

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

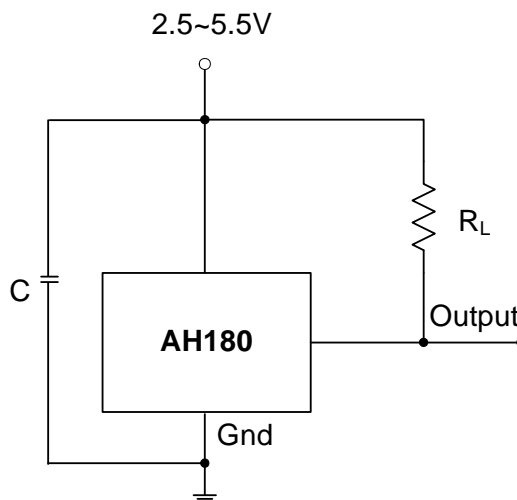
AH180 is comprised of two Hall effect plates and an open-drain output driver, mainly designed for battery-operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). The total power consumption in normal operation is typically 24μW with a 3V power source.

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 (**B_{rp}**), then turned off.

Applications

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

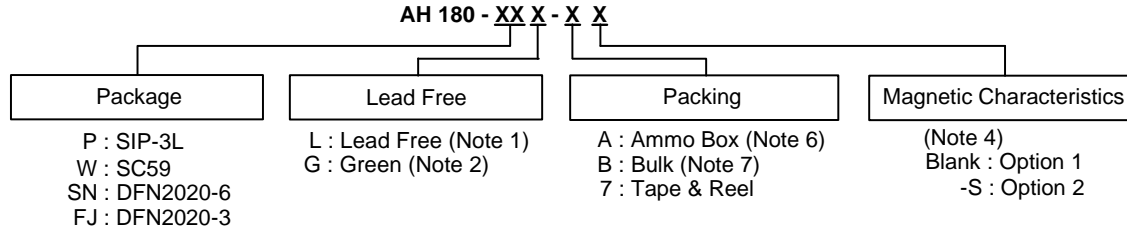
Typical Circuit










Note: 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 10Kohm~100Kohm.

Ordering Information



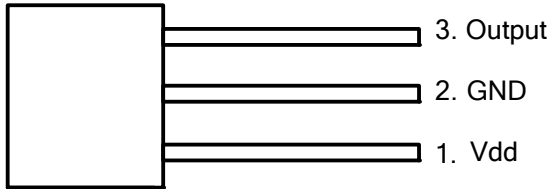
Device	Package Code	Packaging (Note 5)	Bulk		7" Tape and Reel		Ammo Box		Magnetic Characteristics (Note 4)
			Quantity	Part Number Suffix	Quantity	Part Number Suffix	Quantity	Part Number Suffix	
 AH180-PL-B	P	SIP-3L	1000	-B	NA	NA	NA	NA	Blank
 AH180-PL-A	P	SIP-3L	NA	NA	NA	NA	-A	4000/Box	Blank
 AH180-PL-B-S	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. Please visit our website at http://www.diodes.com/products/lead_free.html
 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.

Pin Assignment

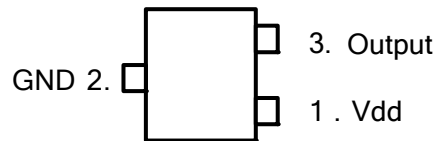
(1) SIP-3L

(Top View)



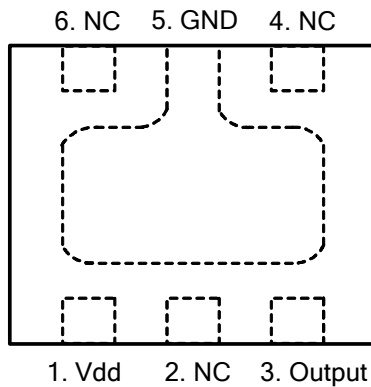
(2) SC59 (commonly known as SOT23 in Asia)

(Top View)



