

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-12	V
Gate-Source Voltage			V <sub>GSS</sub>	-6	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-13 -10	A
	Steady State	T <sub>C</sub> = +25°C T <sub>C</sub> = +70°C	I <sub>D</sub>	-19 -15	A
Maximum Continuous Body Diode Forward Current (Note 6)			I <sub>S</sub>	3	A
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	70	A
Avalanche Current (Note 7) L = 0.3mH			I <sub>AS</sub>	24	A
Avalanche Energy (Note 7) L = 0.3mH			E <sub>AS</sub>	86	mJ

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P <sub>D</sub>	1.05	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	118	°C/W
	t < 10s		83.5	
Total Power Dissipation (Note 6)		P <sub>D</sub>	2.16	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R <sub>θJA</sub>	57	°C/W
	t < 10s		40.3	
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	11.7	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b> (Note 8)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-12	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current (T <sub>J</sub> = +25°C)	I <sub>DSS</sub>	—	—	-1	µA	V <sub>DS</sub> = -9.6V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	-100	nA	V <sub>GS</sub> = -6V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 8)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.6	—	-1.2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	9.8	11.7	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -12A
		—	14.6	18.6		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -9A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.8	-1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -16A
<b>DYNAMIC CHARACTERISTICS</b> (Note 9)						
Input Capacitance	C <sub>iss</sub>	—	913	—	pF	V <sub>DS</sub> = -6V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	458	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	53	—		
Gate Resistance	R <sub>g</sub>	—	1.85	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = -6V)	Q <sub>g</sub>	—	9.5	—	nC	V <sub>DS</sub> = -6V, I <sub>D</sub> = -12A
Total Gate Charge (V <sub>GS</sub> = -4.5V)	Q <sub>g</sub>	—	7.1	—		
Gate-Source Charge	Q <sub>gs</sub>	—	1.4	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	1.1	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	6.3	—	ns	V <sub>DS</sub> = -6V, V <sub>GS</sub> = -4.5V, R <sub>L</sub> = 1Ω, R <sub>g</sub> = 4.7Ω, I <sub>D</sub> = -12A
Turn-On Rise Time	t <sub>R</sub>	—	2.6	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	14.4	—		
Turn-Off Fall Time	t <sub>F</sub>	—	3.9	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	13.5	—	ns	I <sub>F</sub> = -12A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	2.5	—	nC	I <sub>F</sub> = -12A, dI/dt = 100A/µs

- Notes:
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
  7. I<sub>AS</sub> and E<sub>AS</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Guaranteed by design. Not subject to production testing.

