

**Product Summary**

$BV_{DSS}$	$R_{DS(on)}$ max	$I_D$ max $T_C = +25^\circ C$
-20V	5.5m $\Omega$ @ $V_{GS} = -4.5V$	-71 A
	7.5m $\Omega$ @ $V_{GS} = -2.5V$	-60 A

**Description**

This MOSFET is designed to minimize on-state resistance ( $R_{DS(on)}$ ) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

**Applications**

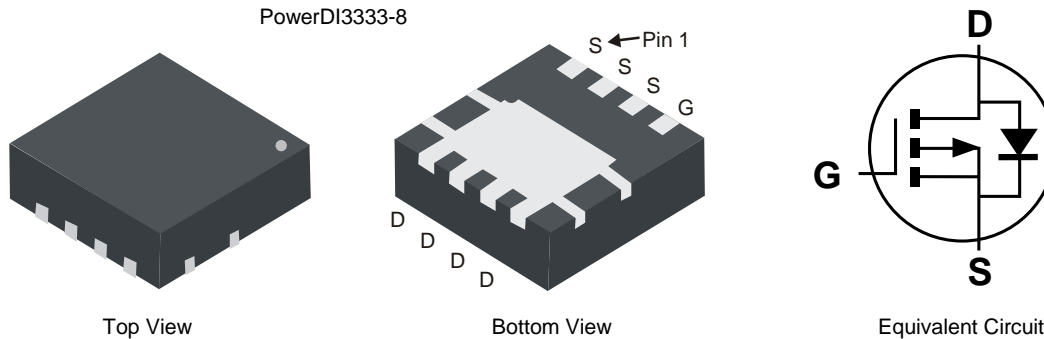
- Load Switch
- Power Management Functions

**Features**

- Low  $R_{DS(on)}$  – 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
- **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](mailto:contact@diodes.com) 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 Lead-Frame; Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.030 grams (Approximate)



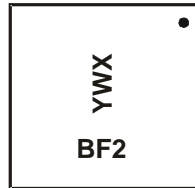
**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMP26M1UFG-7	PowerDI3333-8	2,000/Tape & Reel
DMP26M1UFG-13	PowerDI3333-8	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

PowerDI3333-8



BF2 = Product Type Marking Code  
 YWX = Date Code Marking  
 Y = Year (ex: 1= 2021)  
 W = Week (ex: a = week 27; z represents week 52 and 53)  
 X = Internal code (ex: U = Monday)

### Date Code Key

Year	2020	2021	2022	2023	2024	2025	2026	2027
Code	0	1	2	3	4	5	6	7
Week	1-26		27-52			53		
Code	A-Z		a-z			z		
Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Code	T	U	V	W	X	Y	Z	

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

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V <sub>DSS</sub>	-20	V	
Gate-Source Voltage	V <sub>GSS</sub>	±10	V	
Continuous Drain Current (Note 7) V <sub>GS</sub> = -4.5V	Steady State	T <sub>C</sub> = +25°C	-71	A
		T <sub>C</sub> = +70°C	-56	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	-110	A	
Maximum Continuous Body Diode Forward Current (Note 5)	I <sub>S</sub>	-2	A	
Avalanche Current L = 0.1mH (Note 8)	I <sub>AS</sub>	-37	A	
Avalanche Energy L = 0.1mH (Note 8)	E <sub>AS</sub>	-71	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>	1.67	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	75	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	3.0	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	41	°C/W
Thermal Resistance, Junction to Case (Note 7)	R <sub>θJC</sub>	3.0	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 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> ratings are based on low frequency and duty cycles to keep T<sub>J</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 (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	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> = -16V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.4	—	-1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	—	4.7	5.5	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -15A
		—	5.8	7.5		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -10A
		—	7.8	12		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -1A
		—	11	17		V <sub>GS</sub> = -1.5V, I <sub>D</sub> = -1A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.7	-1.1	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -10A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>ISS</sub>	—	5392	—	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>OSS</sub>	—	608	—		
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	564	—		
Gate Resistance	R <sub>G</sub>	—	2.05	—	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>	—	75	—	nC	V <sub>DD</sub> = -10V, I <sub>D</sub> = -20A
Total Gate Charge (V <sub>GS</sub> = -10V)	Q <sub>g</sub>	—	164	—		
Gate-Source Charge	Q <sub>gs</sub>	—	6.9	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	19.8	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	9	—	ns	V <sub>DD</sub> = -10V, V <sub>GEN</sub> = -4.5V, R <sub>GEN</sub> = 1Ω, I <sub>D</sub> = -10A
Turn-On Rise Time	t <sub>r</sub>	—	24	—		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	69	—		
Turn-Off Fall Time	t <sub>f</sub>	—	107	—		
Reverse Recovery Time	t <sub>RR</sub>	—	54	—	ns	I <sub>F</sub> = -10A, di/dt = 100A/μs
Reverse Recovery Charge	Q <sub>RR</sub>	—	55	—	nC	

