Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_C = +25°C
-30V	20mΩ @ V_{GS} = -10V	-30A
	29mΩ @ V_{GS} = -5V	-30A

Description and Applications

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

- Backlighting
- Power-management functions
- DC-DC converters

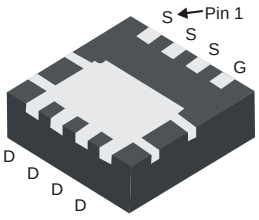
Features and Benefits

- 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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

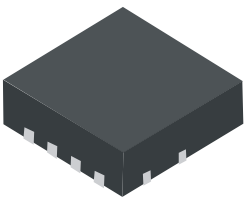
Mechanical Data

- Package: PowerDI® 3333-8
- Package 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 e3
- Weight: 0.03 grams (Approximate)

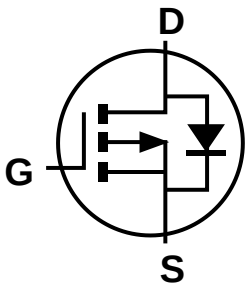
PowerDI3333-8



Bottom View



Top View



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMP3036SFG-7	PowerDI3333-8	2,000	Tape & Reel
DMP3036SFG-13	PowerDI3333-8	3,000	Tape & Reel

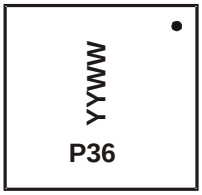
Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- 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/.

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Marking Information

Site 1

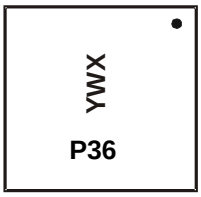
PowerDI3333-8



P36 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 23 = 2023)
WW = Week Code (01 to 53)

Site 2:

PowerDI3333-8



P36 = Product Type Marking Code
YWX = Date Code Marking
Y = Year (ex: 3 = 2023)
W = Week (ex: a = Week 27; z Represents Week 52 and 53)
X = Internal Code (ex: U = Monday)

Date Code Key

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	3	4	5	6	7	8	9	0	1	2

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_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±25	V
Continuous Drain Current (Note 6) V_{GS} = -10V	T_A = +25°C T_A = +70°C	I_D	-8.7 -7.0	A
Continuous Drain Current (Note 7) V_{GS} = -10V	T_C = +25°C T_C = +70°C	I_D	-30 -25	A
Continuous Drain Current (Note 6) V_{GS} = -5V	T_A = +25°C T_A = +70°C	I_D	-7.2 -5.8	A
Continuous Drain Current (Note 7) V_{GS} = -5V	T_C = +25°C T_C = +70°C	I_D	-30 -24	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I_{DM}	-80	A
Maximum Continuous Body Diode Forward Current (Note 6)		I_S	-3.6	A
Avalanche Current (Note 7) L=0.3mH		I_{AS}	-17.5	A
Avalanche Energy (Note 7) L=0.3mH		E_{AS}	64	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	137	°C/W
	t<10s		65	°C/W
Total Power Dissipation (Note 6)		P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	55	°C/W
	t<10s		26	°C/W
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	3.5	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-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 1inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad).

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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1.0	µA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1.0	-2.0	-2.5	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	13	20	mΩ	V_{GS} = -10V, I_D = -8A
		—	18.4	29		V_{GS} = -5V, I_D = -5A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1931	—	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	226	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	168	—	pF	
Gate Resistance	R_g	—	10.9	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge V_{GS} = -5V	Q_g	—	8.8	—	nC	V_{DS} = -15V, I_D = -10A
Total Gate Charge V_{GS} = -10V	Q_g	—	16.5	—	nC	
Gate-Source Charge	Q_{gs}	—	2.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	3.6	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	8.2	—	ns	V_{GS} = -10V, V_{DD} = -15V, R_{GEN} = 3Ω, I_D = -10A
Turn-On Rise Time	t_R	—	14	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	65	—	ns	
Turn-Off Fall Time	t_F	—	31.6	—	ns	
Reverse Recovery Time	t_{RR}	—	9.3	—	ns	I_F = -8A, di/dt = 500A/µs
Reverse Recovery Charge	Q_{RR}	—	12.2	—	nC	

