

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(on)</sub> Max	I <sub>D</sub> Max T <sub>C</sub> = +25°C
-30V	10mΩ @ V <sub>GS</sub> = -10V	-50A
	18mΩ @ V <sub>GS</sub> = -4.5V	-37A

## Description

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


## Applications

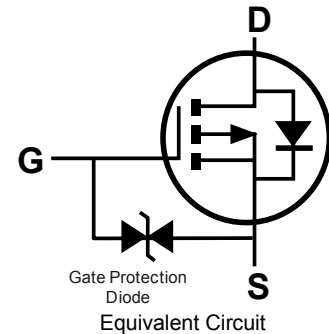
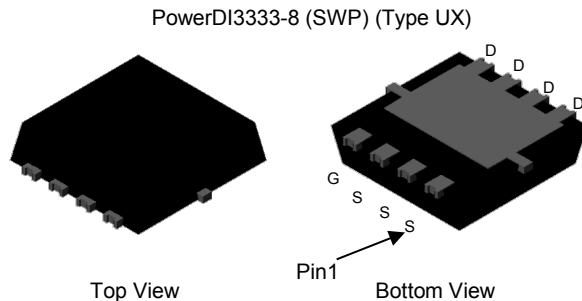
- General Purpose Interfacing Switch
- Power Management Functions

## Features and Benefits

- Low R<sub>DS(on)</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)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Case: PowerDI<sup>®</sup> 3333-8
- 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 
- Weight: 0.072 grams (Approximate)

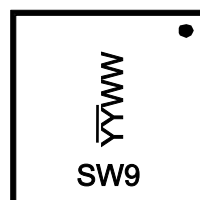


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3011SFVW-7	PowerDI3333-8 (SWP) (Type UX)	2,000/Tape & Reel
DMP3011SFVW-13	PowerDI3333-8 (SWP) (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



SW9 = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Two Digits of Year (ex: 21 = 2021)  
WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DS}$	-30	V
Gate-Source Voltage			$V_{GS}$	$\pm 25$	V
Continuous Drain Current (Note 6) $V_{GS} = -10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-19.8 -12	A
Continuous Drain Current (Note 7) $V_{GS} = -10\text{V}$	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	$I_D$	-50 -40	A
Maximum Continuous Body Diode Forward Current (Note 7)			$I_S$	-2.9	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{DM}$	-176	A
Pulsed Body Diode Forward Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{SM}$	-176	A
Avalanche Current (Note 8) $L = 1\text{mH}$			$I_{AS}$	-14	A
Avalanche Energy (Note 8) $L = 1\text{mH}$			$E_{AS}$	104	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	$P_D$	0.98	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	127	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	$P_D$	2.25	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	55	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	3.3	$^\circ\text{C/W}$
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 9)</b>						
Drain-Source Breakdown Voltage	$BV_{DS}$	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	—	-3.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	8	10	m $\Omega$	$V_{GS} = -10\text{V}, I_D = -11.5\text{A}$
		—	13	18		$V_{GS} = -4.5\text{V}, I_D = -8.5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	-0.7	-1.2	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	$C_{iss}$	—	2380	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	341	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	296	—	pF	
Gate Resistance	$R_g$	—	3	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = -5\text{V}$ )	$Q_g$	—	25	—	nC	$V_{DS} = -15\text{V}, I_D = -11.5\text{A}$
Total Gate Charge ( $V_{GS} = -10\text{V}$ )	$Q_g$	—	46	—	nC	
Gate-Source Charge	$Q_{gs}$	—	6.8	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	13	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	6	—	ns	$V_{DD} = -15\text{V}, V_{GS} = -10\text{V},$ $R_G = 6\Omega, I_D = -11.5\text{A}$
Turn-On Rise Time	$t_R$	—	22	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	43	—	ns	
Turn-Off Fall Time	$t_F$	—	33	—	ns	
Reverse Recovery Time	$t_{RR}$	—	19	—	ns	$I_S = -11.5\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	8.9	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
  - Thermal resistance from junction to soldering point (on the exposed drain pad).
  - $I_{AS}$  and  $E_{AS}$  ratings are based on low frequency and duty cycles to keep  $T_J = +25^\circ\text{C}$ .
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

