

Description

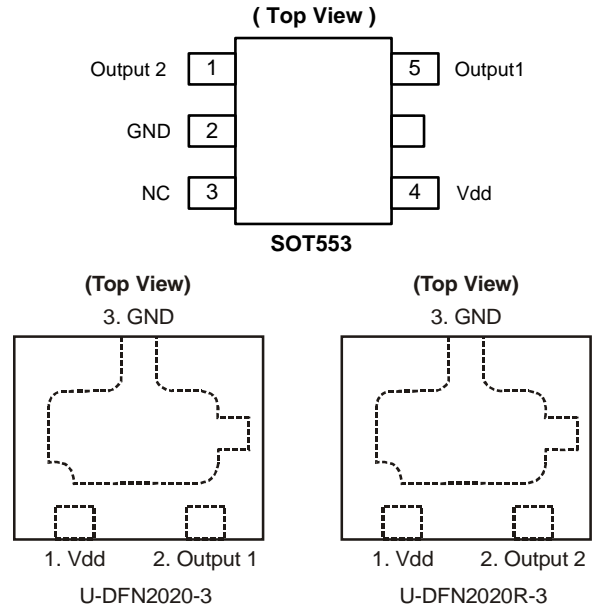
The AH1888 micro power Omni-polar Hall Effect switch IC designed for portable and battery powered equipment such as cellular phones, PDA' s and portable PC' s. Based on two sensitive Hall Effect plates and chopper stabilized architecture the AH1888 provides a reliable solution over the whole operating range. To support portable and battery powered equipment the design has been optimized to operate over the supply range of 1.65V to 3.3V and consumes only 12.6 μ W with a supply of 1.8V.

The outputs are switched with either a north or south pole of sufficient strength. When the magnetic flux density (B) is larger than operate point (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. The AH1888-ZG has two outputs, output one pulls low when switched on and output two is inverted. The AH1888-FJG provides output one and AH1888-FJRG provides output two.

Features

- Omni-polar (north or south pole) operation
- Single or dual output options
- Internal output pull up capability
- Micropower operation
- 1.65V to 3.3V operating range
- Chopper stabilized design provides
- Superior temperature stability
- Minimal switch point drift
- Enhanced immunity to stress
- Good RF noise immunity
- -40°C to 85°C operating temperature
- ESD (HBM) > 4KV for SOT553
- ESD (HBM) > 5KV for U-DFN2020-3 and U-DFN2020R-3
- Package: SOT553, U-DFN2020-3 and U-DFN2020R-3
- Halogen and Antimony free "Green" device

Pin Assignments

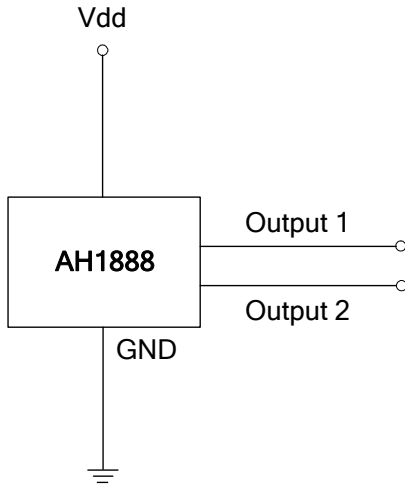


Applications

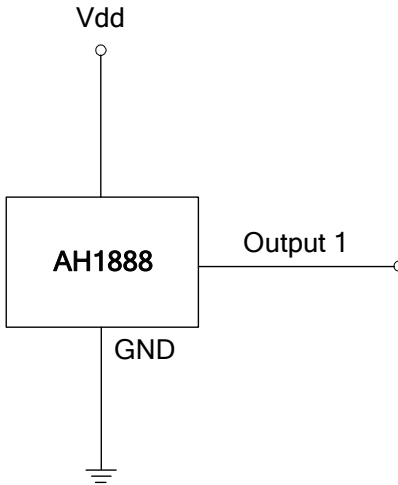
- Cellular phone
- Portable PC and PDAs
- Camcorders
- Cordless phone
- Contactless switch in consumer products

