Features

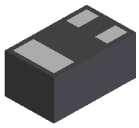
- Low On-Resistance
- Very Low Gate Threshold Voltage, 0.9V max
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface-Mount Package
- ESD Protected Gate
- Ultra Low Profile Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/104/200, 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

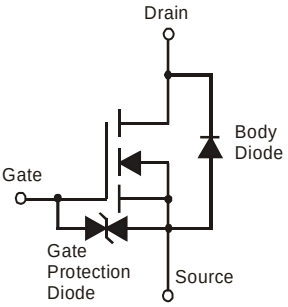
- Package: X2-DFN1006-3
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish — NiPdAu over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.001 grams (Approximate)



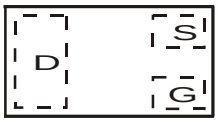
X2-DFN1006-3



Bottom View



Equivalent Circuit



Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DMN2005LP4K-7	X2-DFN1006-3	DN	7	8	3,000	Reel
DMN2005LP4K-7B	X2-DFN1006-3	DN	7	8	10,000	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/.

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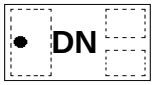
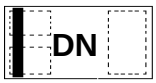
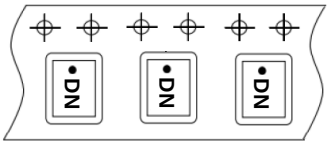
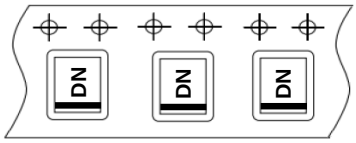
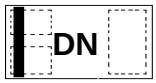
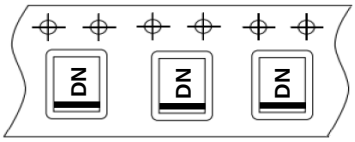
Marking Information

DMN2005LP4K-7	 Top View Dot Denotes Drain Side From date code 1527 (YYWW), this changes to:  Top View Bar Denotes Gate and Source Side  
DMN2005LP4K-7B	 Top View Bar Denotes Gate and Source Side DN or $\overline{DN}$ = Product Type Marking Code 

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Maximum Ratings (@T_A = +25°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)	Continuous Pulsed (Note 6)	I_D	300 350	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	400	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	280	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°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 = 100µA
Zero Gate Voltage Drain Current		I_{DSS}	—	—	10	µA	V_{DS} = 17V, V_{GS} = 0V
Gate-Source Leakage		I_{GSS}	—	—	±5	µA	V_{GS} = ±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 = 100µA
Static Drain-Source On-Resistance		$R_{DS(ON)}$	— — — — —	0.35 0.4 0.45 0.55 0.65	1.5 1.7 1.7 3.5 3.5	Ω	V_{GS} = 4V, I_D = 10mA V_{GS} = 2.7V, I_D = 200mA V_{GS} = 2.5V, I_D = 10mA V_{GS} = 1.8V, I_D = 200mA V_{GS} = 1.5V, I_D = 1mA
Forward Transfer Admittance		$\lvert Y_{fs} \rvert$	40	—	—	mS	V_{DS} = 3V, I_D = 10mA
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{iss}	—	37.1	—	pF	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance		C_{oss}	—	6.5	—	pF	
Reverse Transfer Capacitance		C_{rss}	—	4.8	—	pF	
Switching Time	Turn-On Time	t_{on}	—	4.06	—	ns	V_{DD} = 10V, R_l = 47Ω, V_{GEN} = 4.5V R_{GEN} = 10Ω
	Turn-Off Time	t_{off}	—	13.7	—		

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.

