

## Description

The AH1883 micropower Omnipolar Hall Effect switch IC is designed for portable and battery powered equipment such as cellular phones, cordless phones, camcorders, PDA's, and portable PC's. Based on two high sensitivity Hall Effect plates and chopper stabilized architecture, the AH1883 provides reliable solution over the whole operating range.

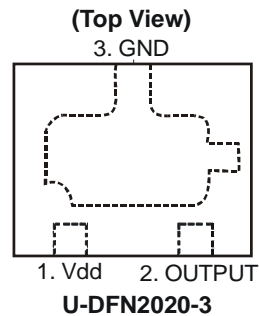
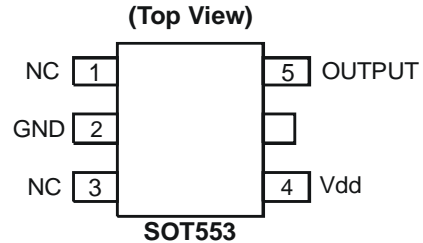
To support portable and battery powered equipment the design has been optimized to operate from 1.65V to 3.3V and consumes 13uW typical with a supply of 1.8V. To minimize PCB space the AH1883 includes a push-pull output structure, therefore does not require an external pull up resistor, and is packaged in small low profile SOT553 and U-DFN2020-3 packages.

Either North or South pole of sufficient strength will turn the output on. When the magnetic flux density (**B**) is larger than operate (**Bop**) the output is switched on. The output is turned off when B becomes lower than the release point (**Brp**). The output will remain off when there is no magnetic field.

## Features

- Micropower operation
- Operation with North or South Pole
- 1.65V to 3.3V 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
- ESD (HBM) > 6kV in SOT553 and U-DFN2020-3
- Small low profile packages: SOT553 and U-DFN2020-3
- "Green" Molding Compound

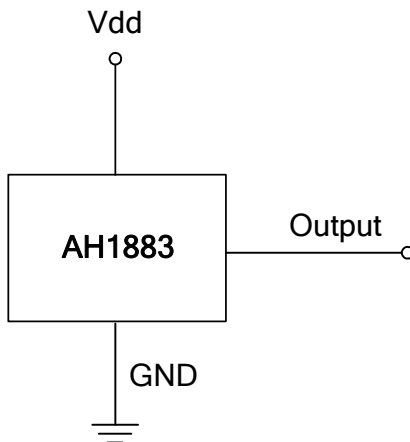
## Pin Assignments



## Applications

- Cellular phone
- PDA
- Portable PCs – Netbook, Notebook, Tablets
- Camcorders
- Cordless phone
- Handheld game consoles
- Proximity detection and contact-less switch applications

