

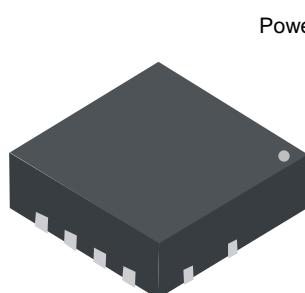
## Product Summary

BV <sub>DSS</sub>	R <sub>DSON</sub> max	I <sub>D</sub> max T <sub>C</sub> = +25°C
40V	11.5mΩ @ V <sub>GS</sub> = 10V	30A
	17.8mΩ @ V <sub>GS</sub> = 4.5V	24A

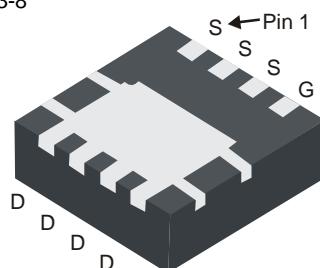
## Description and Applications

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

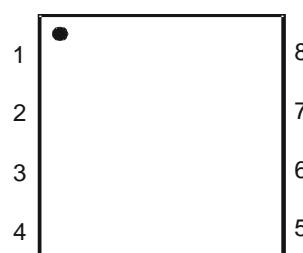
- Backlighting
- Power Management Functions
- DC-DC Converters



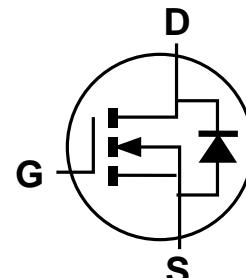
Top View



Bottom View



Top View  
Internal Schematic



Equivalent Circuit

## Ordering Information (Note 4)

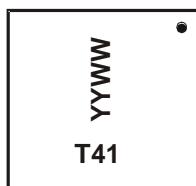
Part Number	Case	Packaging
DMT4011LFG-7	PowerDI3333-8	2,000/Tape & Reel
DMT4011LFG-13	PowerDI3333-8	3,000/Tape & Reel

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 <http://www.diodes.com/products/packages.html>.

## Marking Information

PowerDI3333-8



T41 = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Two Digits of Year (ex: 16 = 2016)  
WW = Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated.

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		$V_{DSS}$	40	V
Gate-Source Voltage		$V_{GSS}$	+20 -16	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	$I_D$	30 24	A
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	10.8 8.6	A
Maximum Continuous Body Diode Forward Current (Note 5)		$I_S$	2.1	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)		$I_{DM}$	65	A
Avalanche Current, $L=0.3\text{mH}$		$I_{AS}$	11.9	A
Avalanche Energy, $L=0.3\text{mH}$		$E_{AS}$	21.4	$\text{mJ}$

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	$P_D$	2	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	62	$^\circ\text{C/W}$
Total Power Dissipation (Note 5)	$T_C = +25^\circ\text{C}$	$P_D$	15.6	W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	8	$^\circ\text{C/W}$
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 6)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	40	-	-	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS} = 32\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	-	-	100 -100	nA	$V_{GS} = +20\text{V}, V_{DS} = 0\text{V}$ $V_{GS} = -16\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	1	-	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	9.2	11.5	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
		-	13.4	17.8		$V_{GS} = 4.5\text{V}, I_D = 20\text{A}$
Diode Forward Voltage	$V_{SD}$	-	-	1.2	V	$V_{GS} = 0\text{V}, I_S = 20\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	$C_{iss}$	-	767	-	$\text{pF}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	-	238	-		
Reverse Transfer Capacitance	$C_{rss}$	-	30.6	-		
Gate Resistance	$R_g$	-	1	-	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	-	7	-	$\text{nC}$	$V_{DS} = 20\text{V}, I_D = 20\text{A}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	-	15.1	-		
Gate-Source Charge	$Q_{gs}$	-	2.1	-		
Gate-Drain Charge	$Q_{gd}$	-	3.2	-		
Turn-On Delay Time	$t_{D(ON)}$	-	3.5	-	$\text{ns}$	$V_{DD} = 20\text{V}, V_{GS} = 10\text{V}, R_G = 1.6\Omega, I_D = 20\text{A}$
Turn-On Rise Time	$t_R$	-	5.8	-		
Turn-Off Delay Time	$t_{D(OFF)}$	-	9.6	-		
Turn-Off Fall Time	$t_F$	-	2	-		
Body Diode Reverse Recovery Time	$t_{RR}$	-	9.8	-	$\text{ns}$	$I_F = 15\text{A}, di/dt = 400\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	$Q_{RR}$	-	5.1	-		