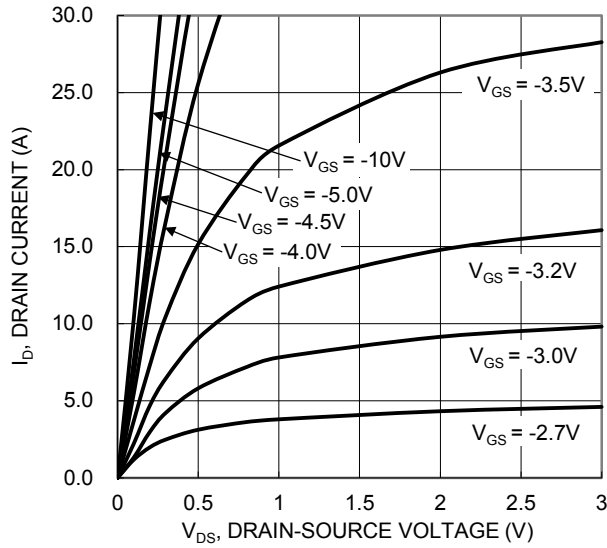


Figure 1. Typical Output Characteristic

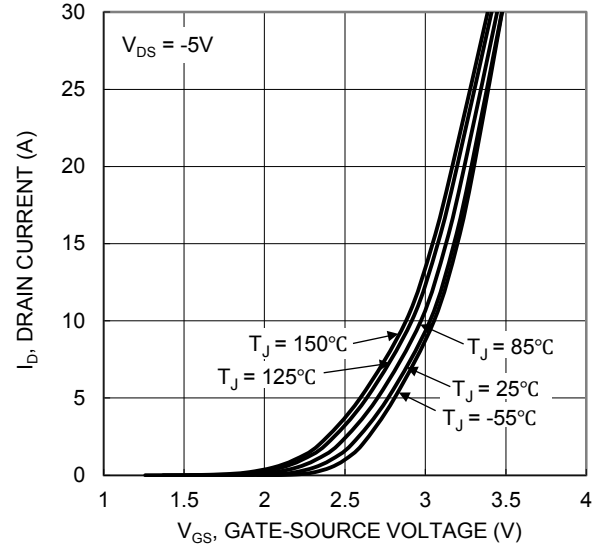


Figure 2. Typical Transfer Characteristic