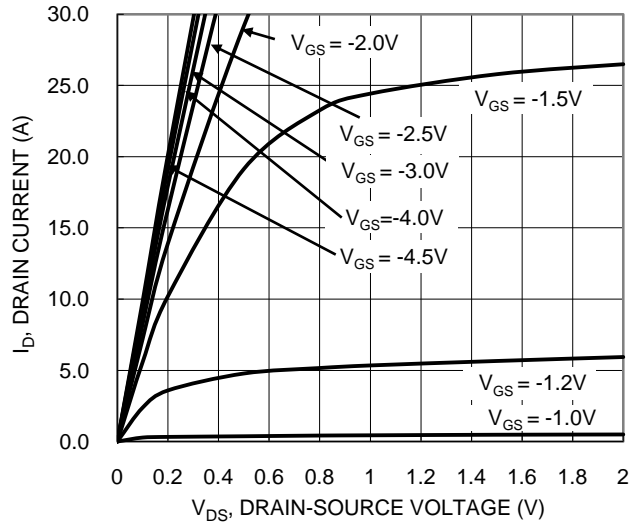


Figure 1. Typical Output Characteristic

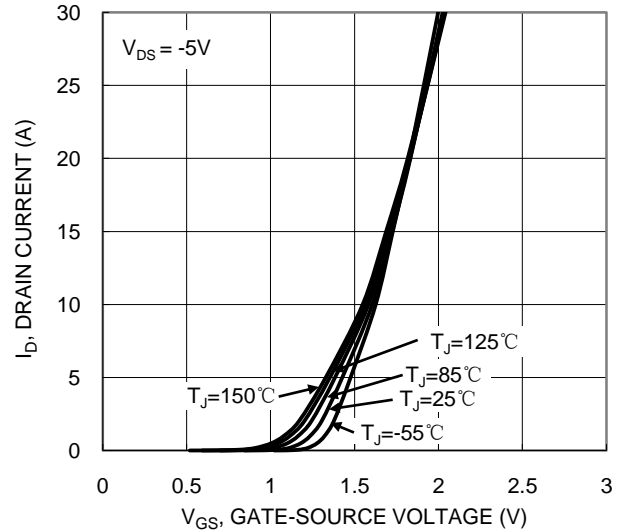


Figure 2. Typical Transfer Characteristic

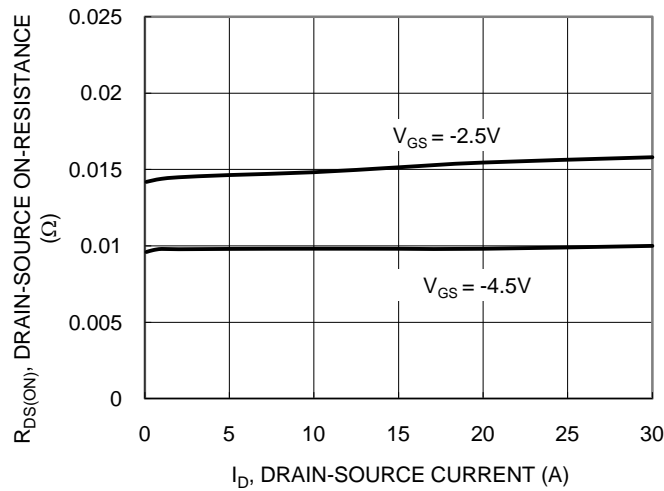


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

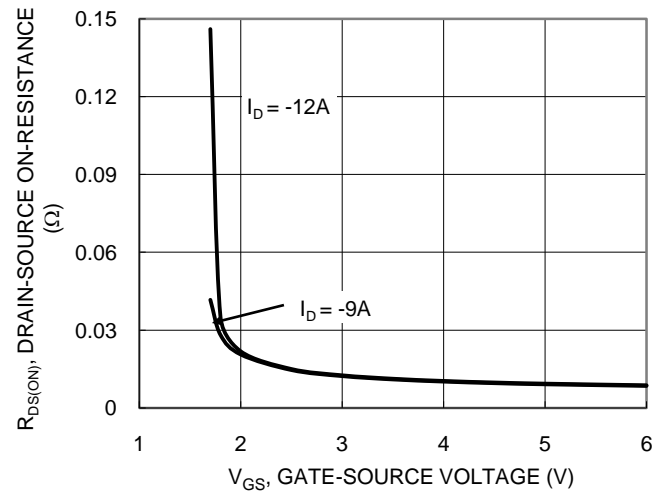


Figure 4. Typical Transfer Characteristic

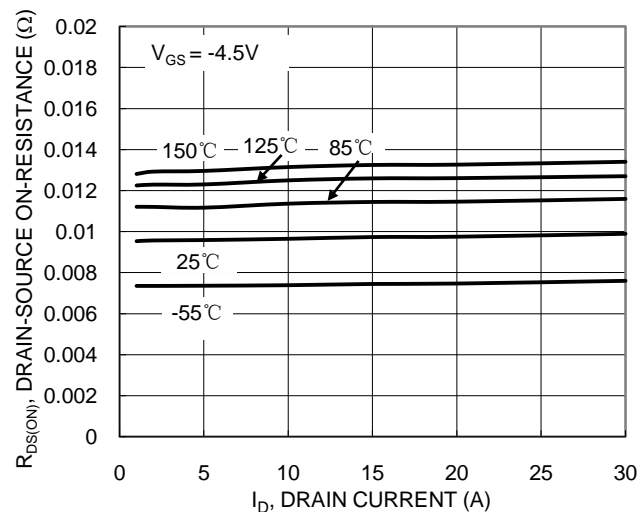


