

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
30V	30mΩ @ V <sub>GS</sub> = 10V	5.5A
	42mΩ @ V <sub>GS</sub> = 4.5V	4.7A

## Features and Benefits

- 100% Unclamped Inductive Switching—Ensures More Reliable and Robust Application
- Low On-Resistance—Minimizes Power Losses
- Low Gate Charge—Minimizes Switching Losses
- Small Form Factor Low-Profile Package—Increased Power Density
- Sidewall Plated for Improved Optical Inspection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN3032LFDBWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

## Description and Applications

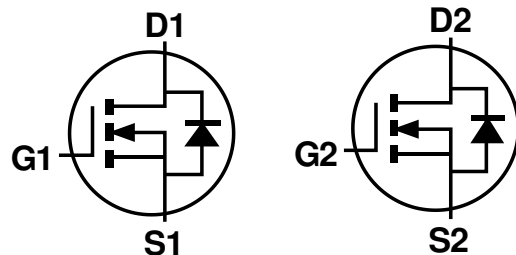
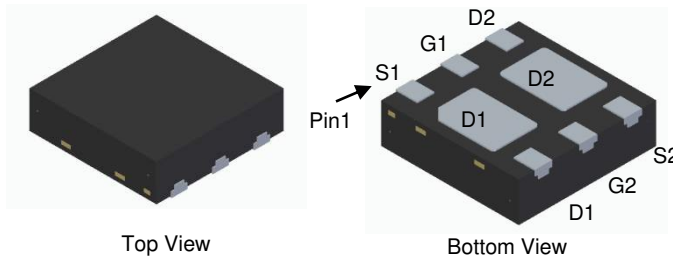
This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and ideal for use in:

- Body Control Electronics
- Power Management Functions
- DC-DC Converters

## Mechanical Data

- Case: U-DFN2020-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **e3**
- Terminals Connections: See Diagram Below
- Weight: 0.007 grams (Approximate)

U-DFN2020-6 (SWP) (Type B)



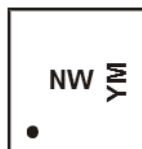
Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3032LFDBWQ-7	U-DFN2020-6 (SWP) (Type B)	3000/Tape & Reel
DMN3032LFDBWQ-13	U-DFN2020-6 (SWP) (Type B)	10,000/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



NW = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	G	H	I	J	K	L	M	N	O	P	R	S

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	Steady State T <sub>A</sub> = +25°C	5.5
		T <sub>A</sub> = +75°C	4.4
Maximum Continuous Body Diode Forward Current (Note 6)	I <sub>S</sub>	1.7	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	30	A
Avalanche Current (Note 7) L = 0.1mH	I <sub>AS</sub>	12	A
Avalanche Energy (Note 7) L = 0.1mH	E <sub>AS</sub>	7.7	mJ

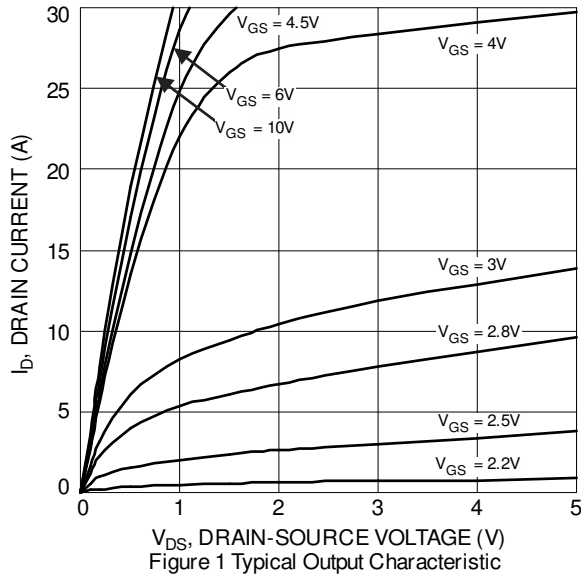
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.82	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	Steady State	153
Total Power Dissipation (Note 6)		P <sub>D</sub>	1.37
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	Steady State	91
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	30
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

