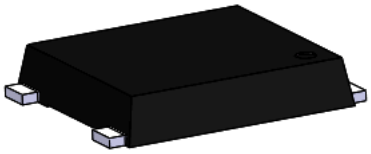
MSB20M(LS)

GLASS PASSIVATED SUFACE MOUNT BRIDGE RECTIFIER

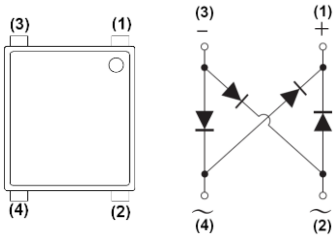
REVERSE VOLTAGE – 1000 Volts FORWARD CURRENT – 2.0 Amperes

GENERAL DESCRIPTION

Suitable for AC-to-DC bridge full wave rectification for SMPS, LED lighting, adapter, battery charger, home appliances, office equipment, and telecommunication applications.



Pin Assignment



FEATURES

- Rating to 1000V PRV
- Ideal for SMT manufacturing
- Compact, thin profile package design
- Reliable robust construction
- UL recognized file #E364304
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

MECHANICAL DATA

- Package Material: Green molding compound, UL flammability classification 94V-0, (No Br. Sb. Cl.)
- Polarity indicator: Symbol molded on body
- Weight: 216mg (Approximate)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

MAXIMUM RATINGS @ T_A = 25°C, unless otherwise specified

PARAMETER		SYMBOL	VALUE	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	1000	V
Maximum DC blocking voltage		V_{DC}	1000	V
Average rectified output current per device	T_C = 110°C	$I_{(AV)}$	2.0	A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load	T_J = 25°C T_J = 125°C	I_{FSM}	75 60	A
Peak forward surge current 1ms single half sine-wave superimposed on rated load	T_J = 25°C T_J = 125°C	I_{FSM}	150 120	A
I^2t rating for fusing (t = 8.3ms)		I^2t	23.3	A^2s
Operating and storage temperature range		T_J, T_{STG}	-55 to +150	°C

STATIC ELECTRICAL CHARACTERISTICS

PARAMETER	TEST CONDITION		SYMBOL	TYP	MAX	UNIT
Forward voltage	I_F = 1A	T_J = 25°C T_J = 125°C	V_F	-- 0.77	1.02 --	V
	I_F = 2A	T_J = 25°C T_J = 125°C		-- 0.94	1.1 --	
Leakage current	V_R = 1000V	T_J = 25°C T_J = 125°C	I_R	--	5 500	uA
Typical junction capacitance (Note 4)			C_T	30		pF

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE	UNIT
Typical thermal resistance (Note 5)	$RthJ_A$ $RthJ_C$ $RthJ_L$	55 10 15	°C/W

Notes:

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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.
4. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
5. Thermal resistance test performed in accordance with JESD-51. Unit mounted on glass-epoxy substrate with 1oz/ft2_15mm x15mm copper pad per pin.

