

## Product Summary

Device	BV <sub>DSS</sub>	R <sub>D1</sub> R <sub>D2</sub> Max	I <sub>D</sub> Max T <sub>C</sub> = +25°C (Note 10)
N-Channel	30V	22mΩ @ V <sub>GS</sub> = 10V	17A
		28mΩ @ V <sub>GS</sub> = 4.5V	14A

## Description

This new generation MOSFET is designed to minimize the on-state resistance (R<sub>D1</sub>R<sub>D2</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

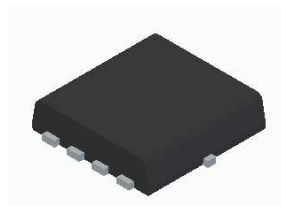
- Ultra Low Gate Threshold Voltage
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Function**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

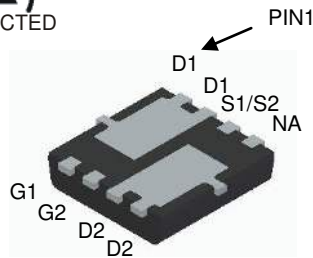
- Case: PowerDI<sup>®</sup> 3333-8 (Type UXD)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208③
- Weight: 0.072 grams (Approximate)



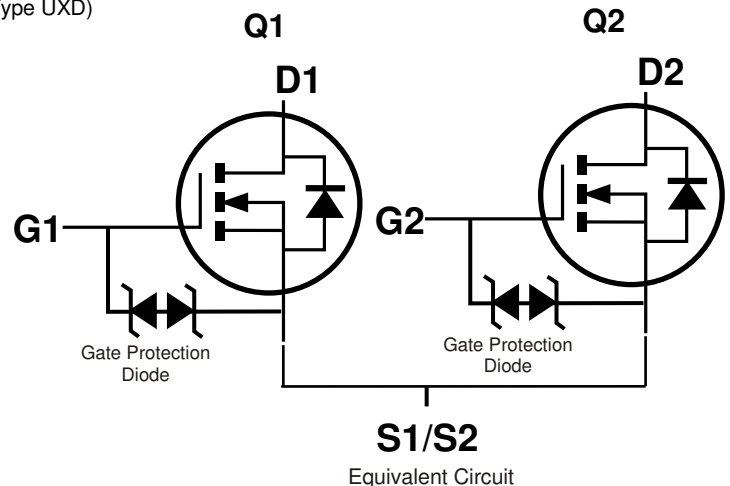
PowerDI3333-8 (Type UXD)



Top View



Bottom View

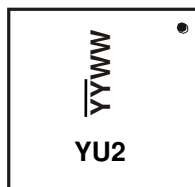


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3022UEV-7	PowerDI3333-8 (Type UXD)	2,000/Tape & Reel
DMT3022UEV-13	PowerDI3333-8 (Type UXD)	3,000/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



YU2 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 18 for 2018)  
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Q1 & Q2	Unit
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	Steady State (Note 10)	17
		T <sub>C</sub> = +25°C T <sub>C</sub> = +70°C	14
Maximum Body Diode Forward Current (Note 6)	I <sub>S</sub>	2	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	50	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I <sub>SM</sub>	50	A
Avalanche Current (Note 7) L = 0.1mH	I <sub>AS</sub>	19	A
Avalanche Energy (Note 7) L = 0.1mH	E <sub>AS</sub>	18.5	mJ

