

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
60V	16mΩ @ V _{GS} = 10V	35A
	22mΩ @ V _{GS} = 4.5V	28A

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)**

Description and Applications

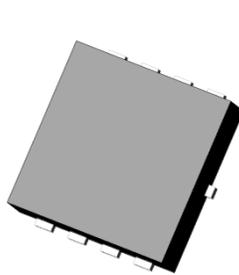
This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Control
- DC-DC Converters
- Power Management

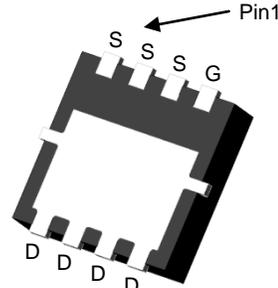
Mechanical Data

- 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 (E3)
- Weight: 0.072 grams (Approximate)

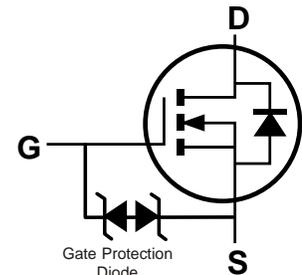
PowerDI3333-8 (Type UX)



Top View



Bottom View



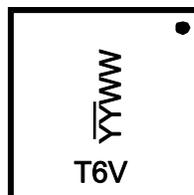
Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6015LFV-7	PowerDI3333-8 (Type UX)	2,000/Tape & Reel
DMT6015LFV-13	PowerDI3333-8 (Type UX)	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 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



T6V= 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}	60	V
Gate-Source Voltage	V _{GSS}	±16	V
Continuous Drain Current (Note 5) V _{GS} = 10V	T _A = +25°C	9.5	A
	T _A = +70°C	7.6	A
	T _C = +25°C	35	A
	T _C = +100°C	22	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	60	A
Maximum Continuous Body Diode Forward Current (Note 5)	I _S	2	A
Avalanche Current, L = 0.1mH	I _{AS}	17	A
Avalanche Energy, L = 0.1mH	E _{AS}	14.5	mJ
V _{DS} Spike	t = 10µs V _{SPIKE}	75	V

