AH180

MICROPOWER OMNIPOLAR HALL-EFFECT SENSOR SWITCH

Features

- Micropower operation
- Operation with magnetic field of either north or south pole (omnipolar)
- 2.5V to 5.5V battery operation
- Chopper stabilized
  - Superior temperature stability
  - Extremely Low Switch-Point Drift
  - Insensitive to Physical Stress
- Good RF noise immunity
- -40°C to 85°C operating temperature
- SIP-3L/SC59/Low profile DFN2020-6, DFN2020-3 package
- ESD (HBM) > 5KV for DFN2020-6, DFN2020-3
  > 6KV for SIP-3L and SC59
- Lead Free Package: SIP-3L (Note 1)
- SC59 (commonly known as SOT23 in Asia), DFN2020-6 and DFN2020-3: Available in "Green" Molding Compound (No Br, Sb) (Note 2)
- Lead Free Finish/RoHS Compliant (Note 3)
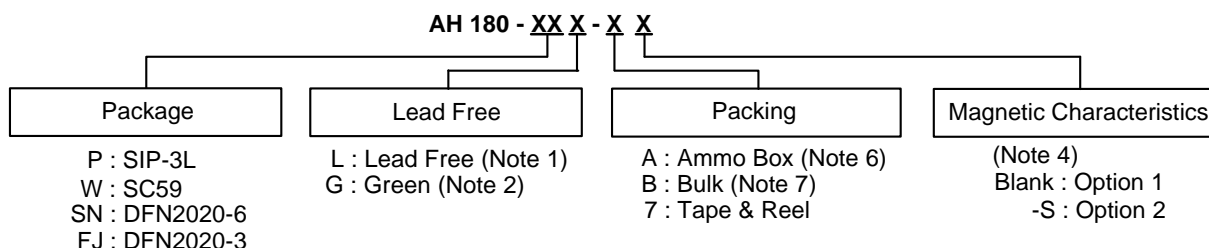
General Description

AH180 is comprised of two Hall effect plates and an open-drain output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total power consumption in normal operation is typically 24µW with a 3V power source.

Either north or south pole of sufficient strength will turn the output on. The output will be turned off under no magnetic field. While the magnetic flux density (B) is larger than operating point (Bop), the output will be turned on (low), the output is held until B is lower than release point (Brp), then turned off.

Applications

- Cover switch in clam-shell cellular phones
- Cover switch in Notebook PC/PDA
- Contact-less switch in consumer products
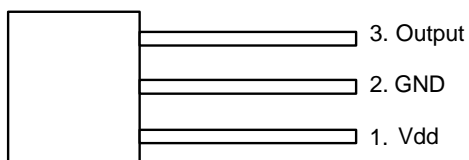
Ordering Information

AH 180 - XX X - X X

Package	Lead Free	Packing	Magnetic Characteristics
P : SIP-3L W : SC59 SN : DFN2020-6 FJ : DFN2020-3	L : Lead Free (Note 1) G : Green (Note 2)	A : Ammo Box (Note 6) B : Bulk (Note 7) 7 : Tape & Reel	(Note 4) Blank : Option 1 -S : Option 2

Device	Package Code	Packaging (Note 5)	Bulk		7" Tape and Reel		Ammo Box		Magentic Characteristics (Note 4)
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffi	
AH180-PL-B	P	SIP-3L	1000	-B	NA	NA	NA	NA	Blank
AH180-PL-A	P	SIP-3L	NA	NA	NA	NA	-A	4000/Box	Blank
AH180-PL-B-S	P	SIP-3L	1000	-B	NA	NA	NA	NA	S
AH180-PL-A-S	P	SIP-3L	NA	NA	NA	NA	-A	4000/Box	S
AH180-WG-7	W	SC59	NA	NA	3000/Tape & Reel	-7	NA	NA	Blank
AH180-SNG-7	SN	DFN2020-6	NA	NA	3000/Tape & Reel	-7	NA	NA	Blank
AH180-FJG-7	FJ	DFN2020-3	NA	NA	3000/Tape & Reel	-7	NA	NA	Blank

Notes:
1. SIP-3L is available in "Lead Free" product only.
2. SC59, DFN2020-6 and DFN2020-3 are available in "Green" product only.
3. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*.
4. Please refer the Magnetic Characteristics table, option 2 is available in SIP-3L package only.
5. 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.
6. Ammo Box is for SIP-3L Spread Lead.
7. Bulk is for SIP-3L Straight Lead.

