

## Description

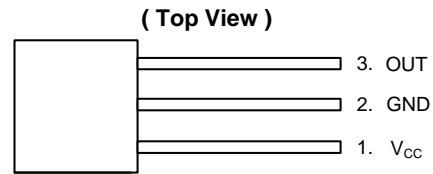
AH1751 is a single-digital-output Hall-effect sensor for high temperature operation. The device includes an on-chip Hall voltage generator for magnetic sensing, an amplifier to amplify Hall voltage, and a comparator to provide switching hysteresis for noise rejection, and an open-collector output pre-driver. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

While the magnetic flux density (B) is larger than threshold  $B_{op}$ , the OUT pin turns on (low). If B removed toward  $B_{rp}$ , the OUT pin is latched "on" state prior to  $B < B_{rp}$ . When  $B < B_{rp}$ , the OUT pin go into "off" state.

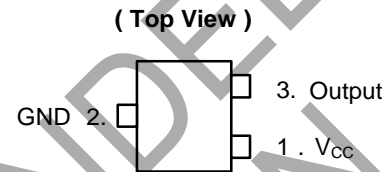
## Features

- Bipolar Hall Effect Latch Sensor
- 3.5V to 20V DC Operation Voltage
- Open Collector Pre-Driver
- 50mA Output Sink Current
- Chip Power Reverse-Connection Protection
- Operating Temperature: -40°C to 125°C
- SIP3, SC59 and SC59R (Commonly known as SOT23 in Asia): Available in "Green" Molding Compound (No Br, Sb)
- **Totally Lead-free & Fully RoHS Compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

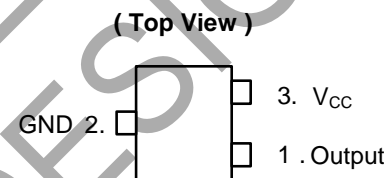
## Pin Assignments



SIP3



SC59



SC59R

## Applications

- Rotor Position Sensing
- Current Switch
- Encoder
- RPM Detection

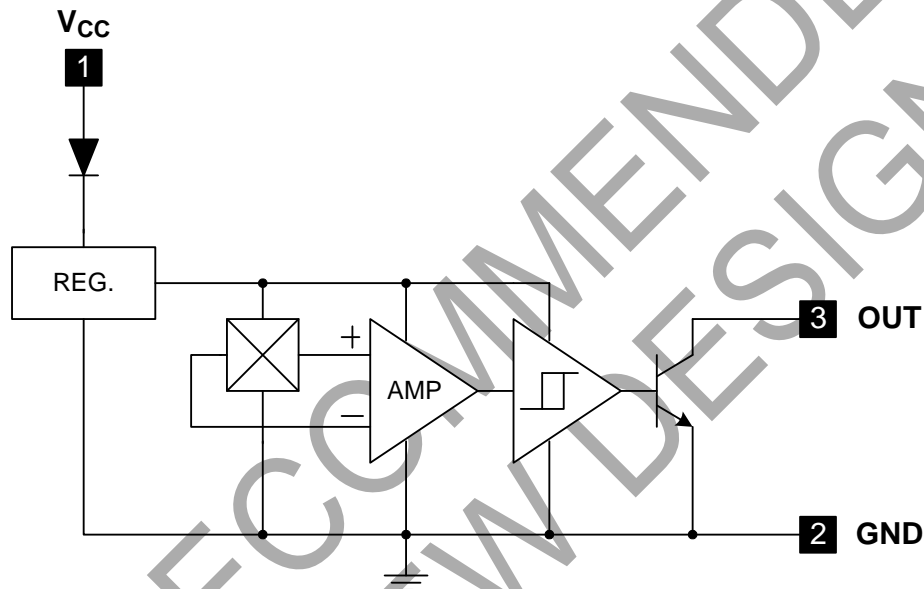
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3).compliant.
2. See <https://www.diodes.com/quality/lead-free/> 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.

