

Product Summary

BV _{DSS}	R _{D(on) MAX}	I _{b MAX} T _c = +25°C
100V	30mΩ @ V _{GS} = 10V	26A
	50mΩ @ V _{GS} = 4.5V	21A

Description

This MOSFET is designed to minimize the on-state resistance (R_{D(on)}) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

- Backlighting
- Power management functions
- DC-DC converters

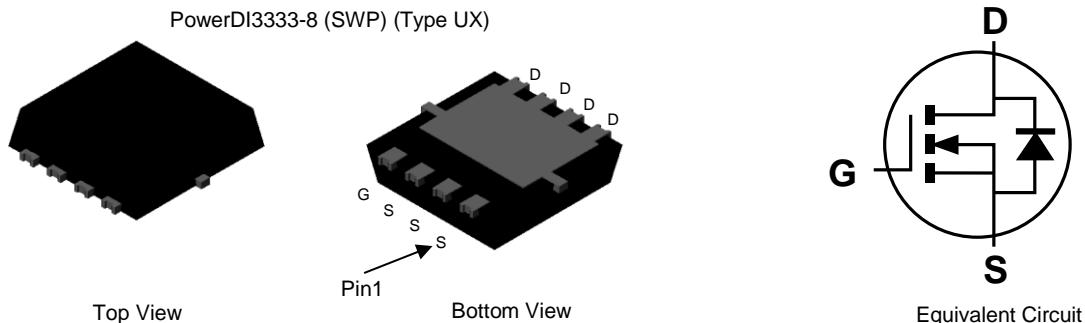
Features and Benefits

- 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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.**

<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 
- Weight: 0.072 grams (Approximate)



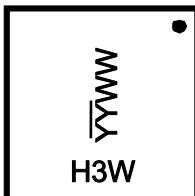
Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMTH10H032LFVW-7	PowerDI3333-8 (SWP) (Type UX)	2,000	Tape and Reel
DMTH10H032LFVW-13	PowerDI3333-8 (SWP) (Type UX)	3,000	Tape and 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



H3W = Product Type Marking Code

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 22 = 2022)

WW = Week Code (01 to 53)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	$T_C = +25^\circ\text{C}$	26	A
	$T_C = +100^\circ\text{C}$	18	
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	104	A
Maximum Continuous Body Diode Forward Current (Note 5)	I_S	26	A
Pulsed Body Diode Forward Current (Note 6)	I_{SM}	104	A
Avalanche Current, $L = 0.3\text{mH}$ (Note 6)	I_{AS}	13	A
Avalanche Energy, $L = 0.3\text{mH}$ (Note 6)	E_{AS}	25.3	mJ

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 7)	P_D	1.7	W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	90	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 8)	P_D	3.8	W
Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	3.3	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

Notes:

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

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

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

8. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	$V_{\text{GS}} = 0\text{V}$, $I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{\text{DS}} = 80\text{V}$, $V_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{\text{GS}} = \pm 20\text{V}$, $V_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{\text{GS(TH)}}$	1.3	—	2.5	V	$V_{\text{DS}} = V_{\text{GS}}$, $I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{\text{DS(ON)}}$	—	22	30	$\text{m}\Omega$	$V_{\text{GS}} = 10\text{V}$, $I_D = 10\text{A}$
		—	32	50		$V_{\text{GS}} = 4.5\text{V}$, $I_D = 5\text{A}$
Diode Forward Voltage	V_{SD}	—	0.8	1	V	$V_{\text{GS}} = 0\text{V}$, $I_S = 6\text{A}$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	683	—	pF	$V_{\text{DS}} = 50\text{V}$, $V_{\text{GS}} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	165	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	6.9	—	pF	$V_{\text{DS}} = 0\text{V}$, $V_{\text{GS}} = 0\text{V}$, $f = 1\text{MHz}$
Gate Resistance	R_g	—	1.2	—	Ω	
Total Gate Charge ($V_{\text{GS}} = 4.5\text{V}$)	Q_g	—	6.3	—	nC	$V_{\text{DS}} = 50\text{V}$, $I_D = 6\text{A}$
Total Gate Charge ($V_{\text{GS}} = 10\text{V}$)	Q_g	—	11.9	—	nC	
Gate-Source Charge	Q_{gs}	—	2.0	—	nC	$V_{\text{DS}} = 50\text{V}$, $R_L = 5.85\Omega$ $V_{\text{GS}} = 10\text{V}$, $R_g = 3\Omega$
Gate-Drain Charge	Q_{gd}	—	3.1	—	nC	
Turn-On Delay Time	$t_{\text{D(ON)}}$	—	4.1	—	ns	$V_{\text{DS}} = 50\text{V}$, $R_L = 5.85\Omega$ $V_{\text{GS}} = 10\text{V}$, $R_g = 3\Omega$
Turn-On Rise Time	t_{R}	—	4.5	—	ns	
Turn-Off Delay Time	$t_{\text{D(OFF)}}$	—	12.5	—	ns	$V_{\text{DS}} = 50\text{V}$, $R_L = 5.85\Omega$ $V_{\text{GS}} = 10\text{V}$, $R_g = 3\Omega$
Turn-Off Fall Time	t_{F}	—	9.3	—	ns	
Reverse Recovery Time	t_{RR}	—	31.5	—	ns	$I_F = 6\text{A}$, $di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{RR}	—	94.6	—	nC	