Notes:

- $R_{\theta JA}$  is determined with the device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta JA}$  is determined by the user's board design.
- Short duration pulse test used to minimize self-heating effect.
- Guaranteed by design. Not subject to product testing.

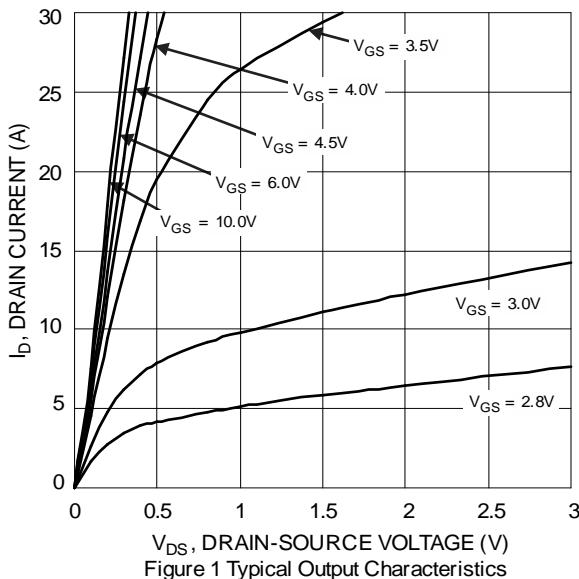


Figure 1 Typical Output Characteristics

