NEW PRODUCT

Description

The AH374 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 band-gap regulator provides a temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

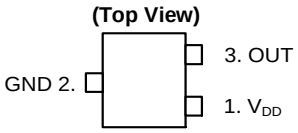
When the magnetic flux density (B) is larger than operate point (B_{OP}), output is switched on (OUT pin is pulled low). The output state is held on until a magnetic flux density reversal falls below B_{RP}. When B is less than B_{RP}, the output is switched off.

The AH374 is available in SIP-3 (Ammo Pack), SIP-3 (Bulk Pack), SC59 and SOT23 packages.

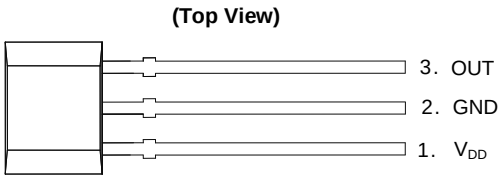
Features

- Bipolar Hall Effect Latch Operation
- 2.2V to 20V Operating Range
- Open Drain Pre-Driver
- 25mA Output Sink Capability
- -40°C to +125°C Operating Temperature
- Industry Standard SIP-3 (Ammo Pack), SIP-3 (Bulk Pack), SC59 and SOT23 Packages
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Pin Assignments



SC59 and SOT23



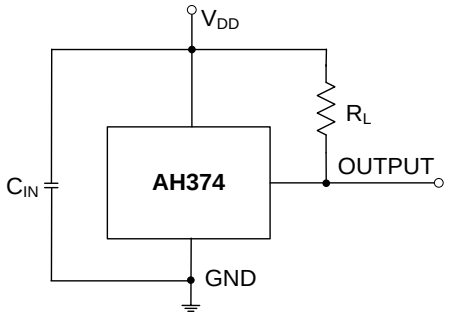
SIP-3 (Bulk Pack)

Applications

- Brush-Less DC Motor
- Brush-Less DC Fan
- Revolution Counting
- Speed Measurement

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 Application Circuits



Typical AH374 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, the recommended resistance is 10kΩ ~ 100kΩ.

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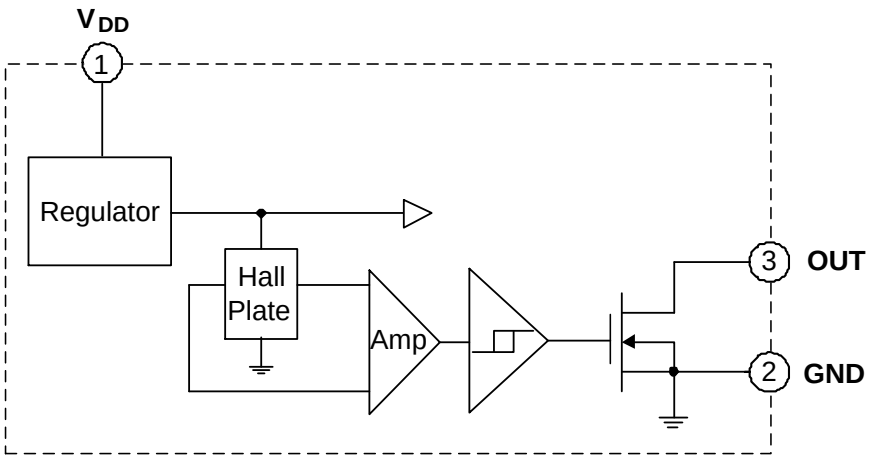
NEW PRODUCT

Pin Descriptions

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

Pin Number	Pin Name	Function
1	V_{DD}	Power Supply Input
2	GND	Ground
3	OUT	Output

Functional Block Diagram



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Absolute Maximum Ratings (Note 5) @T_A = +25°C, unless otherwise specified.)

Symbol	Characteristic		Value	Unit
V_{DD}	Supply Voltage (Note 6)		28	V
V_{OUT} (Off)	Output "Off" Voltage		28	V
I_O (Sink)	Output "On" Current (Sink)		25	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	mW
T_S	Storage Temperature Range		-65 to +150	°C
T_J	Maximum Junction Temperature		+150	°C

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 28V 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 = +25°C, unless otherwise specified.)

Symbol	Characteristic	Condition	Rating	Unit
V_{DD}	Supply Voltage (Note 7)	Operating	2.2 to 20	V
T_A	Operating Temperature Range	Operating	-40 to +125	°C

Note: 7. The output of IC will be switched after the supply voltage is over 2.2V, but the magnetic characteristics will not be normal until the supply is over 2.5V.

