

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = 25^\circ C$
60V	3.0 Ω @ $V_{GS} = 10V$	400mA
	4.0 Ω @ $V_{GS} = 5V$	330mA

Description and Applications

These N-Channel enhancement mode field effect transistors are produced using DIODES proprietary, high density, uses advanced trench technology. These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance. These products are particularly suited for low voltage, low current applications such as small

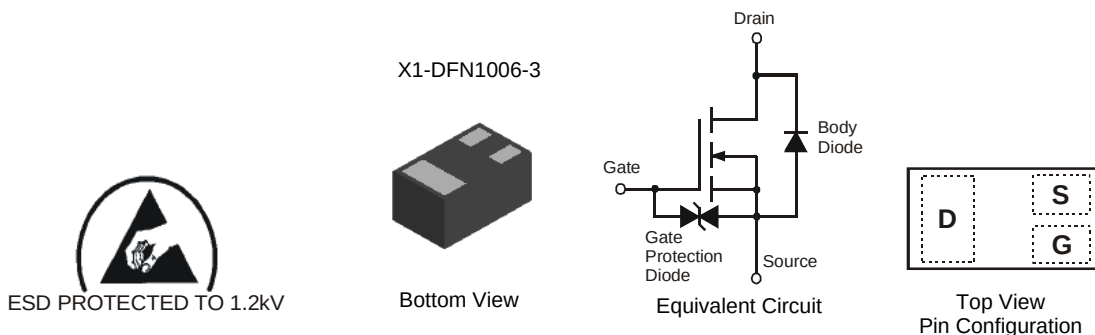
- Load switching

Features and Benefits

- N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- **ESD Protected Gate, 1.2kV HBM**
- **Lead, Halogen and Antimony Free, RoHS Compliant**
- "Green" Device (Notes 1 and 2)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: X1-DFN1006-3
- 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 over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.001 grams (approximate)

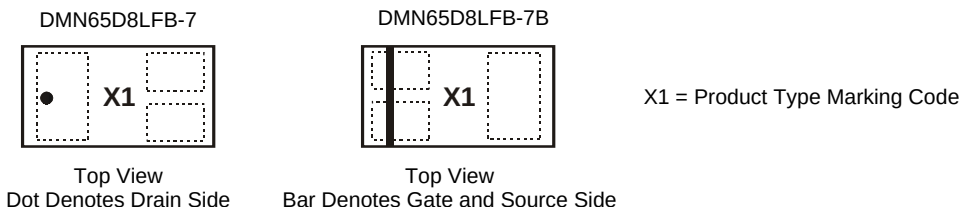


Ordering Information (Note 3)

Part Number	Case	Packaging
DMN65D8LFB-7	X1-DFN1006-3	3,000/Tape & Reel
DMN65D8LFB-7B	X1-DFN1006-3	10,000/Tape & Reel

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
 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



ate Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 4) $V_{GS} = 10V$	Steady State	$T_A = 25^\circ C$	I_D	260	mA
		$T_A = 70^\circ C$		210	
Continuous Drain Current (Note 5) $V_{GS} = 10V$	Steady State	$T_A = 25^\circ C$	I_D	400	mA
		$T_A = 70^\circ C$		310	

Thermal Characteristics

Characteristic	Symbol	Value	Units
Power Dissipation, @ $T_A = 25^\circ C$ (Note 4)	P_D	430	mW
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ C$ (Note 4)	$R_{\theta JA}$	290	$^\circ C/W$
Power Dissipation, @ $T_A = 25^\circ C$ (Note 5)	P_D	840	mW
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ C$ (Note 5)	$R_{\theta JSA}$	147	$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current $T_J = 25^\circ C$	I_{DSS}	-	-	0.1	μA	$V_{DS} = 60V, V_{GS} = 0V$
Gate-Body Leakage	I_{GSS}	-	-	± 10	μA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	1.2	-	2.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Static Drain-Source On-Resistance	$R_{DS(on)}$	-	-	3.0 4.0	Ω	$V_{GS} = 10V, I_D = 0.115A$ $V_{GS} = 5V, I_D = 0.1115A$
Forward Transfer Admittance	$ Y_{fs} $	80	320	-	mS	$V_{DS} = 10V, I_D = 0.115A$
Diode Forward Voltage	V_{SD}	-	0.7	1.2	V	$V_{GS} = 0V, I_S = 0.115A$
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	-	25	-	pF	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$
Output Capacitance	C_{oss}	-	4.7	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	2.5	-	pF	
Turn-On Delay Time	$t_{D(on)}$	-	3.27	-	ns	$V_{DD} = 30V, V_{GEN} = 10V,$ $R_{GEN} = 25\Omega, I_D = 0.115A$
Turn-On Rise Time	t_r	-	3.15	-	ns	
Turn-Off Delay Time	$t_{D(off)}$	-	12.025	-	ns	
Turn-Off Fall Time	t_f	-	6.29	-	ns	