## Pin Descriptions

Pin Name	Description
V <sub>CC</sub>	Input Power
GND	Ground
OUT	Output Stage

## Functional Block Diagram



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

Symbol	Parameter	Rating	Unit	
V <sub>CC</sub>	Supply Voltage	20	V	
V <sub>OUT</sub> (off)	Output "OFF" Voltage	20	V	
I <sub>O</sub> (sink)	Output "ON" Current	100	mA	
T <sub>ST</sub>	Storage Temperature Range	-65 to +150	°C	
T <sub>J(MAX)</sub>	Maximum Junction Temperature	+150	°C	
P <sub>D</sub>	Power Dissipation	SIP3	550	mW
		SC59 and SC59R	230	mW

## Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	Supply Voltage	Operating (Note 4)	3.5	20	V
$T_A$	Operating Temperature Range	Operating	-40	+125	°C

Note: 4. Operating, the output is switching as magnetic field change ( $S > 300G$ ,  $N < -300G$ ).

## Electrical Characteristics (@ $T_A = +25^\circ C$ , unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{OUT(SAT)}$	Output Saturation Voltage	$V_{CC} = 12V$ , OUT "ON" $I_O = 50mA$	-	200	300	mV
$I_{CC}$	Supply Current	$V_{CC} = 12V$ , OUT "OFF"	-	3.5	6	mA

## Magnetic Characteristics (@ $T_A = +25^\circ C$ , $V_{CC} = 4V$ to $20V$ , unless otherwise specified. Note 5)

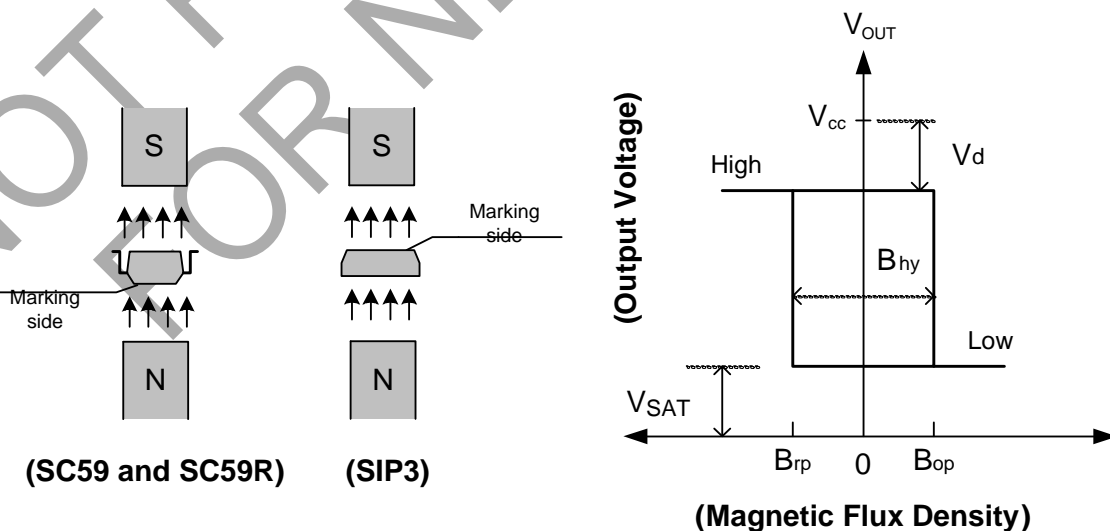
A grade

(1mT = 10 Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
$B_{ops}$ (south pole to brand side)	Operation Point	5	-	70	Gauss
$B_{rps}$ (south pole to brand side)	Release Point	-70	-	-5	Gauss
$B_{hy}$ ( $ B_{opx} - B_{rpx} $ )	Hysteresis	-	75	-	Gauss

Notes: 5. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.