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

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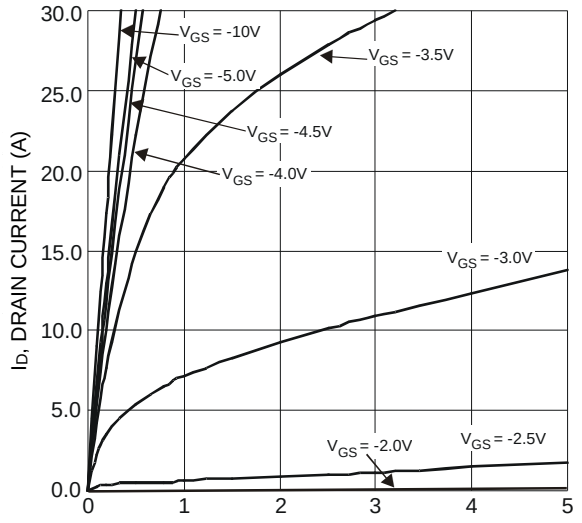


Figure 1 Typical Output Characteristics

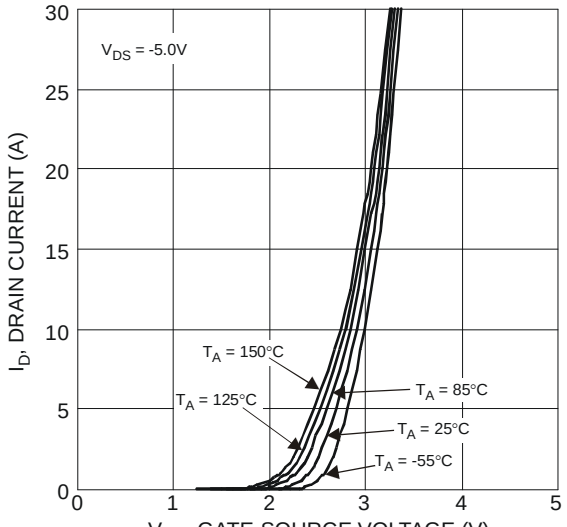


Figure 2 Typical Transfer Characteristics

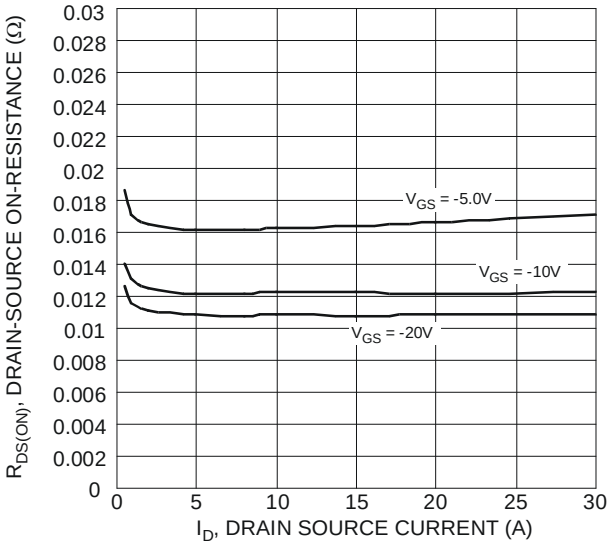


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

