

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> max	I <sub>D</sub> max T <sub>A</sub> = +25°C
-30V	10mΩ @ V <sub>GS</sub> = -10V	-11.5A
	18mΩ @ V <sub>GS</sub> = -4.5V	-8.7A

## Description

This 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

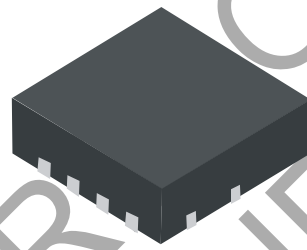
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

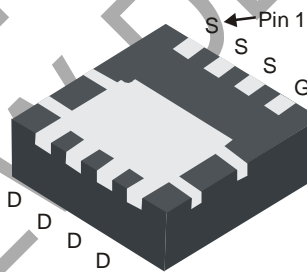
- Low R<sub>DS(ON)</sub> – Ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMP3017SFGQ](#))**

## Mechanical Data

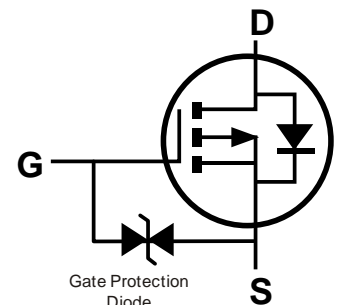
- Case: PowerDI3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.072 grams (Approximate)



Top View



Bottom View



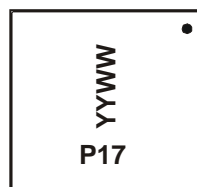
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3017SFG-7	PowerDI3333-8	2,000/Tape & Reel
DMP3017SFG-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) compliant.
  2. 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.
  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



P17 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 17 = 2017)  
 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		$V_{GSS}$	$\pm 25$	V	
Continuous Drain Current (Note 6) $V_{GS} = -10\text{V}$	Steady State	$I_D$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	-11.5 -9.4	A
	$t < 10\text{s}$		$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	-15.2 -12.1	A
Maximum Continuous Body Diode Forward Current (Note 5)		$I_S$	-3.0	A	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)		$I_{DM}$	-80	A	
Avalanche Current (Note 7) $L = 1\text{mH}$		$I_{AR}$	-14	A	
Repetitive Avalanche Energy (Note 7) $L = 1\text{mH}$		$E_{AR}$	104	mJ	

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	$P_D$	0.94	W
	$T_A = +70^\circ\text{C}$		0.6	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	137	$^\circ\text{C/W}$
	$t < 10\text{s}$		82	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	$P_D$	2.2	W
	$T_A = +70^\circ\text{C}$		1.3	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	60	$^\circ\text{C/W}$
	$t < 10\text{s}$		36	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	3.0	$^\circ\text{C/W}$
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 8)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 10$	$\mu A$	$V_{GS} = \pm 25V, V_{DS} = 0V$
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	-1.0	—	-3.0	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	8.5	10	m $\Omega$	$V_{GS} = -10V, I_D = -11.5A$
		—	15	18		$V_{GS} = -4.5V, I_D = -8.5A$
Forward Transfer Admittance	$ Y_{fs} $	—	24	—	S	$V_{DS} = -5V, I_D = -11.5A$
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	$C_{iss}$	—	2246	—	pF	$V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz$
Output Capacitance	$C_{oss}$	—	352	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	294	—	pF	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
Gate Resistance	$R_g$	—	5.1	12	$\Omega$	
Total Gate Charge ( $V_{GS} = -5V$ )	$Q_g$	—	20.5	—	nC	$V_{DS} = -15V, I_D = -11.5A$
Total Gate Charge ( $V_{GS} = -10V$ )	$Q_g$	—	41	—	nC	
Gate-Source Charge	$Q_{gs}$	—	7.6	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	8.0	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	7.5	—	ns	$V_{DD} = -15V, V_{GS} = -10V, R_g = 6\Omega, I_D = -11.5A$
Turn-On Rise Time	$t_r$	—	15.4	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	45.6	—	ns	
Turn-Off Fall Time	$t_f$	—	36.8	—	ns	
<b>BODY DIODE CHARACTERISTICS</b>						
Diode Forward Voltage	$V_{SD}$	—	-0.7	—	V	$V_{GS} = 0V, I_S = -1A$
Reverse Recovery Time (Note 9)	$t_{RR}$	—	20	—	ns	$I_S = -11.5A, dI/dt = 100A/\mu s$
Reverse Recovery Charge (Note 9)	$Q_{RR}$	—	9.5	—	nC	

- 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.
  - $I_{AR}$  and  $E_{AR}$  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.

