Description and Applications

The DIODES™ DLS3035FGBQ low-side switch provides a component and area-reducing solution for efficient power domain switching. In addition to integrated control functionality with ultra-low on−resistance, this device offers system safeguards and monitoring via fault protection and fault signaling. This cost effective solution is ideal for power management applications requiring low power consumption in a small footprint.

Applications

- USB charging port short to VBAT protection for automotive
- Low side drive loads

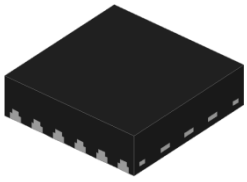
Features and Benefits

- Integrated 30V N-Channel MOSFET with Ultra Low R_{ON}
- Short-Circuit Protection with Hiccup Recovery
- Thermal Shutdown
- Fault Reporting
- Extremely Low Standby Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DLS3035FGBQ is suitable for automotive applications requiring specific change control; this part is AEC-Q100 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

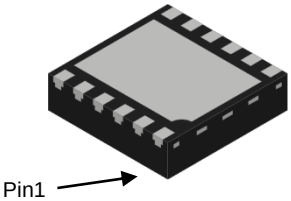
Mechanical Data

- Package: V-DFN3030-12
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.024 grams (Approximate)

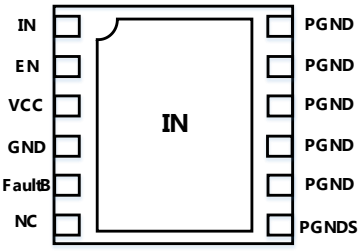
V-DFN3030-12 (Type B)



Top View



Bottom View



Top View

Ordering Information (Note 4)

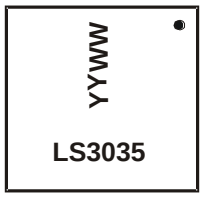
Part Number	Package	Tape Width	Tape Pitch	Packing	
				Qty.	Carrier
DLS3035FGBQ-7	V-DFN3030-12 (Type B)	8mm	4mm	3,000	Tape & Reel
DLS3035FGBQ-7A	V-DFN3030-12 (Type B)	12mm	8mm	1,500	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

Site 1

V-DFN3030-12 (Type B)



LS3035 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 22 = 2022)
WW = Week Code (01 to 53)

Site 2

V-DFN3030-12 (Type B)

LS3035 = Product Type Marking Code
YWX = Date Code Marking
Y = Year (ex: 2 = 2022)
W = Week (ex: a = Week 27; z Represents Week 52 and 53)
X = Internal Code (ex: U = Monday)

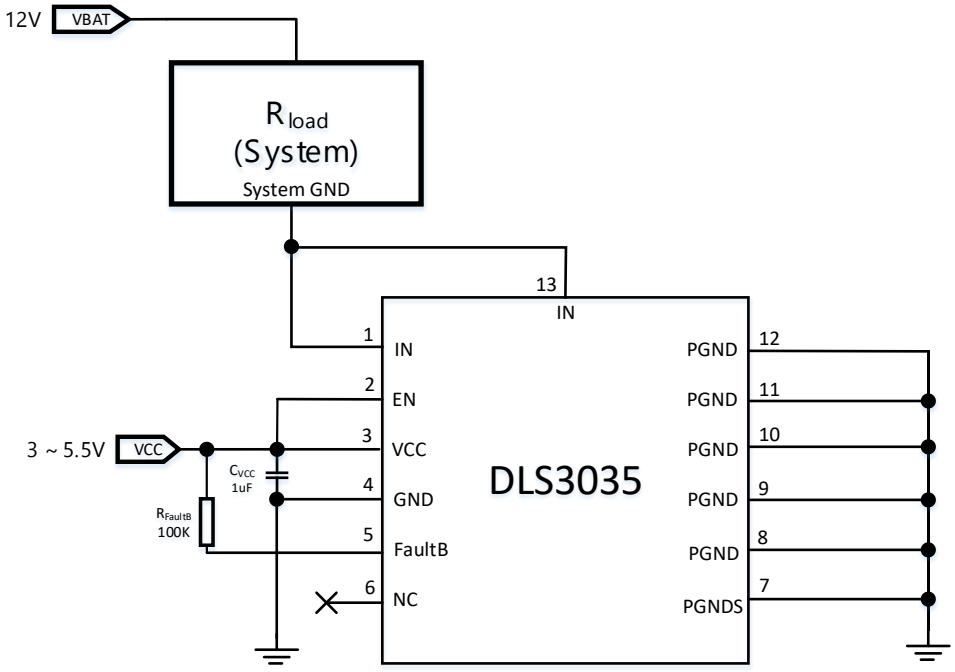
Date Code Key

Year	2020	…	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	0	…	2	3	4	5	6	7	8	9	0	1

