Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D T_A = +25°C
25V	4Ω @ V_{GS} = 4.5V	0.32A
	5Ω @ V_{GS} = 2.7V	0.28A

Description

This 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.

Applications

- Load switch
- Portable applications
- Power Management Functions

Features

- 0.4mm ultra low profile package for thin application
- 0.48mm^2 package footprint, 16 times smaller than SOT23
- Low $V_{GS(th)}$, can be driven directly from a battery
- Low $R_{DS(on)}$
- ESD Protected Gate (>6kV Human Body Mode)
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

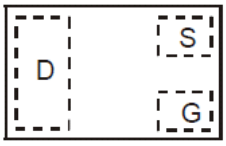
Mechanical Data

- Case: X2-DFN0806-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.00043 grams (approximate)

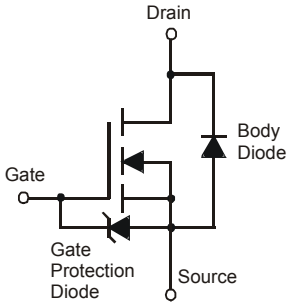
ESD HBM >6kV

X2-DFN0806-3

Bottom View



Top View
Package Pin Configuration



Equivalent Circuit

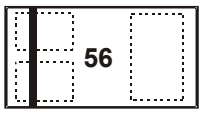
Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DMN25D0UFA-7B	Standard	X2-DFN0806-3	10,000/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/quality/lead_free.html 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/products/packages.html.

Marking Information

DMN25D0UFA-7B



56 = Product Type Marking Code

Top View
Bar Denotes Gate and Source Side

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	25	V
Gate-Source Voltage		V_{GSS}	8	
Continuous Drain Current, V_{GS} = 4.5V	(Note 6)	I_D	0.32	A
	T_A = +70°C (Note 6)		0.25	
	(Note 5)	I_D	0.24	A
Pulsed Drain Current	(Note 7)	I_{DM}	1.2	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	0.63	W
	(Note 5)		0.28	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	201	°C/W
	(Note 5)		338	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	25	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	100	nA	V_{GS} = 8V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.6	—	1.2	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	—	4	Ω	V_{GS} = 4.5V, I_D = 0.4A
		—	—	5		V_{GS} = 2.7V, I_D = 0.2A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	1	-	S	V_{DS} = 5V, I_D = 0.4A
Diode Forward Voltage	V_{SD}	—	0.76	1.2	V	V_{GS} = 0V, I_S = 0.29A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	27.9	—	pF	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	6.1	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	2	—	pF	
Gate Resistance	R_g	—	26.4	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	—	0.36	—	nC	V_{DS} = 5V, V_{GS} = 4.5V, I_D = 0.2A
Gate-Source Charge	Q_{gs}	—	0.06	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.04	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	2.9	—	ns	V_{DS} = 6V, V_{GS} = 4.5V, I_D = 0.5A, R_G = 50Ω
Turn-On Rise Time	t_r	—	1.8	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	6.6	—	ns	
Turn-Off Fall Time	t_f	—	2.3	—	ns	

Notes:
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
7 .Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

