

Product Summary

Device	BV _{DSS}	R _{D1} R _{D2} Max	I _D Max T _C = +25°C (Note 10)
N-Channel	30V	22mΩ @ V _{GS} = 10V	17A
		28mΩ @ V _{GS} = 4.5V	14A

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{D1}R_{D2}), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

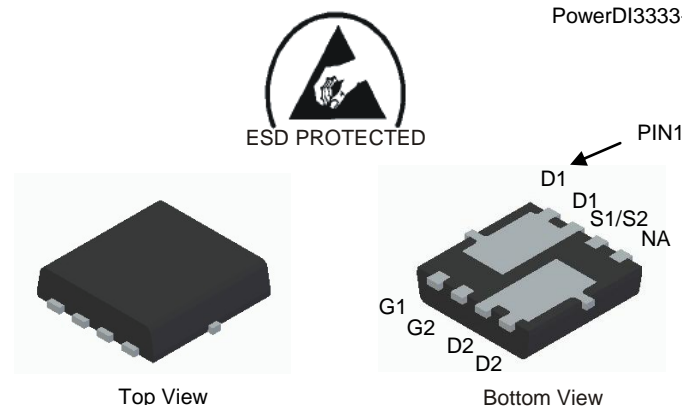
- General Purpose Interfacing Switch
- Power Management Functions

Features and Benefits

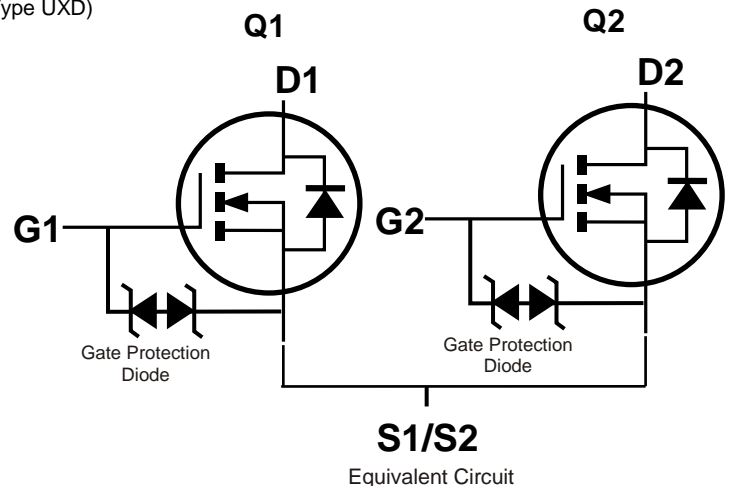
- Ultra Low Gate Threshold Voltage
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Function**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: PowerDI[®] 3333-8 (Type UXD)
- 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 208②
- Weight: 0.072 grams (Approximate)



PowerDI3333-8 (Type UXD)



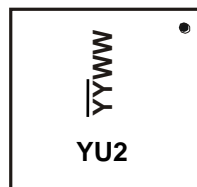
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3022UEV-7	PowerDI3333-8 (Type UXD)	2,000/Tape & Reel
DMT3022UEV-13	PowerDI3333-8 (Type UXD)	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



YU2 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 18 for 2018)
 WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Q1 & Q2	Unit		
Drain-Source Voltage	V _{DSS}	30	V		
Gate-Source Voltage	V _{GSS}	±12	V		
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	Steady State (Note 10)	T _C = +25°C	17	A
			T _C = +70°C	14	
Maximum Body Diode Forward Current (Note 6)	I _S	2	A		
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	50	A		
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	50	A		
Avalanche Current (Note 7) L = 0.1mH	I _{AS}	19	A		
Avalanche Energy (Note 7) L = 0.1mH	E _{AS}	18.5	mJ		

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	137	°C/W
Total Power Dissipation (Note 6)	P _D	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	70	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	12	
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 1-inch square copper plate.
7. UIS in production with L = 0.1mH, starting T_A = +25°C.

