



40V N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI®

Product Summary

V _{(BR)DSS}	R _{DS(ON)} max	I _D max T _A = +25°C			
40V	7.5 m Ω @ V _{GS} = 10V	14.4A			
400	$10m\Omega$ @ $V_{GS} = 4.5V$	12.5A			

Description and Applications

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.

- Backlighting
- Power Management Functions
- DC-DC Converters

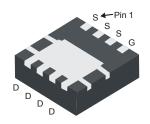
Features and Benefits

- 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: 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 (2)
- Weight: 0.072 grams (approximate)

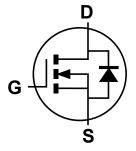
POWERDI®3333-8







Top View



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN4008LFG-7	POWERDI [®] 3333-8	2000/Tape & Reel
DMN4008LFG-13	POWERDI®3333-8	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



N47= Product Type Marking Code YYWW = Date Code Marking YY = Last digit of year (ex: 13 = 2013) WW = Week code (01 ~ 53)



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

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V_{DSS}	40	V		
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note C) / _ 10\/	Steady State	T _A = +25°C T _A = +70°C	I _D	14.4 11.6	А
Continuous Drain Current (Note 6) V _{GS} = 10V	t<10s	T _A = +25°C T _A = +70°C	I _D	19.2 15.4	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	90	Α		
Maximum Continuous Body Diode Forward Current (I _S	3	Α		
Avalanche Current, L = 0.1mH	I _{AS}	38	Α		
Avalanche Energy, L = 0.1mH	E _{AS}	75	mJ		

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

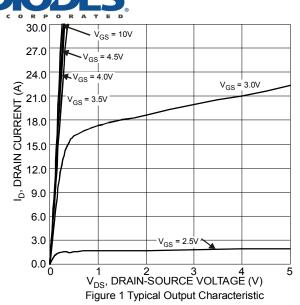
Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)		P_{D}	1.0	W
Thermal Decistance, Junction to Ambient (Note 5)	Steady state	6	119	°C/W
Thermal Resistance, Junction to Ambient (Note 5)	t<10s	$R_{\theta JA}$	66	
Total Power Dissipation (Note 6)		P_{D}	2.3	W
Thermal Besistance Iteration to Ambient (Note 6)		0	53	
Thermal Resistance, Junction to Ambient (Note 6)	t<10s	R _{0JA}	30	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	6.1	
Operating and Storage Temperature Range	•	$T_{J,} T_{STG}$	-55 to +150	°C

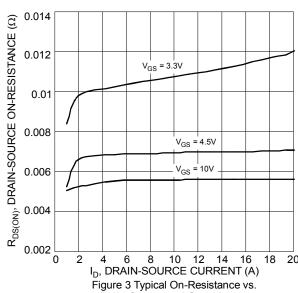
Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

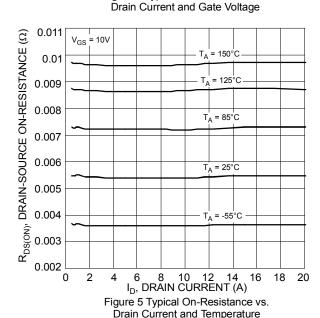
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)							
Drain-Source Breakdown Voltage	BV _{DSS}	40	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C		-	_	1	μΑ	V _{DS} = 40V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}		_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	V _{GS(th)}	1	_	3	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
	R _{DS (ON)}		5.5	7.5	mΩ	$V_{GS} = 10V, I_D = 10A$	
Static Drain-Source On-Resistance		-	7	10		$V_{GS} = 4.5V, I_D = 8A$	
	, ,	_	_	20		$V_{GS} = 3.3V, I_D = 6A$	
Diode Forward Voltage	V_{SD}	_	0.7	1.1	V	V _{GS} = 0V, I _S = 1A	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	C _{iss}		3537	_	pF	.,	
Output Capacitance	Coss	_	257	_	pF	$V_{DS} = 20V, V_{GS} = 0V,$ -f = 1MHz	
Reverse Transfer Capacitance	C _{rss}	_	215	_	pF	I - IMITZ	
Gate Resistance	R_g	_	0.9	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Q_g		34	_	nC		
Total Gate Charge (V _{GS} = 10V)		_	74	_	nC	\\ - 20\\ \ \ - 10A	
Gate-Source Charge	Q _{gs}	_	10.2	_	nC	$V_{DS} = 20V, I_{D} = 10A$	
Gate-Drain Charge	Q_{gd}	_	12.5	_	nC	1	
Turn-On Delay Time	t _{D(on)}		8.2	_	ns		
Turn-On Rise Time	t _r	_	14.1	_	ns	V _{GS} = 10V, V _{DS} = 20V,	
Turn-Off Delay Time	t _{D(off)}		69.7	_	ns	$R_G = 6\Omega, I_D = 10A$	
Turn-Off Fall Time	t _f		24.4	_	ns	1	
Body Diode Reverse Recovery Time	t _{rr}		18.5	_	nS		
Body Diode Reverse Recovery Charge	Q _{rr}		12.0	_	nC	I _F = 10A, di/dt = 100A/μs	

