



30V N-CHANNEL ENHANCEMENT MODE MOSFET POWERDI

Product Summary

BV _{DSS}	R _{DS(ON)} max	I _D max T _C = +25°C		
00)/	$4.4m\Omega$ @ $V_{GS} = 10V$	62A		
30V	5.5 m Ω @ $V_{GS} = 4.5$ V	56A		

Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- Power Management Functions
- DC-DC Converters

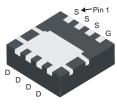
Features and Benefits

- Low R_{DS(ON)} Ensures on-state losses are minimized
- Small, form factor thermally efficient package enables higher density end products
- Occupies only 33% of the board area occupied by SO-8 enabling smaller end products
- 100% Unclamped Inductive Switch (UIS) Test in Production
- 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
- PPAP Capable (Note 4)

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: 0.072 grams (Approximate)

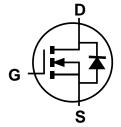
PowerDI3333-8



Bottom View



Top View



Equivalent Circuit

Ordering Information (Note 5)

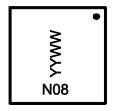
Part Number	Case	Packaging
DMN3008SFGQ-7	PowerDI3333-8	2,000/Tape & Reel
DMN3008SFGQ-13	PowerDI3333-8	3,000/Tape & Reel

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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

PowerDI3333-8



N08 = Product Type Marking Code YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 16 = 2016) WW = Week Code (01 to 53)



Characteristic	Symbol	Value	Units		
Drain-Source Voltage	V_{DSS}	30	V		
Gate-Source Voltage			V _{GSS}	±20	V
	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	17.6 14.1	А
Continuous Drain Current (Note 7) V _{GS} = 10V	t<10s	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	23.0 18.4	А
	Steady State	$T_C = +25$ °C $T_C = +70$ °C	I _D	62 50	А
Pulsed Drain Current (10µs pulse, duty cycle = 1%)	I _{DM}	80	А		
Maximum Continuous Body Diode Forward Current	Is	2	Α		
Avalanche Current, L = 0.1mH			I _{AS}	45	А
Avalanche Energy, L = 0.1mH			E _{AS}	101	mJ

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

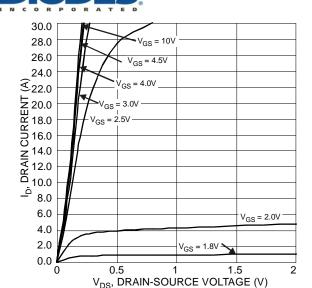
Characteristic	Symbol	Value	Units		
Total Power Dissipation (Note 6)	$T_A = +25^{\circ}C$	ם	0.9	W	
Total Power Dissipation (Note 6)	$T_A = +70^{\circ}C$	P_{D}	0.6		
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	ם	134	°C/W	
Thermal Resistance, Junction to Ambient (Note 6)	t < 10s	$R_{\theta JA}$	79	°C/W	
Total Power Dissipation (Note 7)	$T_A = +25^{\circ}C$	٦	2.1	W	
Total Power Dissipation (Note 7)	$T_A = +70^{\circ}C$	P_{D}	1.3		
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	ם	58	°C/W	
Thermal Resistance, Junction to Ambient (Note 1)	t < 10s	$R_{\theta JA}$	34	°C/W	
Thermal Resistance, Junction to Case (Note 7)		R ₀ JC	4.8	°C/W	
Operating and Storage Temperature Range		$T_{J_{I}}T_{STG}$	-55 to +150	°C	

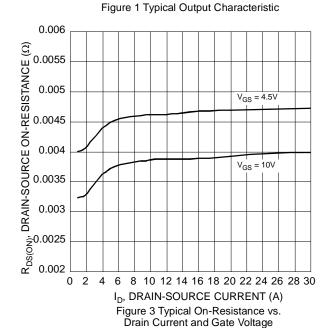
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

