



**THE DATASHEET OF  
DMN3032LFDBQ-13**



## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ Max	$I_D$ Max $T_A = +25^\circ\text{C}$
30V	30m $\Omega$ @ $V_{GS} = 10\text{V}$	6.2A
	42m $\Omega$ @ $V_{GS} = 4.5\text{V}$	5.2A

## 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
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

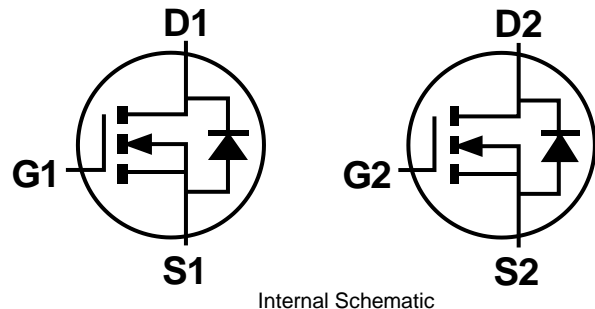
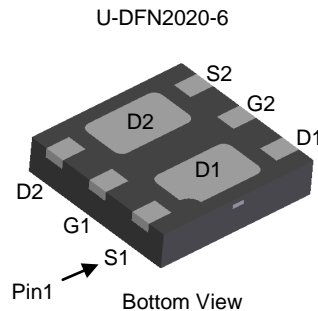
## Description and Applications

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 NiPdAu Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Terminals Connections: See Diagram Below
- Weight: 0.0065 grams (Approximate)

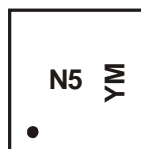


## Ordering Information (Notes 4 & 5)

Part Number	Case	Packaging
DMN3032LFDBQ-7	U-DFN2020-6	3,000/Tape & Reel
DMN3032LFDBQ-13	U-DFN2020-6	10,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



N5 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: C = 2015)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021
Code	C	D	E	F	G	H	I

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 7) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C	6.2	A
		T <sub>A</sub> = +75°C	5.0	A
Maximum Continuous Body Diode Forward Current (Note 7)	I <sub>S</sub>	2	A	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	25	A	
Avalanche Current (Note 8) L = 0.1mH	I <sub>AS</sub>	12	A	
Avalanche Energy (Note 8) L = 0.1mH	E <sub>AS</sub>	10	mJ	

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.0	W	
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	Steady state	127	°C/W
		t < 10s	75	
Total Power Dissipation (Note 7)	P <sub>D</sub>	1.7	W	
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJA</sub>	Steady state	72	°C/W
		t < 10s	43	
Thermal Resistance, Junction to Case (Note 7)	R <sub>θJC</sub>	9	°C	
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 9)</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 10)	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 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	1.5	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>	-	25	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>	-	0.75	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 10)</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.