Typical Application Circuit

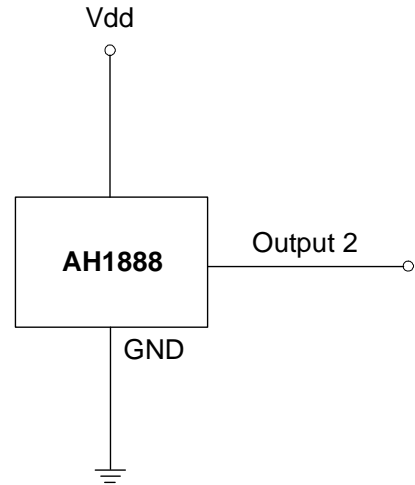
(1) SOT553



(2) U-DFN2020-3



(3) U-DFN2020R-3

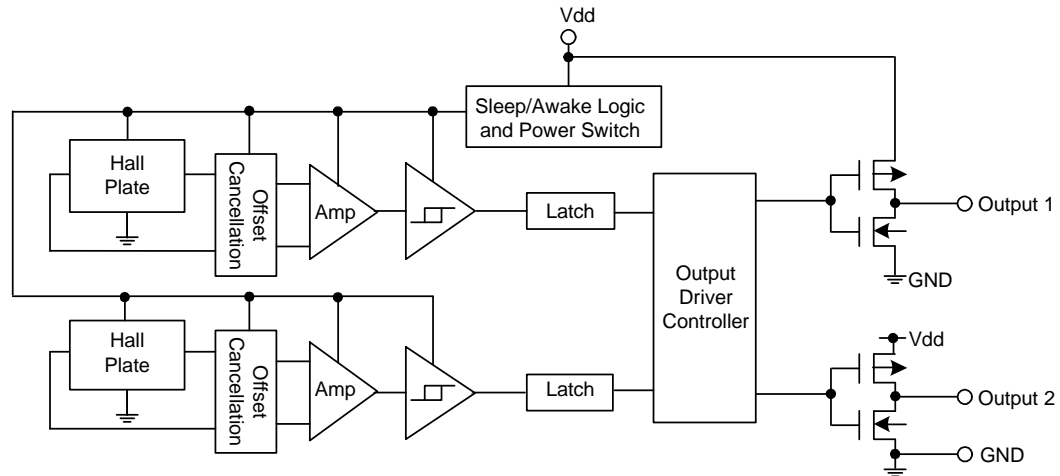


Pin Descriptions

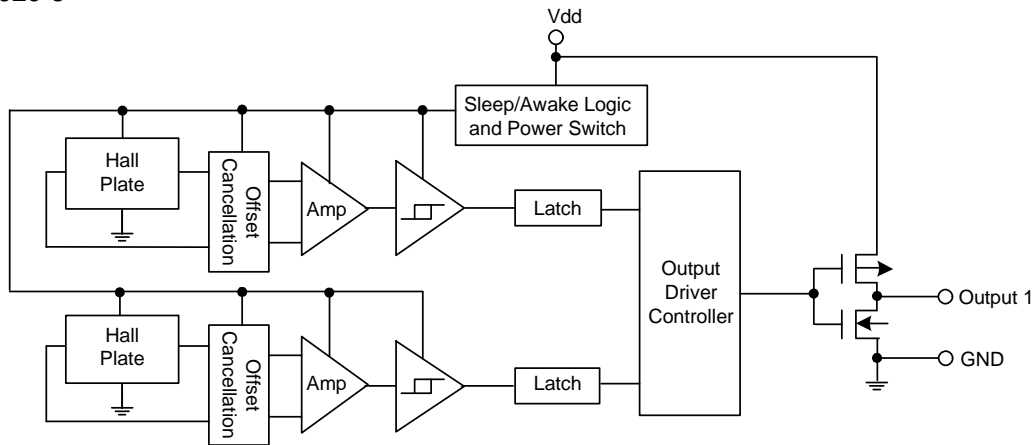
Pin Name	P/I/O	Description
Vdd	P/I	Power Supply Voltage
GND	P/I	Ground
Output 1	O	Output Pin (Active Low)
Output 2	O	Output Pin (Active High)

