

DUAL 30V N-CHANNEL ENHANCEMENT MODE MOSFET
PowerDI3333-8 (Type UXC)
Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
30V	10mΩ @ V _{GS} = 10V	25A
	14mΩ @ V _{GS} = 4.5V	20A

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Description

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

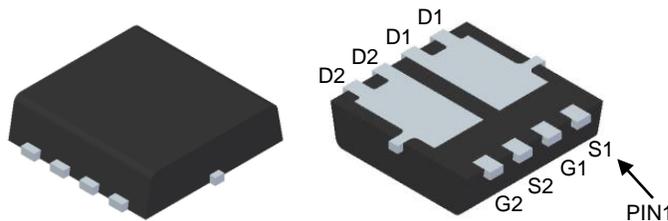
Applications

- Power Management Functions
- Analog Switch

Mechanical Data

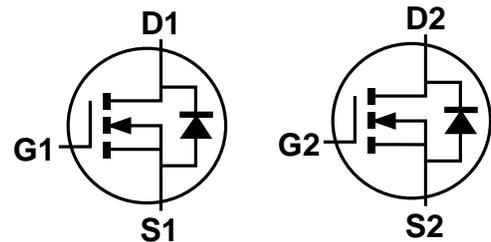
- Case: PowerDI[®] 3333-8 (Type UXC)
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.072 grams (Approximate)

PowerDI3333-8 (Type UXC)



Top View

Bottom View

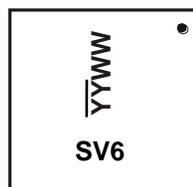


Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3006LDV-7	PowerDI3333-8 (Type UXC)	2000/Tape & Reel
DMT3006LDV-13	PowerDI3333-8 (Type UXC)	3000/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, see <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


- SV6 = 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	Value	Unit
Drain-Source Voltage			V _{DSS}	30	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = 10V (Note 7)	Steady State	T _C = +25°C T _C = +70°C	I _D	25 20	A
Maximum Body Diode Forward Current (Note 7)			I _S	25	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	90	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)			I _{SM}	90	A
Avalanche Current (L = 0.1mH) (Note 8)			I _{AS}	34	A
Avalanche Energy (L = 0.1mH) (Note 8)			E _{AS}	58	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 _{θJA}	134	°C/W
	t < 10s			78	
Total Power Dissipation (Note 6)			P _D	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R _{θJA}	70	°C/W
	t < 10s			41	
Thermal Resistance, Junction to Case (Note 7)			R _{θJC}	14	
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 T _J = +25°C	I _{DSS}	—	—	1	µA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = +20V, V _{DS} = 0V V _{GS} = -16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	3.0	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	7.6	10	mΩ	V _{GS} = 10V, I _D = 9.0A V _{GS} = 4.5V, I _D = 8.5A
		—	10.0	14		
Diode Forward Voltage	V _{SD}	—	0.70	1.2	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	1,155	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	456	—		
Reverse Transfer Capacitance	C _{rss}	—	72	—		
Gate Resistance	R _G	—	1.6	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _G	—	8.4	—	nC	V _{DD} = 15V, I _D = 9A
Total Gate Charge (V _{GS} = 10V)	Q _G	—	16.7	—		
Gate-Source Charge	Q _{GS}	—	2.2	—		
Gate-Drain Charge	Q _{GD}	—	3.5	—		
Turn-On Delay Time	t _{D(ON)}	—	3.5	—	ns	V _{DD} = 15V, V _{GS} = 10V, R _G = 3Ω, I _D = 9A
Turn-On Rise Time	t _R	—	5.5	—		
Turn-Off Delay Time	t _{D(OFF)}	—	13.5	—		
Turn-Off Fall Time	t _F	—	4.6	—		
Reverse Recovery Time	t _{RR}	—	19.3	—	ns	I _F = 1.5A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	8.6	—	nC	

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PCB, 2oz copper, with thermal bias to bottom layer 1inch 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.

