

## Product Summary

<b>BV<sub>DSS</sub></b>	<b>R<sub>D(S(ON))</sub> max</b>	<b>I<sub>D</sub> max</b> <b>T<sub>C</sub> = +25°C</b>
30V	12mΩ @ V <sub>GS</sub> = 10V	21A
	17mΩ @ V <sub>GS</sub> = 4.5V	18A

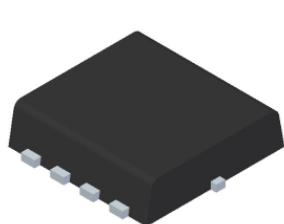
## Description

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

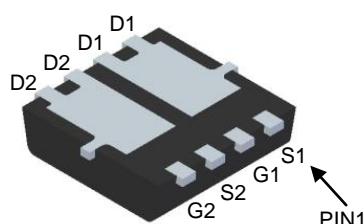
## Applications

- Power Management Functions
- Analog Switch

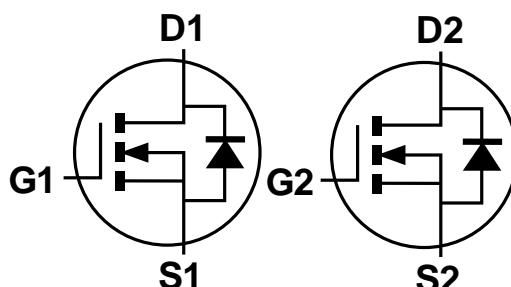
PowerDI3333-8 (Type UXC)



Top View



Bottom View



Equivalent Circuit

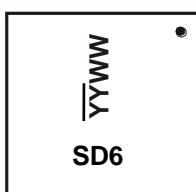
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3016LDV-7	PowerDI3333-8 (Type UXC)	2000/Tape & Reel
DMN3016LDV-13	PowerDI3333-8 (Type UXC)	3000/Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

## Marking Information



SD6 = Product Type Marking Code

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 16 for 2016)

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	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	$I_D$	21 17	A
Maximum Body Diode Forward Current (Note 6)			$I_S$	2	A
Pulsed Drain Current (380 $\mu\text{s}$ pulse, Duty cycle = 1%)			$I_{DM}$	70	A
Avalanche Current (L = 0.1mH) (Note 8)			$I_{AS}$	22	A
Avalanche Energy (L = 0.1mH) (Note 8)			$E_{AS}$	24	$\text{mJ}$

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			$P_D$	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		$R_{\theta JA}$	134	$^\circ\text{C/W}$
	$t < 10\text{s}$			78	
Total Power Dissipation (Note 6)			$P_D$	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		$R_{\theta JA}$	70	$^\circ\text{C/W}$
	$t < 10\text{s}$			41	
Thermal Resistance, Junction to Case (Note 7)			$R_{\theta JC}$	15	
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	$BV_{DSS}$	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	$\mu\text{A}$	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	1.4	-	2.0	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	9.5	12	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 7\text{A}$
			14	17		$V_{GS} = 4.5\text{V}, I_D = 7\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.70	1.0	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	$C_{iss}$	-	1184	-	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	137	-		
Reverse Transfer Capacitance	$C_{rss}$	-	107	-		
Gate Resistance	$R_g$	-	3.0	-	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	-	9.5	-	nC	$V_{DS} = 15\text{V}, I_D = 12\text{A}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	-	21	-		
Gate-Source Charge	$Q_{gs}$	-	3.8	-		
Gate-Drain Charge	$Q_{qd}$	-	4.1	-		
Turn-On Delay Time	$t_{D(ON)}$	-	4.5	-	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 1.5\Omega, R_G = 3\Omega$
Turn-On Rise Time	$t_R$	-	3.3	-		
Turn-Off Delay Time	$t_{D(OFF)}$	-	14	-		
Turn-Off Fall Time	$t_F$	-	3.6	-		
Reverse Recovery Time	$t_{RR}$	-	9.3	-	ns	$I_F = 12\text{A}, di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	-	2.5	-	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  $E_{AS}$  rating 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.