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Pin Assignment

(1) SIP-3L

(Top View)

3. Output

2. GND

1. Vdd

(2) SC59

(Top View)

GND 2.

3. Output

1 . Vdd

(3) DFN2020-6

(Bottom view)

1. Vdd   NC   3. Output

NC   NC

2. GND
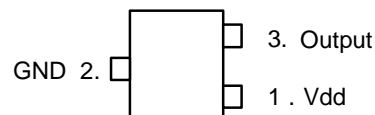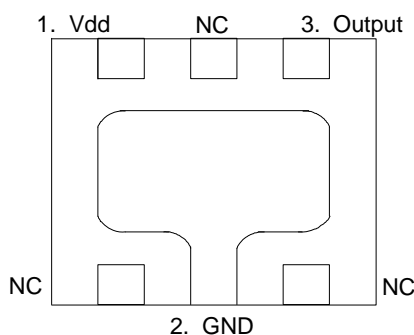
(4) DFN2020-3

(Bottom view)

1. Vdd   3. Output

2. GND
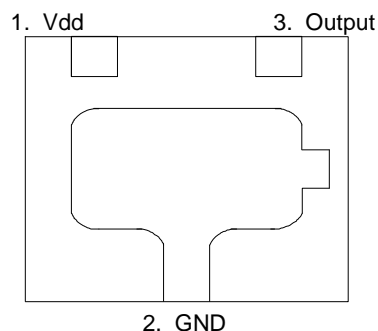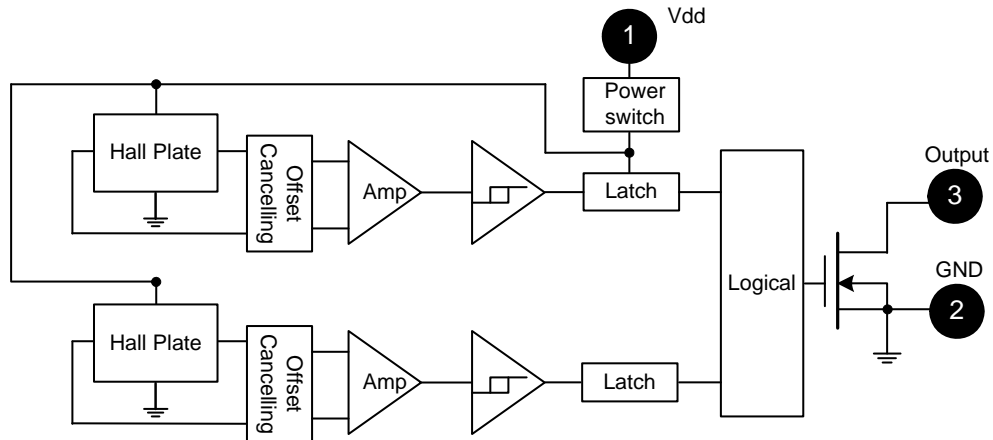
Notes: 8. NC is "No Connection" which is recommended to be tied to ground.

Pin Descriptions

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

Block Diagram

Typical Circuit
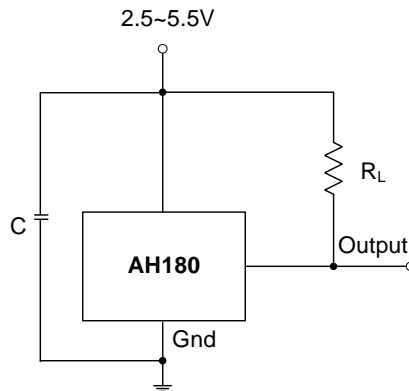
Notes: 9. C is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 10nF~100nF.
                R_L is the pull-up resistor, the recommended resistance is 10KΩ~100KΩ.

