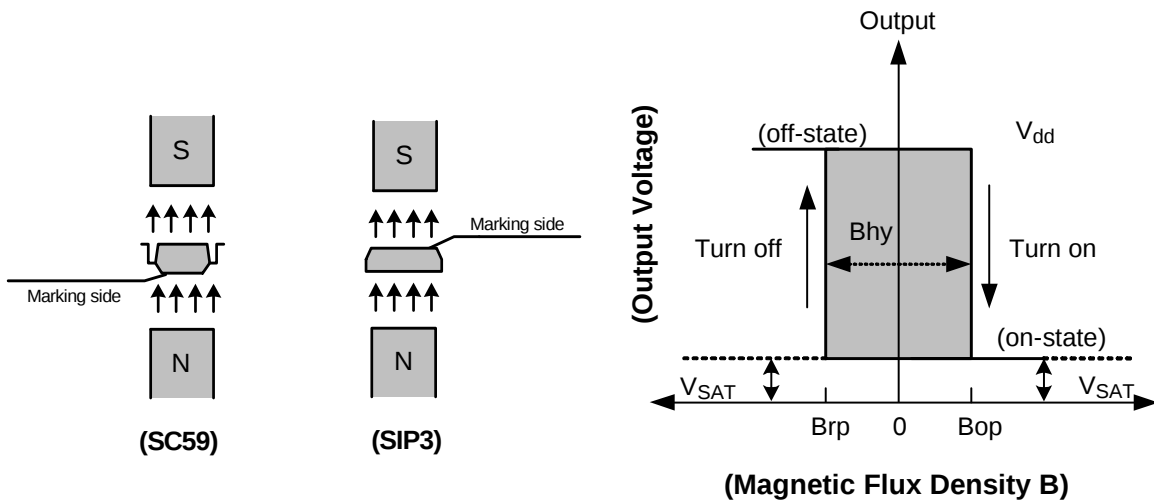
7. Typical data is at $T_A = +25^\circ\text{C}$, $V_{DD} = 24\text{V}$ and is design information only.

Magnetic Characteristics ($T_A = +25^\circ\text{C}$, $V_{DD} = 3\text{V}$ to 28V , Note 8)

(1mT=10Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
B_{op}	Operate Point	5	30	60	Gauss
B_{rp}	Release Point	-60	-30	-5	Gauss
B_{hys}	Hysteresis	-	60	-	Gauss

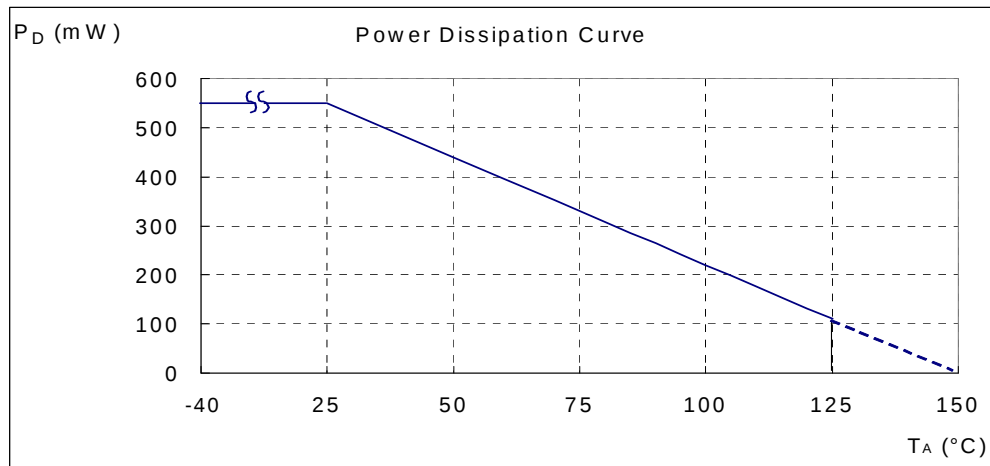
Notes: 8. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.



