



60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET PowerDI3333-8

Product Summary

BVDSS	R _{DS(ON)} max	I _D max T _C = +25°C
	16mΩ @ V _{GS} = 10V	41A
60V	27mΩ @ V _{GS} = 4.5V	31.6A

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

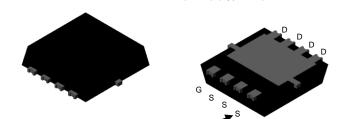
Features and Benefits

- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching (UIS) Test in Production Ensures More Reliable and Robust End Application
- Small form factor thermally efficient package enables higher density end products
- Wettable Flank for Improved Optical Inspection
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The DMTH6016LFVWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

https://www.diodes.com/quality/product-definitions/

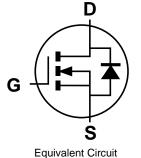
Mechanical Data

- Package: PowerDI[®]3333-8
- Package 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: 0.03 grams (Approximate)



Pin1

PowerDI3333-8 (SWP) (Type UX)



Ordering Information (Note 4)

Top View

Part Number	Packago	Packing		
Part Number	Package	Qty.	Carrier	
DMTH6016LFVWQ-7	PowerDI3333-8 (SWP) (Type UX)	2,000	Tape & Reel	
DMTH6016LFVWQ-13	PowerDI3333-8 (SWP) (Type UX)	3,000	Tape & Reel	

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.

Bottom View

- 2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



H6W = Product Type Marking Code

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 23 = 2023)

WW = Week Code (01 to 53)



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

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V_{DSS}	60	V	
Gate-Source Voltage	Vgss	±20	V	
Continuous Drain Current (Note 7) $V_{GS} = 10V$ $T_{C} = +25^{\circ}C$ $T_{C} = +100^{\circ}C$		ΙD	41 29	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	lом	160	Α	
Maximum Continuous Body Diode Forward Current (Note 7)	Is	33	Α	
Pulsed Body Diode Forward Current (Note 7)	Ism	160	Α	
Avalanche Current, L = 0.1mH (Note 8)	las	16	Α	
Avalanche Energy, L = 0.1mH (Note 8)	Eas	12.8	mJ	

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

Characteristic	Symbol	Value	Unit		
Total Power Dissipation (Note 5)	PD	1.17	W		
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	RθJA	128	°C/W	
Total Power Dissipation (Note 6)	PD	2.38	W		
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	63	°C/W	
Thermal Resistance, Junction to Case (Note 7)		Rелс	3.7	- C/VV	
Operating and Storage Temperature Range		TJ, TSTG	-55 to +175	°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	BVDSS	60	_	_	V	$V_{GS} = 0V, I_{D} = 250\mu A$	
Zero Gate Voltage Drain Current	IDSS	_	_	1	μΑ	V _{DS} = 48V, V _{GS} = 0V	
Gate-Source Leakage	Igss	_	_	±100	nA	$V_{GS} = \pm 20V$, $V_{DS} = 0V$	
ON CHARACTERISTICS (Note 9)							
Gate Threshold Voltage	Vgs(TH)	1	_	2.5	V	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	
Static Drain-Source On-Resistance	D	_	12.3	16	0	V _G S = 10V, I _D = 20A	
Static Drain-Source On-Resistance	RDS(ON)	_	20.3	27	mΩ	$V_{GS} = 4.5V, I_{D} = 18A$	
Diode Forward Voltage	V_{SD}	_	0.7	1.2	V	V _{GS} = 0V, I _S = 1A	
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	Ciss	_	939	_		V _{DS} = 30V, V _{GS} = 0V, f = 1MHz	
Output Capacitance	Coss	_	270	_	pF		
Reverse Transfer Capacitance	Crss	_	23.4	_			
Gate Resistance	Rg	_	1.4	_	Ω	$V_{DS} = 0V$, $V_{GS} = 0V$, $f = 1MHz$	
Total Gate Charge (V _{GS} = 4.5V)	Qg	_	7.3	_			
Total Gate Charge (V _{GS} = 10V)	Qg	_	15.1	_		\/ 00\/ L 40A	
Gate-Source Charge	Qgs	_	2.5	_	nC	V _{DS} = 30V, I _D = 10A	
Gate-Drain Charge	Qgd	_	3.5	_			
Turn-On Delay Time	tD(ON)	_	3.9	_			
Turn-On Rise Time	t _R		6.3	_		Vgs = 10V, Vps = 30V,	
Turn-Off Delay Time	t _{D(OFF)}	_	14.3	_	ns	$R_G = 6\Omega$, $I_D = 10A$	
Turn-Off Fall Time	tF	_	5.9	_			
Reverse Recovery Time	trr	_	22	_	ns		
Reverse Recovery Charge	Q _{RR}	_	12	_	nC	$I_F = 10A$, di/dt = $100A/\mu s$	

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).

