

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
60V	$2\Omega @ V_{GS} = 10V$	540mA
	$3\Omega @ V_{GS} = 5V$	430mA

## Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

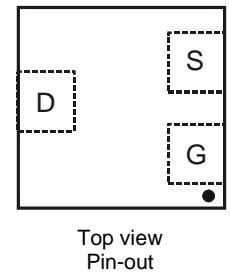
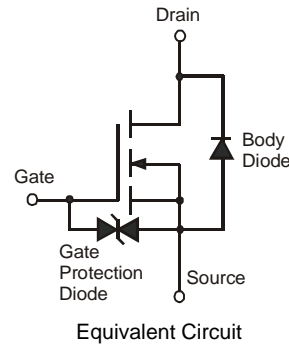
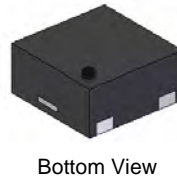
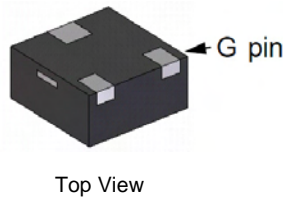
- DC-DC Converters
- Power management functions
- Battery Operated Systems and Solid-State Relays
- Load switch

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate to 2kV
- **Lead Free/RoHS Compliant (Note 1)**
- **Green Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## 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
- Terminal Connections: See Diagram
- Weight: 0.005 grams (approximate)

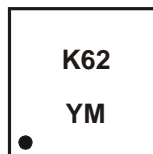


## Ordering Information (Note 3)

Part Number	Case	Packaging
DMN62D0SFD-7	X1-DFN1212-3	3000/Tape & Reel

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>
  3. For packaging details, go to our website at <http://www.diodes.com>

## Marking Information



K62 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2007	2008	2009	2010	2011	2012
Code	U	V	W	X	Y	Z

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	Units
Drain-Source Voltage			V <sub>DSS</sub>	60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) 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 5) 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 5)			I <sub>S</sub>	1.0	A

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P <sub>D</sub>	0.43	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	R <sub>θJA</sub>	260	°C/W
	t < 10s		182	°C/W
Total Power Dissipation (Note 5)		P <sub>D</sub>	0.89	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R <sub>θJA</sub>	140	°C/W
	t < 10s		98	°C/W
Thermal Resistance, Junction to Case (Note 5)		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 6)</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 6)</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 7)</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:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

