



N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)}	I _D T _A = 25°C
201/	18.6mΩ @ V _{GS} = 10V	8.0A
30V	26.5mΩ @ V _{GS} = 4.5V	6.5A

Description

This new generation MOSFET has been designed to minimize the onstate resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

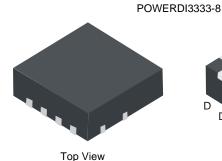
- Backlighting
- DC-DC Converters
- Power management functions

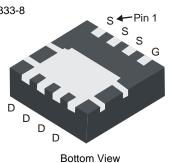
Features

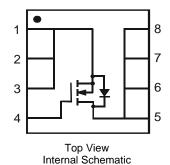
- Low R_{DS(ON)} ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product
- 100% UIS (Avalanche) rated
- 100% Ra tested
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: POWERDI3333-8
- 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 Below
- Terminals: Finish Matte Tin annealed over Copper leadframe.
 Solderable per MIL-STD-202, Method 208 63
- Weight: 0.072 grams (approximate)







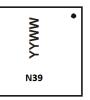
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3029LFG-7	POWERDI3333-8	2000 / Tape & Reel
DMN3029LFG-13	POWERDI3333-8	3000 / Tape & Reel

Notes:

- 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 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



N39 = Product marking code YYWW = Date code marking YY = Last digit of year (ex: 10 for 2010) WW = Week code (01 – 53)



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

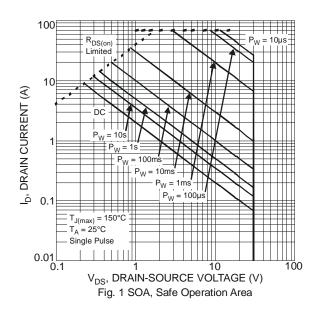
Characteri	Symbol	Value	Unit		
Drain-Source Voltage	V _{DSS}	30	V		
Gate-Source Voltage	V _{GSS}	±25	V		
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	5.3 4.2	А
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I _D	8.0 6.3	А
Continuous Drain Current (Note 6) V _{GS} = 10V	t ≤ 10s	$T_A = +25$ °C $T_A = +70$ °C	I _D	9.5 7.7	А
Continuous Drain Current (Note 6) V _{GS} = 4.5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	6.5 4.9	А
Continuous Drain Current (Note 6) V _{GS} = 4.5V	t ≤ 10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	7.8 6.2	А
Pulsed Drain Current (Note 7)	I _{DM}	70	Α		
Avalanche Current (Notes 7 & 8)	I _{AR}	18	Α		
Repetitive Avalanche Energy (Notes 7 & 8) L = 0.1mH			E _{AR}	16	mJ

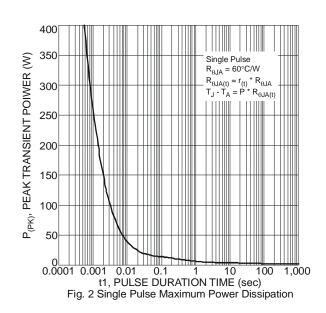
Thermal Characteristics

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P _D	1.0	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5)	R _{0JA}	130.6	°C/W
Power Dissipation (Note 6)	P _D	2.07	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 6)	R _{0JA}	62.5	°C/W
Power Dissipation (Note 6) t ≤ 10s	P _D	3.0	W
Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 6) t ≤ 10s	R _{0JA}	43.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

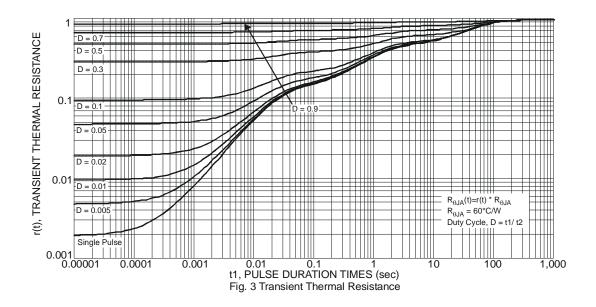
Notes:

- 5. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
- 6. Device mounted on 2" x 2" FR-4 PCB with high coverage 2 oz. Copper, single sided.
- 7. Repetitive rating, pulse width limited by junction temperature. 8. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep $T_J = +25^{\circ}C$.