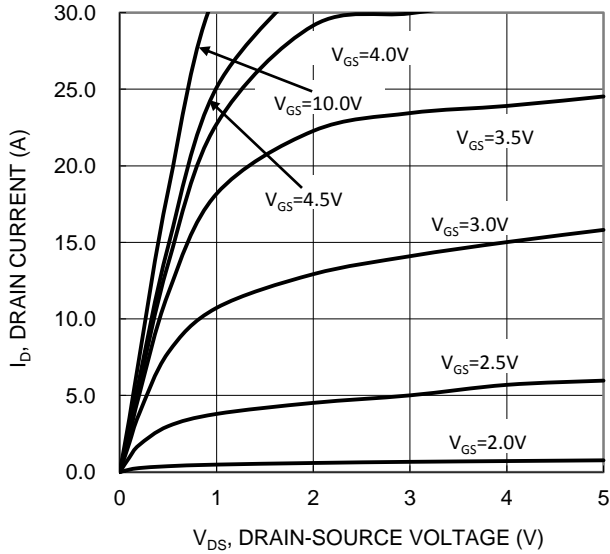


Figure 1. Typical Output Characteristic

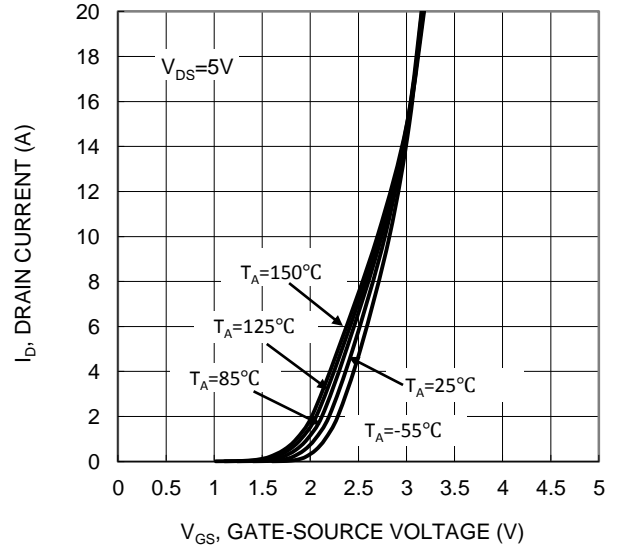


Figure 2. Typical Transfer Characteristic

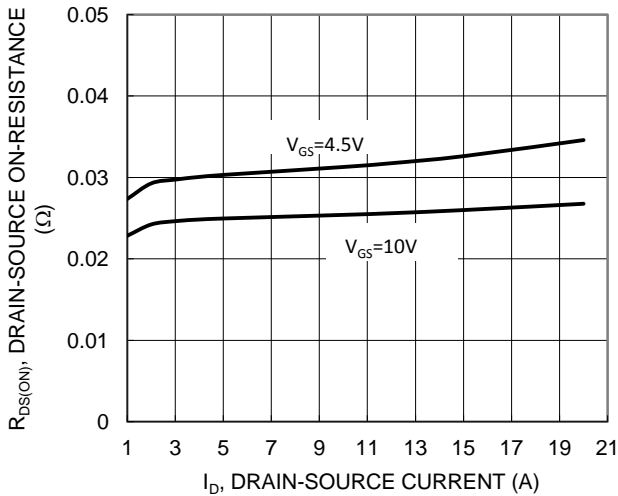


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

