

Product Summary

Device	BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C (Note 10)
Q1 & Q2	30V	12mΩ @ V _{GS} = 10V	20A
		20mΩ @ V _{GS} = 4.5V	17A
		25mΩ @ V _{GS} = 3.8V	15A

Description

This new generation 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.


Applications

- General Purpose Interfacing Switch
- Power Management Functions

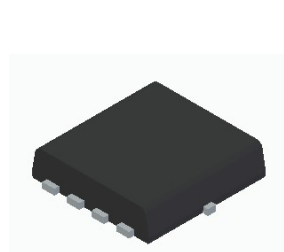
Features and Benefits

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

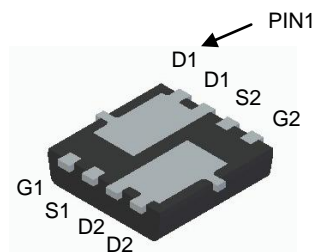
Mechanical Data

- 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 
- Weight: 0.072 grams (Approximate)

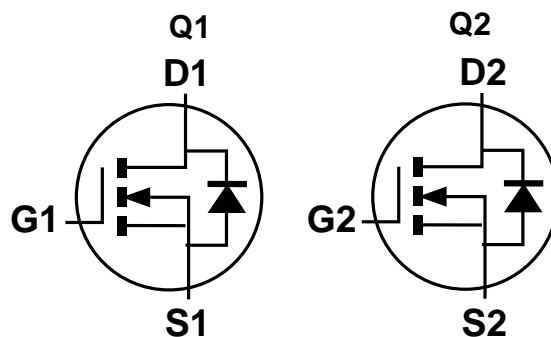
PowerDI3333-8 (Type UXD)



Top View



Bottom View



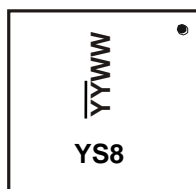
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3009LEV-7	PowerDI3333-8 (Type UXD)	2,000/Tape & Reel
DMT3009LEV-13	PowerDI3333-8 (Type UXD)	3,000/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



YS8 = 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}	+20, -16	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State (Note 10)	T _C = +25°C T _C = +70°C	I _D	20 15	A
Maximum Body Diode Forward Current (Note 6)			I _S	2.4	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 (Note 7) L = 0.1mH			I _{AS}	19.3	A
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	18.6	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.0	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	129	°C/W
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	68	°C/W
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	19	
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 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
Zero Gate Voltage Drain Current T _J = +150°C (Note 9)	I _{DSS}	—	—	100	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 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	9	12	mΩ	V _{GS} = 10V, I _D = 14.4A
		—	13	20		V _{GS} = 4.5V, I _D = 7A
		—	16	25		V _{GS} = 3.8V, I _D = 5A
		—	—	—		—
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 10A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	823	-	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	352	-		
Reverse Transfer Capacitance	C _{rss}	—	52	-		
Gate Resistance	R _g	—	1.2	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	12	-	nC	V _{DS} = 15V, I _D = 14.4A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.8	-		
Gate-Source Charge	Q _{gs}	—	1.7	-		
Gate-Drain Charge	Q _{gd}	—	2.4	-		
Turn-On Delay Time	t _{D(ON)}	—	3.2	-	ns	V _{GS} = 10V, V _{DD} = 15V, R _g = 1Ω, I _D = 10A
Turn-On Rise Time	t _R	—	5.2	-		
Turn-Off Delay Time	t _{D(OFF)}	—	8.9	-		
Turn-Off Fall Time	t _F	—	1.5	-		
Body Diode Reverse Recovery Time	t _{RR}	—	16.4	-	ns	I _F = 10A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	5.9	-	nC	I _F = 10A, di/dt = 100A/μs

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
 - UIS in production with L = 0.1mH, starting T_A = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.
 - Package limited.