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	µA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±10V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	1.8	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{D1} R _{D2}	—	12.2	22	mΩ	V _{GS} = 10V, I _D = 11A
		—	17.6	28		V _{GS} = 4.5V, I _D = 7A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 8.8A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	903	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	386	—		
Reverse Transfer Capacitance	C _{riss}	—	67	—		
Gate Resistance	R _G	—	1.2	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _G	—	13.9	—	nC	V _{DS} = 15V, I _D = 10A
Total Gate Charge (V _{GS} = 4.5V)	Q _G	—	6.9	—		
Gate-Source Charge	Q _{GS}	—	1.5	—		
Gate-Drain Charge	Q _{GD}	—	2.8	—		
Turn-On Delay Time	t _{D(ON)}	—	3.8	—	ns	V _{GS} = 10V, V _{DD} = 15V, R _G = 1Ω, I _D = 8.8A
Turn-On Rise Time	t _r	—	6.7	—		
Turn-Off Delay Time	t _{D(OFF)}	—	10.5	—		
Turn-Off Fall Time	t _f	—	1.7	—		
Body Diode Reverse Recovery Time	t _{RR}	—	17	—	ns	I _F = 8.8A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	6.8	—	nC	

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

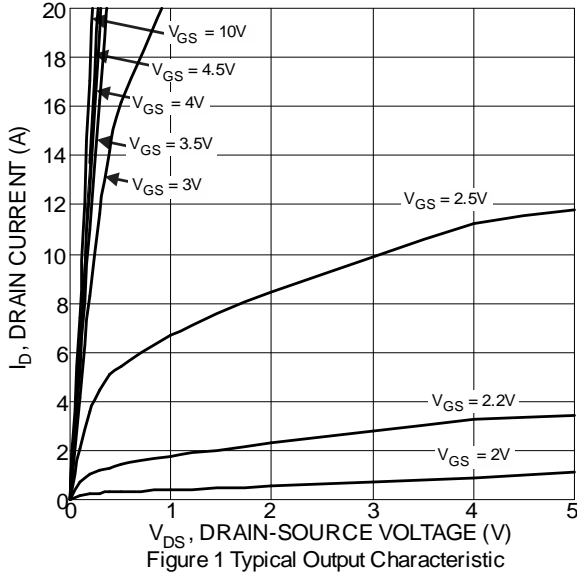


Figure 1 Typical Output Characteristic

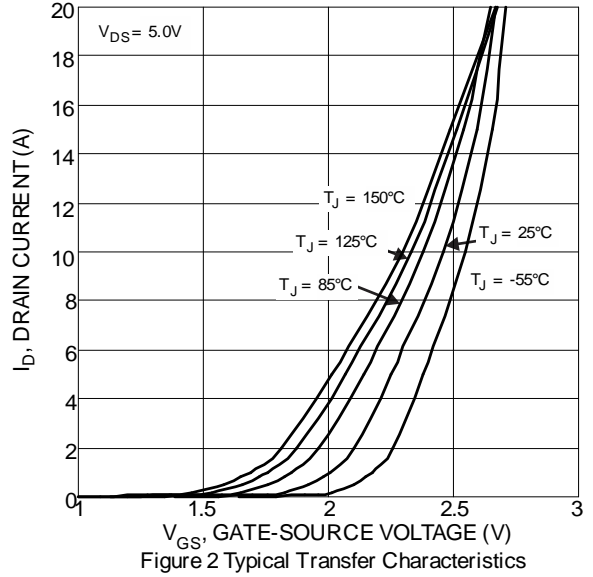


Figure 2 Typical Transfer Characteristics

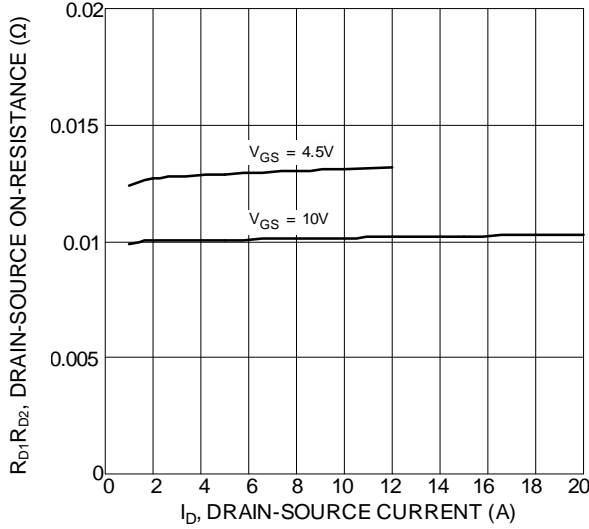


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

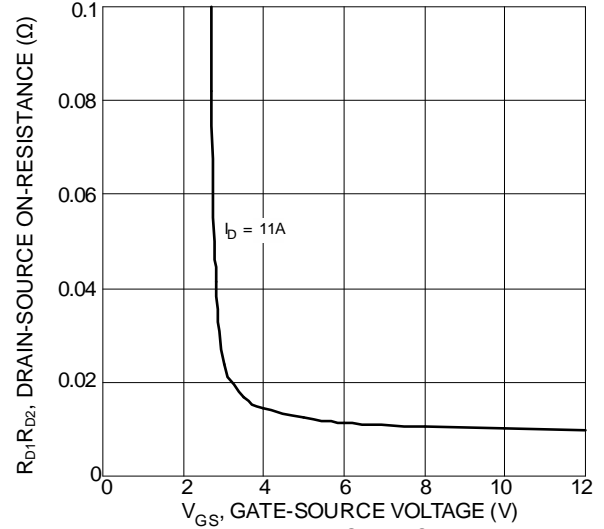


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

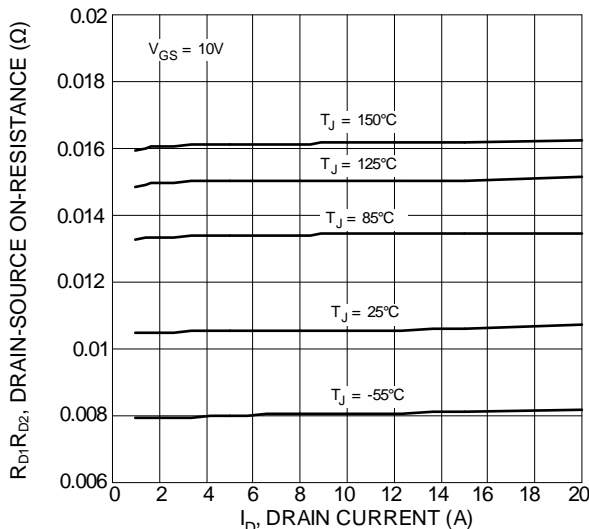


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

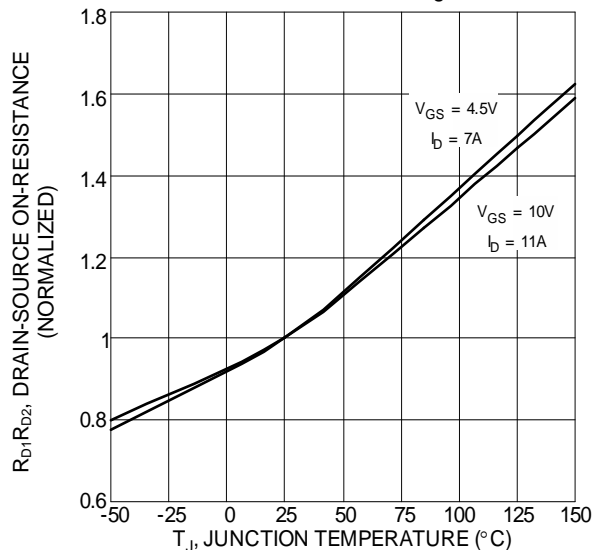


