

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
30V	30mΩ @ V _{GS} = 10V	5.5A
	42mΩ @ V _{GS} = 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

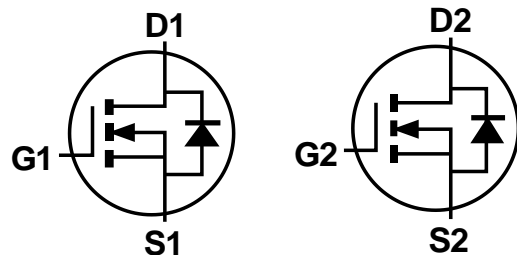
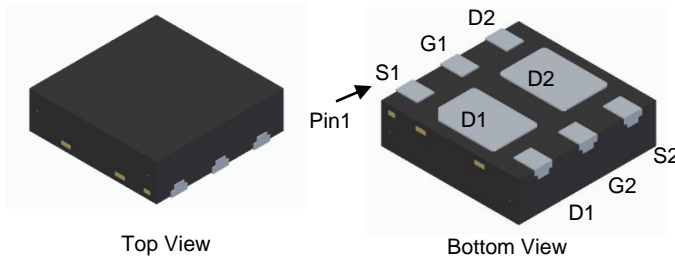
This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and ideal for use in:

- 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)



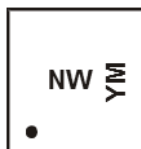
Internal Schematic

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_A = +25°C, unless otherwise specified.)

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

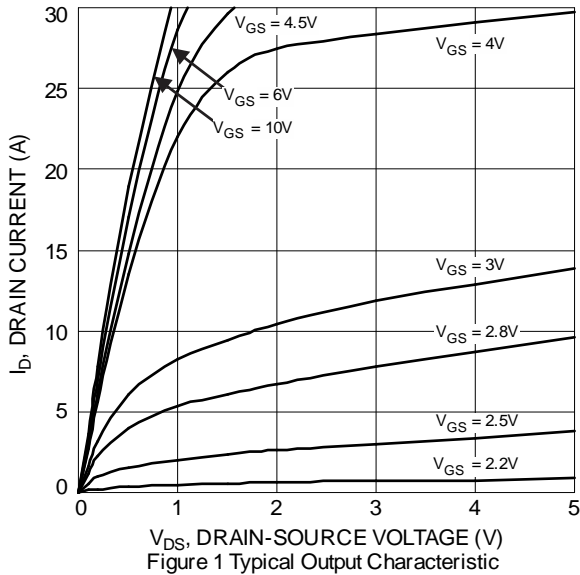
Thermal Characteristics

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

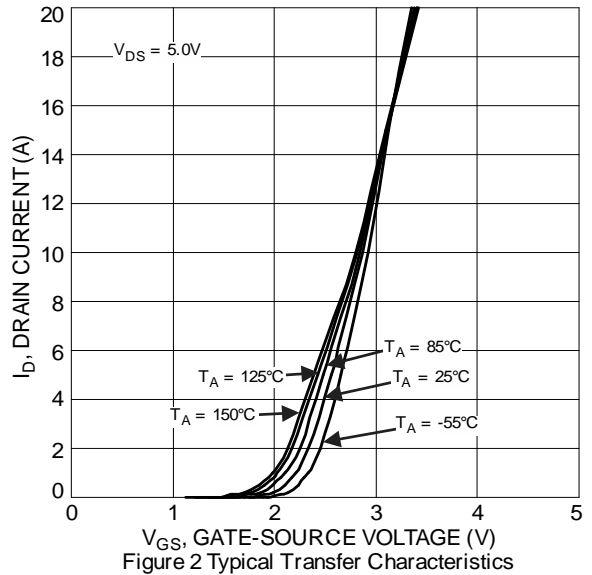
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