**Thermal Characteristics**

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>	137	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	70	°C/W
Thermal Resistance, Junction to Case (Note 6)	R <sub>θJC</sub>	12	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.  
7. UIS in production with L = 0.1mH, starting T<sub>A</sub> = +25°C.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 8)						
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	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	µA	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 8)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.5	—	1.8	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>D1</sub> R <sub>D2</sub>	—	12.2	22	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 11A
		—	17.6	28		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7A
Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 8.8A
<b>DYNAMIC CHARACTERISTICS</b> (Note 9)						
Input Capacitance	C <sub>iss</sub>	—	903	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	386	—		
Reverse Transfer Capacitance	C <sub>riss</sub>	—	67	—		
Gate Resistance	R <sub>G</sub>	—	1.2	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>G</sub>	—	13.9	—	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 10A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>G</sub>	—	6.9	—		
Gate-Source Charge	Q <sub>GS</sub>	—	1.5	—		
Gate-Drain Charge	Q <sub>GD</sub>	—	2.8	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	3.8	—	ns	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V, R <sub>G</sub> = 1Ω, I <sub>D</sub> = 8.8A
Turn-On Rise Time	t <sub>R</sub>	—	6.7	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	10.5	—		
Turn-Off Fall Time	t <sub>F</sub>	—	1.7	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	17	—	ns	I <sub>F</sub> = 8.8A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	6.8	—	nC	

- Notes: 8. Short duration pulse test used to minimize self-heating effect.  
9. Guaranteed by design. Not subject to product testing.  
10. Package limited.