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

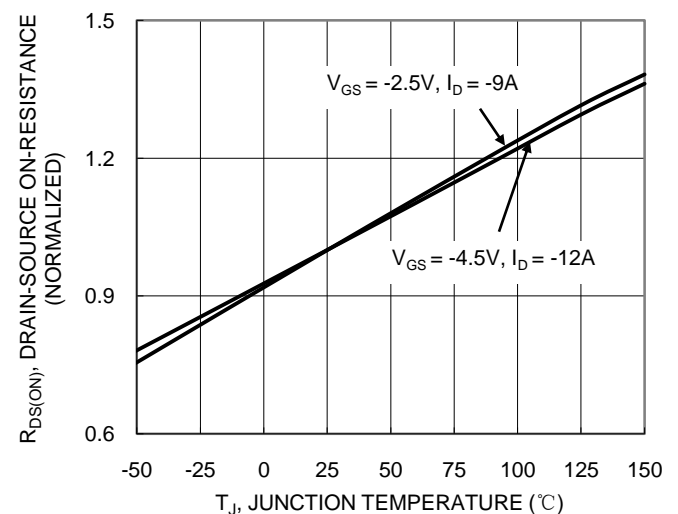


Figure 6. On-Resistance Variation with Temperature

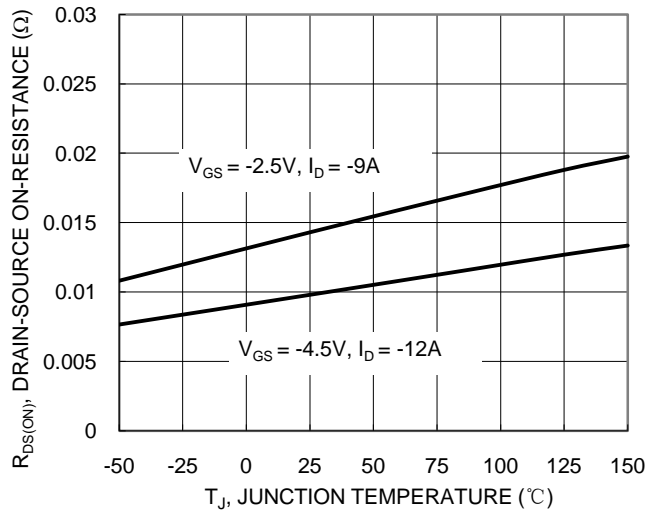


Figure 7. On-Resistance Variation with Temperature

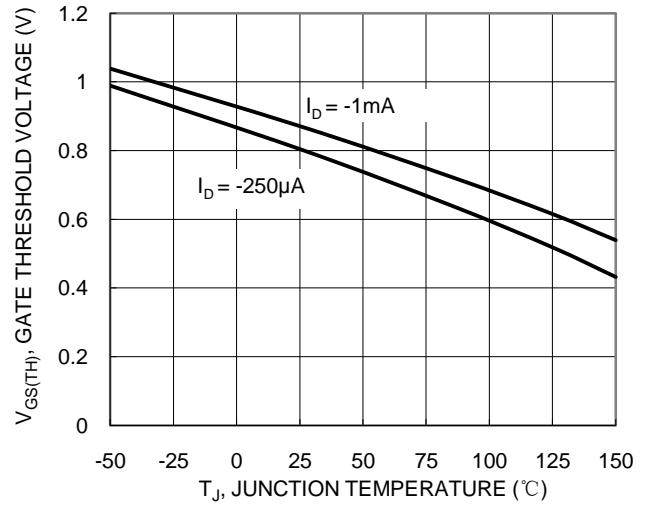


Figure 8. Gate Threshold Variation vs. Junction Temperature

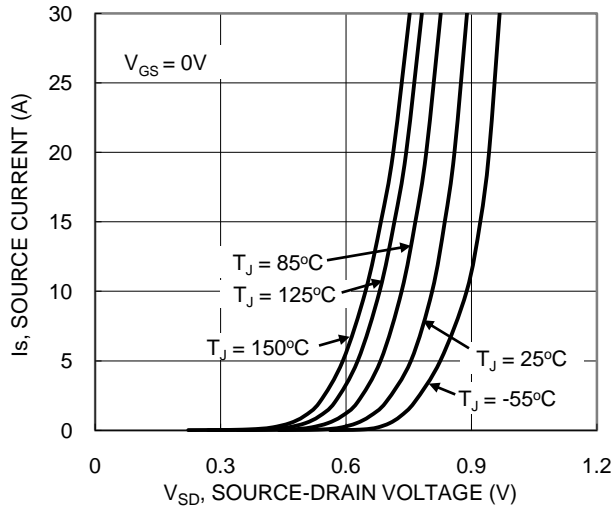