Notes: 9. Short duration pulse test used to minimize self-heating effect.

10. Guaranteed by design. Not subject to product testing.

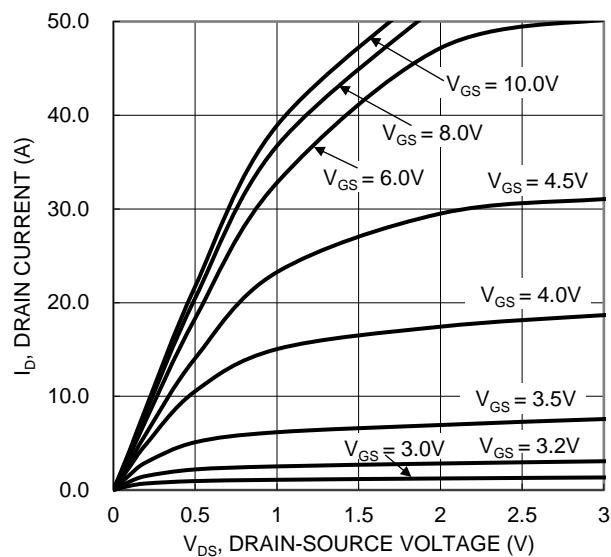


Figure 1. Typical Output Characteristic

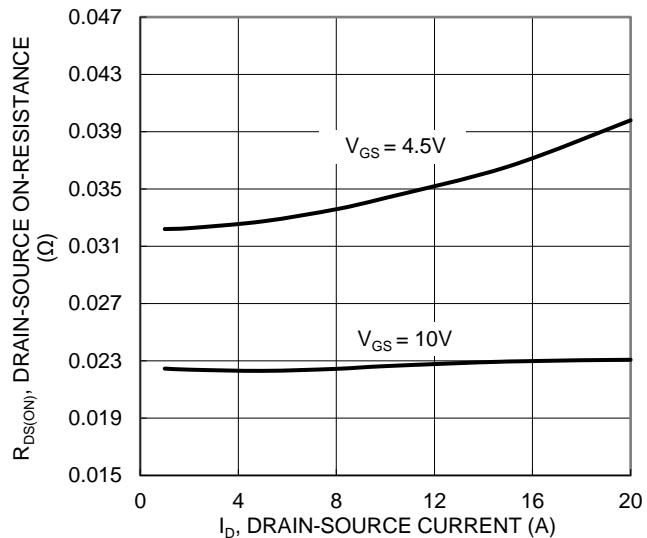


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

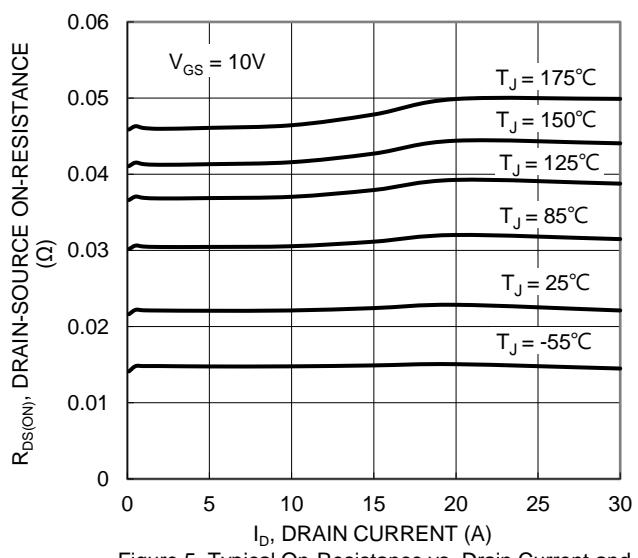


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

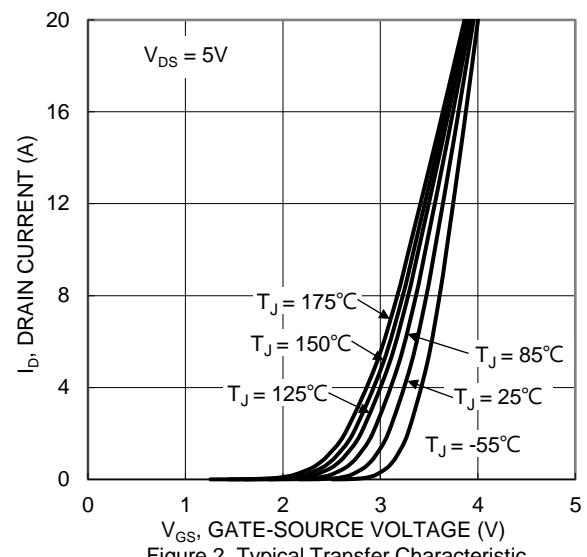