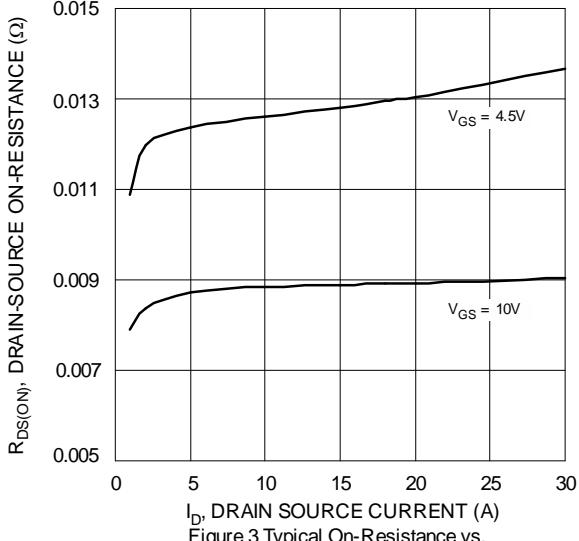


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

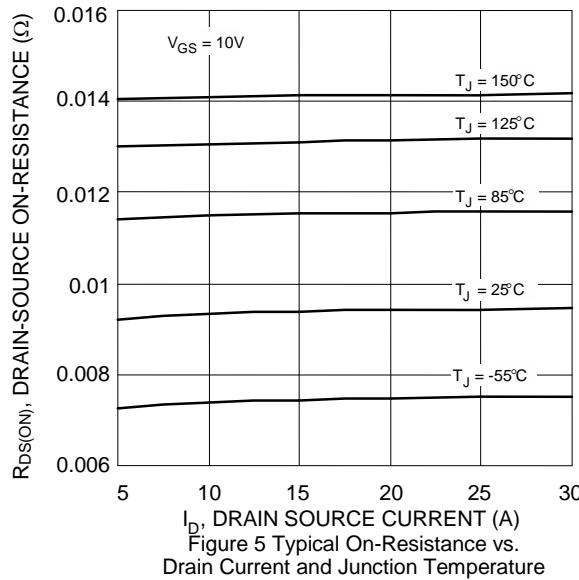


Figure 5 Typical On-Resistance vs.  
Drain Current and Junction Temperature

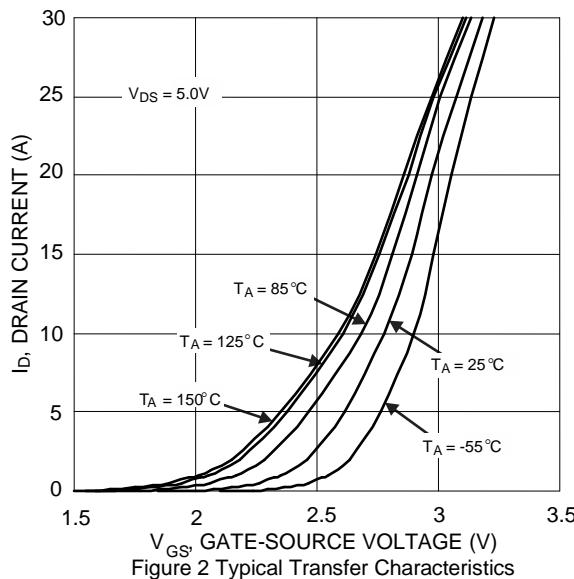


Figure 2 Typical Transfer Characteristics

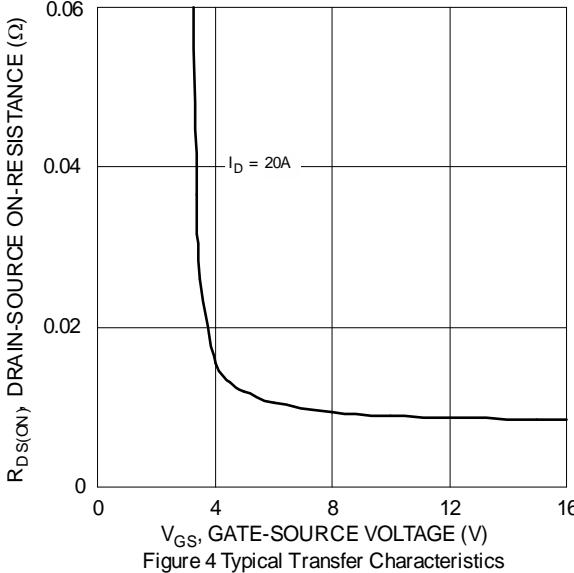


Figure 4 Typical Transfer Characteristics