RATING AND CHARACTERISTIC CURVES
MSB20M

FIG.1- FORWARD CURRENT DERATING CURVE

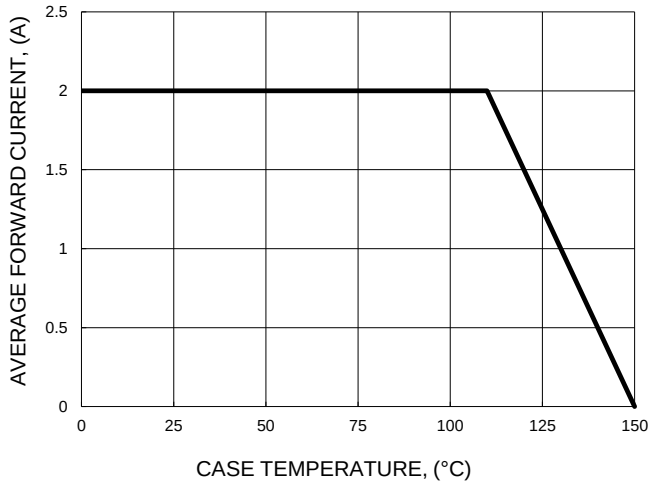


FIG.2- MAXIMUM NON-REPETITIVE SURGE CURRENT

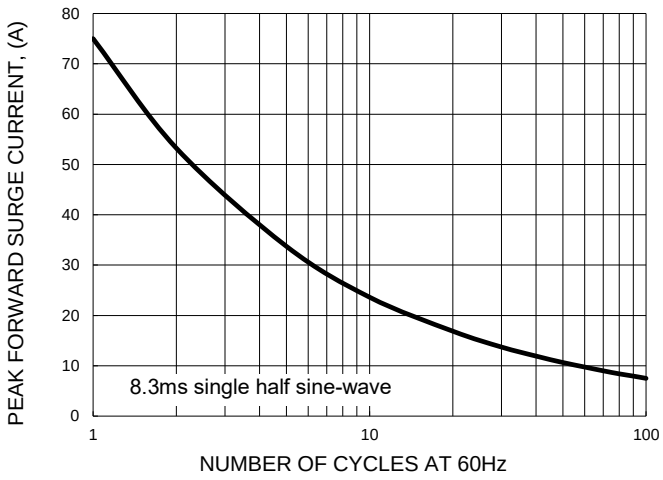


FIG.3- TYPICAL FORWARD CHARACTERISTICS

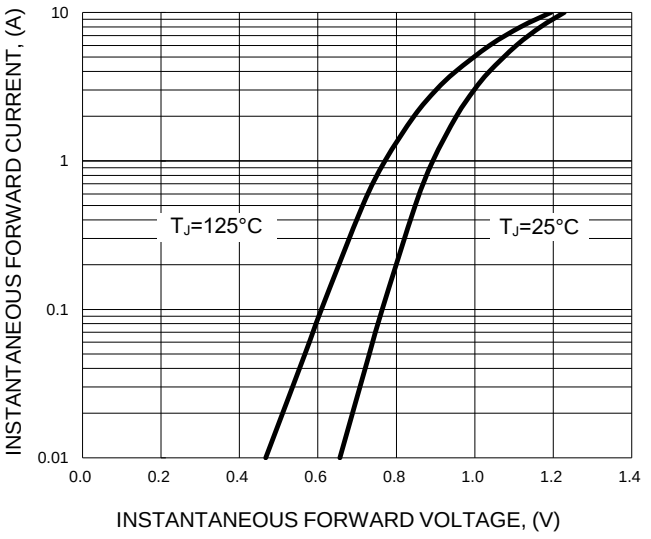


FIG.4- TYPICAL JUNCTION CAPACITANCE