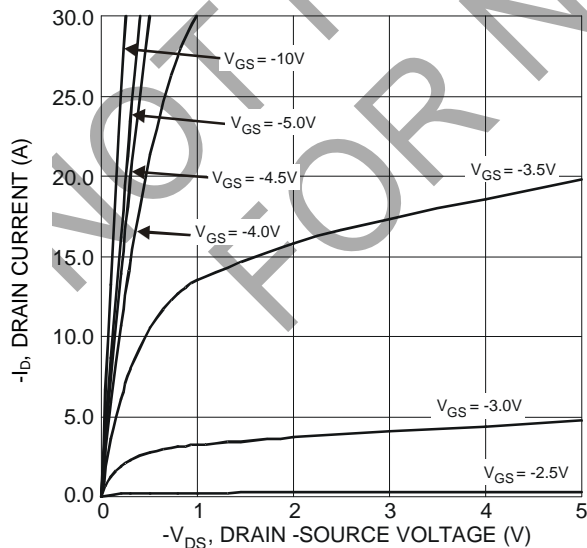


Figure 1 Typical Output Characteristics

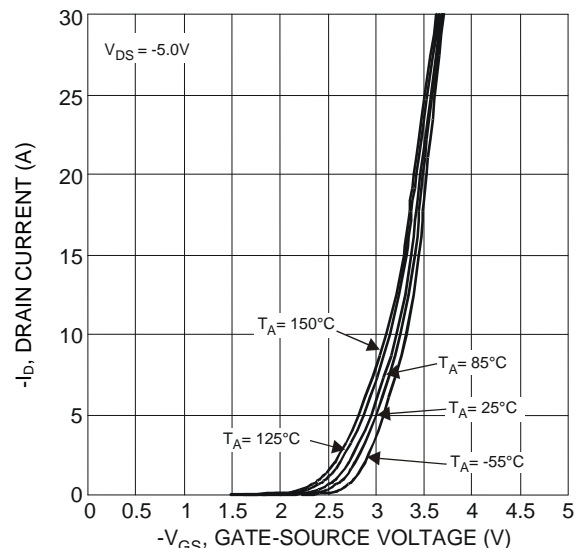


Figure 2 Typical Transfer Characteristics

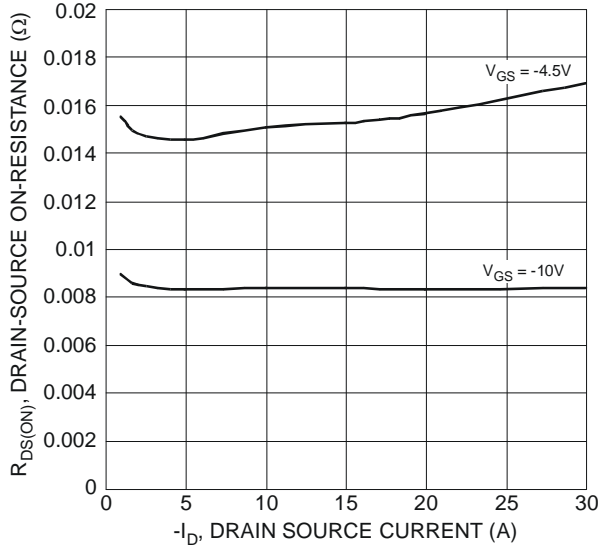


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

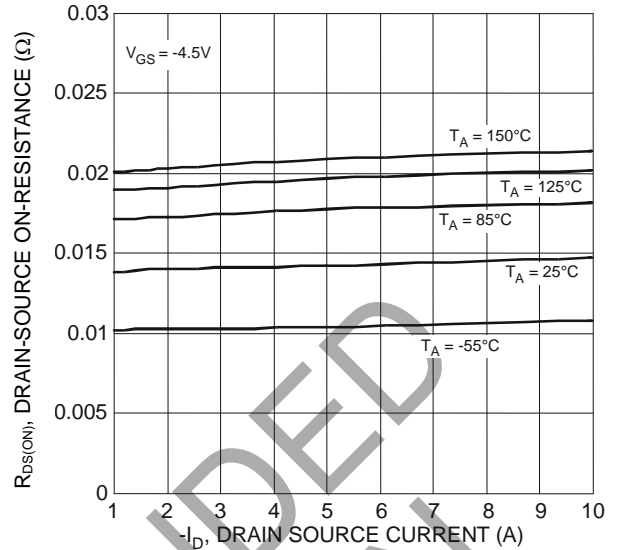


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