Absolute Maximum Ratings   (at T_A= 25°C)

Symbol	Characteristics		Values	Unit
Vdd	Supply voltage		7	V
B	Magnetic flux density		Unlimited	
Ts	Storage Temperature Range		-65 to +150	°C
P_D	Package Power Dissipation	SIP-3L	550	mW
		SC59-3L/ DFN2020-6/ DFN2020-3	230	mW
T_J	Maximum Junction Temperature		150	°C

Recommended Operating Conditions   (T_A = 25°C)

Symbol	Parameter	Conditions	Rating	Unit
Vdd	Supply Voltage	Operating	2.5~5.5	V
T_A	Operating Temperature Range	Operating	-40 to +85	°C

Electrical Characteristics (T_A = +25°C, Vdd = 3V; unless otherwise specified)

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
Vout	Output On Voltage	Iout =1mA	—	0.1	0.3	V
Ioff	Output Leakage Current	Vout =5.5V, Output off	—	<0.1	1	µA
Idd(en)		Chip enable, T_A = 25°C, Vdd = 3V	—	3	6	mA
Idd(en)		Chip enable, T_A = -40~85°C, Vdd = 2.5~5.5V	—	3	9	mA
Idd(dis)		Chip disable, T_A = 25°C, Vdd = 3V	—	5	10	µA
Idd(dis)	Supply Current	Chip disable, T_A = -40~85°C, Vdd = 2.5~5.5V	—	5	15	µA
Idd(avg)		Average supply current, T_A = 25°C, Vdd = 3V	—	8	16	µA
Idd(avg)		Average supply current, T_A = -40~85°C, Vdd = 2.5~5.5V	—	8	24	µA
Tawake	Awake Time	(Note 10)	—	75	125	µs
Tperiod	Period	(Note 10)	—	75	125	ms
D.C.	Duty Cycle		—	0.1	—	%

Notes: 10. When power is initially on, the operating Vdd (2.5V to 5.5V) must be applied to be guaranteed for the output sampling. The output state is valid after the second operating phase (typical 150ms).
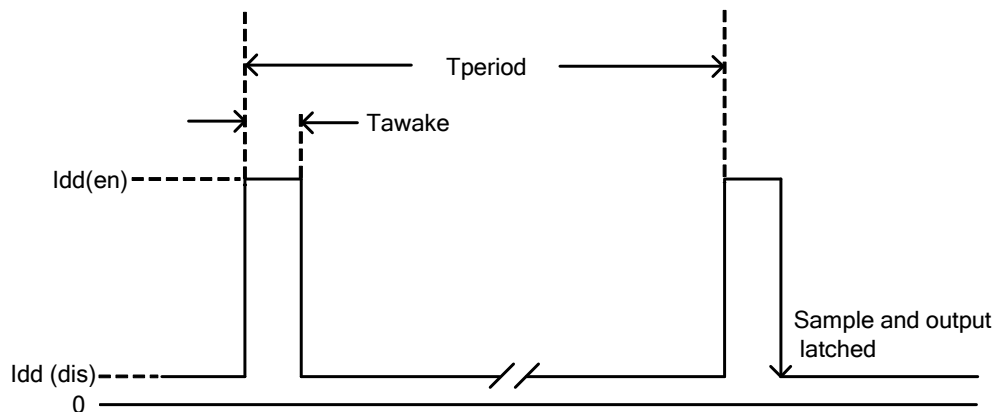
Magnetic Characteristics (T_A = 25°C, Vdd = 3V, Note 11,12)

(1mT=10 Gauss)

| Symbol	Characteristic	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operate Point	-	40	60	Gauss
Bopn(north pole to brand side)		-60	-40	-	
Brps(south pole to brand side)	Release Point Option 1	10	30	-	
Brpn(north pole to brand side)		-	-30	-10	
Brps(south pole to brand side)	Release Point Option 2	20	30	-	
Brpn(north pole to brand side)		-	-30	-20	
Bhy($\left| Bopx - Brpx \right|$)	Hysteresis	-	15	-	