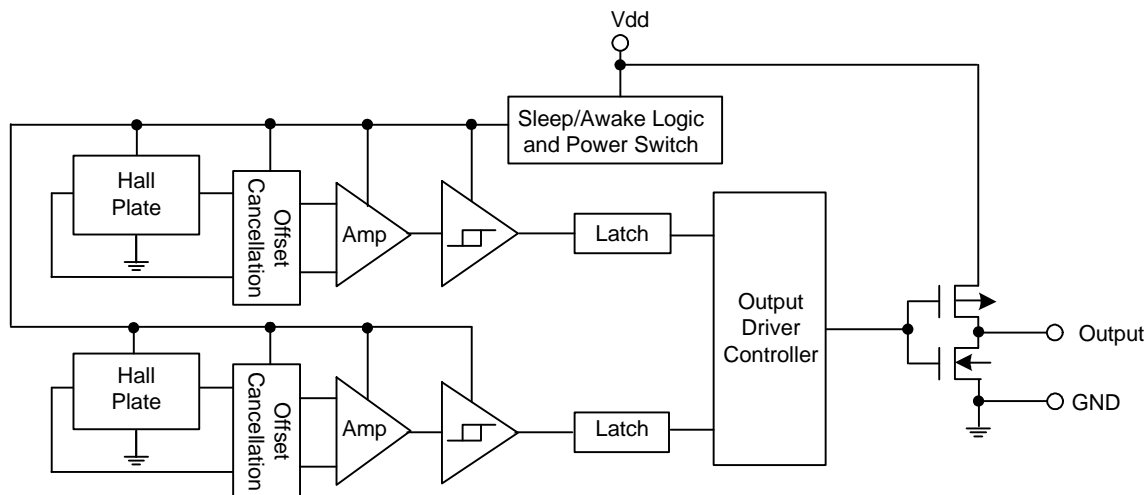
**Typical Application Circuit**



**Pin Descriptions**

Pin Name	P/I/O	Pin #	Description
NC		1	No Connection
GND	P/I	2	Ground
NC		3	No Connection
Vdd	P/I	4	Power Supply Voltage
Output	O	5	Output Pin ( active Low )

**Functional Block Diagram**



### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ , Note 1)

Symbol	Characteristics	Values	Unit
V <sub>DD</sub>	Supply voltage	5	V
B	Magnetic flux density	Unlimited	
T <sub>S</sub>	Storage Temperature Range	-65 to +150	°C
P <sub>D</sub>	Package Power Dissipation	230	mW
T <sub>J</sub>	Maximum Junction Temperature	150	°C

Notes: 1. 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

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

Symbol	Parameter	Conditions	Rating	Unit
V <sub>DD</sub>	Supply Voltage	Operating	1.65 to 3.3	V
T <sub>A</sub>	Operating Temperature Range	Operating	-40 to +85	°C

### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ , V<sub>DD</sub> = 1.8V, unless otherwise specified)

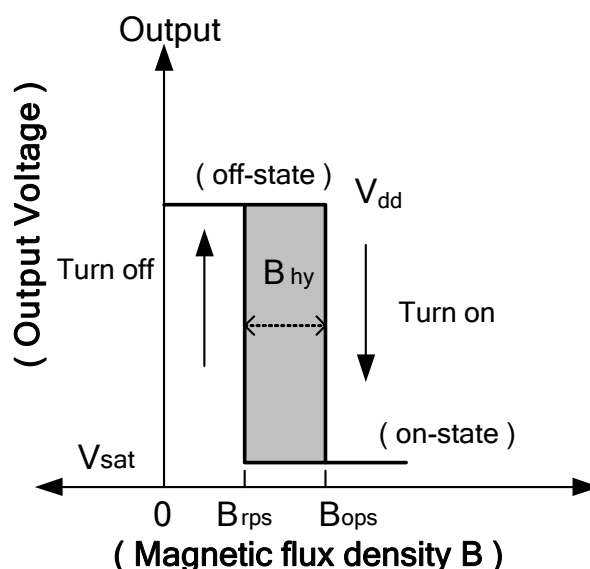
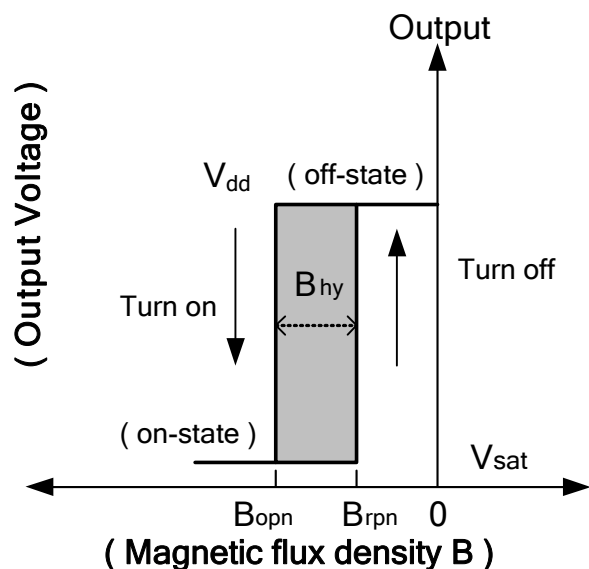
Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
V <sub>OH</sub>	Output On Voltage (High side)	I <sub>O</sub> = -0.5mA	V <sub>DD</sub> -0.2	-	-	V
V <sub>OL</sub>	Output On Voltage (Low side)	I <sub>O</sub> = 0.5mA	-	-	0.2	V
I <sub>DD</sub> (en)	Supply Current	Chip enable	-	2	4	mA
I <sub>DD</sub> (dis)		Chip disable	-	5	8	µA
I <sub>DD</sub> (avg)		average supply current	-	7	12	µA
T <sub>awake</sub>	Awake Time		-	50	100	µs
T <sub>period</sub>	Period		-	50	100	ms
D.C.	Duty Cycle		-	0.1	-	%