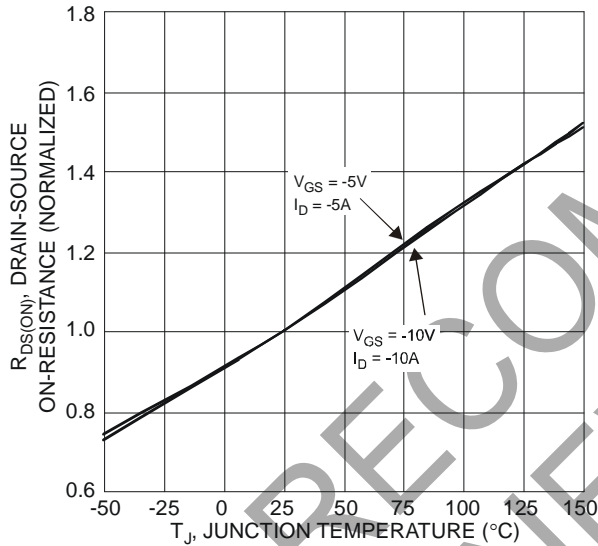


Figure 5 On-Resistance Variation with Temperature

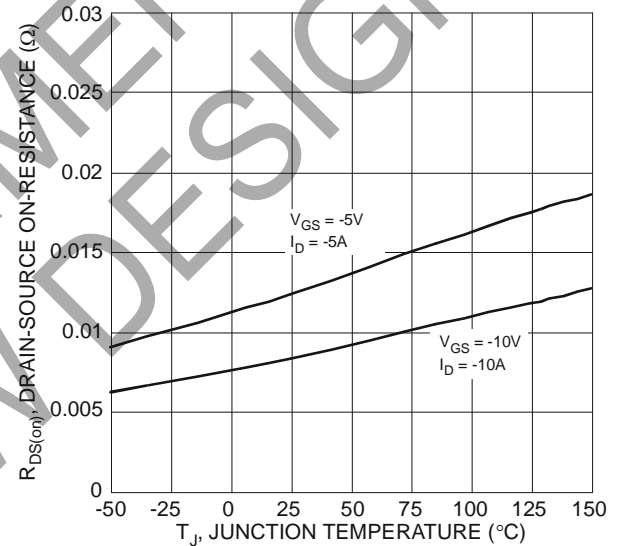


Figure 6 On-Resistance Variation with Temperature

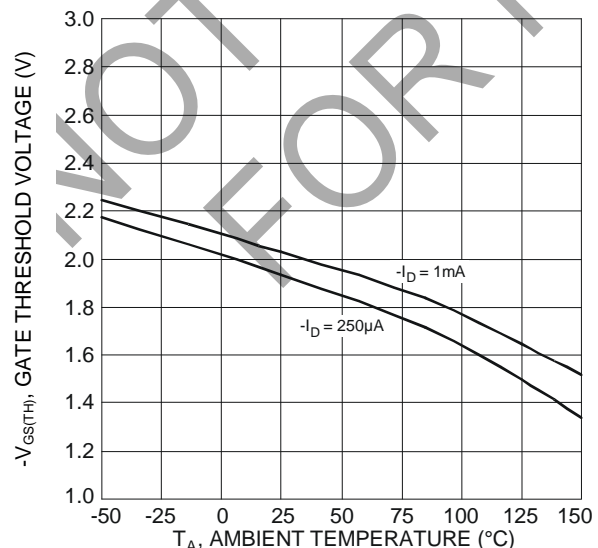


Figure 7 Gate Threshold Variation vs. Ambient Temperature

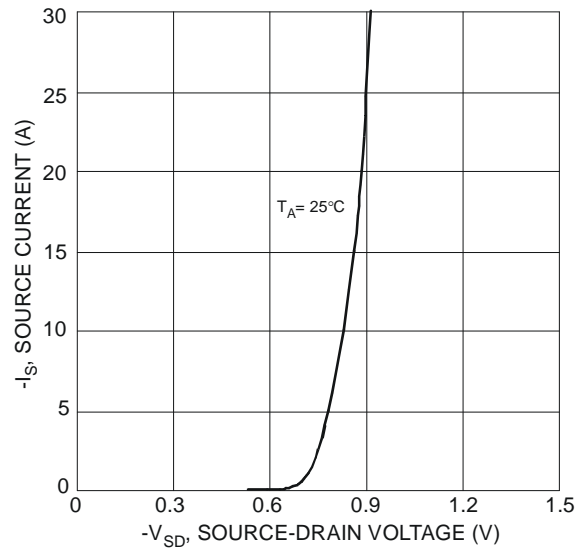


Figure 8 Diode Forward Voltage vs. Current

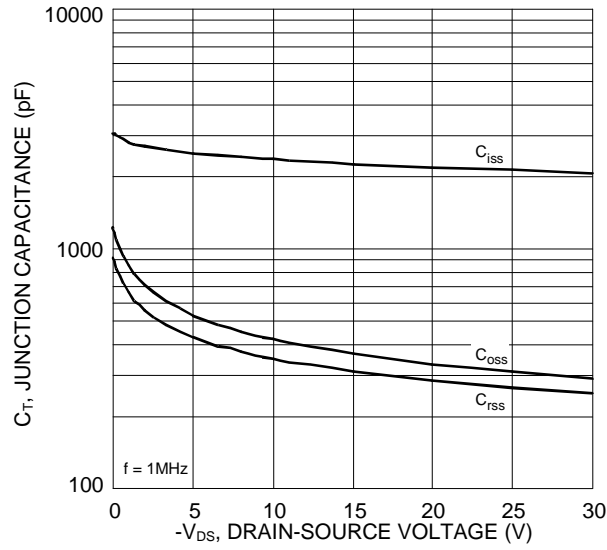


