

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
60V	2Ω @ V <sub>GS</sub> = 10V	540mA
	3Ω @ V <sub>GS</sub> = 5V	430mA

## Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

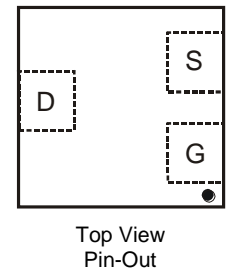
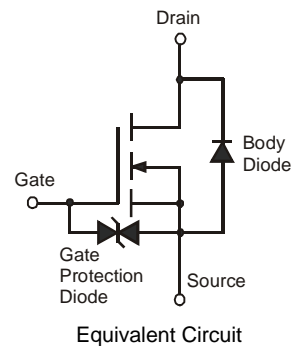
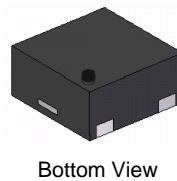
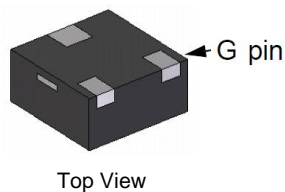
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Load Switch

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate to 2kV
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Case: X1-DFN1212-3
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e4)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (Approximate)



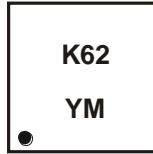
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN62D0SFD-7	X1-DFN1212-3	3000/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:



K62 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: 1 = 2021)  
 M = Month (ex: 9 = September)

Date Code Key

<b>Year</b>	<b>2011</b>	...	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<b>Code</b>	Y	...	I	J	K	L	M	N	O	P	R	S

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

Site 2:



K62 = Product Type Marking Code  
 YWX = Date Code Marking  
 Y = Year (ex: 1 = 2021)  
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)  
 X = Internal Code (ex: U = Monday)

Date Code Key

<b>Year</b>	<b>2011</b>	...	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<b>Code</b>	1	...	1	2	3	4	5	6	7	8	9	0

<b>Week</b>	<b>1-26</b>	<b>27-52</b>	<b>53</b>
<b>Code</b>	A-Z	a-z	z

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

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	540 430	mA
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	630 500	mA
Continuous Drain Current (Note 6) V <sub>GS</sub> = 5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	430 340	mA
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	510 410	mA
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	1.0	A
Maximum Body Diode Forward Current (Note 6)			I <sub>S</sub>	540	mA

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P <sub>D</sub>	0.43	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R <sub>θJA</sub>	260	°C/W
	t < 10s			182	°C/W
Total Power Dissipation (Note 6)			P <sub>D</sub>	0.89	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R <sub>θJA</sub>	140	°C/W
	t < 10s			98	°C/W
Thermal Resistance, Junction to Case (Note 6)			R <sub>θJC</sub>	112	°C/W
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 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 10µA
Zero Gate Voltage Drain Current @ T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	100	nA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	10	µA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	1.6	2.5	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	2	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA
		—	—	3		V <sub>GS</sub> = 5V, I <sub>D</sub> = 50mA
Forward Transfer Admittance	Y <sub>fs</sub>	—	130	—	mS	V <sub>DS</sub> = 3V, I <sub>D</sub> = 30mA
Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 300mA
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	30.2	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	4.4	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	2.8	—	pF	
Gate Resistance	R <sub>g</sub>	—	131	—	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>	—	0.39	—	nC	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1A
Total Gate Charge (V <sub>GS</sub> = 10.0V)	Q <sub>g</sub>	—	0.87	—	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	0.14	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.09	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	3.95	—	ns	V <sub>DS</sub> = 30V, I <sub>D</sub> = 200mA V <sub>GS</sub> = 10V, R <sub>G</sub> = 25Ω
Turn-On Rise Time	t <sub>r</sub>	—	3.81	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	16.0	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	9.04	—	ns	

- Notes:
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to production testing.