**Magnetic Characteristics ( $T_A = 25^\circ\text{C}$ ,  $V_{dd} = 1.8\text{V}\sim 3.0\text{V}$ , Note 2 & 3)**

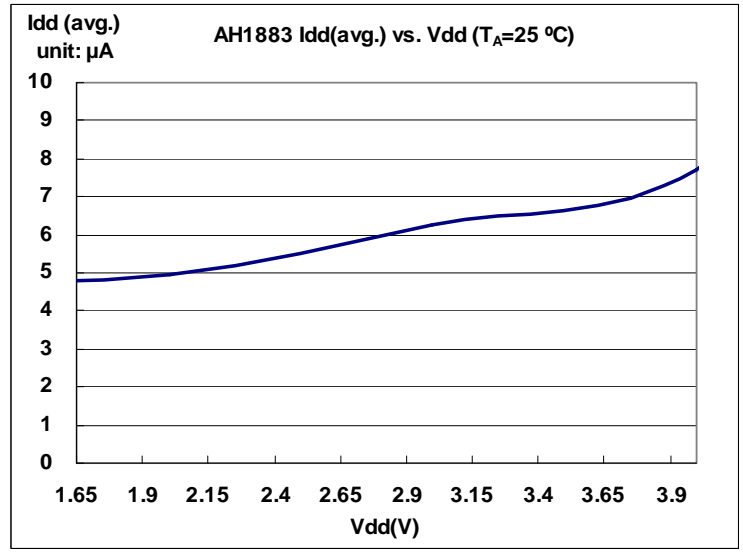
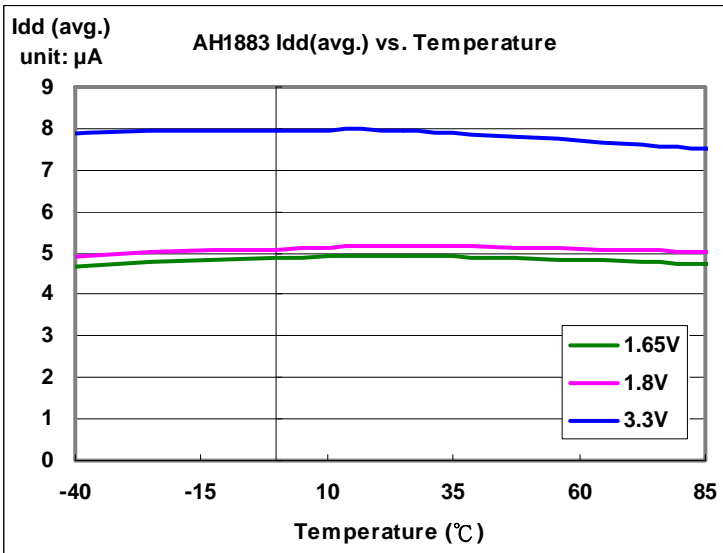
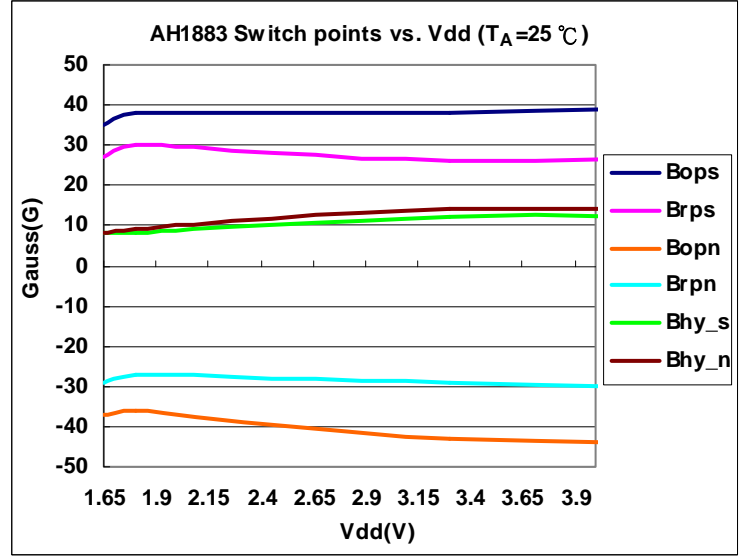
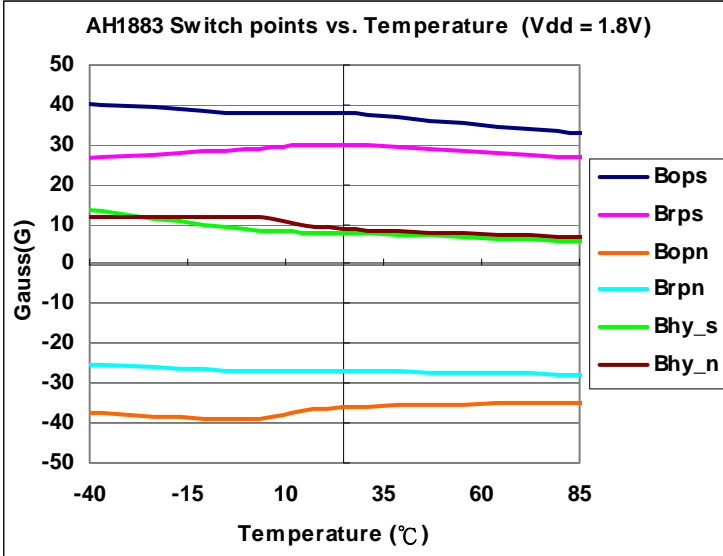
(1mT=10 Gauss)