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

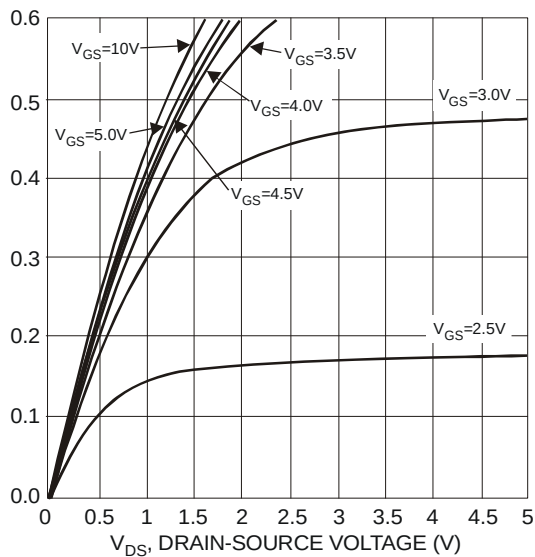


Fig. 1 Typical Output Characteristics

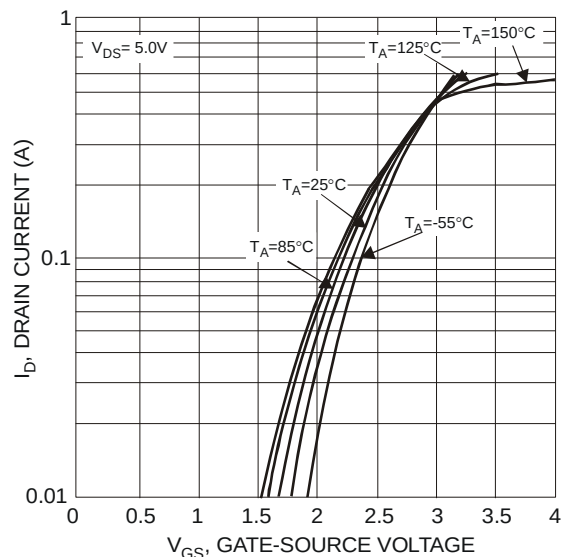


Fig. 2 Typical Transfer Characteristics

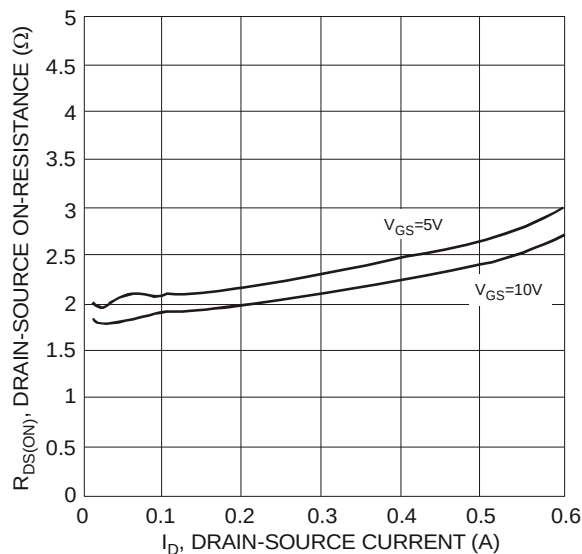


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Charge

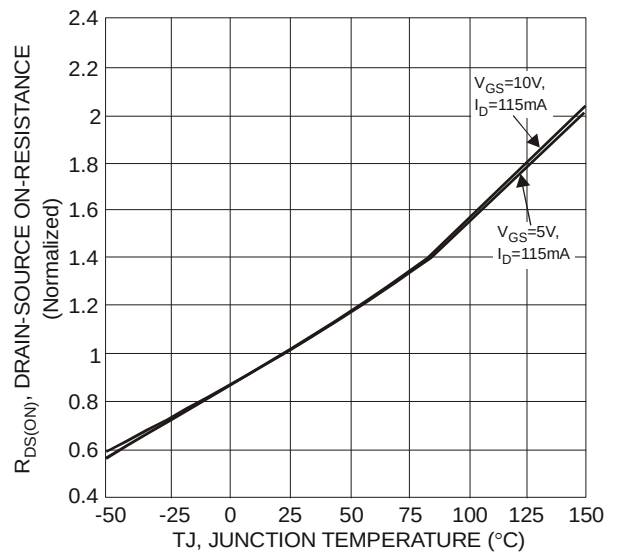


Fig. 4 On-Resistance Variation with Temperature

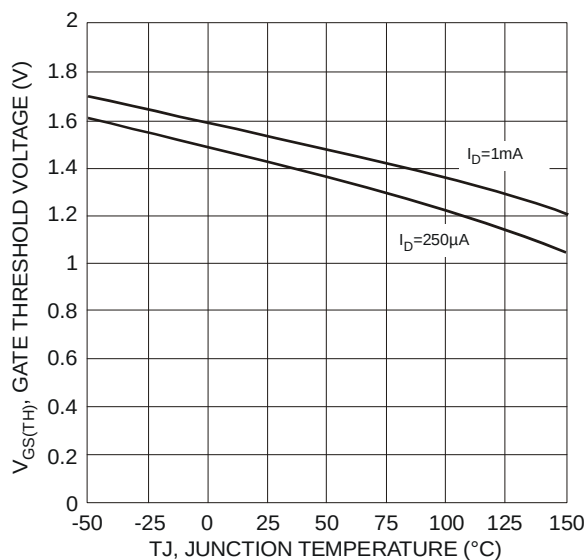


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

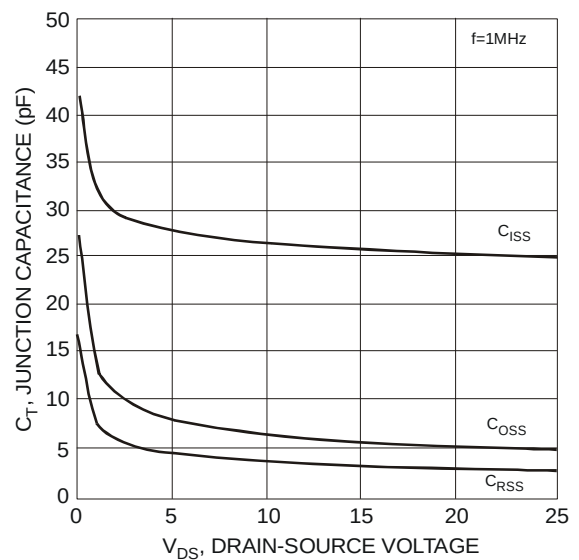