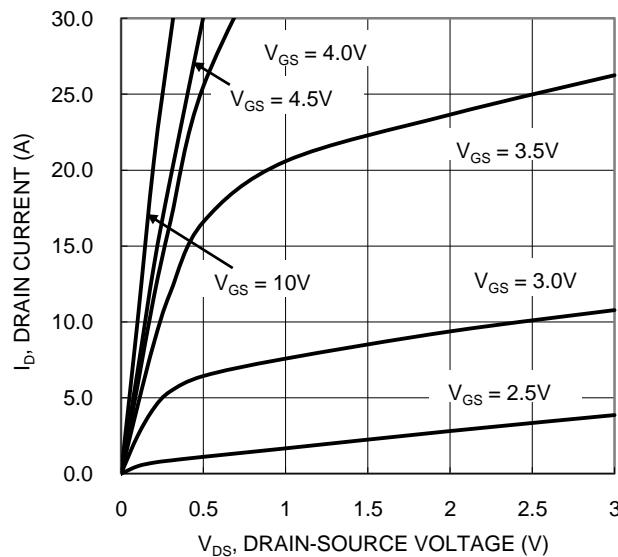


Figure 1. Typical Output Characteristic

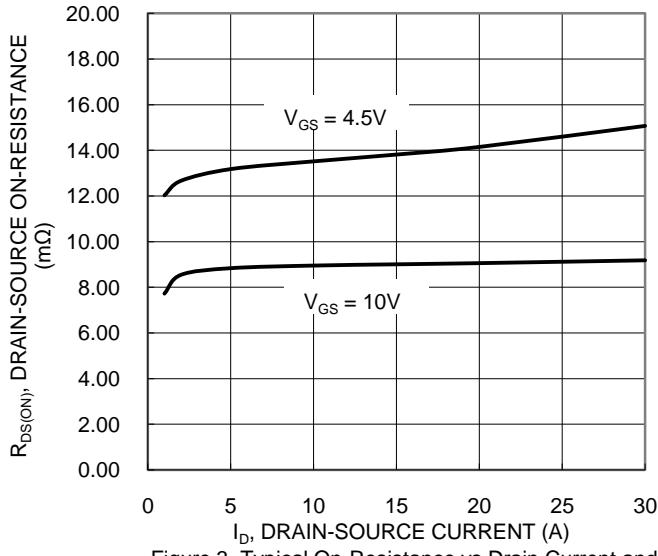


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

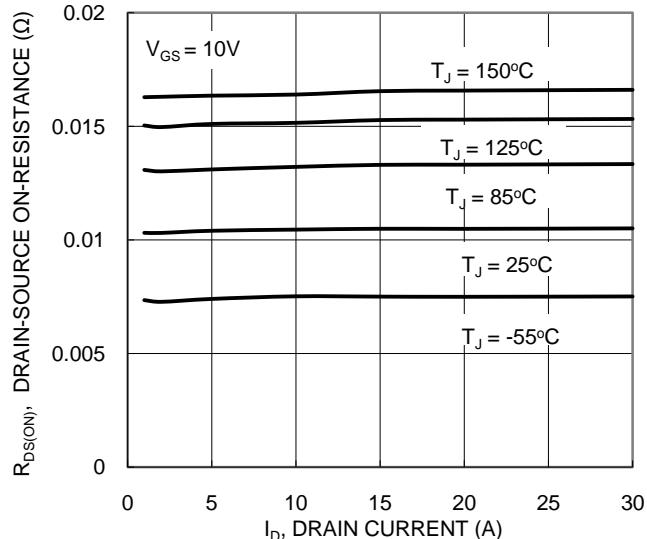