Notes: 11. Typical data is at T_A = 25°C, Vdd = 3V, and for design information only.
        12. Operating point and release point will vary with supply voltage and operating temperature.
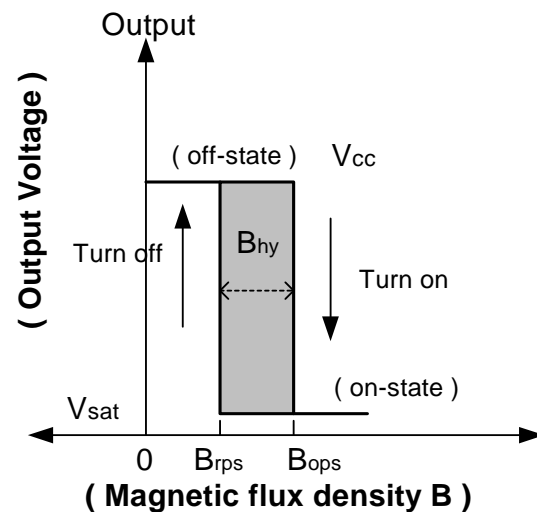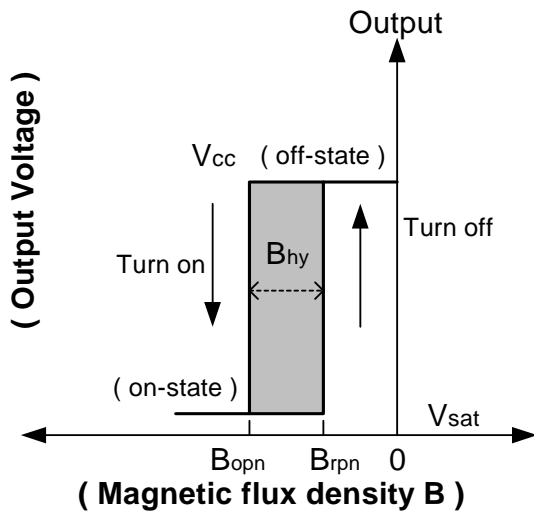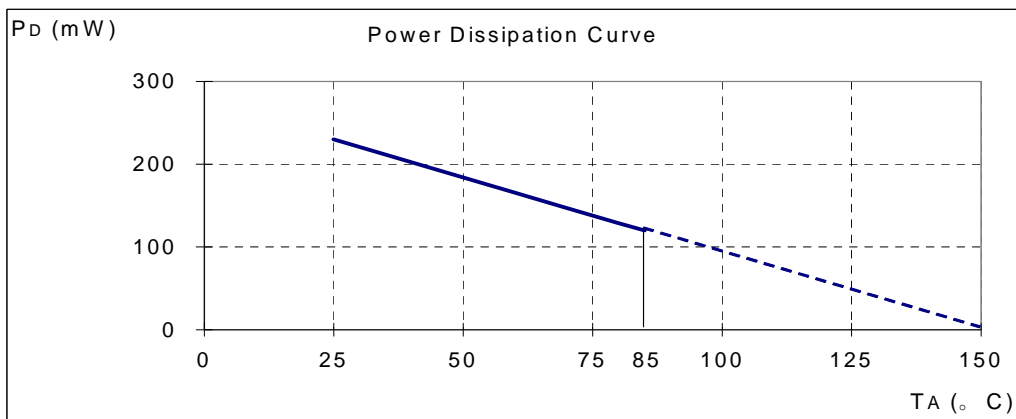
Performance Characteristics