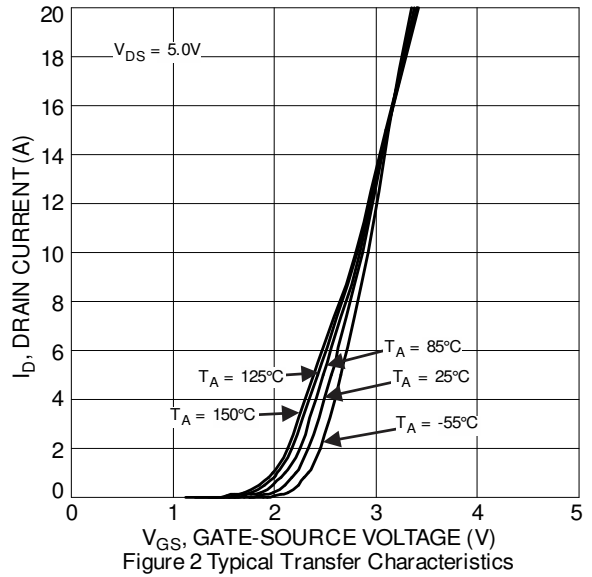
**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	1.0	µA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current T <sub>J</sub> = +150°C (Note 9)	I <sub>DSS</sub>	—	—	100	µA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	—	2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	24	30	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 5.8A
			30	42		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.8A
Diode Forward Voltage	V <sub>SD</sub>	—	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	500	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	52	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	44	—	pF	
Gate Resistance	R <sub>g</sub>	—	2.3	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	5.0	—	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 5.8A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	10.6	—	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	1.3	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	1.8	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	2.2	—	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 2.6Ω, R <sub>G</sub> = 3Ω
Turn-On Rise Time	t <sub>R</sub>	—	2.6	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	9.7	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	2.0	—	ns	

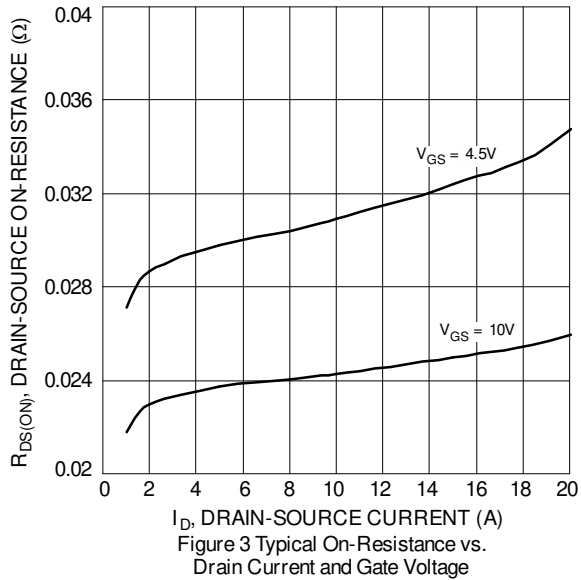
- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - I<sub>AS</sub> and E<sub>AS</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.



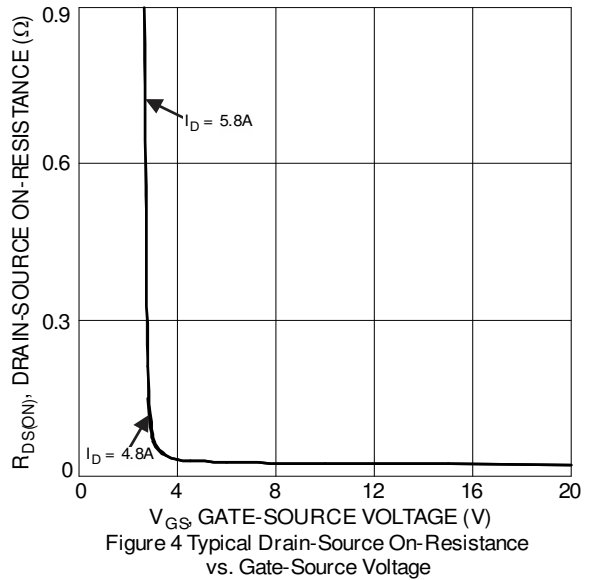
$V_{DS}$ , DRAIN-SOURCE VOLTAGE (V)  
Figure 1 Typical Output Characteristic