Symbol	Characteristic	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operate Point	-	37	55	Gauss
Bopn(north pole to brand side)		-55	-37	-	
Brps(south pole to brand side)	Release Point	6	29	-	
Brpn(north pole to brand side)		-	-29	-6	
Bhy( Bopx - Brpx )	Hysteresis	3	8	-	

Notes: 2. Typical data is at  $T_A = 25^\circ\text{C}$ ,  $V_{dd} = 3\text{V}$ , and for design information only.  
3. The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.



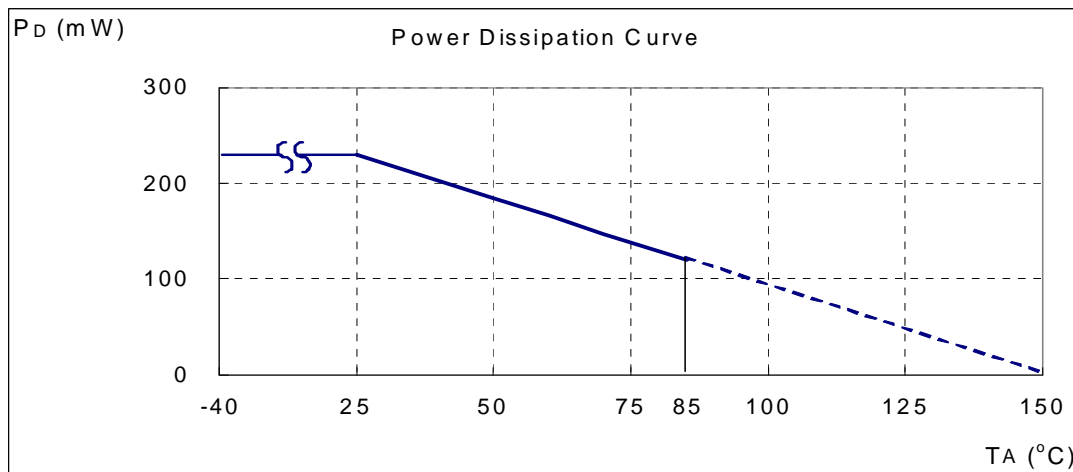
**Typical Operating Characteristics**



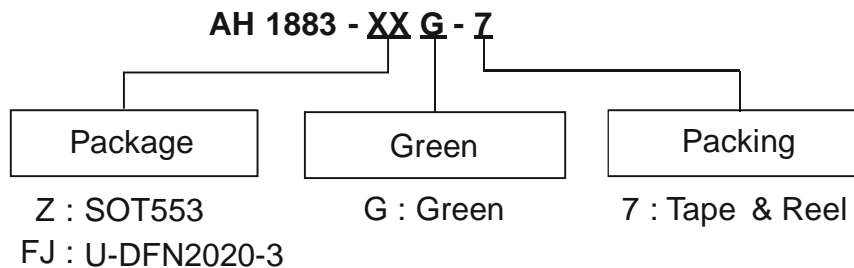
**Performance Characteristics**

For SOT553 and U-DFN2020-3

T <sub>A</sub> (°C)	25	50	60	70	80	85	90	100	110	120	130	140	150
P <sub>D</sub> (mW)	230	184	166	147	129	120	110	92	74	55	37	18	0



