



100V N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = +25°C
	110mΩ @ V _{GS} = 10V	3.8 A
100V	122mΩ @ $V_{GS} = 6.0V$	3.6 A

Description

This MOSFET is 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

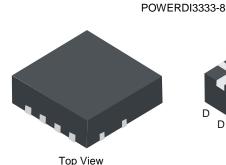
Features and Benefits

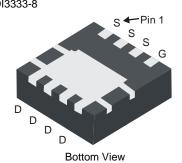
- Low R_{DS(ON)} ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony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

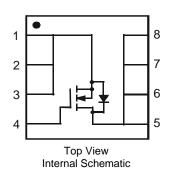
Mechanical Data

- 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: 0.008 grams (approximate)







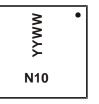
Ordering Information (Note 4)

Г	Part Number	Compliance	Case	Packaging
	DMN10H120SFG-7	Standard	POWERDI3333-8	2000/Tape & Reel
	DMN10H120SFG-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.
- 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



N10 = 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 Prain Correct (Note C) // 40)/	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	3.8 3.0	Α
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	5.3 4.2	Α
Continuous Dunin Comment (Note C) // C)/	Steady State	$T_A = +25$ °C $T_A = +70$ °C	I _D	3.6 2.9	Α
Continuous Drain Current (Note 6) V _{GS} = 6V	t<10s	T _A = +25°C T _A = +70°C	I _D	5.0 4.0	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	•	I_{DM}	20	А	

Thermal Characteristics ($@T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Total Dawar Dissination (Note 5)	$T_A = +25$ °C	D	1.0	W
Total Power Dissipation (Note 5)	$T_A = +70^{\circ}C$	P_D	0.6	
Thermal Begintenes, Junetian to Ambient (Note 5)	Steady state	D	131	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	76	
Total Dower Dissinction (Note 6)	$T_A = +25$ °C	Б.	2.4	W
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P_D	1.5	
Thermal Decistores, Junction to Ambient (Note C)	Steady state	D.	52	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	$R_{\theta JA}$	27	
Thermal Resistance, Junction to Case (Note 6)	$R_{ heta JC}$	6.9		
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	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	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		-	68	110	mΩ	$V_{GS} = 10V, I_D = 3.3A$	
Static Drain-Source Off-Resistance	R _{DS (ON)}	-	75	122		$V_{GS} = 6.0V, I_D = 3.0A$	
Forward Transfer Admittance	Y _{fs}	-	13	-	S	$V_{DS} = 10V, I_D = 3.3A$	
Diode Forward Voltage	V_{SD}	-	0.78	-	V	$V_{GS} = 0V, I_S = 3.2A$	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}	1	549	-	pF	V 50V V 0V	
Output Capacitance		-	41.1	-	pF	$V_{DS} = 50V, V_{GS} = 0V,$ -f = 1.0MHz	
Reverse Transfer Capacitance	C_{rss}	-	19.0	-	pF	1 – 1.01/11/12	
Gate Resistance	R_g	-	1.6	-	Ω	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$	
Total Gate Charge V _{GS} = 10V	Q_{g}	-	10.6	-	nC		
Total Gate Charge V _{GS} = 4.5V	Qq	-	5.2	-	nC	V 50V L 0.0A	
Gate-Source Charge	Q_{gs}	-	2.3	-	nC	$V_{DS} = 50V, I_D = 3.3A$	
Gate-Drain Charge	Q _{gd}	-	2.6	-	nC	1	
Turn-On Delay Time	t _{D(on)}	-	3.8	-	ns		
Turn-On Rise Time	t _r	-	1.8	-	ns	$V_{GS} = 10V, V_{DS} = 50V,$	
Turn-Off Delay Time	t _{D(off)}	-	11.5	-	ns	$R_G = 6.0\Omega$, $I_D = 3.3A$	
Turn-Off Fall Time	t _f	-	2.5	-	ns		

Notes:

- 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
- 7. Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design. Not subject to product testing.

