



DMN6069SFG

60V N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI[®]

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C		
	50mΩ @ V _{GS} = 10V	18A		
60V	$63m\Omega$ @ $V_{GS} = 4.5V$	16A		

Features and Benefits

- Low R_{DS(ON)} Ensures On-State Losses are Minimized
- Small Form Factor Thermally Efficient Package Enables Higher **Density End Products**
- Occupies Just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- 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

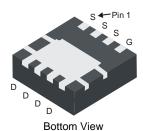
Description and Applications

This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

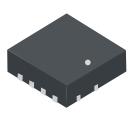
- Backlighting
- **Power Management Functions**
- **DC-DC Converters**

Mechanical Data

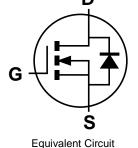
- Case: POWERDI®3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.03 grams (Approximate)







Top View



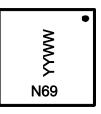
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN6069SFG-7	POWERDI3333-8	2,000/Tape & Reel
DMN6069SFG-13	POWERDI3333-8	3,000/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



N69 = Product Type Marking Code YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 15 = 2015) WW = Week Code (01 to 53)



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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V _{DSS}	60	V		
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Dusin Courset (Nata C) // 401/	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	5.6 4.5	А
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	$T_C = +25$ °C $T_C = +70$ °C	I _D	18 14.5	А
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%	I _{DM}	25	Α		
Maximum Continuous Body Diode Forward Current (Is	2.5	Α		
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	12	Α
Repetitive Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	7.2	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)		P_{D}	0.93	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	C	134	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	82	
Total Power Dissipation (Note 6)		P_{D}	2.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	_	53	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	33	
Thermal Resistance, Junction to Case		$R_{ heta JC}$	5	
Operating and Storage Temperature Range		$T_{J_i} T_{STG}$	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

^{6.} Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

^{7.} I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.



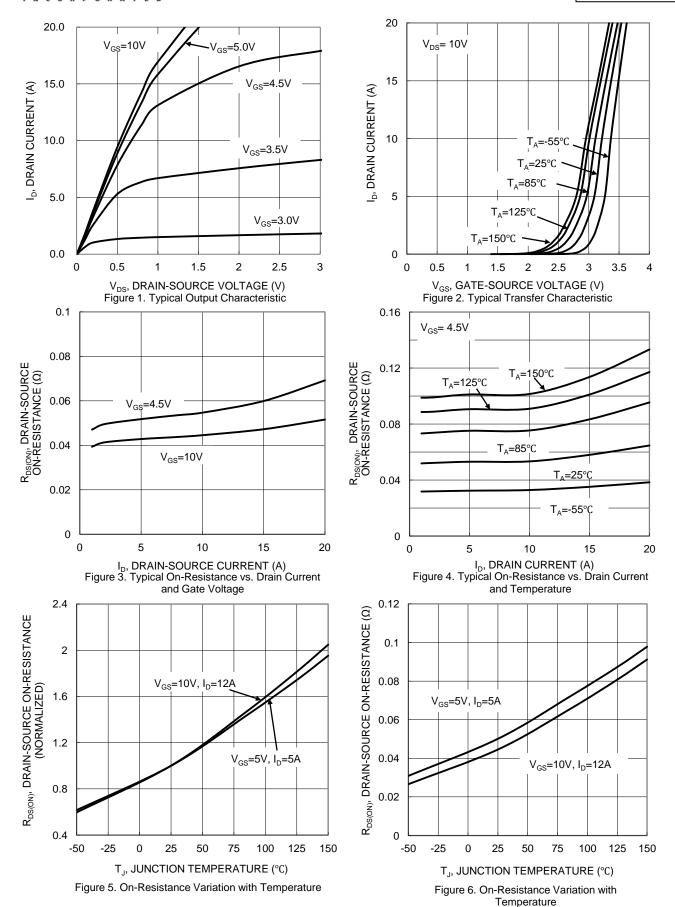
Electrical Characteristics (T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	60	_	_	V	$V_{GS} = 0V$, $I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	1	μΑ	$V_{DS} = 60V$, $V_{GS} = 0V$	
Zero Gate Voltage Drain Current T _J = +150°C (Note 9)	I _{DSS}	_	_	100	μΑ	$V_{DS} = 60V$, $V_{GS} = 0V$	
Gate-Source Leakage	I_{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(TH)}	1	_	3	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	39	50	mΩ	$V_{GS} = 10V, I_D = 4.5A$	
Static Brain Gource on Resistance	NDS(ON)	_	47	63	11132	$V_{GS} = 4.5V, I_D = 3A$	
Diode Forward Voltage	V _{SD}	_	_	1.1	V	$V_{GS} = 0V, I_S = 2.5A$	
On State Drain Current (Note 9)	I _{D(ON)}	20	_	_	Α	$V_{DS} \ge 5V$, $V_{GS} = 10V$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}		740	1,480	pF), oo, , , o, ,	
Output Capacitance	Coss	1	40	80	pF	$V_{DS} = 30V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	-	28	55	pF	1 = 1.0MHZ	
Gate Resistance	R_g		2.2	4	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Q_g	1	6.4	12	nC		
Total Gate Charge (V _{GS} = 10V)	Q_g		14	25	nC	V _{DS} = 30V, I _D = 12A	
Gate-Source Charge	Q_gs		2.8	5.5	nC	VDS = 30V, ID = 12A	
Gate-Drain Charge	Q_{gd}		2.3	5	nC		
Turn-On Delay Time	t _{D(ON)}		3.6	10	nS		
Turn-On Rise Time	t _R		5.0	10	nS	$V_{DS} = 30V, I_D = 12A$ $V_{GS} = 10V, R_G = 6.0\Omega$	
Turn-Off Delay Time	t _{D(OFF)}	1	12	24	nS		
Turn-Off Fall Time	t _F	_	3.3	10	nS		
Body Diode Reverse Recovery Time	t _{RR}	1	11	22	nS	1 4 5 A di/dt 100 A / 10	
Body Diode Reverse Recovery Charge	Q_{RR}	_	5.1	10	nC	$I_F = 4.5A$, di/dt = 100A/ μ s	

