

## Product Summary

BV <sub>DSS</sub>	R <sub>DSON</sub> Max	I <sub>D</sub> Max T <sub>C</sub> = +25°C
30V	5.0mΩ @ V <sub>GS</sub> = 10V	76A
	8.5mΩ @ V <sub>GS</sub> = 4.5V	58A

## Description

This MOSFET is designed to minimize the on-state resistance (R<sub>DSON</sub>), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

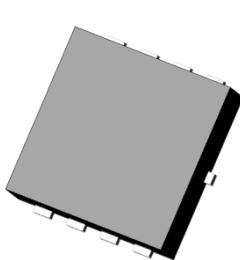
- Power Management Functions
- Analog Switch

## Features

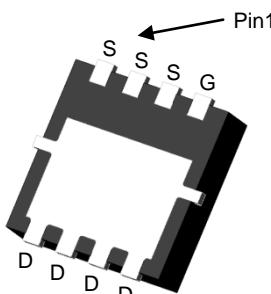
- Low R<sub>DSON</sub> – Ensures On-State Losses are Minimized
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- Occupies just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

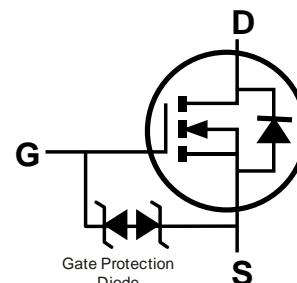
- Case: PowerDI® 3333-8 (Type UX)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.072 grams (Approximate)



Top View



Bottom View



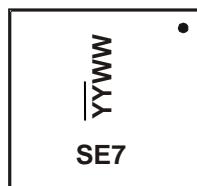
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMT35M7LFV-7	PowerDI3333-8 (Type UX)	2,000/Tape & Reel
DMT35M7LFV-13	PowerDI3333-8 (Type UX)	3,000/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



SE7 = 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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 7)	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	$I_D$	76 61	A
Maximum Body Diode Forward Current (Note 6)			$I_S$	2.7	A
Pulsed Drain Current (380 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{DM}$	90	A
Pulsed Body Diode Forward Current (380 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{SM}$	90	A
Avalanche Current ( $L = 0.1\text{mH}$ ) (Note 8)			$I_{AS}$	28	A
Avalanche Energy ( $L = 0.1\text{mH}$ ) (Note 8)			$E_{AS}$	39	mJ

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			$P_D$	0.95	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		$R_{\theta JA}$	131	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)			$P_D$	1.98	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		$R_{\theta JA}$	63	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 7)			$R_{\theta JC}$	2.9	
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</b> (Note 9)						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current ( $T_J = +25^\circ\text{C}$ )	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS</b> (Note 9)						
Gate Threshold Voltage	$V_{GS(\text{TH})}$	1.0	—	2.4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	3.6	5.0	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
		—	6.8	8.5		$V_{GS} = 4.5\text{V}, I_D = 16\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.7	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS</b> (Note 10)						
Input Capacitance	$C_{iss}$	—	1,667	—	$\text{pF}$	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	573	—		
Reverse Transfer Capacitance	$C_{rss}$	—	534	—		
Gate Resistance	$R_g$	—	0.75	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	21	—	$\text{nC}$	$V_{DD} = 15\text{V}, I_D = 20\text{A}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	36	—		
Gate-Source Charge	$Q_{gs}$	—	4.8	—		
Gate-Drain Charge	$Q_{gd}$	—	14	—		
Turn-On Delay Time	$t_{D(\text{ON})}$	—	5.3	—	$\text{ns}$	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_g = 3\Omega, I_D = 20\text{A}$
Turn-On Rise Time	$t_R$	—	12.3	—		
Turn-Off Delay Time	$t_{D(\text{OFF})}$	—	18.0	—		
Turn-Off Fall Time	$t_F$	—	15.5	—		
Reverse Recovery Time	$t_{RR}$	—	16	—	$\text{ns}$	$I_F = 15\text{A}, di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	14	—	$\text{nC}$	

- 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 1inch 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  $T_J = +25^\circ\text{C}$ .
  9. Short duration pulse test used to minimize self-heating effect.
  10. Guaranteed by design. Not subject to product testing.