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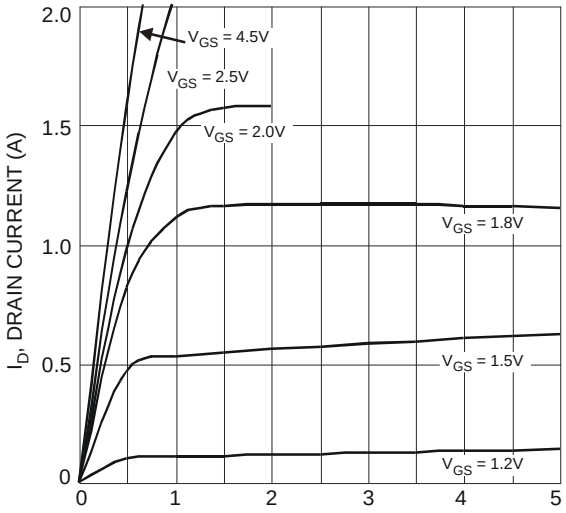

Fig. 1 Typical Output Characteristics

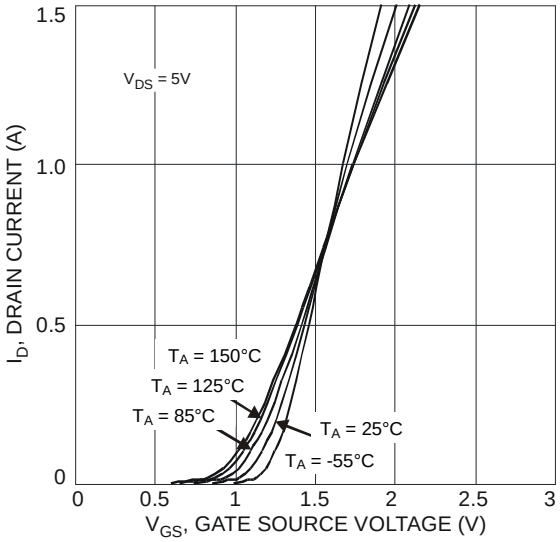

Fig. 2 Typical Transfer Characteristics

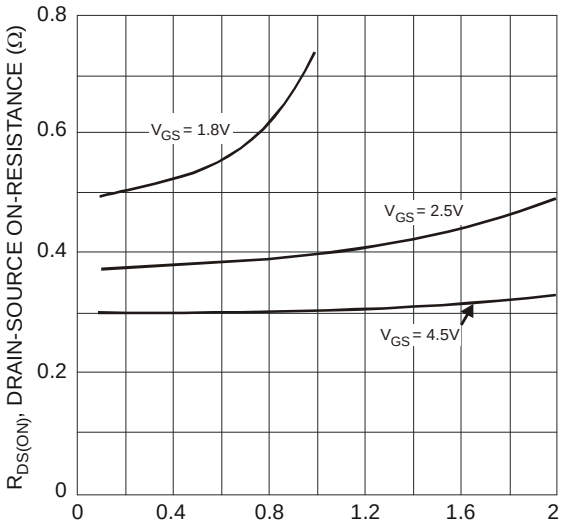

Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

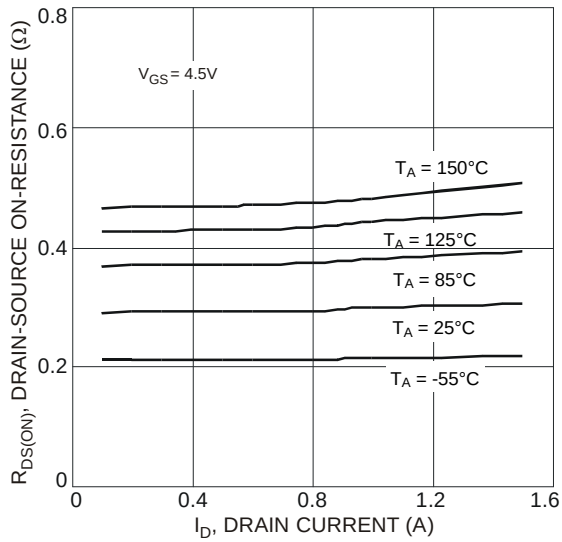