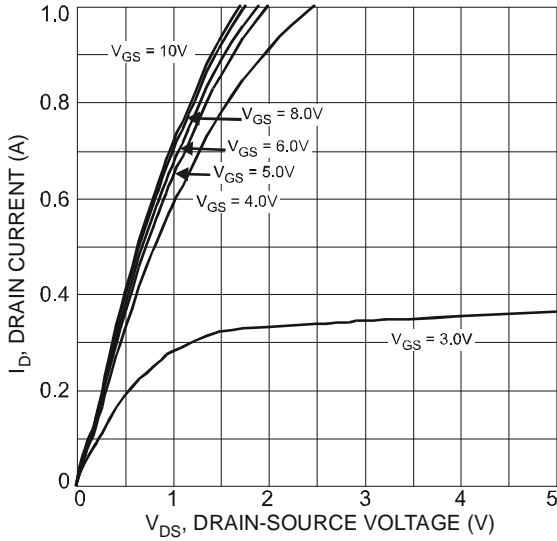


Fig. 1 Typical Output Characteristic

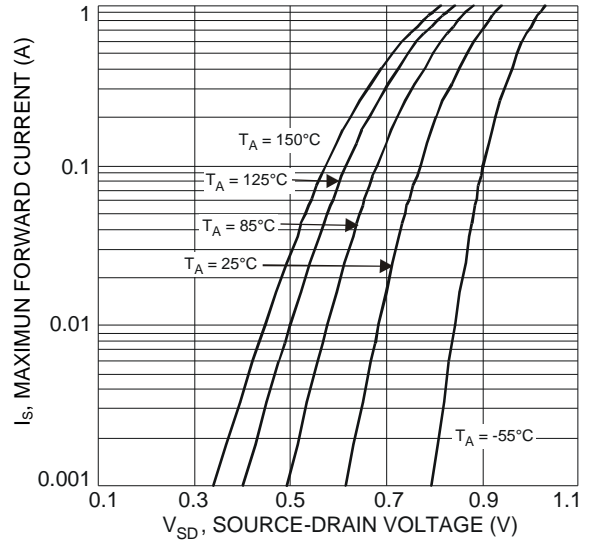


Fig. 2 Maximum Forward Current vs. Source-Drain Voltage

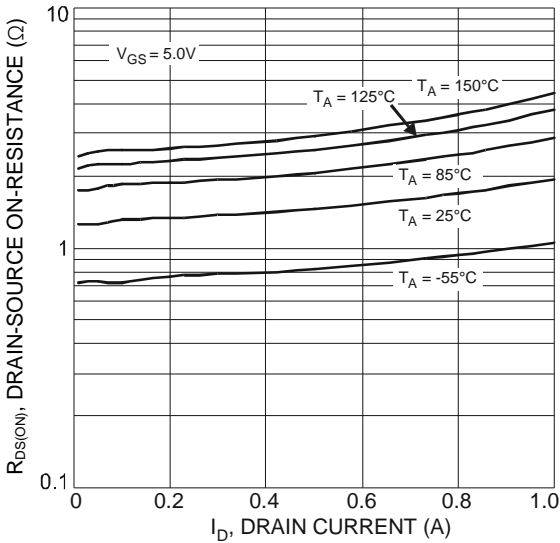


Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

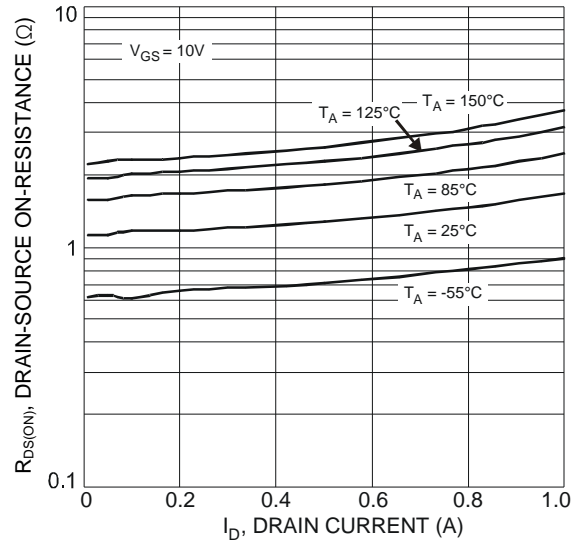


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

