

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	

Description

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.

Applications

- Load Switch
- Power Management Functions

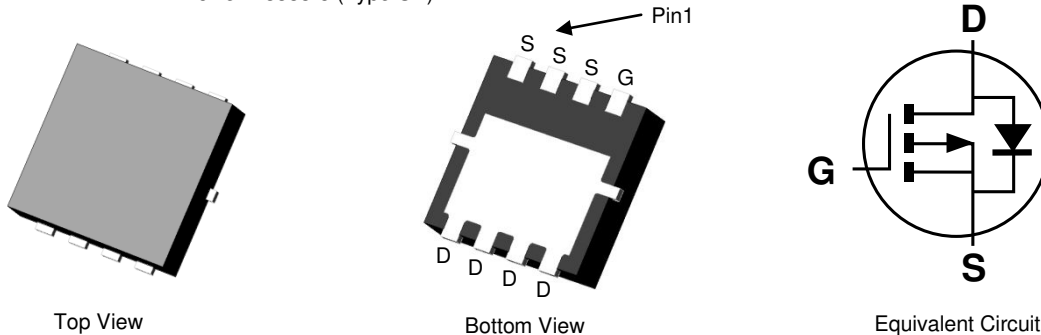
Features

- 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)**

Mechanical Data

- Case: PowerDI[®] 3333-8 (Type UX)
- 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: 0.03 grams (Approximate)

PowerDI3333-8 (Type UX)

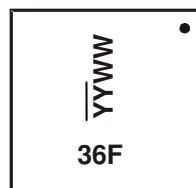


Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3036SFV-7	PowerDI3333-8 (Type UX)	2000/Tape & Reel
DMP3036SFV-13	PowerDI3333-8 (Type UX)	3000/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 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



36F = 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°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, V _{GS} = -10V (Note 6)	I _D	T _A = +25°C	-8.7	A
		T _A = +70°C	-7.0	
Continuous Drain Current, V _{GS} = -10V (Note 7)	I _D	T _C = +25°C	-30	A
		T _C = +70°C	-25	
Maximum Continuous Body Diode Forward Current (Note 7)	I _S	-3.6	A	
Pulsed Drain Current (380μs Pulse, Duty Cycle = 1%)	I _{DM}	-80	A	
Avalanche Current, L = 0.3mH (Note 8)	I _{AS}	-17.5	A	
Avalanche Energy, L = 0.3mH (Note 8)	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)	R _{θJA}	Steady State	137	°C/W
Total Power Dissipation (Note 6)		P _D	2.3	
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	Steady State	55	°C/W
Thermal Resistance, Junction to Case (Note 7)		R _{θJC}	3.5	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±25V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-2.5	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	20	mΩ	V _{GS} = -10V, I _D = -8A
		—	—	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 10)						
Input Capacitance	C _{ISS}	—	1931	—	pF	V _{DS} = -15V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{OSS}	—	226	—		
Reverse Transfer Capacitance	C _{RSS}	—	168	—		
Gate Resistance	R _G	—	11	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
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	—		
Gate-Source Charge	Q _{gs}	—	2.6	—		
Gate-Drain Charge	Q _{gd}	—	3.6	—		
Turn-On Delay Time	t _{D(ON)}	—	8.2	—	ns	V _{DD} = -15V, V _{GS} = -10V, R _{GEN} = 3Ω, I _D = -10A
Turn-On Rise Time	t _R	—	14	—		
Turn-Off Delay Time	t _{D(OFF)}	—	65	—		
Turn-Off Fall Time	t _F	—	31.6	—		
Reverse Recovery Time	t _{RR}	—	9.3	—	ns	I _F = -8A, di/dt = 500A/μs
Reverse Recovery Charge	Q _{RR}	—	12.2	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
 - Thermal resistance from junction to soldering point (on the exposed drain pad).
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

