

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
60V	69mΩ @ V _{GS} = 10V	14A
	100mΩ @ V _{GS} = 4.5V	12A

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.

- Power-Management Functions
- DC-DC Converters

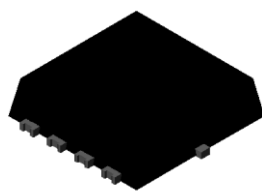
Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- Low R_{DS(ON)}—Ensures Minimal On-State Losses
- 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
- Wettable Flank for Improved Optical Inspections
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at**
<https://www.diodes.com/products/automotive/automotive-products/>.
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
<https://www.diodes.com/quality/product-definitions/>
- **An Automotive-Compliant Part is Available Under Separate Datasheet (DMN6069SFVWQ)**

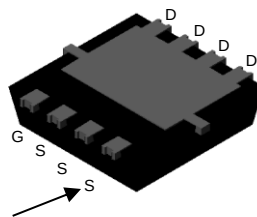
Mechanical Data

- Case: PowerDI®3333-8
- 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: 0.072 grams (Approximate)

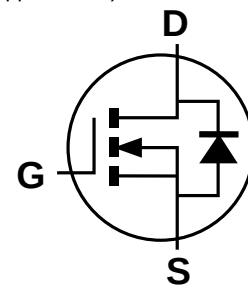
PowerDI3333-8 (SWP) (Type UX)



Top View



Pin1 Bottom View



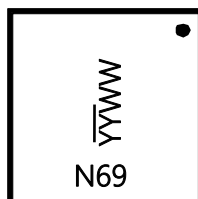
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN6069SFVW-7	PowerDI3333-8 (SWP) (Type UX)	2,000/Tape & Reel
DMN6069SFVW-13	PowerDI3333-8 (SWP) (Type UX)	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



N69 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 21 = 2021)
 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}	±20	V
Continuous Drain Current, V _{GS} = 10V (Note 5)	Steady State	T _A = +25°C T _A = +70°C	I _D	4.0 3.2	A
Continuous Drain Current, V _{GS} = 10V (Note 6)	Steady State	T _C = +25°C T _C = +70°C	I _D	14 11	A
Pulsed Drain Current (380μs Pulse, Duty Cycle = 1%)			I _{DM}	56	A
Maximum Continuous Body Diode Forward Current (Note 5)			I _S	4.0	A
Pulsed Source Current (380μs Pulse, Duty Cycle = 1%)			I _{SM}	56	A
Avalanche Current , L = 0.1mH			I _{AS}	12	A
Repetitive Avalanche Energy , L = 0.1mH			E _{AS}	7.2	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P _D	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	50	°C/W
Total Power Dissipation (Note 6)		P _D	32	W
Thermal Resistance, Junction to Case (Note 6)	Steady State	R _{θJC}	3.9	°C/W
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 thermal bias to bottom layer 1inch square copper plate.
 6. Thermal resistance from junction to soldering point (on the exposed drain pad).

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
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} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	35	69	mΩ	V _{GS} = 10V, I _D = 3A
		—	41	100		V _{GS} = 4.5V, I _D = 2.4A
Diode Forward Voltage	V _{SD}	—	0.8	1.1	V	V _{GS} = 0V, I _S = 2.5A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	740	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	40	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	28	—	pF	
Gate Resistance	R _g	—	2.2	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6.4	—	nC	V _{DS} = 30V, I _D = 12A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	14	—	nC	
Gate-Source Charge	Q _{gs}	—	2.8	—	nC	
Gate-Drain Charge	Q _{gd}	—	2.3	—	nC	
Turn-On Delay Time	t _{d(ON)}	—	3.6	—	ns	V _{DS} = 30V, I _D = 12A V _{GS} = 10V, R _G = 6.0Ω
Turn-On Rise Time	t _r	—	5.0	—	ns	
Turn-Off Delay Time	t _{d(OFF)}	—	12	—	ns	
Turn-Off Fall Time	t _f	—	3.3	—	ns	
Body Diode Reverse Recovery Time	t _{RR}	—	11	—	ns	I _F = 1.9A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	5.1	—	nC	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

