



100V N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = +25°C
	80mΩ @ V _{GS} = 10V	4.2A
100V	99mΩ @ V _{GS} = 6.0V	3.6A

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

- Power Management Functions
- DC-DC Converters

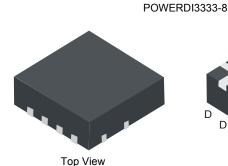
Features and Benefits

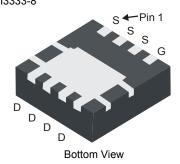
- Low R_{DS(ON)} ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony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

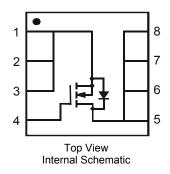
Mechanical Data

- 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 Indicator: See diagram
 Terminals: Finish Matte Tin annealed over Copper leadframe.

 Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.034 grams (approximate)







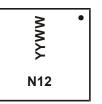
Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging	
DMN10H099SFG-7	Standard	POWERDI3333-8	2000/Tape & Reel	
DMN10H099SFG-13	Standard	POWERDI3333-8	3000/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



N12 = Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 13 = 2013) WW = Week code (01 ~ 53)



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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V _{DSS}	100	V		
Gate-Source Voltage	V _{GSS}	±20	V		
Continuous Drain Current (Note 6) V = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	4.2 3.3	А
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	T _A = +25°C T _A = +70°C	I _D	5.8 4.5	А
Continuous Dunin Coursest (Nata C) V	Steady State	T _A = +25°C T _A = +70°C	I _D	3.6 2.9	А
Continuous Drain Current (Note 6) V _{GS} = 6V	t<10s	T _A = +25°C T _A = +70°C	I _D	5.2 4.1	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	20	Α

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

Characteristic	Symbol	Value	Units	
Total Dawar Dissipation (Note 5)	T _A = +25°C	6	0.98	W
Total Power Dissipation (Note 5)	T _A = +70°C	P _D	0.57	
Thermal Decistance Junction to Ambient (Note 5)	Steady state	0	131	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	76	
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	ь	2.31	W
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P_{D}	1.18	
Thermal Desigtance, Junction to Ambient (Note C)		D	55	
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	28	°C/W
Thermal Resistance, Junction to Case (Note 6)	$R_{ heta JC}$	6.9		
Operating and Storage Temperature Range	$T_{J_i}T_{STG}$	-55 to +150	°C	

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

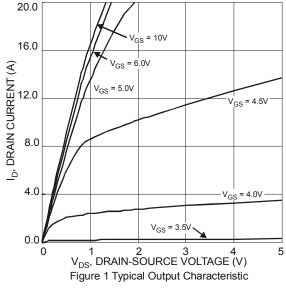
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage		100	-	-	V	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1.0	μΑ	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	1.5	2.0	3.0	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$
Static Drain-Source On-Resistance	J	-	54	80	mΩ	$V_{GS} = 10V, I_D = 3.3A$
Static Dialii-Source Off-Resistance	R _{DS (ON)}	-	58	99	11122	$V_{GS} = 6.0V, I_D = 3.0A$
Forward Transfer Admittance	Y _{fs}	-	13	-	S	$V_{DS} = 10V, I_D = 3.3A$
Diode Forward Voltage	V _{SD}	-	0.77	-	V	$V_{GS} = 0V, I_S = 3.2A$
DYNAMIC CHARACTERISTICS (Note 8)	<u> </u>					
Input Capacitance	C _{iss}	-	1172	-	pF	., 50,4,14, 0)4
Output Capacitance		-	40.8	-	pF	V _{DS} = 50V, V _{GS} = 0V, f = 1.0MHz
Reverse Transfer Capacitance	C _{rss}	-	31.3	-	pF	1 - 1.0WHZ
Gate Resistance	Rg	-	1.6	-	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Total Gate Charge V _{GS} = 10V	Qg	-	25.2	-	nC	
Total Gate Charge V _{GS} = 4.5V	Qq	-	12.2	-	nC],, 50,4,1 0.0A
Gate-Source Charge	Q _{gs}	-	5.3	-	nC	$V_{DS} = 50V, I_D = 3.3A$
Gate-Drain Charge	Q_{gd}	-	5.9	-	nC	
Turn-On Delay Time	t _{D(on)}	-	5.4	-	ns	
Turn-On Rise Time	t _r	-	5.9	-	ns	V _{GS} = 10V, V _{DS} = 50V,
Turn-Off Delay Time	t _{D(off)}	-	20.0	-	ns	$R_G = 6.0\Omega$, $I_D = 3.3A$
Turn-Off Fall Time	t _f	-	7.3	-	ns	1