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

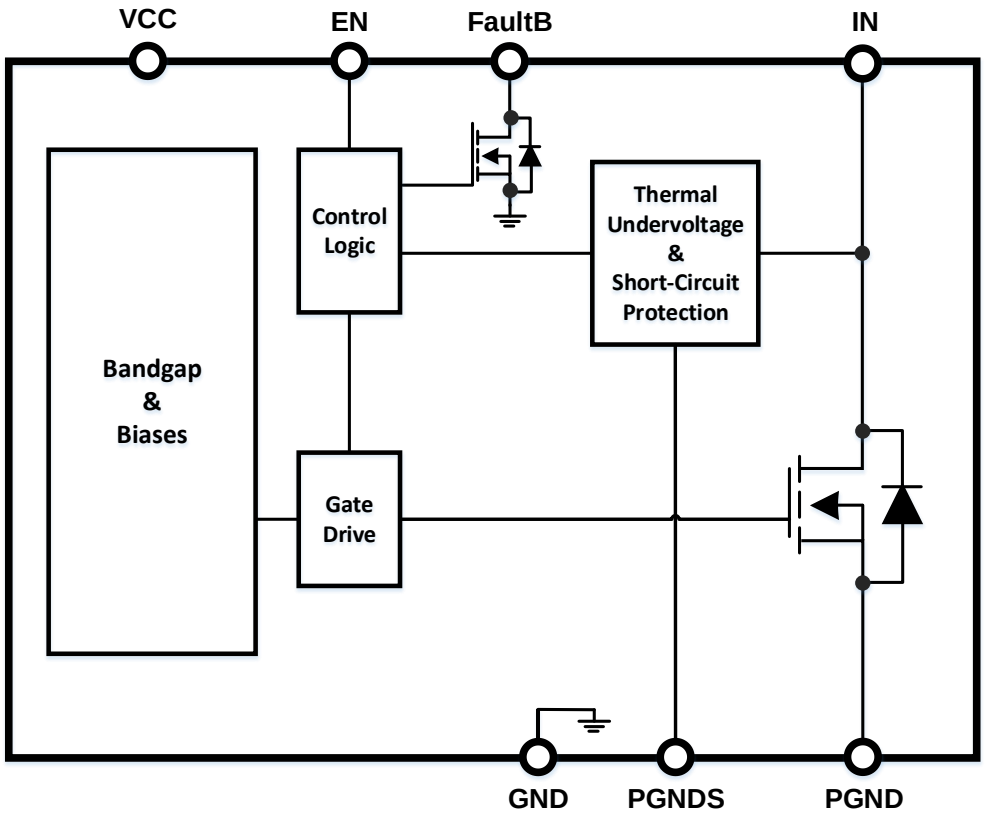
Typical Application Circuit



Pin Description

Pin Number	Pin Name	Pin Function
1, 13	IN	Drain of internal MOSFET, Pin 1 must be connected to Pin 13.
2	EN	Active−high digital input used to turn on the MOSFET, pin has an internal pull down resistor to GND (For LS application, tied to V_{CC} would be better).
3	VCC	Supply voltage to controller (3.0V to 5.5V).
4	GND	Ground.
5	FaultB	Fault status indicator. Active Low, open-drain output. Whenever an exception happens, the output of this pin is pulled to GND.
6	NC	Not connected Pin.
7	PGNDS	PGND sense connection which must be tied to GND.
8 to 12	PGND	Source of internal MOSFET, connected to GND.