(1) SIP-3L

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
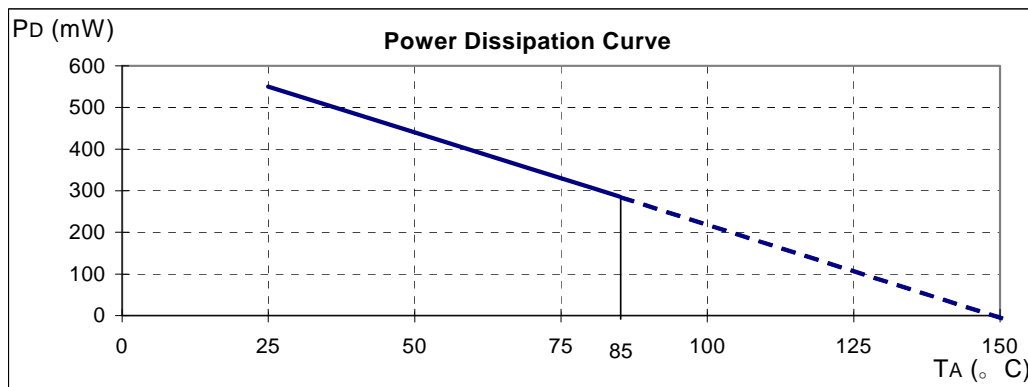
(2) SC59, DFN2020-6 and DFN2020-3

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

Marking Information

(1) SIP-3L

(Top View)

180
Y WW X

Y : Year : "7" = 2007
           "8" = 2008
WW : Nth Week 01~52
X : Internal code
     a~z : Lead Free

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

(Top View)

XX Y M X

XX : K0 : AH180
Y : Year 0~9
M : Month A~L
X : Internal code
     A~Z : Green
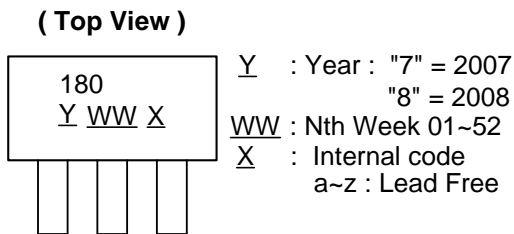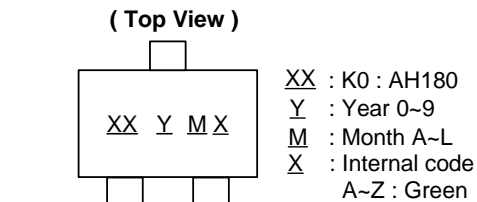
Part Number	Package	Identification Code
AH180	SC59	K0

(3) DFN2020-6

(Top View)

180
YMX

Pin 1 indicator
Y : Year 0~9
M : Month A~L
X : Internal code
    A~Z : Green

(4) DFN2020-3

(Top View)

X X
YMX

Pin 1 indicator
K0 : AH180
Date code
Internal code
A~Z: Green Package
M : Month (A~L)
Y : Year
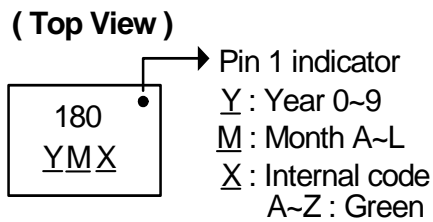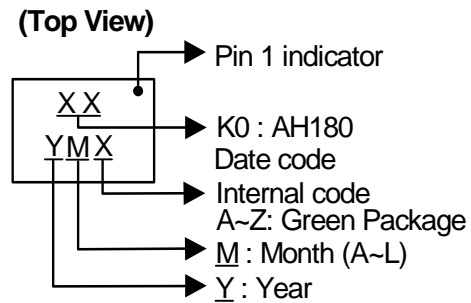
Part Number	Package	Identification Code
AH180	DFN2020-3	K0

MICROPOWER OMNIPOLAR HALL-EFFECT SENSOR SWITCH

Package Information   (All Dimensions in mm)

(1) Package Type: SIP-3L for Bulk only
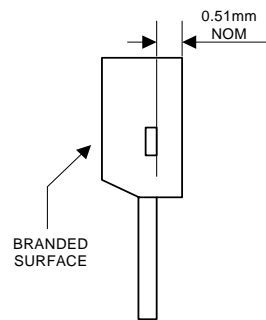
Active Area Depth
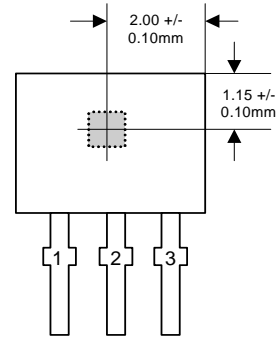
Sensor Location