Electrical Characteristics (@T_A = +25°C, V_{DD} = 12V, unless otherwise specified.)

Symbol	Characteristic	Condition	Min	Typ	Max	Unit
V_{OUT}	Output On Voltage	I_{OUT} = 20mA	—	300	400	mV
I_{DD}	Supply Current	B < B_{RP}	—	2	4	mA
I_{OFF}	Output Leakage Current	Output off	—	< 0.1	10	µA

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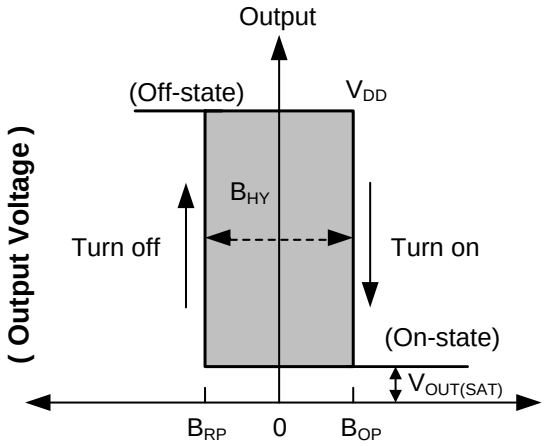
NEW PRODUCT

Magnetic Characteristics (Note 8) (@T_A = +25°C, V_{DD} = 2.5V to 20V, unless otherwise specified.)

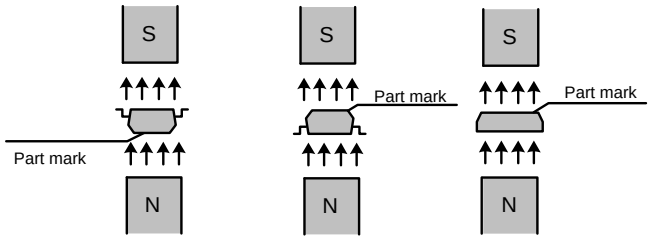
(1mT=10 Gauss)

Symbol	Characteristic	Min	Typ	Max	Unit
B_{OP} (South pole to part marking side for SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) and SOT23 package ; South pole to the non-part marking side for SC59 package. See diagram below)	Operation Point	5	30	60	Gauss
B_{RP} (North pole to part marking side for SIP-3 (Ammo Pack), SIP-3 (Bulk Pack) and SOT23 package; North pole to the non-part marking side for SC59 package. See diagram below)	Release Point	-60	-30	-5	
B_{HY} ($\|B_{OPX}\|$-$\|B_{RPX}\|$)	Hysteresis	—	60	—	

Note: 8. The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.



(Magnetic Flux Density B)



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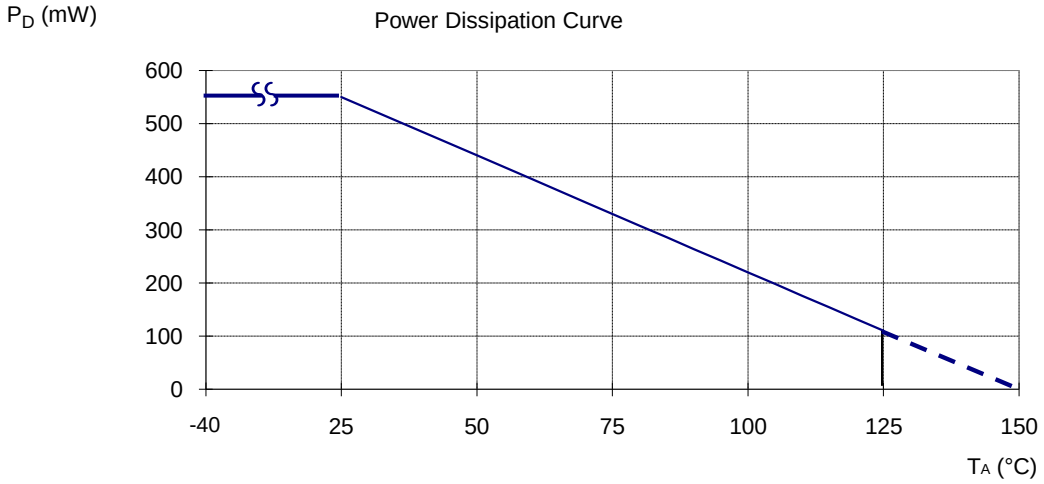
Thermal Performance Characteristics