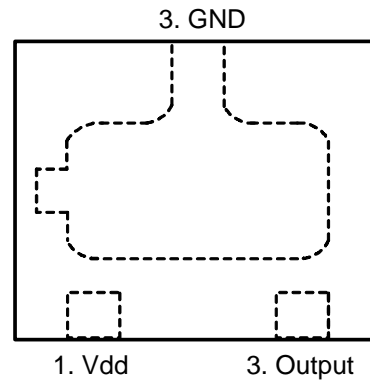
(3) DFN2020-6

(Top View)



(4) DFN2020-3

(Top View)

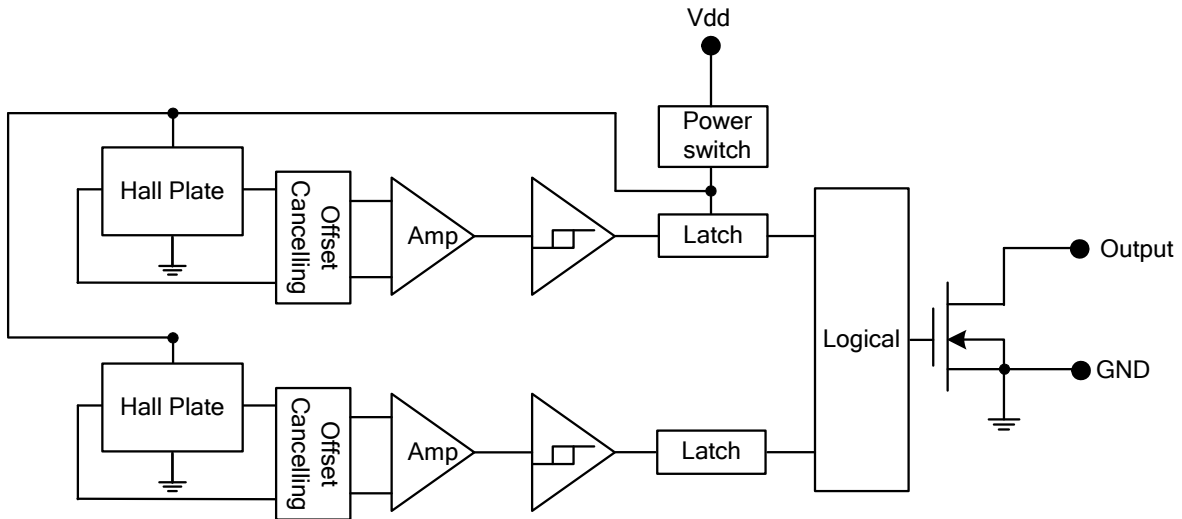


Notes: 8. NC is "No Connection" which is recommended to be tied to ground.

Pin Descriptions

Name	P/I/O	Description
Vdd	P/I	Power Supply Input
GND	P/I	Ground
Output	O	Output Pin
NC	NC	No Connected

Block Diagram



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

Symbol	Characteristics	Values	Unit	
Vdd	Supply voltage	7	V	
B	Magnetic flux density	Unlimited		
Ts	Storage Temperature Range	-65 to +150	$^\circ\text{C}$	
P _D	Package Power Dissipation	SIP-3L	550	mW
		SC59-3L/ DFN2020-6/ DFN2020-3	230	mW
T _J	Maximum Junction Temperature	150	$^\circ\text{C}$	

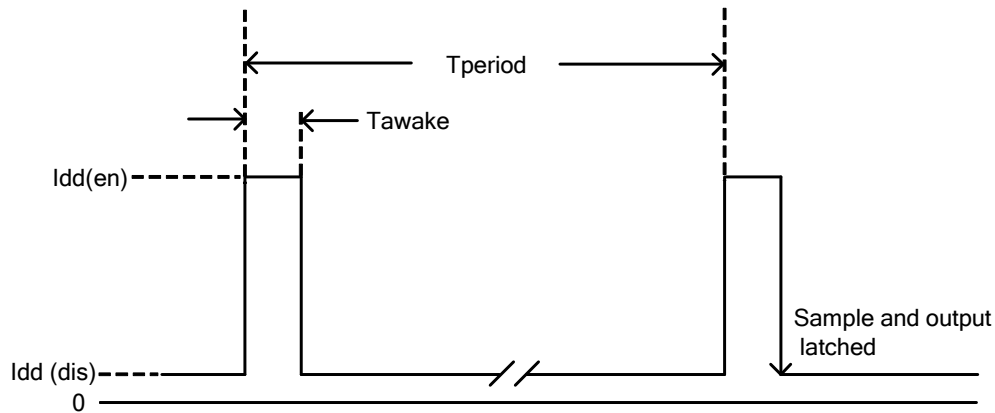
Recommended Operating Conditions ($T_A = 25^\circ\text{C}$)