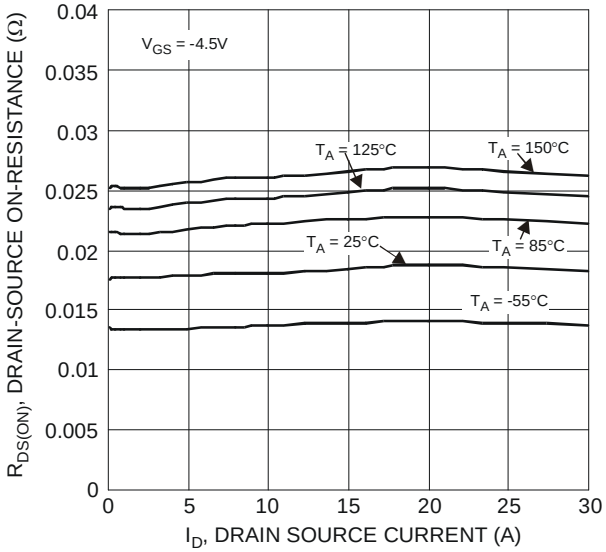


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

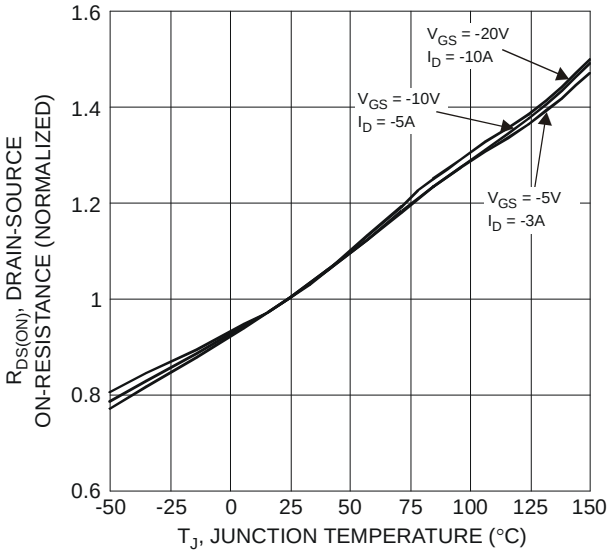


Figure 5 On-Resistance Variation with Temperature

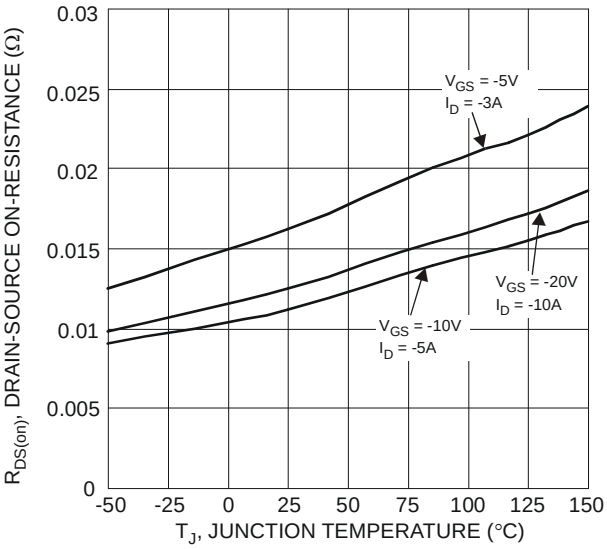


Figure 6 On-Resistance Variation with Temperature

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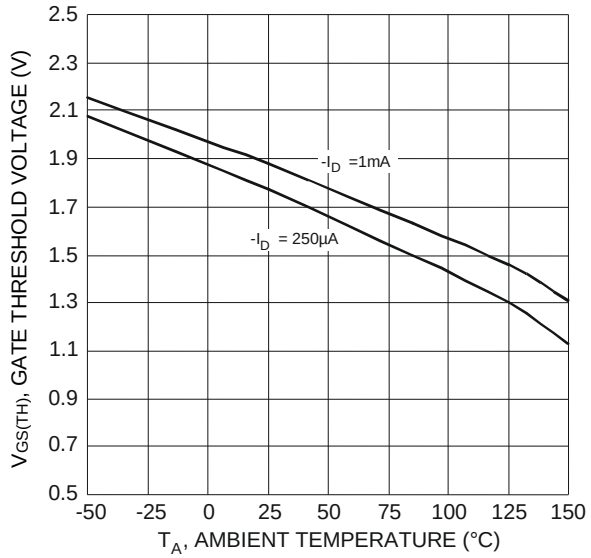