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

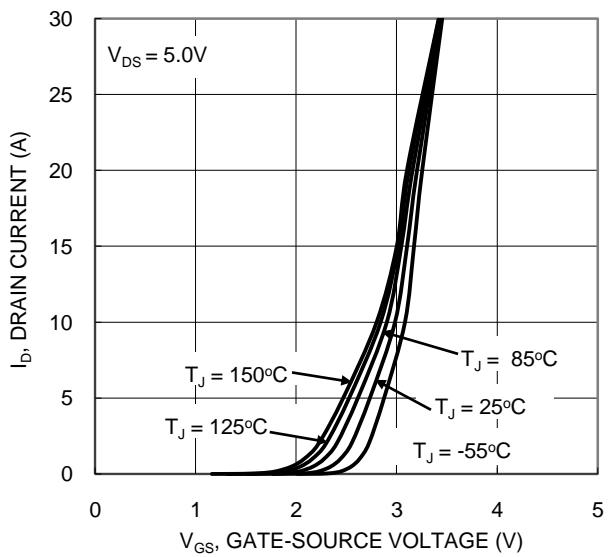


Figure 2. Typical Transfer Characteristic

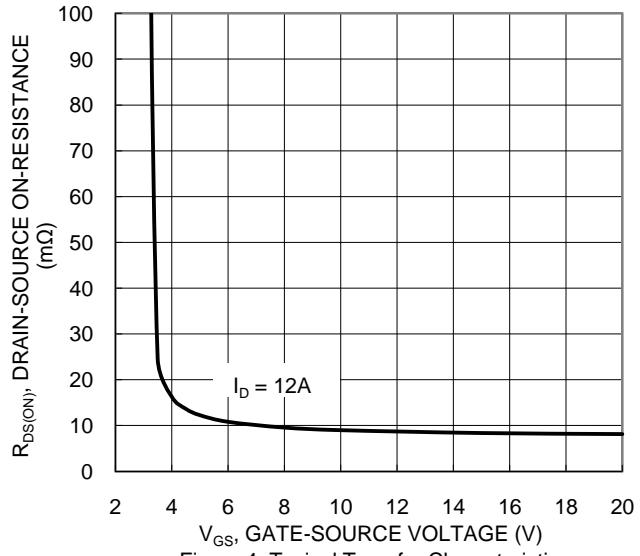


Figure 4. Typical Transfer Characteristic

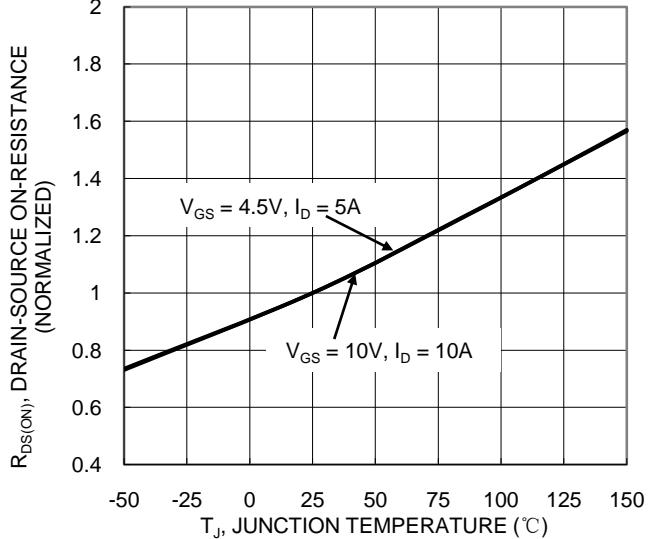