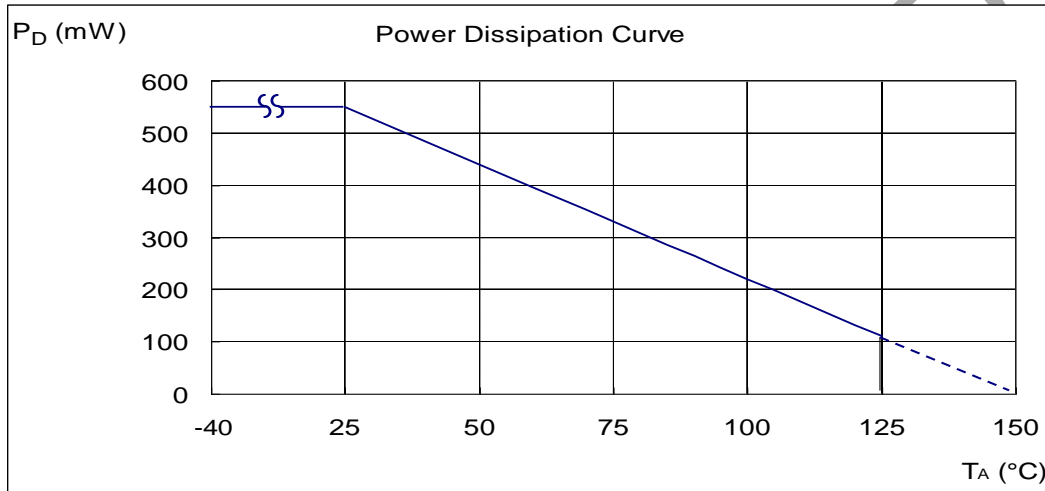
## Operating Characteristics



**Performance Characteristics**

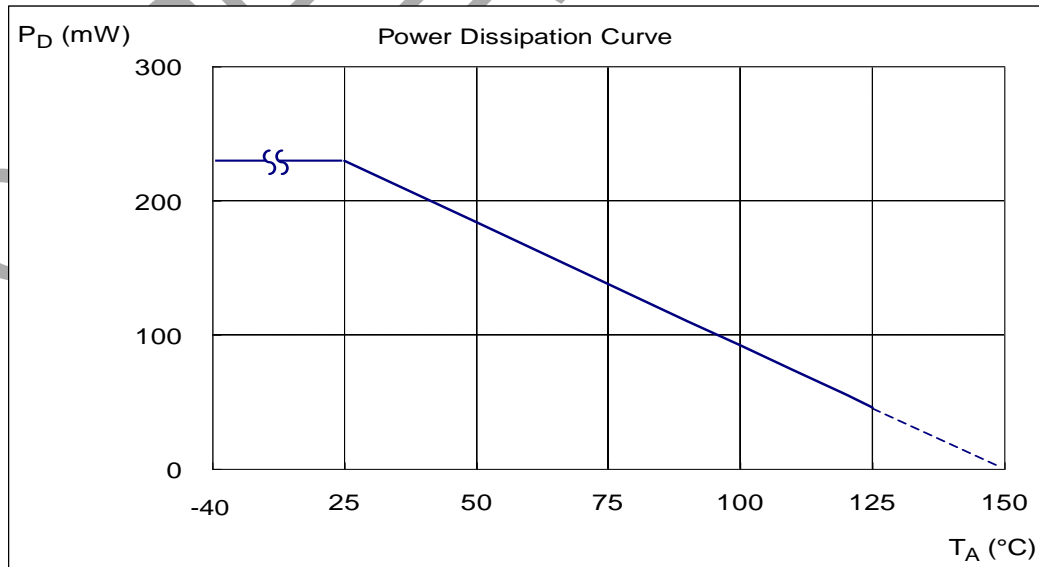
**(1) SIP3**

$T_A$ (°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



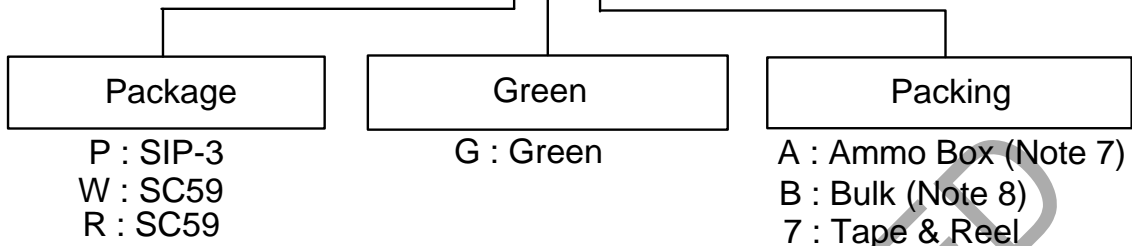
**(2) SC59 and SC59R (Commonly known as SOT23 in Asia)**