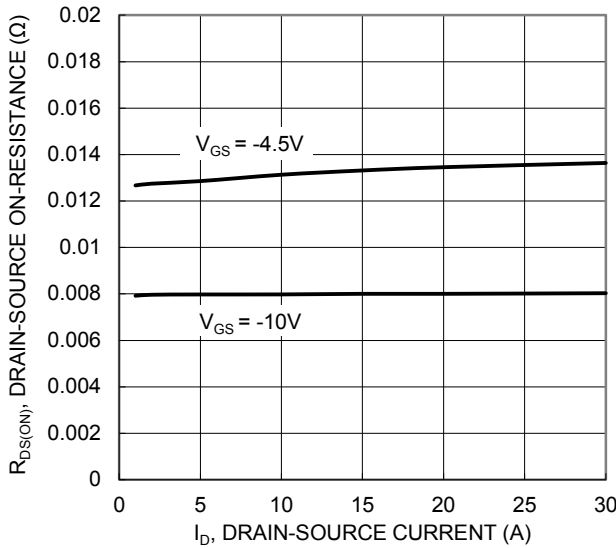


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

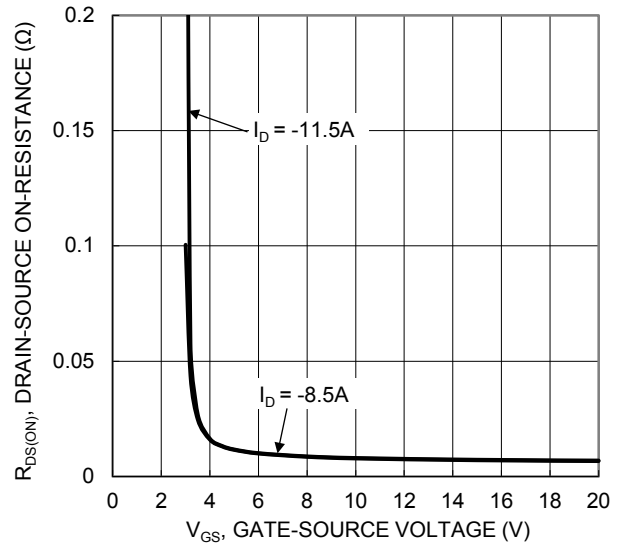


Figure 4. Typical Transfer Characteristic