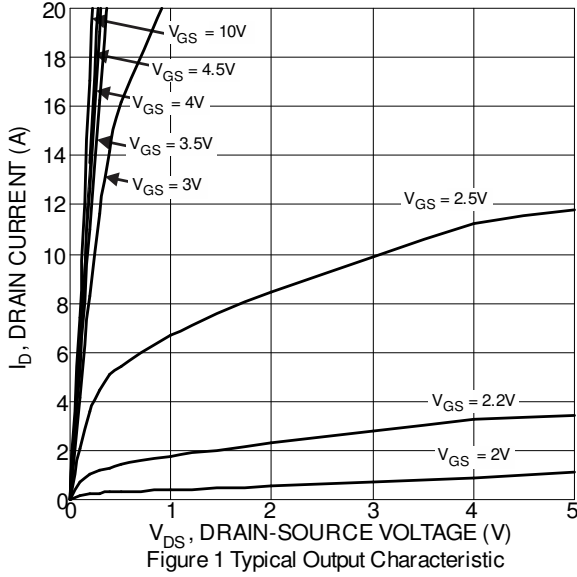


Figure 1 Typical Output Characteristic

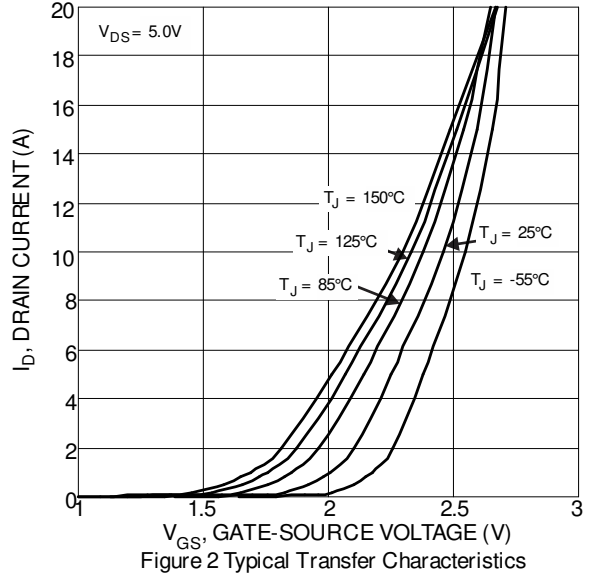


Figure 2 Typical Transfer Characteristics

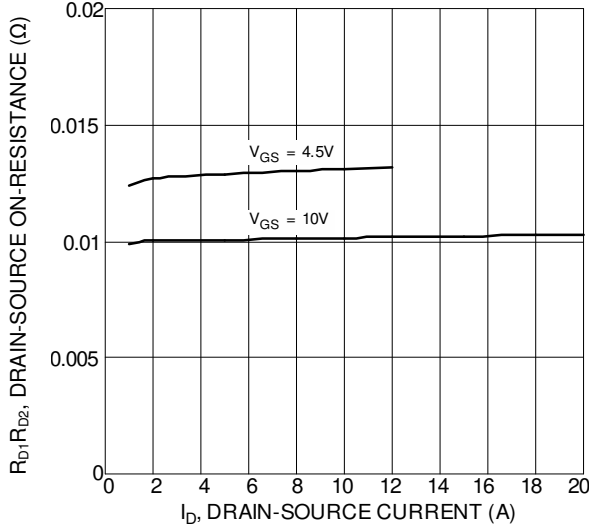


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

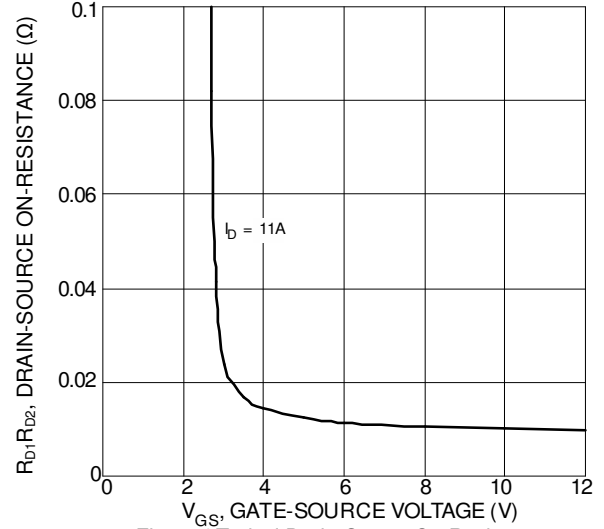


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