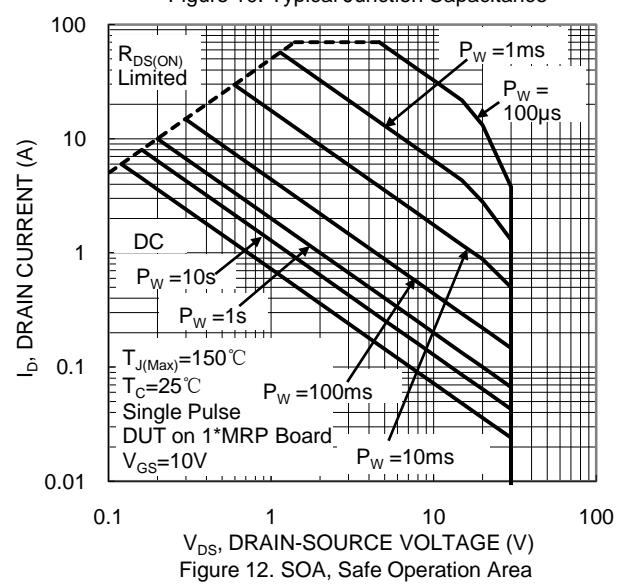
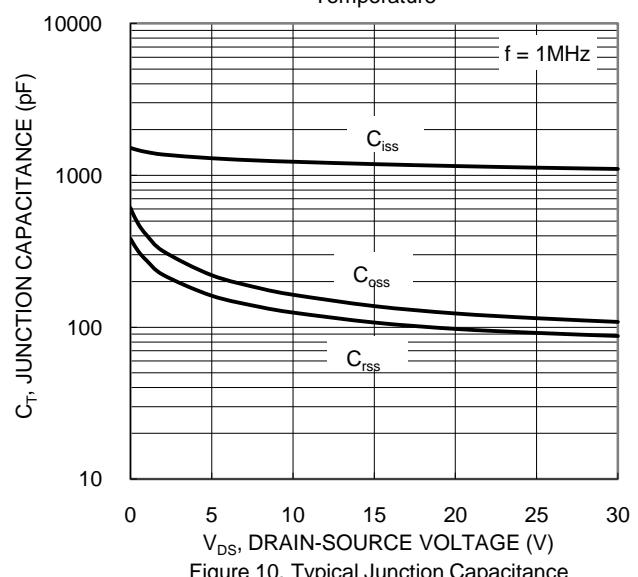
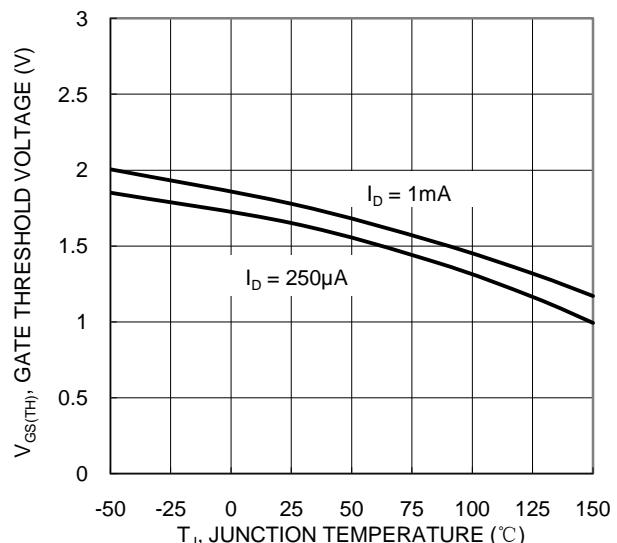
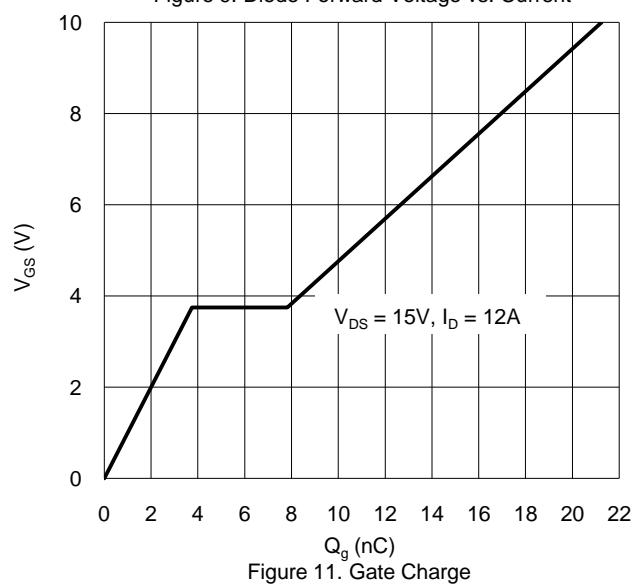
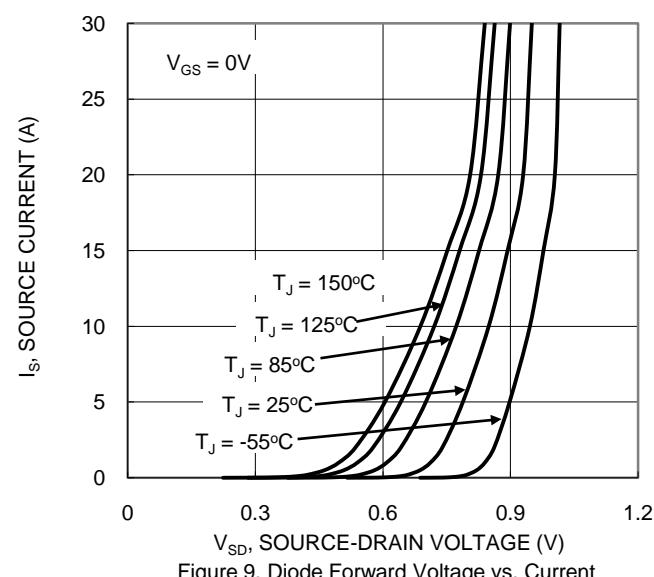
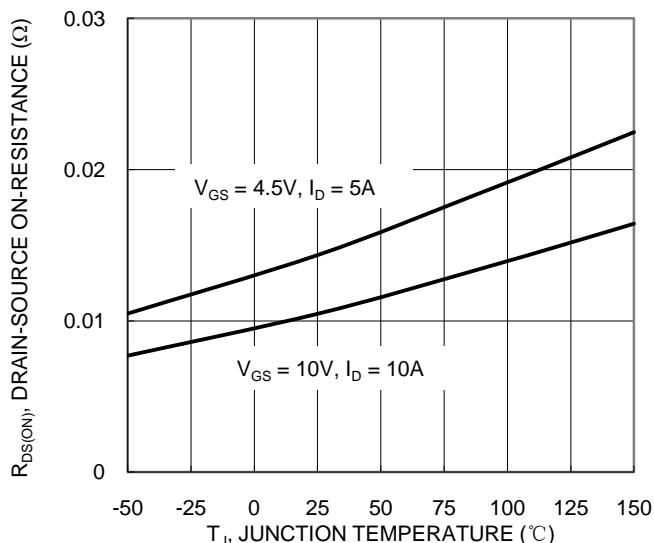