Figure 9 Typical Junction Capacitance

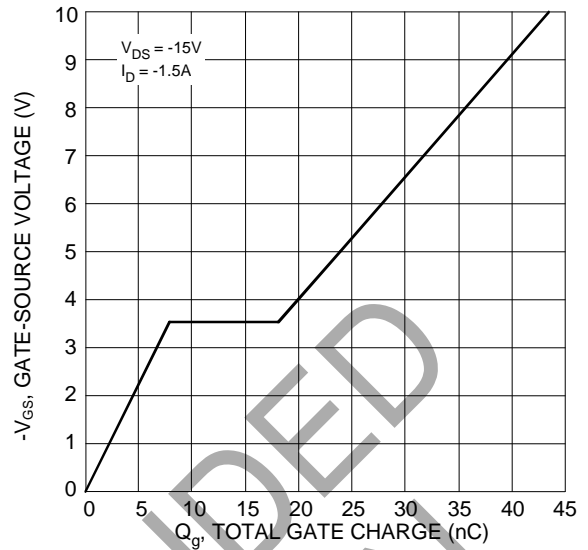


Figure 10 Gate Charge

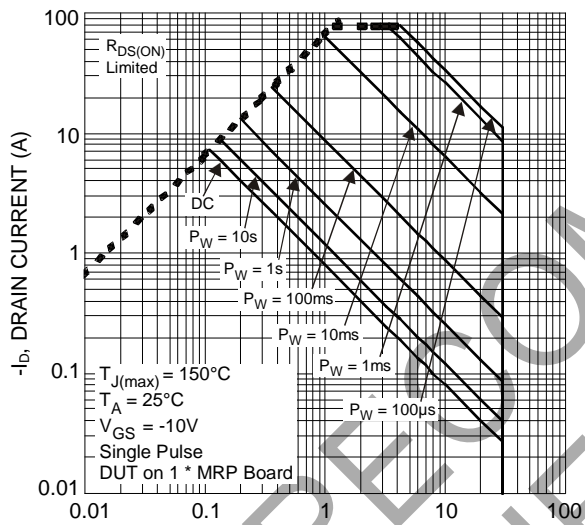


Figure 11 SOA, Safe Operation Area

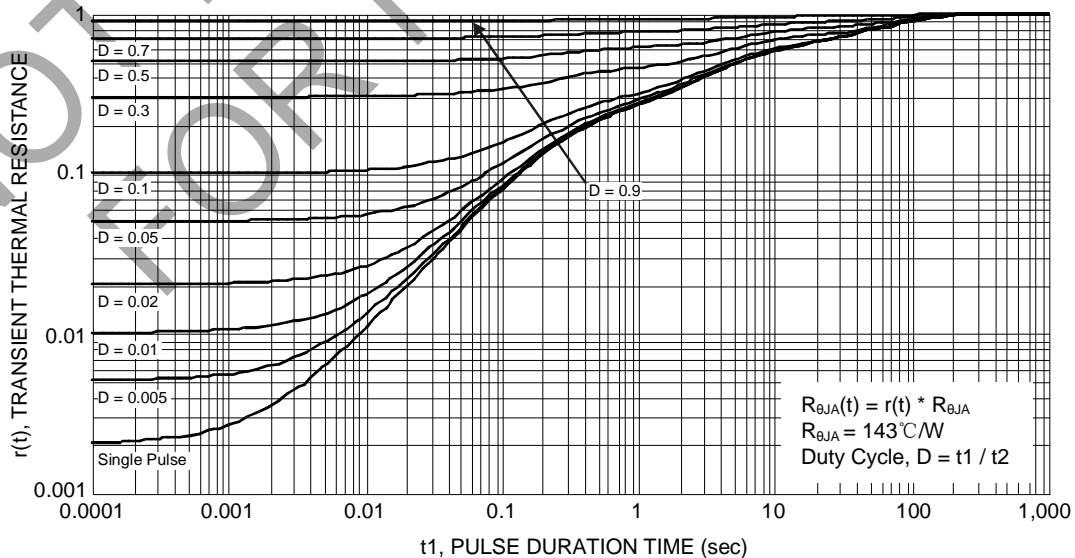
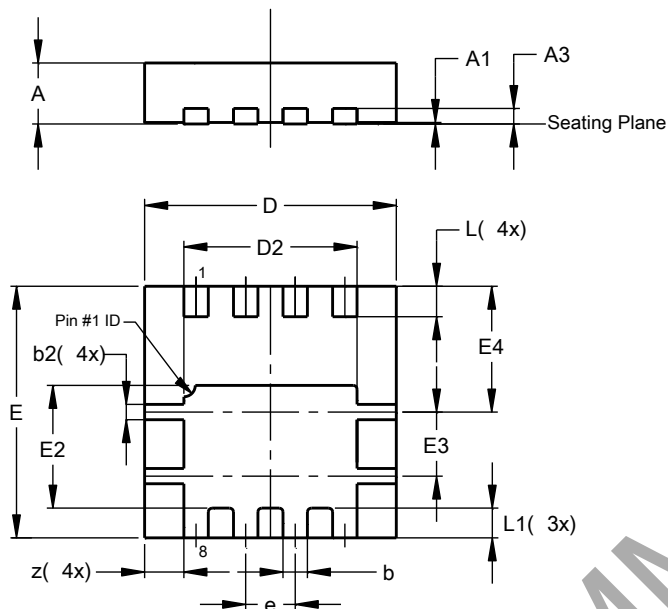


Figure 12 Transient Thermal Resistance

## Package Outline Dimensions

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

**PowerDI3333-8**

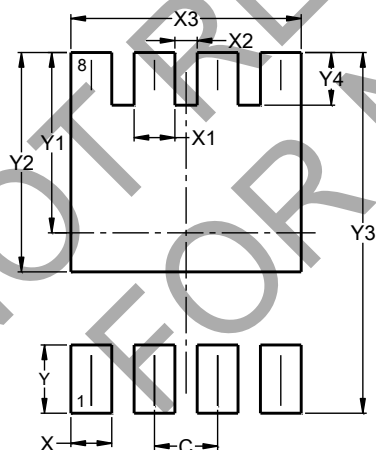


PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	-	-	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	-	-	0.65
L	0.35	0.45	0.40
L1	-	-	0.39
z	-	-	0.515
All Dimensions in mm			

## 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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