Figure 2. Typical Transfer Characteristic

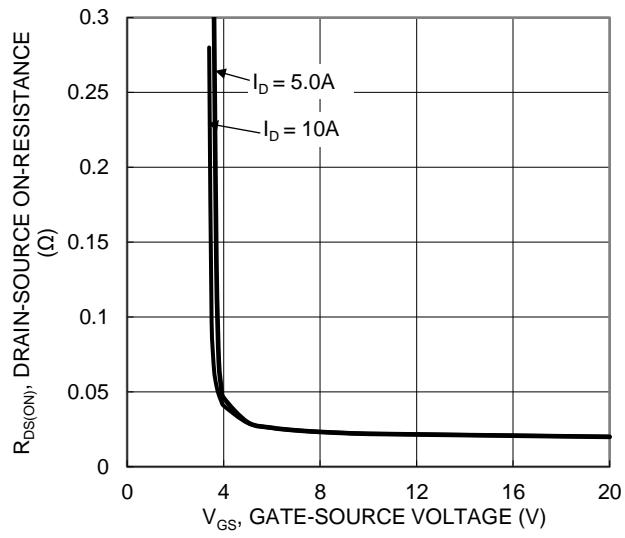


Figure 4. Typical Transfer Characteristic

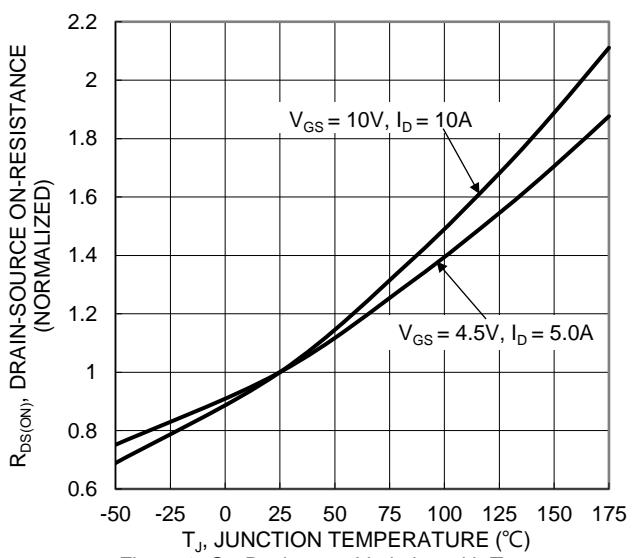
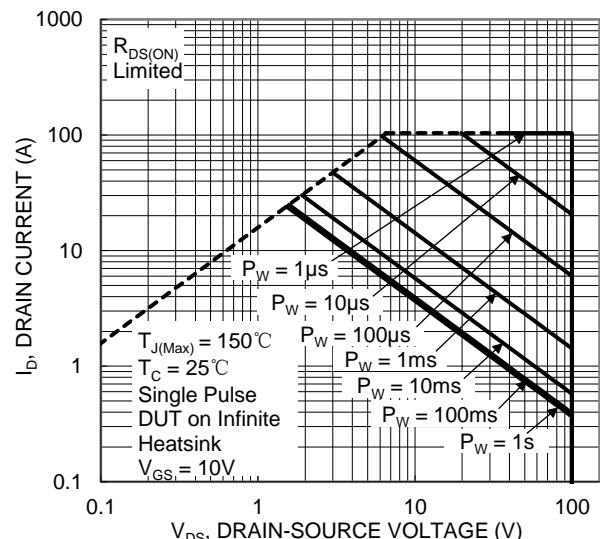
