

30V N-CHANNEL ENHANCEMENT MODE MOSFET PowerDI3333-8 (Type UX)

Product Summary

BV _{DSS}	R _{DS(ON)} max	I _D max T _C = +25°C
	5.5mΩ @ V _{GS} = 10V	60A
30V	9.0mΩ @ V _{GS} = 4.5V	50A

Description and Applications

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.

- Backlighting
- Power Management Functions
- DC-DC Converters

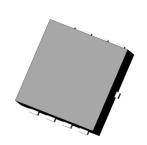
Features and Benefits

- 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)

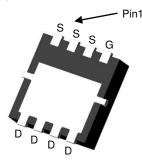
Mechanical Data

- Case: PowerDI[®]3333-8 (Type UX)
- 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)

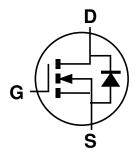
PowerDI3333-8 (Type UX)







Bottom View



Equivalent Circuit

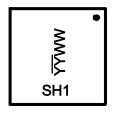
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3009LFV-7	PowerDI3333-8 (Type UX)	2,000/Tape & Reel
DMN3009LFV-13	PowerDI3333-8 (Type UX)	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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



SH1= Product Type Marking Code YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 17 = 2017) WW = Week Code (01 to 53)



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

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	30	٧	
Gate-Source Voltage	V_{GSS}	±20	V	
Continuous Drain Current (Note 7) $V_{GS} = 10V$ $T_{C} = +25^{\circ}C$ $T_{C} = +70^{\circ}C$		ΙD	60 50	Α
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	90	Α	
Maximum Continuous Body Diode Forward Current (Note 7)	Is	60	Α	
Avalanche Current, L = 0.1mH (Note 8)	I _{AS}	33	Α	
Avalanche Energy, L = 0.1mH (Note 8)	Eas	58	mJ	

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_{D}	1.0	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{ heta JA}$	126	°C/W
Total Power Dissipation (Note 6)		P _D	2.0	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction to Case (Note 7)		$R_{ heta JC}$	3.5	C/VV
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 9)							
Drain-Source Breakdown Voltage	BV _{DSS}	30	_	1	٧	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	$V_{DS} = 24V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 9)							
Gate Threshold Voltage	$V_{GS(TH)}$	1	_	3	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance			3.5	5.5	mΩ	$V_{GS} = 10V, I_D = 30A$	
Static Drain-Source On-nesistance	R _{DS(ON)}		4.6	9.0		$V_{GS} = 4.5V, I_D = 15A$	
Diode Forward Voltage	V_{SD}		0.7	1.2	V	$V_{GS} = 0V, I_S = 1A$	
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	C _{iss}		2,000	_	pF	45)/)/	
Output Capacitance	Coss	_	315	_	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	
Reverse Transfer Capacitance	Crss		247	_	pF	II = IIVIDZ	
Gate Resistance	R_g		2.2	1	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg		20	_	nC		
Total Gate Charge (V _{GS} = 10V)	Qg		42	1	nC	V _{DS} = 15V. I _D = 15A	
Gate-Source Charge	Q_{gs}		4.7	1	nC	V _{DS} = 15V, I _D = 15A	
Gate-Drain Charge	Q_{gd}		7.4		nC	1	
Turn-On Delay Time	t _{D(ON)}	_	3.9	_	ns	$V_{DD} = 15V, V_{GS} = 10V,$ $R_G = 3.3\Omega, , I_D = 15A$	
Turn-On Rise Time	t _R	_	4.1	_	ns		
Turn-Off Delay Time	t _{D(OFF)}	_	31	_	ns		
Turn-Off Fall Time	t _F	_	15	_	ns		
Body Diode Reverse Recovery Time	t _{RR}	_	15	_	ns	-I _F = 15A, di/dt = 100A/μs	
Body Diode Reverse Recovery Charge	Q _{RR}	_	6.0	_	nC		

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 1-inch square copper plate.

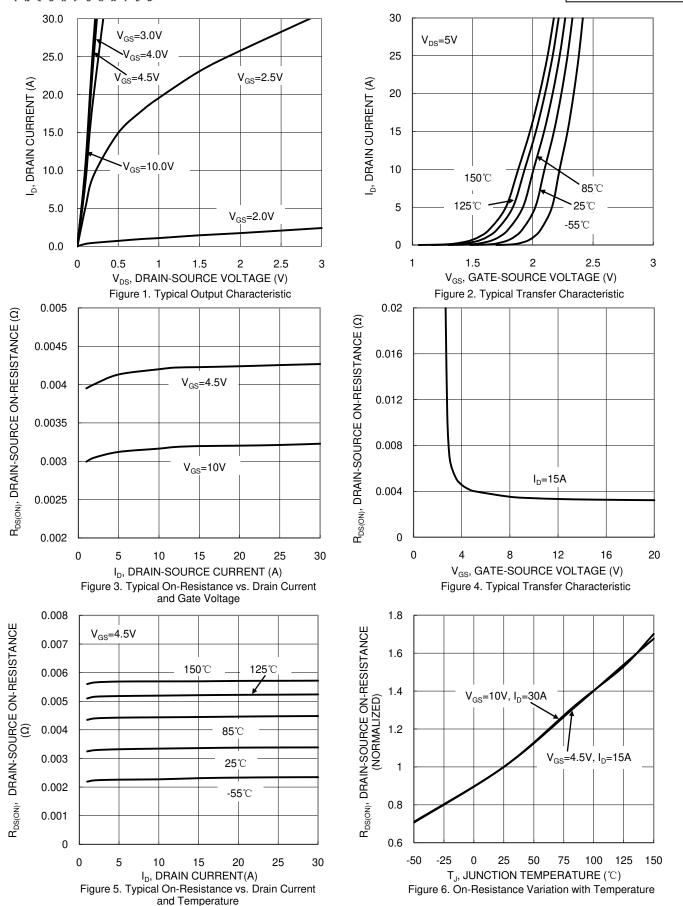
7. Thermal resistance from junction to soldering point (on the exposed drain pad).

8. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25^{\circ}C$.

S. Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.

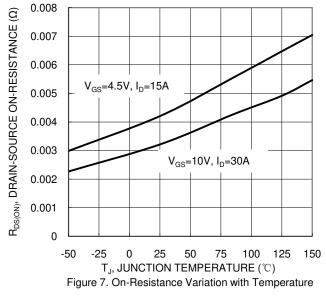












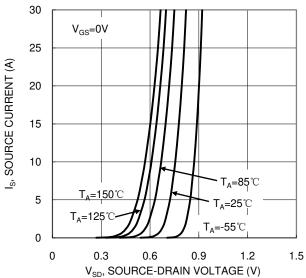
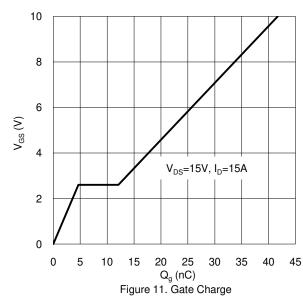


Figure 9. Diode Forward Voltage vs. Current



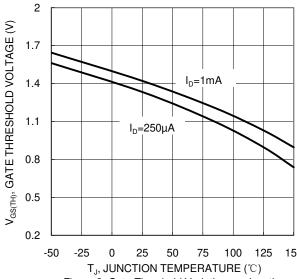
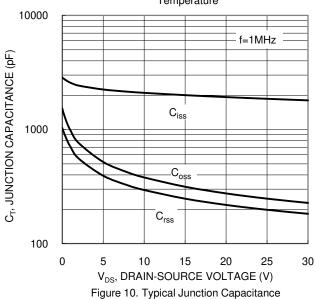
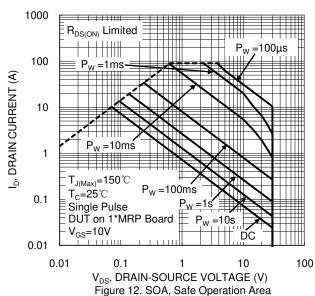
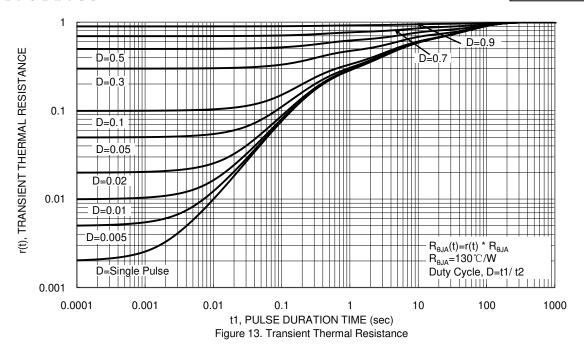


Figure 8. Gate Threshold Variation vs. Junction Temperature







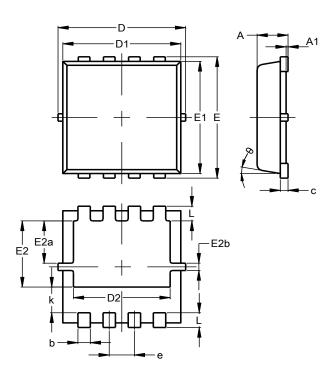




Package Outline Dimensions

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

PowerDI3333-8 (Type UX)

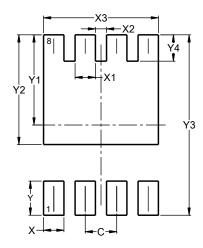


PowerDI3333-8 (Type UX)					
Dim	Min	Max	Тур		
Α	0.75	0.85	0.80		
A1	0.00	0.05			
b	0.25	0.40	0.32		
С	0.10	0.25	0.15		
D	3.20	3.40	3.30		
D1	2.95	3.15	3.05		
D2	2.30	2.70	2.50		
Е	3.20	3.40	3.30		
E1	2.95	3.15	3.05		
E2	1.60	2.00	1.80		
E2a	0.95	1.35	1.15		
E2b	0.10	0.30	0.20		
е	0.65 BSC				
k	0.50	0.90	0.70		
L	0.30	0.50	0.40		
θ	0°	12°	10°		
All Dimensions in mm					

Suggested Pad Layout

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

PowerDI3333-8 (Type UX)



Dimensions	Value (in mm)
С	0.650
X	0.420
X1	0.420
X2	0.230
Х3	2.370
Υ	0.700
Y1	1.850
Y2	2.250
Y3	3.700
Y4	0.540



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