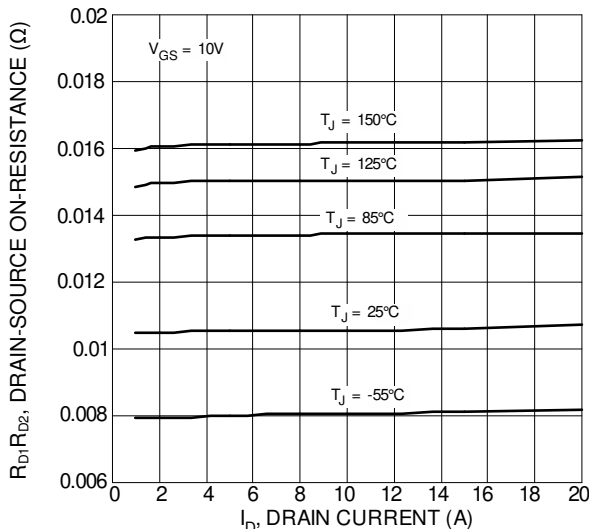


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

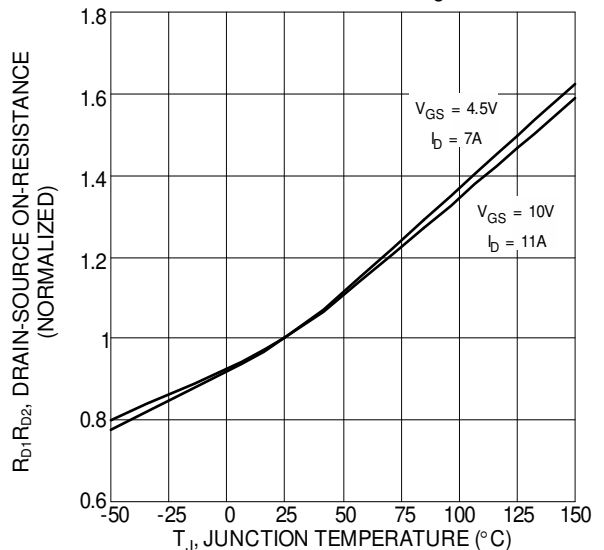


Figure 6 On-Resistance Variation with Temperature

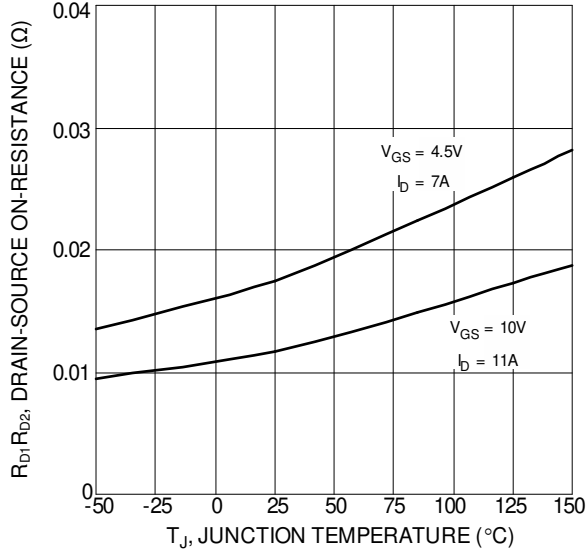


Figure 7 On-Resistance Variation with Temperature

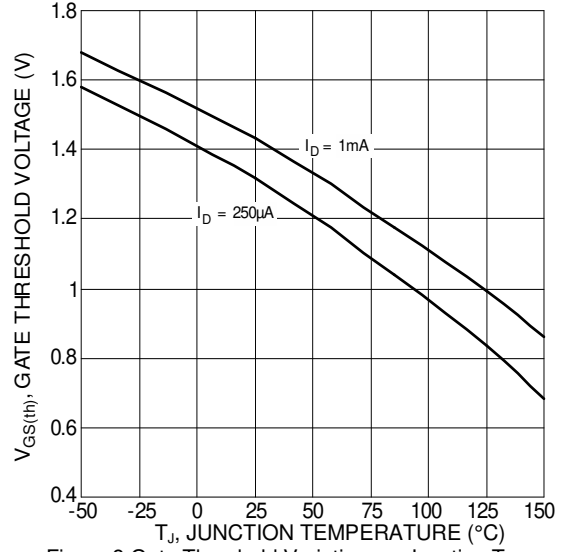