Figure 7 Gate Threshold Variation vs. Ambient Temperature

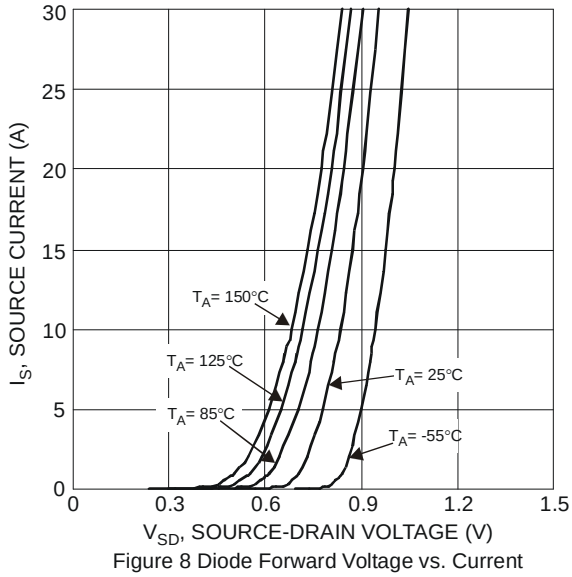


Figure 8 Diode Forward Voltage vs. Current

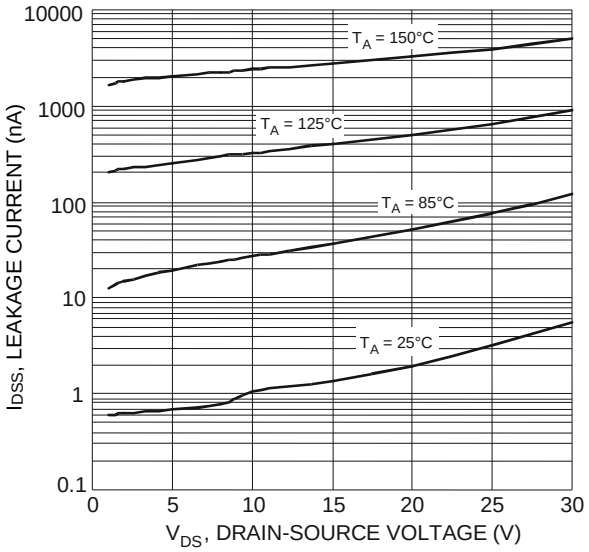


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

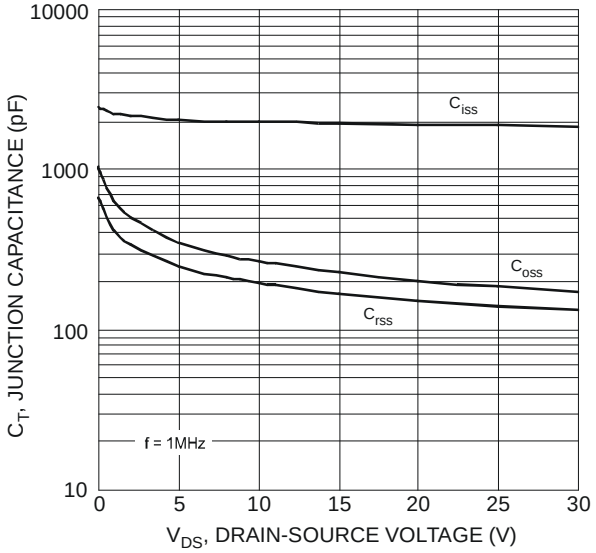


Figure 10 Typical Junction Capacitance

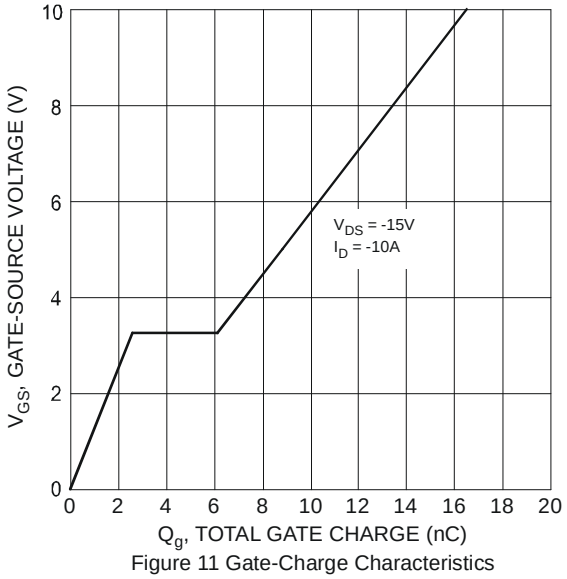


Figure 11 Gate-Charge Characteristics

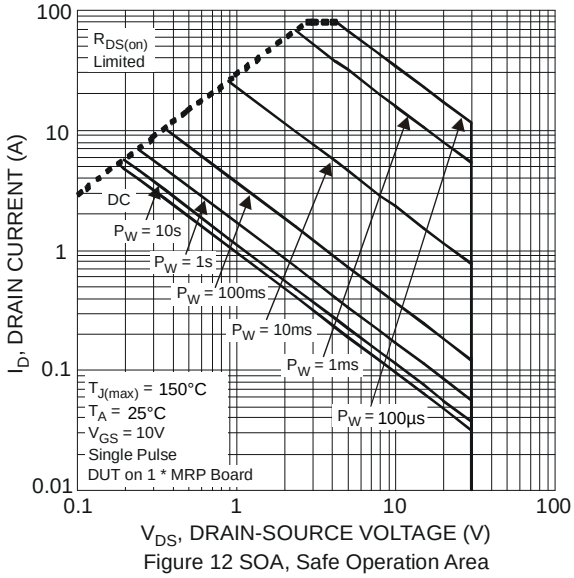


Figure 12 SOA, Safe Operation Area

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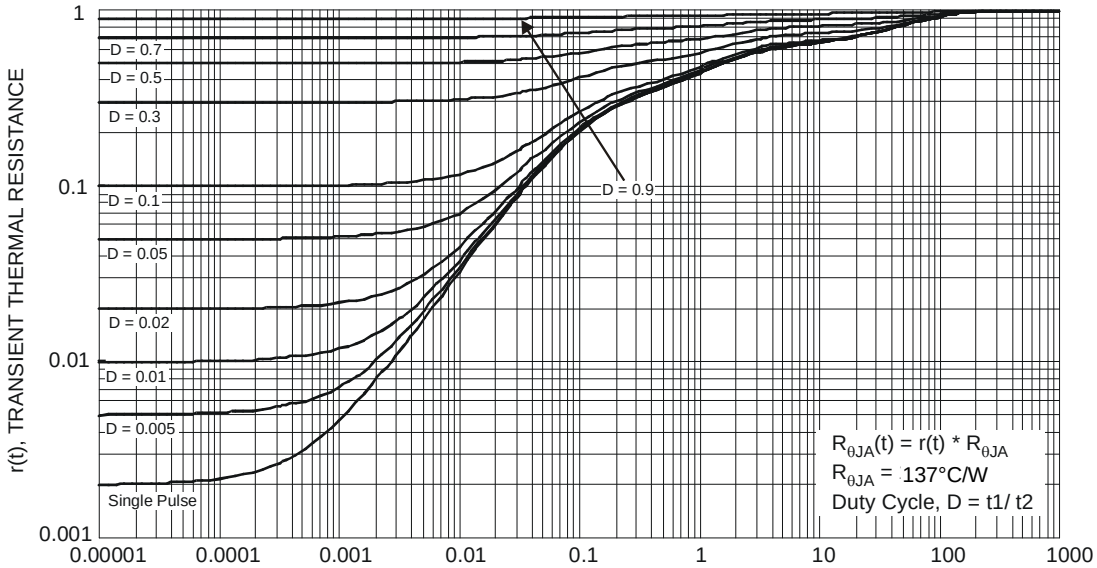


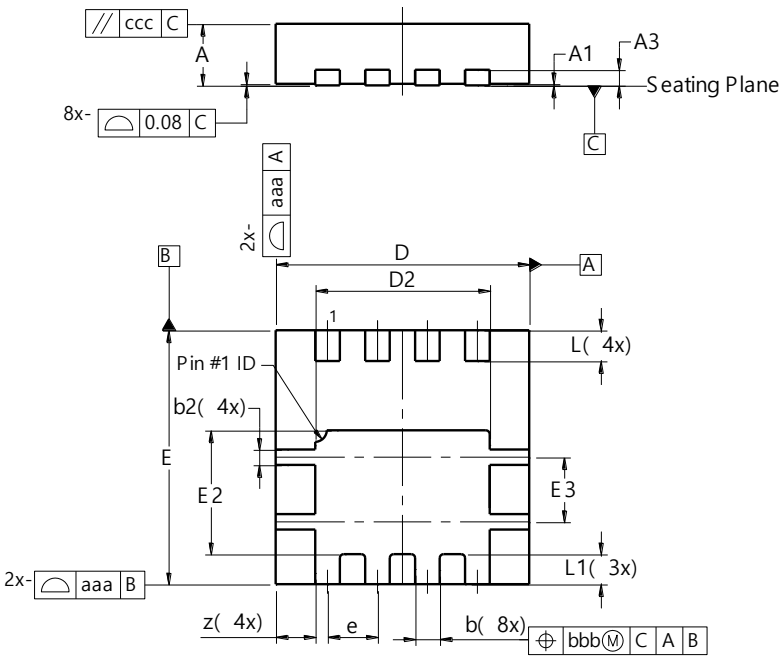
Figure 13 Transient Thermal Resistance

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Package Outline Dimensions

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

PowerDI3333-8

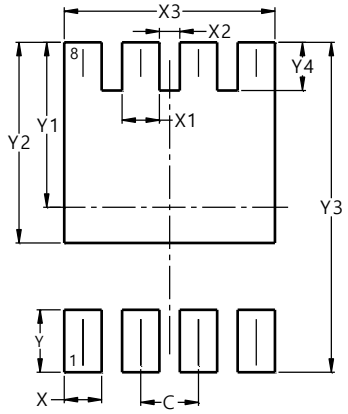


PowerDI3333-8			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	–	–	0.203
b	0.27	0.37	0.32
b2	–	–	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
e	–	–	0.65
L	0.35	0.45	0.40
L1	–	–	0.39
z	–	–	0.515
aaa	0.25		
bbb	0.10		
ccc	0.10		
All Dimensions 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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