

**DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**

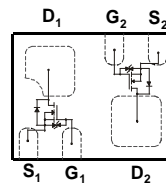
**Features**

- 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 <sup>(e4)</sup>

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<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GSS</sub>	±10	V
Drain Current per element (Note 5)	I <sub>D</sub>	Continuous	300
		Pulsed (Note 6)	350
			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>	400	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	231	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 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 (per element) (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 100μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	10	μA	V <sub>DS</sub> = 17V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±5	μA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (per element) (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.53	—	0.9	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 100μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	0.35	1.5	Ω	V <sub>GS</sub> = 4V, I <sub>D</sub> = 10mA
		—	0.4	1.7		V <sub>GS</sub> = 2.7V, I <sub>D</sub> = 200mA
		—	0.45	1.7		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 10mA
		—	0.55	3.5		V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 200mA
		—	0.65	3.5		V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 1mA
Forward Transfer Admittance	Y <sub>fs</sub>	40	—	—	mS	V <sub>DS</sub> = 3V, I <sub>D</sub> = 10mA

- Notes: 5. Device mounted on FR-4 PCB.  
6. Pulse width ≤10μs, Duty Cycle ≤1%.  
7. Short duration pulse test used to minimize self-heating effect.

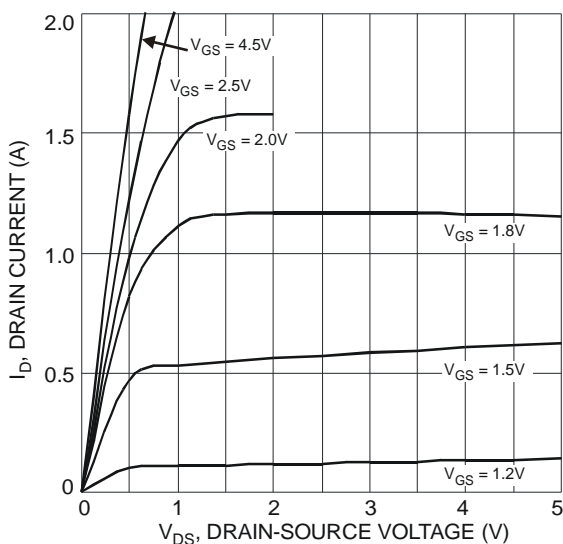


Figure 1 Typical Output Characteristics

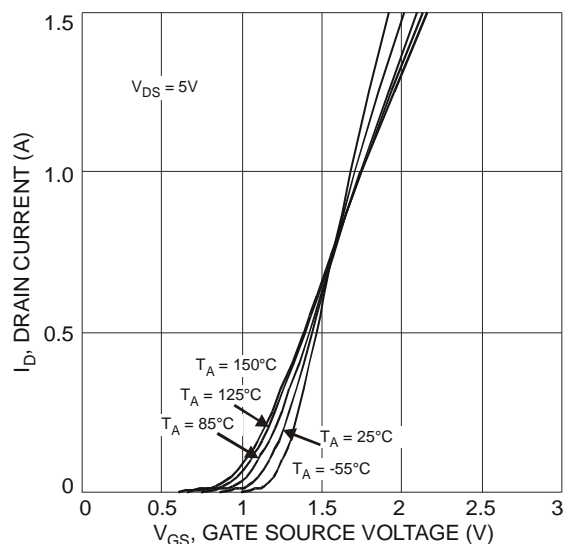