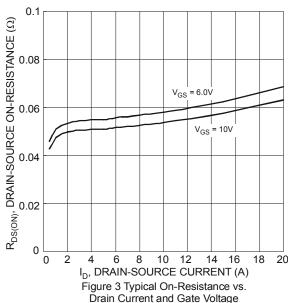
 Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 Short duration pulse test used to minimize self-heating effect. Notes:

8. Guaranteed by design. Not subject to product testing.









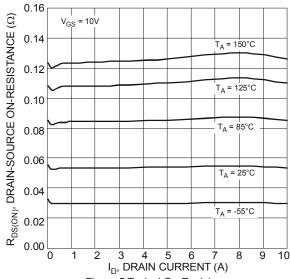
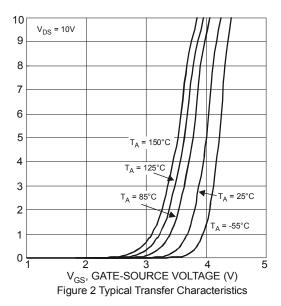
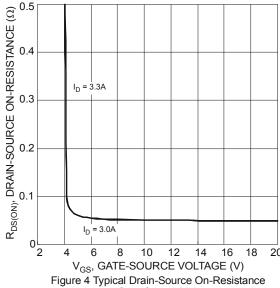
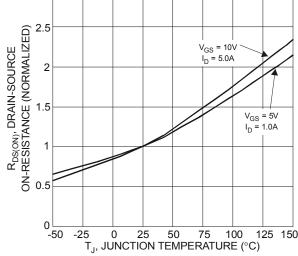


Figure 5 Typical On-Resistance vs. **Drain Current and Temperature**

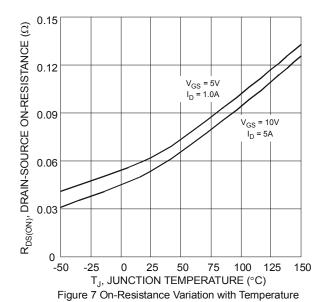


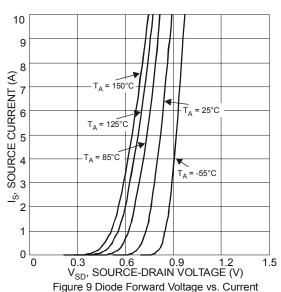


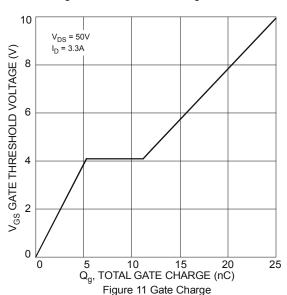
vs. Gate-Source Voltage 3 2.5











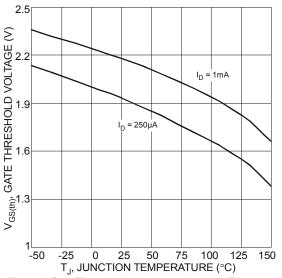
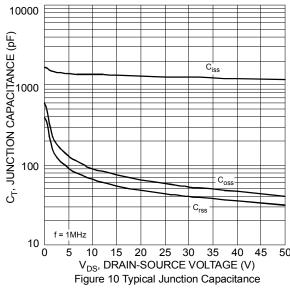
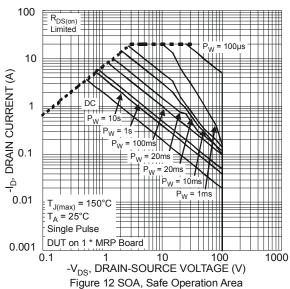
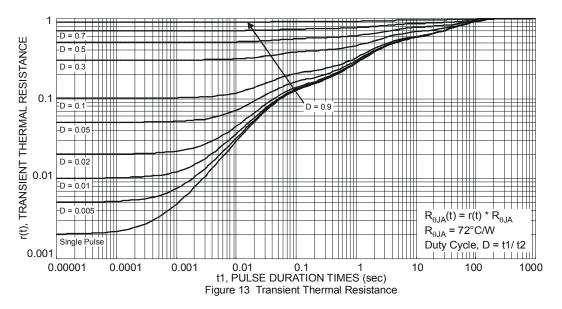


Figure 8 Gate Threshold Variation vs. Ambient Temperature



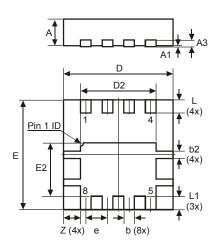






Package Outline Dimensions

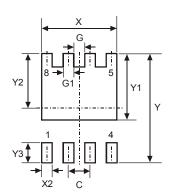
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI3333-8					
Dim	Min	Max	Тур		
D	3.25	3.35	3.30		
Е	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			
Υ	3.700			
Y1	2.250			
Y2	1.850			
Y3	0.700			
Х	2.370			
X2	0.420			



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