Functional Block Diagram



Absolute Maximum Rating

Parameter	Rating
IN to GND	-0.3V to 32V
EN, VCC, FaultB to GND	-0.3V to 6V
I_{MAX}	20A
Storage Temperature (T_S)	-55°C to +150°C
ESD Capability, Human Body Model	2kV
ESD Capability, Charge Device Model	500V

Recommended Operating Ranges

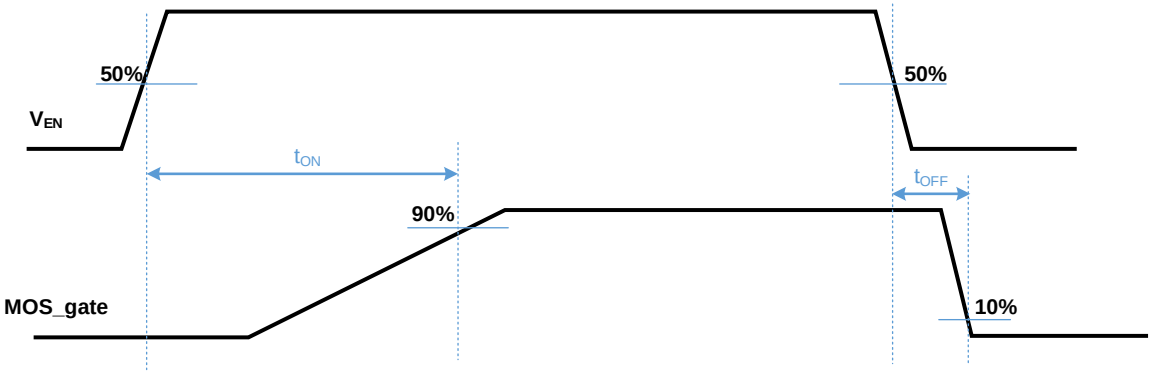
Parameter	Rating
Supply Voltage (V_{VCC})	3V to 5.5V
Input Voltage (V_{IN})	0V to 24V
Ambient Temperature (T_A)	-40°C to +125°C
Junction Temperature (T_J)	-40°C to +150°C
Package Thermal Resistance (θ_{JC})	4.5°C/W
Package Thermal Resistance (θ_{JA})	40°C/W

Electrical Characteristics (T_A = +25°C, V_{VCC} = 5.0V, V_{IN} = 0.1V, unless otherwise specified.)

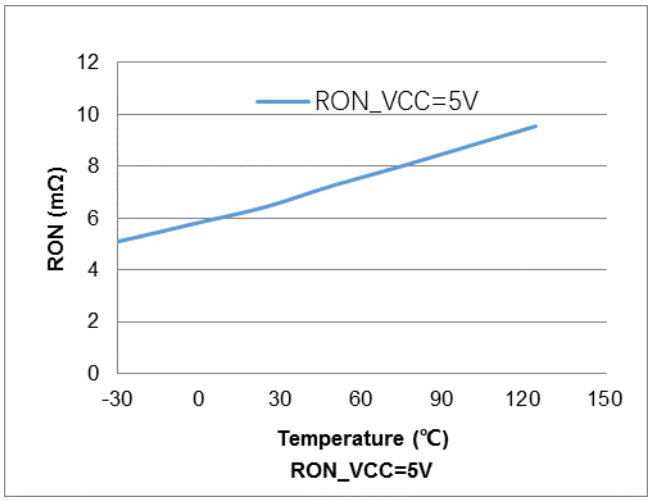
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IN}	Input Voltage	—	-0.3	—	30	V
V_{VCC}	Supply Voltage	—	3.0	—	5.5	V
I_{DYN}	V_{CC} Dynamic Supply Current	V_{EN} = V_{VCC} = 3V	—	65	150	μA
		V_{EN} = V_{VCC} = 5.5V	—	85	200	μA
I_{STBY}	V_{CC} Shutdown Supply Current	V_{VCC} = 3V, V_{EN} = 0V	—	0.1	1	μA
		V_{VCC} = 5.5V, V_{EN} = 0V	—	0.1	2	μA
V_{ENH}	EN High Level Voltage	V_{VCC} = 3V to 5.5V	2.0	—	—	V
V_{ENL}	EN Low Level Voltage	V_{VCC} = 3V to 5.5V	—	—	0.8	V
V_{FaultB}	FaultB Output Low Voltage	V_{VCC} = 5V, I_{SINK} = 5mA	—	—	0.2	V
I_{FaultB}	FaultB Output Leakage Current	V_{VCC} = 5V	—	—	100	nA
Switching Device						
R_{ON}	Switch On-State Resistance	V_{VCC} = 5V, I_{IN} = 1A	—	8	10	mΩ
I_{LEAK}	Input Shutdown Supply Current	V_{EN} = 0V, V_{IN} = 24V	—	100	—	μA
R_{PDEN}	EN Pull Down Resistance	—	—	1000	—	kΩ
Fault Protection						
T_{OTP}	Thermal Shutdown Threshold	V_{VCC} = 3V to 5.5V	—	150	—	°C
T_{OTPHYS}	Thermal Shutdown Hysteresis	V_{VCC} = 3V to 5.5V	—	30	—	°C
UVLO	V_{CC} Lockout Threshold	—	—	2.55	—	V
$UVLO_{HYS}$	V_{CC} Lockout Hysteresis	—	—	200	—	mV
V_{SCP}	Short−Circuit Protection Threshold	V_{VCC} = 3V to 5.5V, V_{IN} Ramp Up	180	265	350	mV

