

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

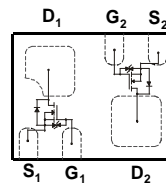
Features

- Ultra Low Profile Package
- Low On-Resistance
- Very Low Gate Threshold Voltage, 0.9V Max.
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: X2-DFN1310-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish — NiPdAu annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 ^(e4)

X2-DFN1310-6



Top View
Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2005DLP4K-7	X2-DFN1310-6	3000/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> 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 <http://www.diodes.com>.

Marking Information



DL = Product Type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	± 10	V
Drain Current per element (Note 5)	I_D	Continuous	300
		Pulsed (Note 6)	350

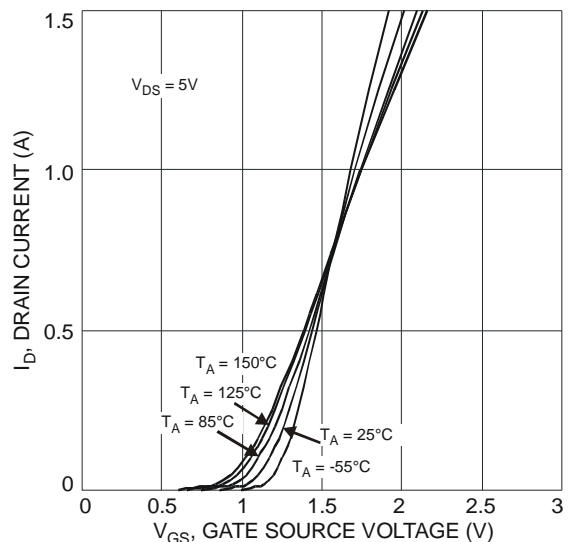
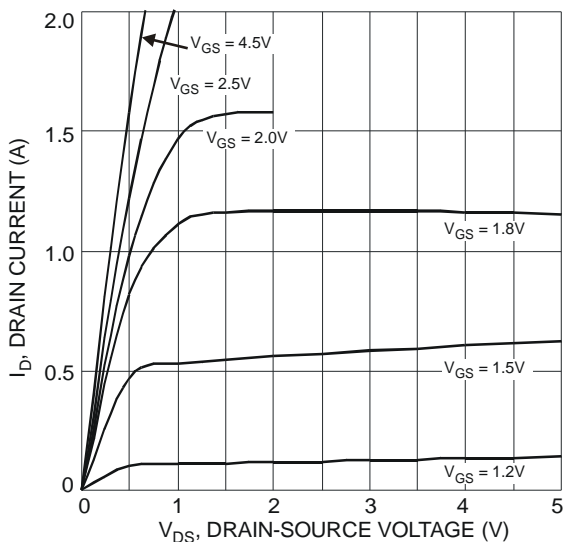
Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	400	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	231	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	$^\circ\text{C}$

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (per element) (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	$V_{GS} = 0V, I_D = 100\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	10	μA	$V_{DS} = 17V, V_{GS} = 0V$
Gate-Source Leakage	I_{GSS}	—	—	± 5	μA	$V_{GS} = \pm 8V, V_{DS} = 0V$
ON CHARACTERISTICS (per element) (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.53	—	0.9	V	$V_{DS} = V_{GS}, I_D = 100\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	0.35	1.5	Ω	$V_{GS} = 4V, I_D = 10\text{mA}$
		—	0.4	1.7		$V_{GS} = 2.7V, I_D = 200\text{mA}$
		—	0.45	1.7		$V_{GS} = 2.5V, I_D = 10\text{mA}$
		—	0.55	3.5		$V_{GS} = 1.8V, I_D = 200\text{mA}$
		—	0.65	3.5		$V_{GS} = 1.5V, I_D = 1\text{mA}$
Forward Transfer Admittance	$ Y_{fs} $	40	—	—	mS	$V_{DS} = 3V, I_D = 10\text{mA}$

- Notes:
- Device mounted on FR-4 PCB.
 - Pulse width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
 - Short duration pulse test used to minimize self-heating effect.