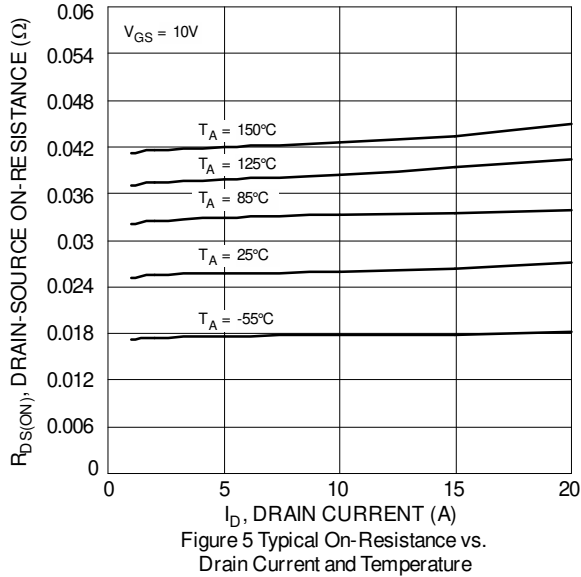
$V_{GS}$ , GATE-SOURCE VOLTAGE (V)  
Figure 2 Typical Transfer Characteristics



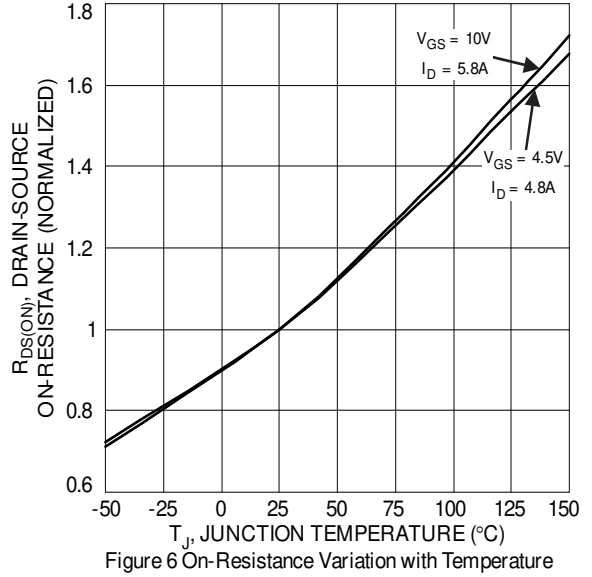
$I_D$ , DRAIN-SOURCE CURRENT (A)  
Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage



$V_{GS}$ , GATE-SOURCE VOLTAGE (V)  
Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage



$I_D$ , DRAIN CURRENT (A)  
Figure 5 Typical On-Resistance vs. Drain Current and Temperature



$T_J$ , JUNCTION TEMPERATURE ( $^\circ C$ )  
Figure 6 On-Resistance Variation with Temperature

