

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> max	I <sub>D</sub> max T <sub>C</sub> = +25°C
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>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

- Power Management Functions
- Analog Switch

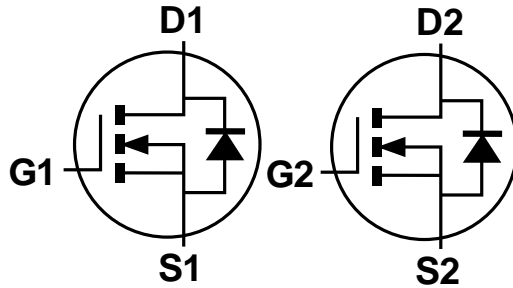
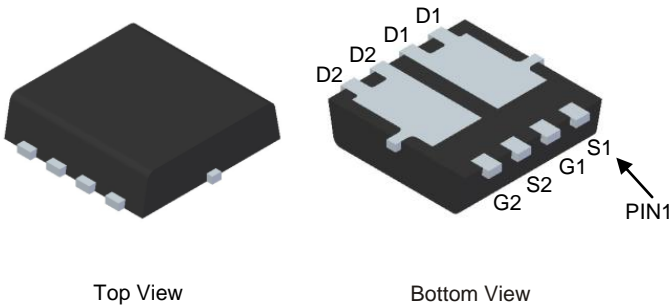
## Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: PowerDI3333-8 (Type UXC)
- 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 <sup>(e3)</sup>
- Weight: 0.072 grams (Approximate)

PowerDI3333-8 (Type UXC)

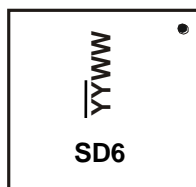


## Ordering Information (Note 4)

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current, V <sub>GS</sub> = 10V (Note 7)	I <sub>D</sub>	T <sub>C</sub> = +25°C	21
		T <sub>C</sub> = +70°C	17
Maximum Body Diode Forward Current (Note 6)	I <sub>S</sub>	2	A
Pulsed Drain Current (380µs pulse, Duty cycle = 1%)	I <sub>DM</sub>	70	A
Avalanche Current (L = 0.1mH) (Note 8)	I <sub>AS</sub>	22	A
Avalanche Energy (L = 0.1mH) (Note 8)	E <sub>AS</sub>	24	mJ

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	Steady State	134
		t < 10s	78
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	Steady State	70
		t < 10s	41
Thermal Resistance, Junction to Case (Note 7)	R <sub>θJC</sub>	15	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	1	µA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.4	-	2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	9.5	12	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 7A
			14	17		
Diode Forward Voltage	V <sub>SD</sub>	-	0.70	1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iss</sub>	-	1184	-	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	137	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	107	-		
Gate Resistance	R <sub>g</sub>	-	3.0	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	-	9.5	-	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 12A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	-	21	-		
Gate-Source Charge	Q <sub>gs</sub>	-	3.8	-		
Gate-Drain Charge	Q <sub>gd</sub>	-	4.1	-		
Turn-On Delay Time	t <sub>D(ON)</sub>	-	4.5	-	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 1.5Ω, R <sub>G</sub> = 3Ω
Turn-On Rise Time	t <sub>R</sub>	-	3.3	-		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	-	14	-		
Turn-Off Fall Time	t <sub>F</sub>	-	3.6	-		
Reverse Recovery Time	t <sub>RR</sub>	-	9.3	-	ns	I <sub>F</sub> = 12A, di/dt = 500A/µs
Reverse Recovery Charge	Q <sub>RR</sub>	-	2.5	-	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 1inch square copper plate.
  - Thermal resistance from junction to soldering point (on the exposed drain pad).
  - I<sub>AS</sub> and E<sub>AS</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