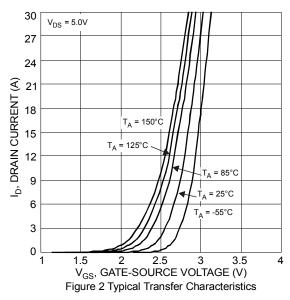
Notes:

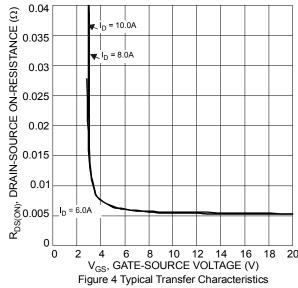
- 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate
 7. Short duration pulse test used to minimize self-heating effect.
- 8. Guaranteed by design.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

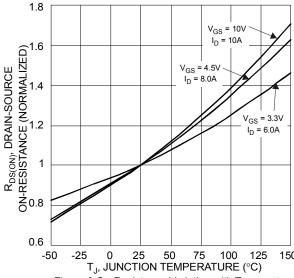




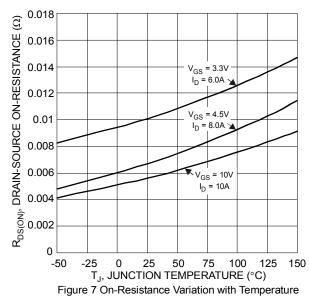


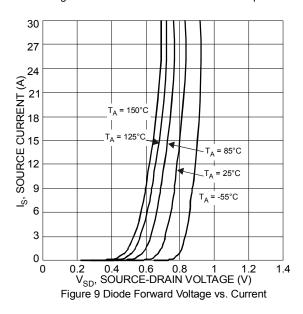


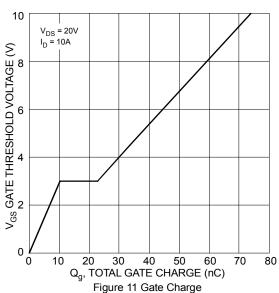


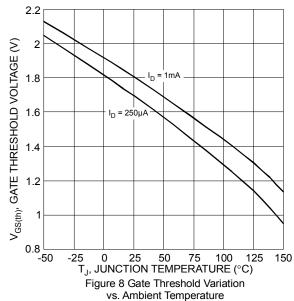


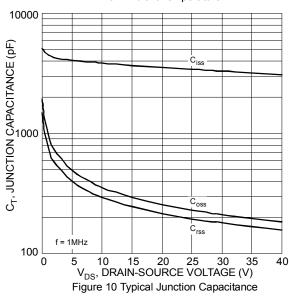


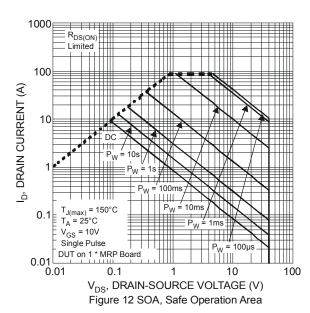




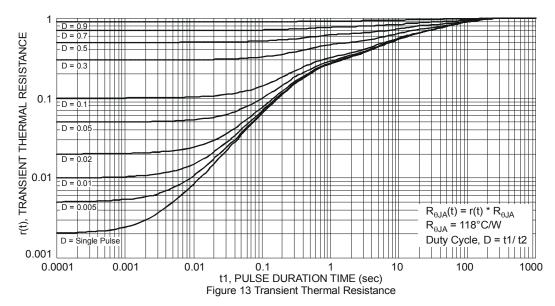






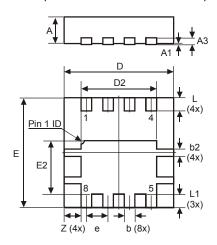






Package Outline Dimensions

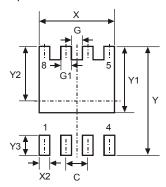
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI®3333-8					
Dim Min Ma		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	b2 – – 0.:		0.20		
L	L 0.35		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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