

## Product Summary

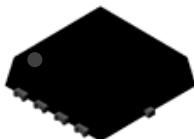
BVDSS	R <sub>D(S)</sub> Max	I <sub>D</sub> Max T <sub>C</sub> = +25°C
60V	8.3mΩ @ V <sub>GS</sub> = 10V	40.6A
	12.5mΩ @ V <sub>GS</sub> = 4.5V	33.1A

## Description and Applications

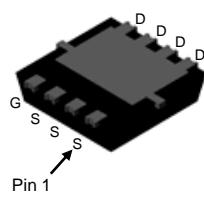
This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- Power Management Functions
- DC-DC Converters

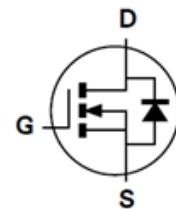
PowerDI3333-8 (SWP) (Type UX)



Top View



Bottom View



Equivalent Circuit

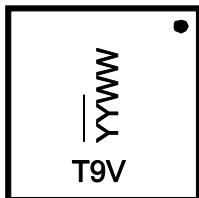
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMT69M5LFVWQ-7	PowerDI3333-8 (SWP) (Type UX)	2000/Tape & Reel
DMT69M5LFVWQ-13	PowerDI3333-8 (SWP) (Type UX)	3000/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



T9V = Product Type Marking Code

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 19 = 2019)

WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	60	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	$T_C = +25^\circ\text{C}$	40.6	A
	$T_C = +70^\circ\text{C}$	32.5	
	$T_A = +25^\circ\text{C}$	14.8	A
	$T_A = +70^\circ\text{C}$	11.9	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	160	A
Maximum Continuous Body Diode Forward Current (Note 5)	$I_S$	40	A
Pulsed Body Diode Forward Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{SM}$	160	A
Avalanche Current, $L = 0.1\text{mH}$	$I_{AS}$	27.4	A
Avalanche Energy, $L = 0.1\text{mH}$	$E_{AS}$	37.5	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	2.74	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	45.6	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)	$P_D$	20.5	W
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	6.1	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	1.4	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	6.2	8.3	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 13.5\text{A}$
		—	9.2	12.5		$V_{GS} = 4.5\text{V}, I_D = 11.5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.8	1.2	V	$V_{GS} = 0\text{V}, I_S = 13.5\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	1406	—	pF	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	540	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	52	—	pF	
Gate Resistance	$R_g$	—	1.85	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	28.4	—	nC	$V_{DS} = 30\text{V}, I_D = 13.5\text{A}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	15.4	—	nC	
Gate-Source Charge	$Q_{gs}$	—	2.4	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	9.0	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	10.5	—	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, R_g = 6\Omega, I_D = 13.5\text{A}$
Turn-On Rise Time	$t_R$	—	49.0	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	30.9	—	ns	
Turn-Off Fall Time	$t_F$	—	79.5	—	ns	
Body Diode Reverse Recovery Time	$t_{RR}$	—	26.7	—	ns	$I_F = 13.5\text{A}, di/dt = 300\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	$Q_{RR}$	—	44.8	—	nC	