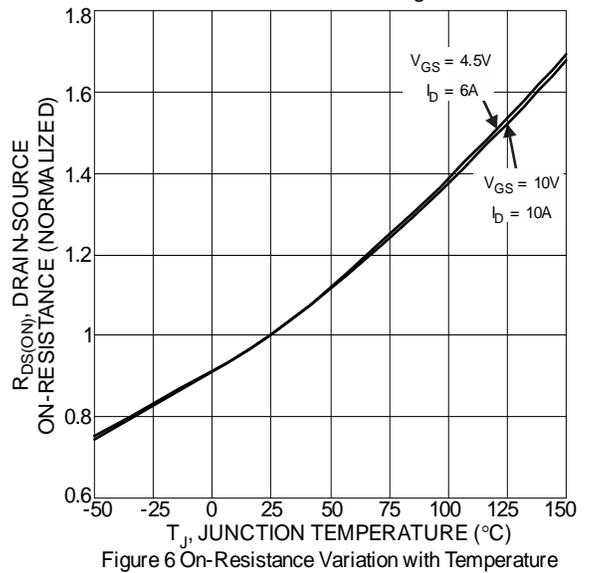
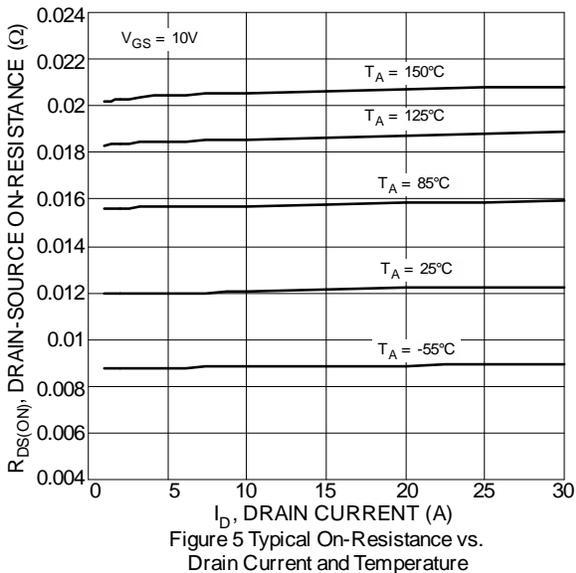
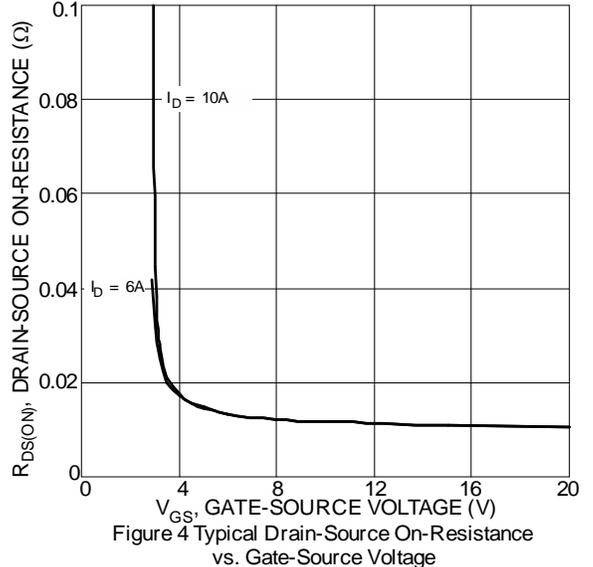
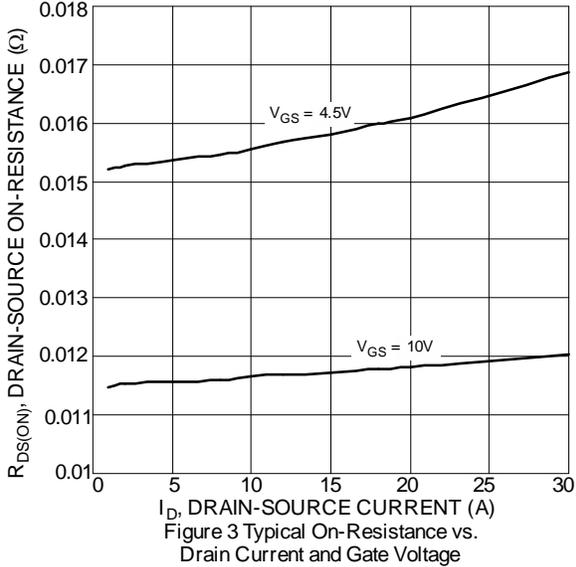
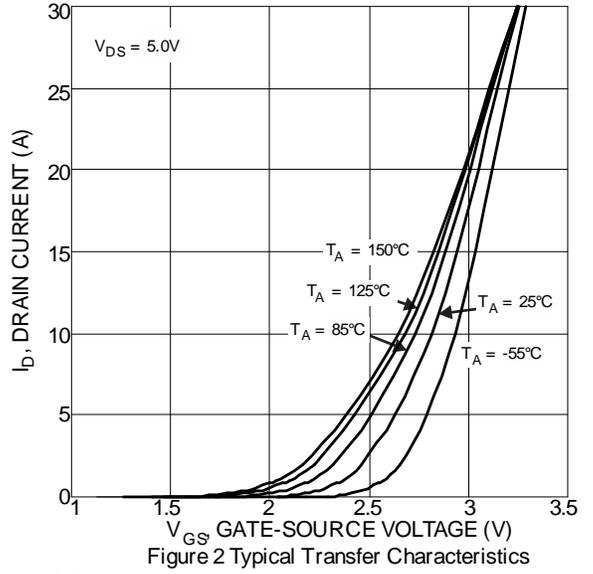
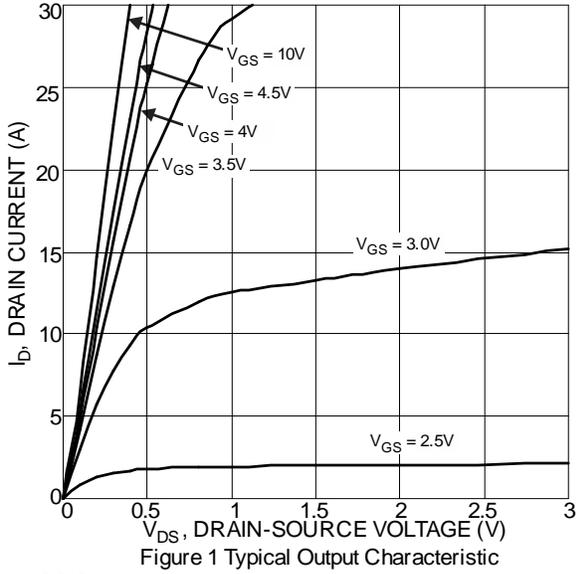
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)	P _D	T _A = +25°C	2.2	W
		T _C = +25°C	30	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	57	°C/W
		t < 10s	35	
Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	4.2		
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 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 48V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	2.5	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	11.7	16	mΩ	V _{GS} = 10V, I _D = 10A
		—	15.7	22		V _{GS} = 4.5V, I _D = 6A
Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iSS}	—	1103	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	251	—	pF	
Reverse Transfer Capacitance	C _{rSS}	—	20	—	pF	
Gate Resistance	R _g	—	1.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	8.9	—	nC	
Total Gate Charge (V _{GS} = 10V)	Q _g	—	18.9	—	nC	
Gate-Source Charge	Q _{gs}	—	3	—	nC	
Gate-Drain Charge	Q _{gd}	—	2.8	—	nC	V _{DS} = 30V, I _D = 10A
Turn-On Delay Time	t _{D(ON)}	—	4.1	—	ns	
Turn-On Rise Time	t _R	—	7.1	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	19.5	—	ns	
Turn-Off Fall Time	t _F	—	8.6	—	ns	V _{GS} = 10V, V _{DS} = 30V, R _g = 6Ω, I _D = 10A
Body Diode Reverse Recovery Time	t _{RR}	—	21.2	—	ns	
Body Diode Reverse Recovery Charge	Q _{RR}	—	13.2	—	nC	I _F = 10A, di/dt = 100A/µs