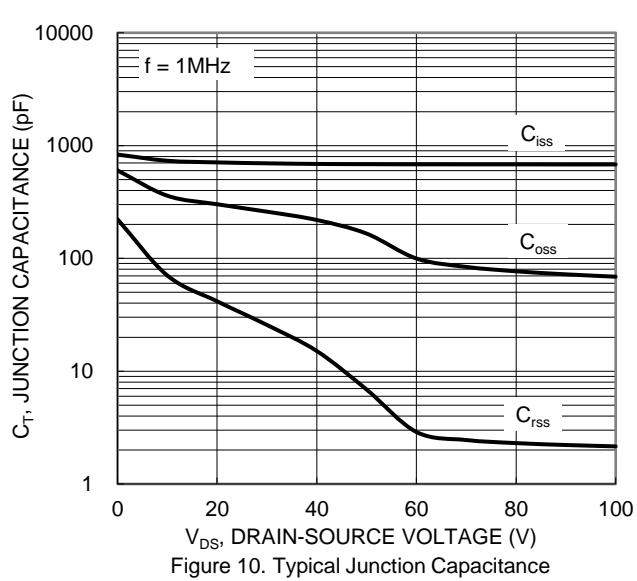
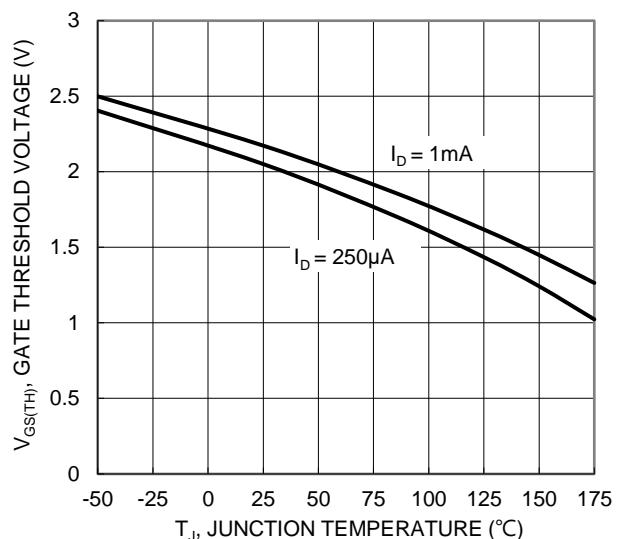
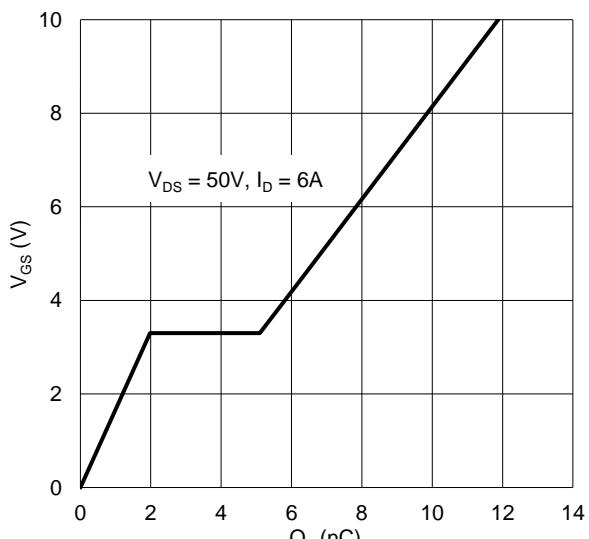
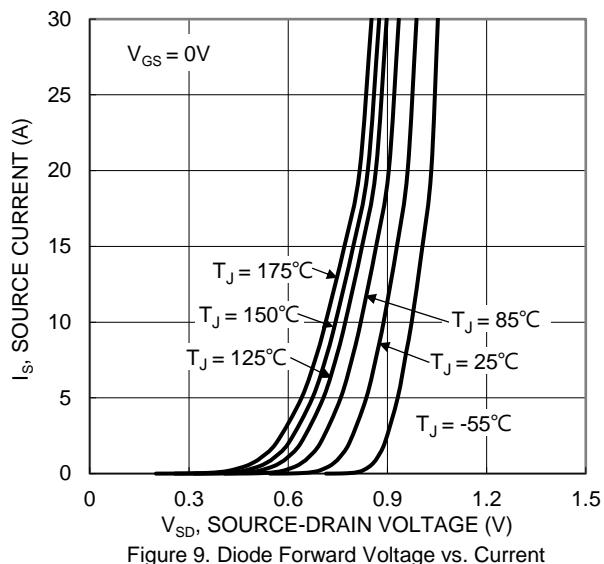
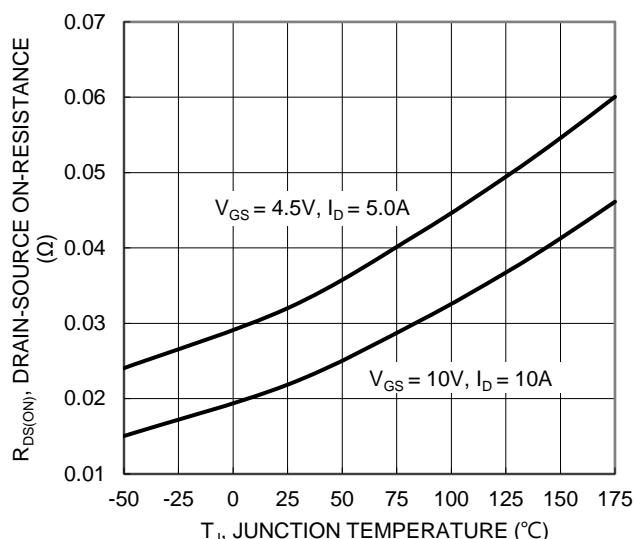