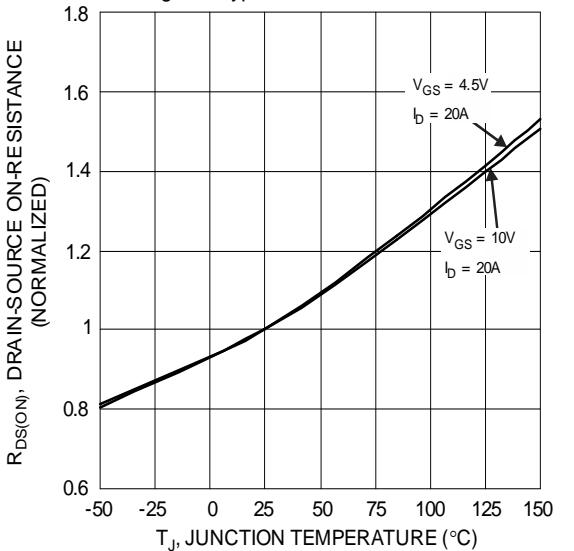


Figure 6 On-Resistance Variation with Junction Temperature

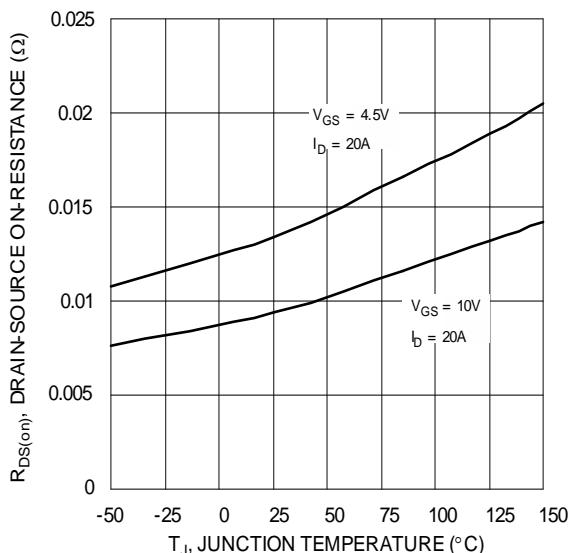


Figure 7 On-Resistance Variation with Junction Temperature

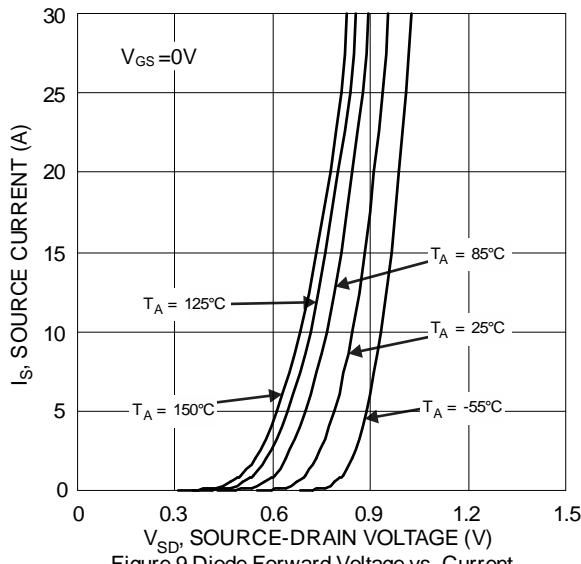


Figure 9 Diode Forward Voltage vs. Current

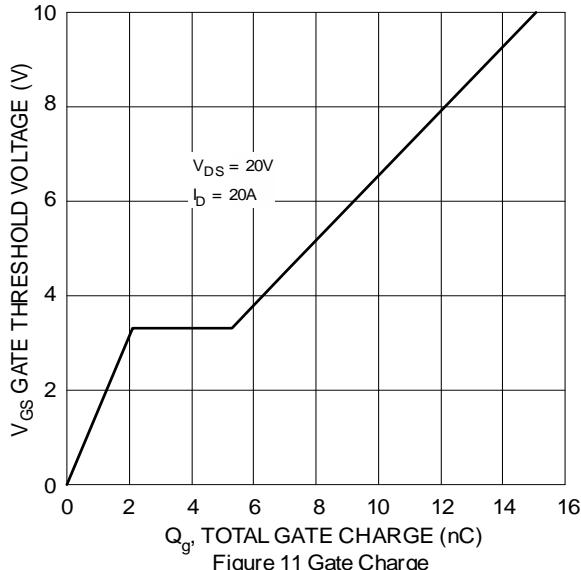


Figure 11 Gate Charge

