

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
40V	10.8mΩ @ V _{GS} = 10V	30.2A
	15mΩ @ V _{GS} = 4.5V	25.6A

Description and Applications

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

- Motor Control
- Power Management Functions
- DC-DC Converters

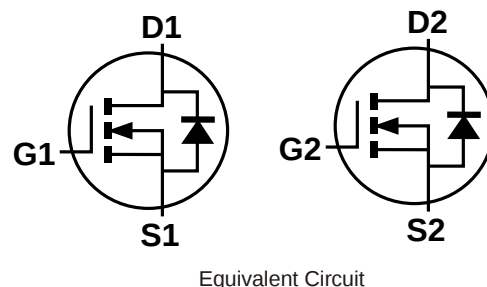
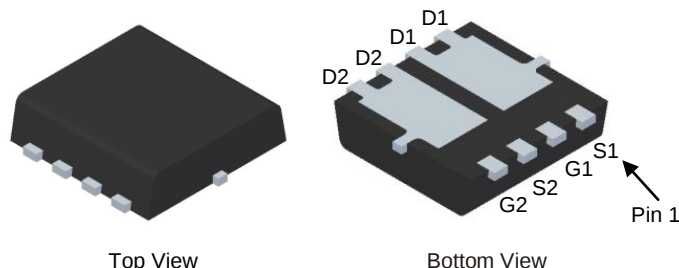
Features

- 100% Unclamped Inductive Switching, Test in Production – Ensures More Reliable and Robust End Application
- High Conversion Efficiency
- Low R_{DS(ON)} – Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMT47M2LDVQ](#))**

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 UXC)

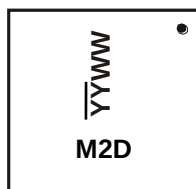


Ordering Information (Note 4)

Part Number	Case	Packaging
DMT47M2LDV-7	PowerDI3333-8 (Type UXC)	2000/Tape & Reel
DMT47M2LDV-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, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



M2D = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 19 for 2019)
WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	40	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 6), V _{GS} = 10V	I _D	T _C = +25°C 30.2	A
		T _C = +100°C 24.2	
Continuous Drain Current (Note 5), V _{GS} = 10V	I _D	T _A = +25°C 11.9	A
		T _A = +70°C 9.5	
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I _{DM}	120	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	16.4	A
Pulsed Body Diode Forward Current (10μs Pulse, Duty Cycle = 1%)	I _{SM}	120	A
Avalanche Current, L = 0.1mH (Note 7)	I _{AS}	22.1	A
Avalanche Energy, L = 0.1mH (Note 7)	E _{AS}	24.4	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	2.34	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	53.7	°C/W
Total Power Dissipation (Note 6)	P _D	14.8	W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	8.43	°C/W
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}	40	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 32V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1.2	1.4	2.3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	8.4	10.8	mΩ	V _{GS} = 10V, I _D = 20A
		—	10.9	15		V _{GS} = 4.5V, I _D = 10A
Diode Forward Voltage	V _{SD}	—	0.9	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	—	891	—	pF	V _{DS} = 20V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	490	—		
Reverse Transfer Capacitance	C _{rSS}	—	14.8	—		
Gate Resistance	R _g	—	1.87	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	14.0	—	nC	V _{DS} = 20V, I _D = 20A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6.72	—		
Gate-Source Charge	Q _{gs}	—	1.04	—		
Gate-Drain Charge	Q _{gd}	—	2.52	—		
Turn-On Delay Time	t _{D(ON)}	—	3.95	—	ns	V _{DD} = 20V, V _{GS} = 10V, R _G = 3Ω, I _D = 20A
Turn-On Rise Time	t _R	—	5.41	—		
Turn-Off Delay Time	t _{D(OFF)}	—	15.4	—		
Turn-Off Fall Time	t _F	—	8.53	—		
Body Diode Reverse Recovery Time	t _{RR}	—	56.6	—	ns	I _F = 20A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	40.0	—	nC	

- Notes:
- 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.