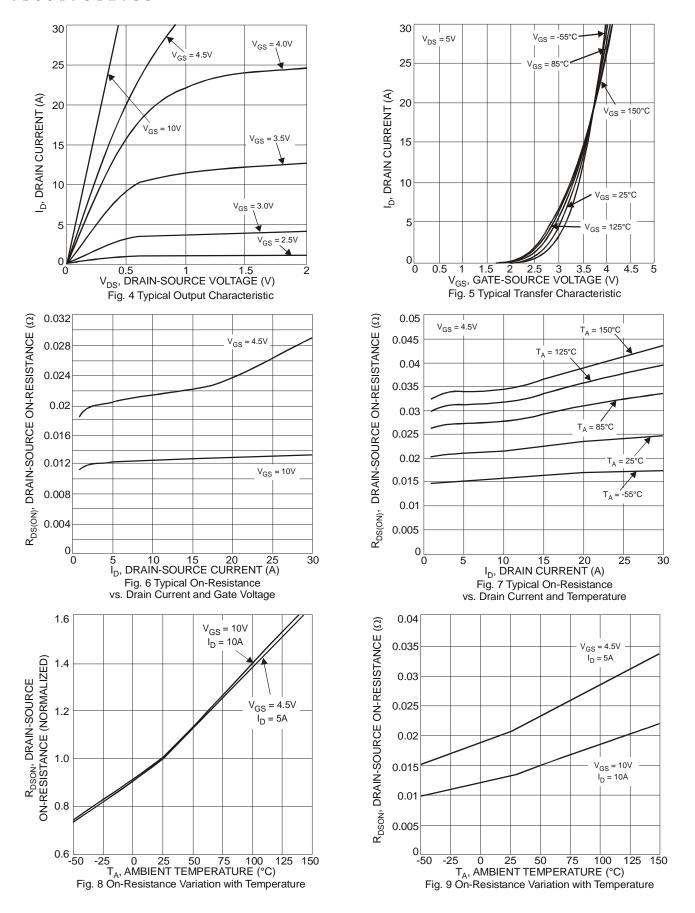
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 9)	Symbol	IVIIII	тур	IVIAX	Ollit	Test Condition	
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	_	0.1	μА	$V_{DS} = 30V, V_{GS} = 0V$	
Gate-Source Leakage		_	_	±100	nA	$V_{GS} = \pm 25V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 9)	I _{GSS}			1100	ША	VGS - ±23V, VDS - 0V	
Gate Threshold Voltage	V _{GS(th)}	0.9	1.2	1.8	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
	* GS(III)	-	13,5	18.6		V _{GS} = 10V, I _D = 10A	
Static Drain-Source On-Resistance	R _{DS (ON)}	-	22	26.5	$m\Omega$	$V_{GS} = 4.5V, I_D = 7.5A$	
Forward Transfer Admittance	Y _{fs}	-	13.0	-	S	V _{DS} = 5V, I _D = 10A	
Diode Forward Voltage	V _{SD}	-	0.7	1.0	V	$V_{GS} = 0V, I_{S} = 1A$	
DYNAMIC CHARACTERISTICS (Note 10)	•	l .					
Input Capacitance	Ciss	-	580	-			
Output Capacitance	Coss			-	pF	$V_{DS} = 15V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	-	70	-		I = 1.0IVIH2	
Gate Resistance	Rq	-	2.0	3.0	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge V _{GS} = 4.5V	Q_g	-	5.3	-		$V_{GS} = 4.5V, V_{DS} = 15V, I_D = 10A$	
Total Gate Charge V _{GS} = 10V	Qg	-	11.3	-	~C		
Gate-Source Charge	Q_{gs}	-	1.9	-	nC	$V_{GS} = 10V, V_{DS} = 15V,$	
Gate-Drain Charge	Q _{ad}	-	1.9	-		$I_D = 10A$	
Turn-On Delay Time	t _{D(on)}	-	4.4	-	ns	V _{GS} = 10V, V _{DS} = 15V,	
Turn-On Rise Time	t _r	-	4.6	-	ns		
Turn-Off Delay Time	t _{D(off)}	-	19.5	-	ns	$R_L = 15\Omega$, $R_G = 6\Omega$	
Turn-Off Fall Time	t _f	-	5.8	-	ns		

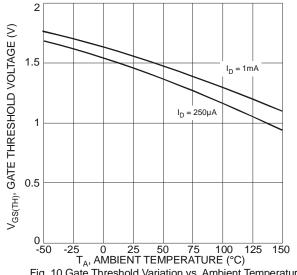
Notes:

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

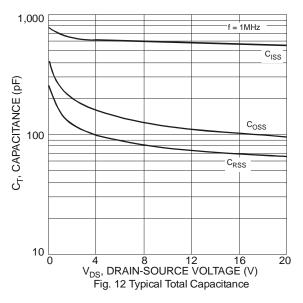


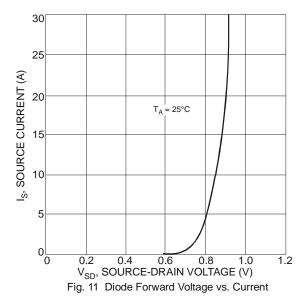


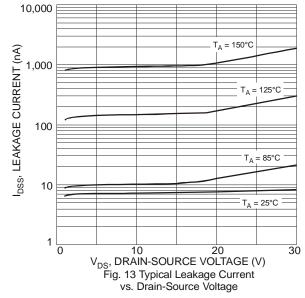








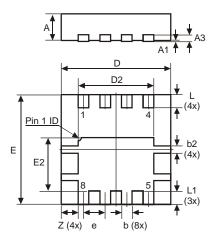






Package Outline Dimensions

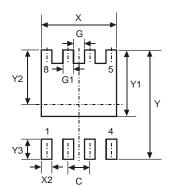
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI3333-8					
Dim	Min	Max	Тур		
D	3.25	3.35	3.30		
E	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
E2	1.56	1.66	1.61		
Α	0.75	0.85	0.80		
A1	0	0.05	0.02		
A3	_	_	0.203		
b	0.27	0.37	0.32		
b2	_	_	0.20		
L	0.35	0.45	0.40		
L1	_	_	0.39		
е	_	_	0.65		
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.



Dimensions	Value (in mm)			
С	0.650			
G	0.230			
G1	0.420			
Y	3.700			
Y1	2.250			
Y2	1.850			
Y3	0.700			
Х	2.370			
X2	0.420			



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