Figure 6. On-Resistance Variation with Temperature



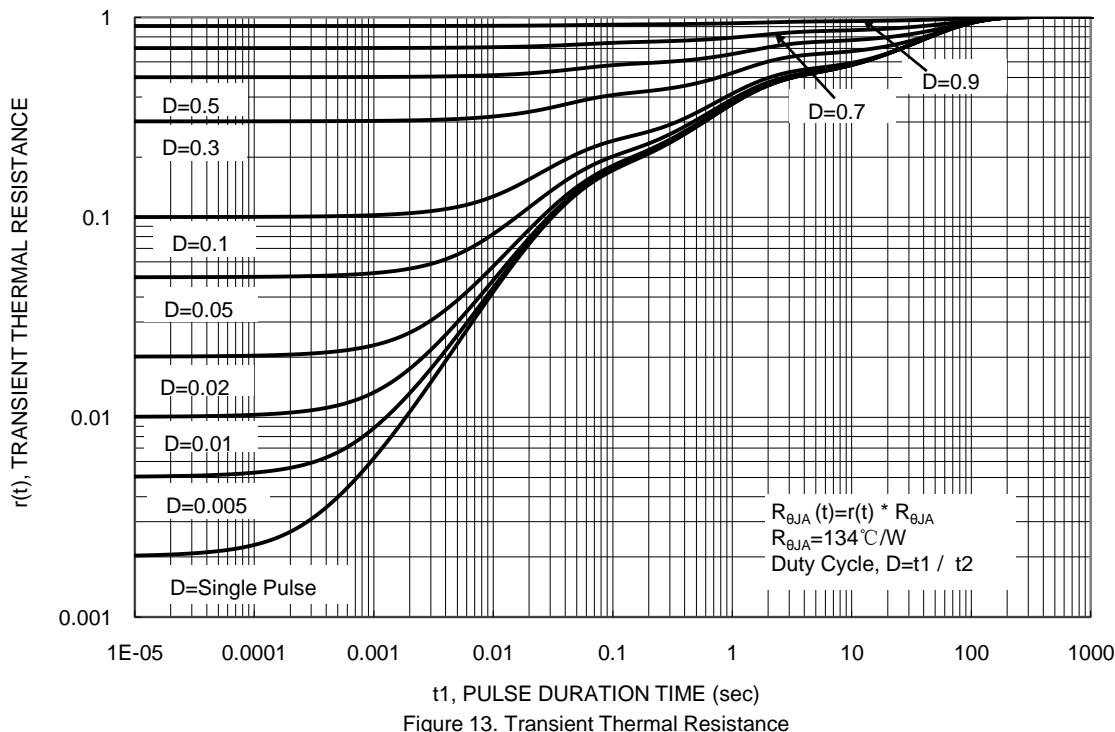
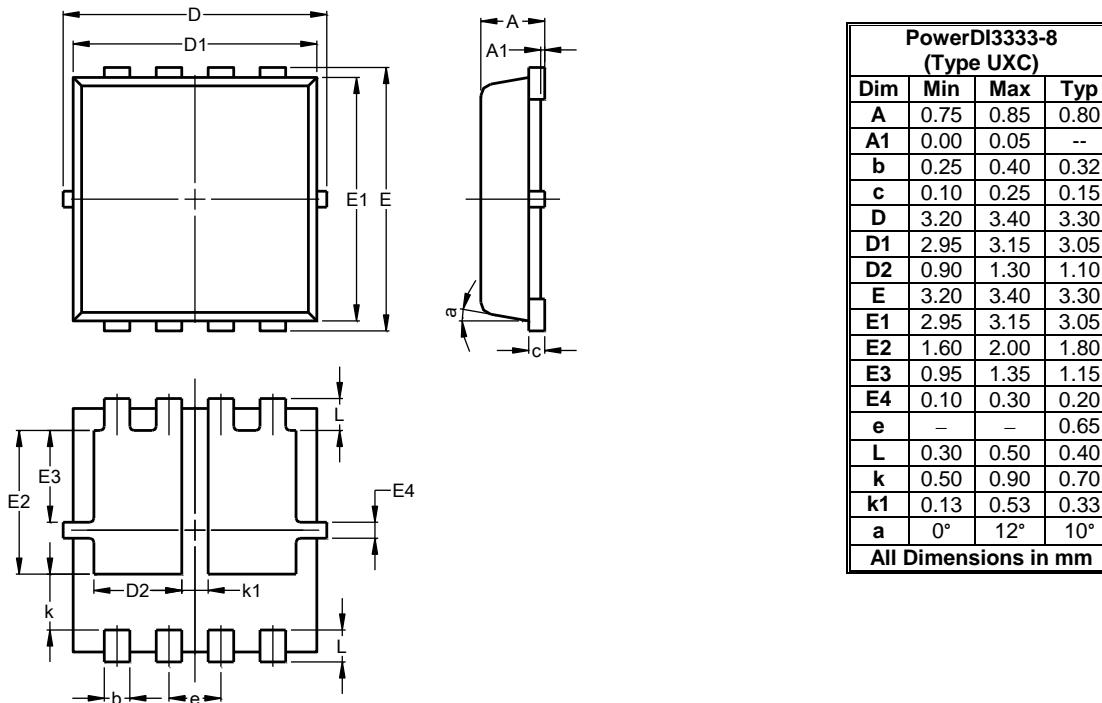