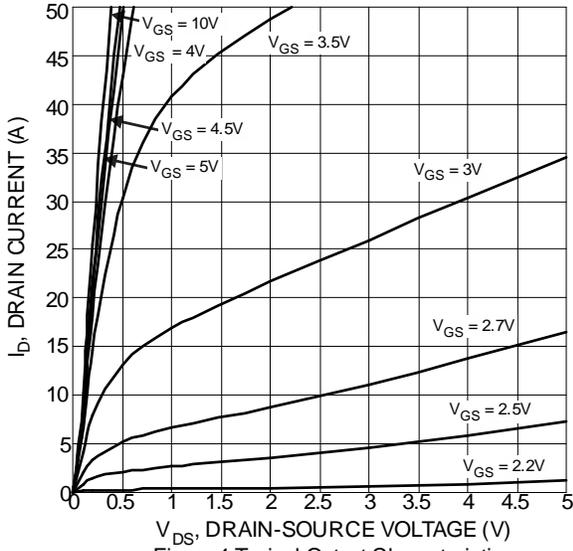


Figure 1 Typical Output Characteristic

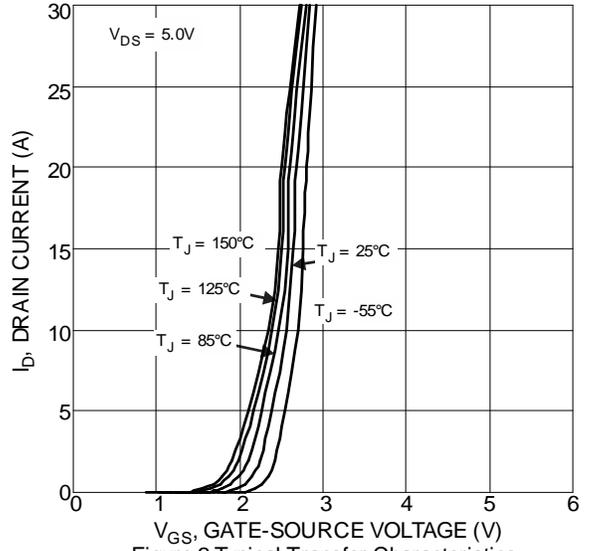


Figure 2 Typical Transfer Characteristics

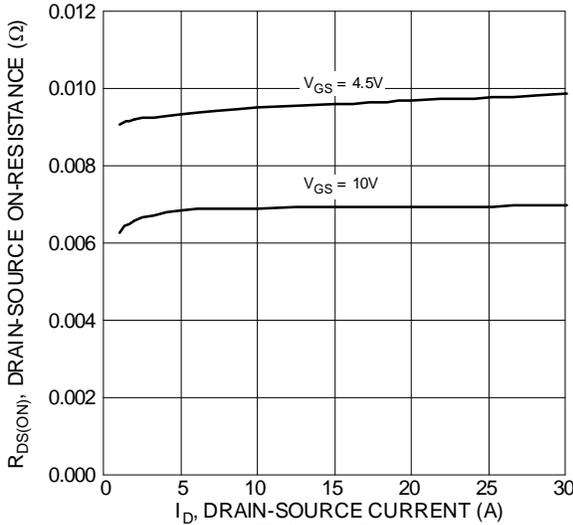


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

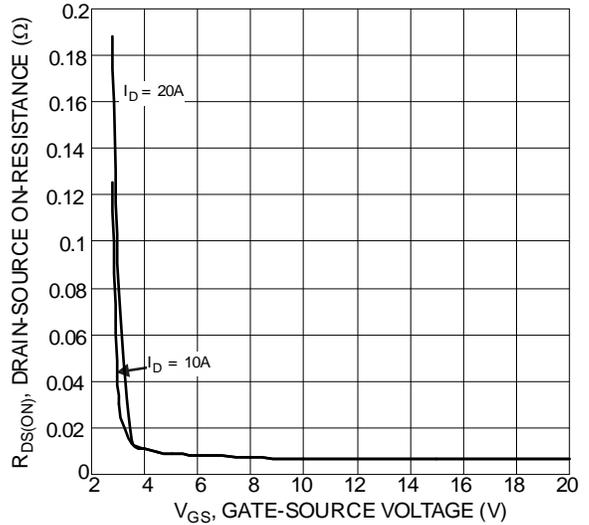


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

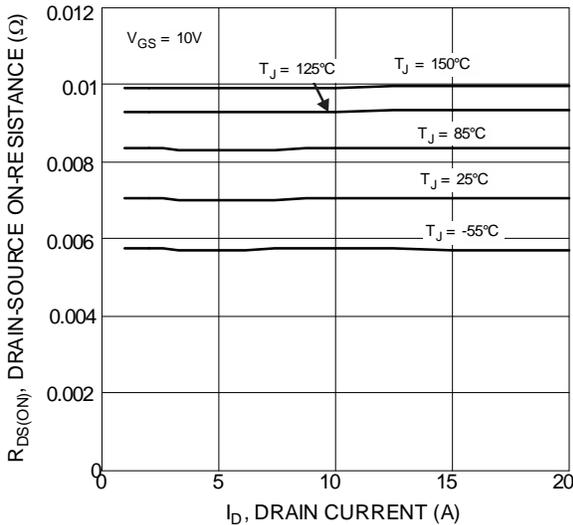


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