Figure 6 On-Resistance Variation with Temperature

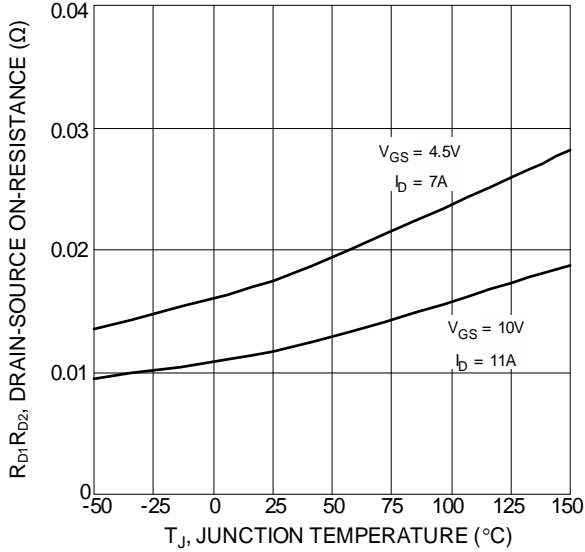


Figure 7 On-Resistance Variation with Temperature

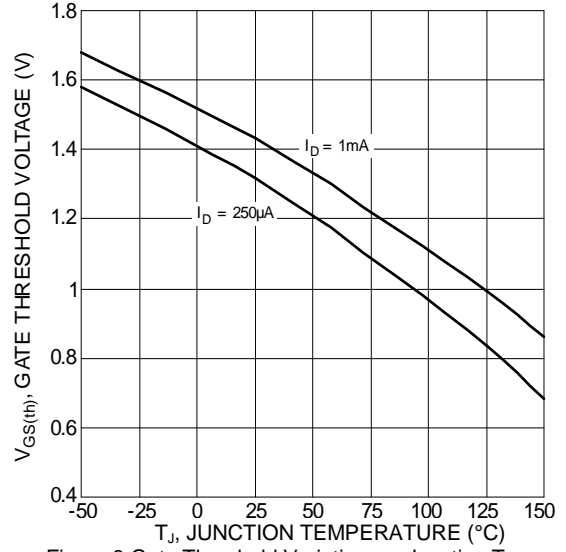


Figure 8 Gate Threshold Variation vs. Junction Temperature

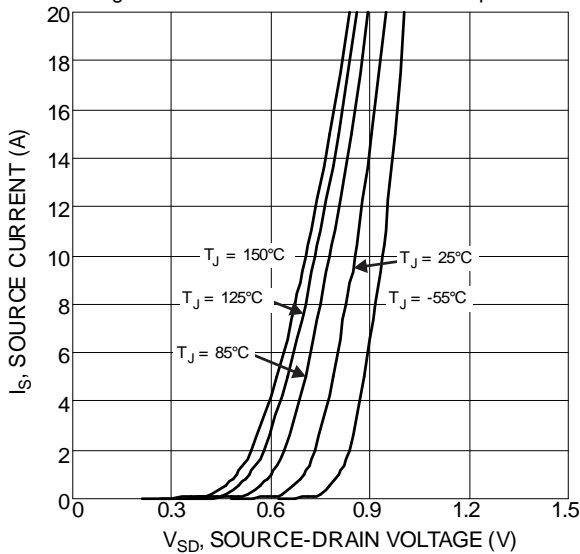


Figure 9 Diode Forward Voltage vs. Current

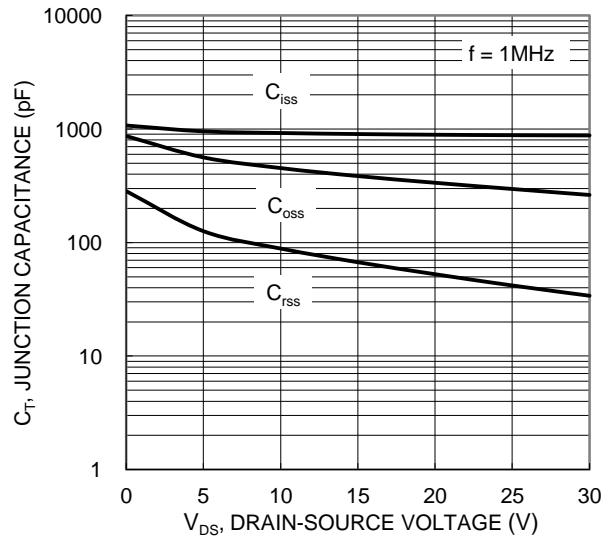


Figure 10 Typical Junction Capacitance

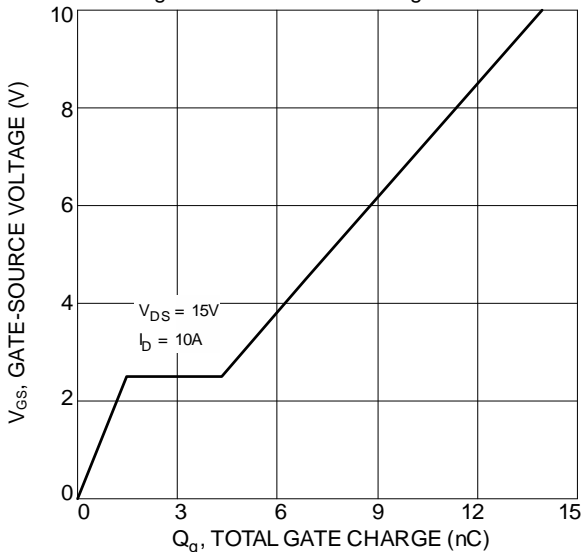


Figure 11 Gate Charge

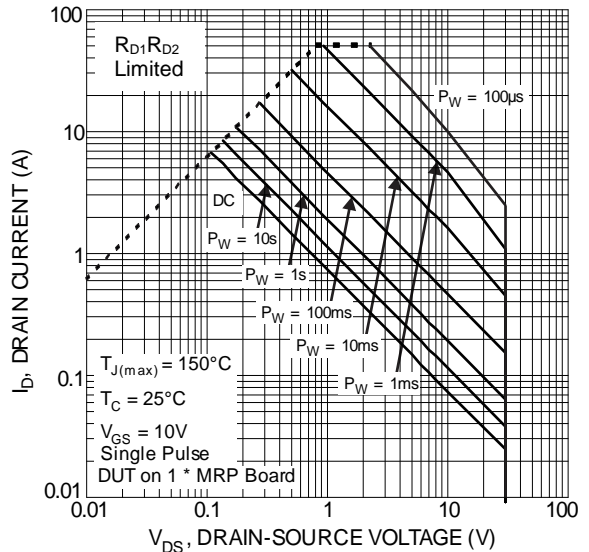
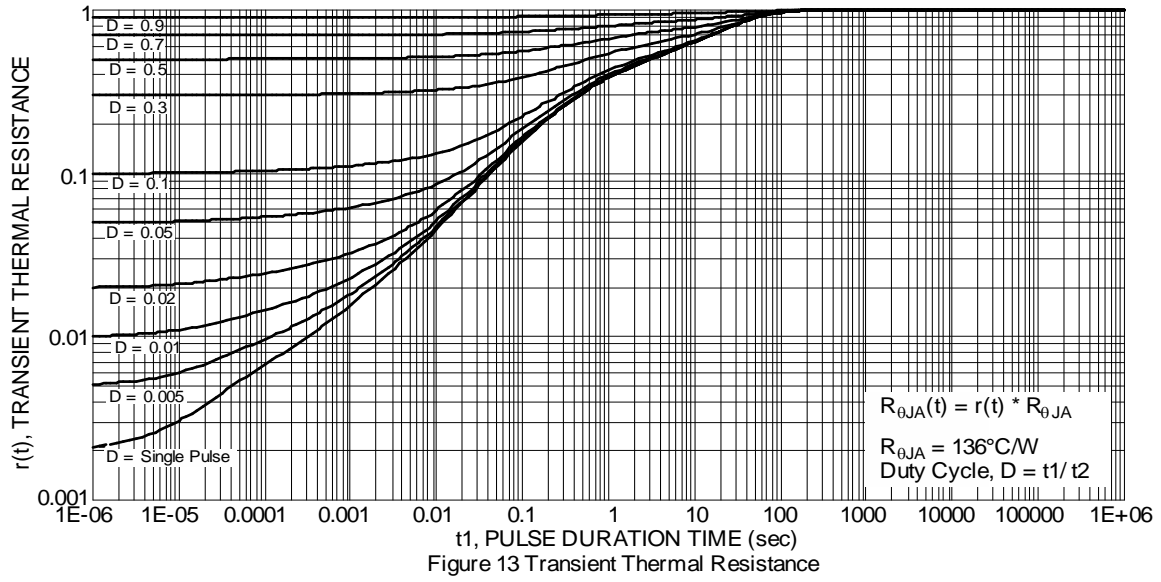