Fig. 6 Typical Junction Capacitance

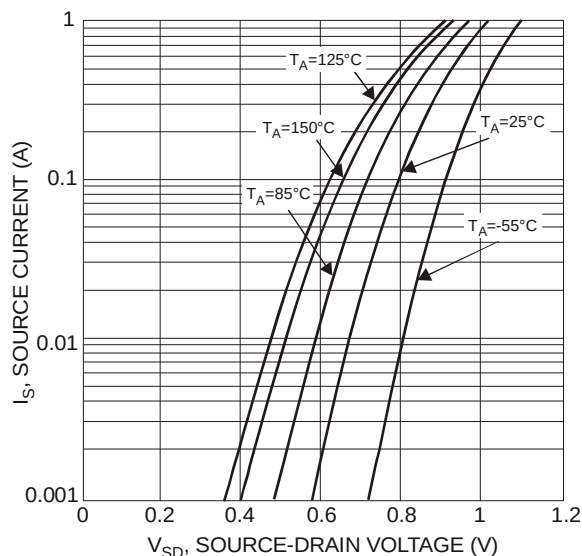
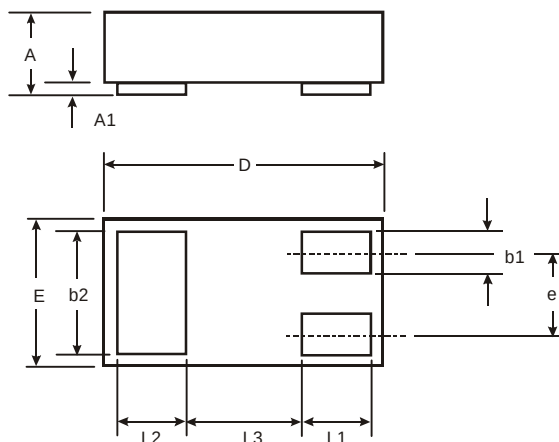


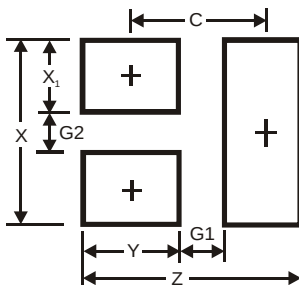
Fig. 7 Diode Forward Voltage vs. Current

Package Outline Dimensions



X1-DFN1006-3			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.03
b1	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	—	—	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	—	—	0.40
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	1.1
G1	0.3
G2	0.2
X	0.7
X1	0.25
Y	0.4
C	0.7

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