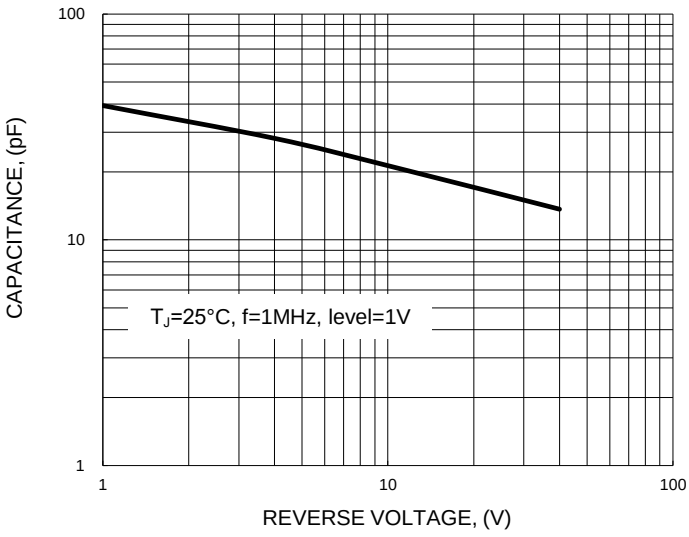


FIG.5- TYPICAL REVERSE CHARACTERISTICS

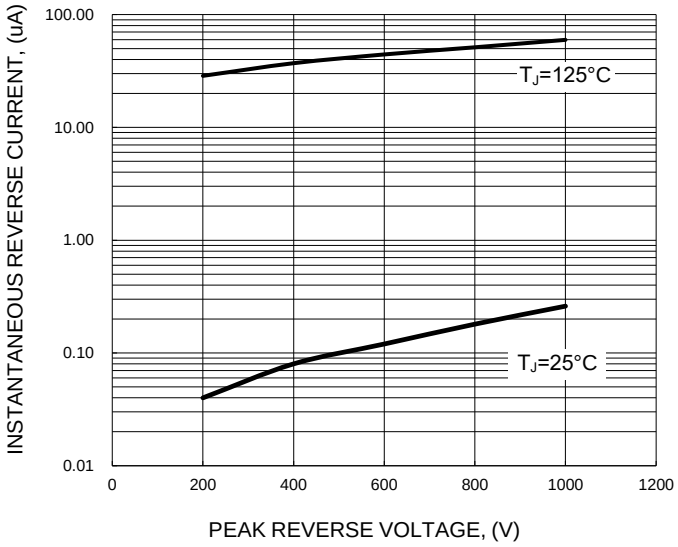
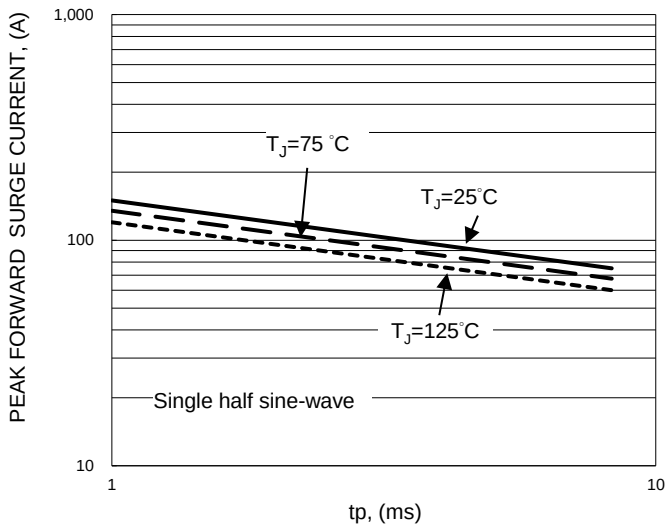


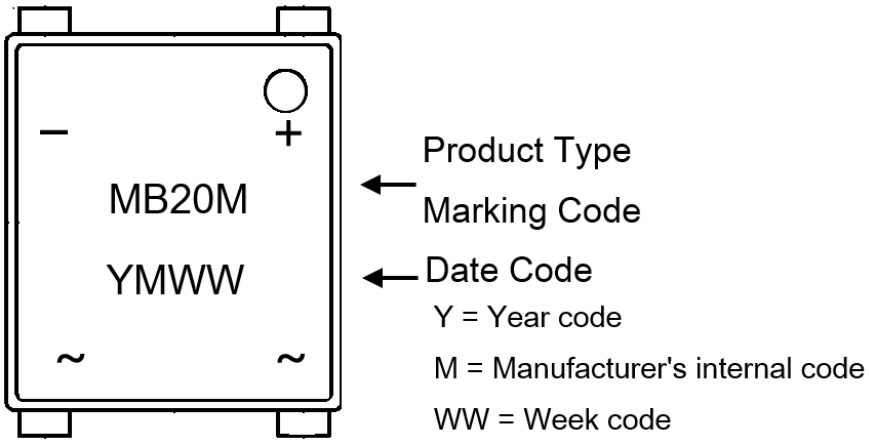
FIG.6- NON-REPETITIVE SURGE URRENT



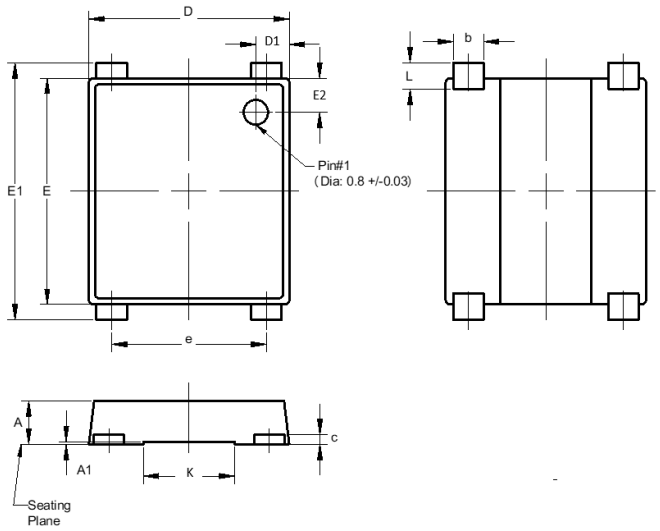
Ordering Information :