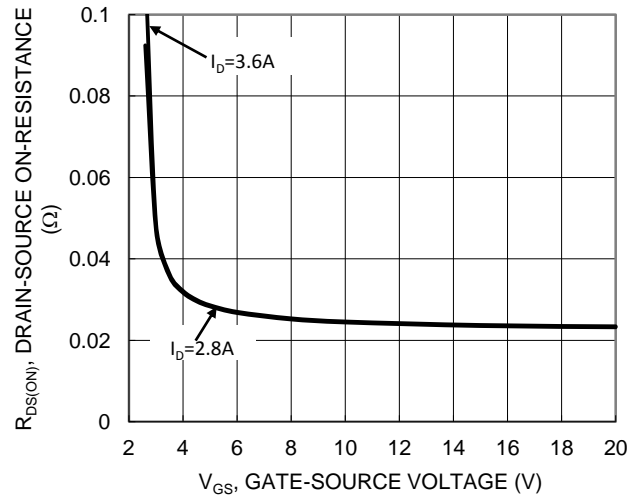


Figure 4. Typical Transfer Characteristic

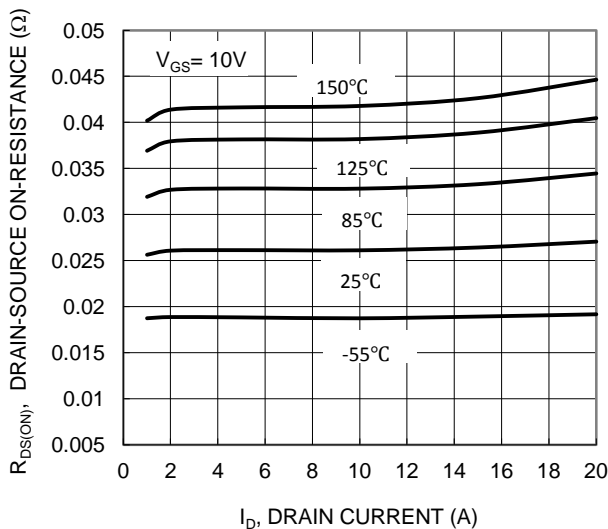


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

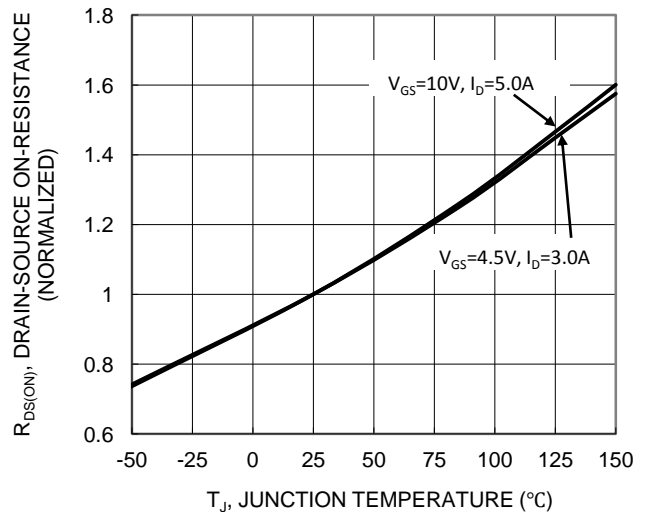


Figure 6. On-Resistance Variation with Temperature

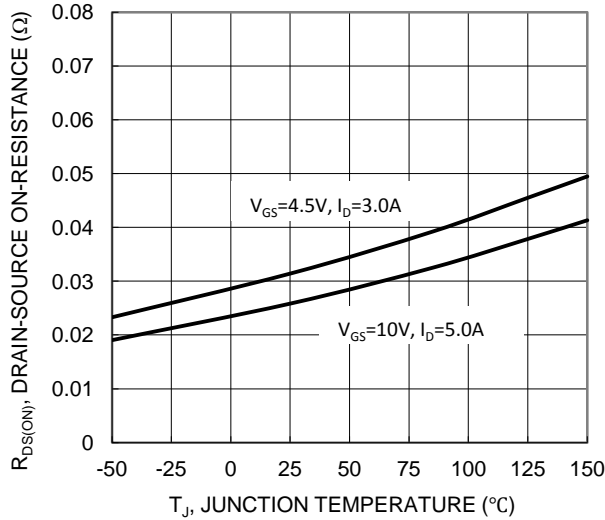