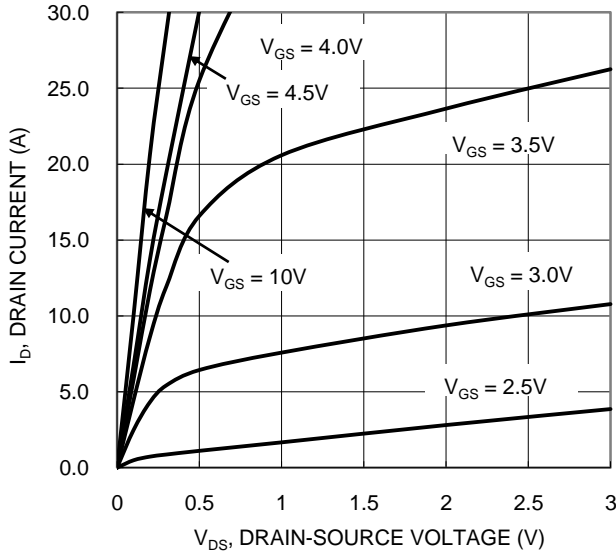


Figure 1. Typical Output Characteristic

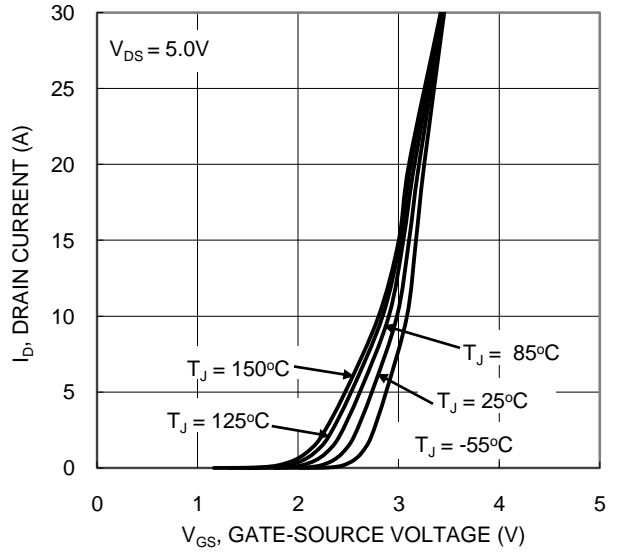


Figure 2. Typical Transfer Characteristic