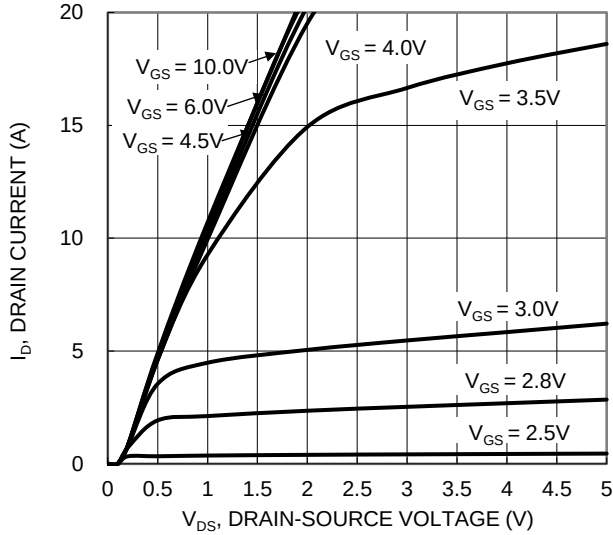


Figure 1. Typical Output Characteristic

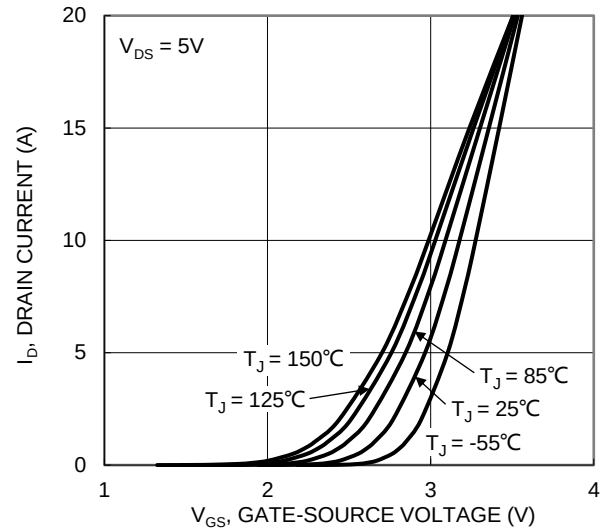


Figure 2. Typical Transfer Characteristic

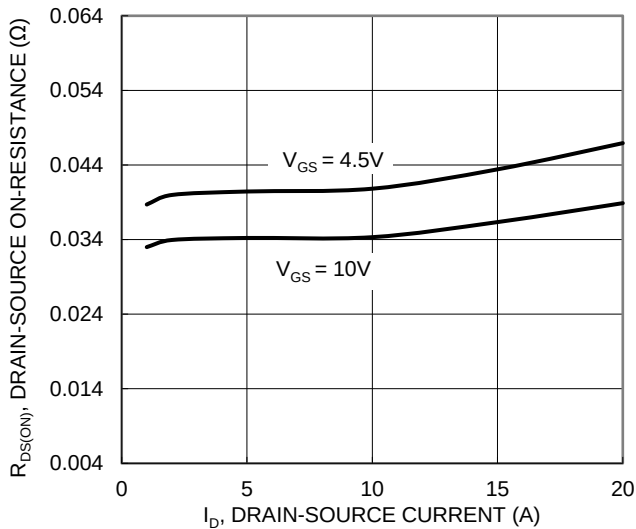