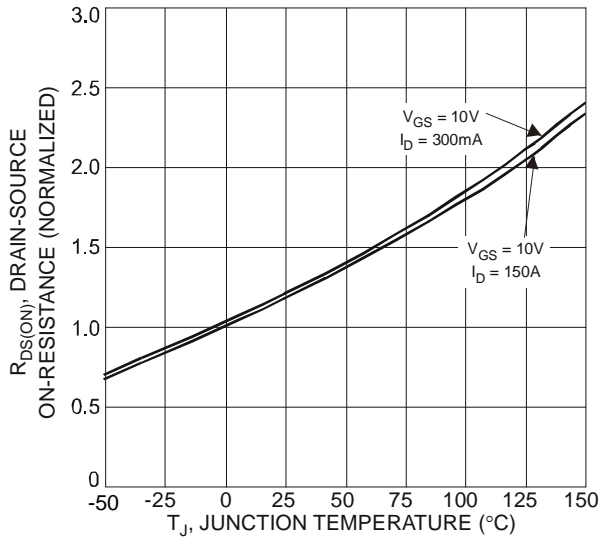


Fig. 5 On-Resistance Variation with Temperature

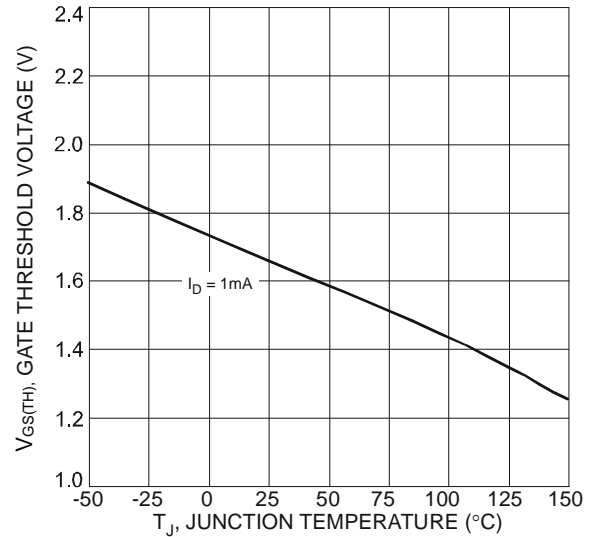


Fig. 6 Gate Threshold Variation vs. Junction Temperature

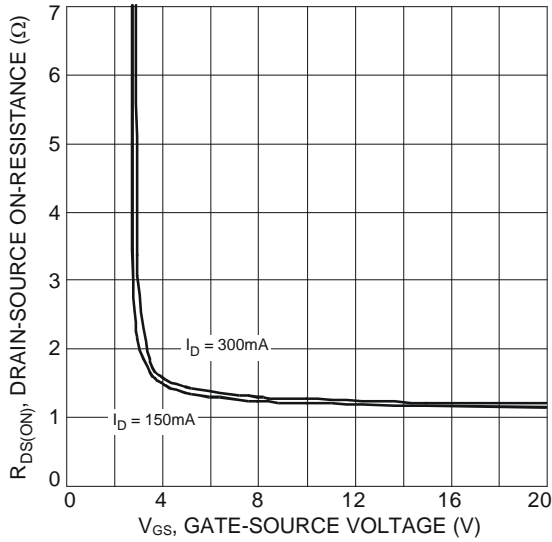


Fig. 7 Typical Transfer Characteristics

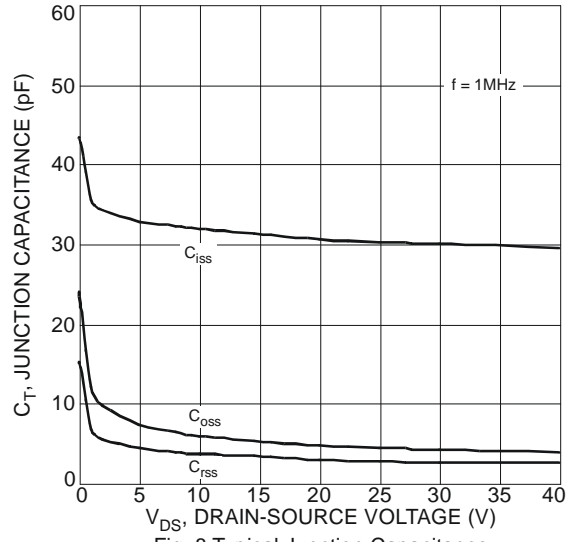


Fig. 8 Typical Junction Capacitance

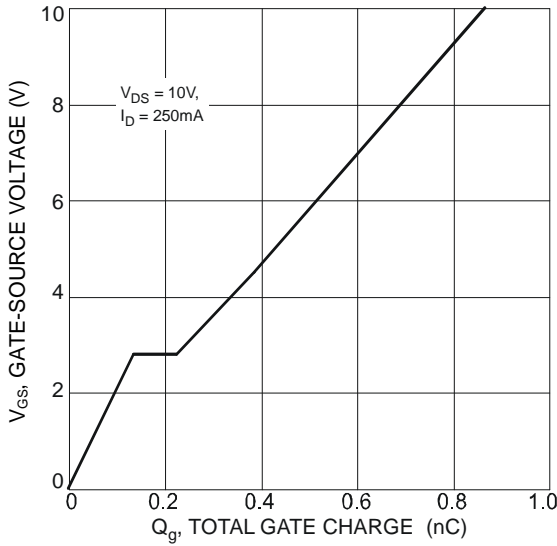


Fig. 9 Gate Charge