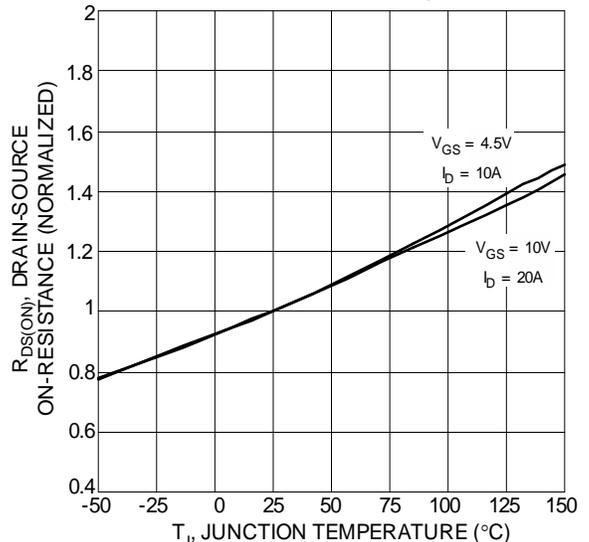


Figure 6 On-Resistance Variation with Temperature

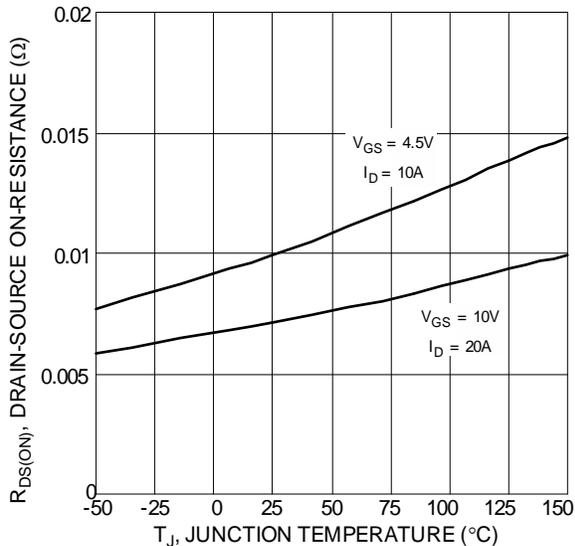


Figure 7 On-Resistance Variation with Temperature

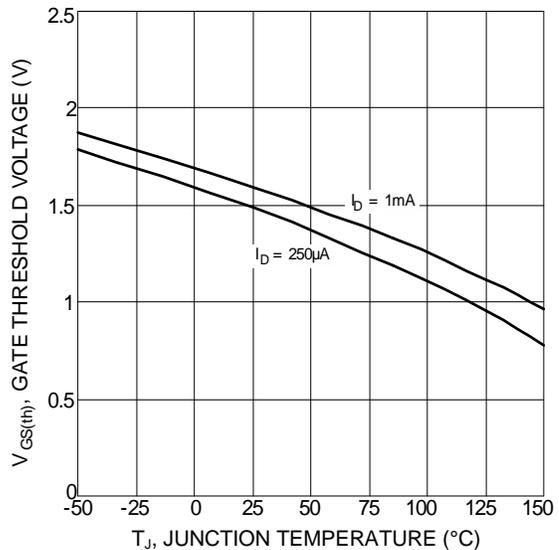


Figure 8 Gate Threshold Variation vs. Junction Temperature

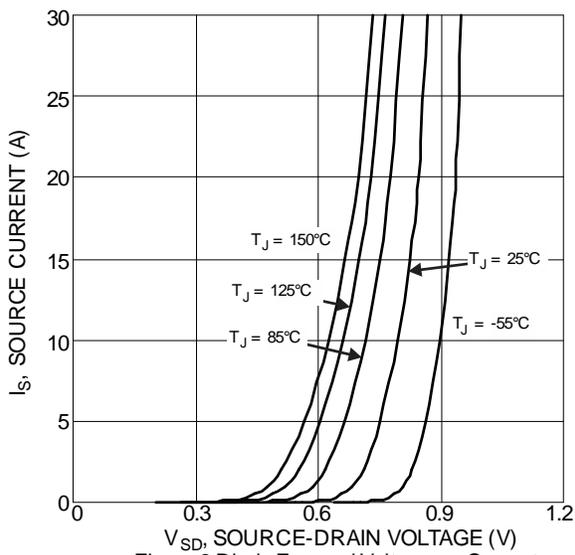


Figure 9 Diode Forward Voltage vs. Current

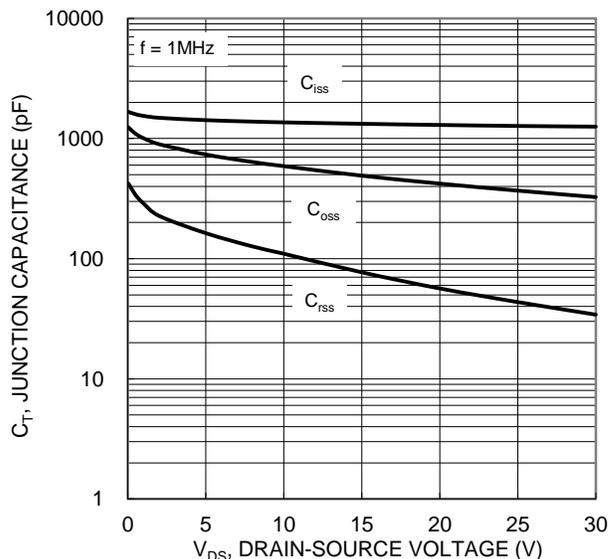