Package Dimension

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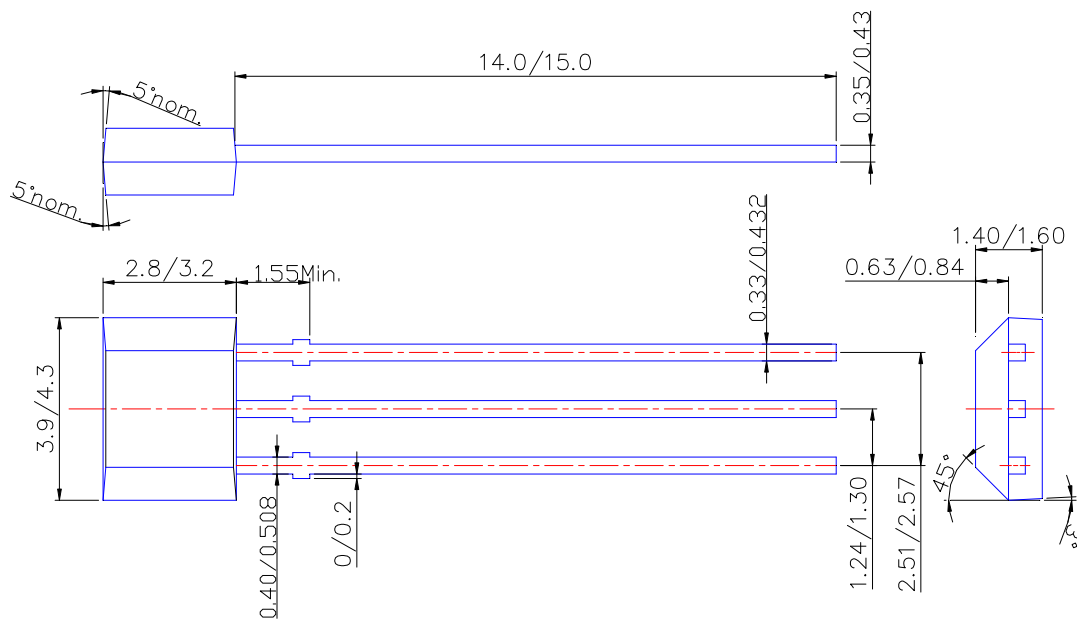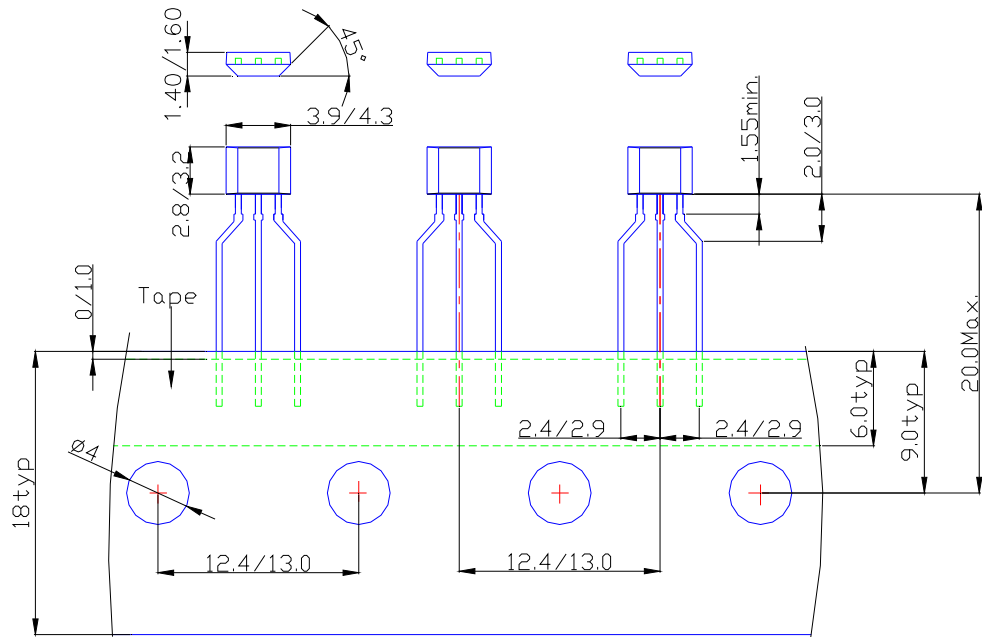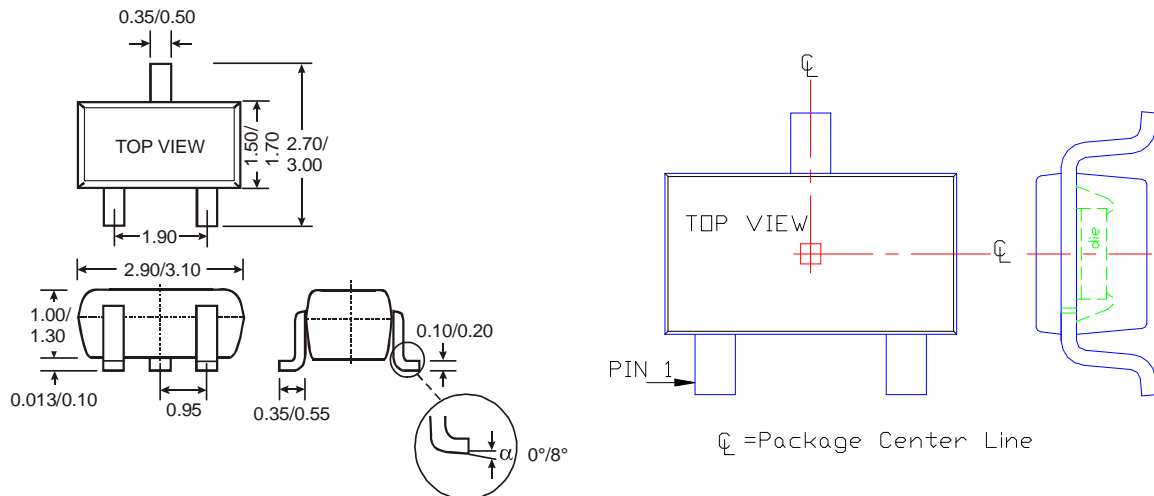