Figure 7. On-Resistance Variation with Temperature

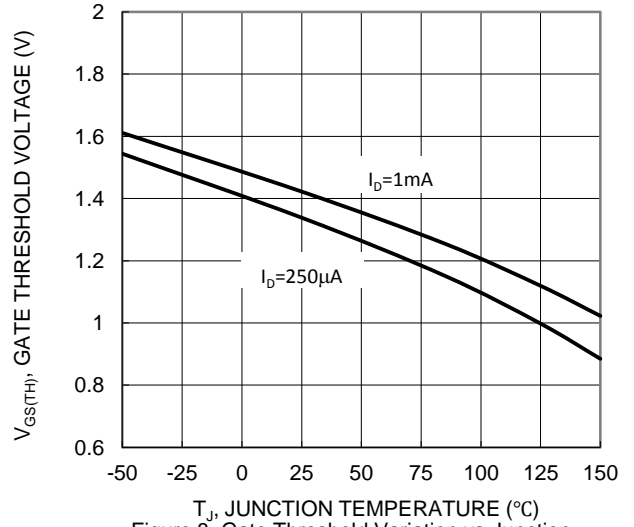


Figure 8. Gate Threshold Variation vs Junction Temperature

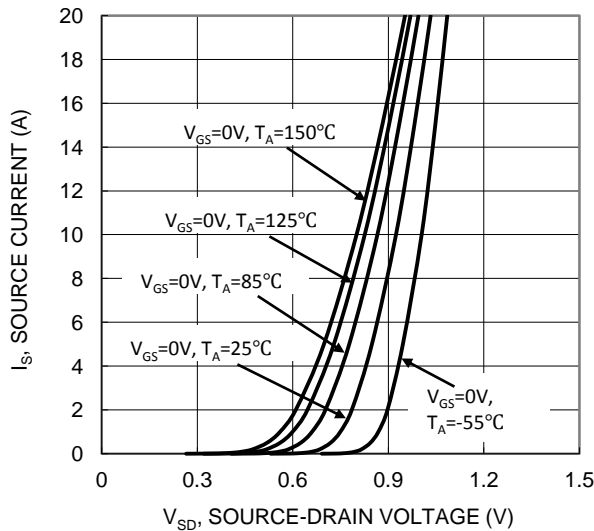


Figure 9. Diode Forward Voltage vs. Current

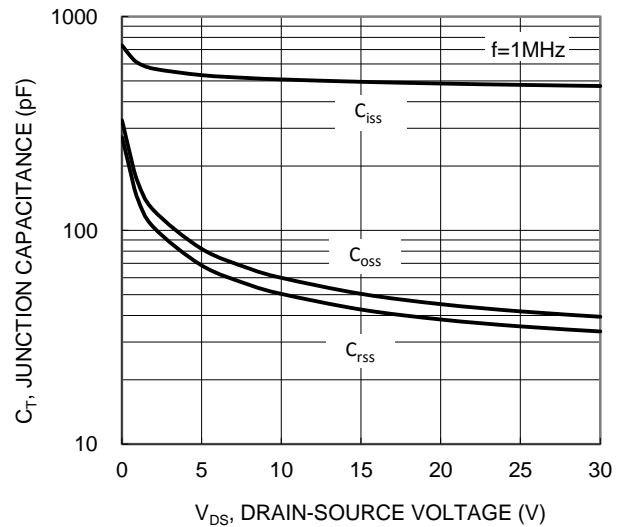