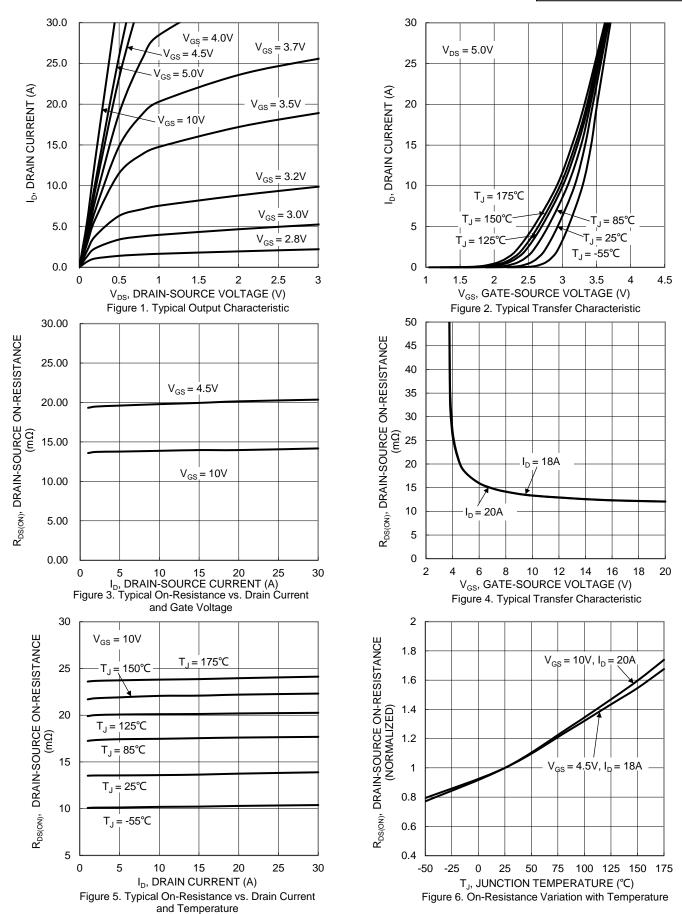
^{8.} I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.

^{9.} Short duration pulse test used to minimize self-heating effect.

^{10.} Guaranteed by design. Not subject to product testing.

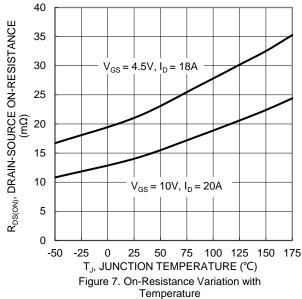


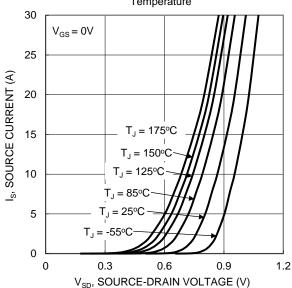


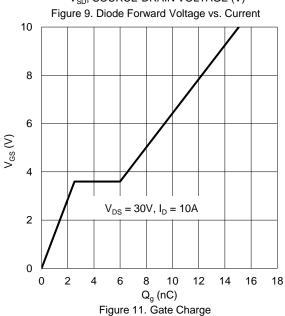












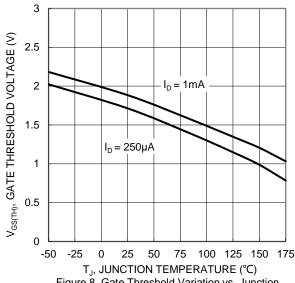
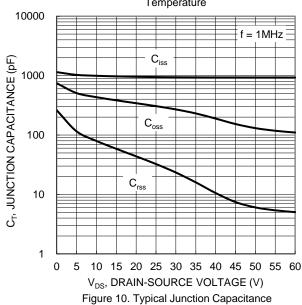


Figure 8. Gate Threshold Variation vs. Junction Temperature



1000 100 ID, DRAIN CURRENT (A) 10 _ 1ms 1 $P_{W} = 10 ms$ P_W = 100ms Single Pulse DUT on Infinite DC Heatsink $V_{GS} = 10V$ 0.01 0.1 10 100 V_{DS} , DRAIN-SOURCE VOLTAGE (V) Figure 12. SOA, Safe Operation Area



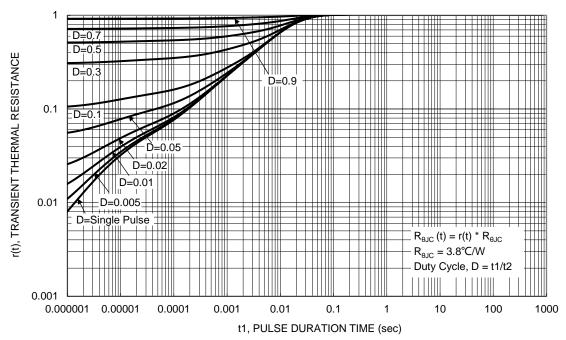


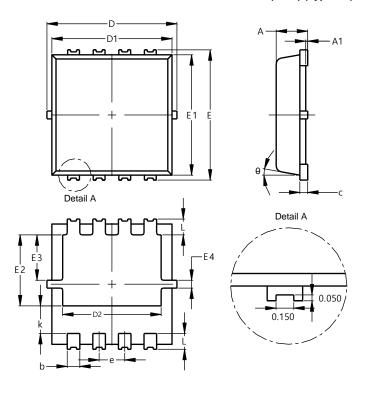
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)

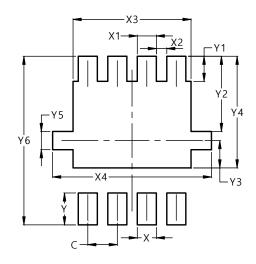


PowerDI3333-8 (SWP)					
(Type UX)					
Dim	Min	Max	Тур		
Α	0.75	0.85	0.80		
A1	0.00	0.05			
b	0.25	0.40	0.32		
С	0.10	0.25	0.15		
D	3.20	3.40	3.30		
D1	2.95	3.15	3.05		
D2	2.30	2.70	2.50		
E	3.20	3.40	3.30		
E1	2.95	3.15	3.05		
E2	1.60	2.00	1.80		
E3	0.95	1.35	1.15		
E4	0.10	0.30	0.20		
е	-	-	0.65		
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 (SWP) (Type UX)



Dimensions	Value (in mm)		
С	0.650		
X	0.420		
X1	0.420		
X2	0.230		
Х3	2.600		
X4	3.500		
Υ	0.700		
Y1	0.550		
Y2	1.650		
Y3	0.600		
Y4	2.450		
Y5	0.400		
Y6	3.700		



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