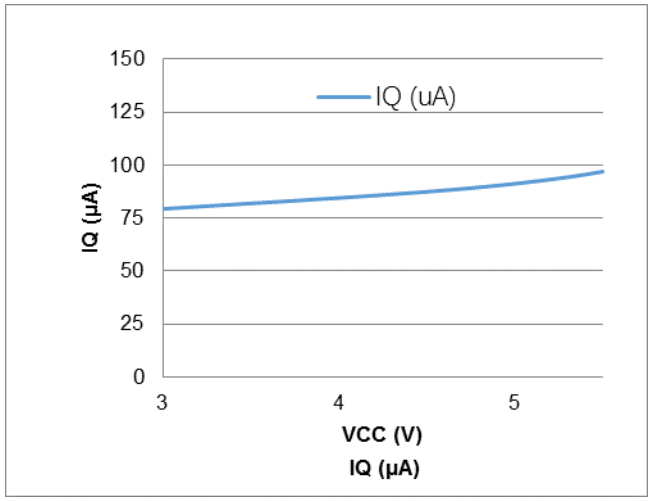
Switching Characeristics (T_A = +25°C, unless otherwise specified.)

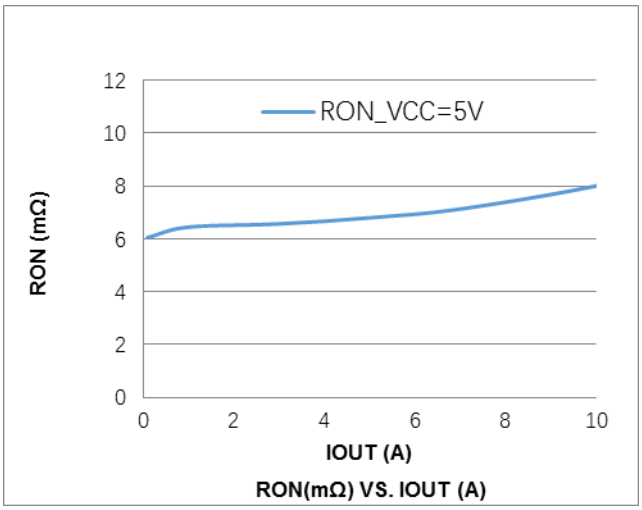
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IN} = 0.1V						
t_{ON}	MOS Output Turn-On Delay Time	V_{VCC} = 5V	—	100	—	μs
t_{OFF}	MOS Output Turn-Off Delay Time	V_{VCC} = 5V	—	0.5	—	

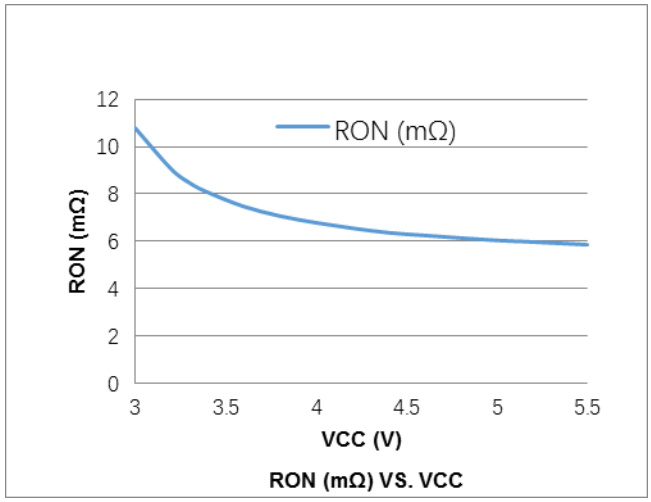


Performance Characterisitics (T_A = +25°C, unless otherwise specified.)









Performance Characterisitics (T_A = +25°C, unless otherwise specified.)