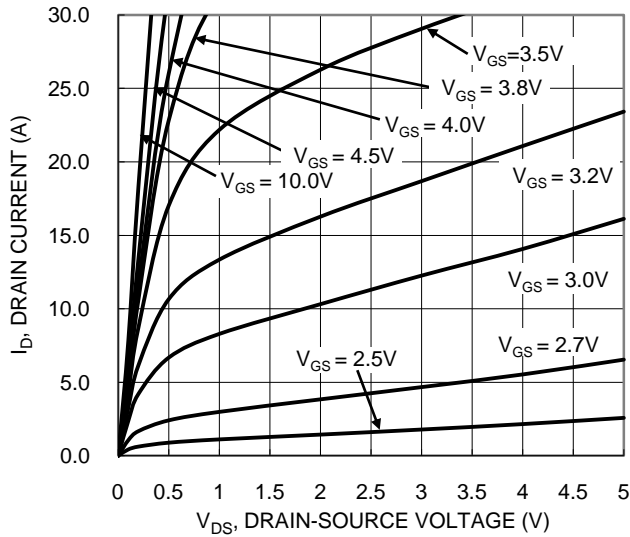


Figure 1. Typical Output Characteristic

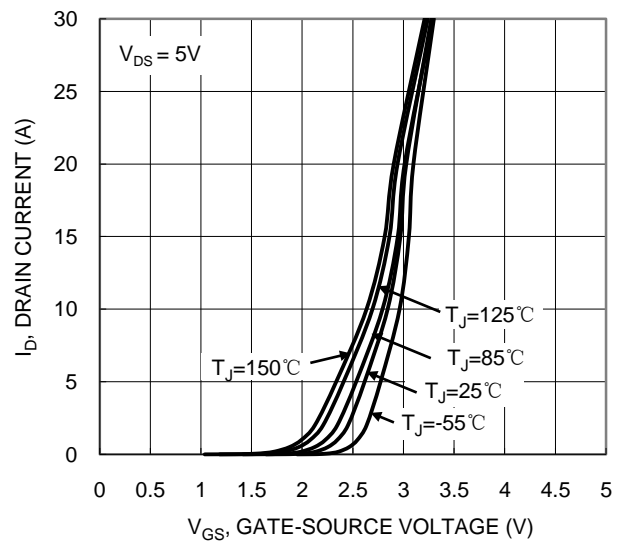


Figure 2. Typical Transfer Characteristic

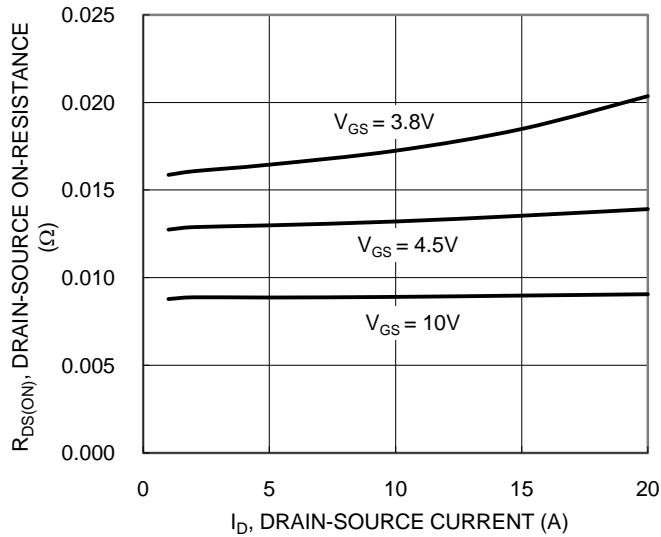


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

