



60V 175°C N-CHANNEL ENHANCEMENT MODE MOSFET PowerDI3333-8 (SWP) (Type UX)

Product Summary

BV _{DSS}	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 minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

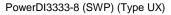
- Backlighting
- Power Management Functions
- DC-DC Converters

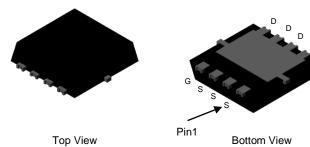
Features and Benefits

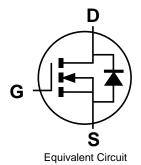
- Rated to +175°C Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching Ensures More Reliable and Robust End Application
- Small form factor thermally efficient package enables higher density end products
- Wettable Flank for Improved Optical Inspection
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- An Automotive-Compliant Part is Available Under Separate Datasheet (<u>DMTH6016LFVWQ</u>)

Mechanical Data

- Case: PowerDI®3333-8 (SWP) (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)







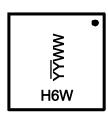
Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH6016LFVW-7	PowerDI3333-8 (SWP) (Type UX)	2,000/Tape & Reel
DMTH6016LFVW-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.
- 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: 18 = 2018)

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	V_{GSS}	±20	V	
Continuous Drain Current (Note 7) $V_{GS} = 10V$ $T_C = +25^{\circ}C$ $T_C = +100^{\circ}C$		D	41 29	А
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	160	Α	
Maximum Continuous Body Diode Forward Current (Note 7)	Is	33	Α	
Pulsed Body Diode Forward Current (Note 8)		I _{SM}	160	Α
Avalanche Current, L = 0.1mH (Note 8)		I _{AS}	16	Α
Avalanche Energy, L = 0.1mH (Note 8)		E _{AS}	12.8	mJ

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

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)		P_D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5) Steady State		$R_{ hetaJA}$	128	°C/W
Total Power Dissipation (Note 6)	P_{D}	2.38	W	
Thermal Resistance, Junction to Ambient (Note 6) Steady State		$R_{ heta JA}$	63	°C/W
Thermal Resistance, Junction to Case (Note 7)		$R_{ heta JC}$	3.7	C/VV
Operating and Storage Temperature Range		T _{J,} T _{STG}	-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	BV _{DSS}	60	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current	I _{DSS}	_	_	1	μΑ	V _{DS} = 48V, 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	_	2.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance		_	12.3	16		$V_{GS} = 10V, I_D = 20A$	
Static Drain-Source On-Resistance	R _{DS(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	C _{iss}	_	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	_	nC	V _{DS} = 30V. I _D = 10A	
Gate-Source Charge	Q _{gs}	_	2.5	_	l lic	V _{DS} = 30V, I _D = 10A	
Gate-Drain Charge	Q _{gd}	_	3.5	_			
Turn-On Delay Time	t _{D(ON)}	_	3.9	<u> </u>			
Turn-On Rise Time	t _R	_	6.3	_		$V_{GS} = 10V, V_{DS} = 30V,$ $R_{G} = 6\Omega, I_{D} = 10A$	
Turn-Off Delay Time	t _{D(OFF)}	_	14.3	_	ns		
Turn-Off Fall Time	t _F	_	5.9	_			
Reverse Recovery Time	t _{RR}	_	22	_	ns , , , , , , , , , , , , , , , , , , ,		
Reverse Recovery Charge	Q _{RR}	_	12	_	nC	$I_F = 10A$, di/dt = 100A/ μ s	

5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided. Notes:

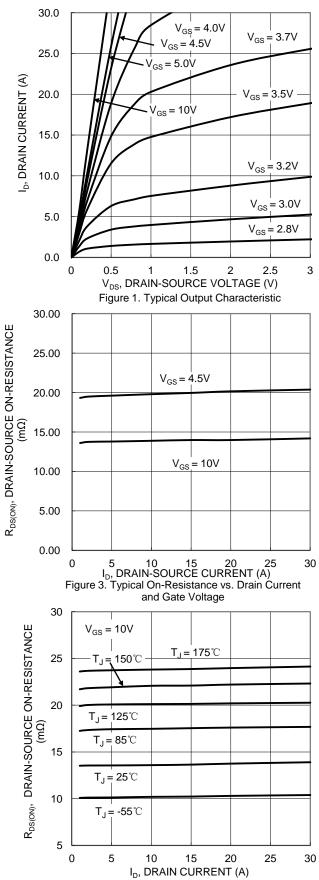
^{6.} Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad).

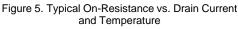
^{8.} I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25$ °C.

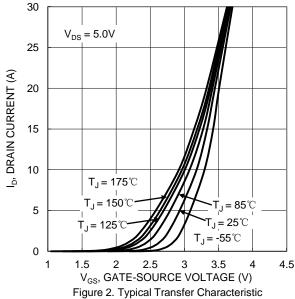
Shall a Language and the based on his medical by and day good.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to product testing.