Figure 10. Typical Junction Capacitance

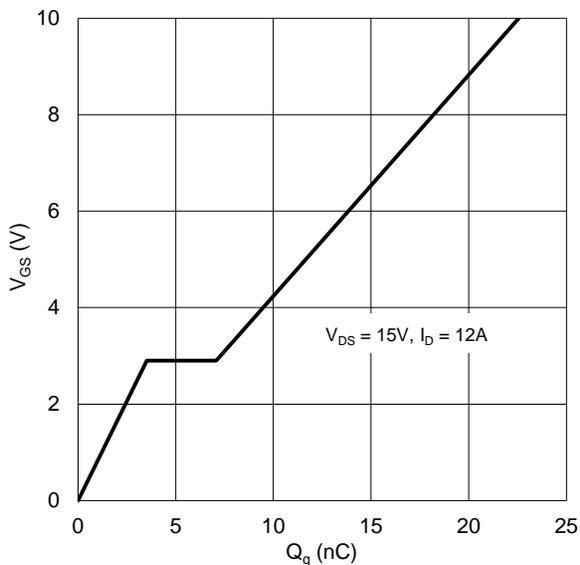


Figure 11. Gate Charge

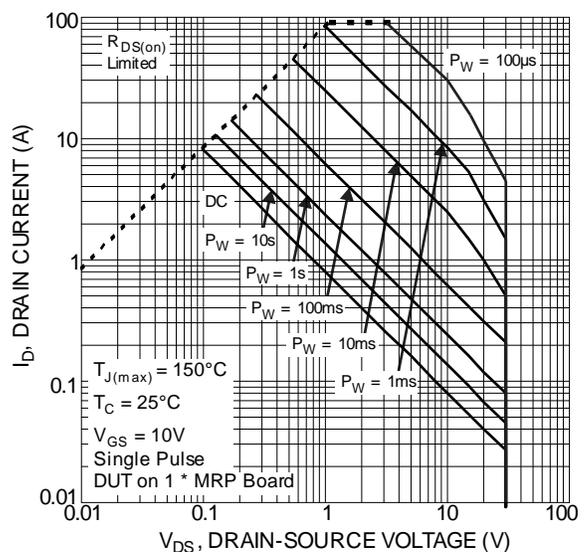


Figure 12 SOA, Safe Operation Area

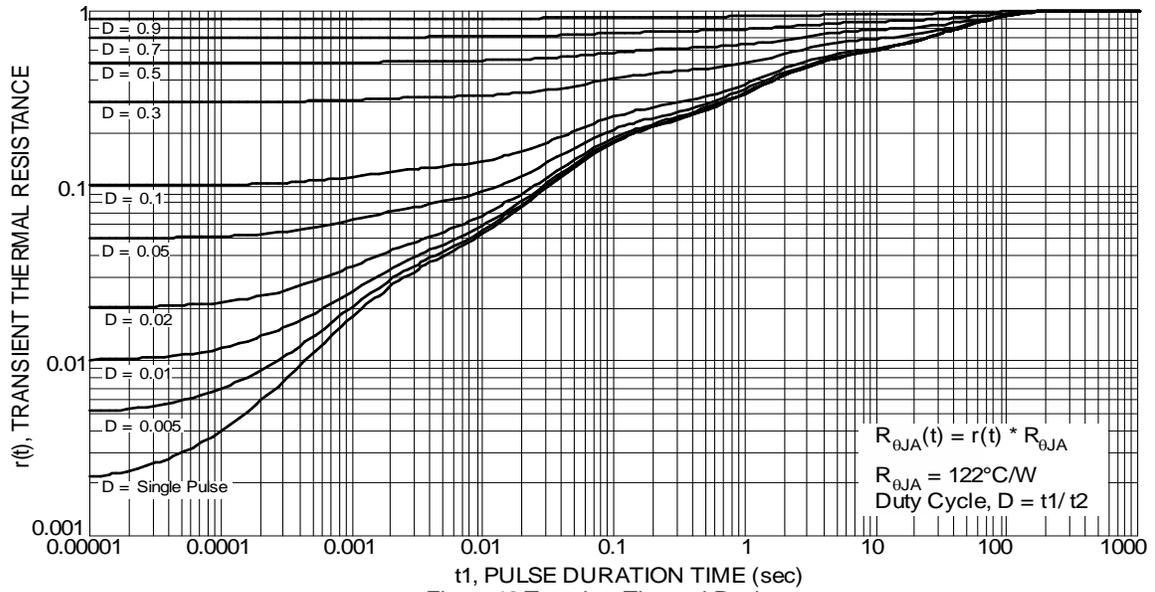
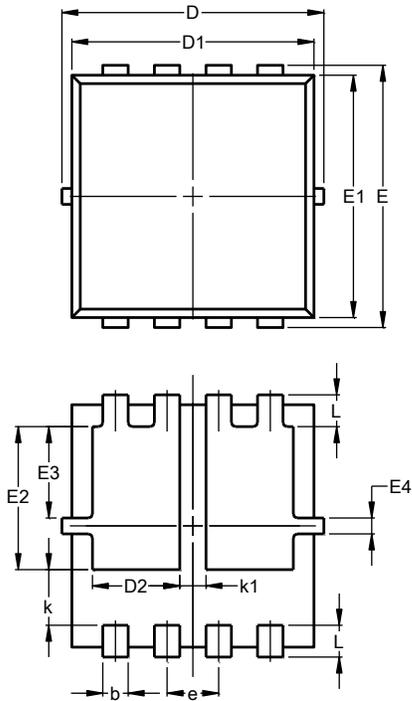


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8 (Type UXC)

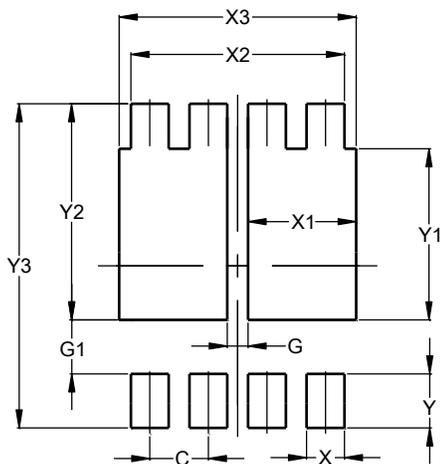


PowerDI3333-8 (Type UXC)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	—
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.90	1.30	1.10
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	—	—	0.65
L	0.30	0.50	0.40
k	0.50	0.90	0.70
k1	0.13	0.53	0.33
a	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 UXC)



Dimensions	Value (in mm)
C	0.650
G	0.230
G1	0.600
X	0.420
X1	1.200
X2	2.370
X3	2.630
Y	0.600
Y1	1.900
Y2	2.400
Y3	3.600

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