Functional Block Diagram

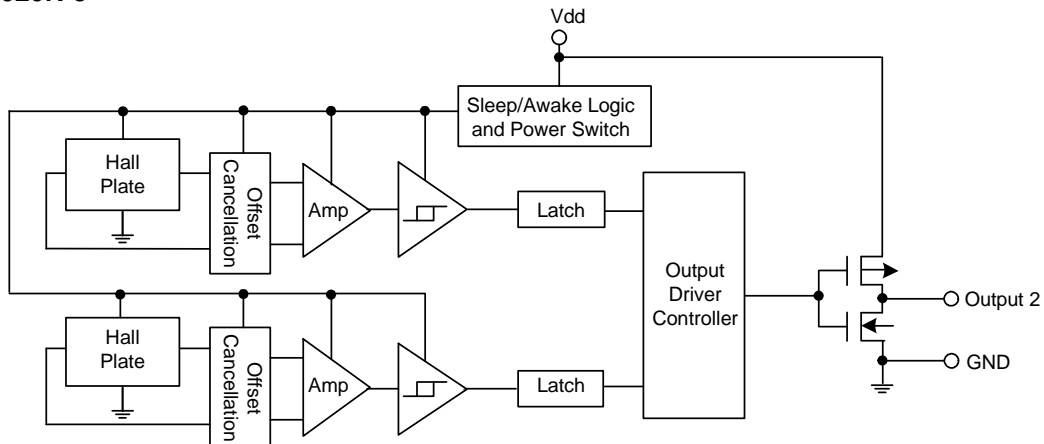
(1) SOT553



(2) U-DFN2020-3



(3) U-DFN2020R-3



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

Symbol	Characteristics	Values	Unit
V _{dd}	Supply voltage	5	V
B	Magnetic flux density	Unlimited	
T _S	Storage Temperature Range	-65 to +150	°C
P _D	Package Power Dissipation	230	mW
T _J	Maximum Junction Temperature	150	°C

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

Symbol	Characteristic	Conditions	Rating	Unit
V _{dd}	Supply Voltage	Operating	1.65 to 3.3	V
T _A	Operating Temperature Range	Operating	-40 to +85	°C

Electrical Characteristics ($T_A = 25^\circ\text{C}$, V_{dd} = 1.8V, unless otherwise specified)

Symbol	Characteristic	Conditions	Min	Typ.	Max	Unit
V _{OH}	Output On Voltage (High side)	I _O = -0.5mA	V _{dd} - 0.2	-	-	V
V _{OL}	Output On Voltage (Low side)	I _O = 0.5mA	-	-	0.2	V
I _{dd} (en)	Supply Current	Chip enable	-	2	4	mA
I _{dd} (dis)		Chip disable	-	5	8	μA
I _{dd} (avg)		Average supply current	-	7	12	μA
T _{awake}	Awake Time	(Note 1)	-	50	100	μs
T _{period}	Period	(Note 1)	-	50	100	ms
D.C.	Duty Cycle		-	0.1	-	%