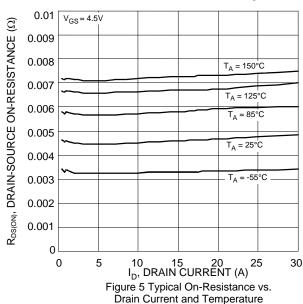
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	10	μΑ	$V_{DS} = 30V, V_{GS} = 0V$	
Gate-Source Leakage		_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)						•	
Gate Threshold Voltage	V _{GS(TH)}	1	_	2.3	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance		_	3.9	4.4	mΩ	$V_{GS} = 10V, I_D = 13.5A$	
Static Drain-Source On-Resistance	R _{DS(ON)}	_	4.6	5.5	11122	$V_{GS} = 4.5V, I_D = 13.5A$	
Diode Forward Voltage	V _{SD}	_	0.75	1.2	V	V _{GS} = 0V, I _S = 1A	
DYNAMIC CHARACTERISTICS (Note 9)	•	•	•	•		•	
Input Capacitance	Ciss	_	3,690	_	pF	101/11/	
Output Capacitance	Coss	_	530	_	рF	$V_{DS} = 10V, V_{GS} = 0V,$ - f = 1MHz	
Reverse Transfer Capacitance	C _{rss}	_	459	_	pF I = IMH2		
Gate Resistance	Rg	_	0.9	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	41	_	nC	V 04/1 074	
Total Gate Charge (V _{GS} = 10V)	Qq	_	86	_	nC		
Gate-Source Charge	Q _{gs}	_	9.2	_	nC	$V_{DS} = 24V, I_{D} = 27A$	
Gate-Drain Charge	Q _{qd}	_	18.6	_	nC	1	
Turn-On Delay Time	t _{D(ON)}	_	5.7	_	ns	$V_{DD} = 15V$, $V_{GS} = 10V$, $R_L = 1.11\Omega$, $R_G = 4.7\Omega$, $I_D = 13.5A$	
Turn-On Rise Time	t _R	_	14.0	_	ns		
Turn-Off Delay Time	t _{D(OFF)}	_	63.7	_	ns		
Turn-Off Fall Time	t _F	_	28.4	_	ns		
Reverse Recovery Time	t _{RR}	_	19.3	_	ns	1 40.54 45/45 4004/	
Reverse Recovery Charge	Q _{RR}	_	10.7	_	nC	I _F = 13.5A, di/dt=100A/μs	

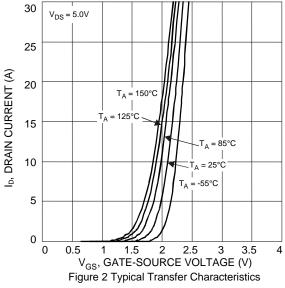
6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.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

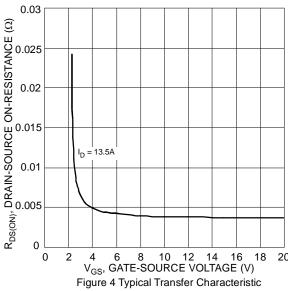
DMN3008SFGQ











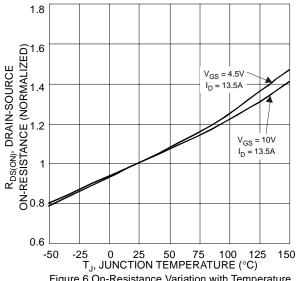
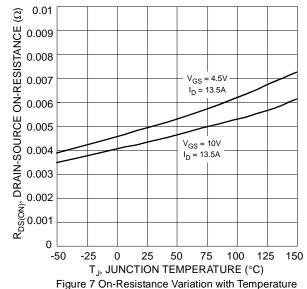
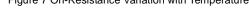


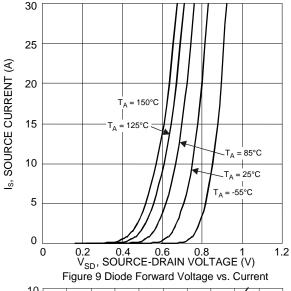
Figure 6 On-Resistance Variation with Temperature