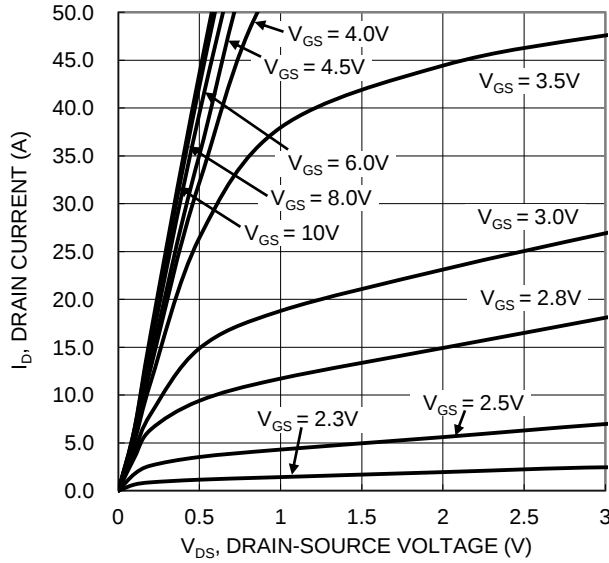


Figure 1. Typical Output Characteristic

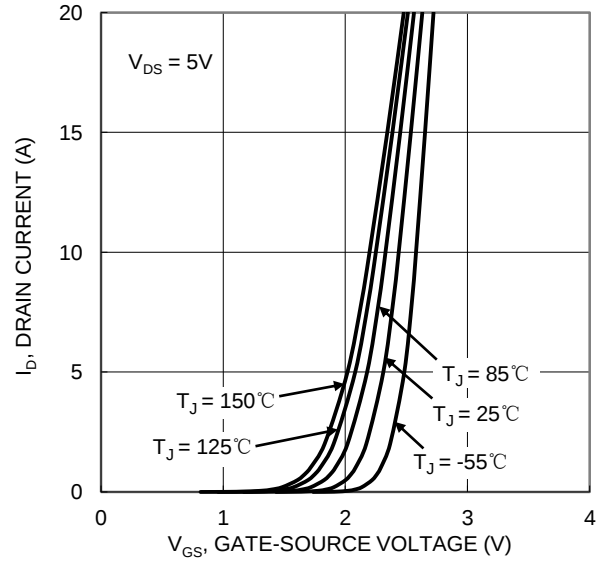


Figure 2. Typical Transfer Characteristic