Symbol	Parameter	Conditions	Rating	Unit
Vdd	Supply Voltage	Operating	2.5~5.5	V
T _A	Operating Temperature Range	Operating	-40 to +85	$^\circ\text{C}$

Electrical Characteristics ($T_A = +25^\circ\text{C}$, $V_{dd} = 3\text{V}$; unless otherwise specified)

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
V_{out}	Output On Voltage	$I_{out} = 1\text{mA}$	—	0.1	0.3	V
I_{off}	Output Leakage Current	$V_{out} = 5.5\text{V}$, Output off	—	<0.1	1	μA
$I_{dd(en)}$	Supply Current	Chip enable, $T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$	—	3	6	mA
$I_{dd(en)}$		Chip enable, $T_A = -40\sim 85^\circ\text{C}$, $V_{dd} = 2.5\sim 5.5\text{V}$	—	3	9	mA
$I_{dd(dis)}$		Chip disable, $T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$	—	5	10	μA
$I_{dd(dis)}$		Chip disable, $T_A = -40\sim 85^\circ\text{C}$, $V_{dd} = 2.5\sim 5.5\text{V}$	—	5	15	μA
$I_{dd(ave)}$		Average supply current, $T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$	—	8	16	μA
$I_{dd(ave)}$		Average supply current, $T_A = -40\sim 85^\circ\text{C}$, $V_{dd} = 2.5\sim 5.5\text{V}$	—	8	24	μA
T_{awake}		Awake Time	(Note 9)	—	75	125
T_{period}	Period	(Note 9)	—	75	125	ms
D.C.	Duty Cycle		—	0.1	—	%

Notes: 9. When power is initially on, the operating V_{dd} (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 ($T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$, Note 10, 11)

Option 1:

(1mT=10 Gauss)

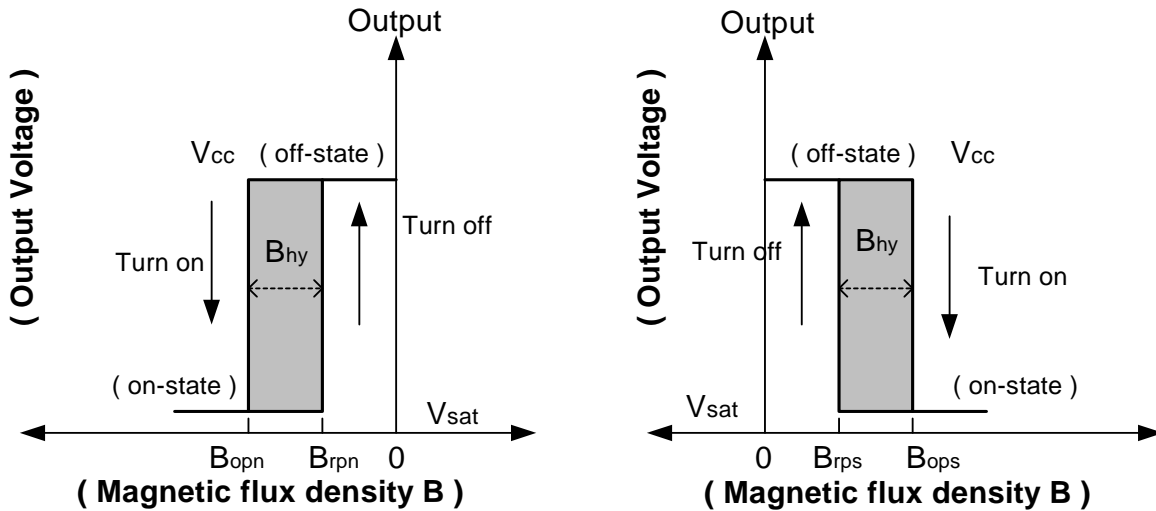
Symbol	Parameter	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operation Point	-	40	60	Gauss
Bopn(north pole to brand side)		-60	-40	-	
Brps(south pole to brand side)	Release Point	10	30	-	
Brpn(north pole to brand side)		-	-30	-10	
Bhy(Bopx – Brpx)	Hysteresis	-	15	-	