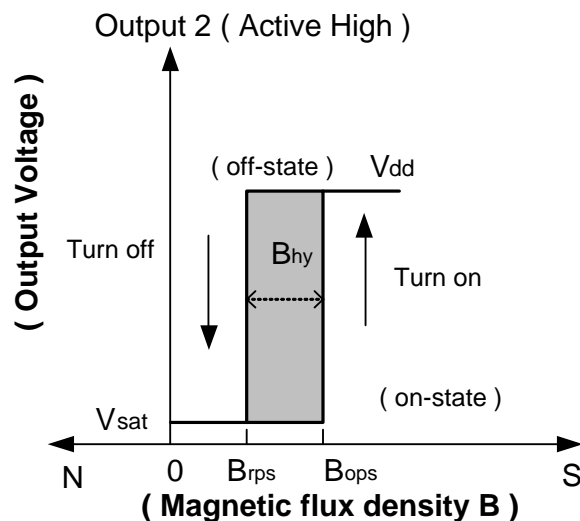
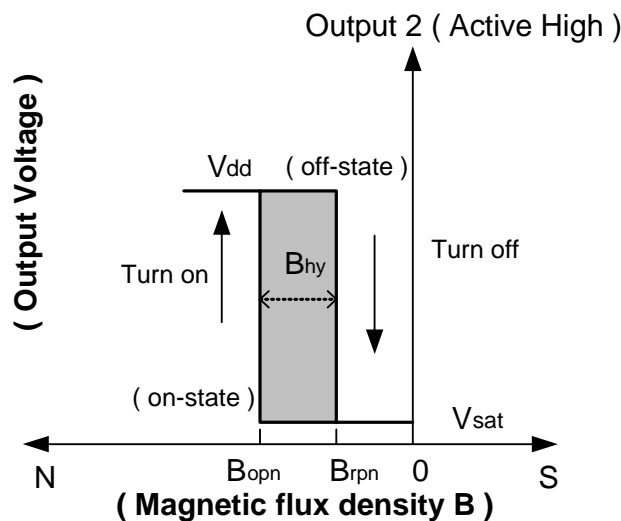
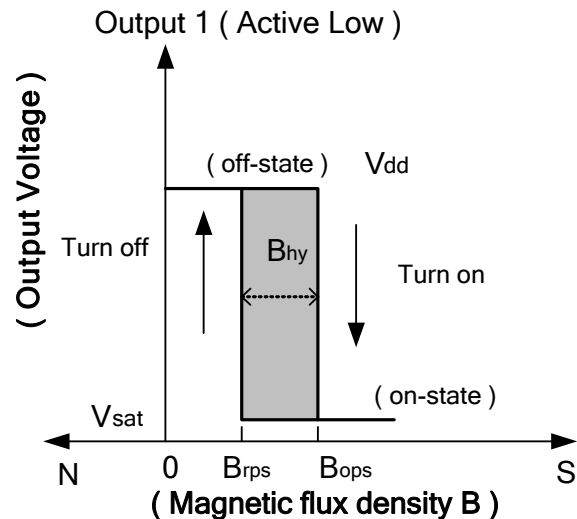
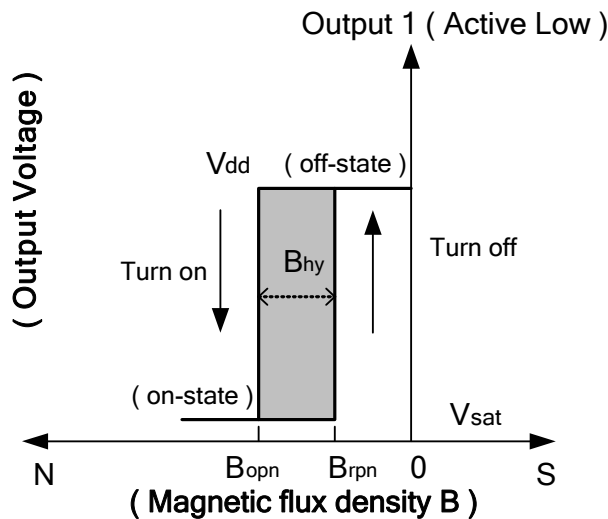
Notes: 1. When power is initially turned on, V_{dd} must be within its correct operating range (1.65V to 3.3V) to guarantee the output sampling. The output state is valid after the second operating cycle (typical 100ms).