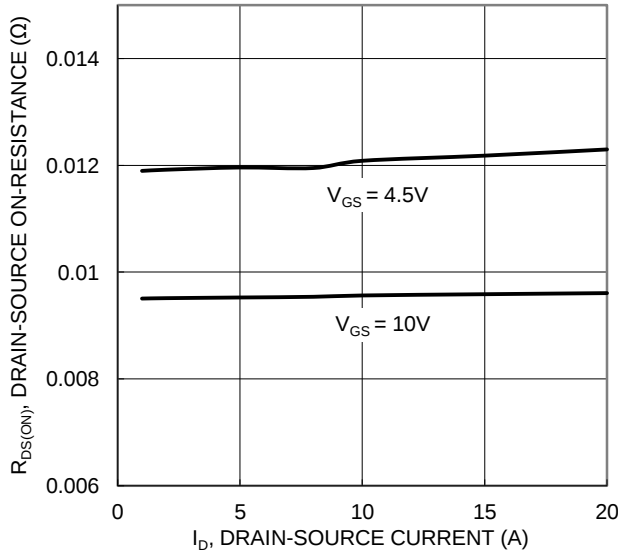


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

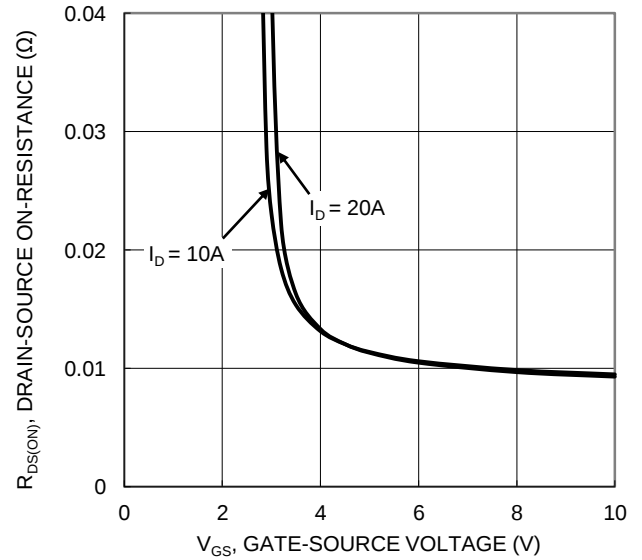


Figure 4. Typical Transfer Characteristic