Figure 10. Typical Junction Capacitance

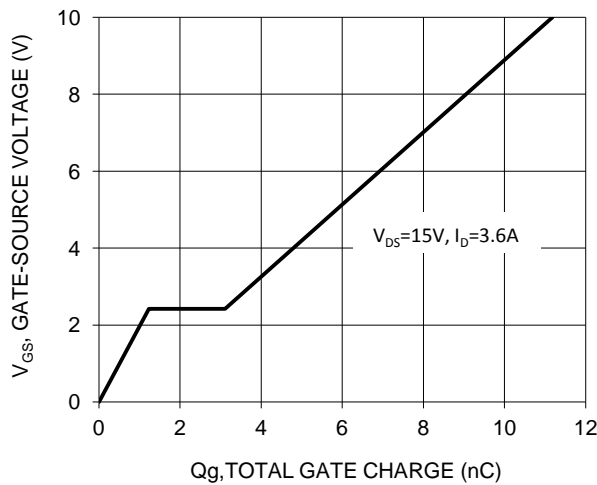


Figure 11. Gate Charge

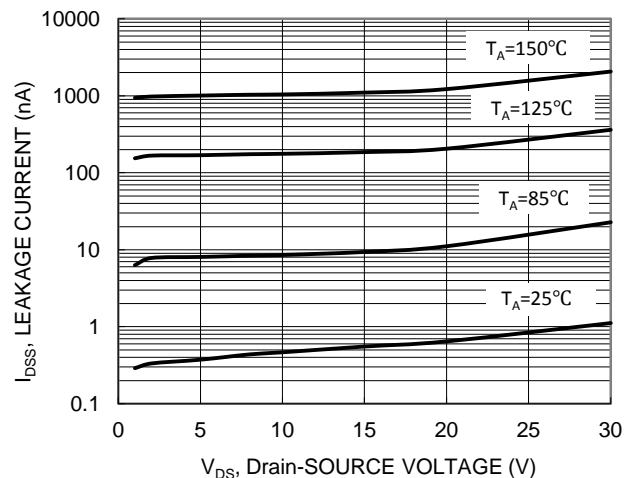
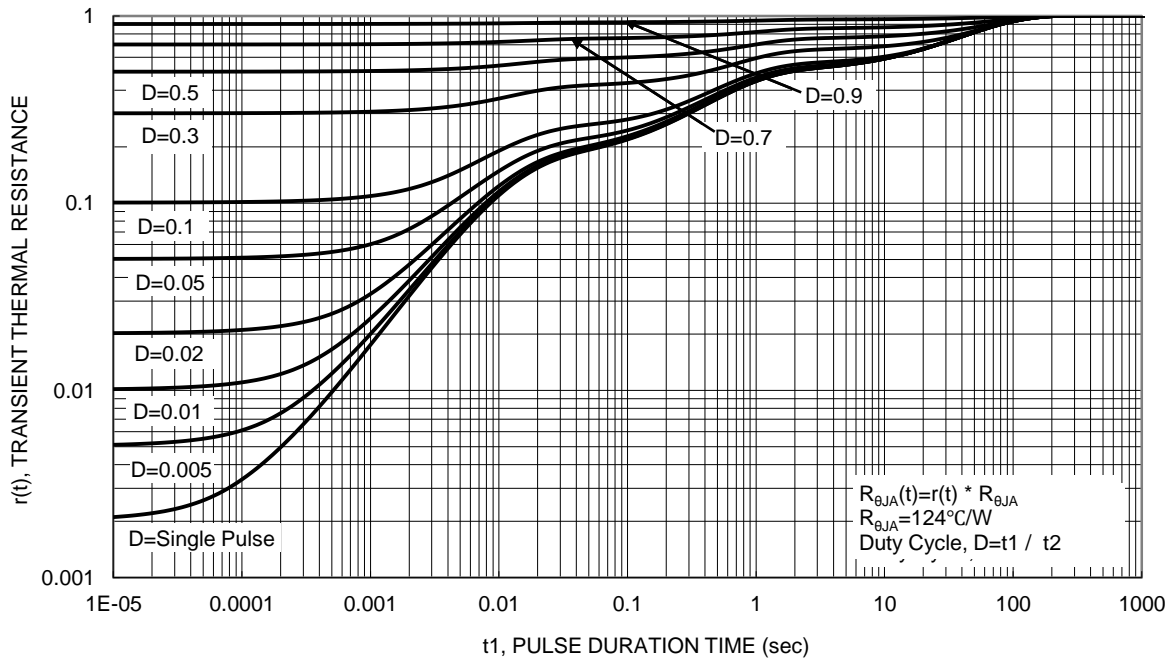
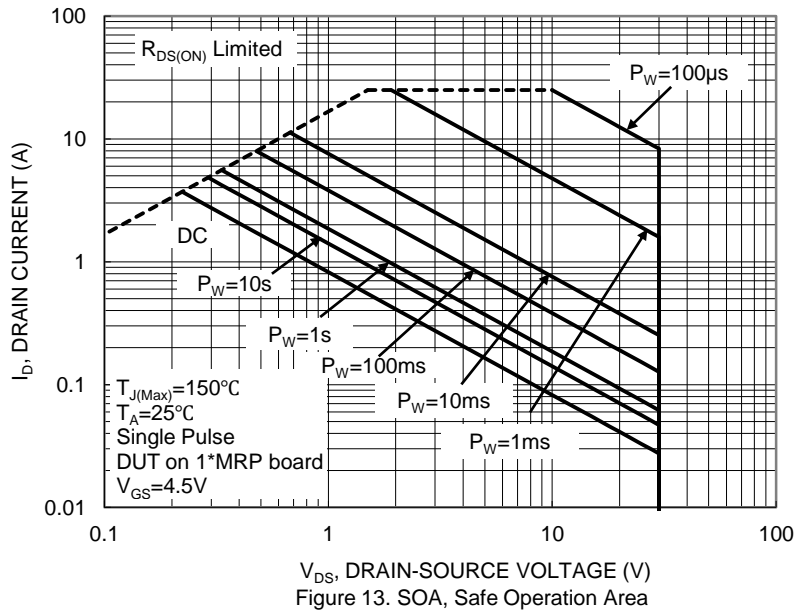
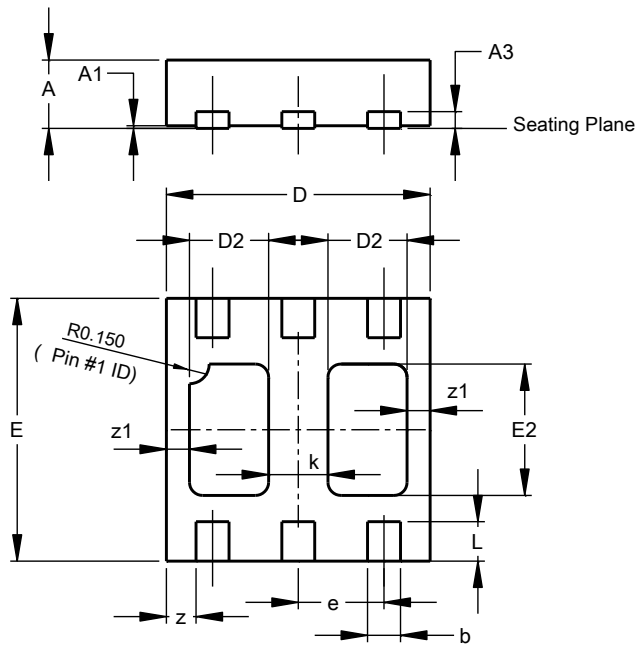