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

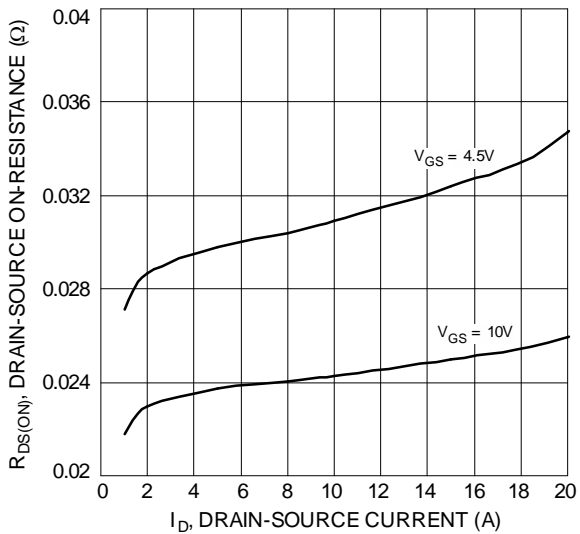
- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration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



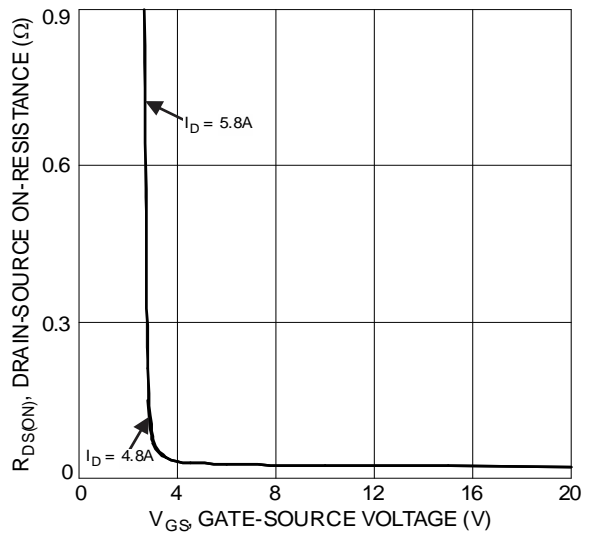
V_{DS} , DRAIN-SOURCE VOLTAGE (V)
Figure 1 Typical Output Characteristic



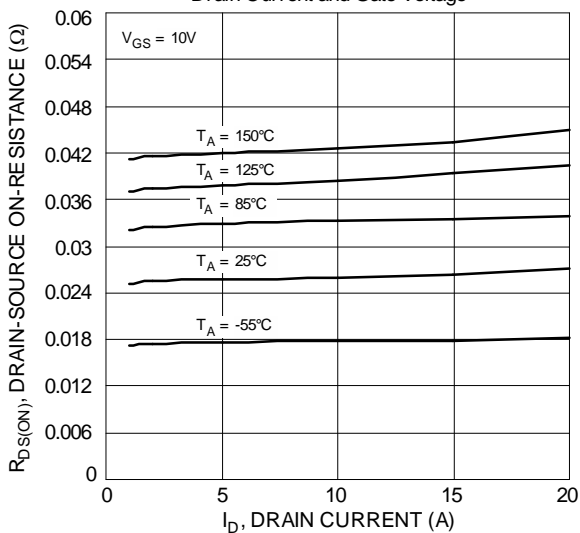
V_{GS} , GATE-SOURCE VOLTAGE (V)
Figure 2 Typical Transfer Characteristics



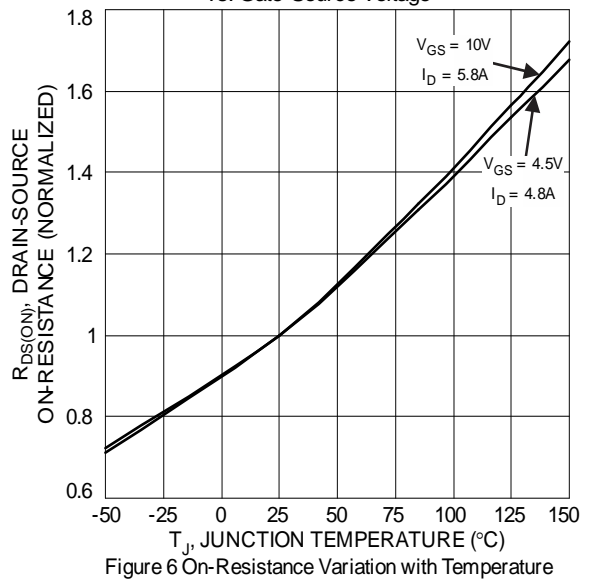
I_D , DRAIN-SOURCE CURRENT (A)
Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage



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

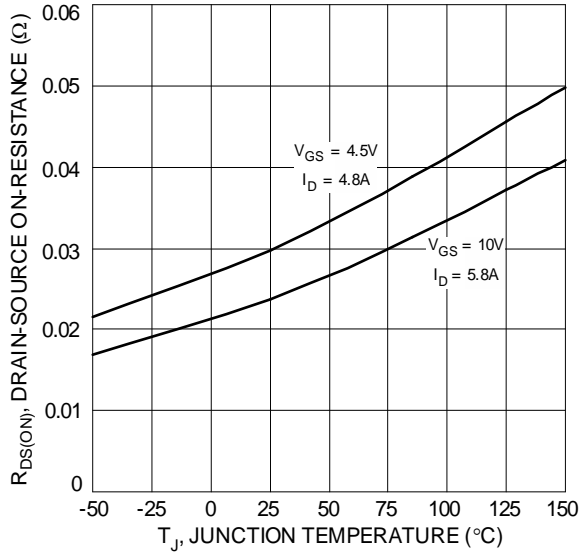


Figure 7 On-Resistance Variation with Temperature

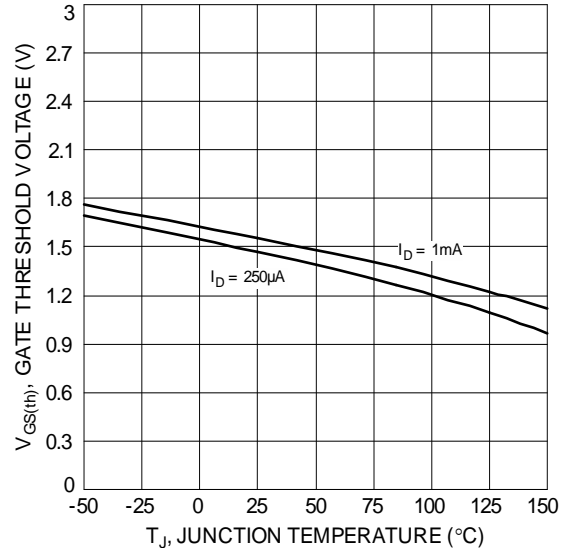


Figure 8 Gate Threshold Variation vs. Junction Temperature

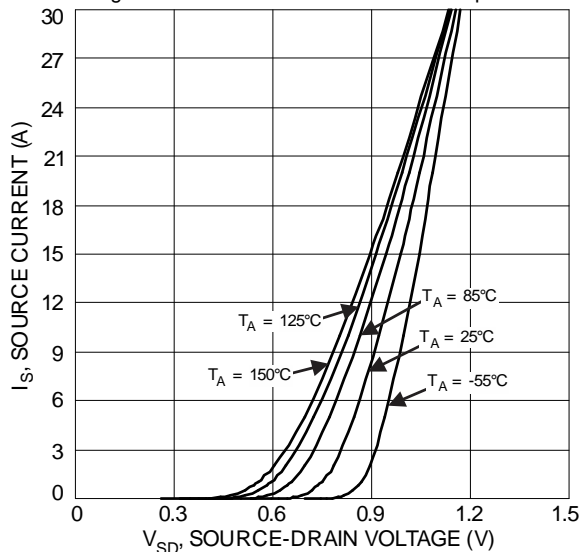