IN = 0V, V_{CC} = 5 = EN = 0V to 5V, R_{disc} = 1kΩ

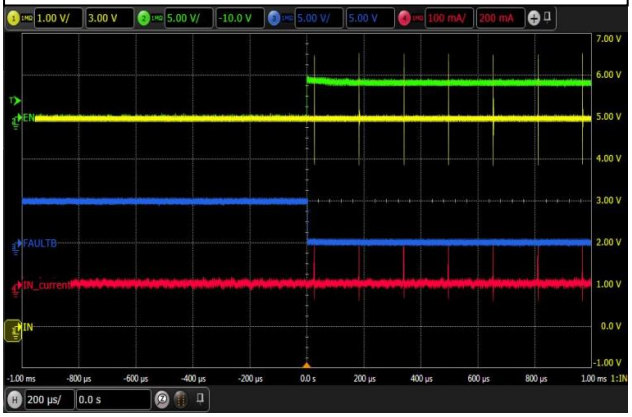
IN = 5V, V_{CC} = 5= EN = 0V to 5V, R_{disc} = 1kΩ

V_{CC} = EN = 5V, IN_Current = 0A to 10A (IN Initial = 0V)

UVLO Locked Out Threshold and Hysteresis.

V_{CC} = EN = 5V, IN = 0V Hard Short to 12V

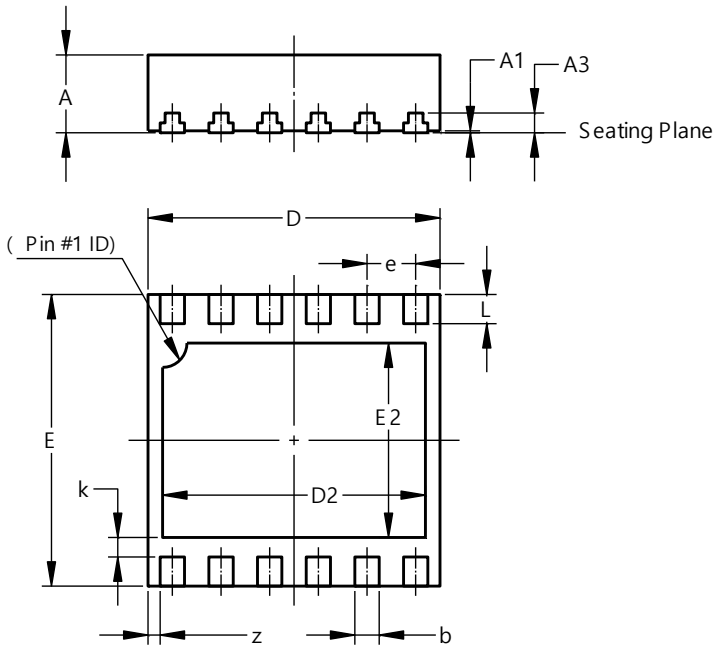
IN = Hard Short to 5V, V_{CC} = EN = 0V to 5V



Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

V-DFN3030-12 (Type B)

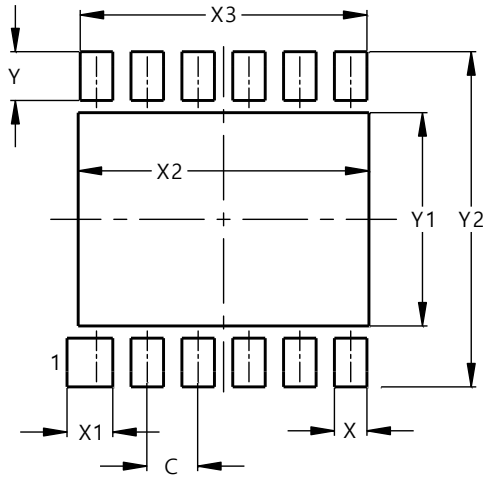


V-DFN3030-12 Type B			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.20	0.30	0.25
D	2.95	3.05	3.00
D2	2.60	2.80	2.70
E	2.95	3.05	3.00
E2	1.90	2.10	2.00
e	0.50BSC		
k	--	--	0.20
L	0.25	0.35	0.30
z	--	--	0.125
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

V-DFN3030-12 (Type B)



Dimensions	Value (in mm)
C	0.50
X	0.32
X1	0.45
X2	2.86
X3	2.82
Y	0.48
Y1	2.10
Y2	3.30

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