Notes:

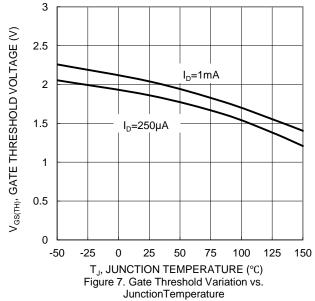
Short duration pulse test used to minimize self-heating effect.
Guaranteed by design. Not subject to product testing.

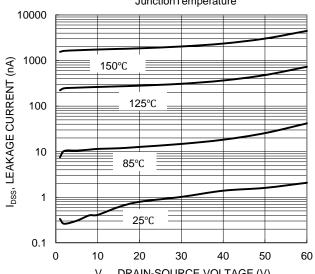


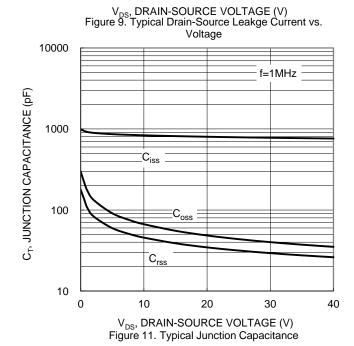


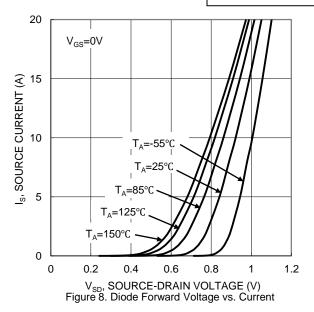


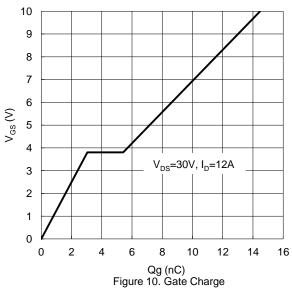


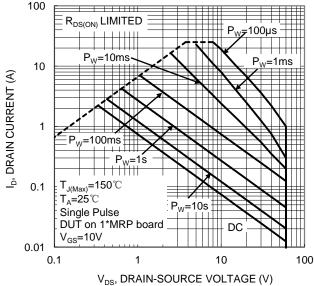




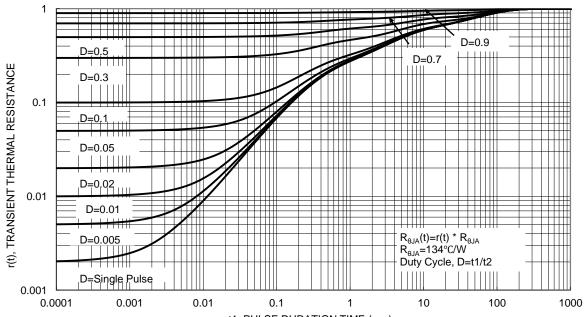












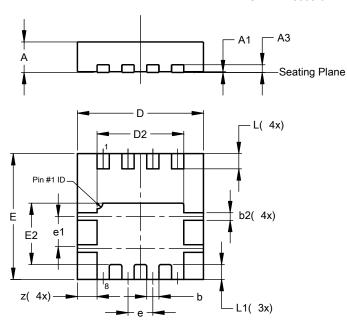
t1, PULSE DURATION TIME (sec) Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

POWERDI3333-8

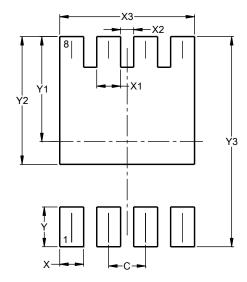


POWERDI3333-8					
Dim	Min	Max	Тур		
Α	0.75	0.85	0.80		
A1	0.00	0.05	0.02		
A3	-	-	0.203		
b	0.27	0.37	0.32		
b2	_	_	0.20		
D	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
Е	3.25	3.35	3.30		
E2	1.56	1.66	1.61		
e	1	-	0.65		
e1	0.79	0.89	0.84		
L	0.35	0.45	0.40		
1	_	_	0.39		
Z	_	_	0.515		
All Dimensions in mm					

Suggested Pad Layout

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

POWERDI3333-8



Dimensions	Value (in mm)
C	0.650
Х	0.420
X1	0.420
X2	0.230
Х3	2.370
Υ	0.700
Y1	1.850
Y2	2.250
V3	2 700



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