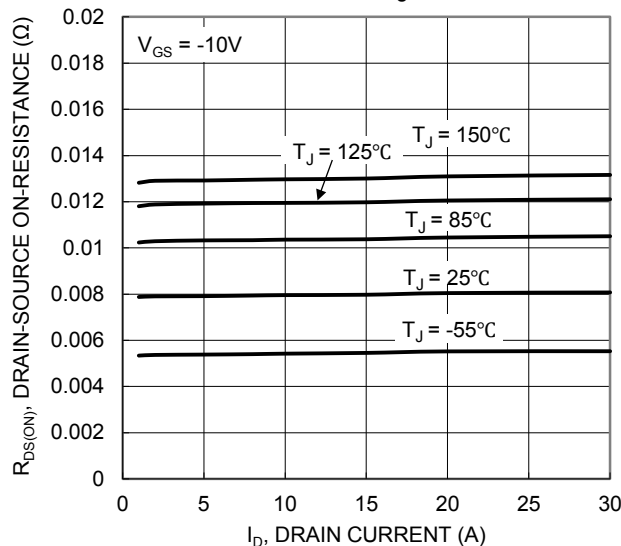


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

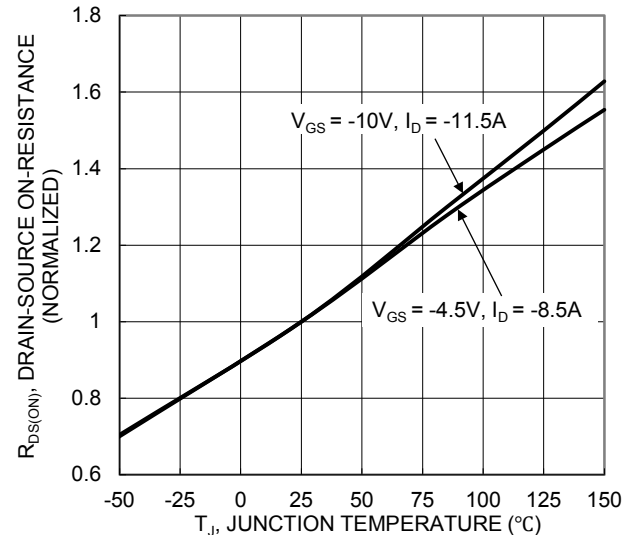
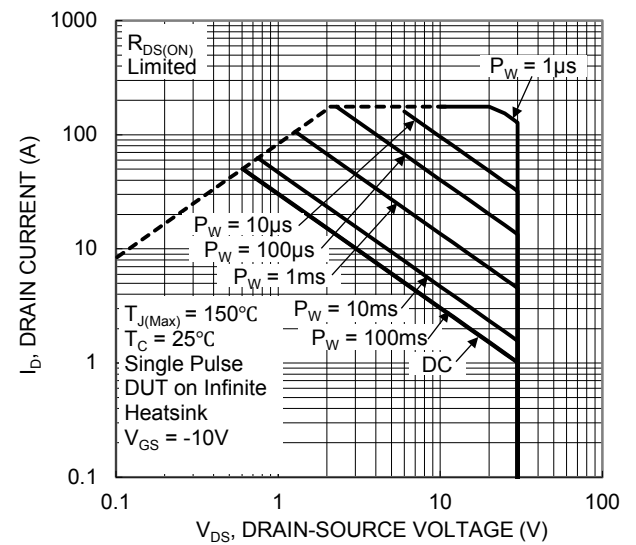
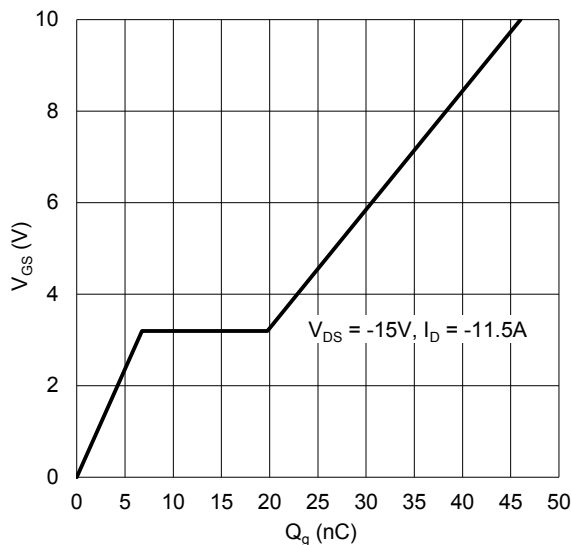