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

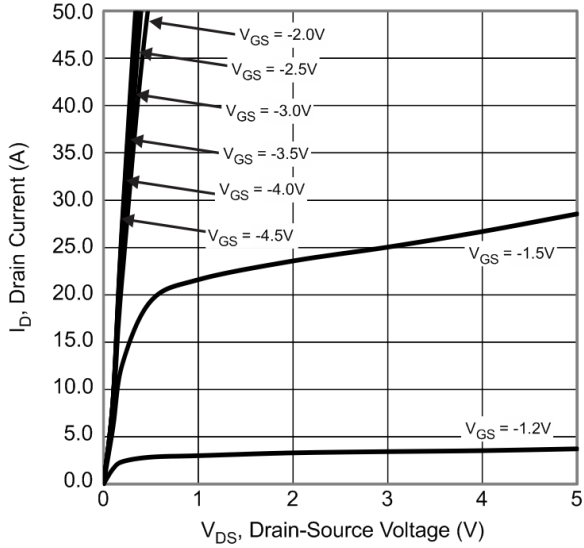


Fig. 1 Typical Output Characteristic

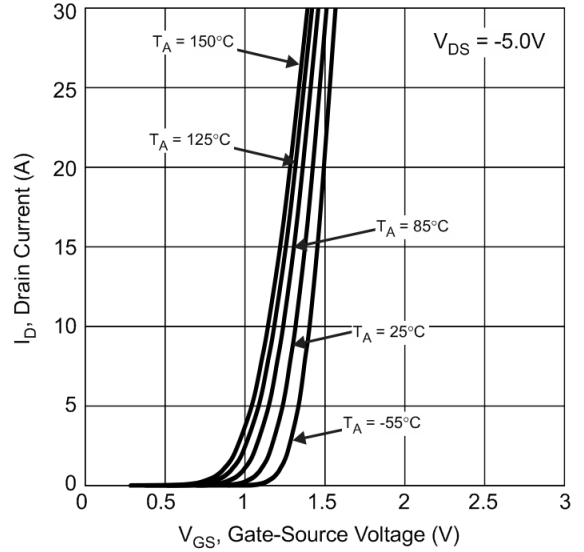


Fig. 2 Typical Transfer Characteristic

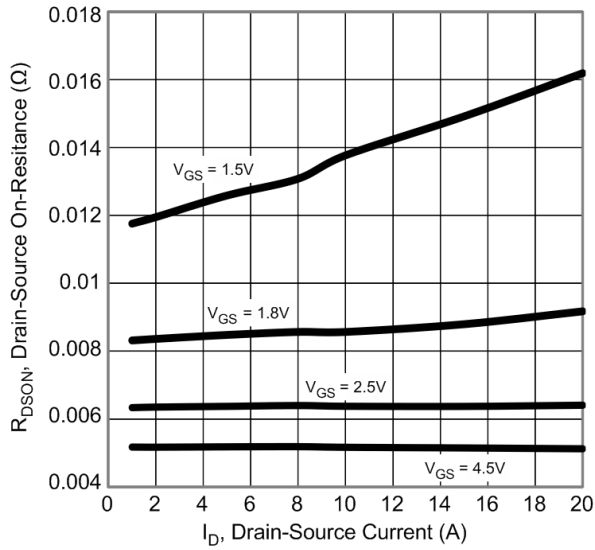


Fig. 3 Typical On-Resistance vs Drain Current and Gate Voltage

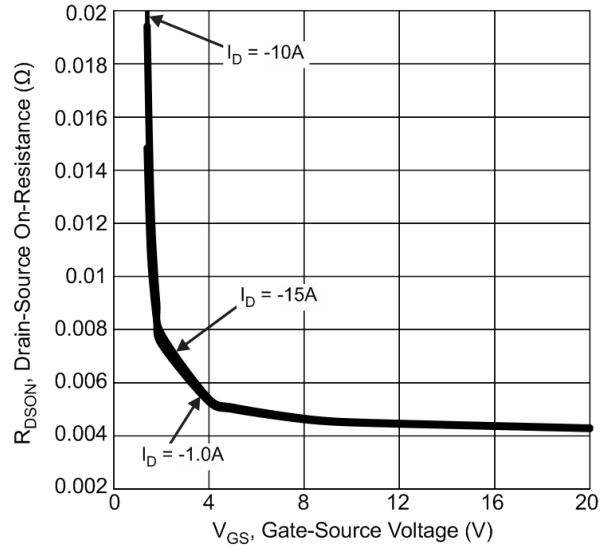