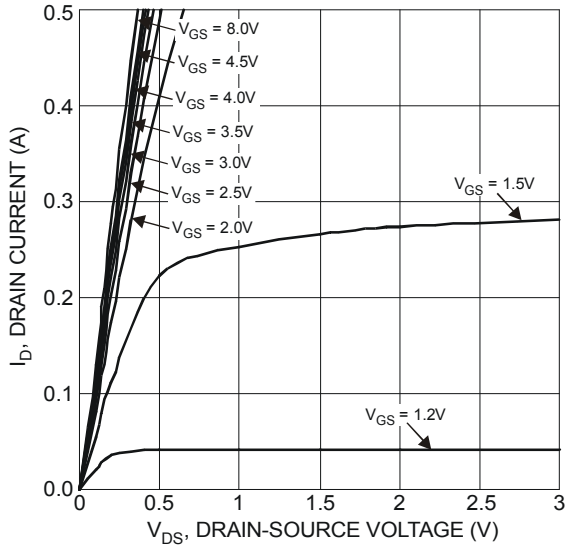


Figure 1 Typical Output Characteristics

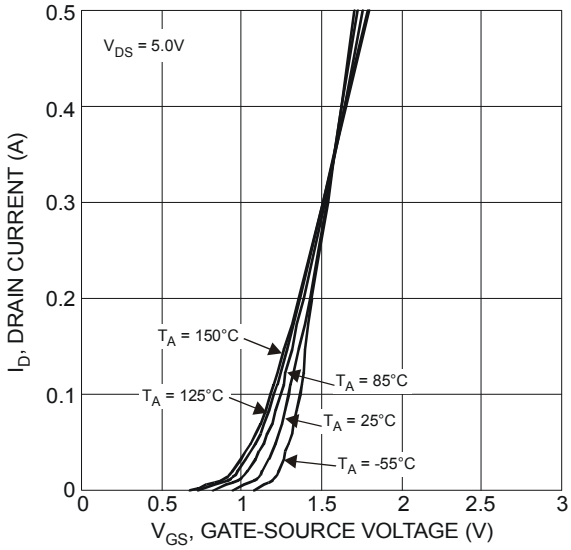


Figure 2 Typical Transfer Characteristics

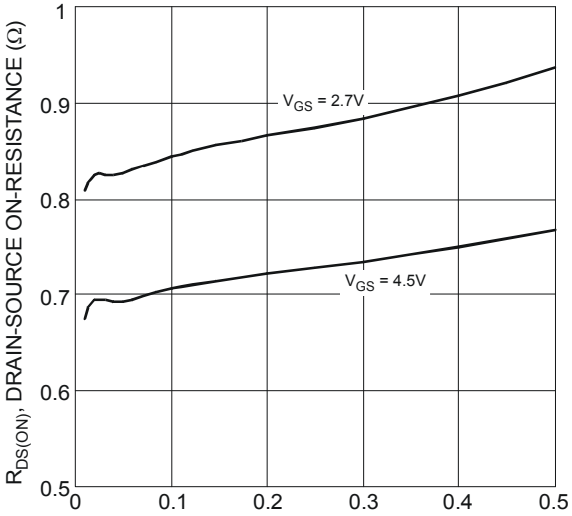


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

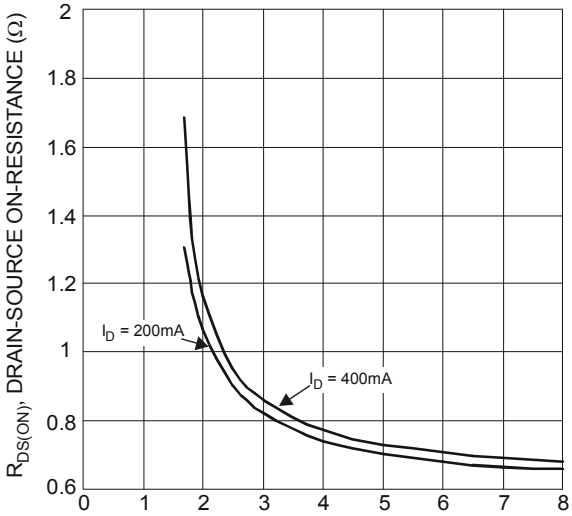


Figure 4 Typical Transfer Characteristics

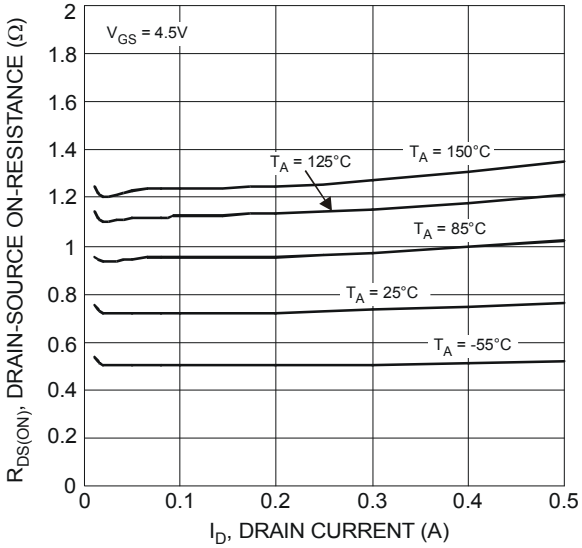