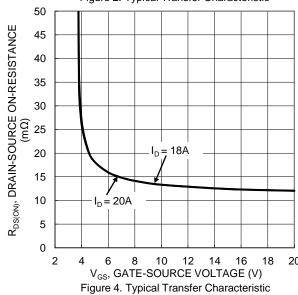












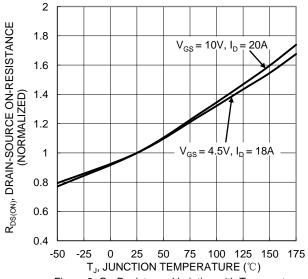


Figure 6. On-Resistance Variation with Temperature





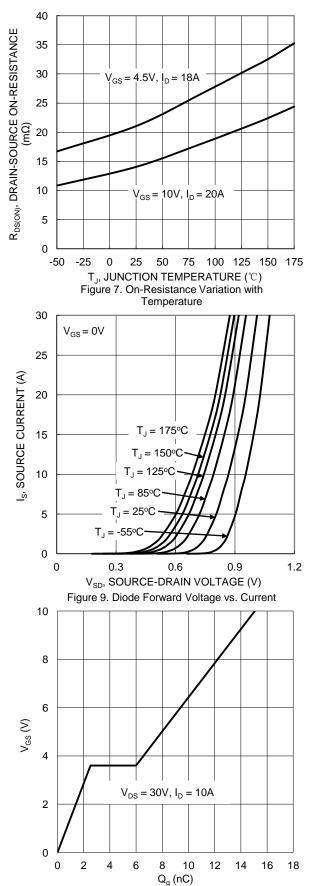
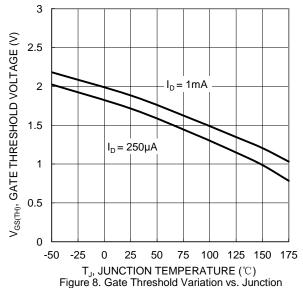
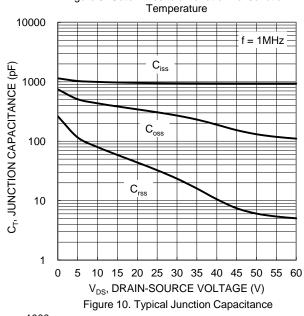
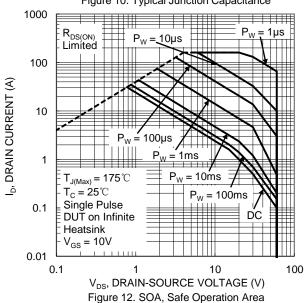


Figure 11. Gate Charge









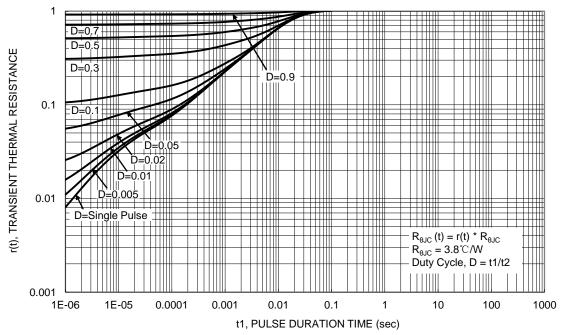


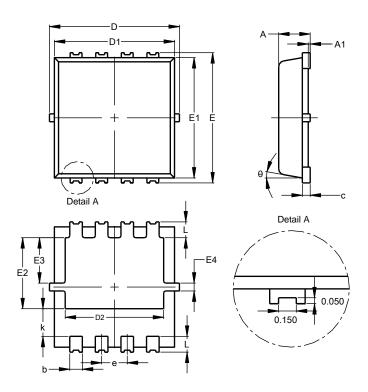
Figure 13. Transient Thermal Resistance



Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)

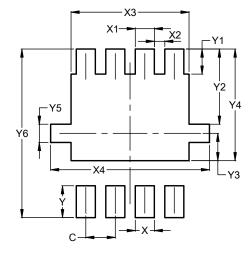


PowerDI3333-8 (SWP)						
(Type UX)						
Dim	Min	Max	Тур			
Α	0.75	0.85	0.80			
A1	0.00	0.05				
b	0.25	0.40	0.32			
С	0.10	0.25	0.15			
D	3.20	3.40	3.30			
D1	2.95	3.15	3.05			
D2	2.30	2.70	2.50			
Е	3.20	3.40	3.30			
E1	2.95	3.15	3.05			
E2	1.60	2.00	1.80			
E3	0.95	1.35	1.15			
E4	0.10	0.30	0.20			
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			
Х	0.420			
X1	0.420			
X2	0.230			
Х3	2.600			
X4	3.500			
Y	0.700			
Y1	0.550			
Y2	1.650			
Y3	0.600			
Y4	2.450			
Y5	0.400			
Y6	3.700			



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