Fig. 4 Typical Drain-Source On-Resistance
vs. Drain Current and Temperature

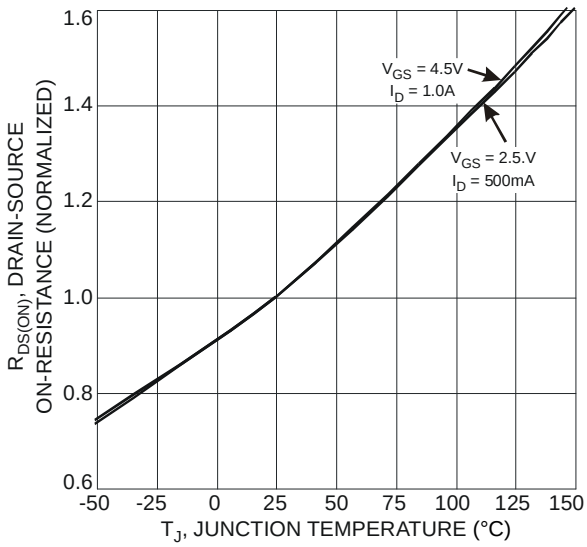

Fig. 5 On-Resistance Variation with Temperature

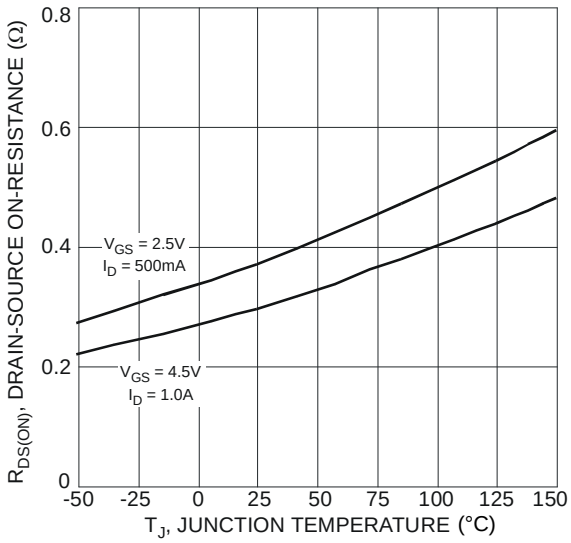

Fig. 6 On-Resistance Variation with Temperature

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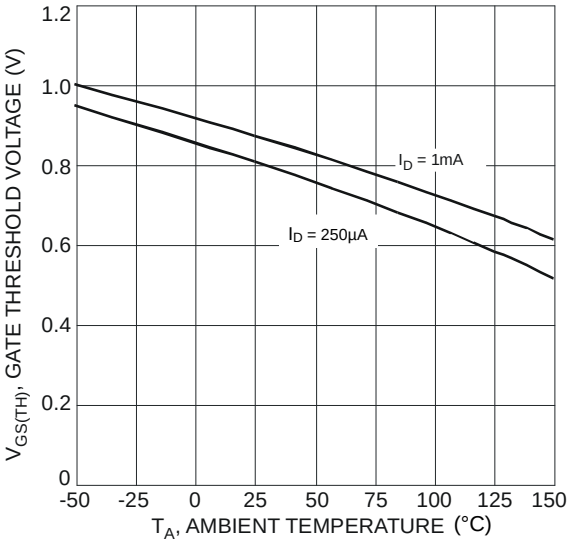