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

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

7. Short duration pulse test used to minimize self-heating effect.

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

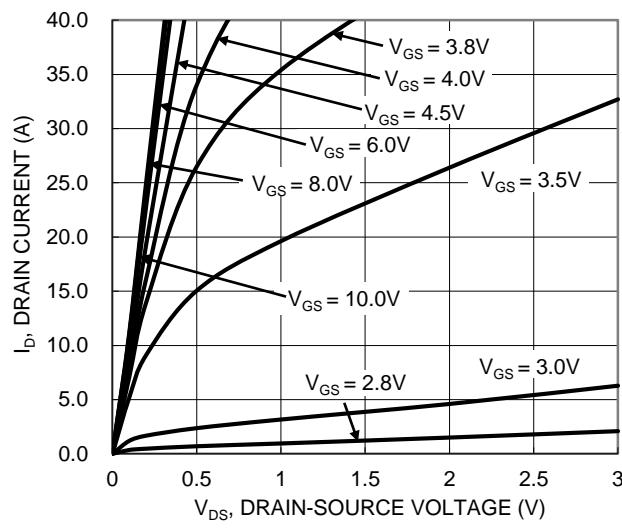


Figure 1. Typical Output Characteristic

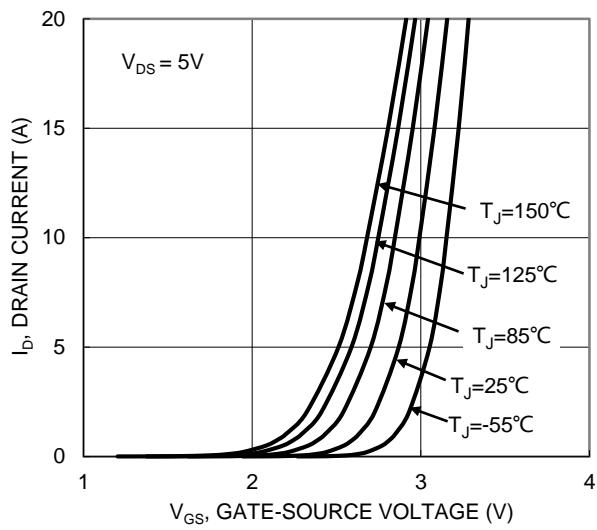


Figure 2. Typical Transfer Characteristic

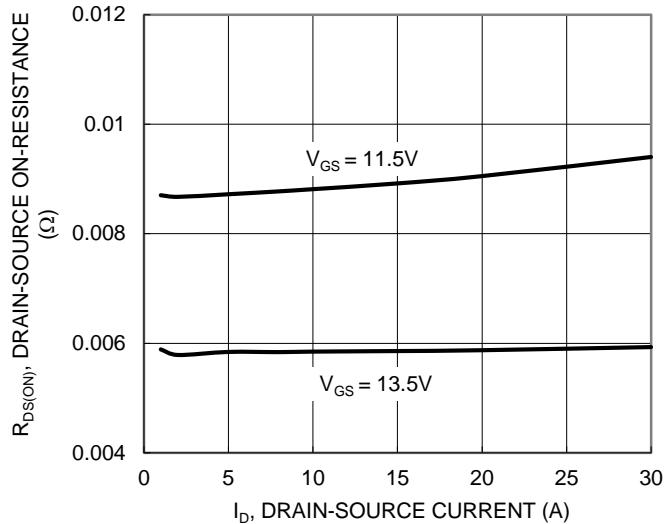


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

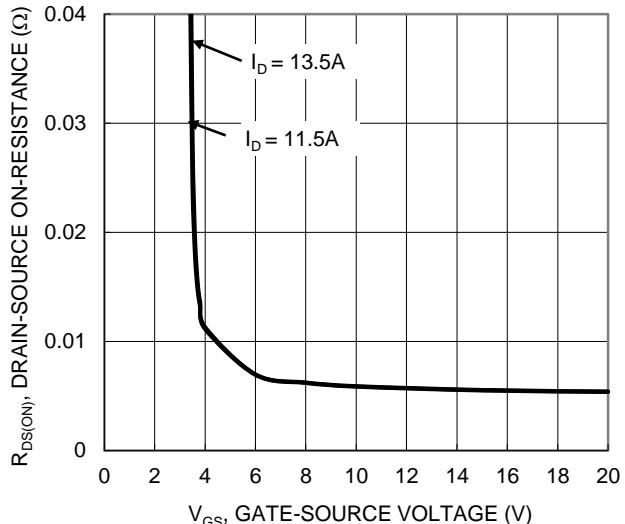


Figure 4. Typical Transfer Characteristic

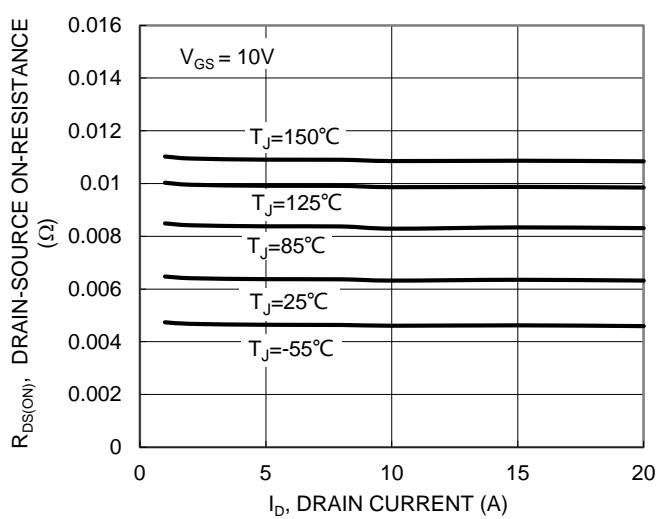