Performance Characteristics

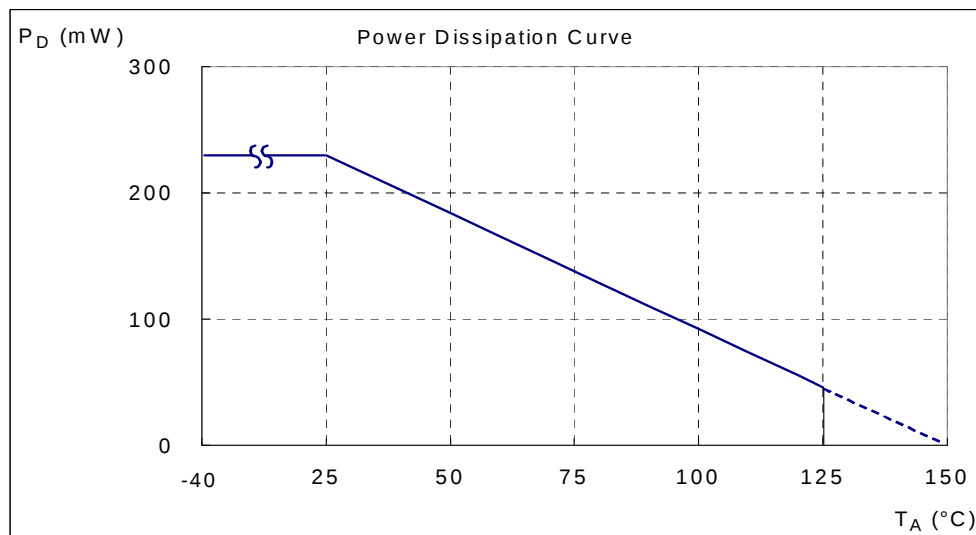
(1) SIP3

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



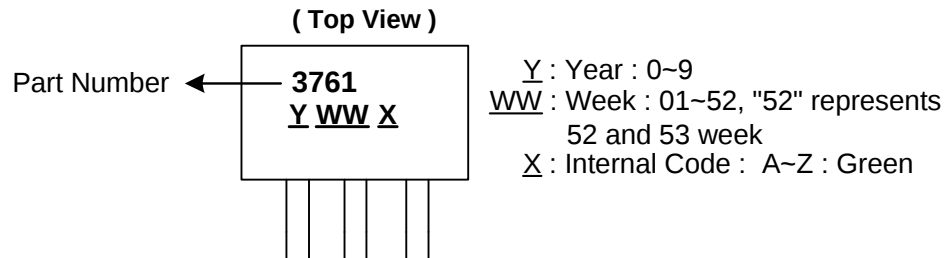
(2) SC59 (Commonly known as SOT23 in Asia)

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

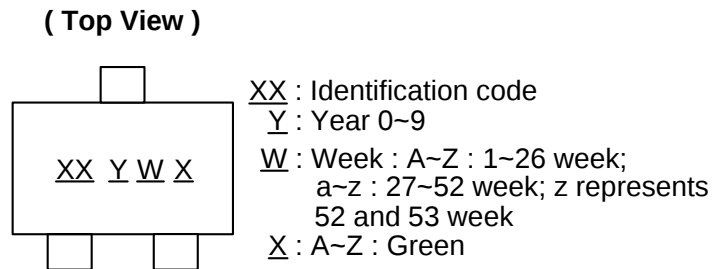


Marking Information

(1) SIP3



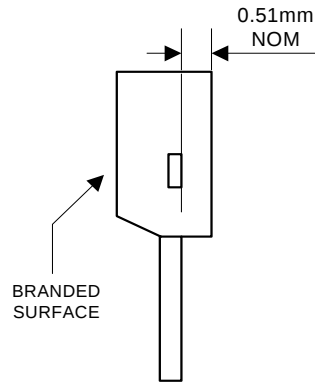
(2) SC59 (Commonly known as SOT23 in Asia)



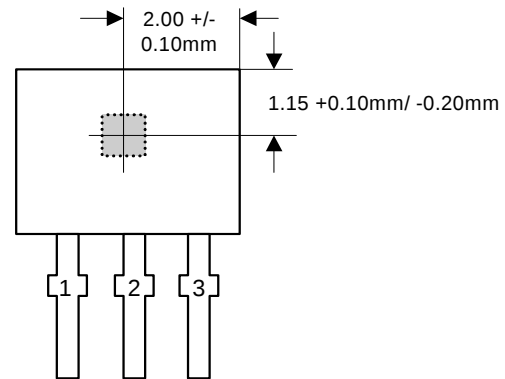
Part Number	Package	Identification Code
AH3761	SC59	P8

Package Information (All Dimensions in mm)