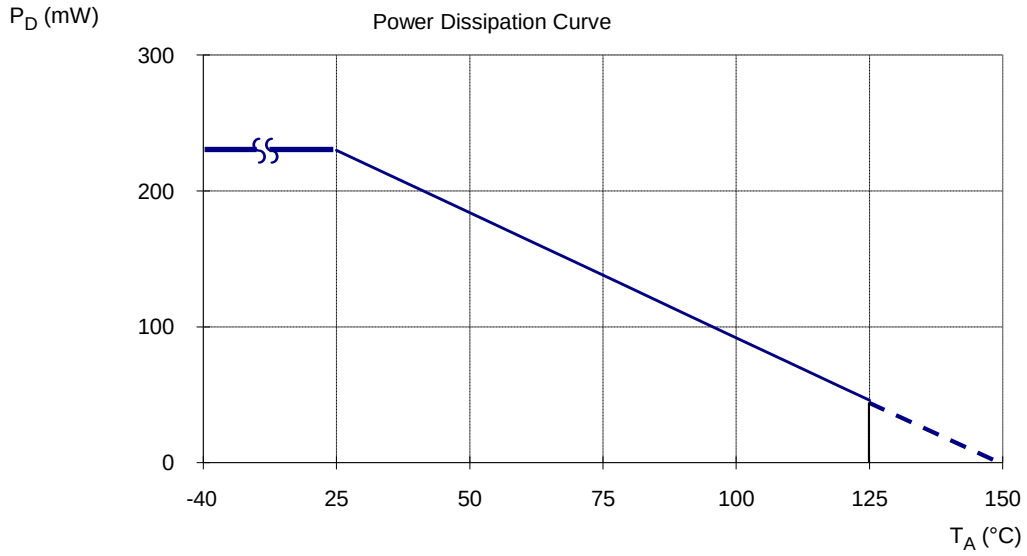
(1) Package Type: SIP-3 (Ammo Pack), SIP-3 (Bulk Pack)

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



(2) Package Type: SC59 and SOT23

T_A (°C)	25	50	60	70	80	85	90	100	110	120	130	140	150
P_D (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0



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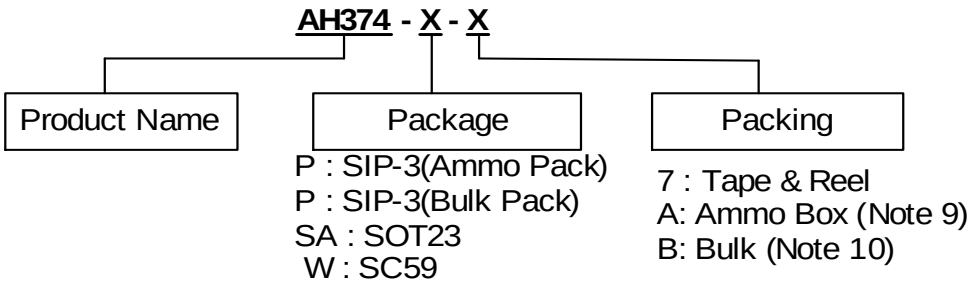
NEW PRODUCT

Ordering Information



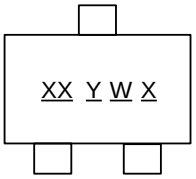
Part Number	Package Code	Packaging (Note 11)	Bulk Box		7" Tape and Reel		Ammo Box	
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix
AH374-P-A	P	SIP-3 (Ammo Pack)	NA	NA	NA	NA	4000/Box	-A
AH374-P-B	P	SIP-3 (Bulk Pack)	1000	-B	NA	NA	NA	NA
AH374-SA-7	SA	SOT23	NA	NA	3000/Tape & Reel	-7	NA	NA
AH374-W-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA

Notes: 9. Ammo Box is for SIP-3 (Ammo Pack) Spread Lead.
10. Bulk is for SIP-3 (Bulk Pack) Straight Lead.
11. Reverse taping as shown on Diodes Incorporated. Surface Mount (SMD) Packaging document AP02007, which can be found on our website http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information

(1) Package Type: SC59 and SOT23

(Top View)

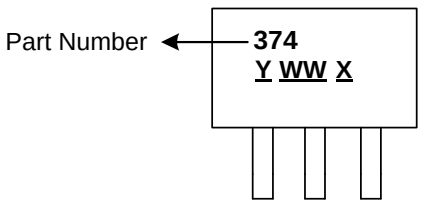


XX : Identification code
Y : Year 0 to 9
W : Week : A to Z : 1 to 26 week;
a to z : 27 to 52 week; z represents
52 and 53 week
X : Internal Code:

Part Number	Package	Identification Code
AH374	SC59	XJ
AH374	SOT23	YJ

(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
AH374	SIP-3	374

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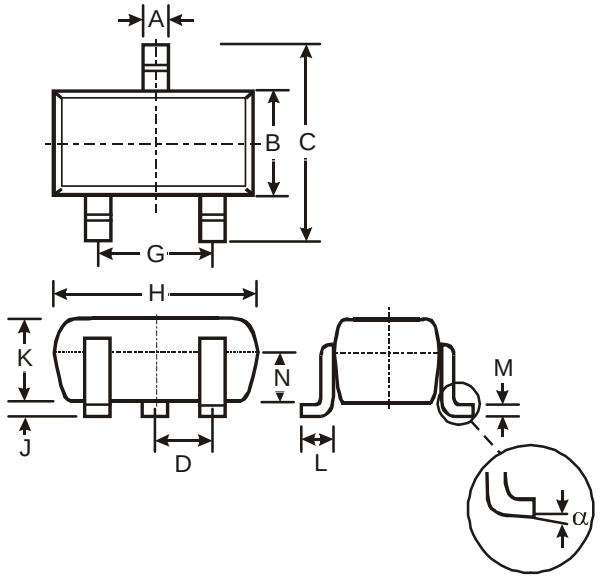
Package Outline Dimensions (All dimensions in mm.)

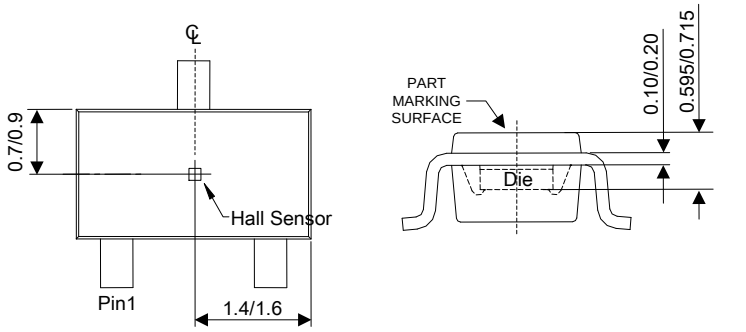
Please see http://www.diodes.com/package-outlines.html for the latest version.

(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			

Min/Max (in mm)



Sensor location

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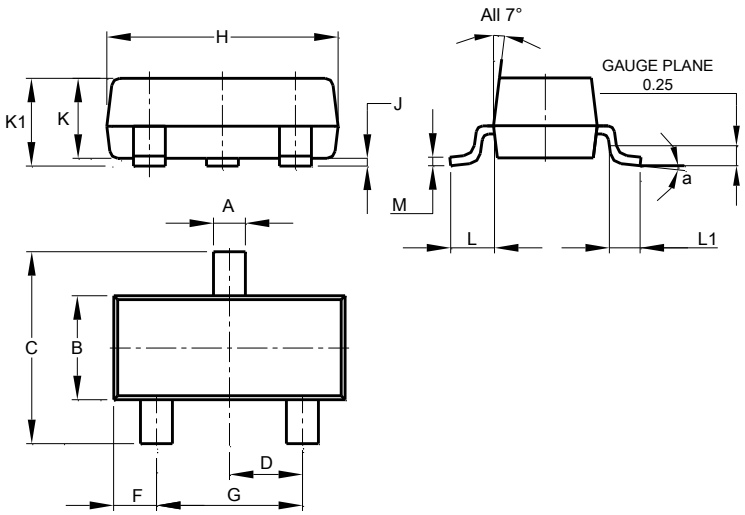
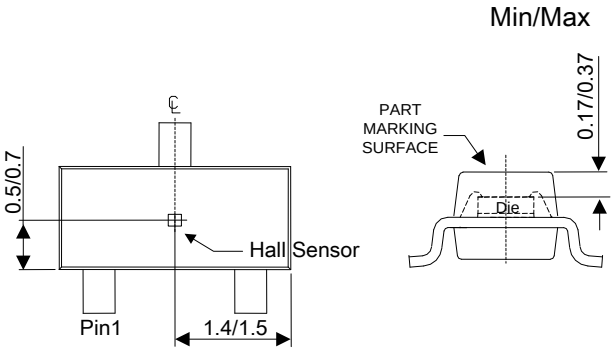
NEW PRODUCT