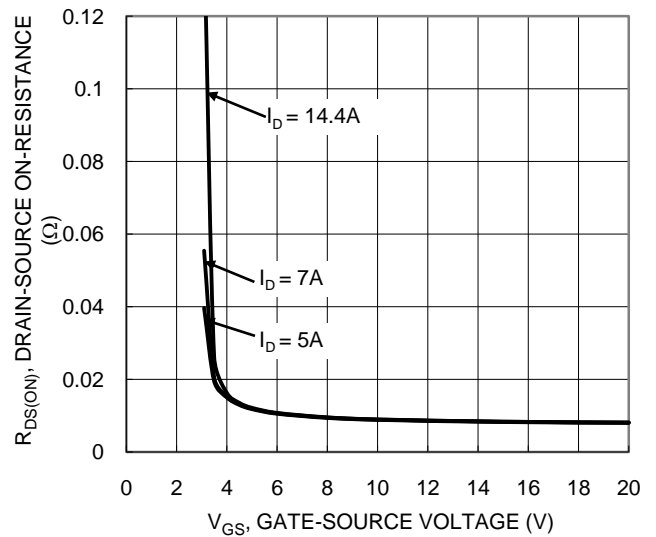


Figure 4. Typical Transfer Characteristic

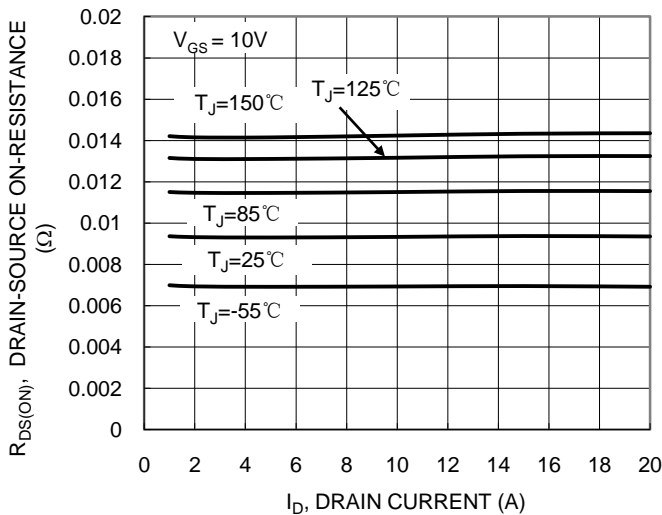


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

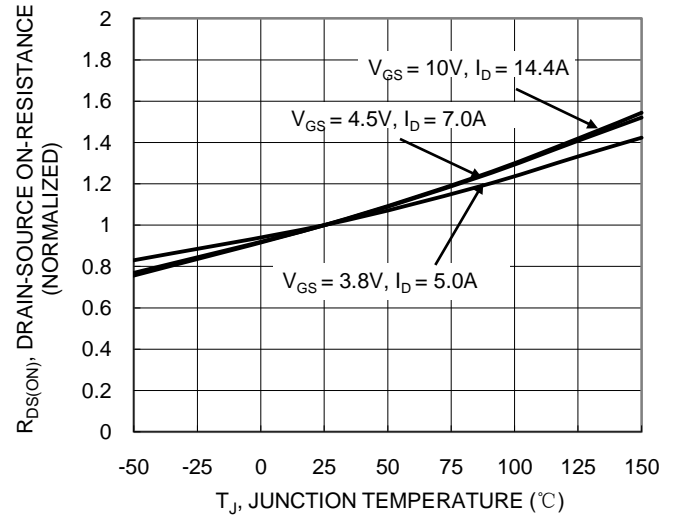
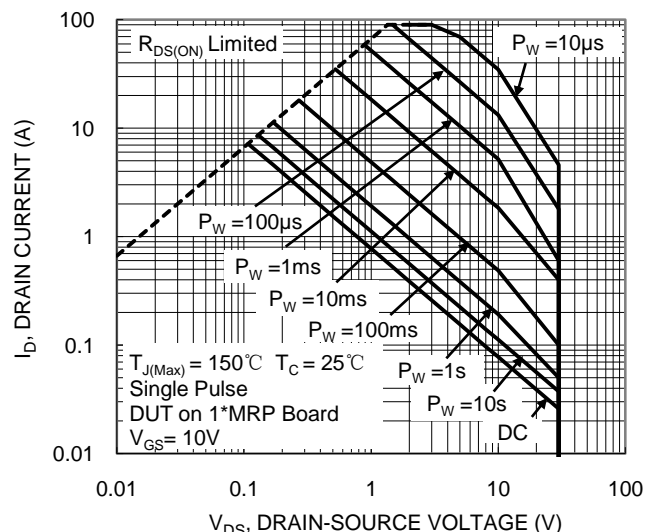