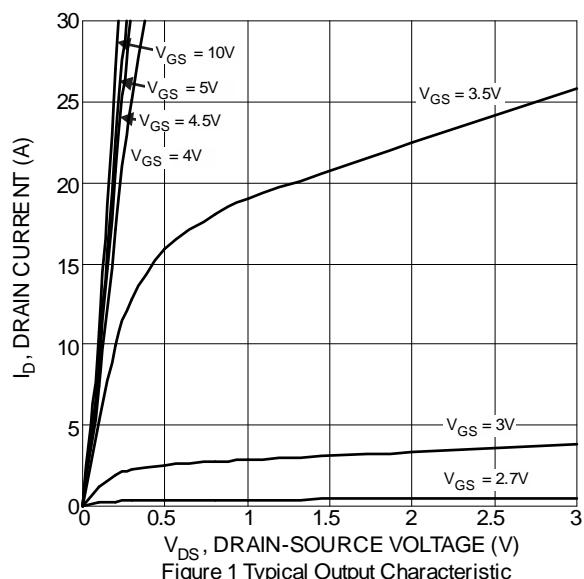


Figure 1 Typical Output Characteristics

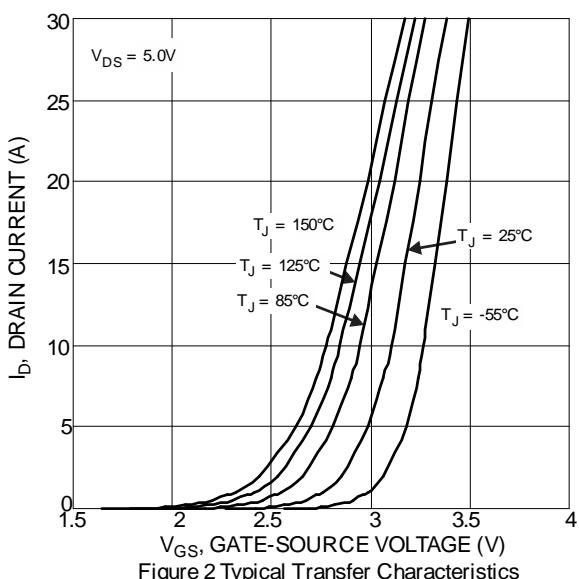


Figure 2 Typical Transfer Characteristics

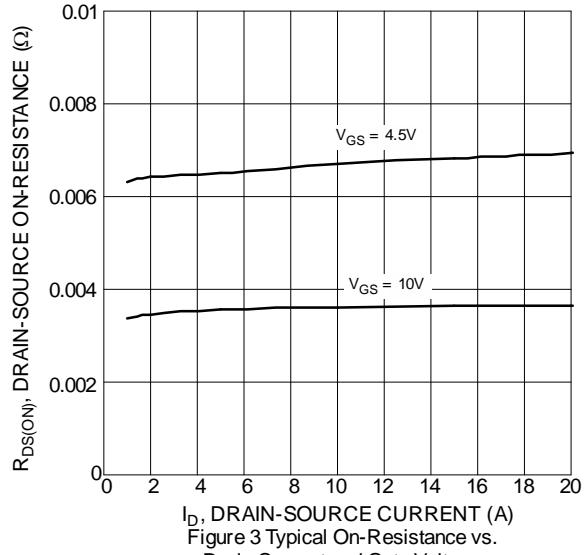


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

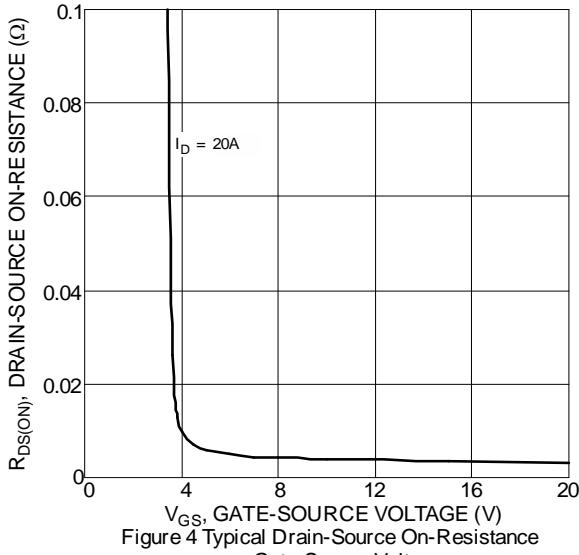


Figure 4 Typical Drain-Source On-Resistance  
vs. Gate-Source Voltage

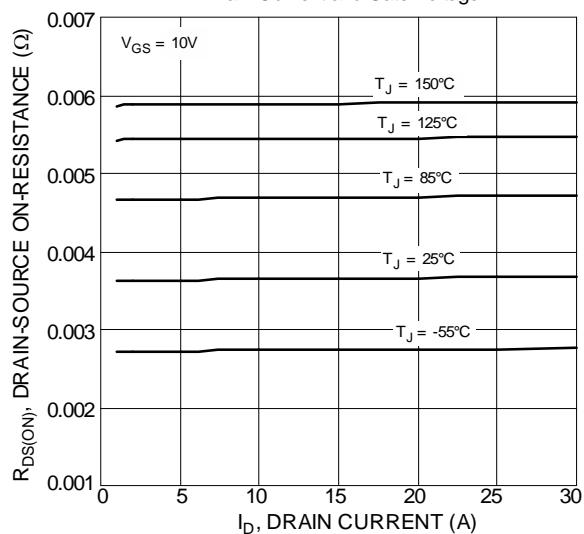