Part Number	Package	Packing	
		Qty.	Carrier
MSB20M_HF	MSBL	2500pcs	Tape & Reel

Marking Information :

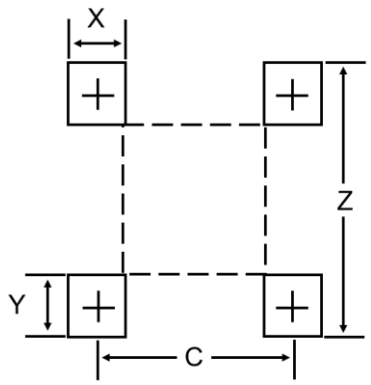


Package Dimension :



MSBL		
Dim	**Min**	**Max**
A	1.30	1.50
A1	0.04	0.08
C	0.27	0.40
D	6.50	6.70
D1	0.95	1.25
E	7.20	7.40
E1	7.90	8.60
E2	0.95	1.25
L	0.65	1.05
b	0.95	1.15
e	5.00	5.20
K	2.90	3.10
All Dimensions in mm		

Suggested Pad Layout :

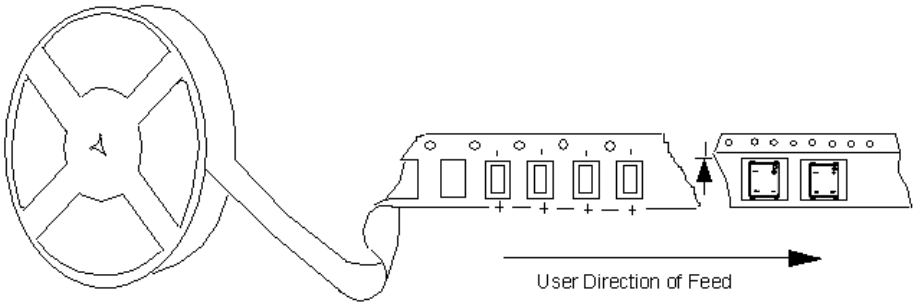


Dimensions	Value (in mm)
C	5.40
X	2.00
Y	2.50
Z	10.71

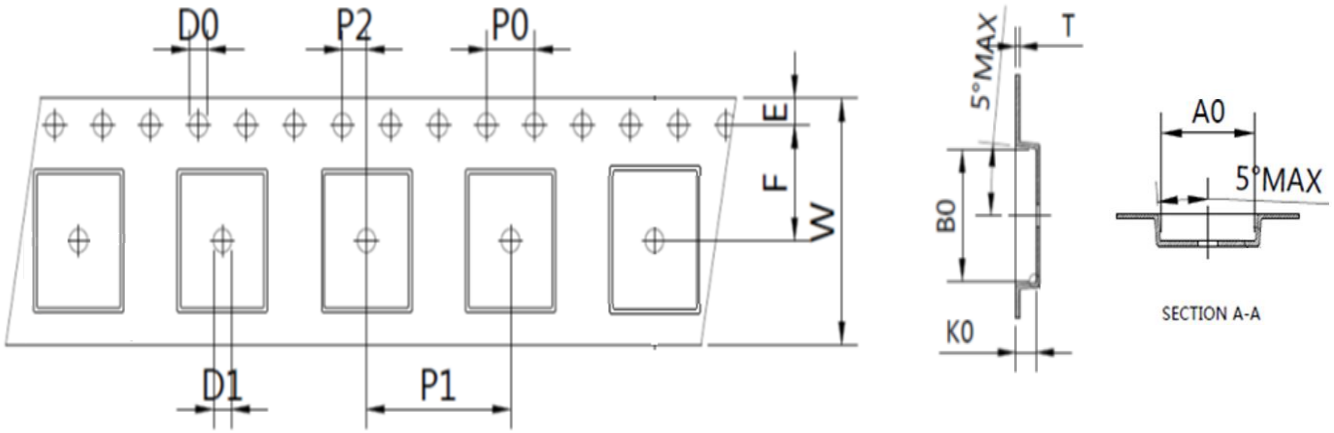
Packaging Information :