Figure 9 Diode Forward Voltage vs. Current

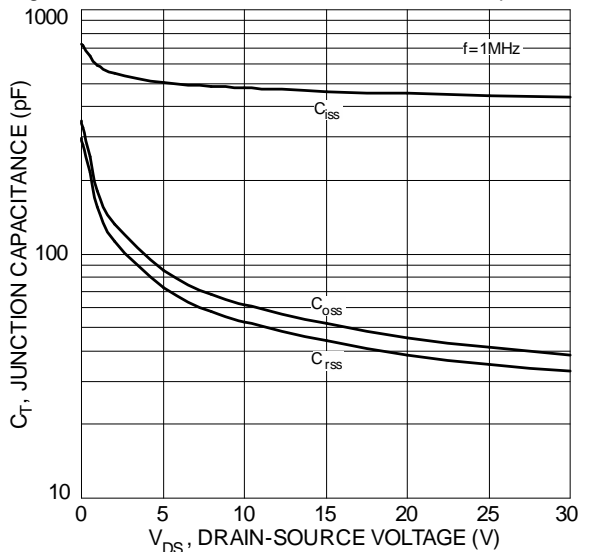


Figure 10 Typical Junction Capacitance

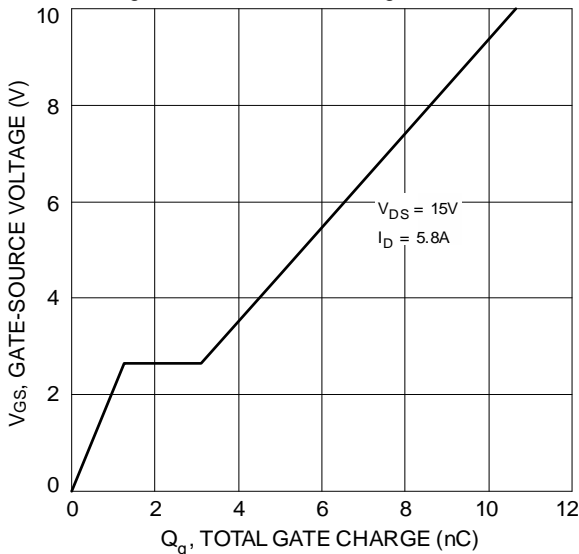


Figure 11 Gate Charge

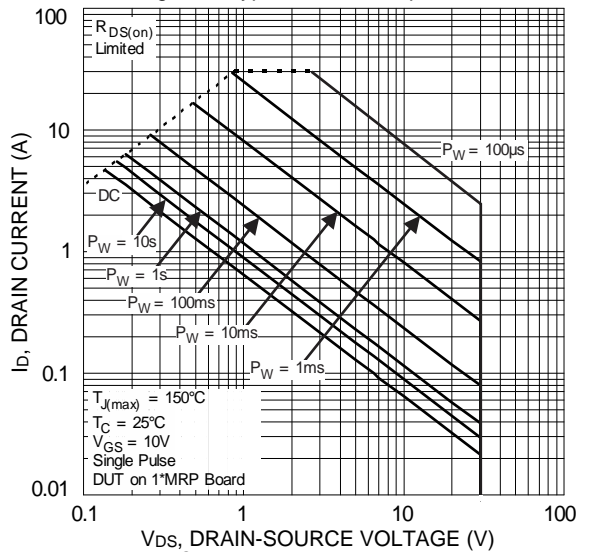
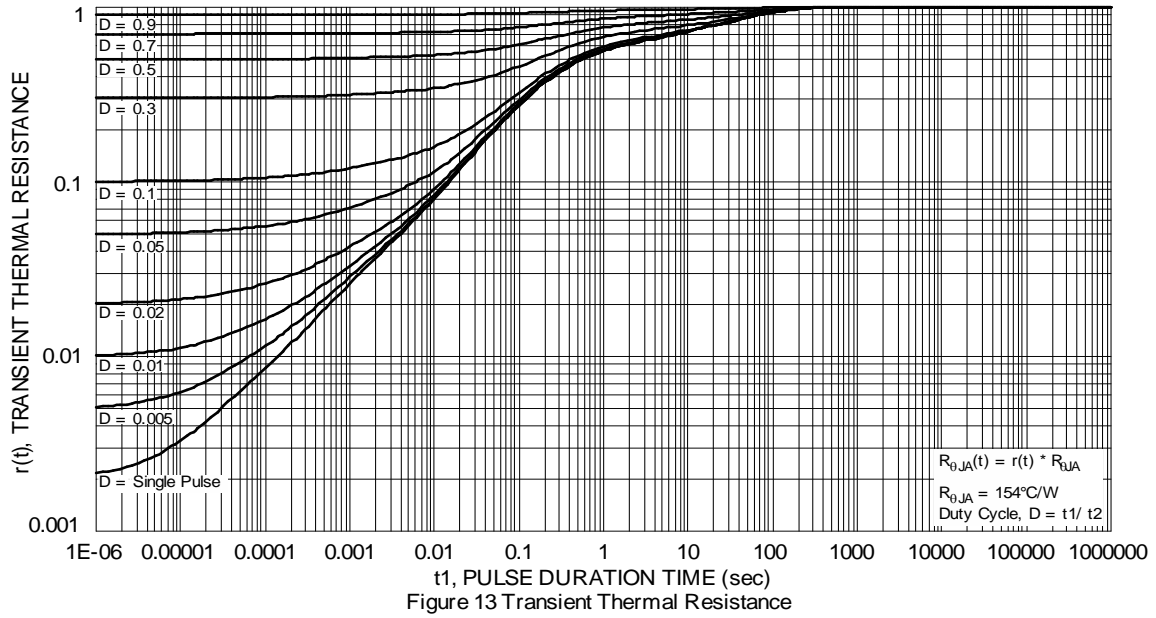