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.



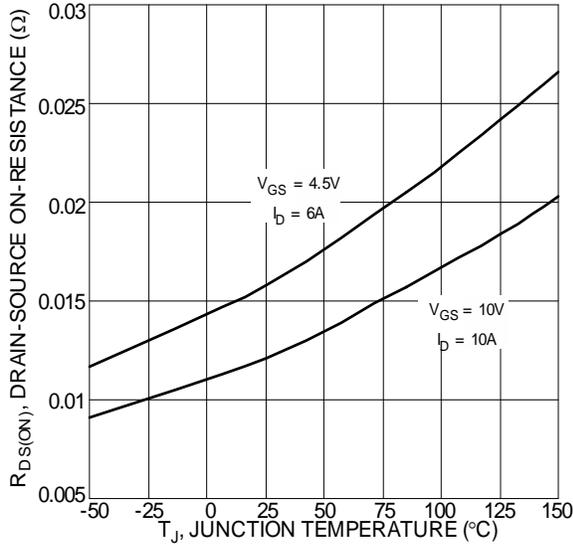


Figure 7 On-Resistance Variation with Temperature

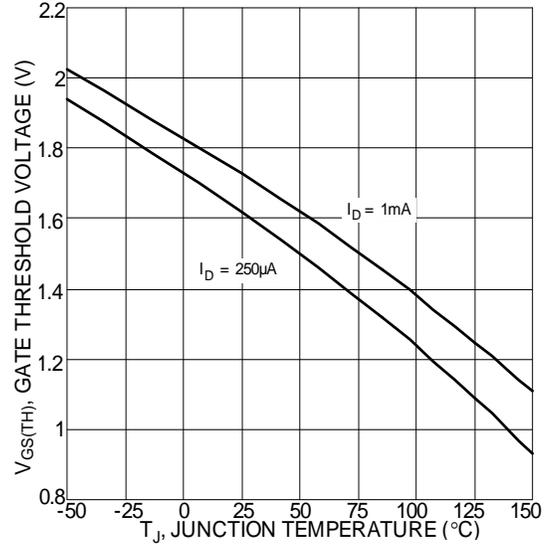


Figure 8 Gate Threshold Variation vs. Temperature

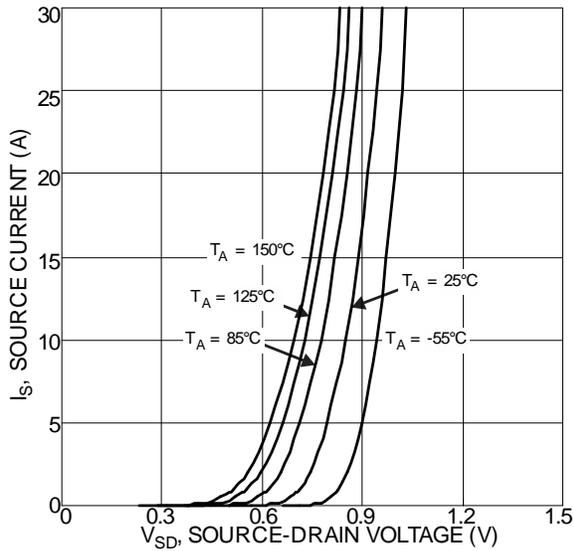


Figure 9 Diode Forward Voltage vs. Current

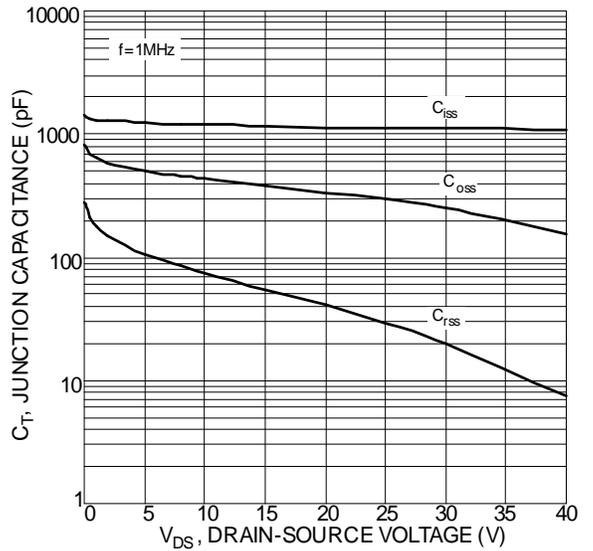


Figure 10 Typical Junction Capacitance

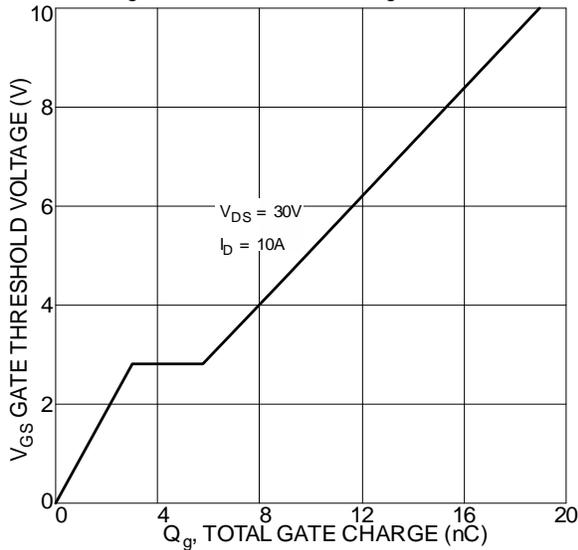