Fig. 4 Typical Transfer Characteristic

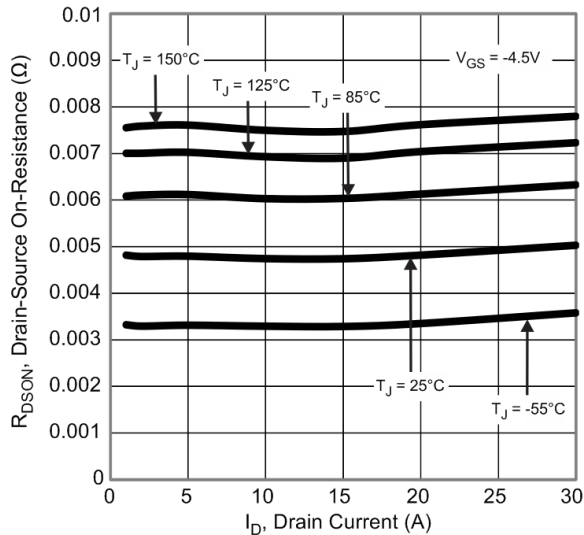


Fig. 5 Typical On-Resistance vs Drain Current and Junction Temperature

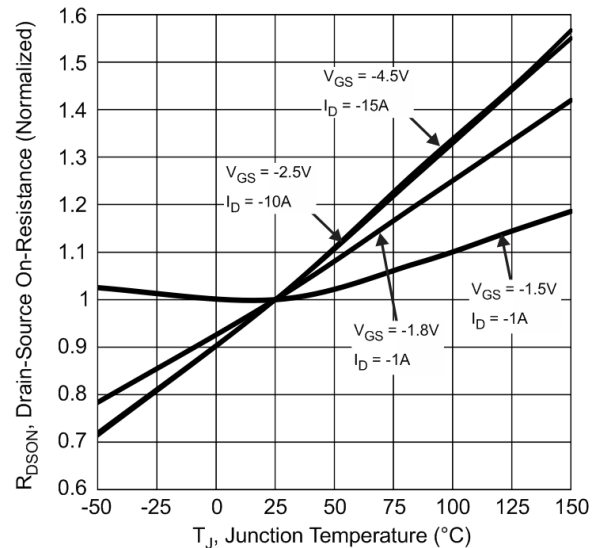


Fig. 6 On-Resistance Variation with Junction Temperature

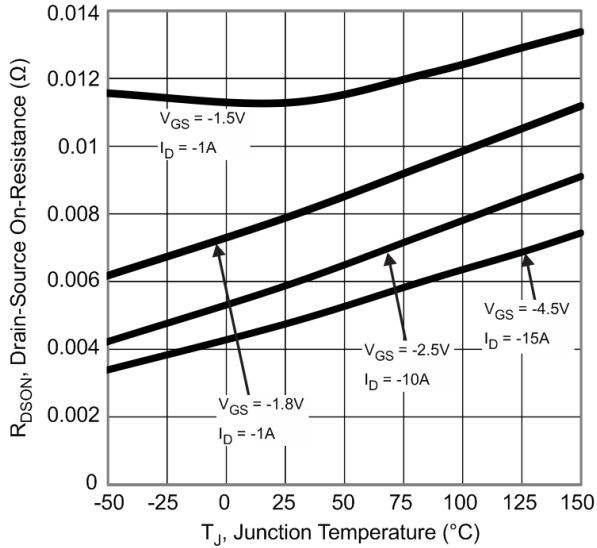


Fig. 7 On-Resistance Variation with Junction Temperature