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

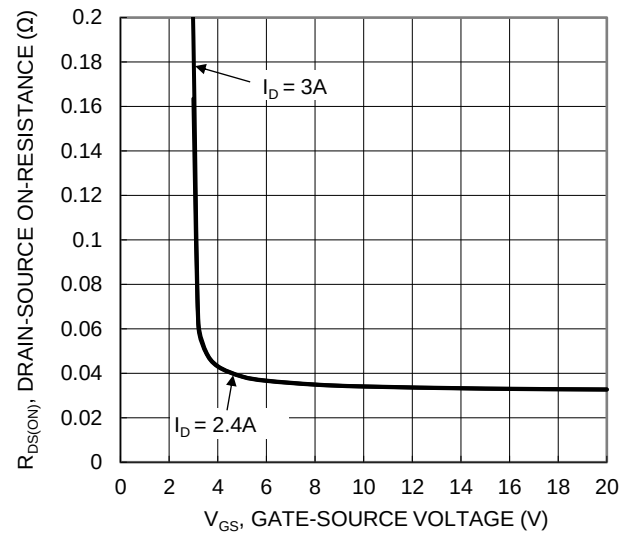


Figure 4. Typical Transfer Characteristic

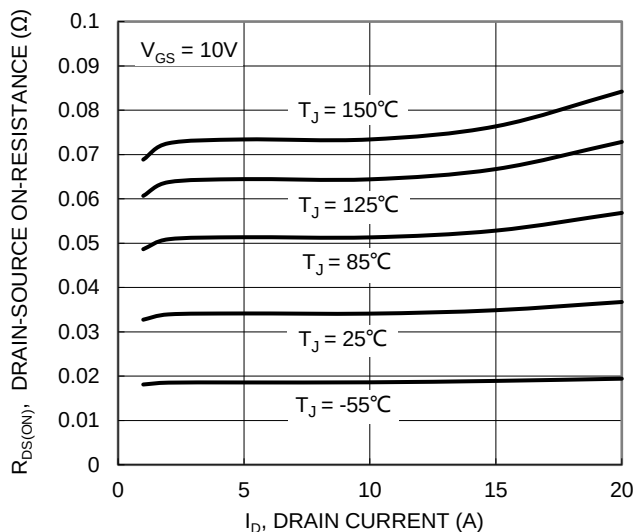


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