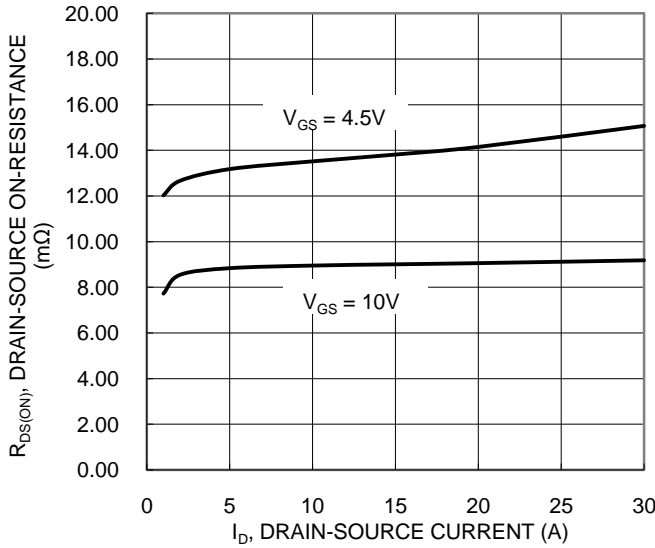


Figure 3. Typical On-Resistance vs Drain Current and Gate Voltage

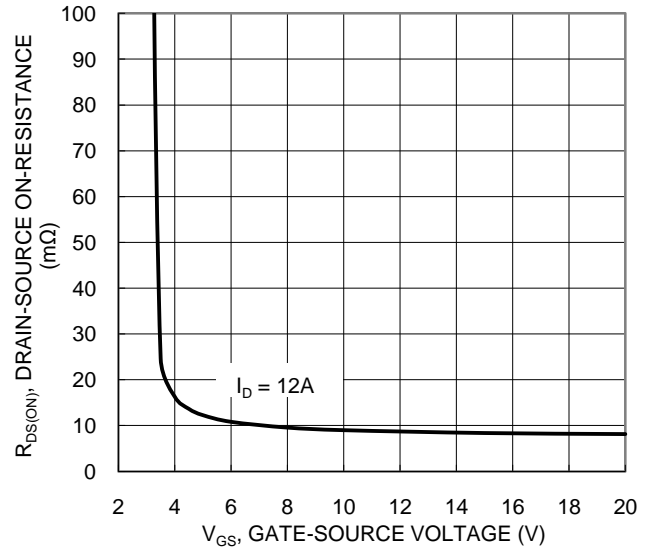


Figure 4. Typical Transfer Characteristic