Figure 8 Gate Threshold Variation vs. Junction Temperature

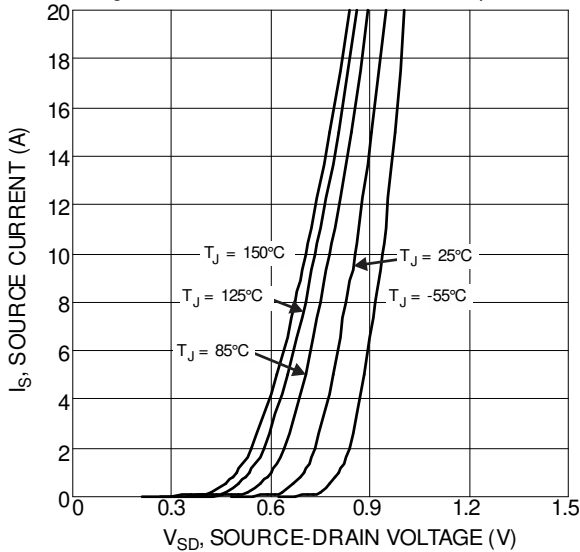


Figure 9 Diode Forward Voltage vs. Current

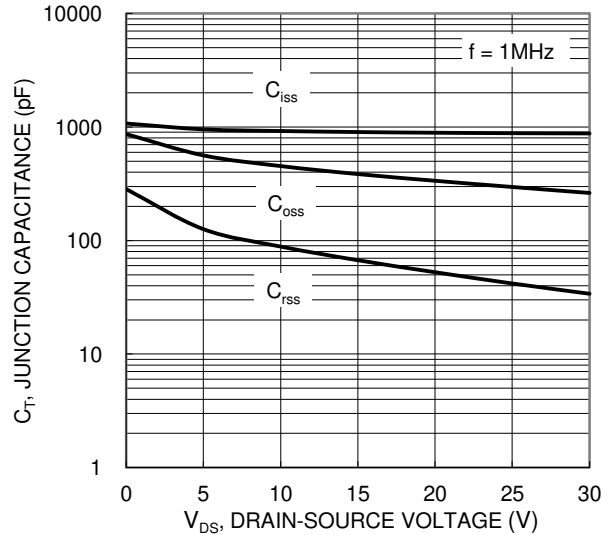


Figure 10 Typical Junction Capacitance

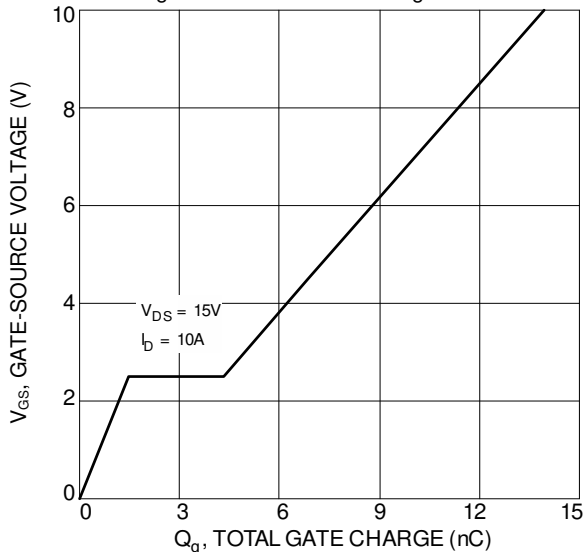


Figure 11 Gate Charge

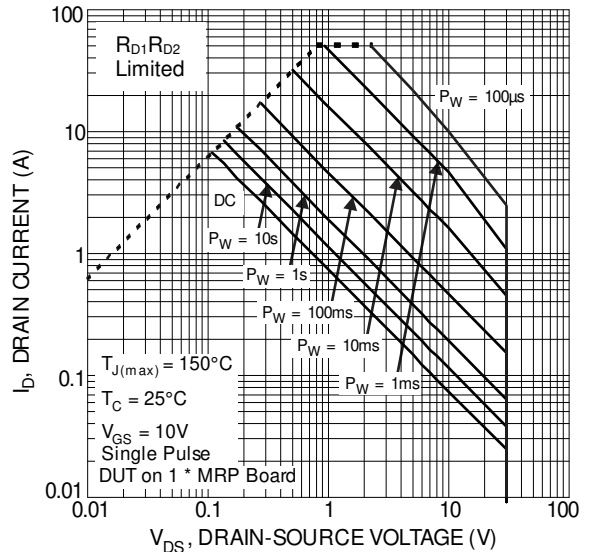
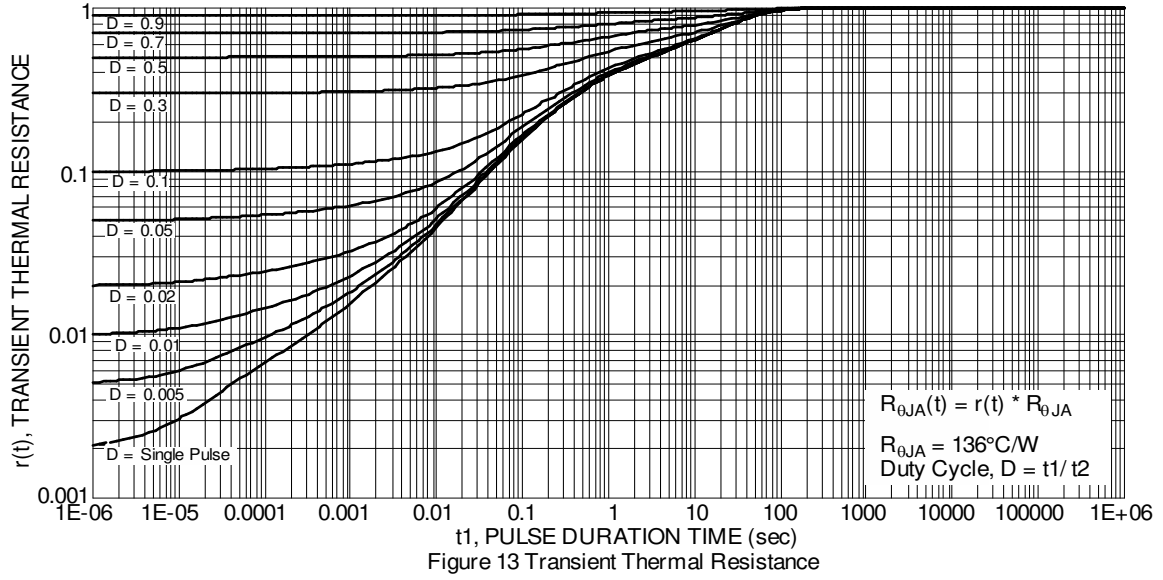