Figure 6. On-Resistance Variation with Temperature



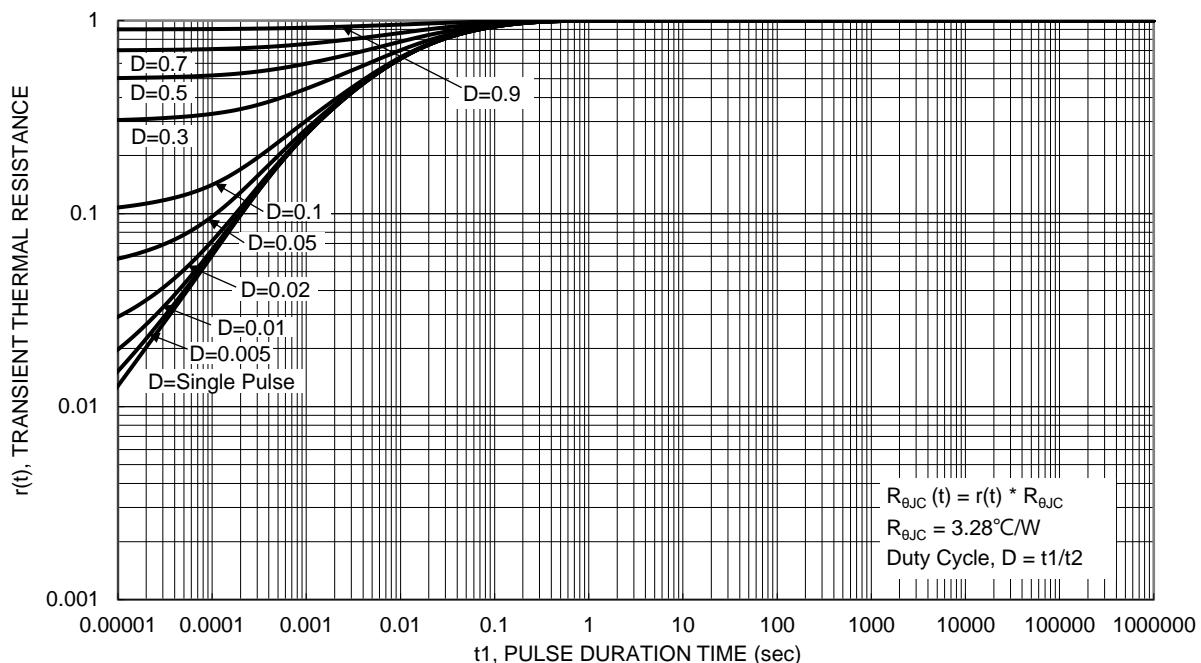
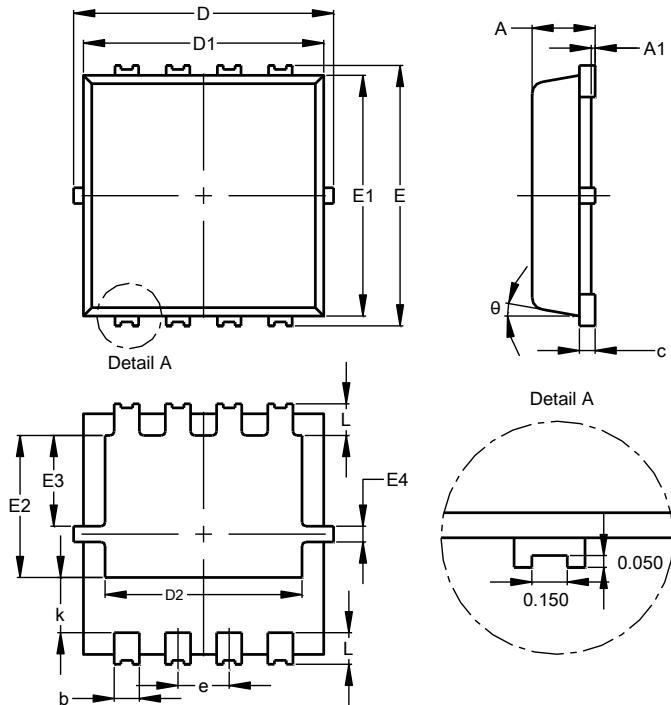


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)



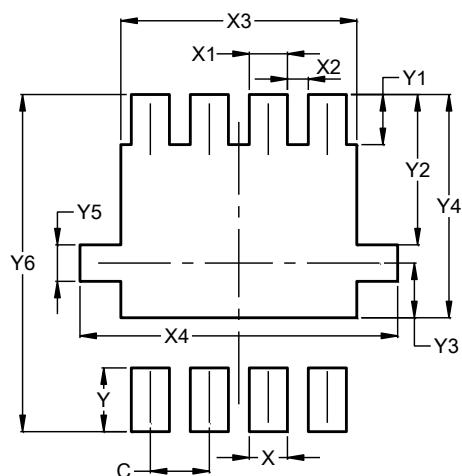
PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40
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)
C	0.650
X	0.420
X1	0.420
X2	0.230
X3	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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