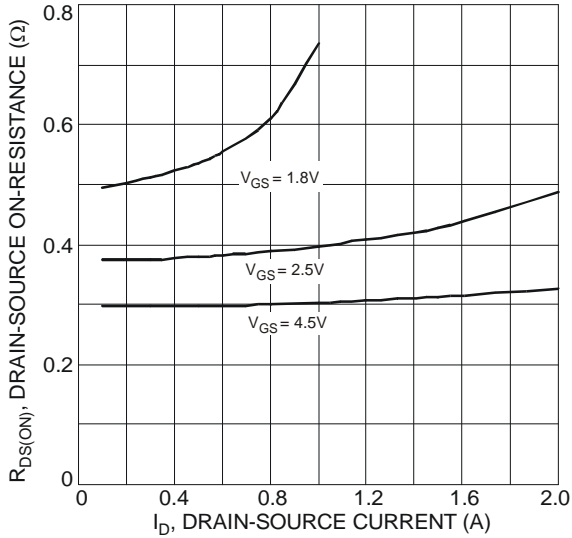


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

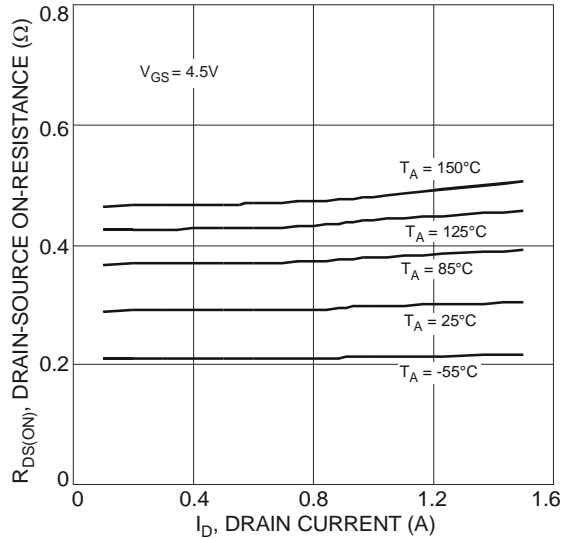


Figure 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

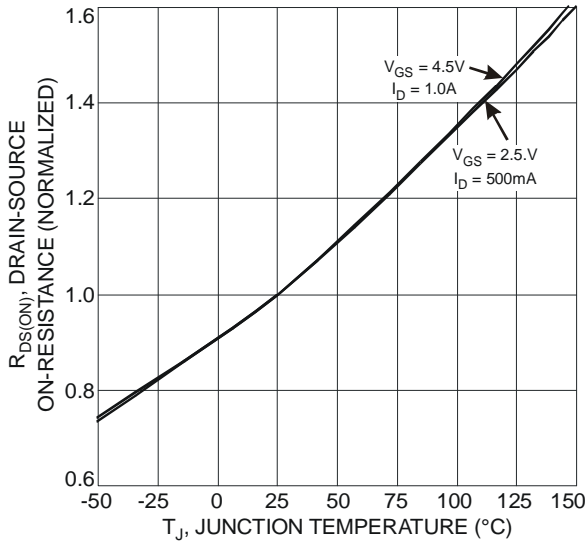


Figure 5 On-Resistance Variation with Temperature

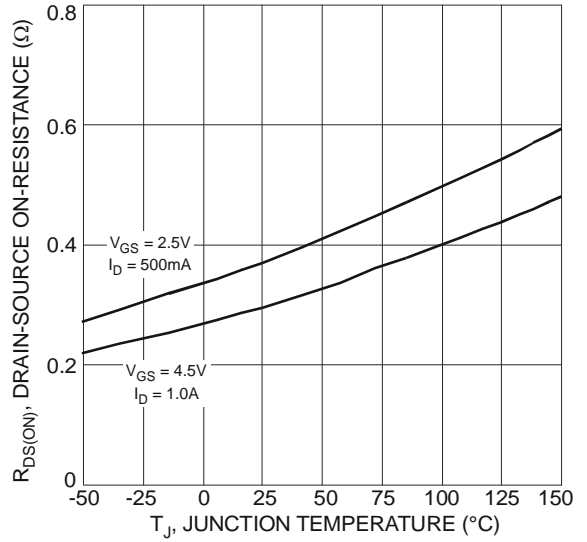


Figure 6 On-Resistance Variation with Temperature

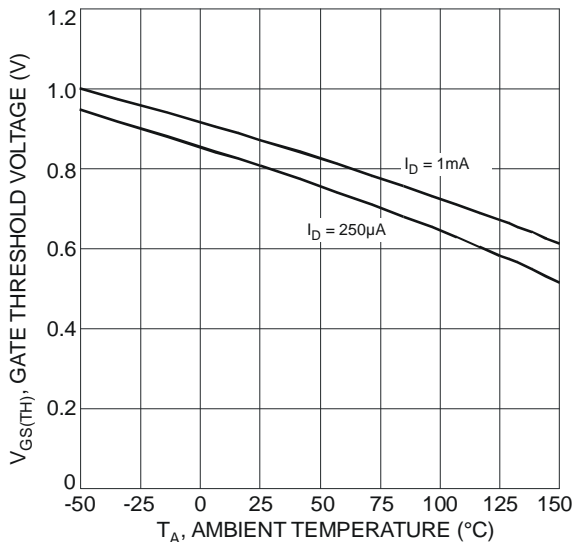


Figure 7 Gate Threshold Variation vs. Ambient Temperature

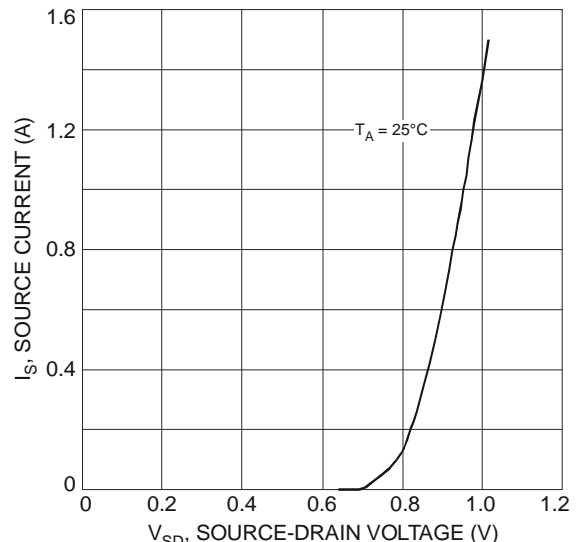
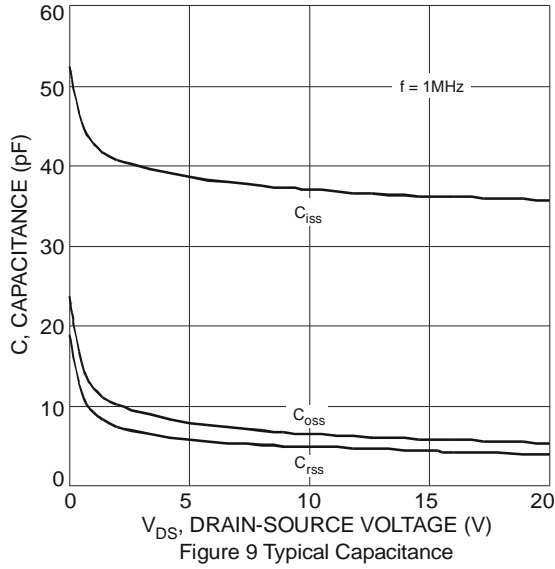