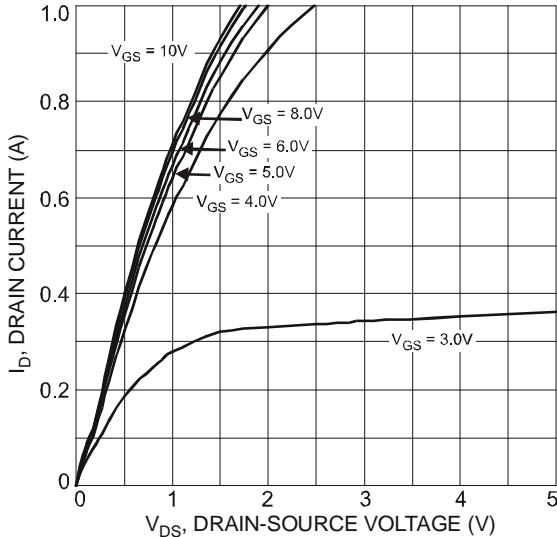


Fig. 1 Typical Output Characteristic

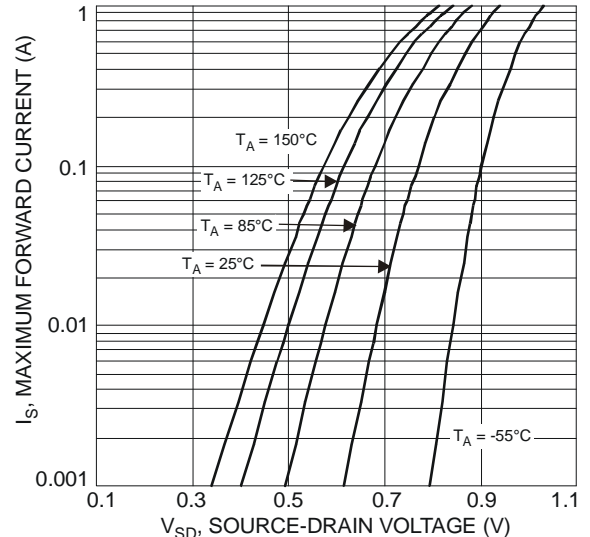


Fig. 2 Maximum Forward Current vs. Source-Drain Voltage

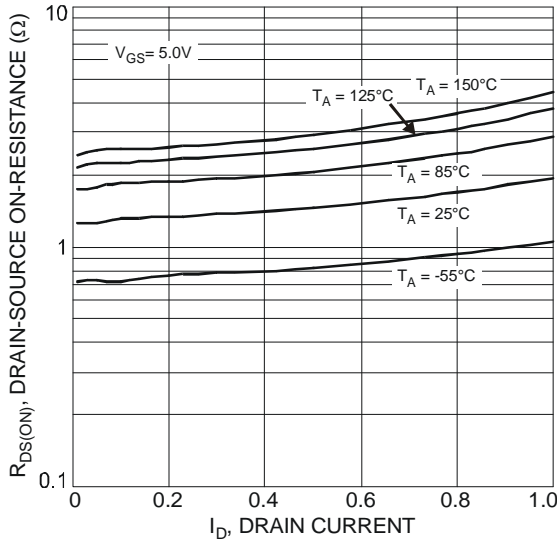


Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

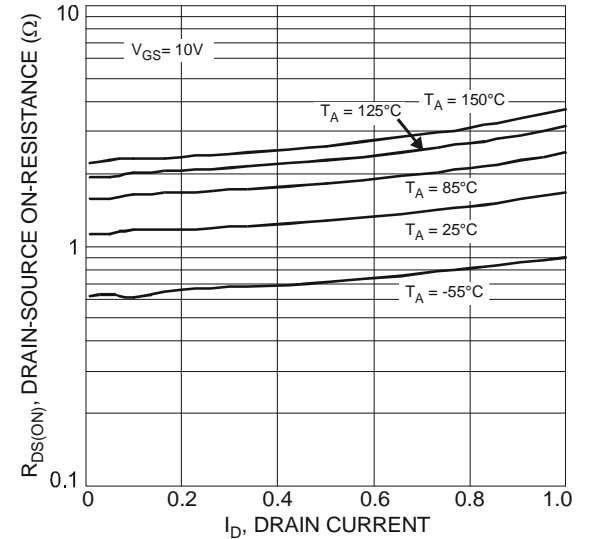


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

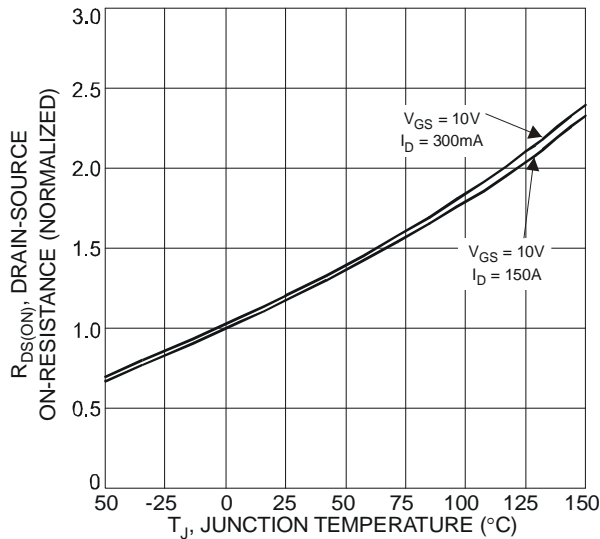


Fig. 5 On-Resistance Variation with Temperature