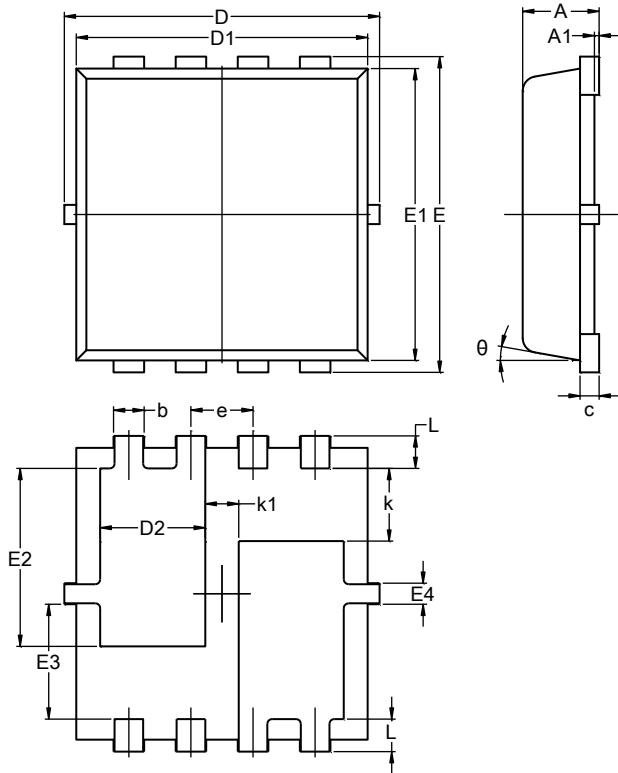
Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

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

**PowerDI3333-8 (Type UXD)**

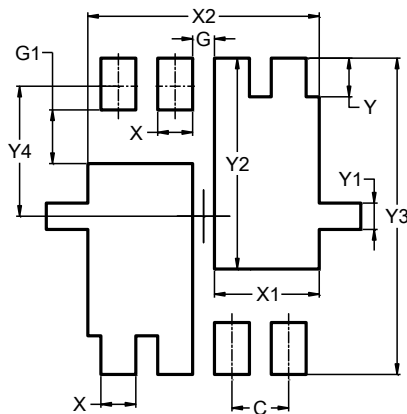


PowerDI3333-8 (Type UXD)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.90	1.30	1.10
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.66	2.06	1.86
E3	1.10	1.30	1.20
E4	0.12	0.32	0.22
e	--	--	0.65
L	0.24	0.44	0.34
k	0.56	0.96	0.76
k1	0.15	0.55	0.35
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 UXD)**



Dimensions	Value (in mm)
C	0.650
G	0.250
G1	0.610
X	0.400
X1	1.200
X2	2.650
Y	0.440
Y1	0.300
Y2	2.400
Y3	3.600
Y4	1.480

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