(1) Package Type: SIP3 for Bulk only

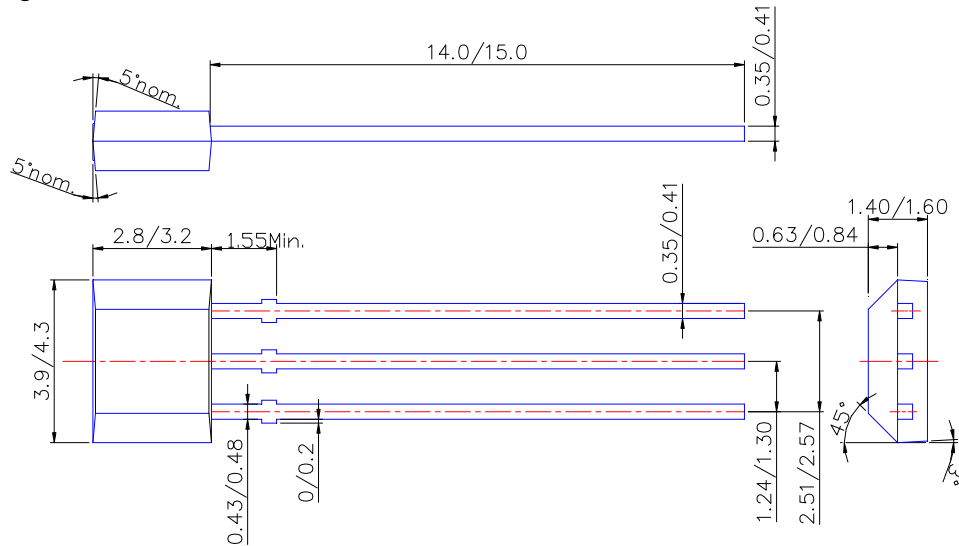


Active Area Depth



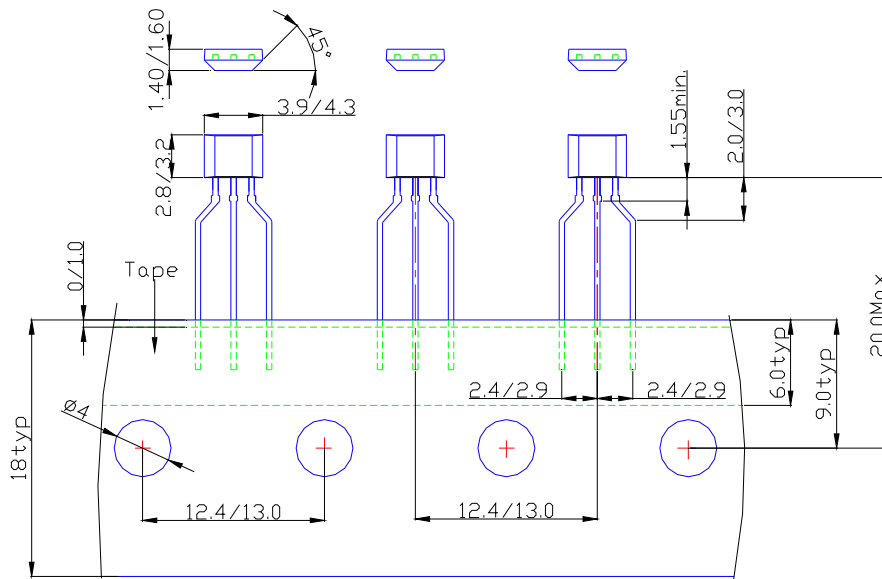
Sensor Location

Package Dimension

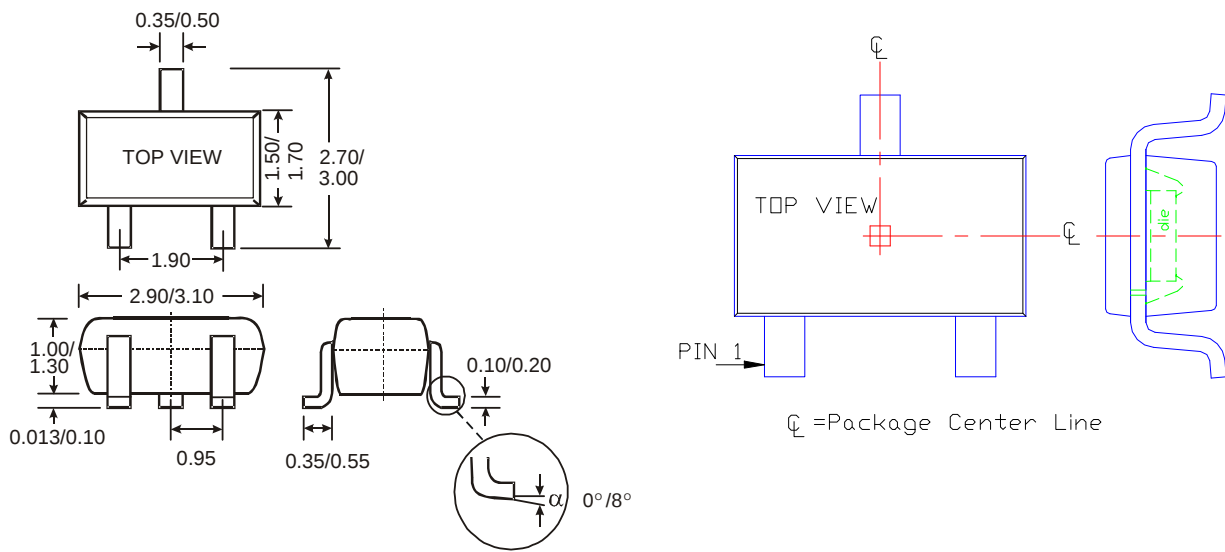


Package Information (Continued)

(2) Package Type: SIP3 for Ammo Pack-only



(3) SC59 (Commonly known as SOT23 in Asia)



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