Fig. 7 Gate Threshold Variation vs. Ambient Temperature

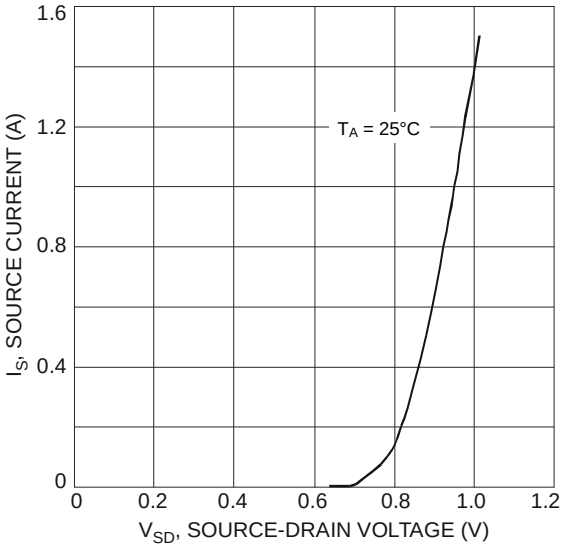

Fig. 8 Diode Forward Voltage vs. Current

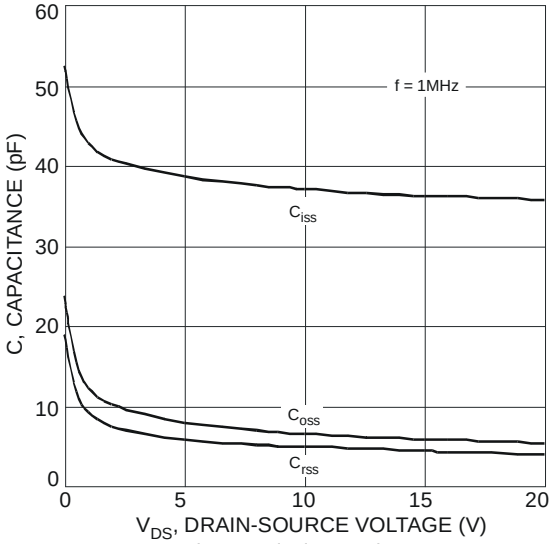

Fig. 9 Typical Capacitance

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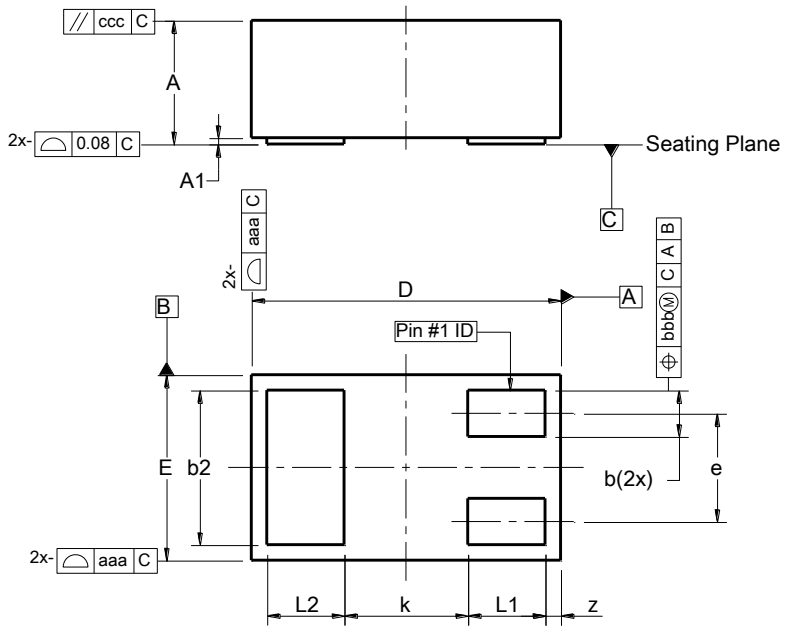
Package Outline Dimensions

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

X2-DFN1006-3

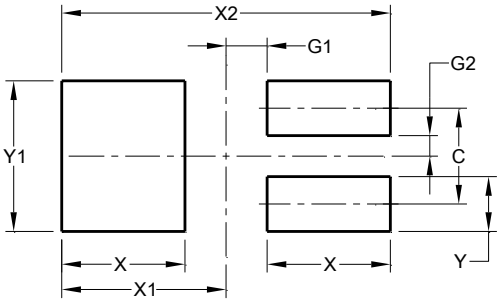


X2-DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	—	0.40	—
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.05	1.00
E	0.55	0.65	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
k	-	-	0.40
z	0.02	0.08	0.05
aaa	0.15		
bbb	0.05		
ccc	0.05		
All Dimensions in mm			

Suggested Pad Layout

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

X2-DFN1006-3



Dimensions	Value (in mm)
C	0.350
G1	0.150
G2	0.075
X	0.450
X1	0.600
X2	1.200
Y	0.200
Y1	0.550

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