$T_A$ (°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



**Ordering Information**

**AH1751 -X X - X**

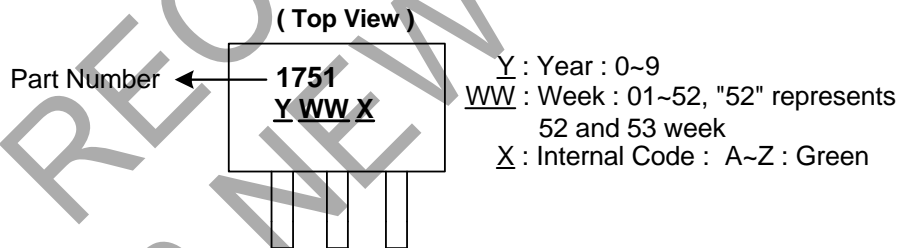


Part Number	Status (Note 9)	Package Code	Packaging (Note 6)	Bulk		7" Tape and Reel		Ammo Box	
				Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH1751-PG-A-A	NRND	P	SIP-3	NA	NA	NA	NA	4000/Box	A
AH1751-PG-B-A	NRND	P	SIP-3	1000	-B	NA	NA	NA	NA
AH1751-WG-7-A	NRND	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA
AH1751-RG-7-A	NRND	W	SC59R	NA	NA	3000/Tape & Reel	-7	NA	NA

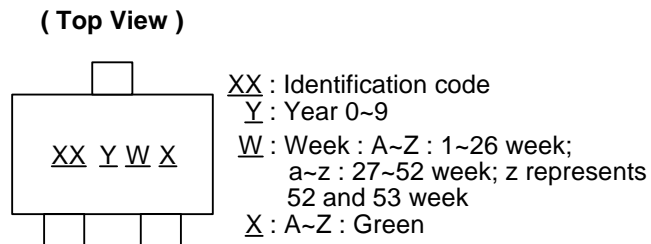
Notes: 6. Pad layout as shown on Diodes Inc. suggested pad layout document, which can be found on our website at <http://www.diodes.com/package-outlines.html>.  
 7. Ammo Box is for SIP3 Spread Lead.  
 8 . Bulk is for SIP-3 Straight Lead.  
 9: NRND = Not Recommended for New Design

**Marking Information**

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



(2) Package Type: SC59 and SC59R (Commonly known as SOT23 in Asia)