Figure 12. Typical Drain-Source Leakage Current vs. Voltage



**Package Outline Dimensions**

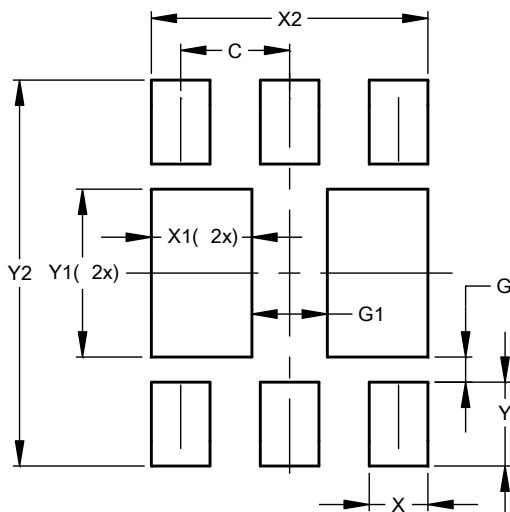
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



U-DFN2020-6 Type B			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.02
A3	-	-	0.13
b	0.20	0.30	0.25
D	1.95	2.075	2.00
D2	0.50	0.70	0.60
e	-	-	0.65
E	1.95	2.075	2.00
E2	0.90	1.10	1.00
k	-	-	0.45
L	0.25	0.35	0.30
z	-	-	0.225
z1	-	-	0.15
All Dimensions in mm			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	0.650
G	0.150
G1	0.450
X	0.350
X1	0.600
X2	1.650
Y	0.500
Y1	1.000
Y2	2.300

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