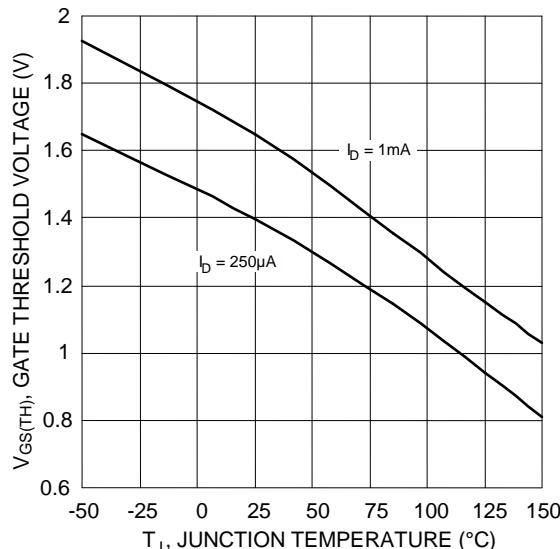


Figure 8 Gate Threshold Variation vs. Junction Temperature

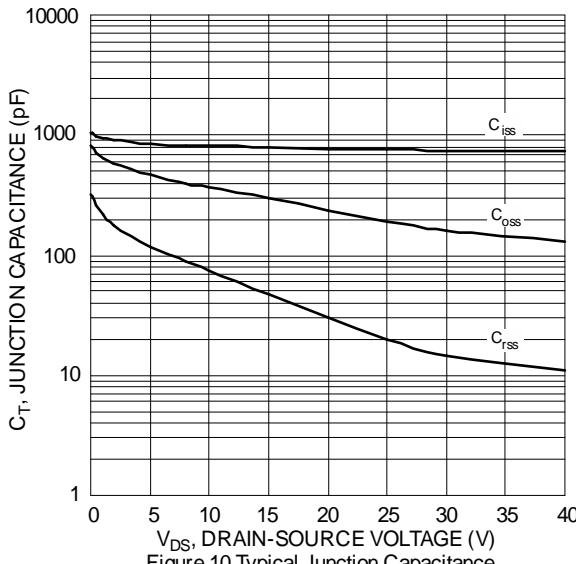


Figure 10 Typical Junction Capacitance

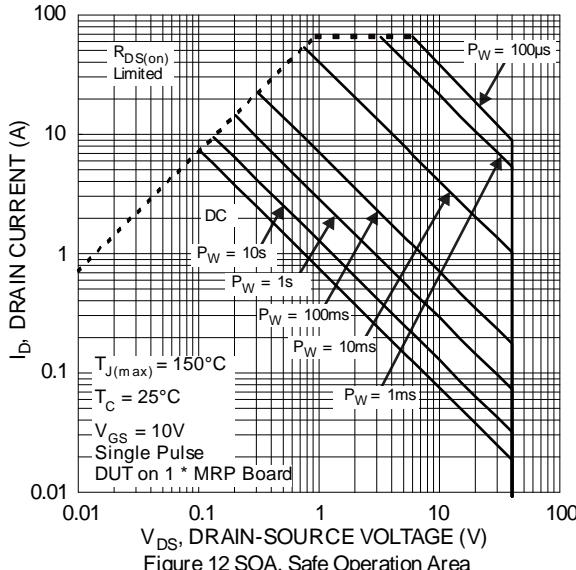


Figure 12 SOA, Safe Operation Area

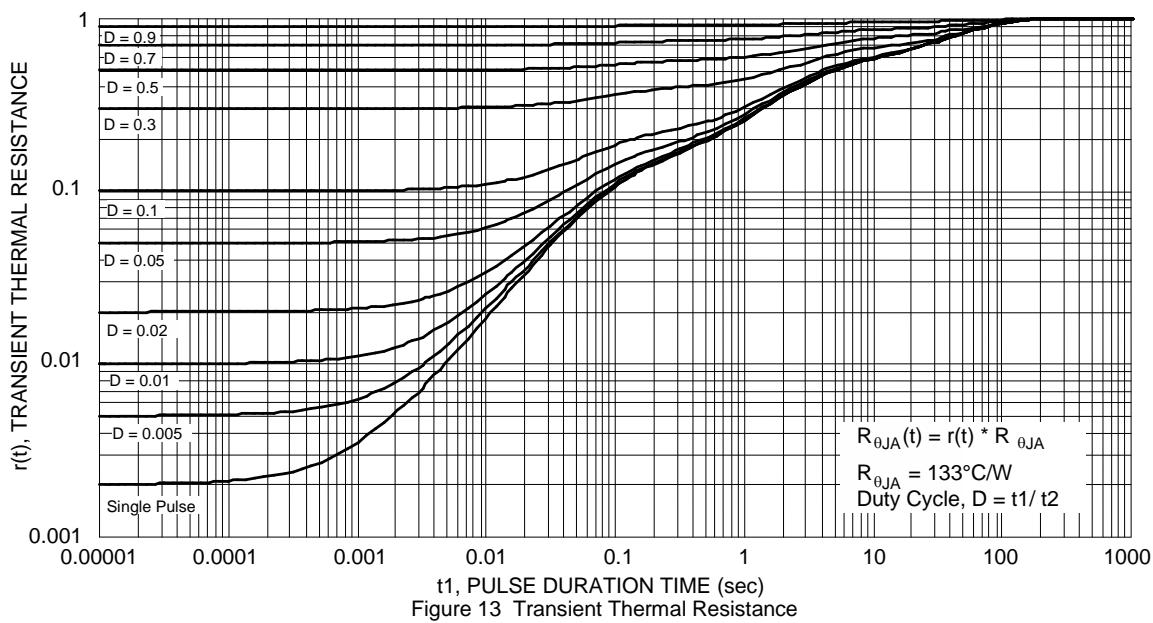
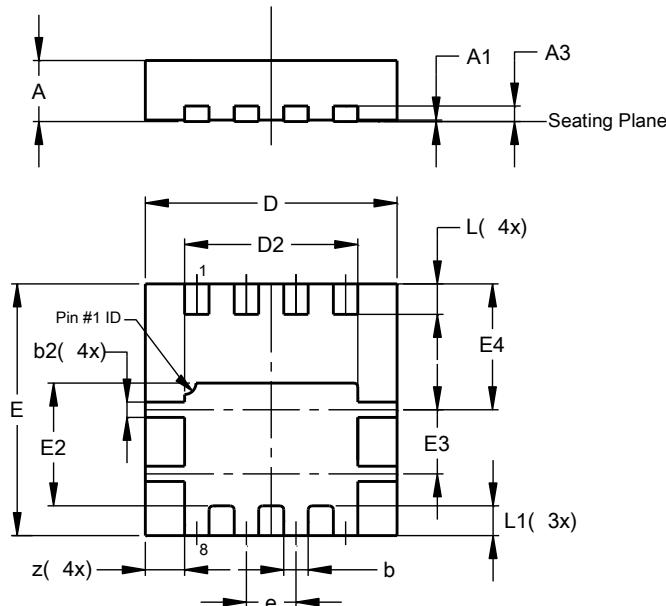


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

PowerDI3333-8



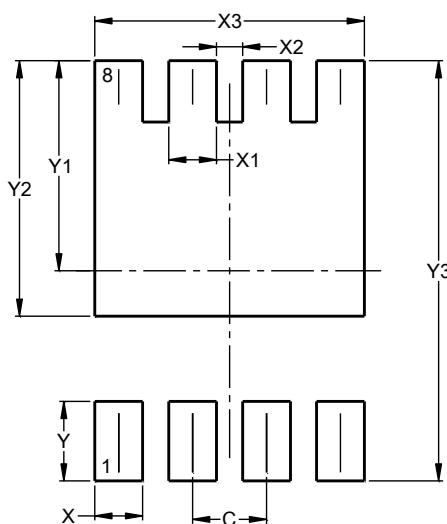
PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	—	—	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	—	—	0.65
L	0.35	0.45	0.40
L1	—	—	0.39
z	—	—	0.515

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

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