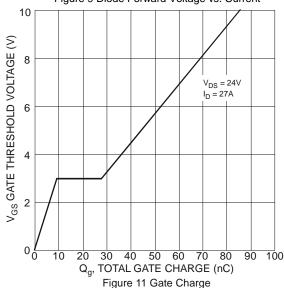


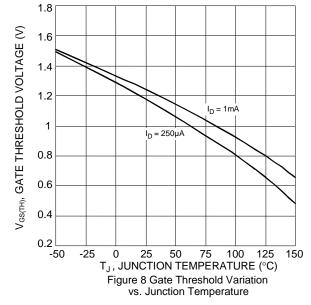












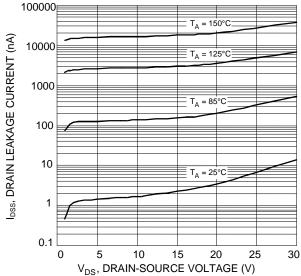
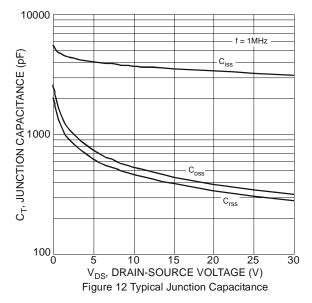
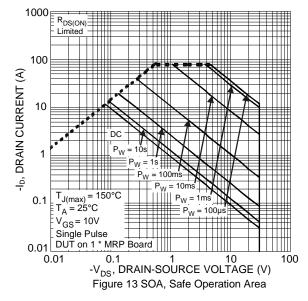
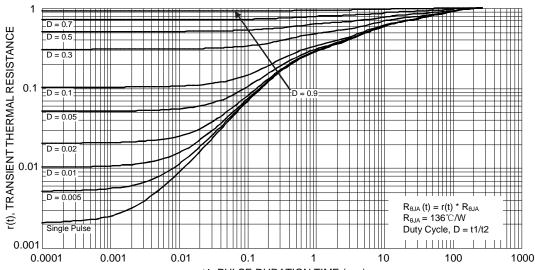


Figure 10 Typical Drain-Source Leakage Current vs. Voltage









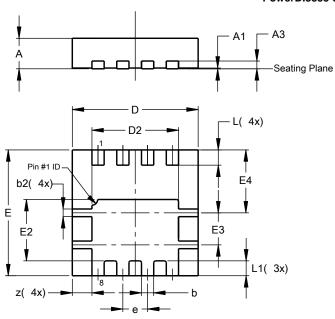
t1, PULSE DURATION TIME (sec) Figure 14 Transient Thermal Resistance



Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

PowerDI3333-8

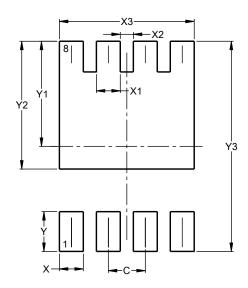


PowerDI3333-8					
Dim	Min	Max	Тур		
Α	0.75	0.85	0.80		
A1	0.00	0.05	0.02		
A3	-	-	0.203		
b	0.27	0.37	0.32		
b2	0.15	0.25	0.20		
ם	3.25	3.35	3.30		
D2	2.22	2.32	2.27		
Е	3.25	3.35	3.30		
E2	1.56	1.66	1.61		
E3	0.79	0.89	0.84		
E4	1.60	1.70	1.65		
е	_	_	0.65		
L	0.35	0.45	0.40		
L1	_	_	0.39		
Z	_	_	0.515		
All Dimensions in mm					

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

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Dimensions	Value (in mm)
C	0.650
X	0.420
X1	0.420
X2	0.230
Х3	2.370
Y	0.700
Y1	1.850
Y2	2.250
Y3	3.700



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многоканальный

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