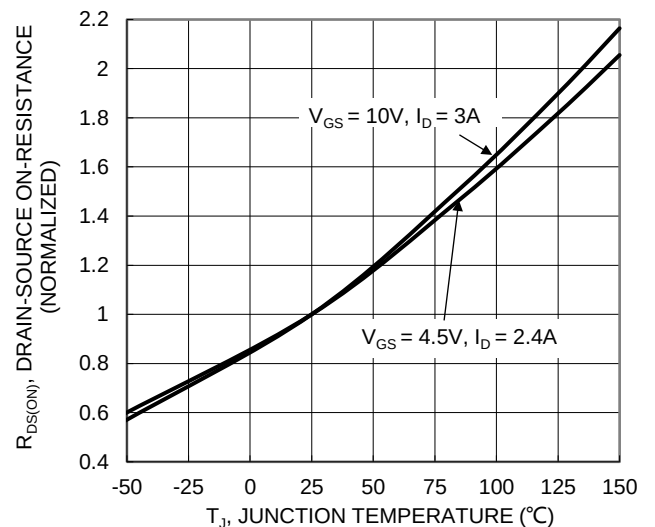
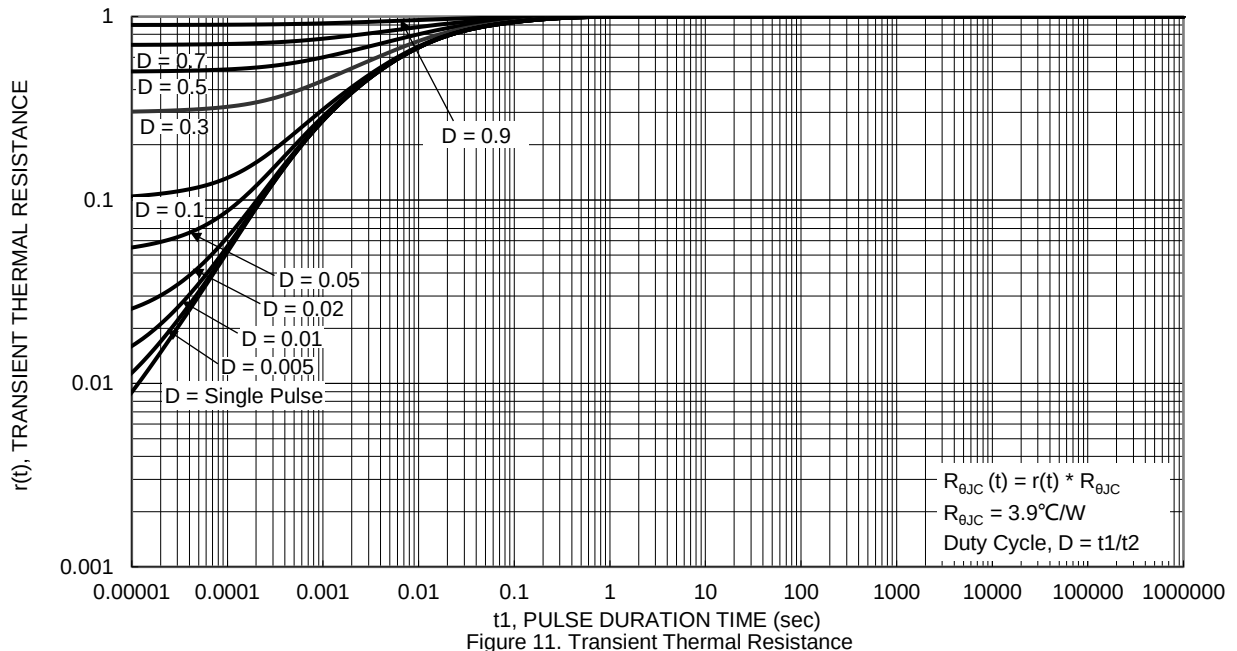
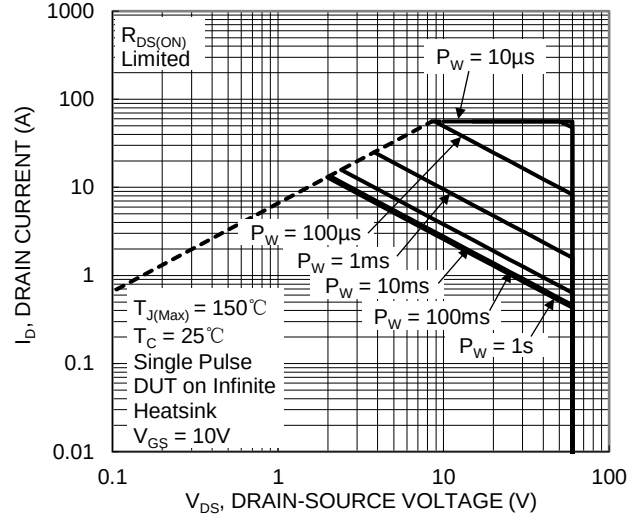
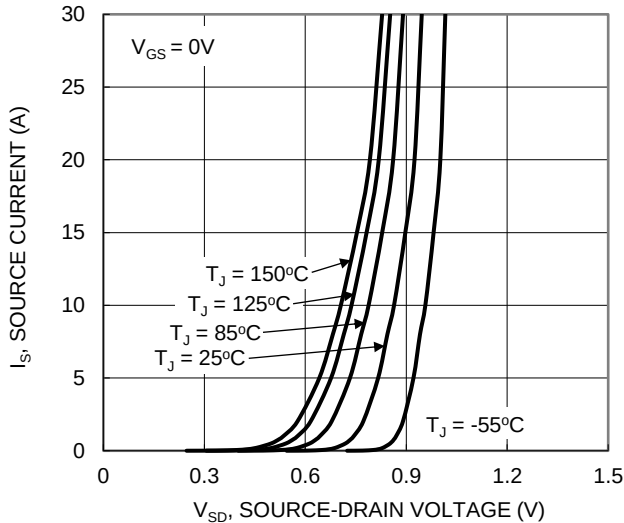
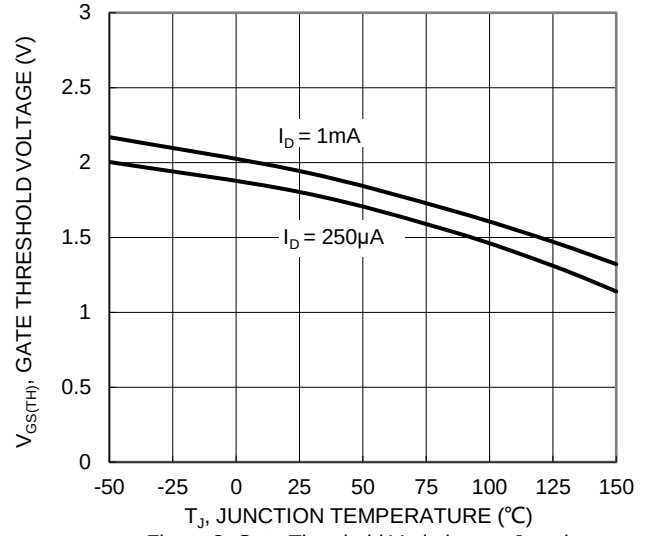
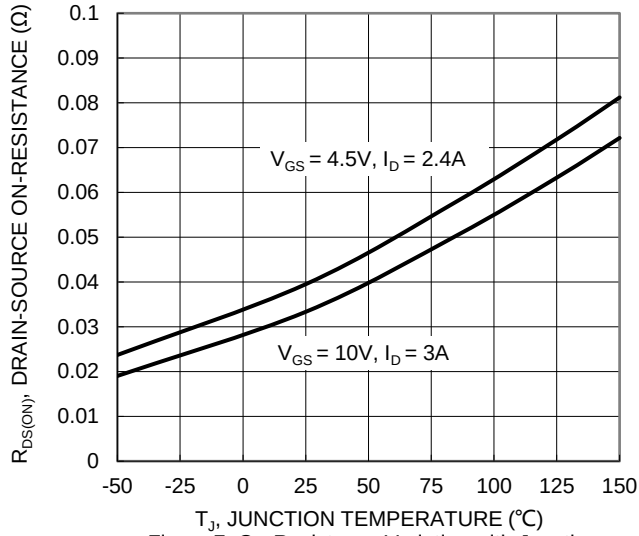