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

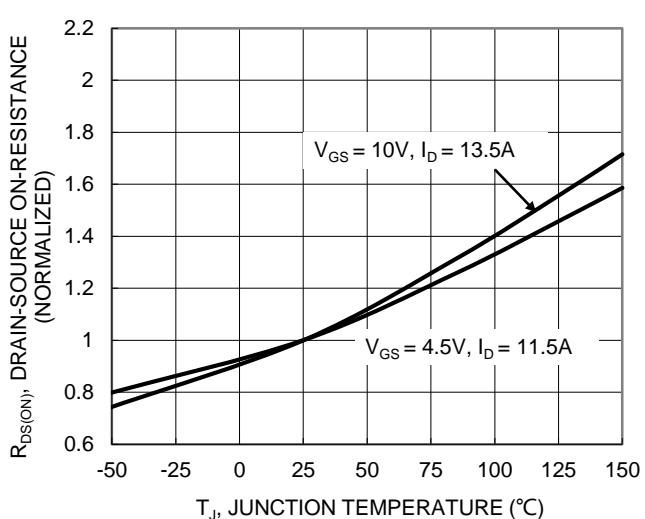
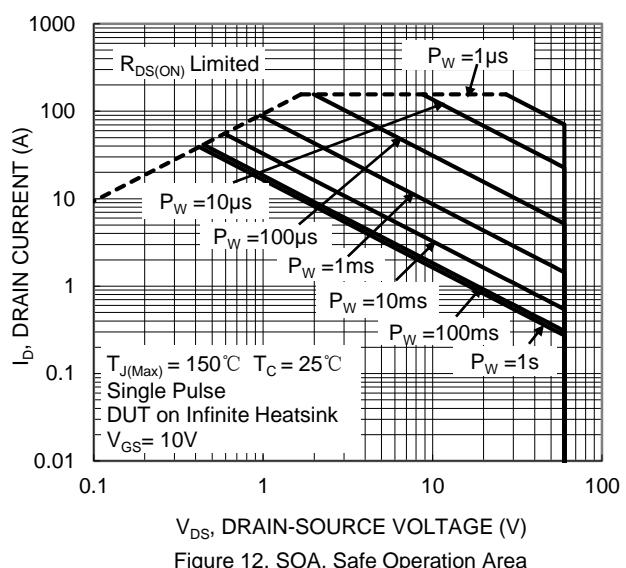
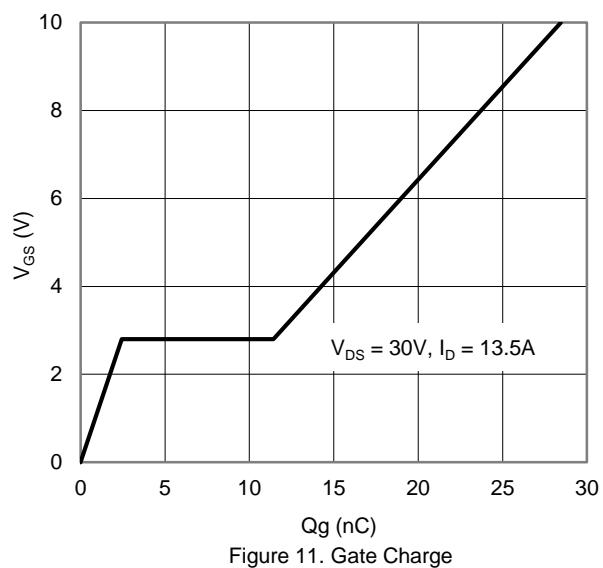
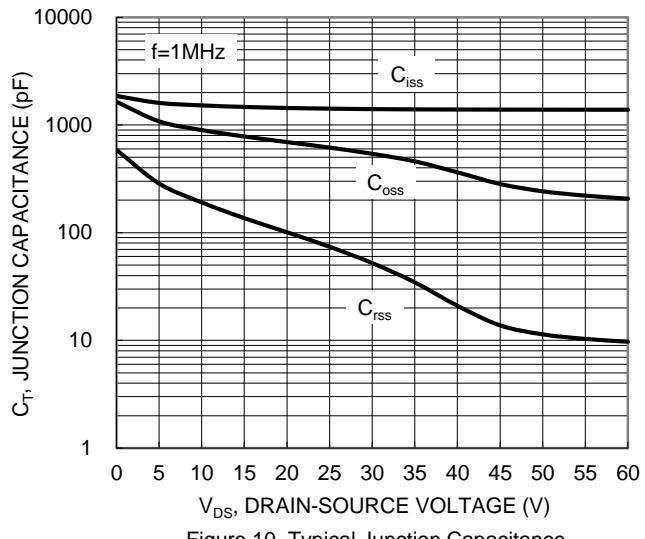
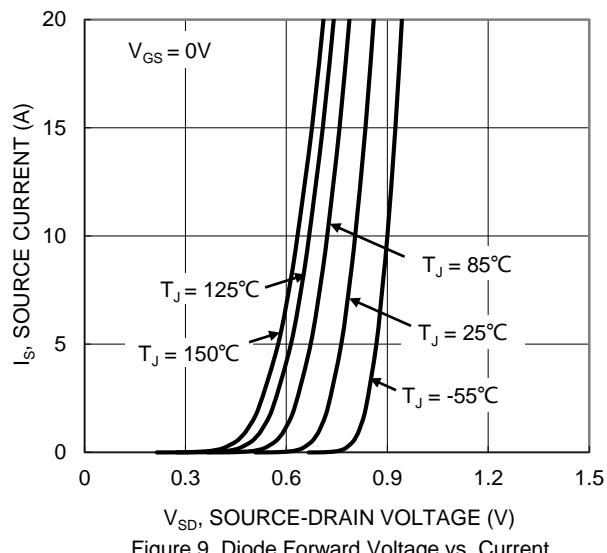
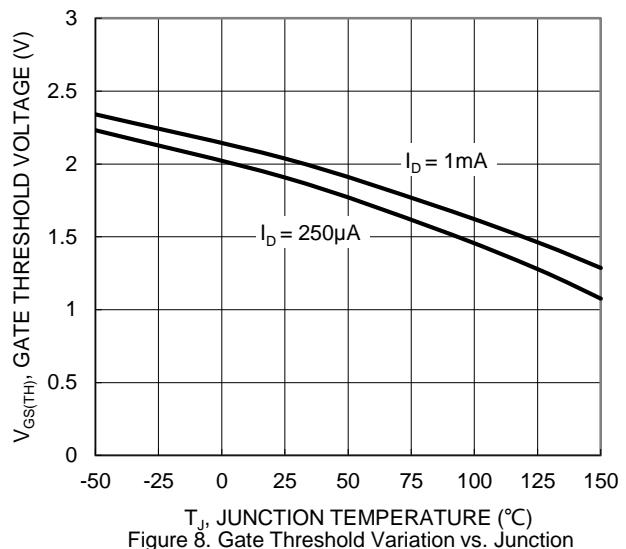
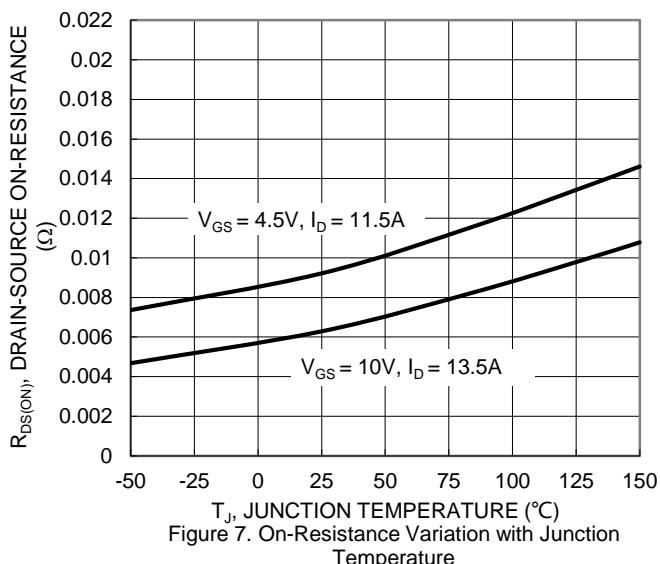