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

(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

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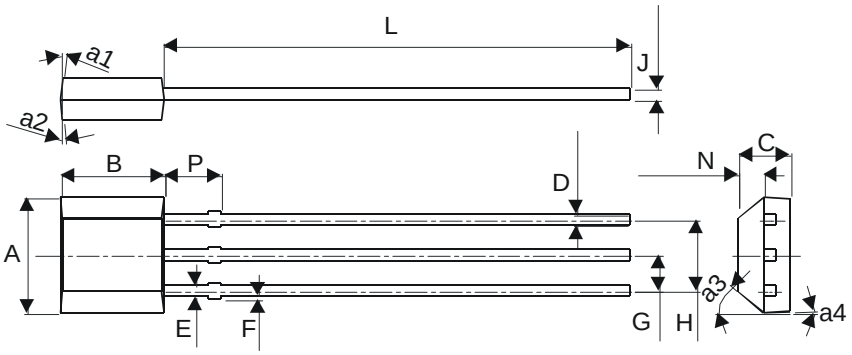
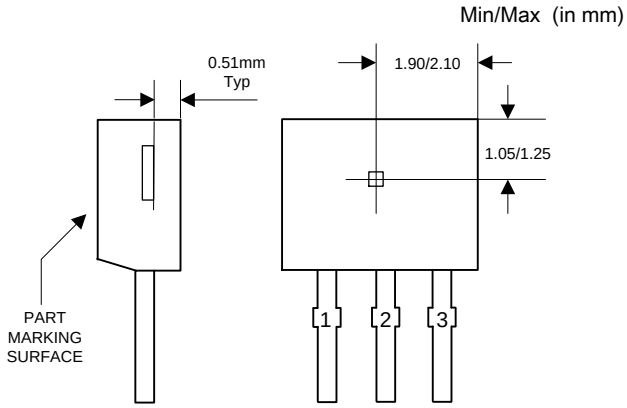
Package Outline Dimensions (Cont.) (All dimensions in mm.)

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



SIP-3 (Bulk Pack)		
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

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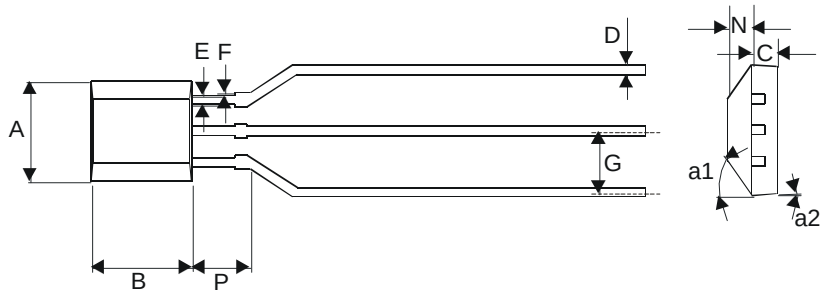
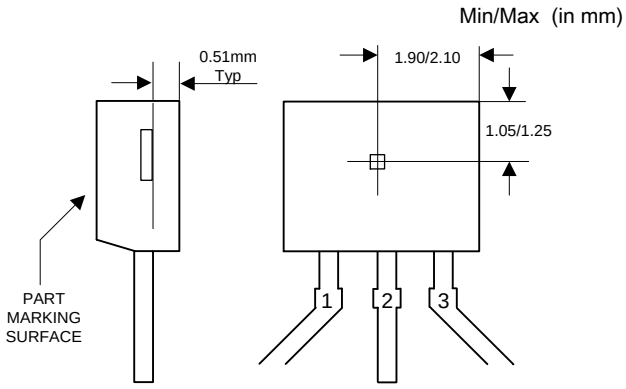
Package Outline Dimensions (Cont.) (All dimensions in mm.)

(4) 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

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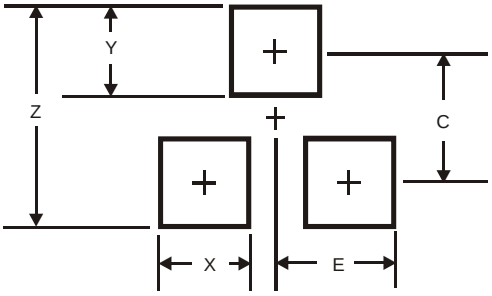
Suggested Pad Layout

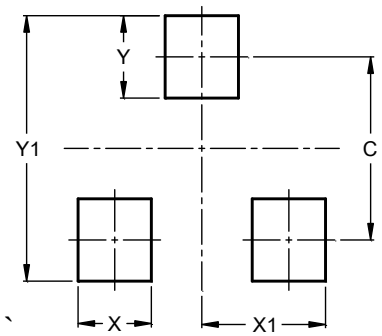
Please see http://www.diodes.com/package-outlines.html for the latest version.

(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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1. are intended to implant into the body, or
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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
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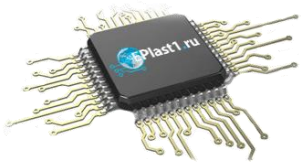
- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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Факс: 8 (812) 320-02-42
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Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.