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

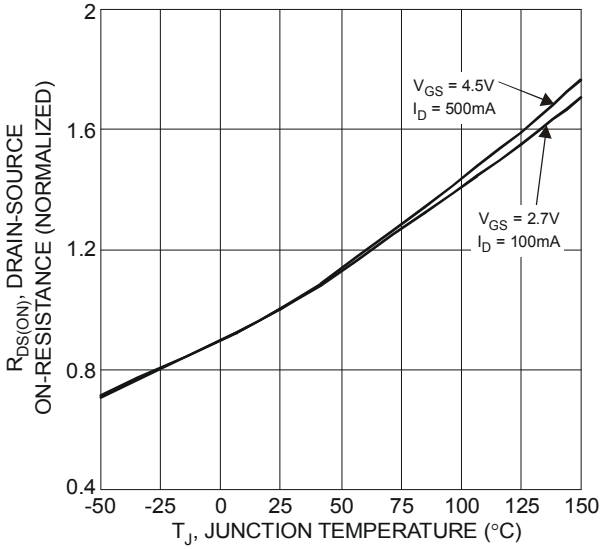


Figure 6 On-Resistance Variation with Temperature

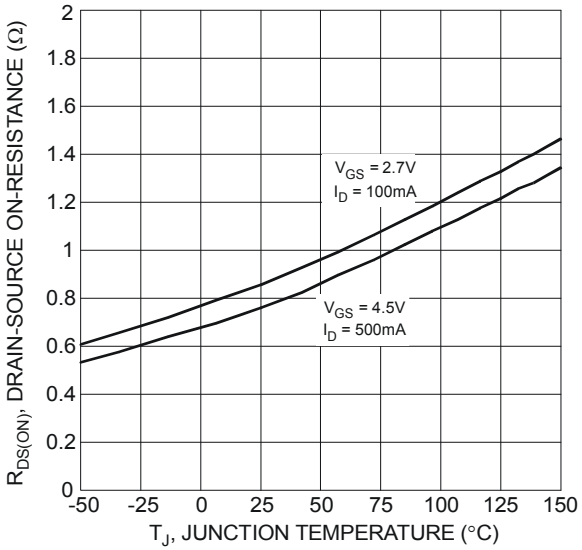


Figure 7 On-Resistance Variation with Temperature

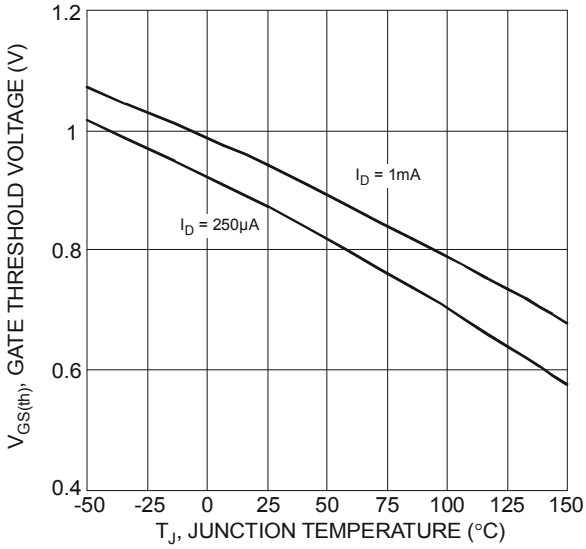


Figure 8 Gate Threshold Variation vs. Ambient Temperature

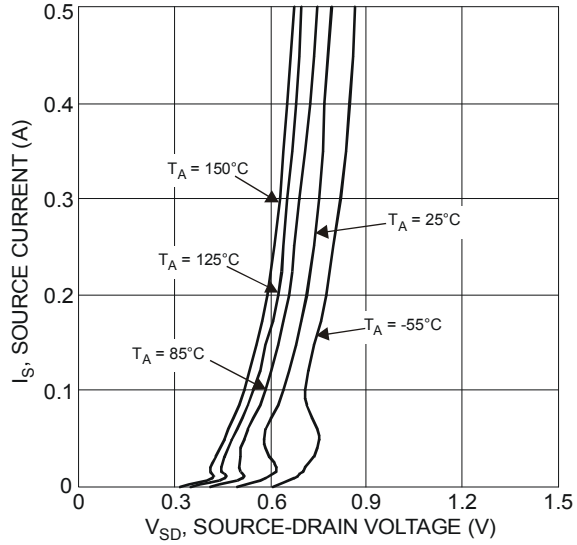


Figure 9 Diode Forward Voltage vs. Current