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

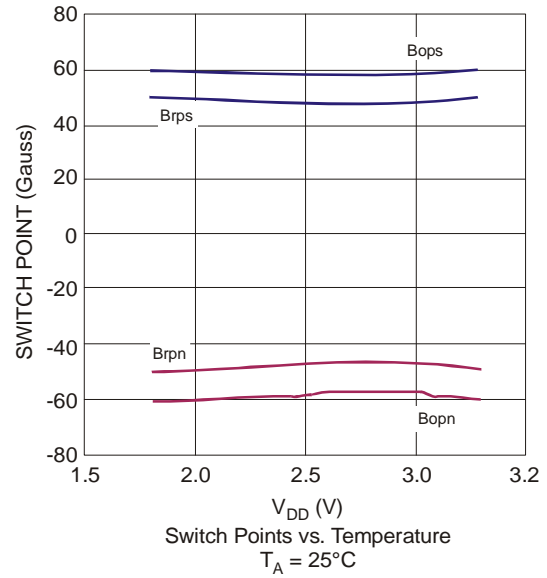
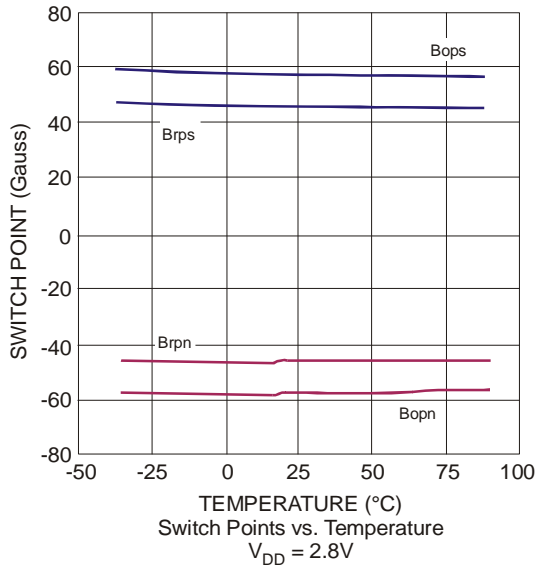
(1mT=10 Gauss)

Symbol	Characteristic	Min	Typ.	Max	Unit
Bops(south pole to brand side)	Operate Point	-	61	79	Gauss
Bopn(north pole to brand side)		-79	-61	-	
Brps(south pole to brand side)	Release Point	35	53	-	
Brpn(north pole to brand side)		-	-53	-35	
$B_{hy}(B_{opx} - B_{rpx})$	Hysteresis	3	8	-	

Notes: 2. Typical data is at $V_{DD} = 3\text{V}$.
3. The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.



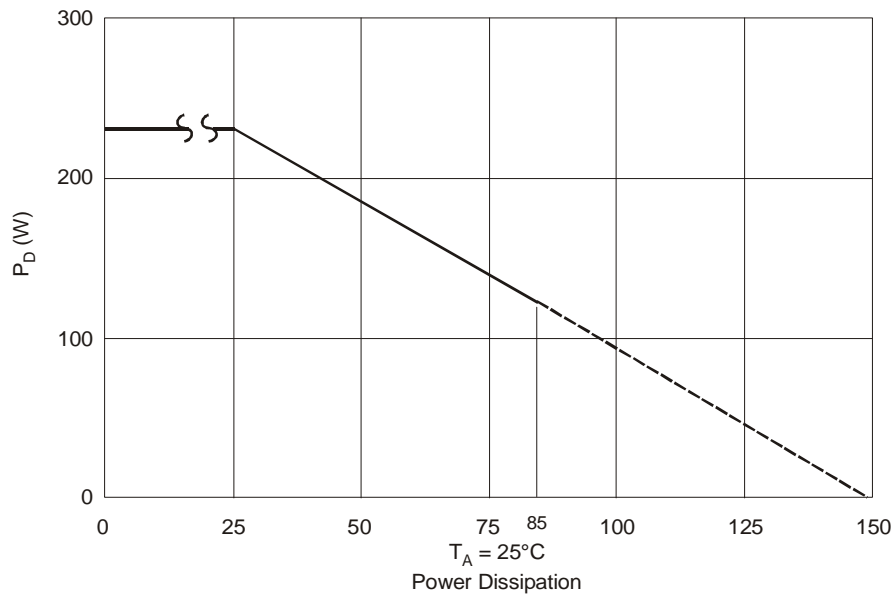
Typical Characteristics



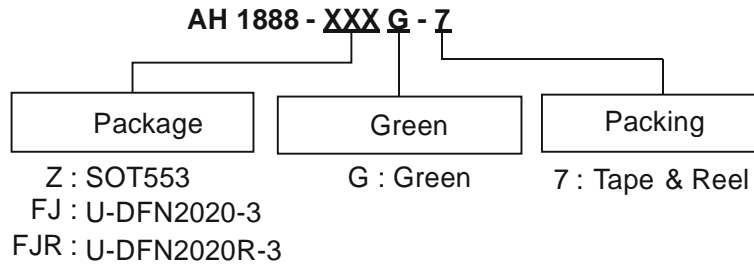
Performance Characteristics




For SOT553, U-DFN2020-3 and U-DFN3030R-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