**Ordering Information**



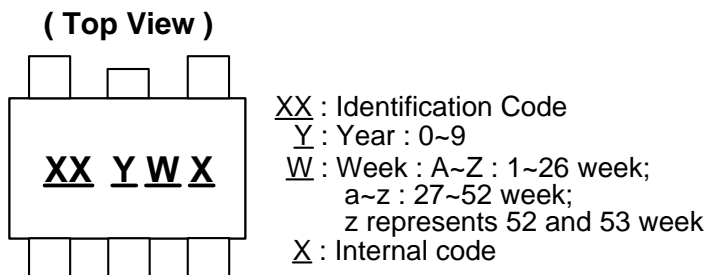
Device	Package Code	Packaging (Note 4 & 5)	7" Tape and Reel	
			Quantity	Part Number Suffix
AH1883-ZG-7	Z	SOT553	3000/Tape & Reel	-7
AH1883-FJG-7	FJ	U-DFN2020-3	3000/Tape & Reel	-7



- Notes:
4. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/products/lead\\_free.html](http://www.diodes.com/products/lead_free.html).
  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>.

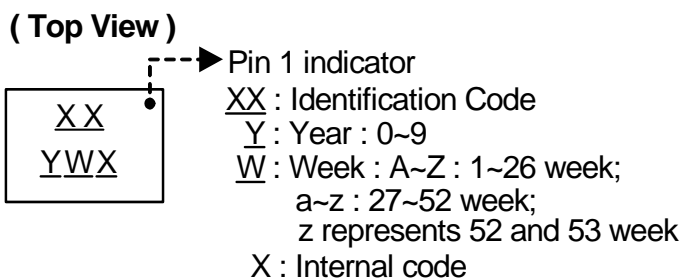
**Marking Information**

**(1) SOT553**



Part Number	Package	Identification Code
AH1883	SOT553	KP

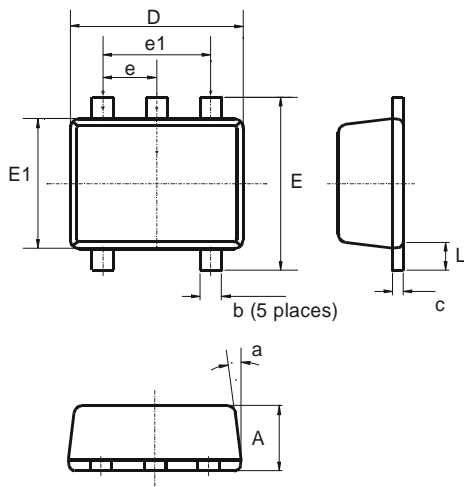
**(2) U-DFN2020-3**



Part Number	Package	Identification Code
AH1883	U-DFN2020-3	KP

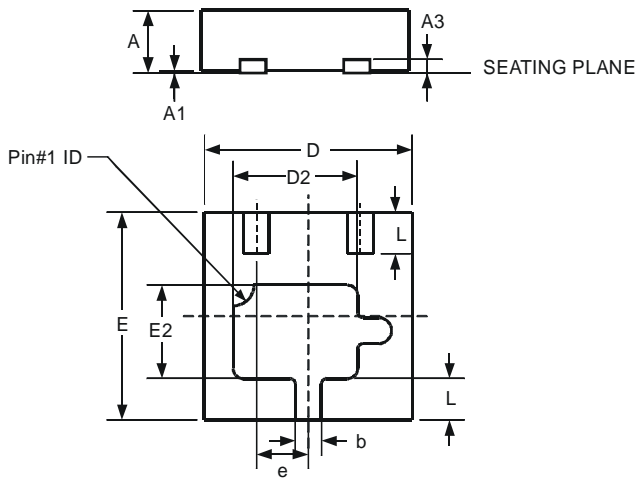
**Package Outline Dimensions (All Dimensions in mm)**