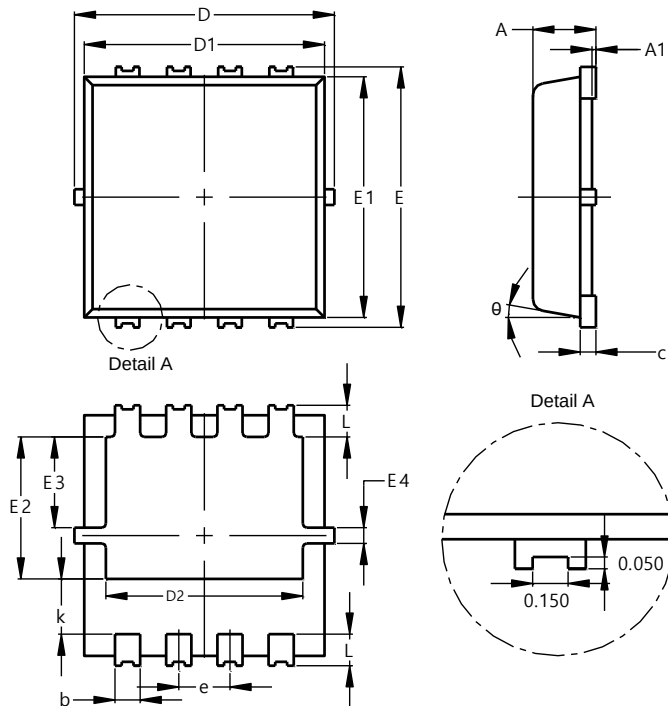
Figure 6. On-Resistance Variation with Junction Temperature



Package Outline Dimensions

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

PowerDI3333-8 (SWP) (Type UX)

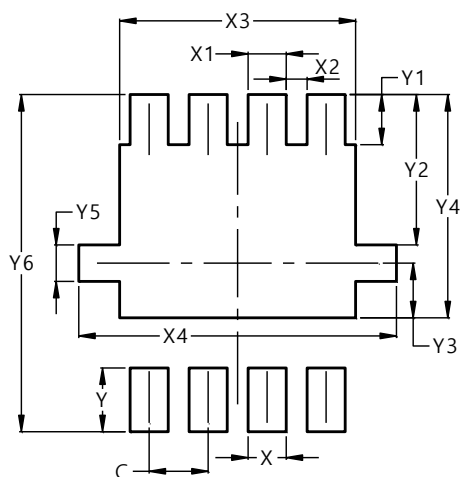


PowerDI3333-8 (SWP) (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
k	0.50	0.90	0.70
L	0.30	0.50	0.40
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 (SWP) (Type UX)



Dimensions	Value (in mm)
C	0.650
X	0.420
X1	0.420
X2	0.230
X3	2.600
X4	3.500
Y	0.700
Y1	0.550
Y2	1.650
Y3	0.600
Y4	2.450
Y5	0.400
Y6	3.700

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