Option 2:

(1mT=10 Gauss)

Symbol	Parameter	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operation Point	-	40	60	Gauss
Bopn(north pole to brand side)		-60	-40	-	
Brps(south pole to brand side)	Release Point	20	30	-	
Brpn(north pole to brand side)		-	-30	-20	
Bhy(Bopx – Brpx)	Hysteresis	-	15	-	

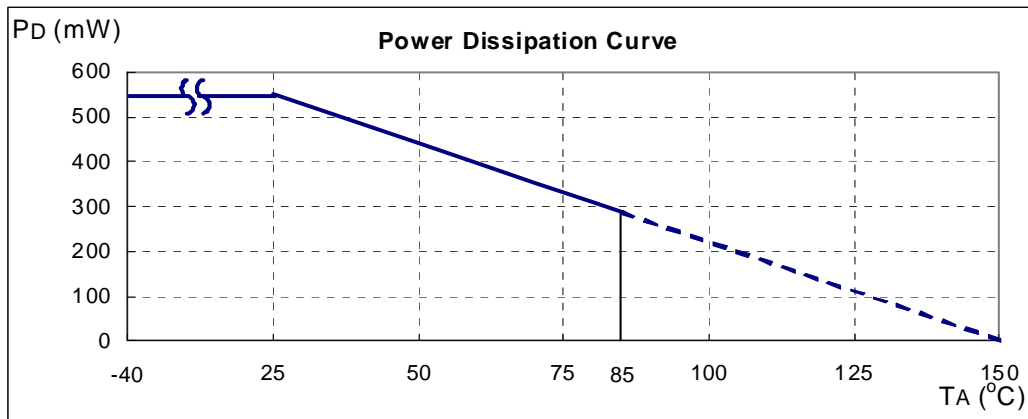
Notes: 10. Typical data is at $T_A = 25^\circ\text{C}$, $V_{dd} = 3\text{V}$, and for design information only.
11. Magnetic characteristics are for design information, which will vary with supply voltage, operating temperature and after soldering.