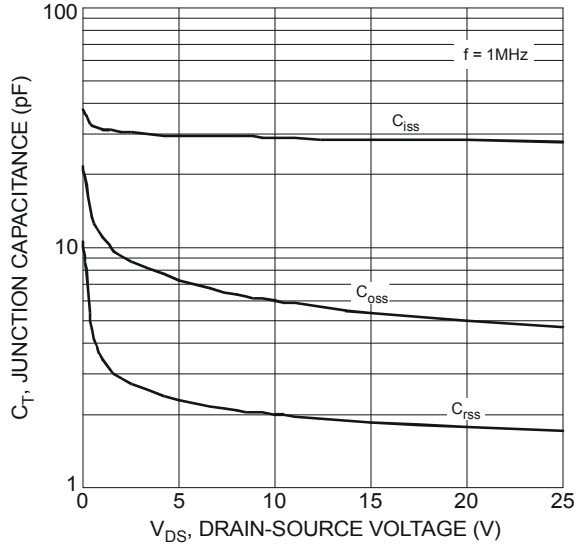


Figure 10 Typical Junction Capacitance

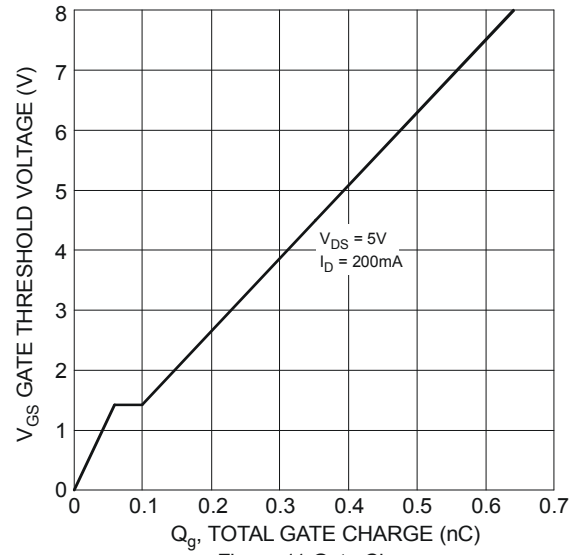


Figure 11 Gate Charge

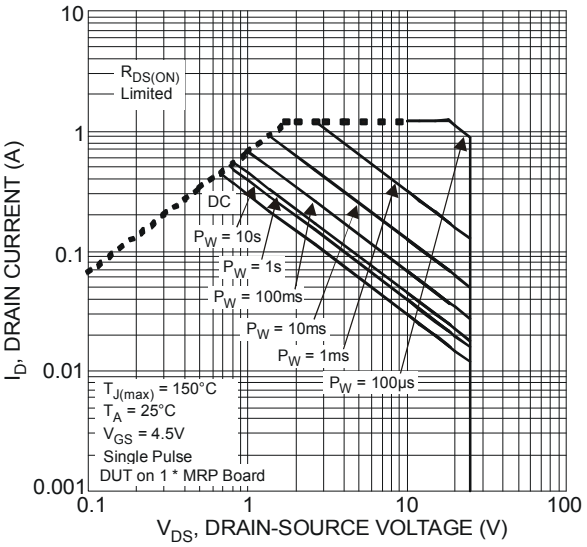


Figure 12 SOA, Safe Operation Area

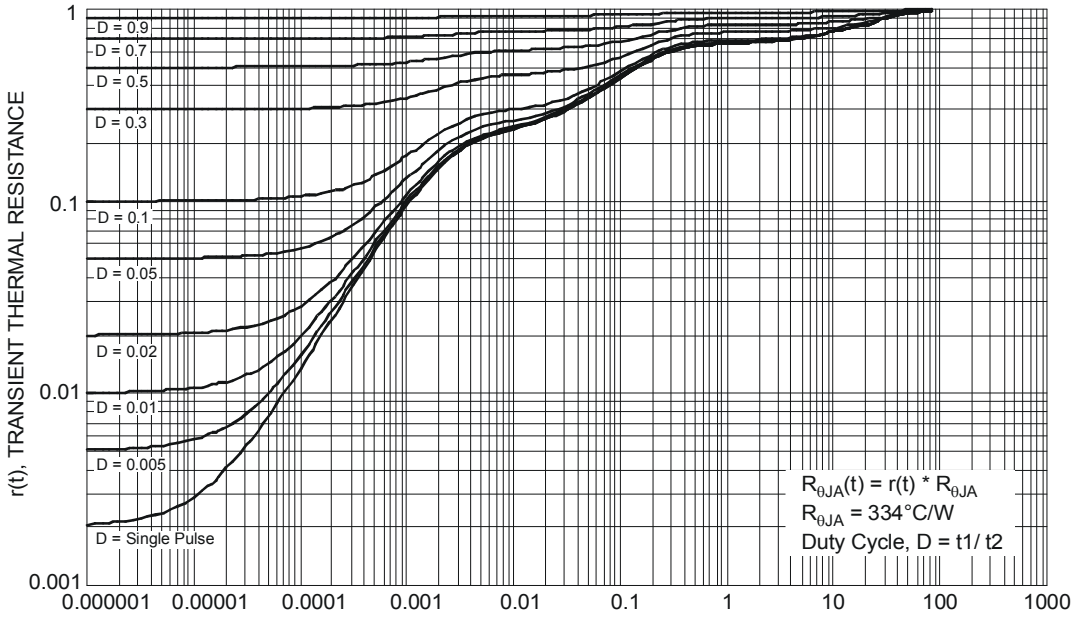
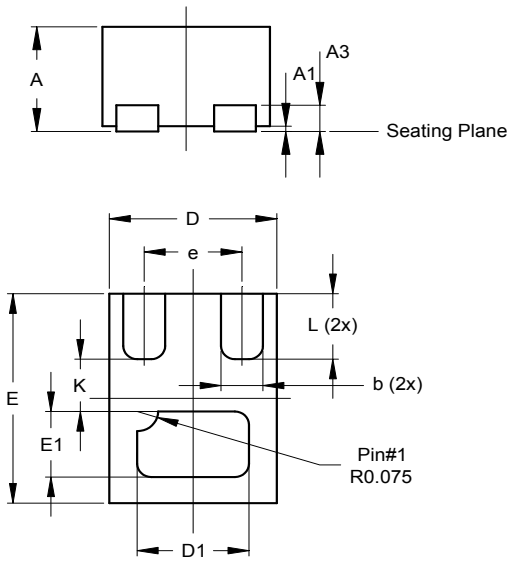


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

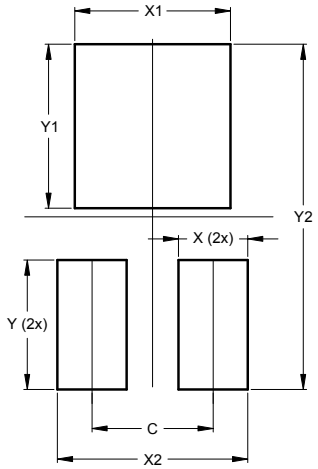
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



X2-DFN0806-3			
Dim	**Min**	**Max**	**Typ**
A	0.375	0.40	0.39
A1	0	0.05	0.02
A3	-	-	0.10
b	0.10	0.20	0.15
D	0.55	0.65	0.60
D1	0.35	0.45	0.40
E	0.75	0.85	0.80
E1	0.20	0.30	0.25
e	-	-	0.35
K	-	-	0.20
L	0.20	0.30	0.25
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	0.350
X	0.200
X1	0.450
X2	0.550
Y	0.375
Y1	0.475
Y2	1.000