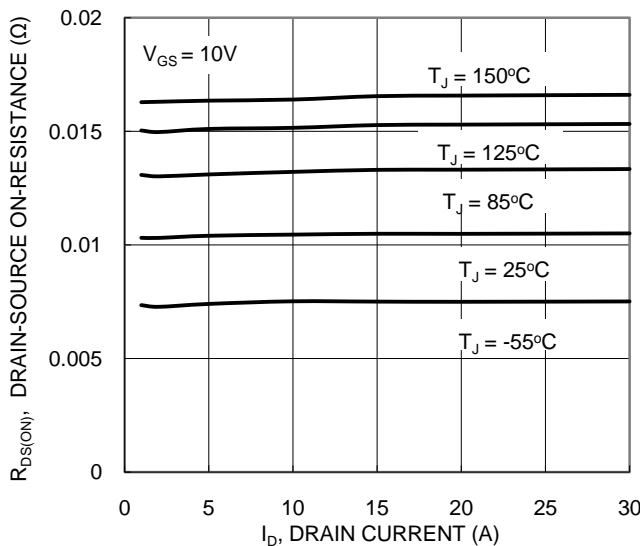


Figure 5. Typical On-Resistance vs Drain Current and Temperature

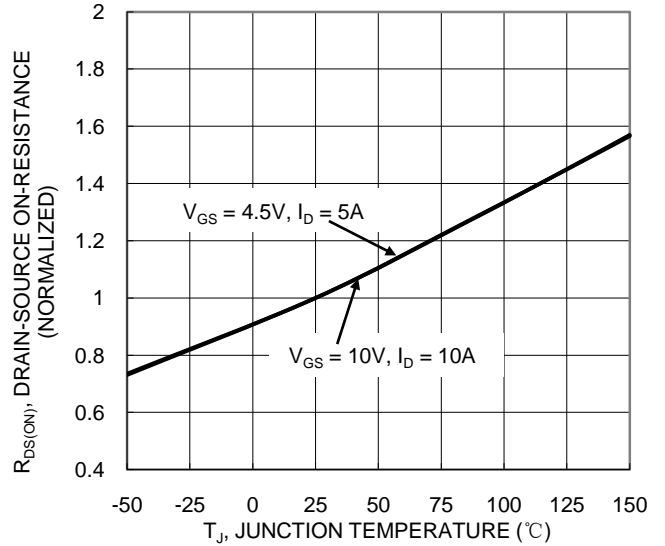
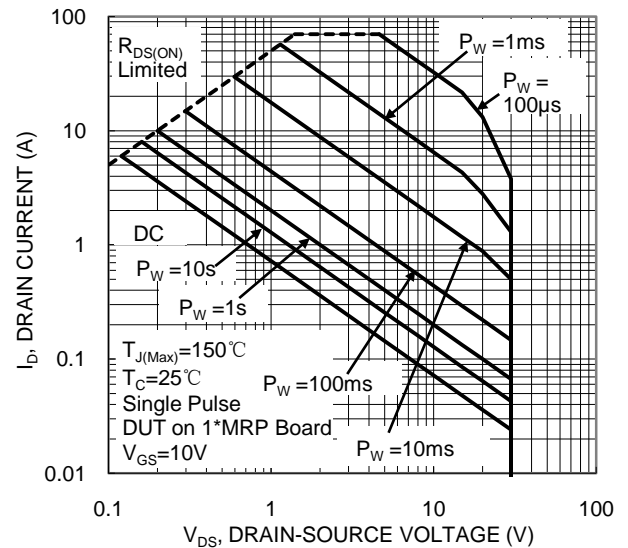