Ordering Information



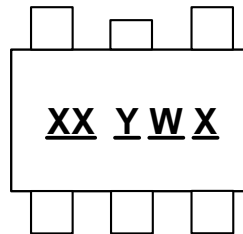
Device	Package Code	Packaging (Note 4 & 5)	7" Tape and Reel	
			Quantity	Part Number Suffix
 AH1888-ZG-7	Z	SOT553	3000/Tape & Reel	-7
 AH1888-FJG-7	FJ	U-DFN2020-3	3000/Tape & Reel	-7
 AH1888-FJRG-7	FJR	U-DFN2020R-3	3000/Tape & Reel	-7

Notes: 4. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free. Please visit our website at 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

(Top View)

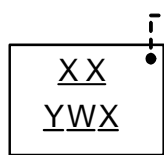


XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
 a~z : 27~52 week;
 z represents 52 and 53 week
X : A~Z : Green

Part Number	Package	Identification Code
AH1888	SOT553	KV

(2) U-DFN2020-3 and U-DFN2020R-3

(Top View)



Pin 1 indicator

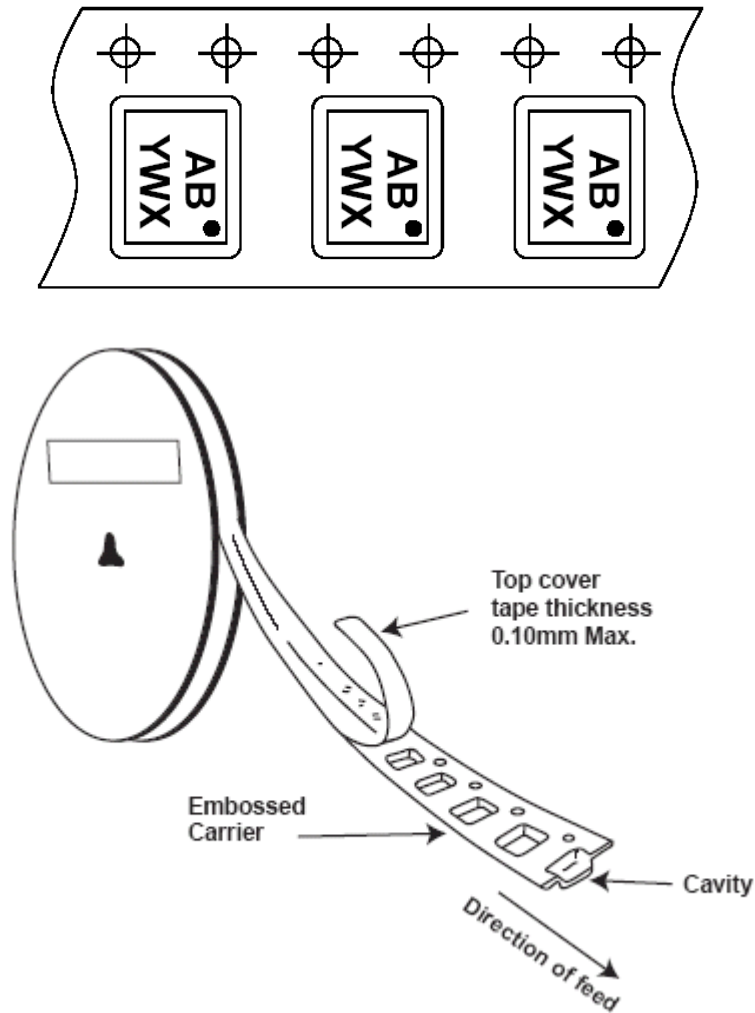
XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
 a~z : 27~52 week;
 z represents 52 and 53 week
X : A~Z : Green

Part Number	Package	Identification Code
AH1888	U-DFN2020-3	KV
AH1888	U-DFN2020R-3	KW

February 2012
© Diodes Incorporated

Taping Orientation (Note 6)

For U-DFN2020-3 and U-DFN2020R-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 © 2012, Diodes Incorporated

www.diodes.com