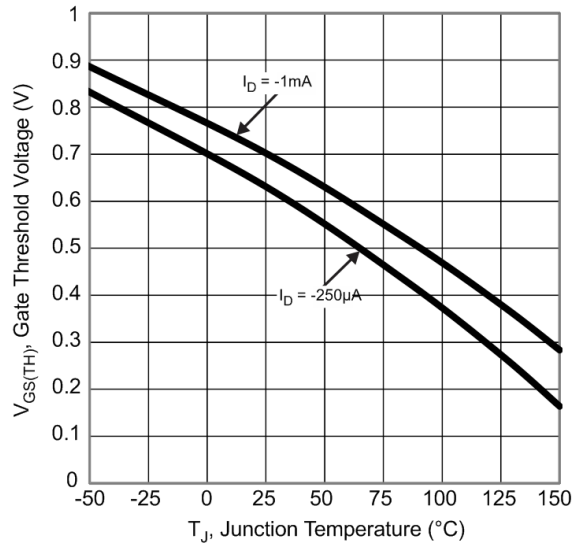


Fig. 8 Gate Threshold Variation vs Junction Temperature

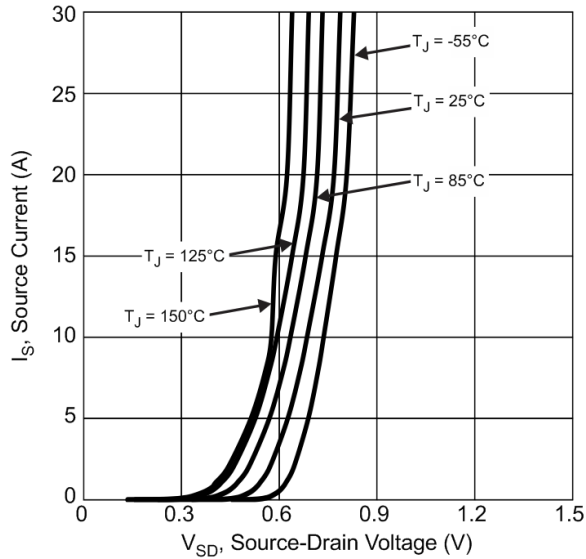


Fig. 9 Diode Forward Voltage vs Current

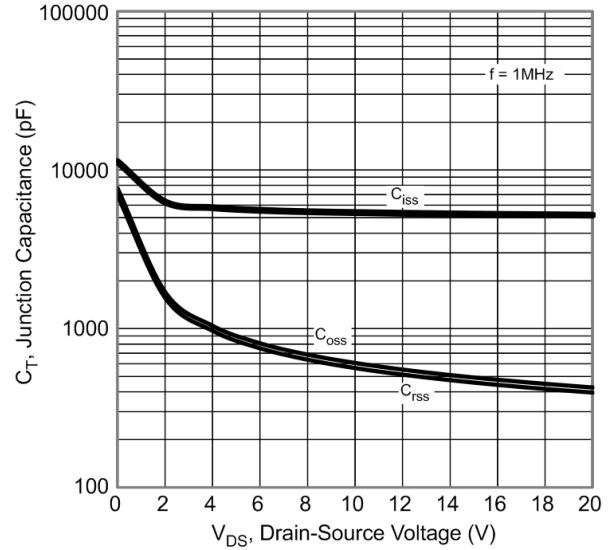


Fig. 10 Typical Junction Capacitance

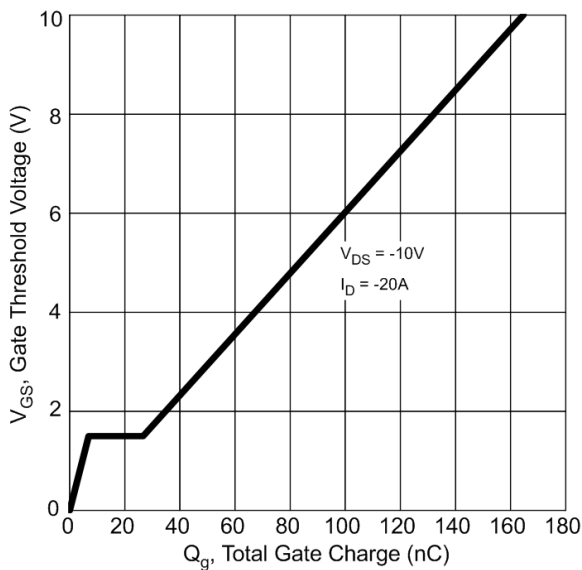


Fig. 11 Gate Charge