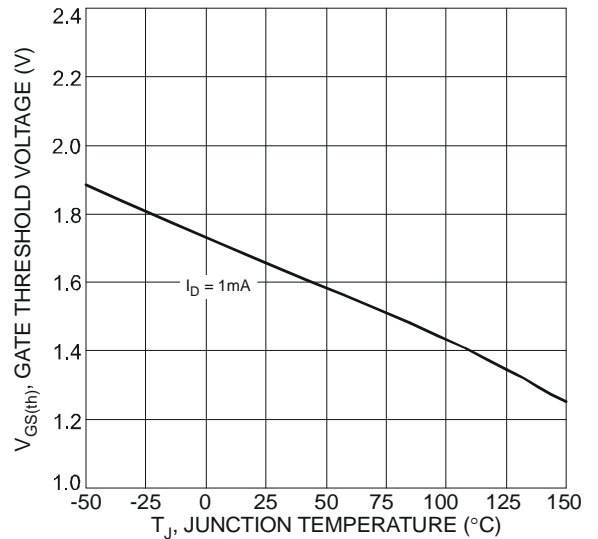


Fig. 6 Gate Threshold Variation vs. Ambient Temperature

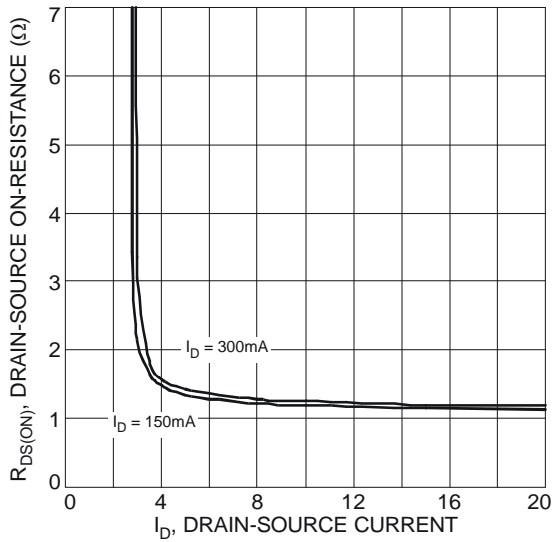


Fig. 7 Typical On-Resistance vs. Drain Current

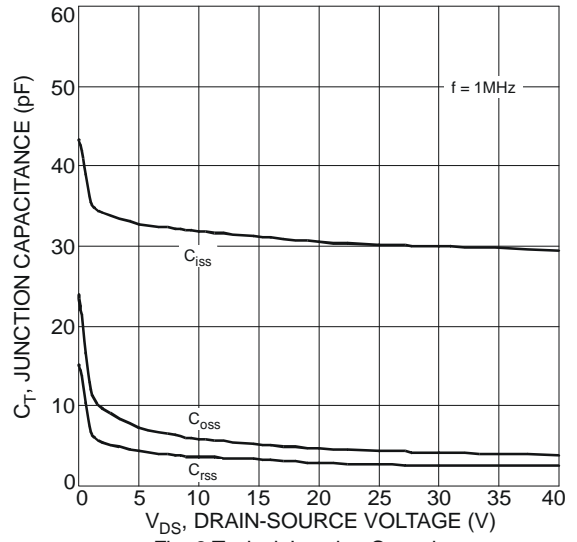


Fig. 8 Typical Junction Capacitance

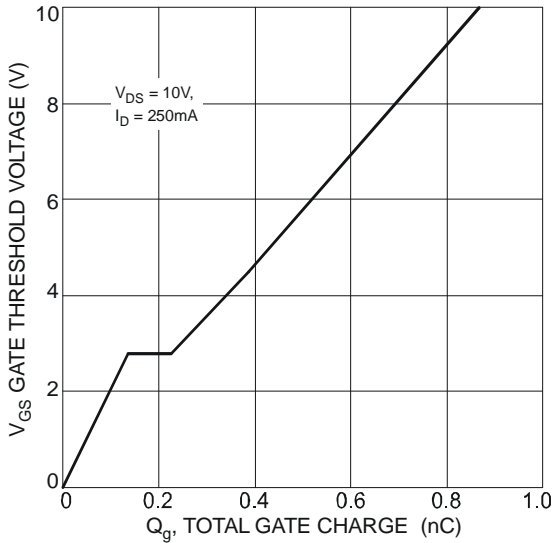


Fig. 9 Gate Charge

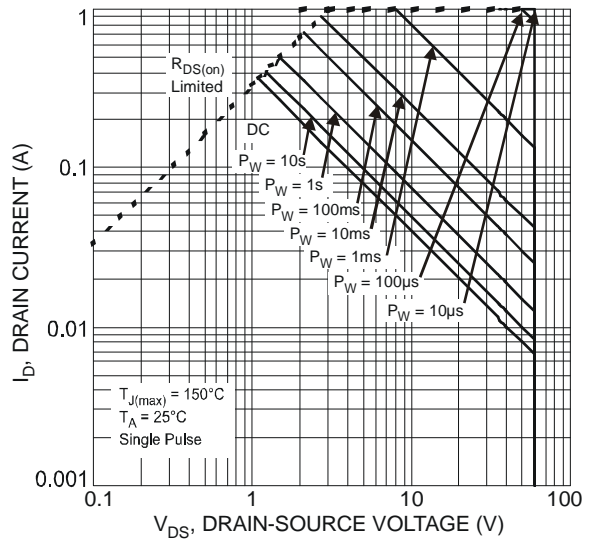


Fig. 10 SOA, Safe Operation Area