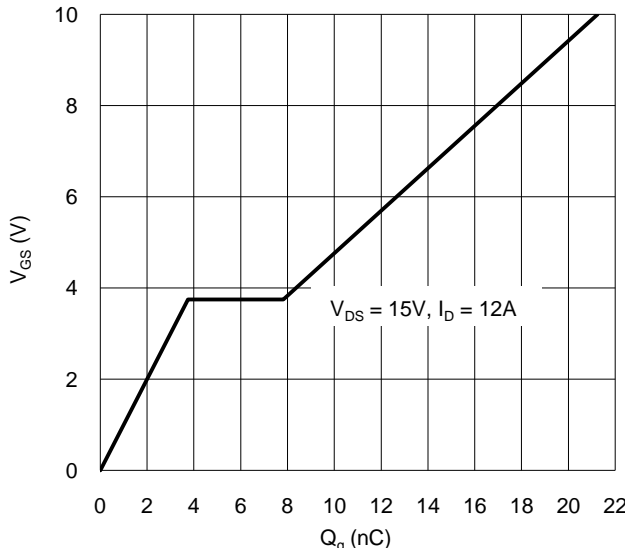
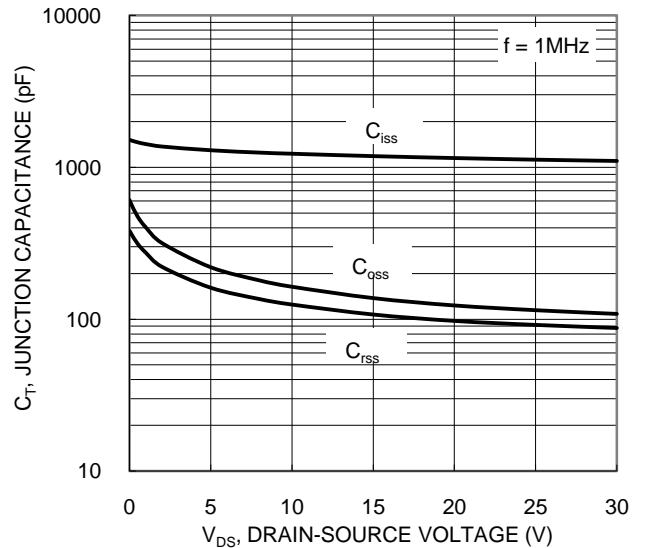
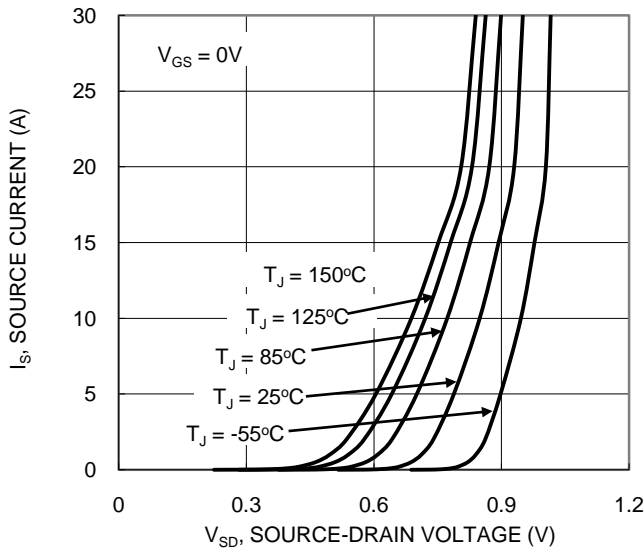
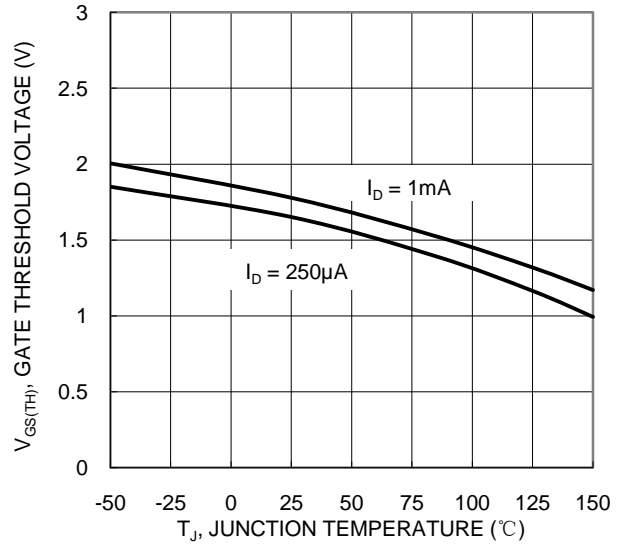
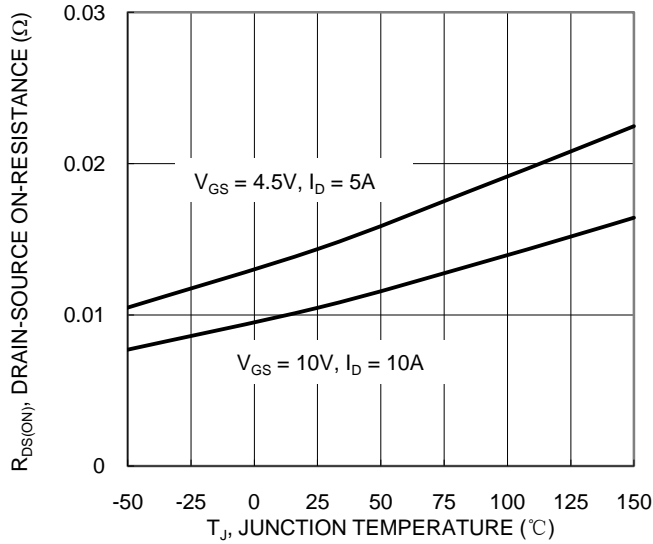