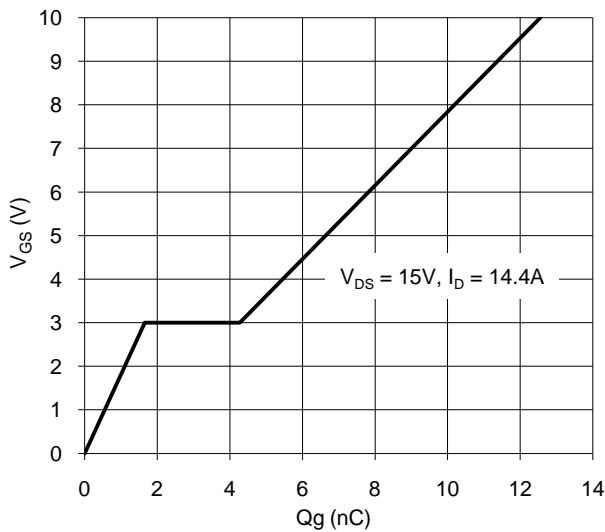
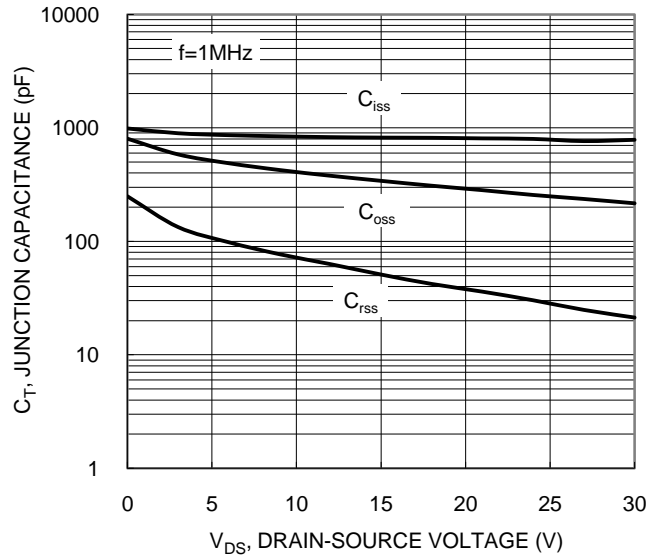
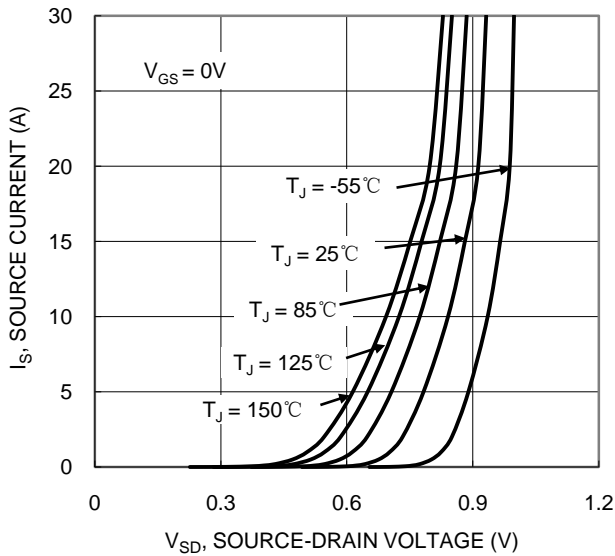
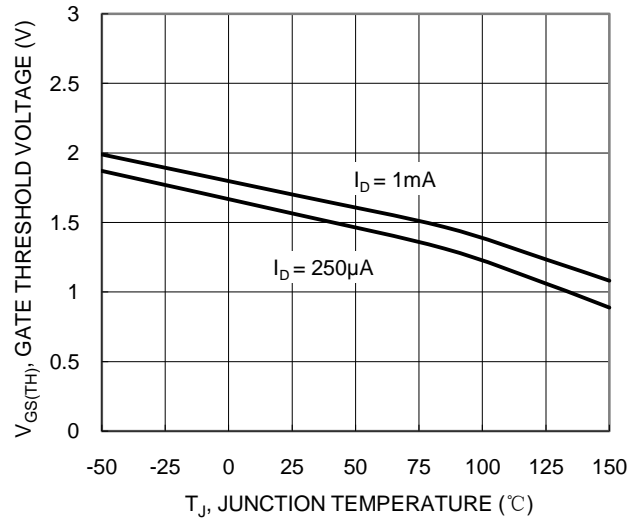
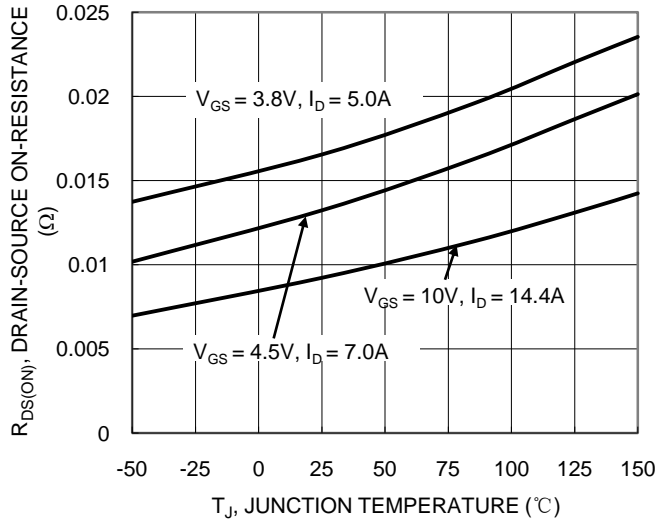
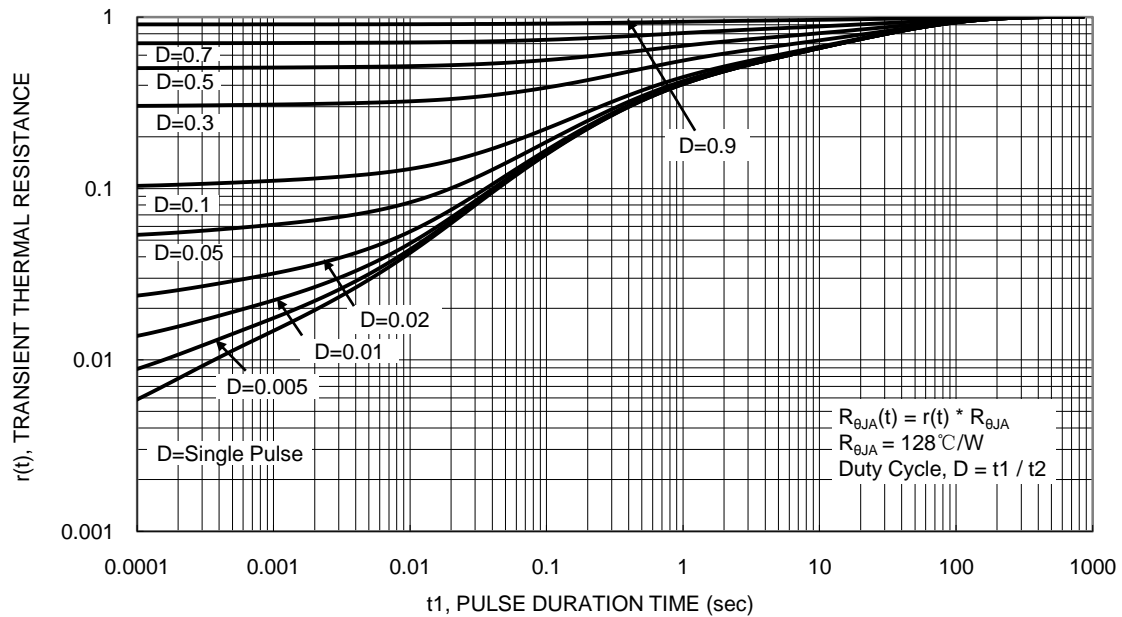