Figure 5 Typical On-Resistance vs.  
Drain Current and Temperature

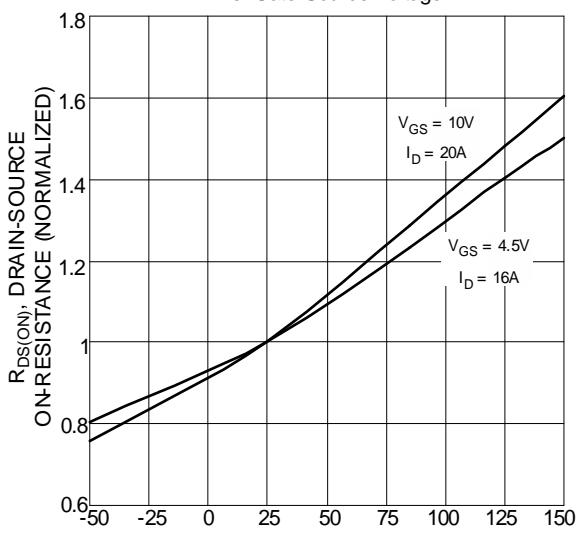


Figure 6 On-Resistance Variation with Temperature

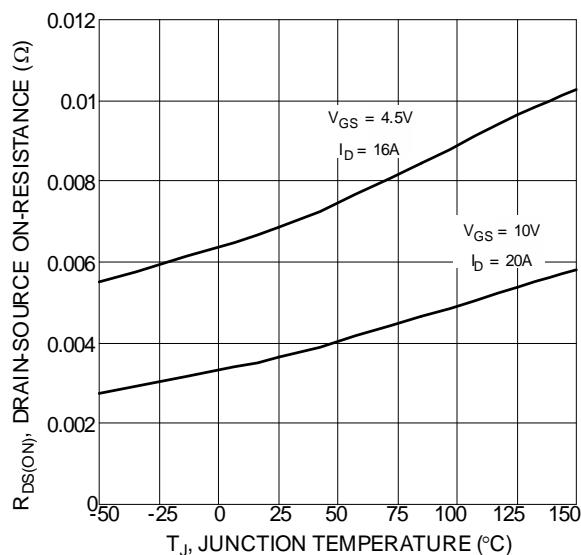


Figure 7 On-Resistance Variation with Temperature

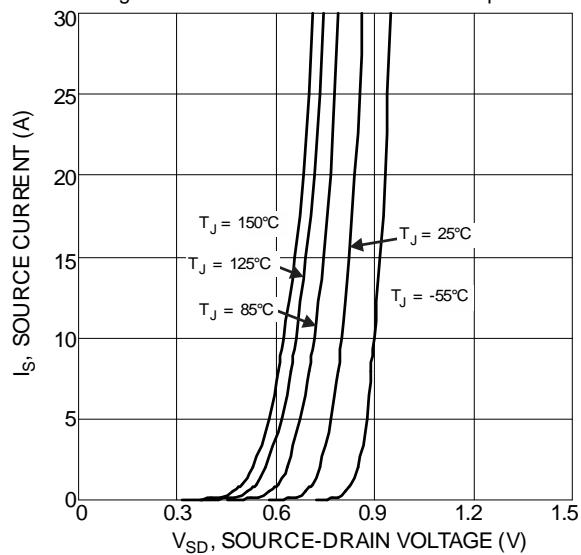


Figure 9 Diode Forward Voltage vs. Current

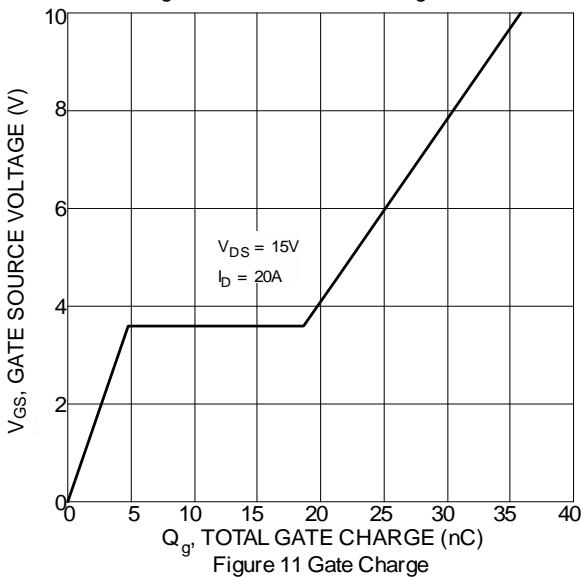


Figure 11 Gate Charge