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

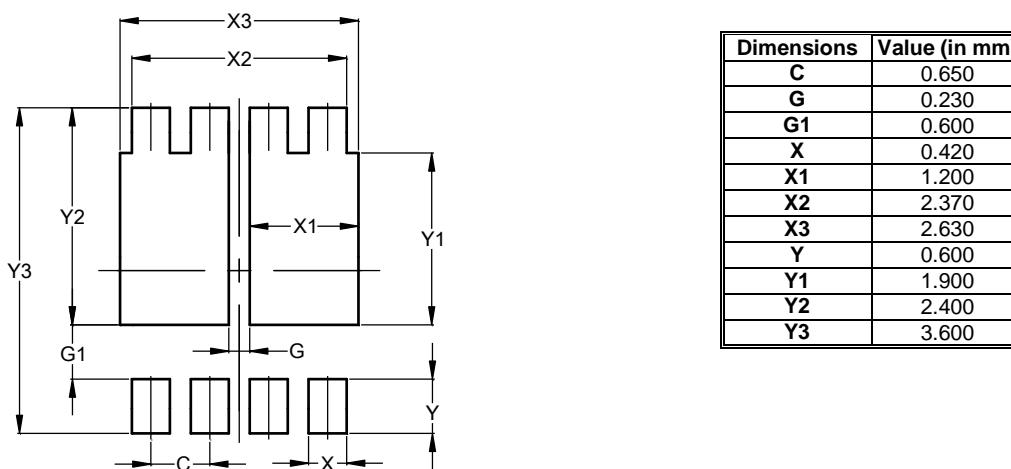
PowerDI3333-8 (Type UXC)



## Suggested Pad Layout

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

PowerDI3333-8 (Type UXC)



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