Figure 11 Gate Charge

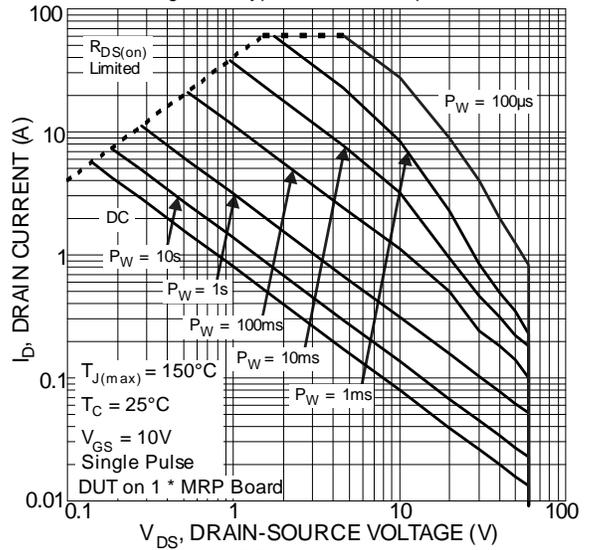
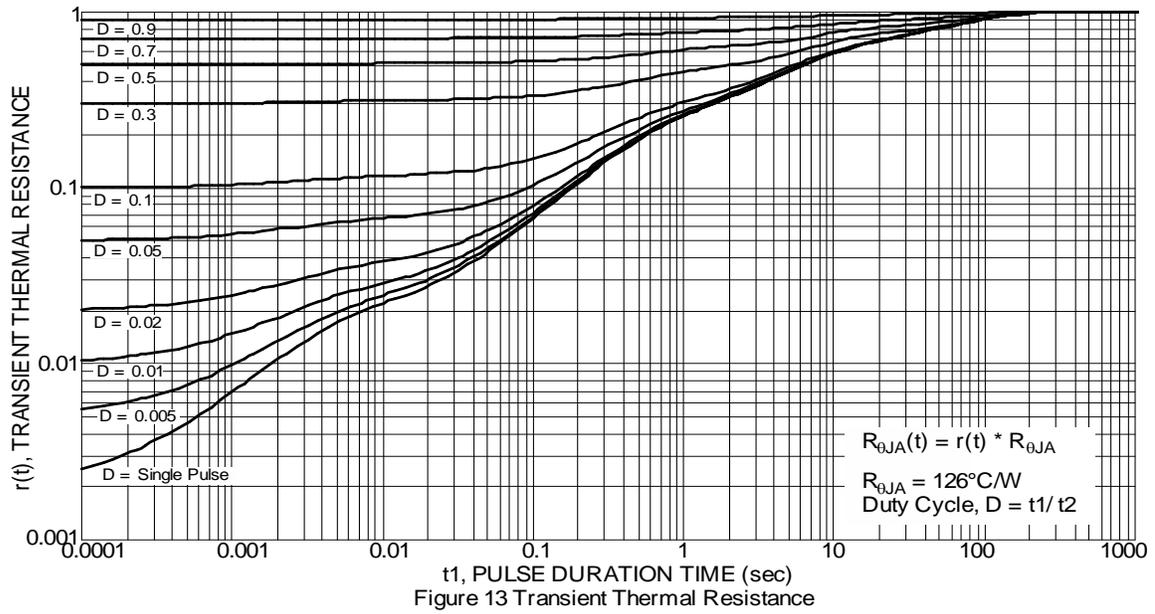


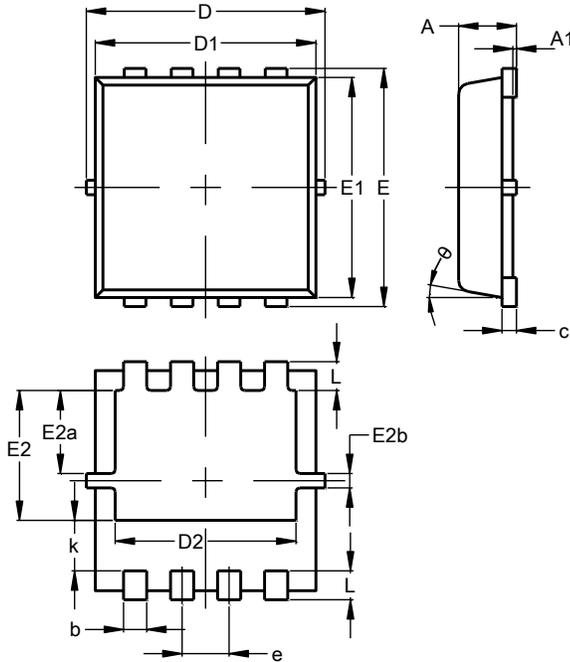
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

PowerDI3333-8 (Type UX)

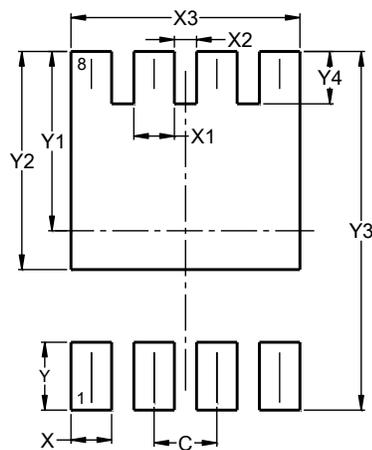


PowerDI3333-8 (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E2a	0.95	1.35	1.15
E2b	0.10	0.30	0.20
e	0.65 BSC		
k	0.50	0.90	0.70
L	0.30	0.50	0.40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