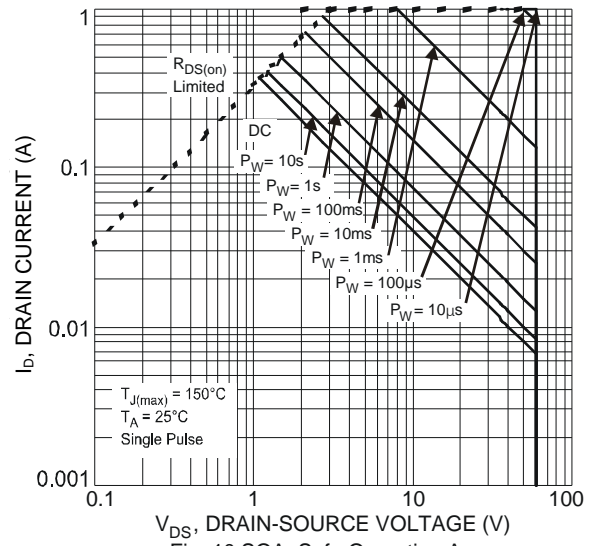


Fig. 10 SOA, Safe Operation Area

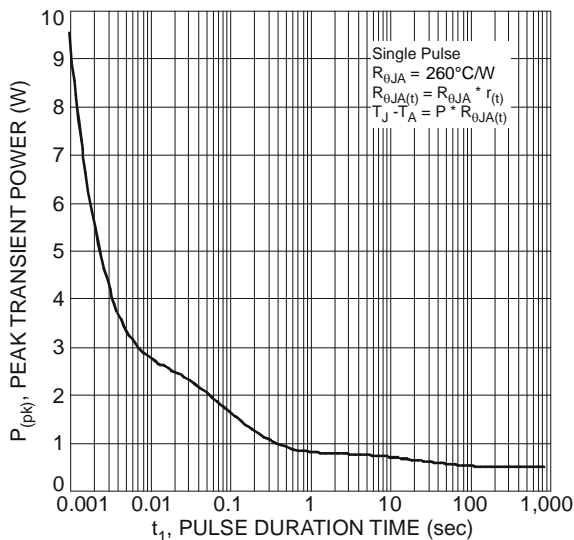
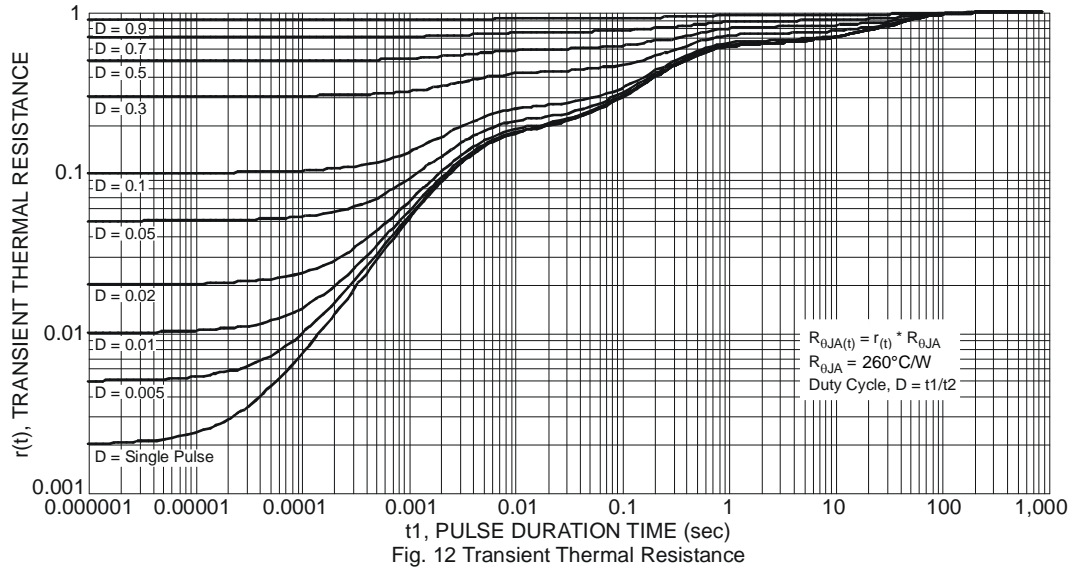


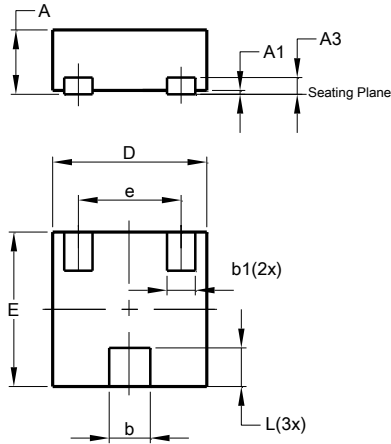
Fig. 11 Single Pulse Maximum Power Dissipation



**Package Outline Dimensions**

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

**X1-DFN1212-3**

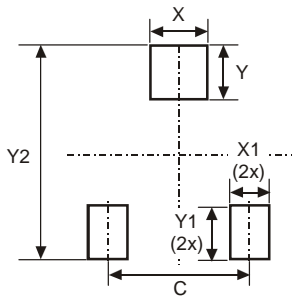


X1-DFN1212-3			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.02
A3	-	-	0.13
b	0.27	0.37	0.32
b1	0.17	0.27	0.22
D	1.15	1.25	1.20
E	1.15	1.25	1.20
e	-	-	0.80
L	0.25	0.35	0.30
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**X1-DFN1212-3**



Dimensions	Value (in mm)
C	0.80
X	0.42
X1	0.32
Y	0.50
Y1	0.50
Y2	1.50

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