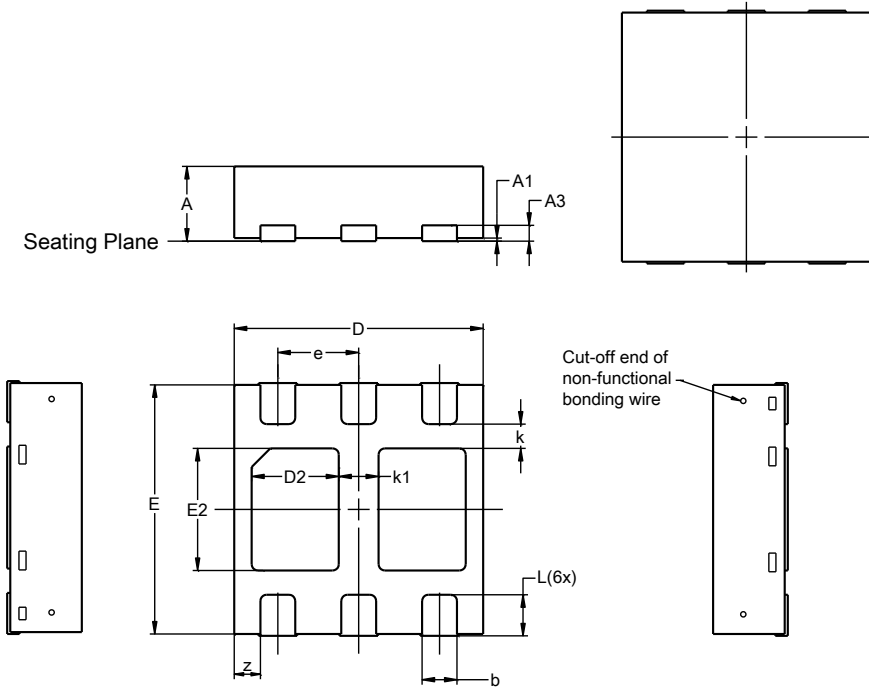
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

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

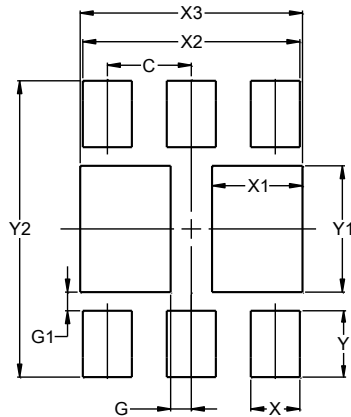


U-DFN2020-6 (SWP) (Type B)			
Dim	Min	Max	Typ
A	0.55	0.65	0.60
A1	0.00	0.05	0.03
A3	--	--	0.127
b	0.23	0.33	0.28
D	1.95	2.05	2.00
D2	0.60	0.80	0.70
E	1.95	2.05	2.00
E2	0.88	1.08	0.98
e	0.65BSC		
k	0.195BSC		
k1	0.32BSC		
L	0.28	0.38	0.33
z	0.21BSC		
All Dimensions in mm			

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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