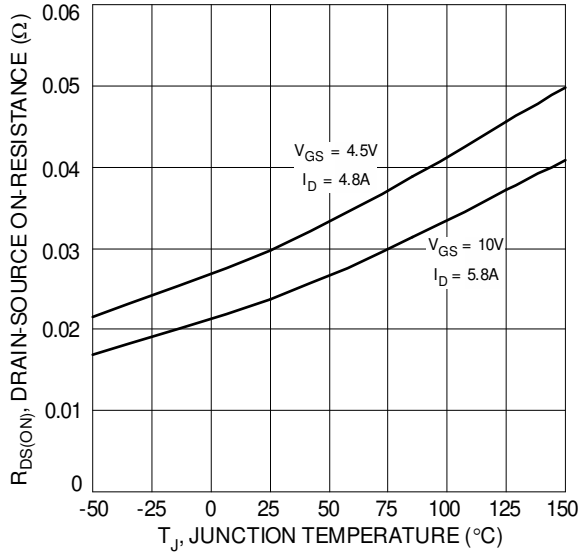


Figure 7 On-Resistance Variation with Temperature

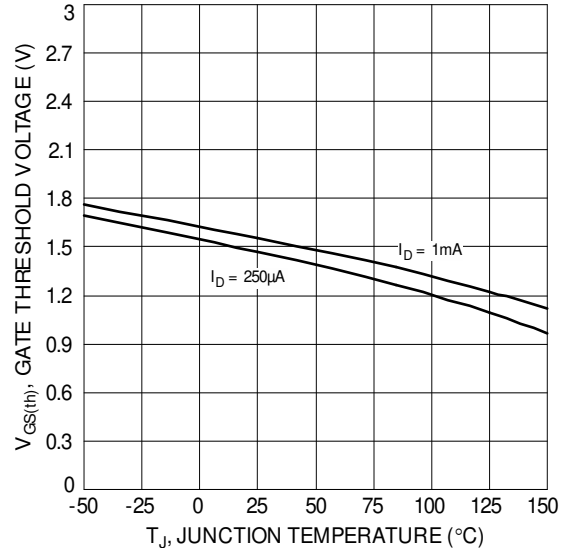


Figure 8 Gate Threshold Variation vs. Junction Temperature

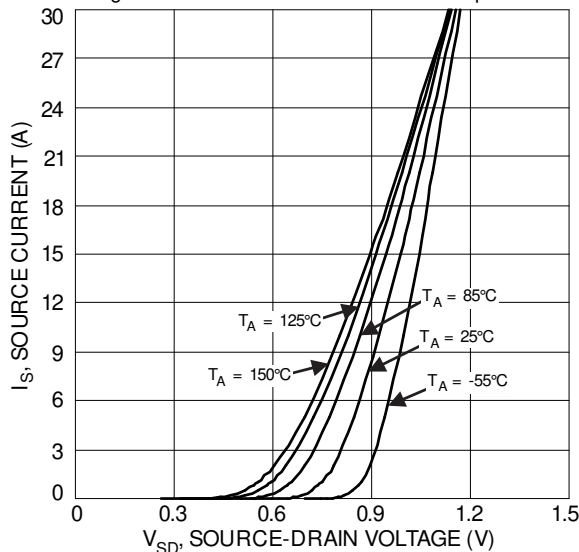