Performance Characteristics

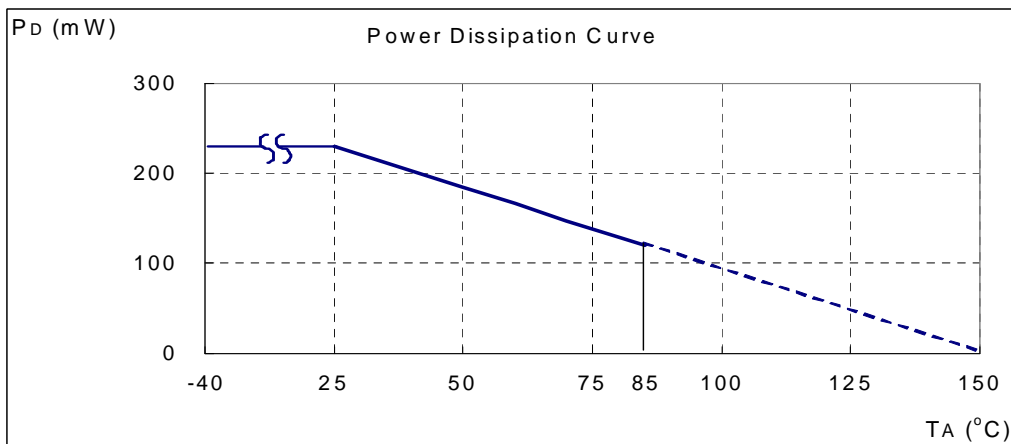
(1) SIP-3L

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



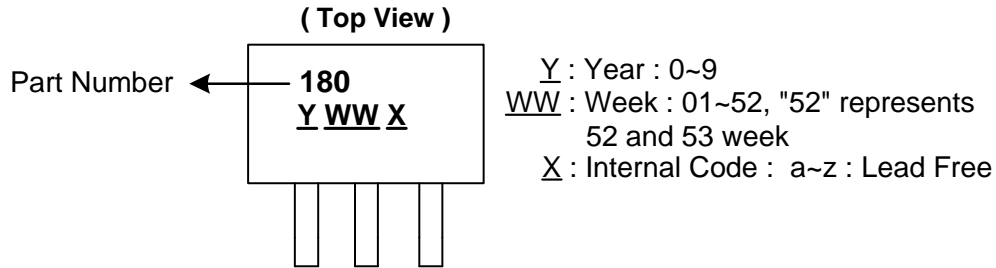
(2) SC59 (commonly known as SOT23 in Asia), DFN2020-6 and DFN2020-3

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

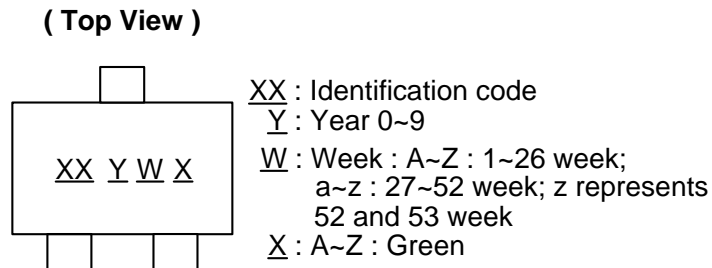


Marking Information

(1) SIP-3L

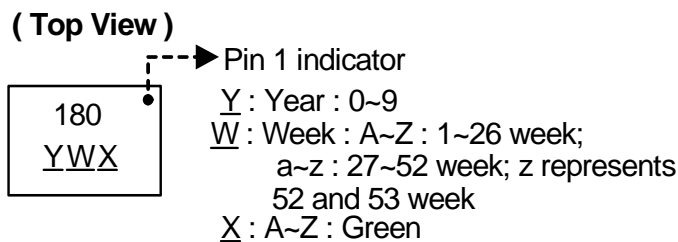


(2) SC59 (commonly known as SOT23 in Asia)



Part Number	Package	Identification Code
AH180	SC59	K0

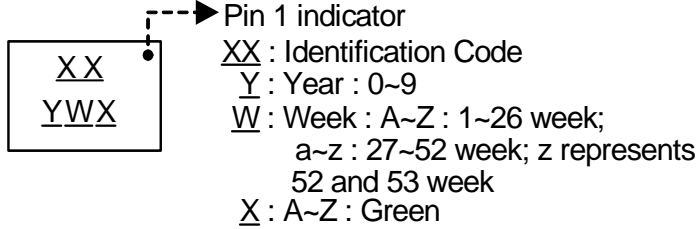
(3) DFN2020-6



Marking Information (Continued)

(4) DFN2020-3

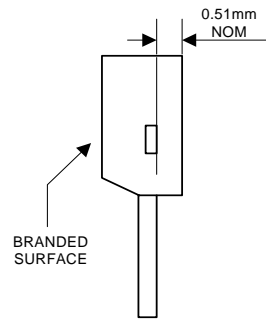
(Top View)



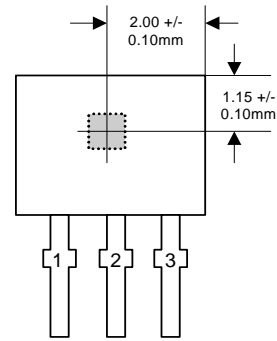
Part Number	Package	Identification Code
AH180	DFN2020-3	K0