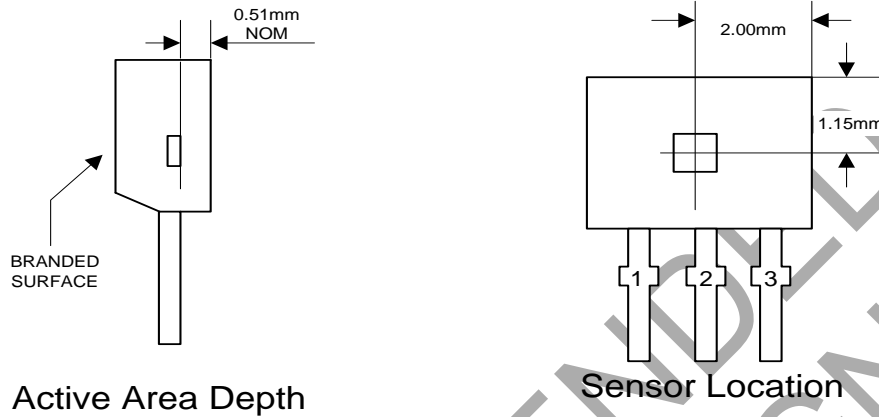


Part Number	Package	Identification Code
AH1751	SC59	RK
AH1751	SC59R	SK

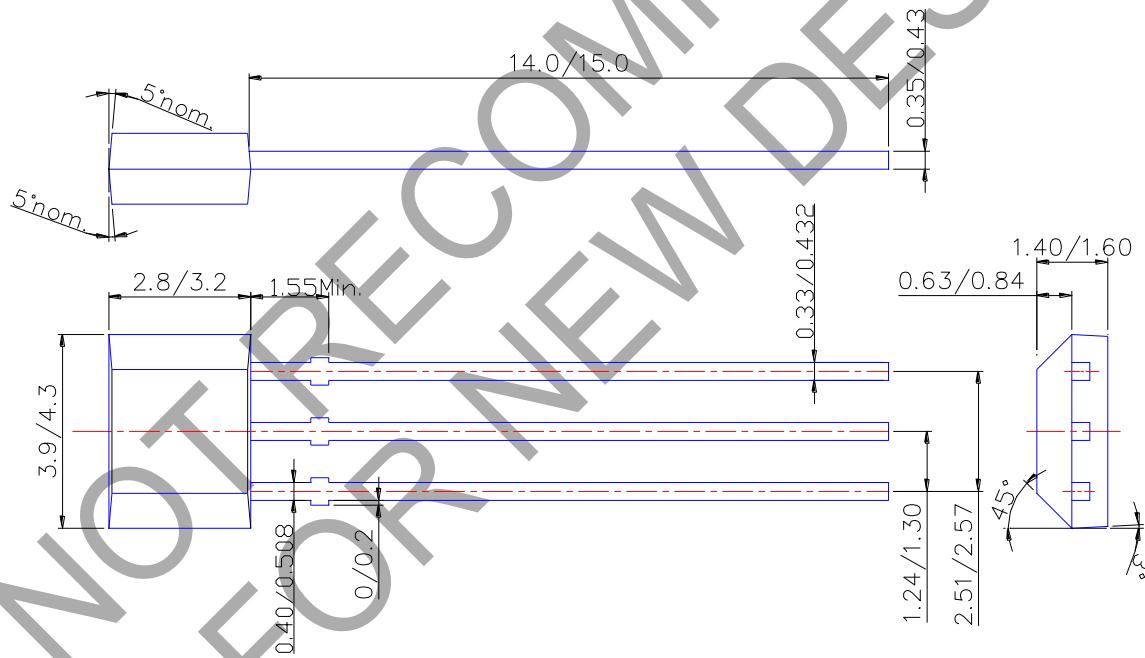
**Package Outline Dimensions and Suggested Pad Layout** (All dimensions in mm.)