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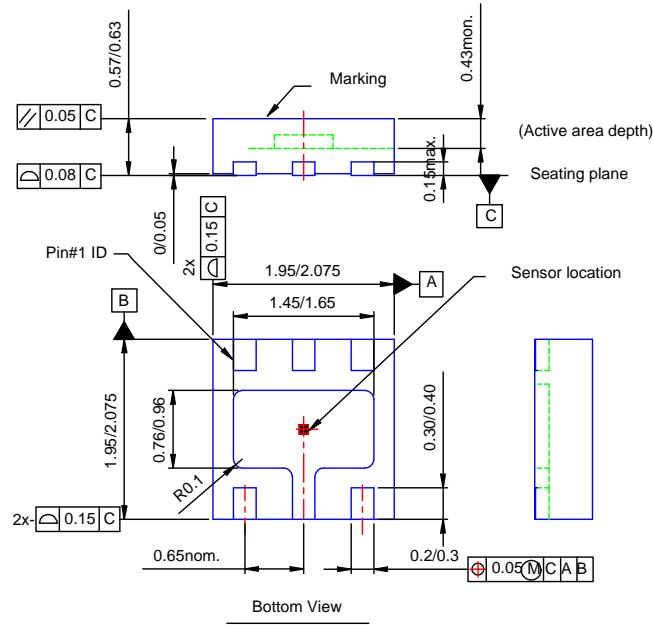
(2) Package Type: SIP-3L for Ammo Pack-only
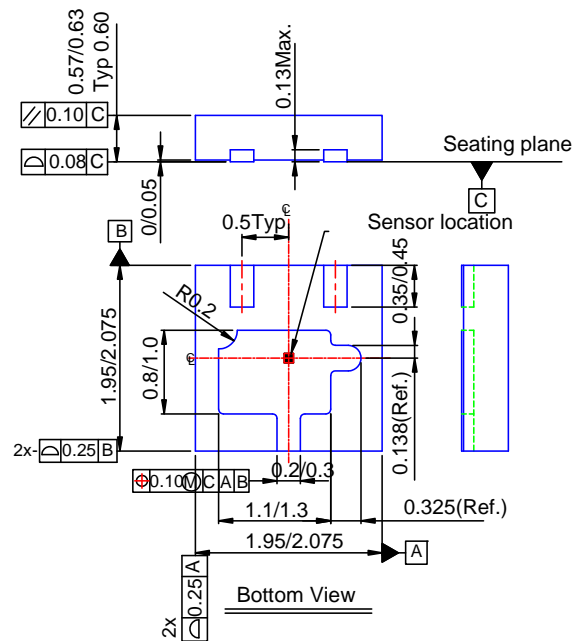