Figure 9 Diode Forward Voltage vs. Current

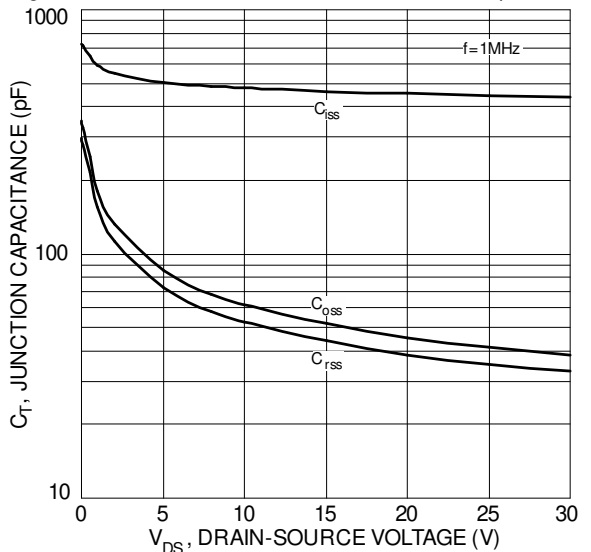


Figure 10 Typical Junction Capacitance

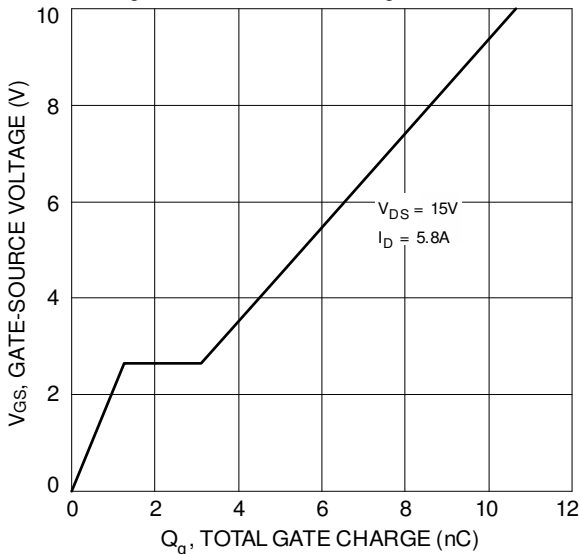


Figure 11 Gate Charge

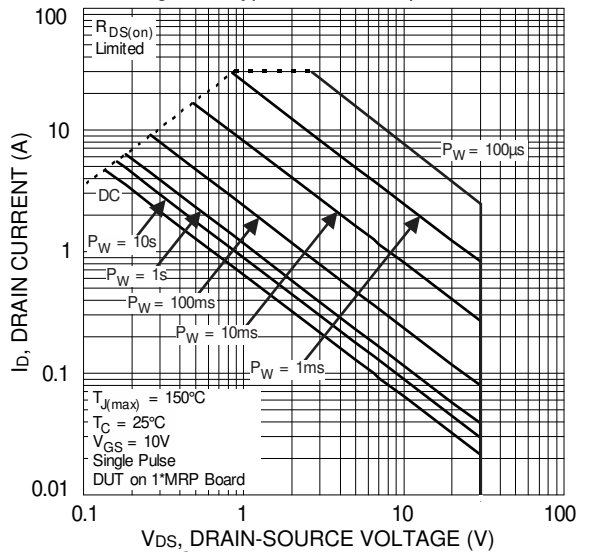
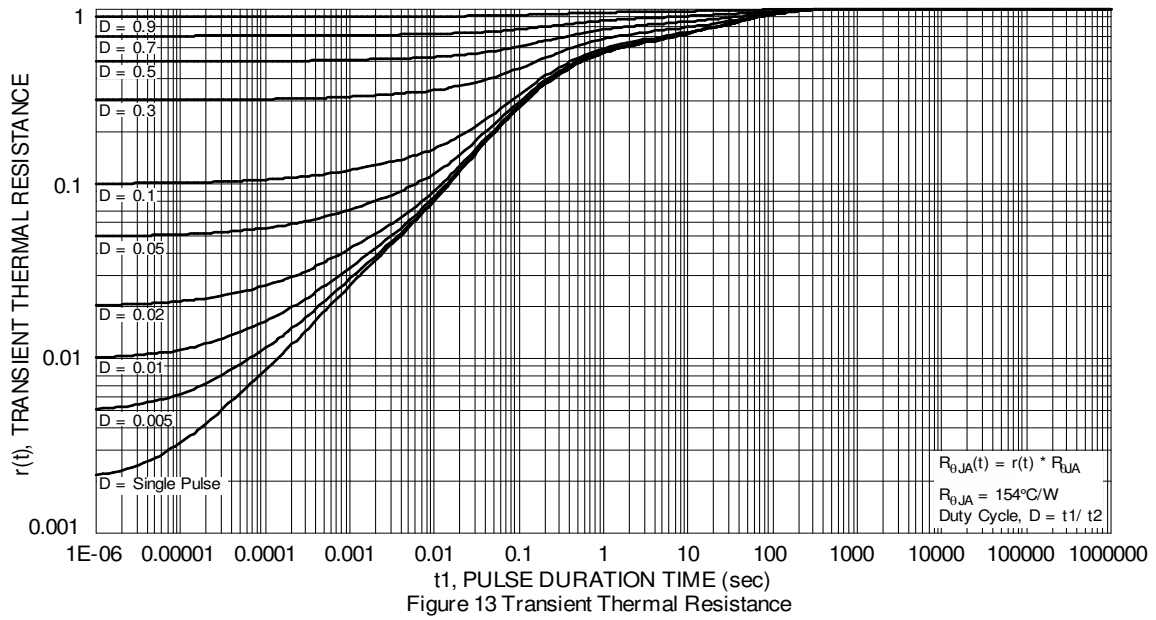