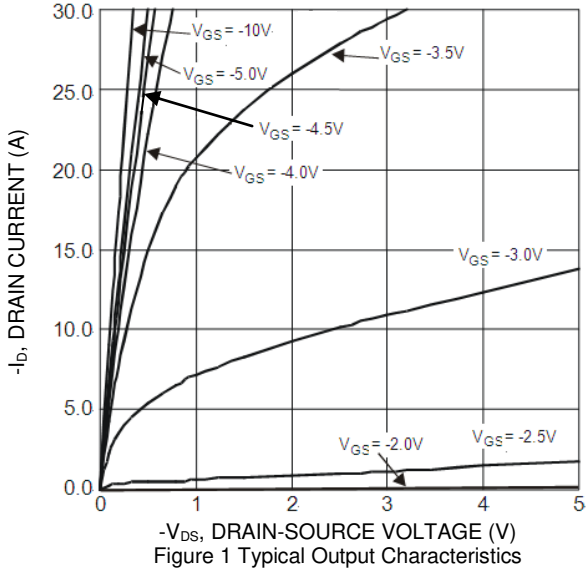


Figure 1 Typical Output Characteristics

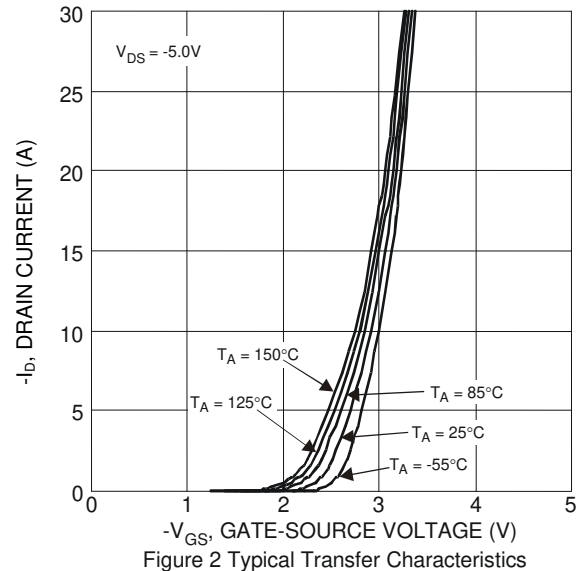


Figure 2 Typical Transfer Characteristics

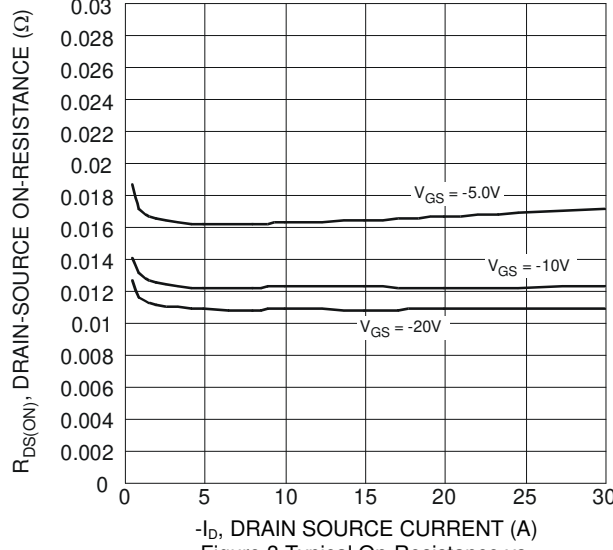


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

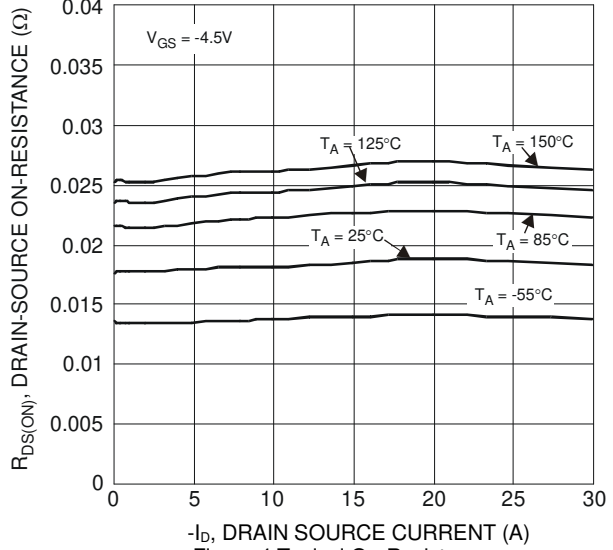


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

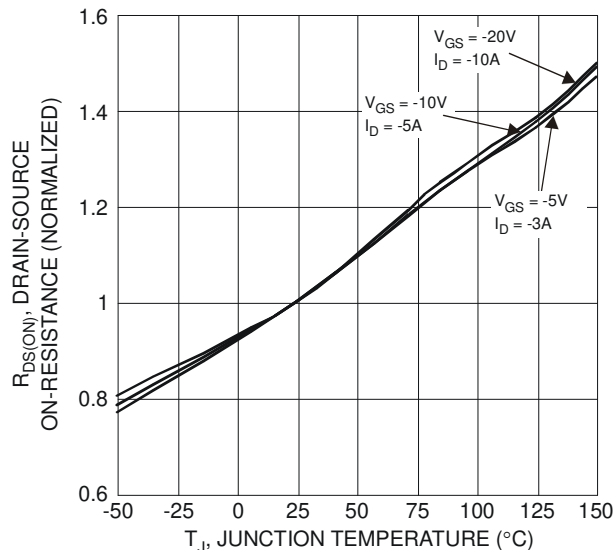