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

(1) Package Type: SIP3 for Bulk pack



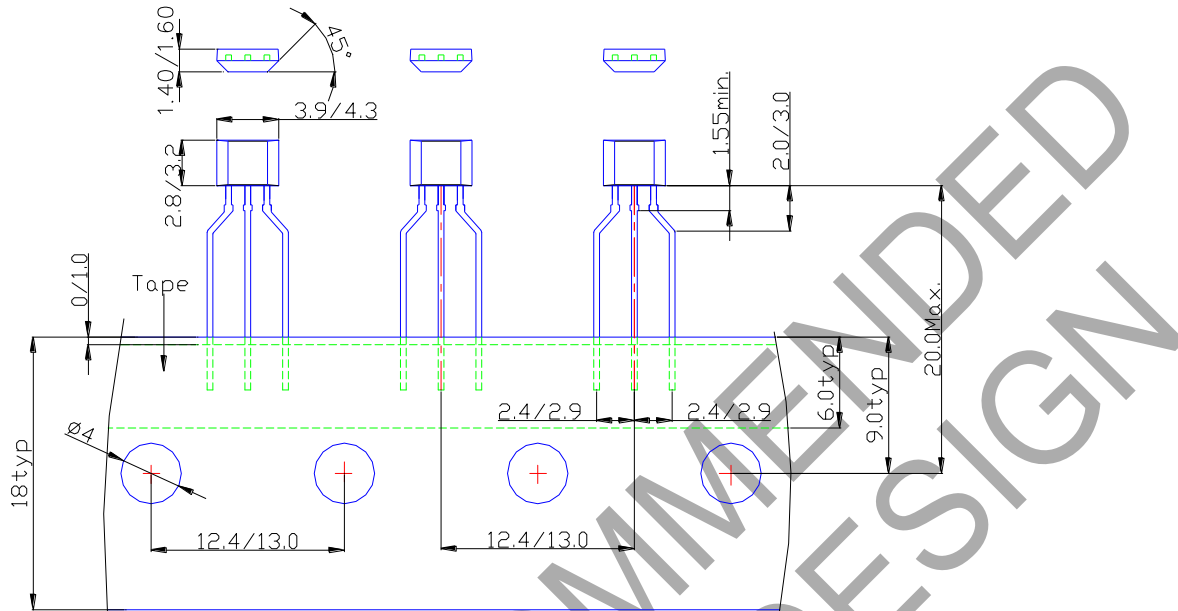
**Package Dimension**



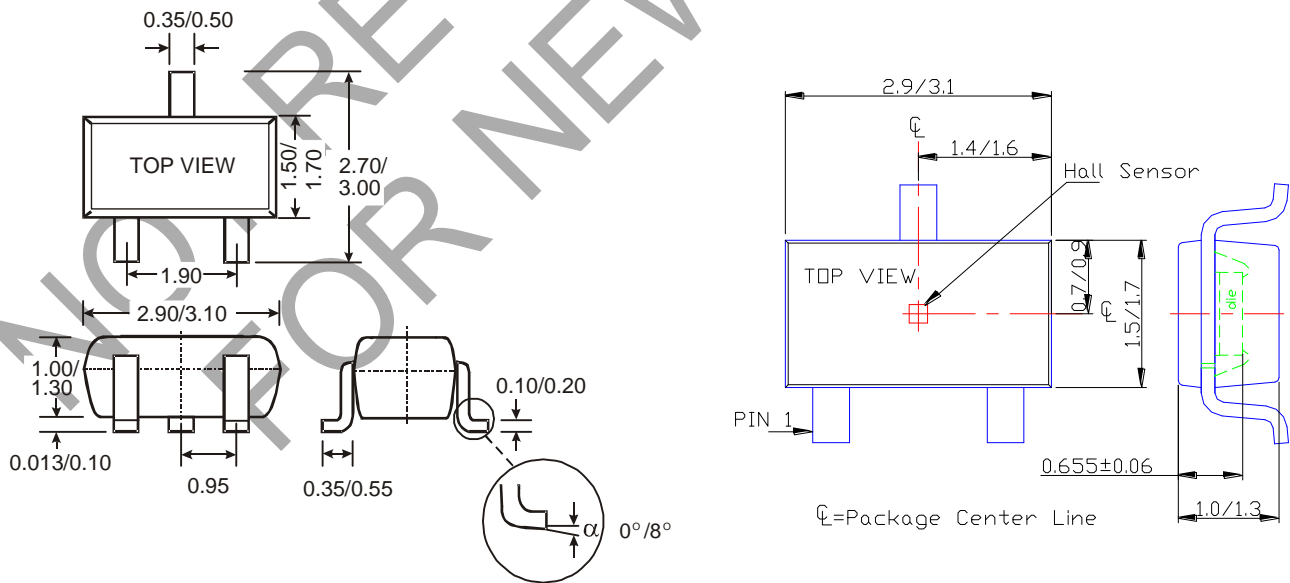
**Package Outline Dimensions and Suggested Pad Layout** (All dimensions in mm. Cont.)

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

**(2) Package Type: SIP3 for Ammo Pack**



**(3) Package Type: SC59 and SC59R (Commonly known as SOT23 in Asia)**



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