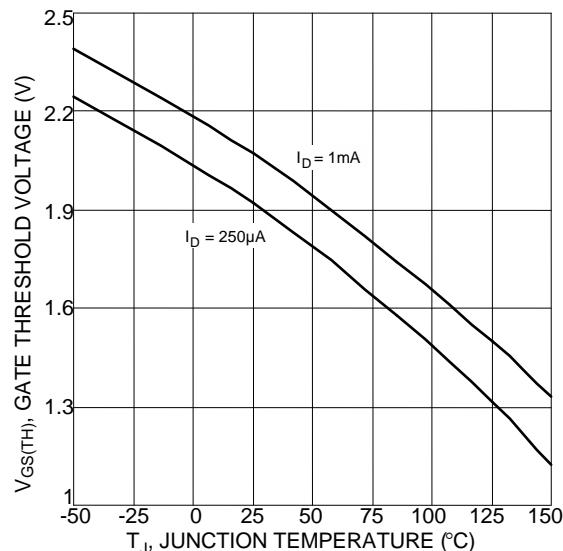


Figure 8 Gate Threshold Variation vs. Junction Temperature

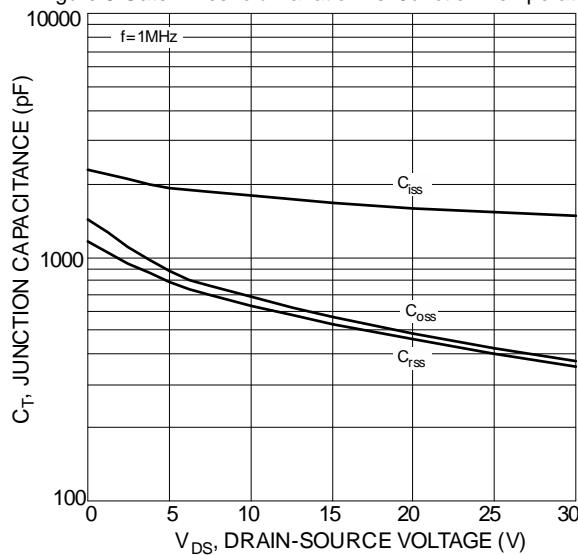


Figure 10 Typical Junction Capacitance

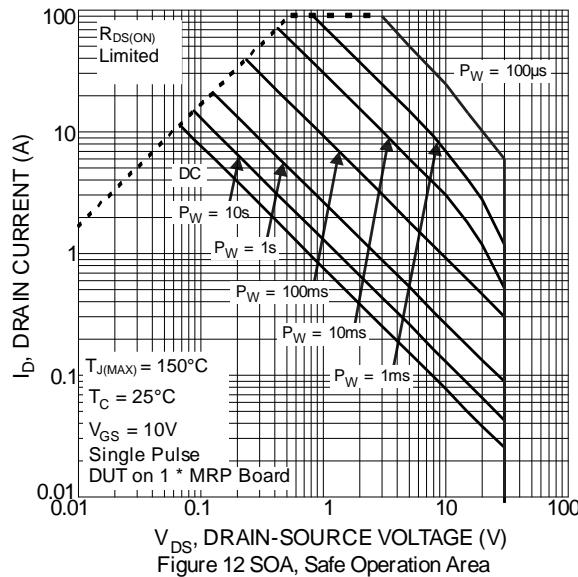


Figure 12 SOA, Safe Operation Area

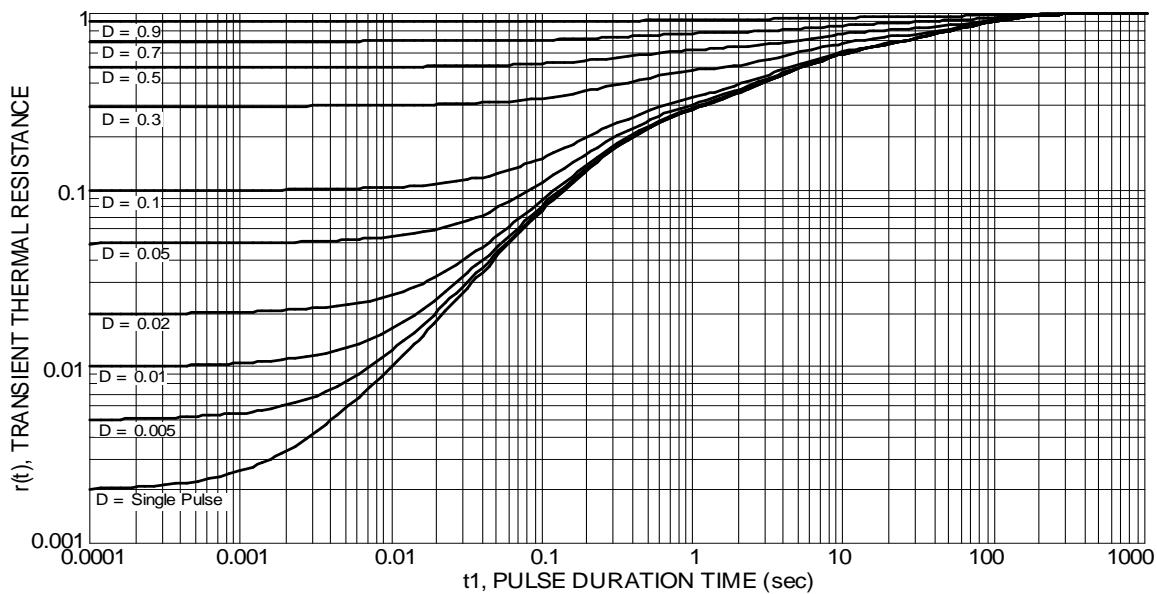
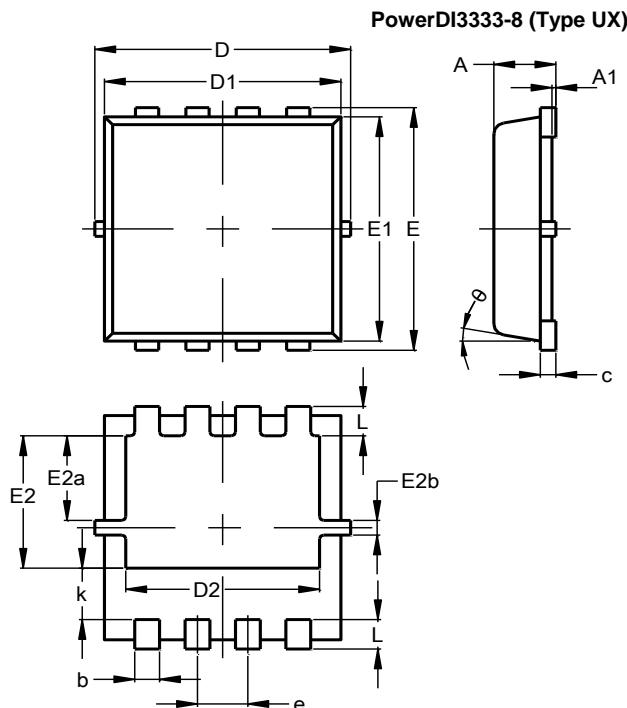


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

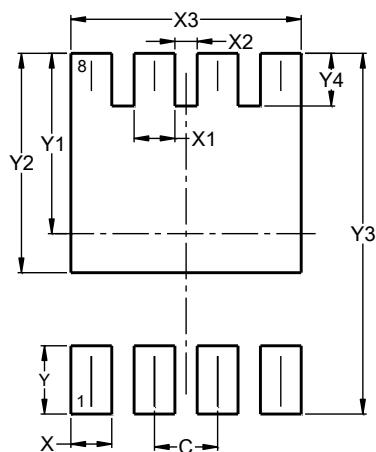


PowerDI3333-8 (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E2a	0.95	1.35	1.15
E2b	0.10	0.30	0.20
e	0.65 BSC		
k	0.50	0.90	0.70
L	0.30	0.50	0.40
$\theta$	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 (Type UX)



Dimensions	Value (in mm)
C	0.650
X	0.420
X1	0.420
X2	0.230
X3	2.370
Y	0.700
Y1	1.850
Y2	2.250
Y3	3.700
Y4	0.540

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