Figure 9. Diode Forward Voltage vs. Current

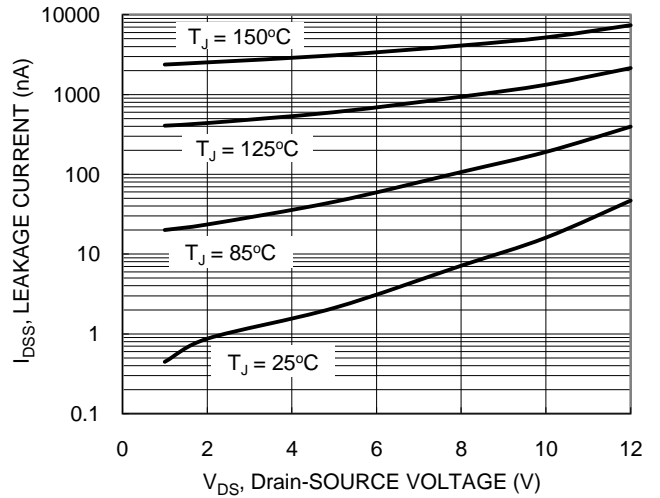


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

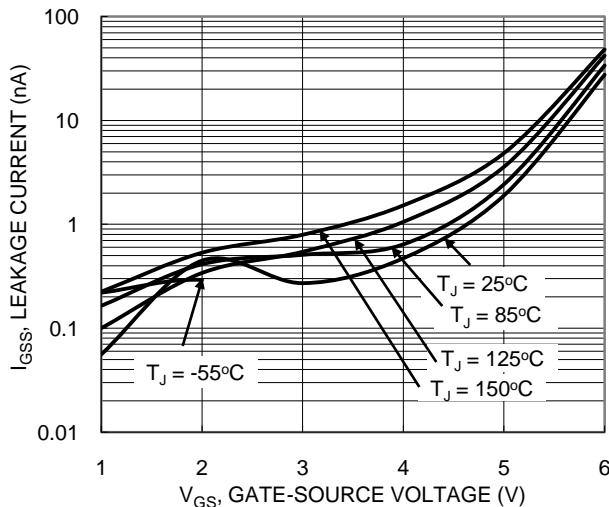


Figure 11. Gate-Source Leakage Current vs. Voltage

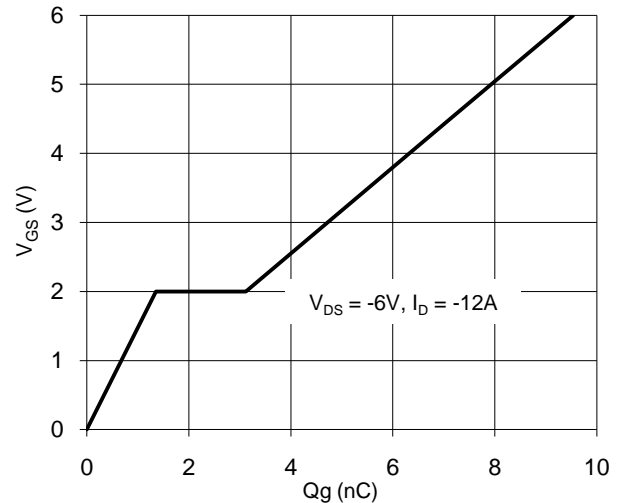
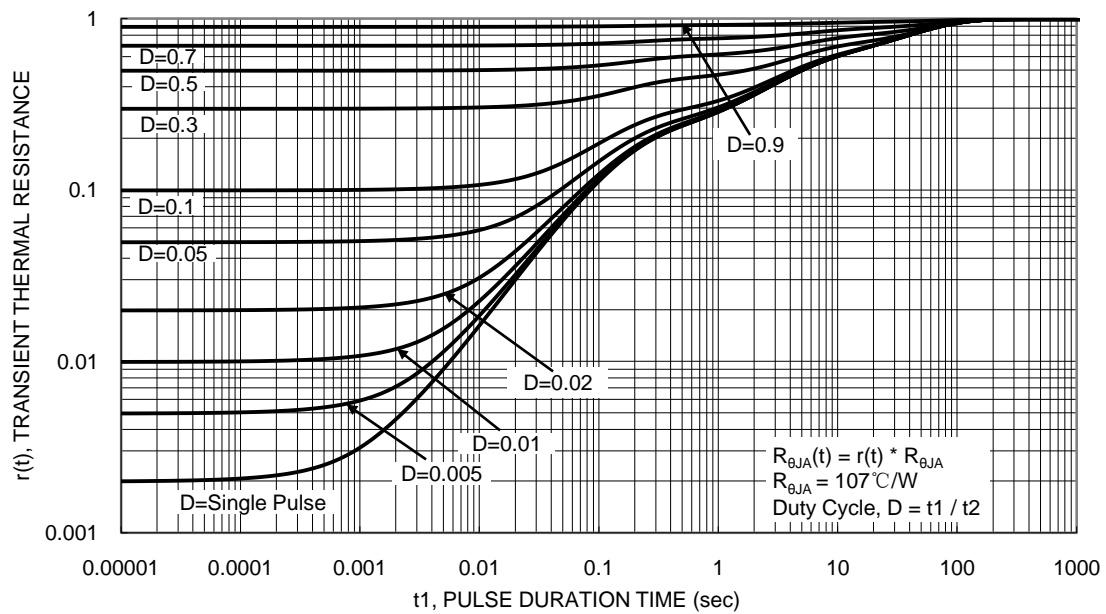
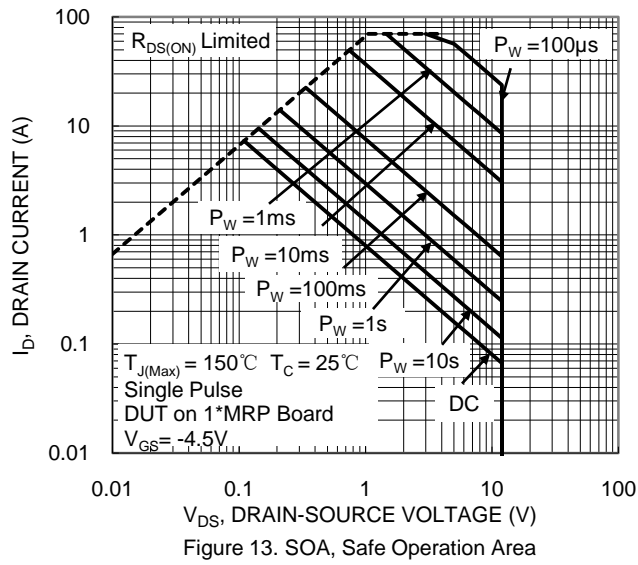


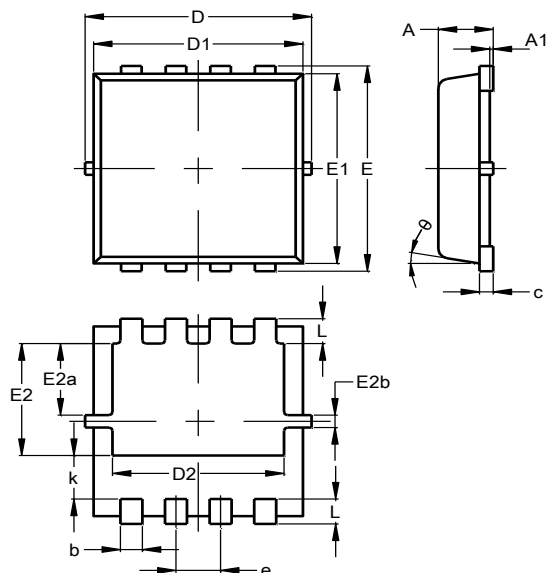
Figure 12. Gate Charge



## Package Outline Dimensions

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

**PowerDI3333-8 (Type UX)**

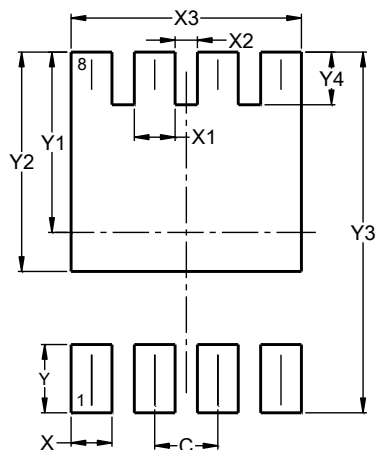


PowerDI3333-8 (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E2a	0.95	1.35	1.15
E2b	0.10	0.30	0.20
e	0.65 BSC		
k	0.50	0.90	0.70
L	0.30	0.50	0.40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