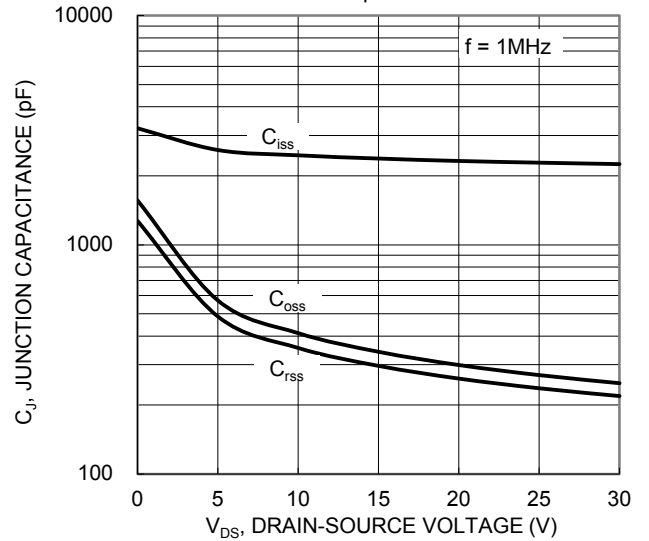
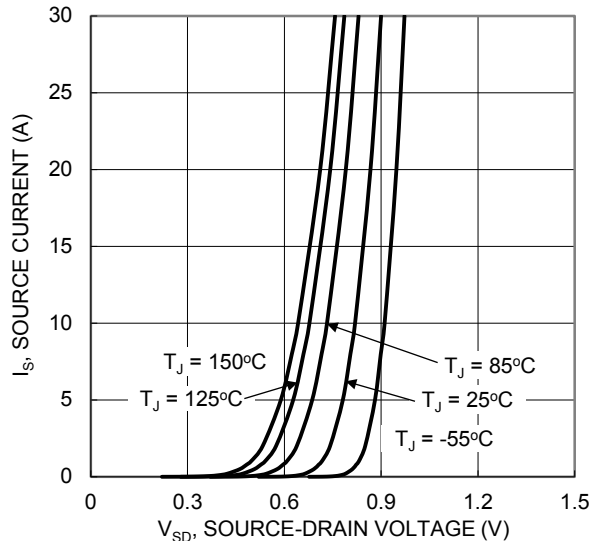
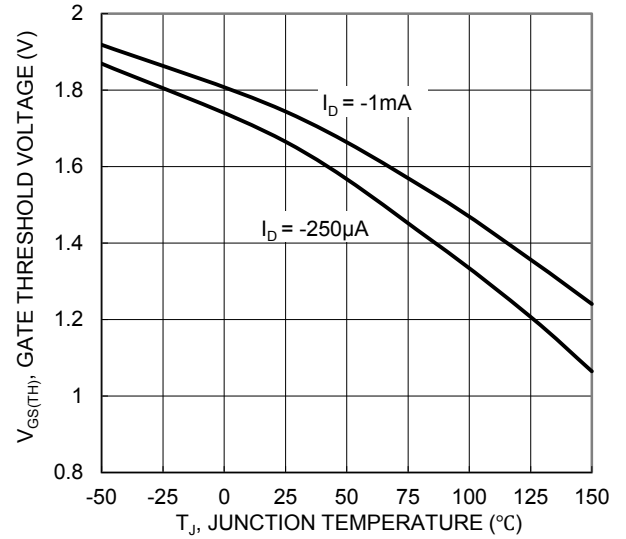
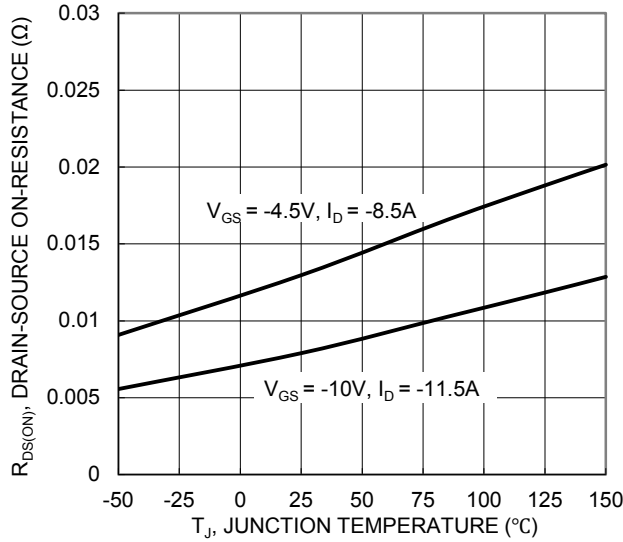