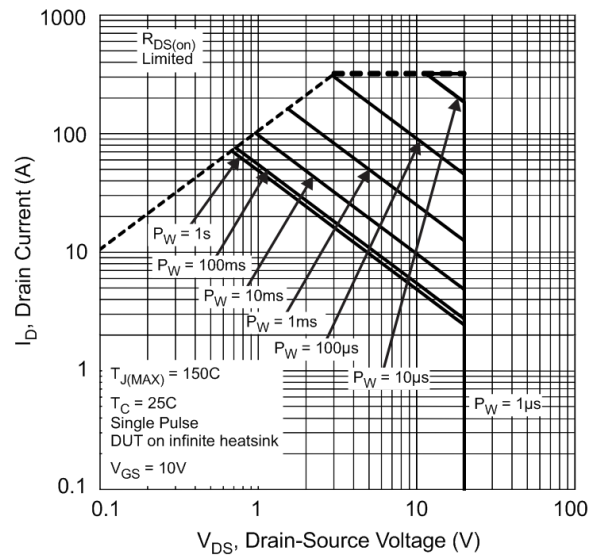


Fig. 12 SOA, Safe Operation Area

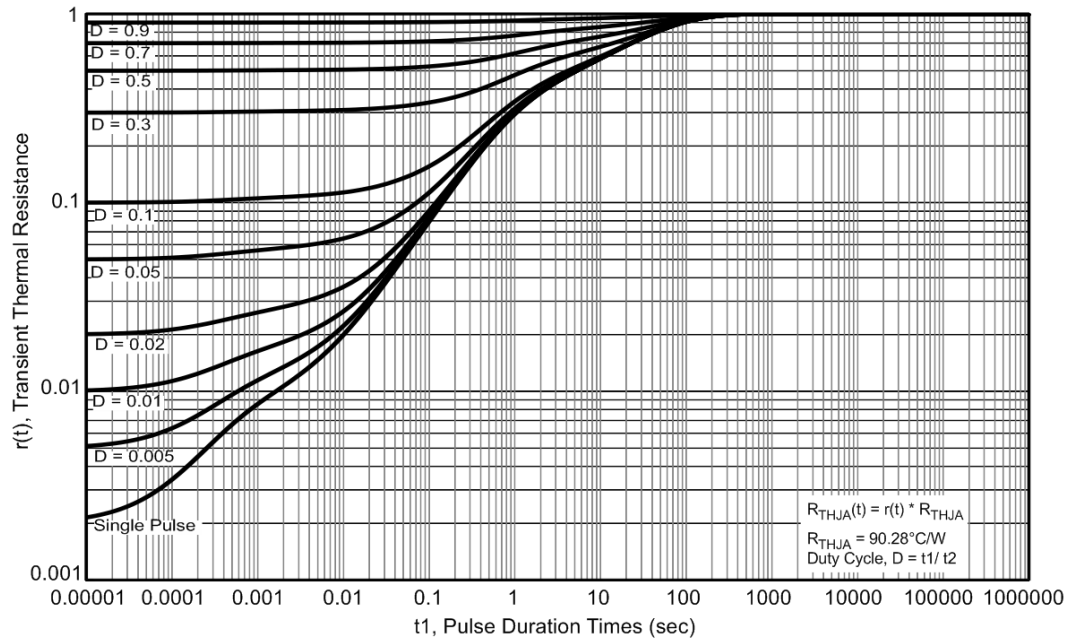
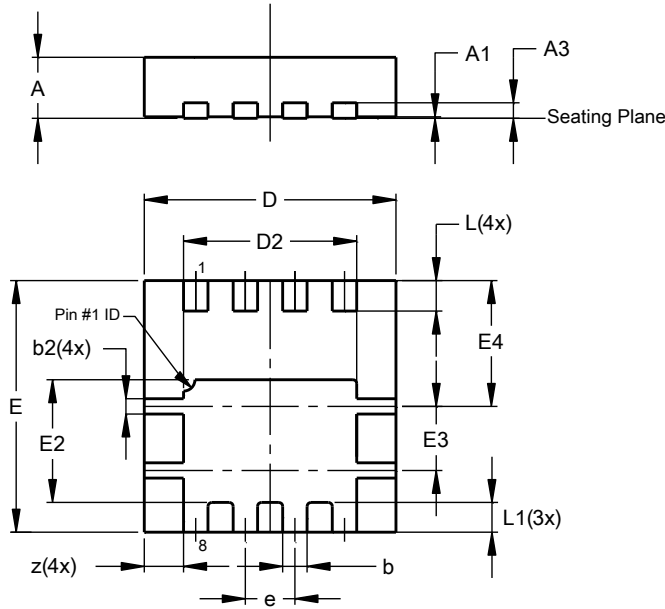


Fig. 13 Transient Thermal Resistance

**Package Outline Dimensions**

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

**PowerDI3333-8**

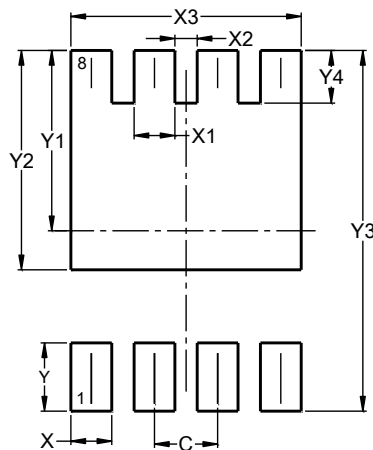


PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	-	-	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	-	-	0.65
L	0.35	0.45	0.40
L1	-	-	0.39
z	-	-	0.515
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**PowerDI3333-8**



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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