Figure 2 Typical Transfer Characteristics

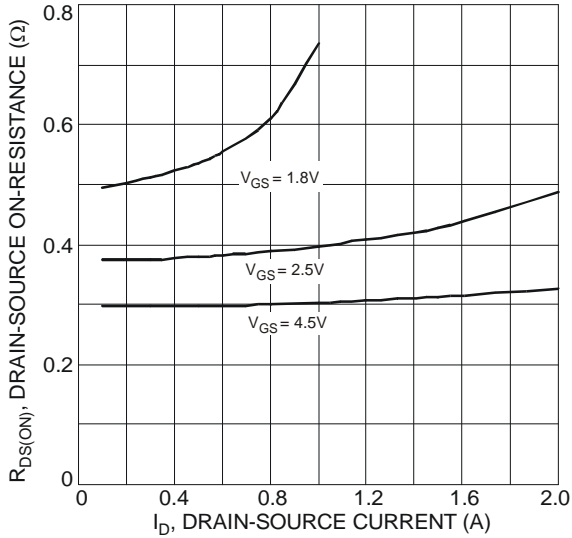


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

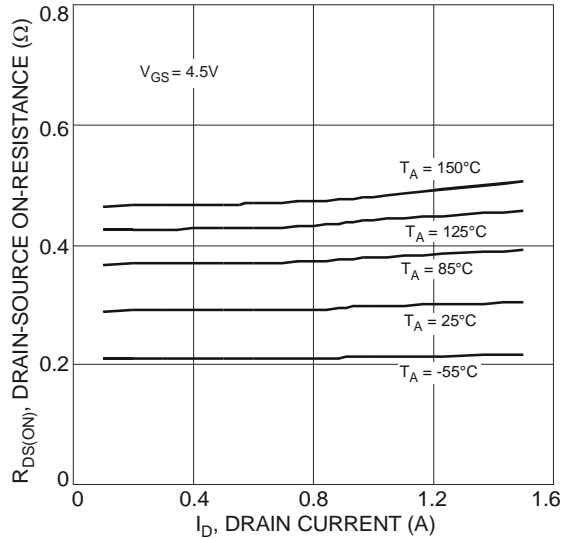


Figure 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

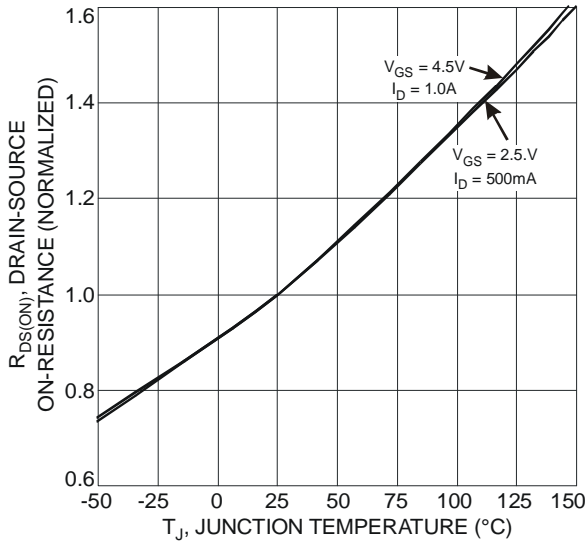


Figure 5 On-Resistance Variation with Temperature

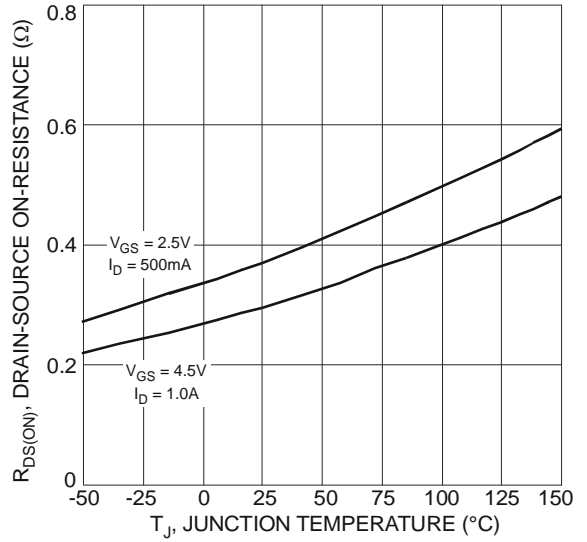


Figure 6 On-Resistance Variation with Temperature

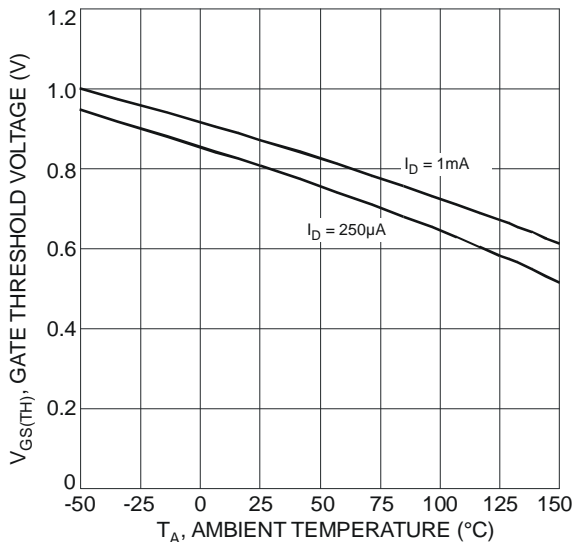


Figure 7 Gate Threshold Variation vs. Ambient Temperature

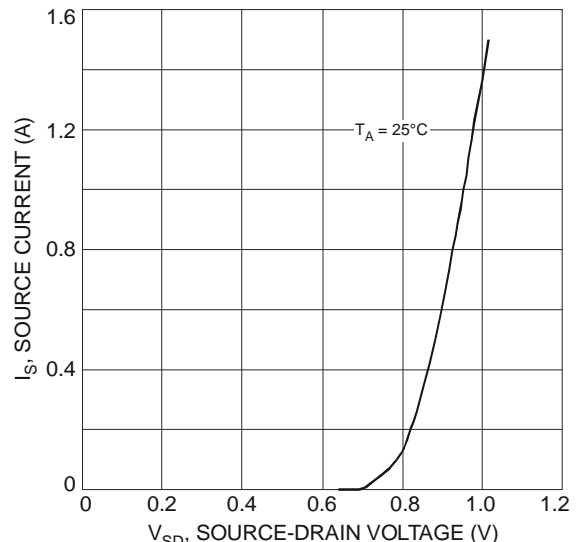
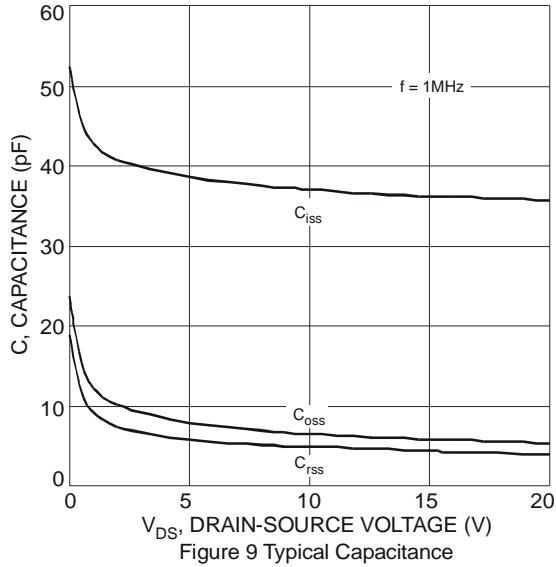
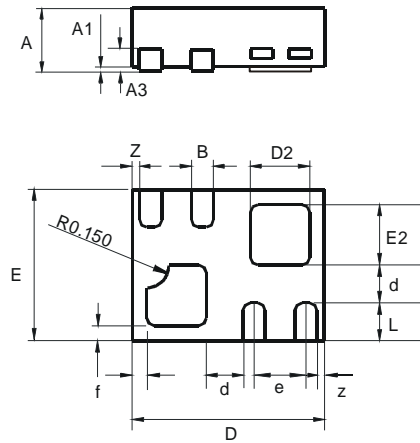


Figure 8 Diode Forward Voltage vs. Current

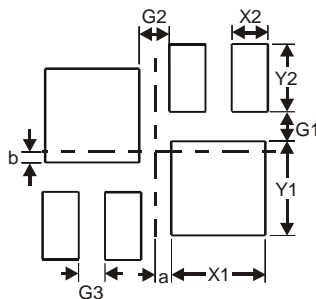


### Package Outline Dimensions



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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