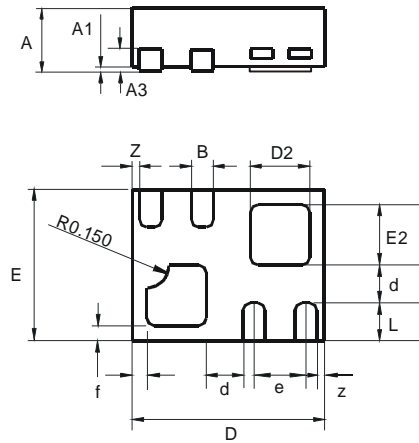


Figure 8 Diode Forward Voltage vs. Current

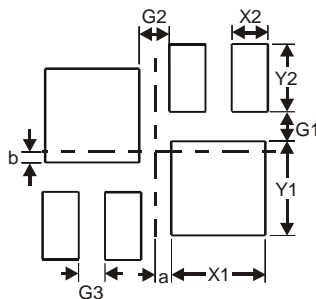


Package Outline Dimensions



X2-DFN1310-6			
Dim	Min	Max	Typ
A	—	0.40	—
A1	0	0.05	0.02
A3	—	—	0.13
b	0.10	0.20	0.15
D	1.25	1.38	1.30
d	—	—	0.25
D2	0.30	0.50	0.40
E	0.95	1.075	1.00
e	—	—	0.35
E2	0.30	0.50	0.40
f	—	—	0.10
L	0.20	0.30	0.25
Z	—	—	0.05
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
G1	0.16
G2	0.17
G3	0.15
X1	0.52
X2	0.20
Y1	0.52
Y2	0.375
a	0.09
b	0.06

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