Figure 6. On-Resistance Variation with Junction Temperature



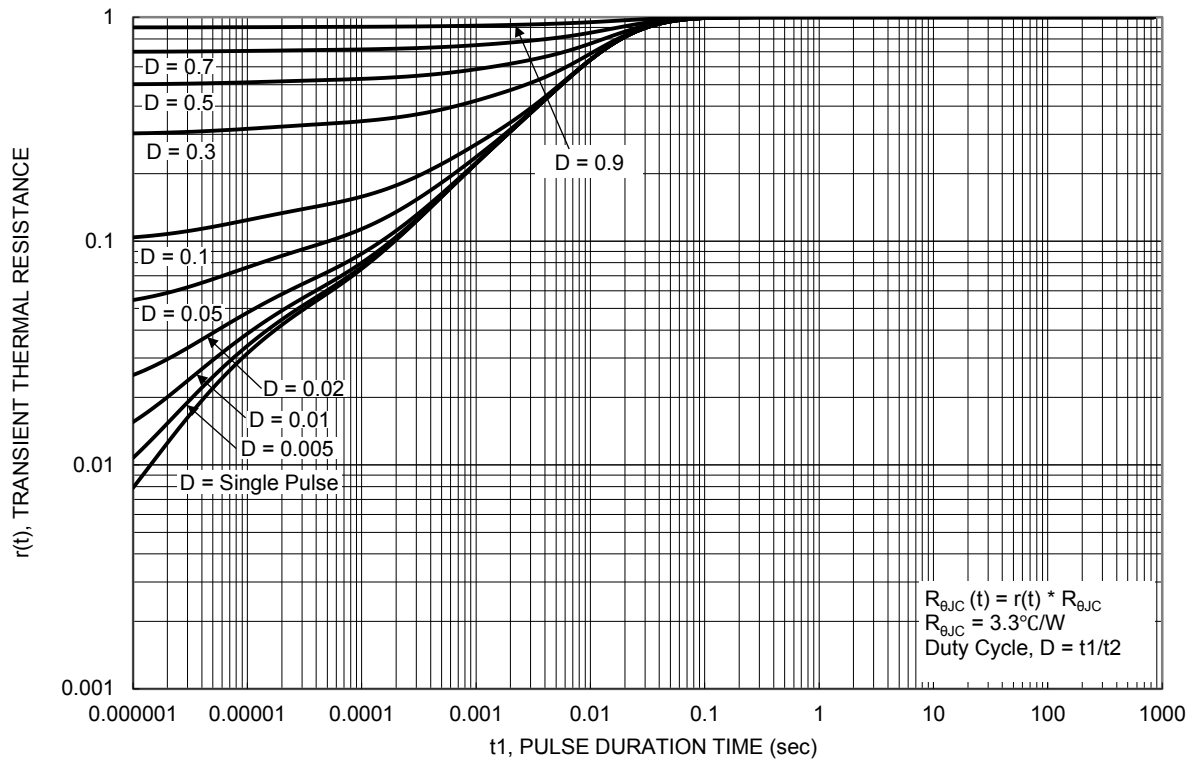
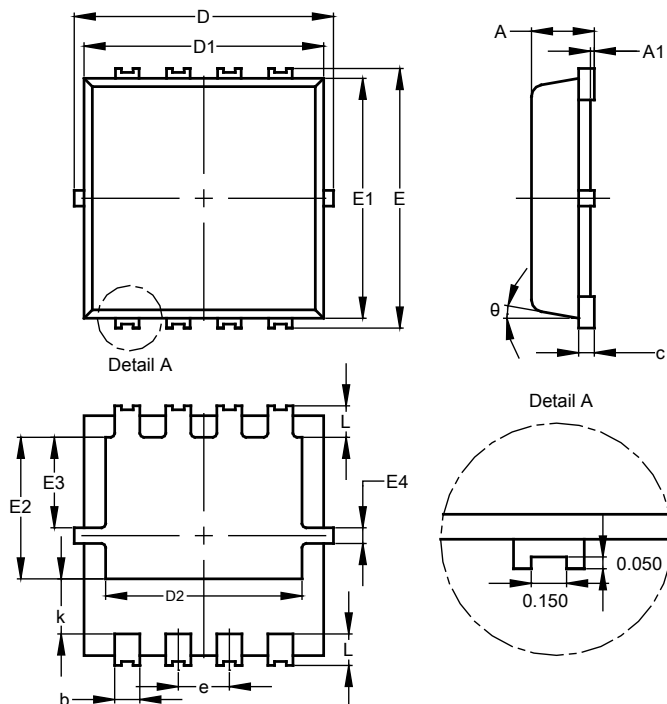


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

### PowerDI3333-8 (SWP) (Type UX)

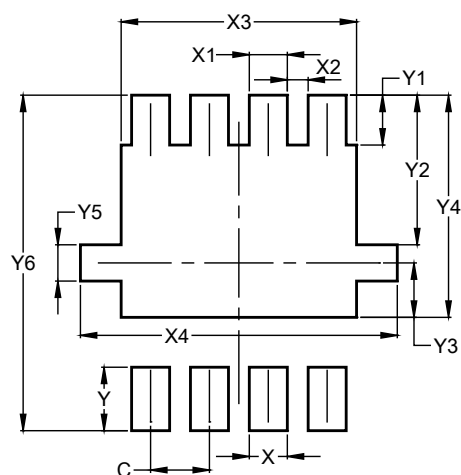


PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40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