Figure 6. On-Resistance Variation with Junction Temperature



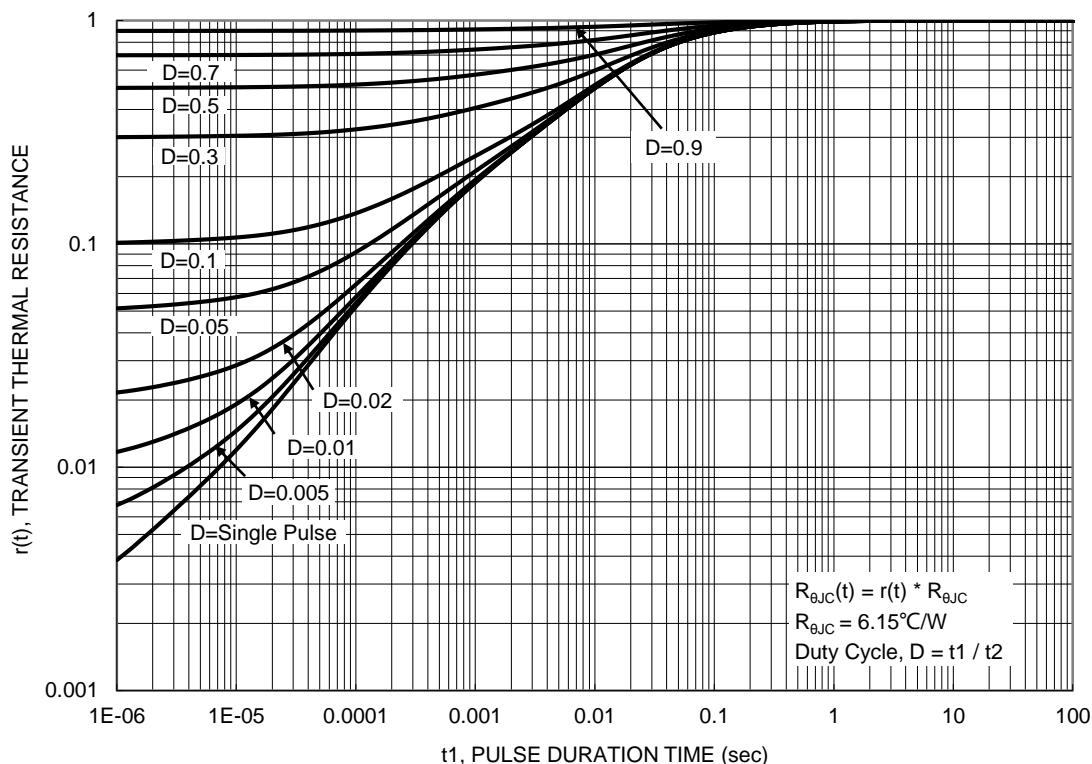
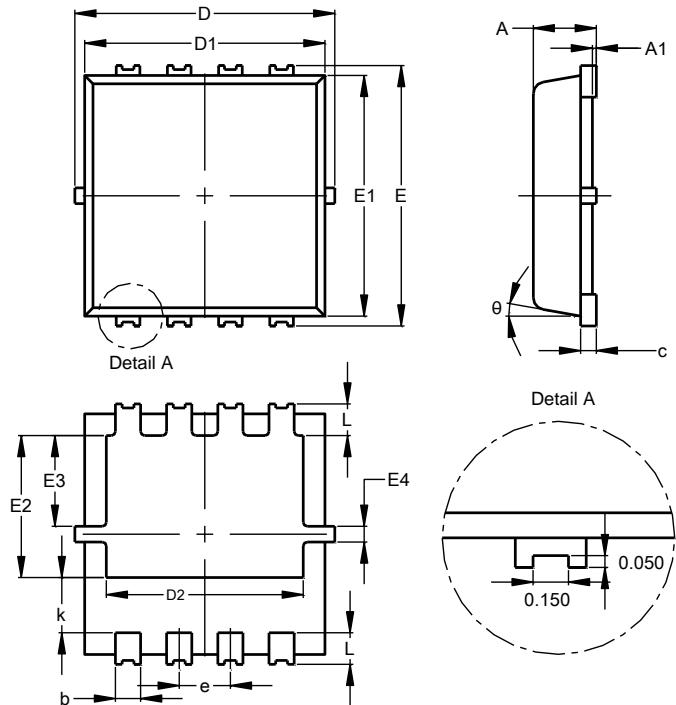


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)



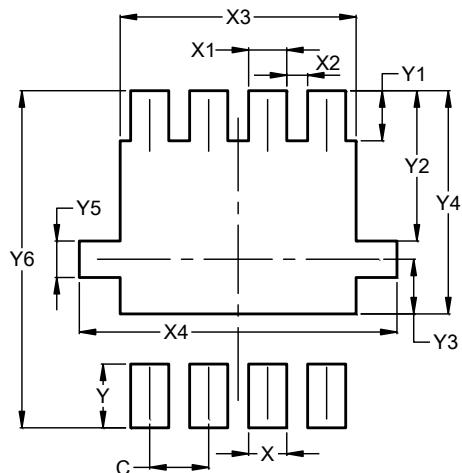
PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40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