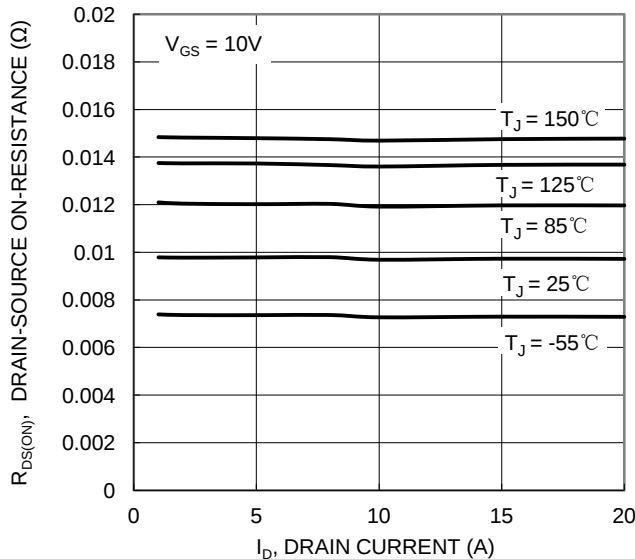


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

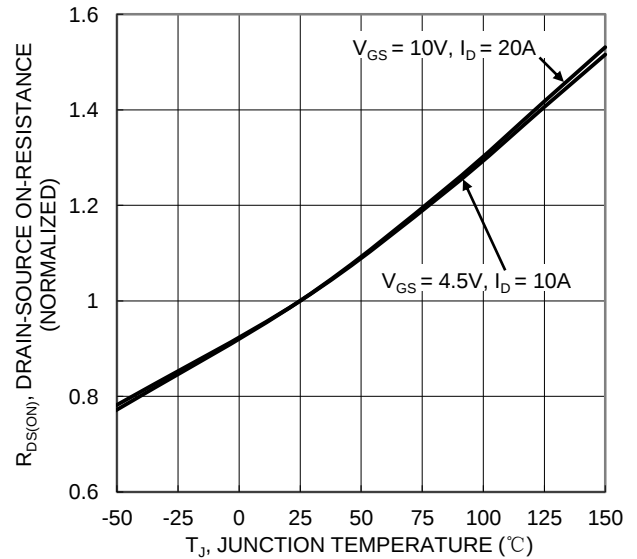
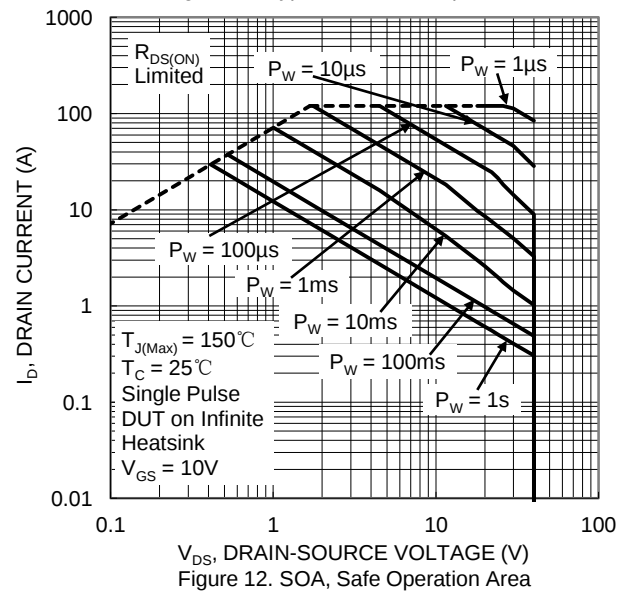
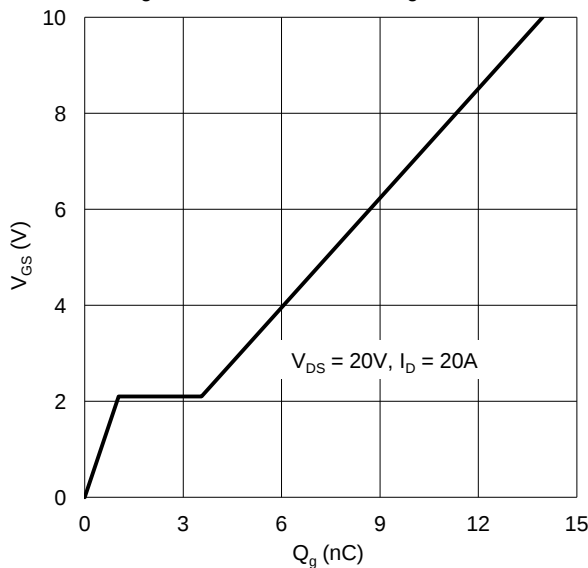