Figure 6. On-Resistance Variation with Temperature



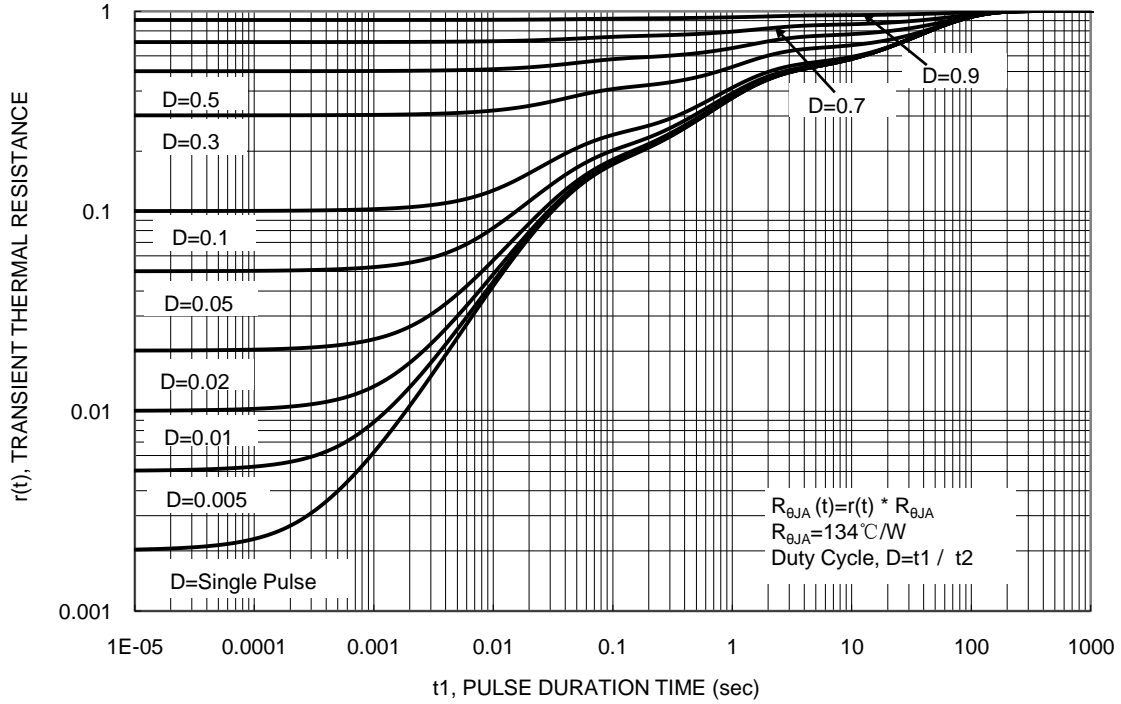
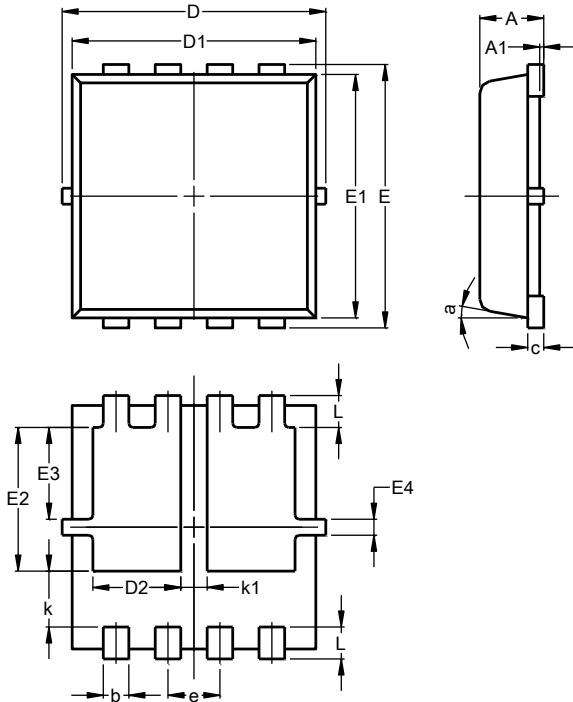


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**PowerDI3333-8 (Type UXC)**

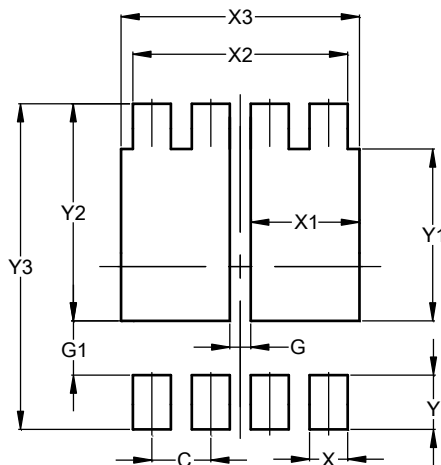


PowerDI3333-8 (Type UXC)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.90	1.30	1.10
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
L	0.30	0.50	0.40
k	0.50	0.90	0.70
k1	0.13	0.53	0.33
a	0°	12°	10°
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**PowerDI3333-8 (Type UXC)**



Dimensions	Value (in mm)
C	0.650
G	0.230
G1	0.600
X	0.420
X1	1.200
X2	2.370
X3	2.630
Y	0.600
Y1	1.900
Y2	2.400
Y3	3.600

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