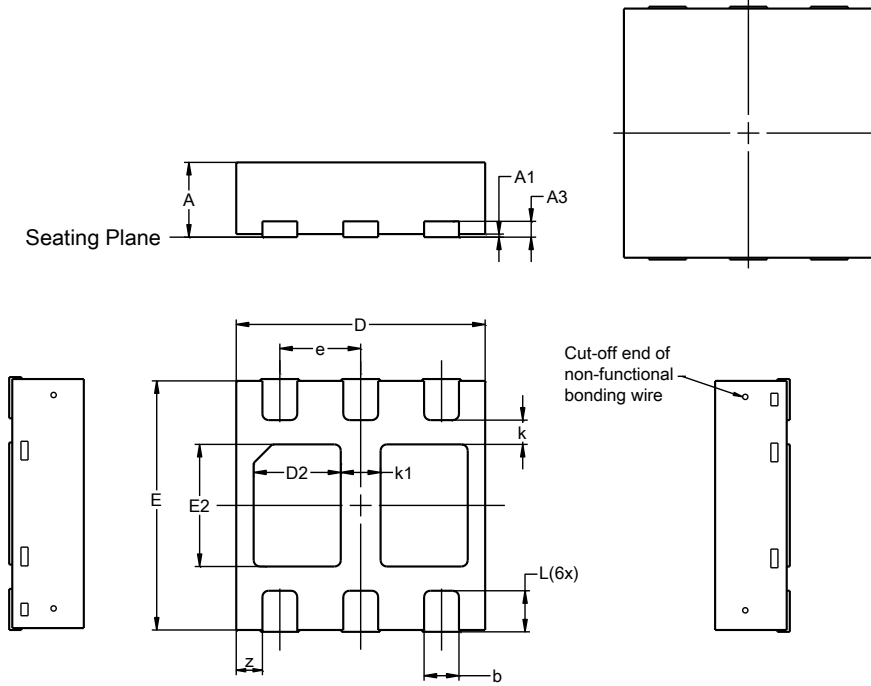
Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

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

**U-DFN2020-6 (SWP) (Type B)**

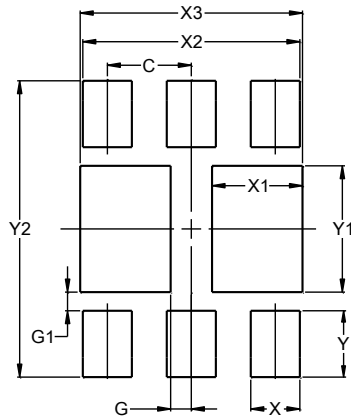


U-DFN2020-6 (SWP) (Type B)			
Dim	Min	Max	Typ
A	0.55	0.65	0.60
A1	0.00	0.05	0.03
A3	--	--	0.127
b	0.23	0.33	0.28
D	1.95	2.05	2.00
D2	0.60	0.80	0.70
E	1.95	2.05	2.00
E2	0.88	1.08	0.98
e	0.65BSC		
k	0.195BSC		
k1	0.32BSC		
L	0.28	0.38	0.33
z	0.21BSC		
All Dimensions in mm			

**Suggested Pad Layout**

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

**U-DFN2020-6 (SWP) (Type B)**



Dimensions	Value (in mm)
C	0.650
G	0.160
G1	0.145
X	0.380
X1	0.700
X2	1.680
X3	1.720
Y	0.515
Y1	0.980
Y2	2.300

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