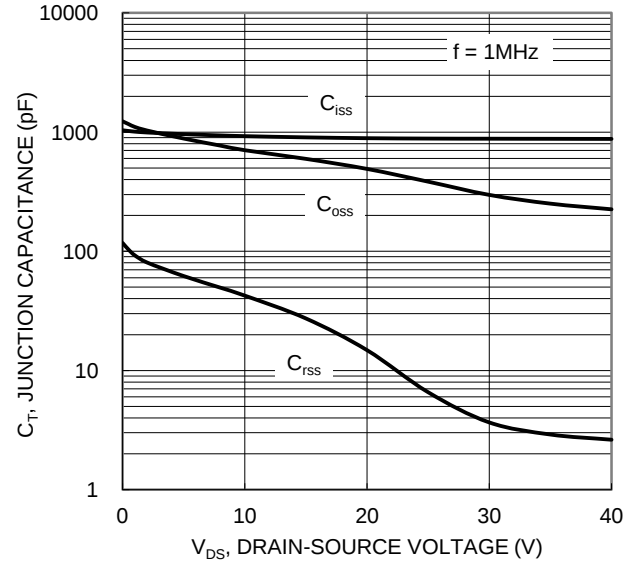
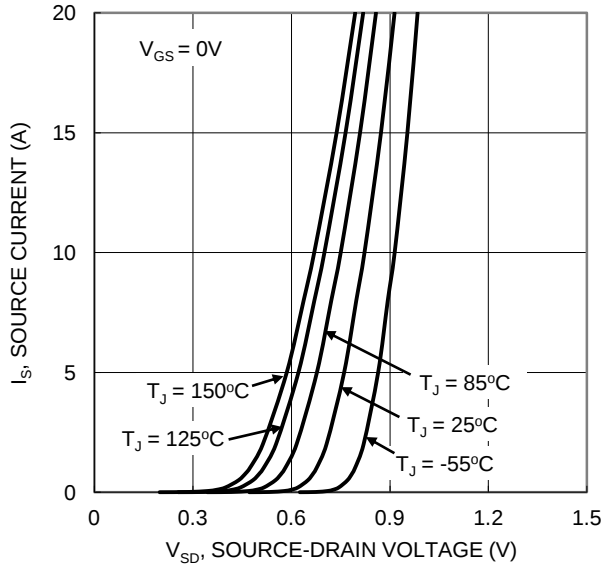
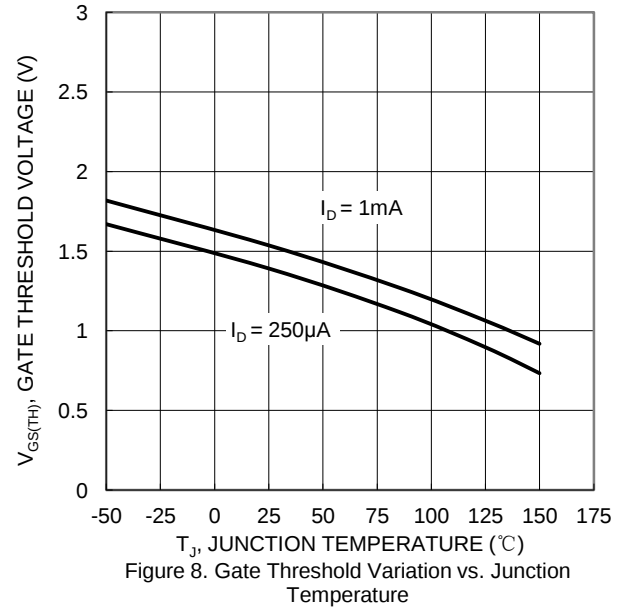
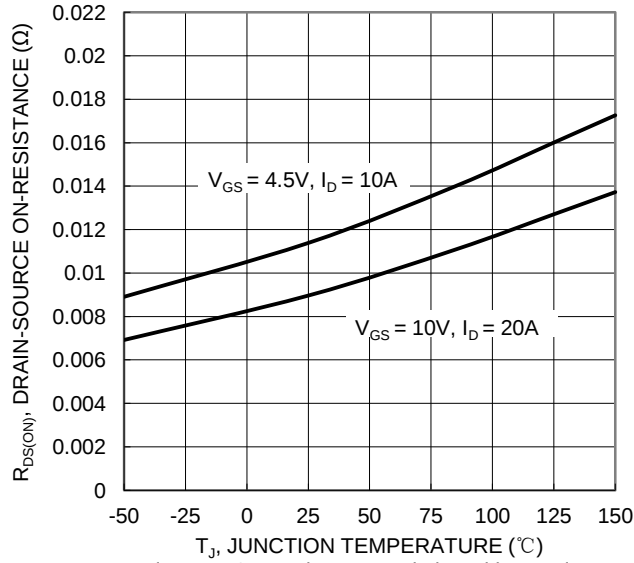