Package	Qty./Reel (Pcs)	Reel Dia. (mm)	Carton Size (mm)	Qty./Carton MOQ (Pcs)
MSBL	2500	330	355*345*245	25k

Polar Units



Embossed Carrier Dimension :



Unit: mm

DIM.	A0	B0	K0	P1	P2	T
SPEC	7.00±0.10	8.85±0.10	1.70±0.10	4.00±0.10	2.00±0.10	0.30±0.05
DIM.	E	F	D0	D1	W	
SPEC	1.75±0.10	7.50±0.10	1.50±0.1	1.50(min)	16.00±0.30	

Remark: 10 Sprocket hole pitch cumulative tolerance is ±0.20mm

Typical IR Reflow Soldering Thermal Profile :

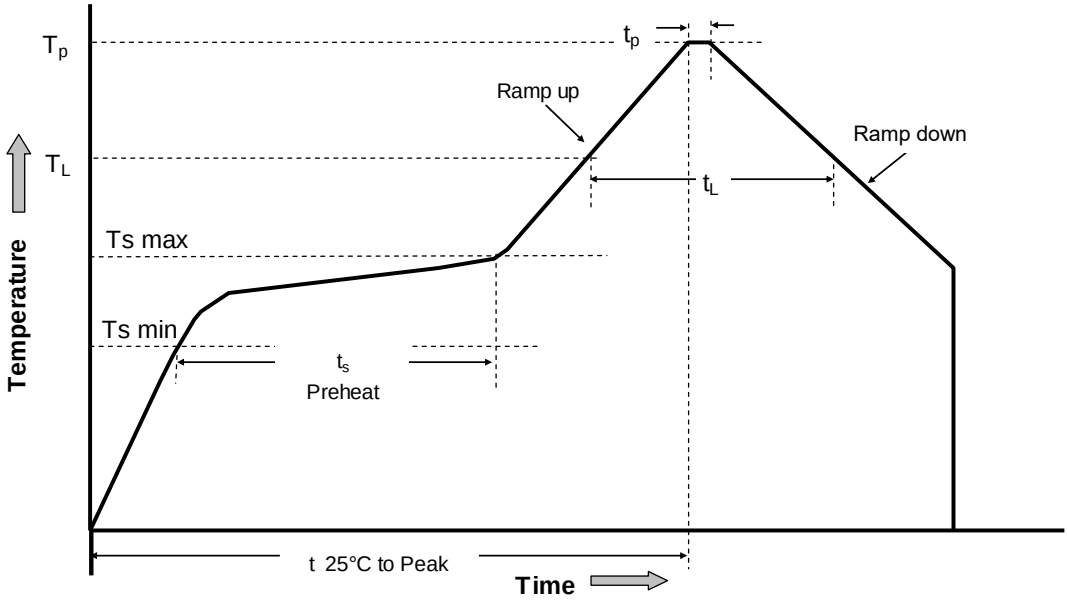


Table 1- Reflow profile

Reflow condition	Sn-Pb assembly	Pb-free assembly
Average ramp-up rate (Liquidus Temperautre (TL) to Peak)	3 °C/second max.	3 °C/second max.
Preheat --Tempautre Min, Ts (Min) --Temperature Max, Ts (Max) --Time (min to max, ts)	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-180 seconds
Ts(max) to TL - Ramp-up Rate		3 °C/second max.
Time maintained above: --Temperature(TL) --Time(tL)	 183 °C 60-150 seconds	 217 °C 60-150 seconds
Peak Temperature (Tp)	240 +0/-5 °C	260 +0/-5 °C
Time within 5 °C of actual Peak Temperature(tp)	10-30 seconds	20-40 seconds
Ramp-down Rate	6 °C/second max.	6 °C/second max.
Time 25 °C to Peak Temperature.	6 minutes max.	8 minutes max.

Note: All temperatures refer to topside of the package, measured on the package body surface

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

9. This Notice may be periodically updated with the most recent version available at https://www.diodes.com/about/company/terms-and-conditions/important-notice

www.diodes.com