Figure 5 On-Resistance Variation with Temperature

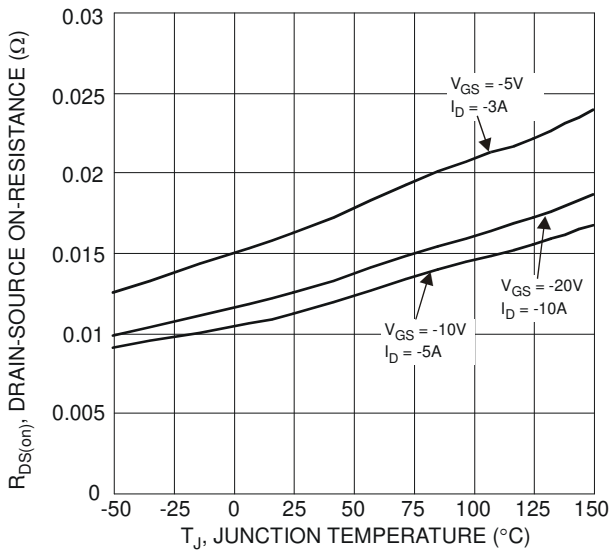


Figure 6 On-Resistance Variation with Temperature

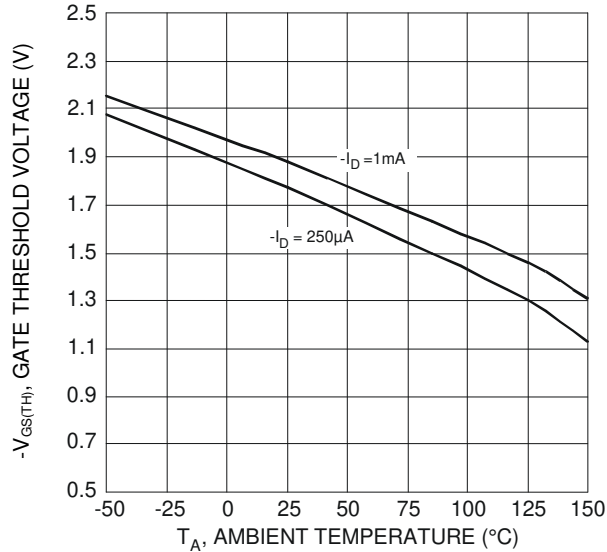


Figure 7 Gate Threshold Variation vs. Ambient Temperature

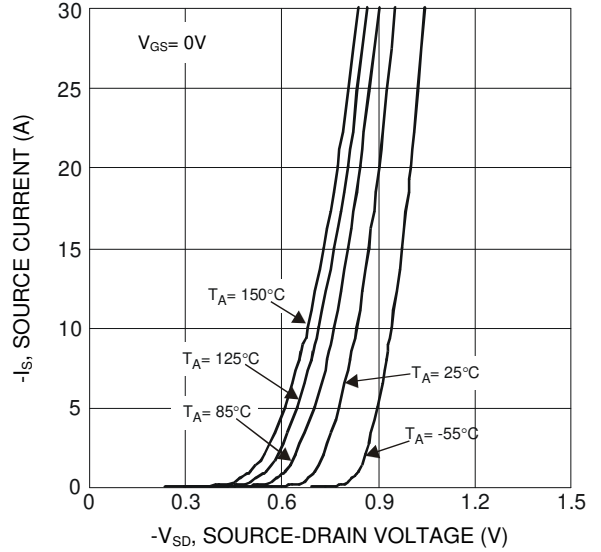


Figure 8 Diode Forward Voltage vs. Current

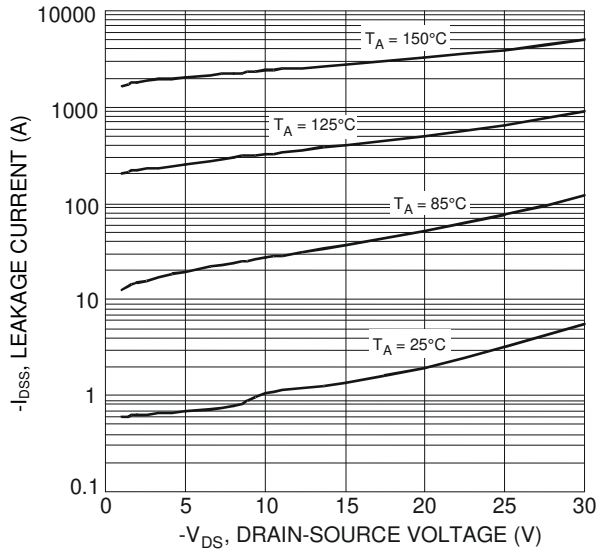