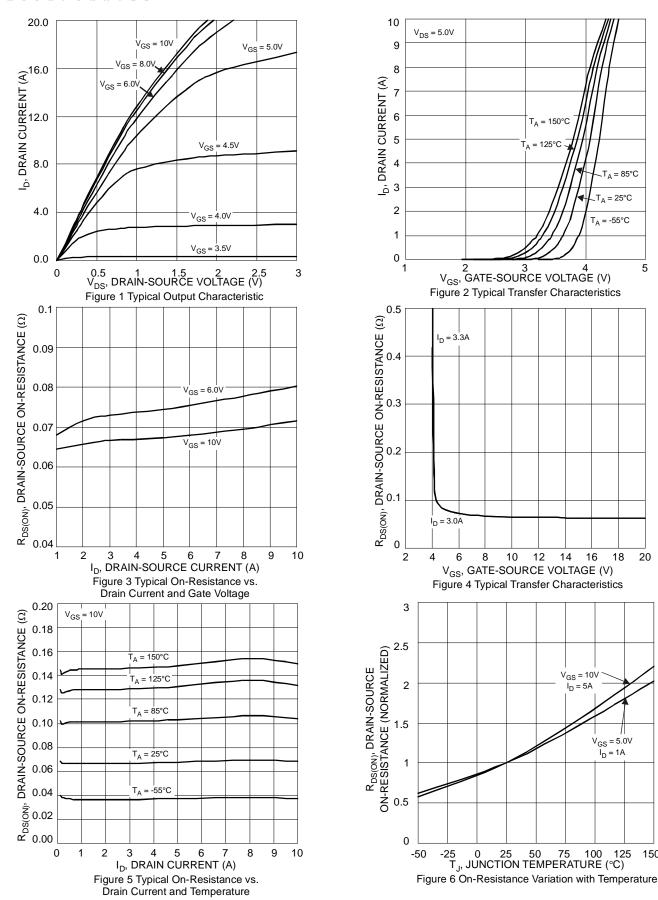
T_A = 25°C

T_A = -55°C

5

20

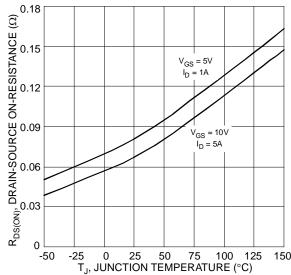


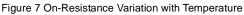


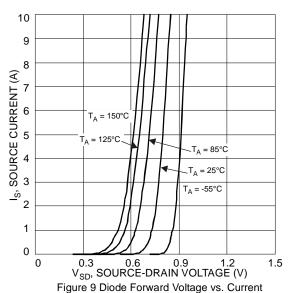
V_{GS} = 5.0V

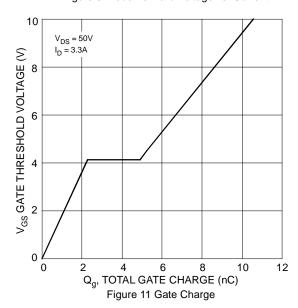
 $\widetilde{I}_D = 1A$











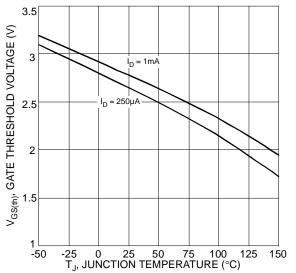
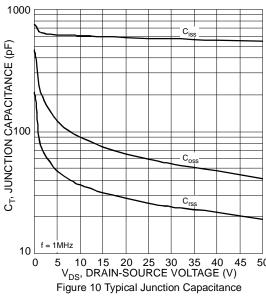
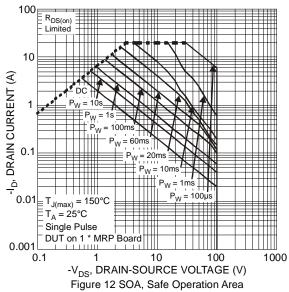
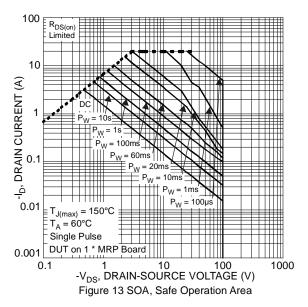


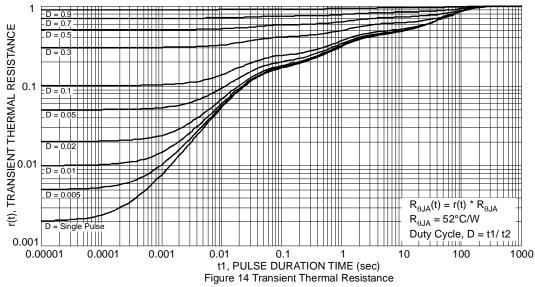
Figure 8 Gate Threshold Variation vs. Ambient Temperature





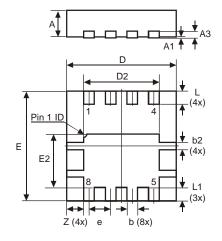






Package Outline Dimensions

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

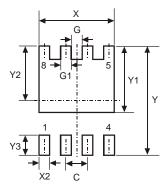


POWERDI3333-8					
Dim	Min Max		Тур		
D	3.25	3.35	3.30		
Е	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
E2	1.56	1.66	1.61		
Α	0.75	0.85	0.80		
A1	0	0.05	0.02		
A3	-	-	0.203		
b	0.27	0.37	0.32		
b2	_	_	0.20		
٦	0.35	0.45	0.40		
L1	_	_	0.39		
е	_	_	0.65		
Z	_	_	0.515		
All Dimensions in mm					



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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