Figure 6. On-Resistance Variation with Temperature

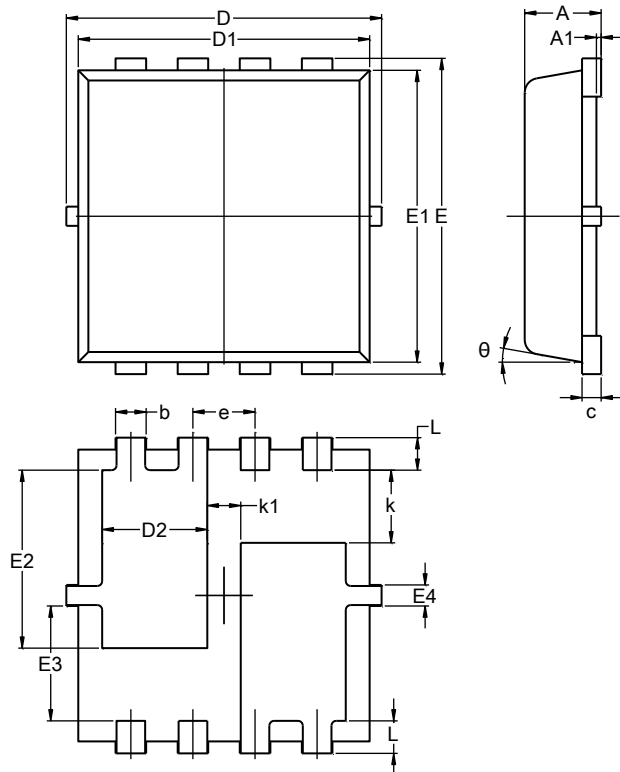




Package Outline Dimensions

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

PowerDI3333-8 (Type UXD)

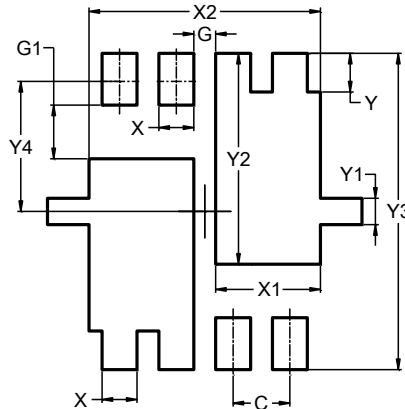


PowerDI3333-8 (Type UXD)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.90	1.30	1.10
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.66	2.06	1.86
E3	1.10	1.30	1.20
E4	0.12	0.32	0.22
e	--	--	0.65
L	0.24	0.44	0.34
k	0.56	0.96	0.76
k1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