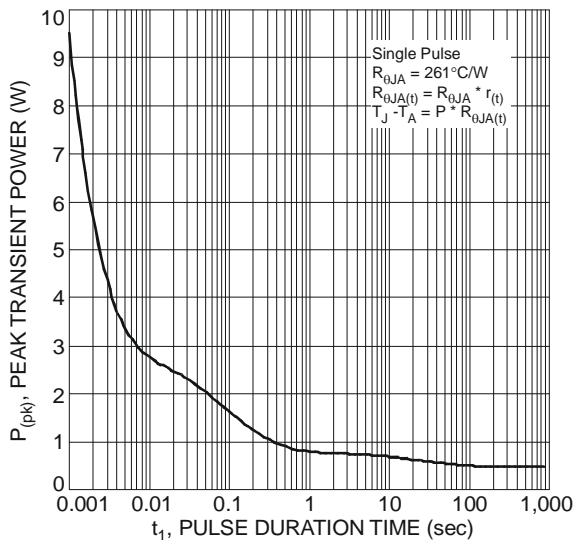
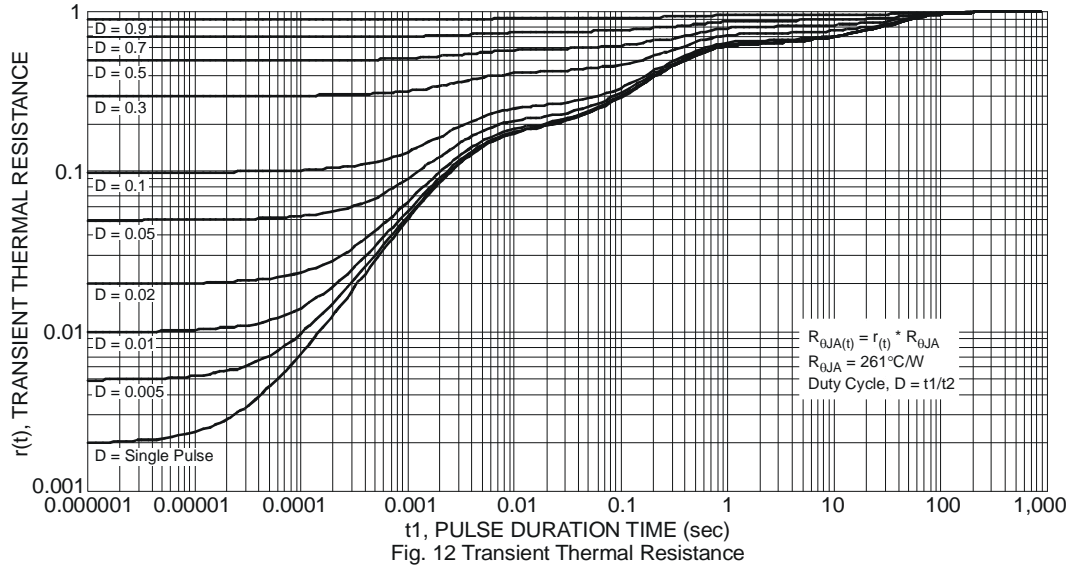
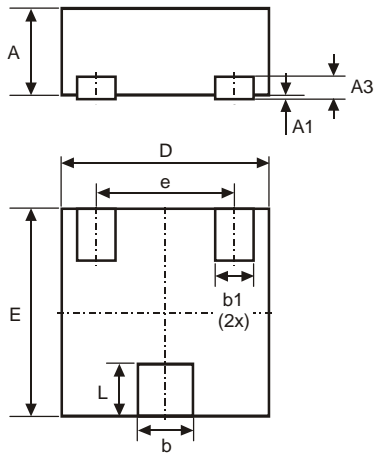


Fig. 11 Single Pulse Maximum Power Dissipation



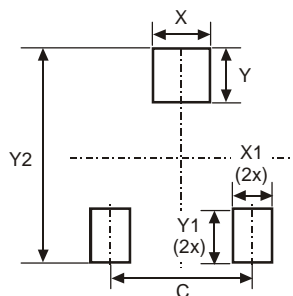
**Package Outline Dimensions**



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

All Dimensions in mm

**Suggested Pad Layout**



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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