Package Information (All Dimensions in mm)

(1) Package Type: SIP-3L for Bulk only

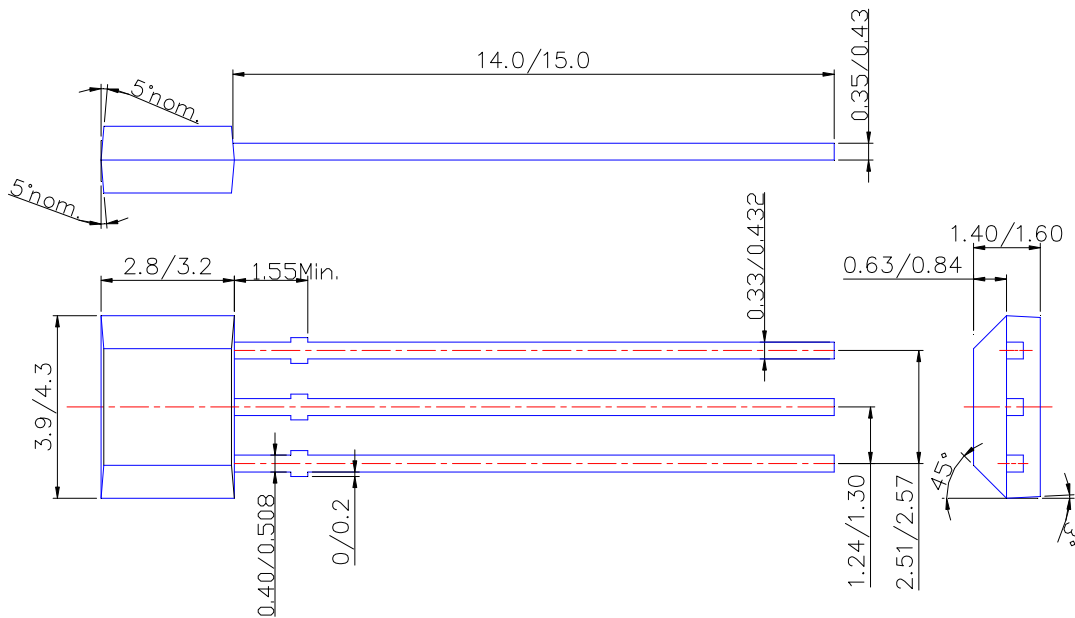


Active Area Depth



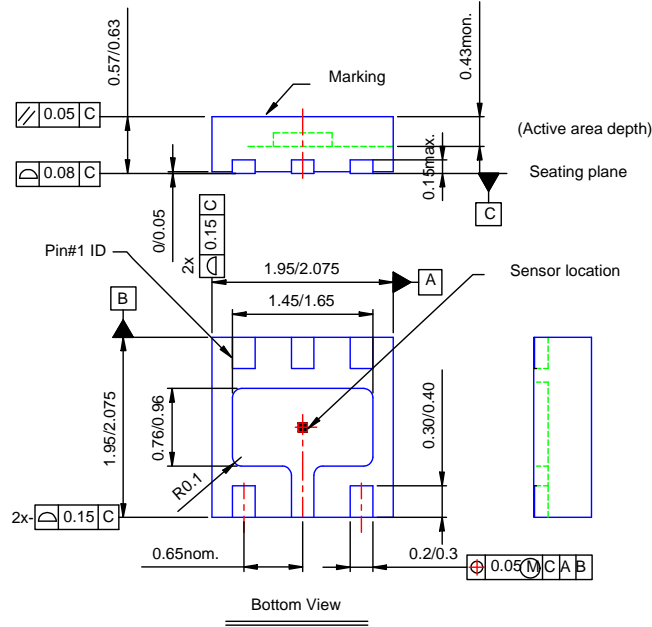
Sensor Location

Package Dimension

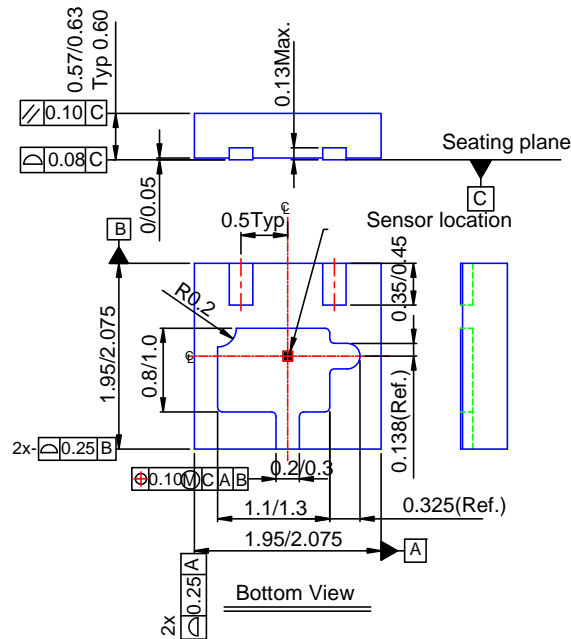


Package Information (Continued)

(4) Package Type: DFN2020-6