(3) SC59 (commonly known as SOT23 in Asia)

Package Information   (Continued)
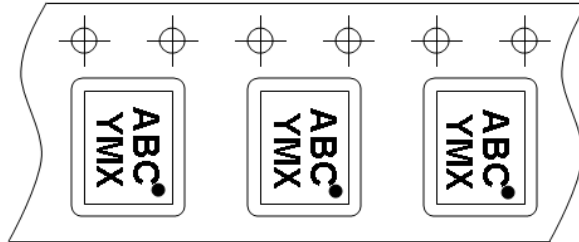
(4) Package Type: DFN2020-6

Bottom View

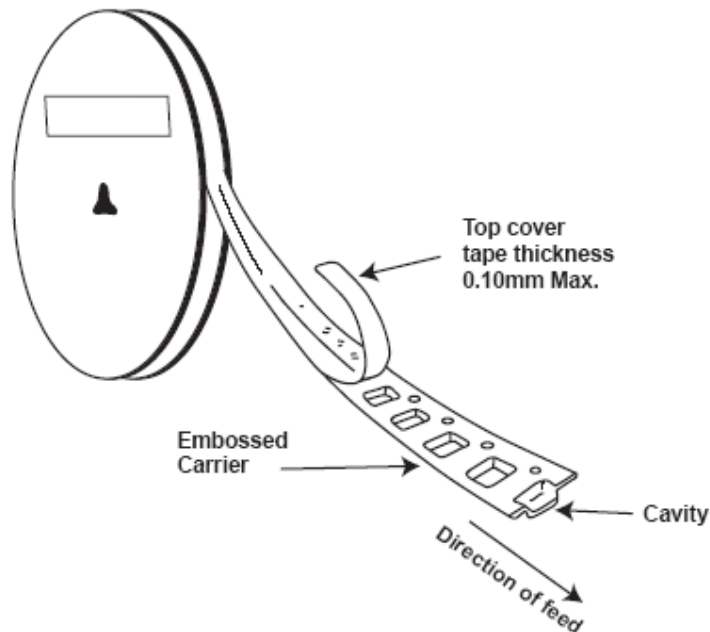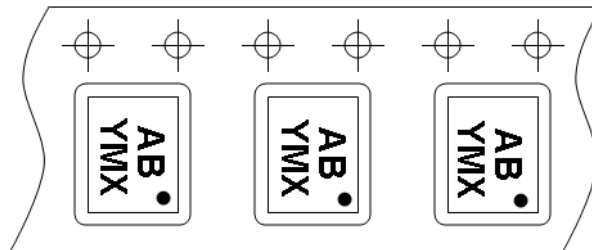**(5) Package Type: DFN2020-3**

Bottom View

Taping Orientation

(1) DFN2020-6

(2) DFN2020-3

Notes: 13.   The taping orientation of the other package type can be found on our website at http://www.diodes.com/datasheets/ap02007.pdf.

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