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

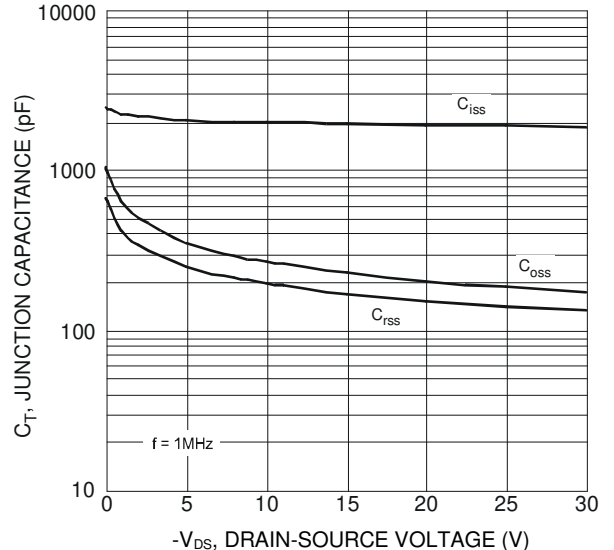


Figure 10 Typical Junction Capacitance

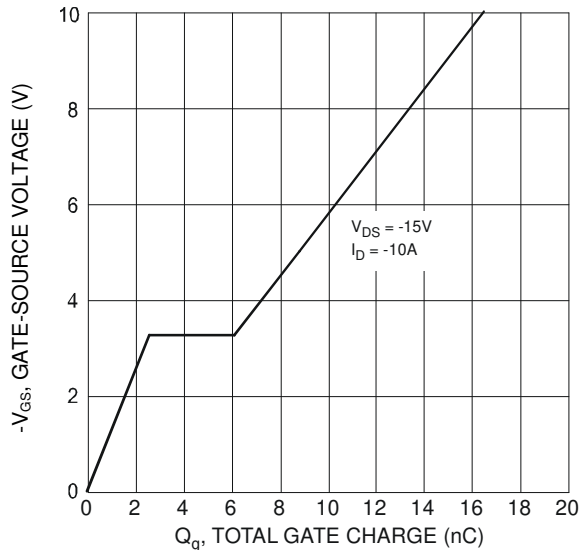


Figure 11 Gate-Charge Characteristics

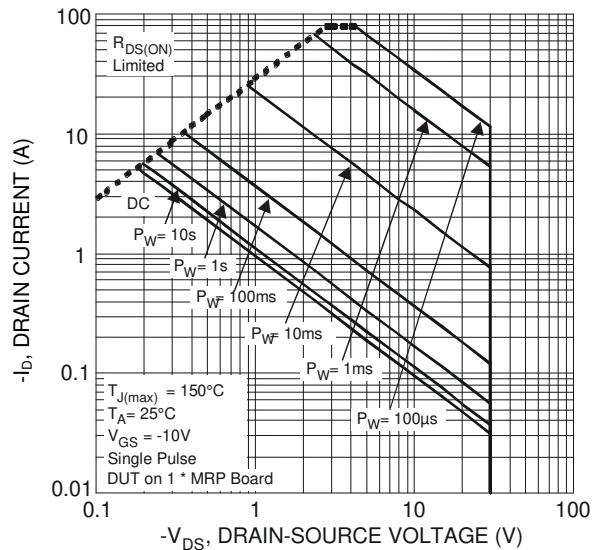


Figure 12 SOA, Safe Operation Area

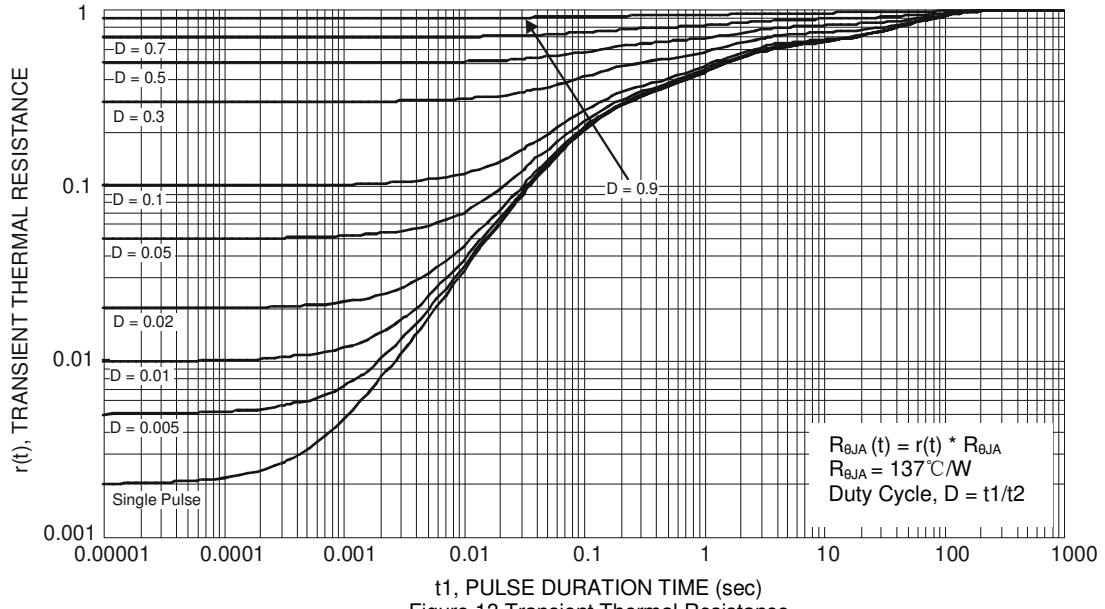
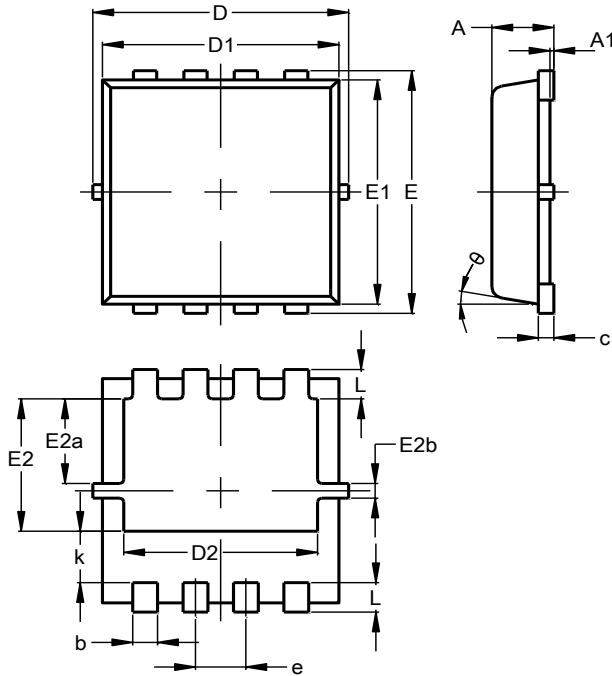


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8 (Type UX)

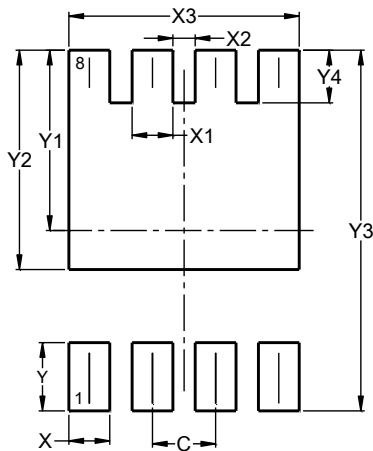


PowerDI3333-8 (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E2a	0.95	1.35	1.15
E2b	0.10	0.30	0.20
e	0.65 BSC		
k	0.50	0.90	0.70
L	0.30	0.50	0.40
θ	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 UX)



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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