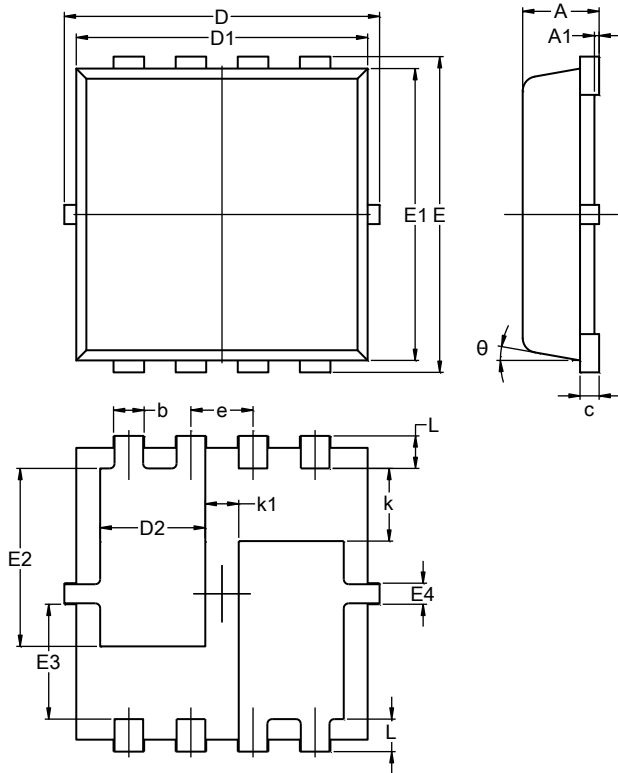
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

PowerDI3333-8 (Type UXD)

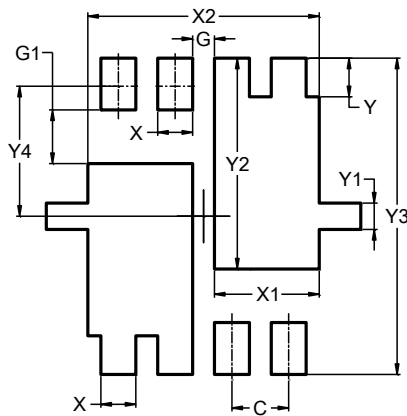


PowerDI3333-8 (Type UXD)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.90	1.30	1.10
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.66	2.06	1.86
E3	1.10	1.30	1.20
E4	0.12	0.32	0.22
e	--	--	0.65
L	0.24	0.44	0.34
k	0.56	0.96	0.76
k1	0.15	0.55	0.35
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 UXD)



Dimensions	Value (in mm)
C	0.650
G	0.250
G1	0.610
X	0.400
X1	1.200
X2	2.650
Y	0.440
Y1	0.300
Y2	2.400
Y3	3.600
Y4	1.480

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