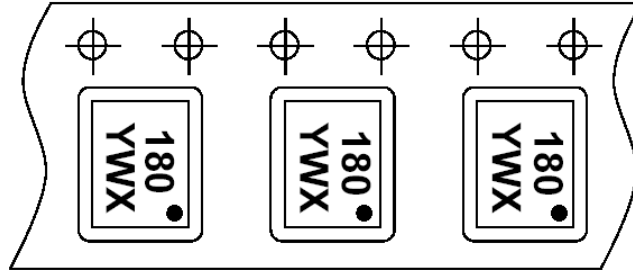


(5) Package Type: DFN2020-3

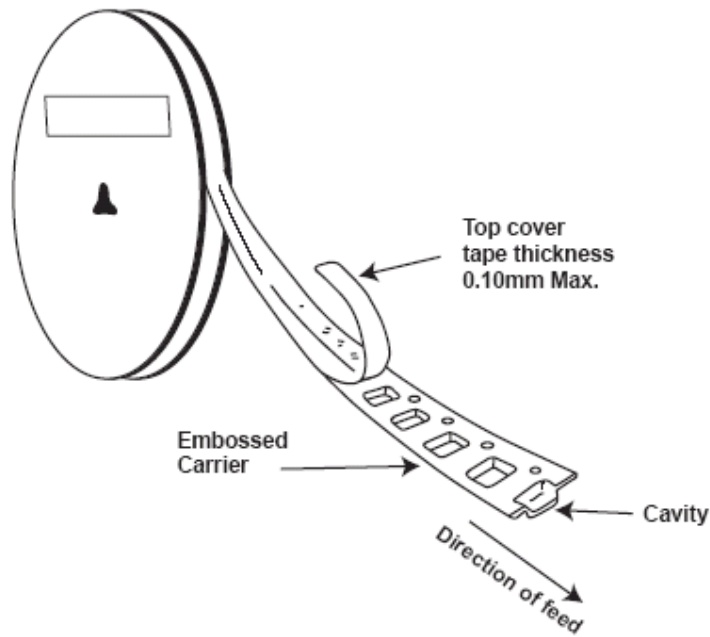
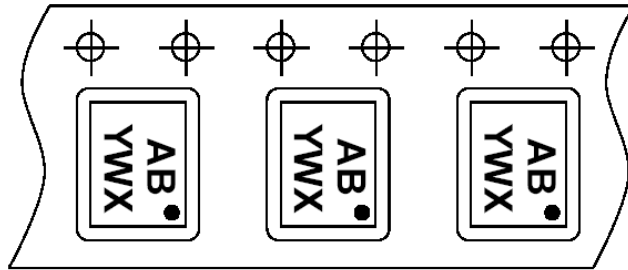


Taping Orientation

(1) DFN2020-6



(2) DFN2020-3



Notes: 12. 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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