**(1) Package Type: SOT553**



SOT553			
Dim	Min	Max	Typ
A	0.55	0.60	0.60
c	0.10	0.18	0.15
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
L	0.10	0.30	0.20
b	0.15	0.30	0.20
e	0.50 Typ		
e1	1.00 Typ		
a	6°	8°	7°
<b>All Dimensions in mm</b>			

**(2) Package Type: U-DFN2020-3**



U-DFN2020-3			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	—	—	0.152
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	1.10	1.30	1.20
e	—	—	0.50
E	1.95	2.075	2.00
E2	0.80	1.00	0.90
L	0.35	0.45	0.40
<b>All Dimensions in mm</b>			

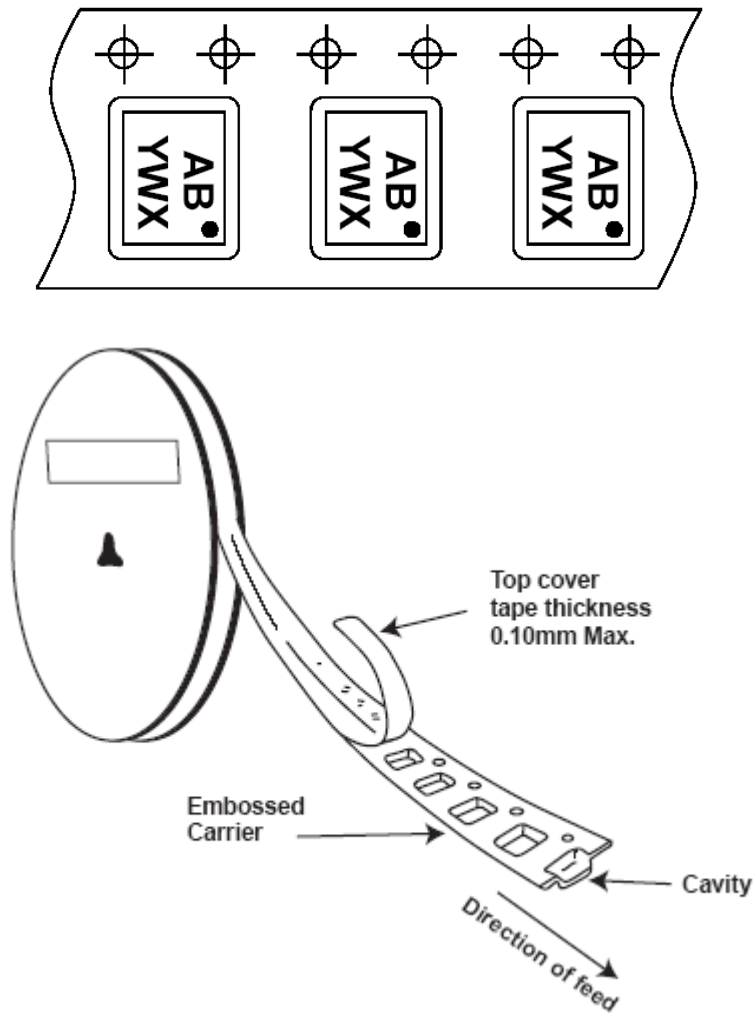


---

**Taping Orientation (Note 6)**

---

For U-DFN2020-3



Notes: 6. The taping orientation of the other package type can be found on our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**IMPORTANT NOTICE**

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

**LIFE SUPPORT**

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
1. are intended to implant into the body, or
  2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2011, Diodes Incorporated

[www.diodes.com](http://www.diodes.com)