Figure 6. On-Resistance Variation with Junction Temperature



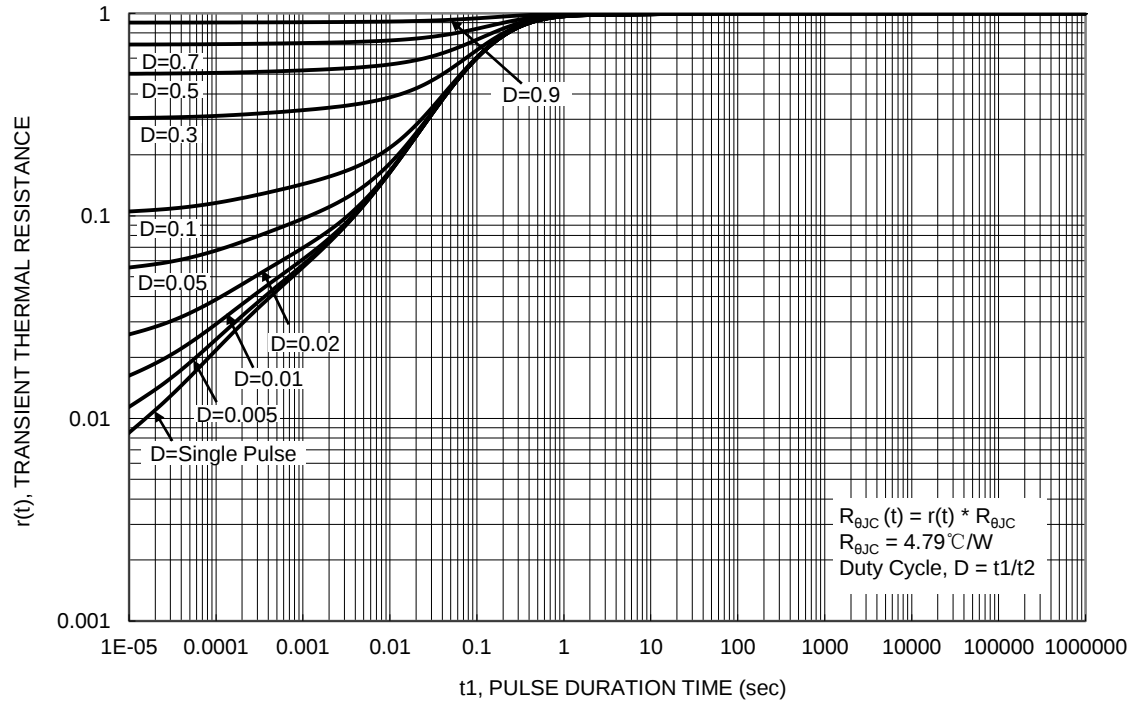
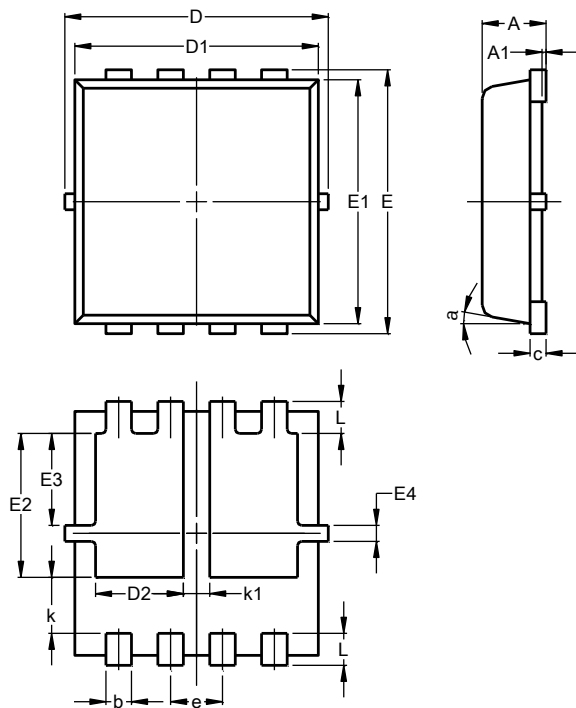


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8 (Type UXC)

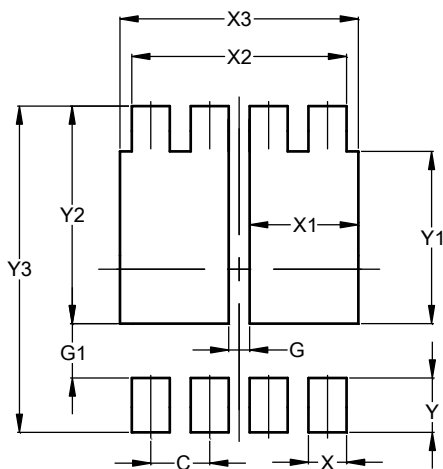


PowerDI3333-8 (Type UXC)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	0.90	1.30	1.10
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E3	0.95	1.35	1.15
E4	0.10	0.30	0.20
e	--	--	0.65
L	0.30	0.50	0.40
k	0.50	0.90	0.70
k1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