

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
80V	6.9mΩ @ V _{GS} = 10V	52A
	10.4mΩ @ V _{GS} = 4.5V	42A

Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- Power Management Functions
- DC-DC Converters

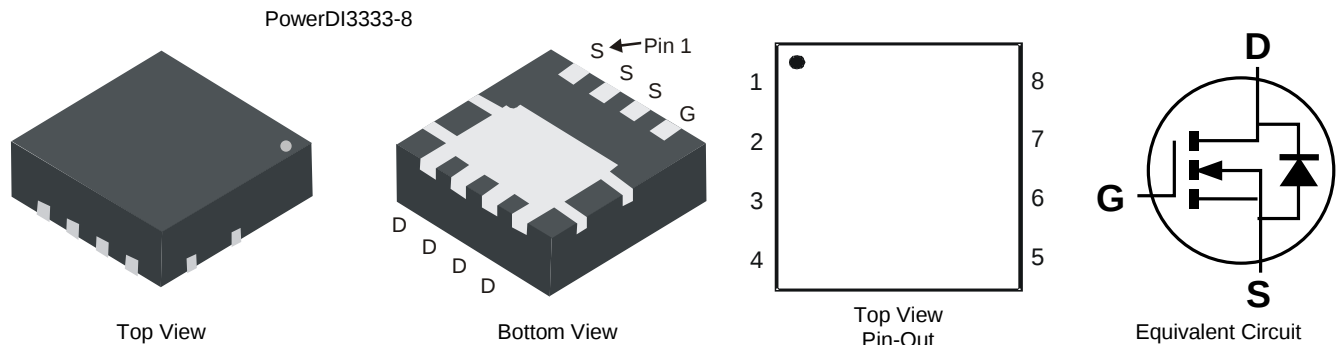
Features and Benefits

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- Low R_{DS(ON)} – Ensures On-State Losses are Minimized
- Excellent Q_{gd} × R_{DS(ON)} Product (FOM)
- Advanced Technology for DC-DC Converts
- 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
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMTH8008LFGQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

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
- Terminal Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208@3
- Weight: 0.072 grams (Approximate)

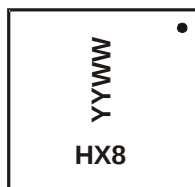


Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH8008LFGQ-7	PowerDI3333-8	2,000/Tape & Reel
DMTH8008LFGQ-13	PowerDI3333-8	3,000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 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



HX8 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 19 = 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}	80	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 7) V _{GS} = 10V	I _D	52 37	A
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	17 12	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	45	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	200	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	200	A
Avalanche Current, L = 1mH (Note 8)	I _{AS}	18	A
Avalanche Energy, L = 1mH (Note 8)	E _{AS}	162	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	126	°C/W
Total Power Dissipation (Note 6)	P _D	3.1	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	49	°C/W
Total Power Dissipation (Note 7)	P _D	28.3	W
Thermal Resistance, Junction to Case (Note 7)	R _{θJC}	5.3	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	80	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{bss}	—	—	1	µA	V _{DS} = 64V, V _{GS} = 0V
Gate-Source Leakage	I _{gss}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	1.2	—	2.5	V	V _{DS} = V _{GS} , I _D = 1mA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	5.3	6.9	mΩ	V _{GS} = 10V, I _D = 20A
		—	7.9	10.4		V _{GS} = 4.5V, I _D = 10A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	2254	—	pF	V _{DS} = 40V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	745	—		
Reverse Transfer Capacitance	C _{rss}	—	31	—		
Gate Resistance	R _g	—	1.98	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	18.3	—	nC	V _{DS} = 40V, I _D = 14A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	37.7	—		
Gate-Source Charge	Q _{gs}	—	5.3	—		
Gate-Drain Charge	Q _{gd}	—	7.8	—		
Turn-On Delay Time	t _{D(ON)}	—	6.9	—	ns	V _{DD} = 40V, V _{GS} = 10V, I _D = 14A, R _G = 6Ω
Turn-On Rise Time	t _r	—	12	—		
Turn-Off Delay Time	t _{D(OFF)}	—	37	—		
Turn-Off Fall Time	t _f	—	21	—		
Body Diode Reverse Recovery Time	t _{RR}	—	42	—	ns	I _S = 14A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	53	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 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.

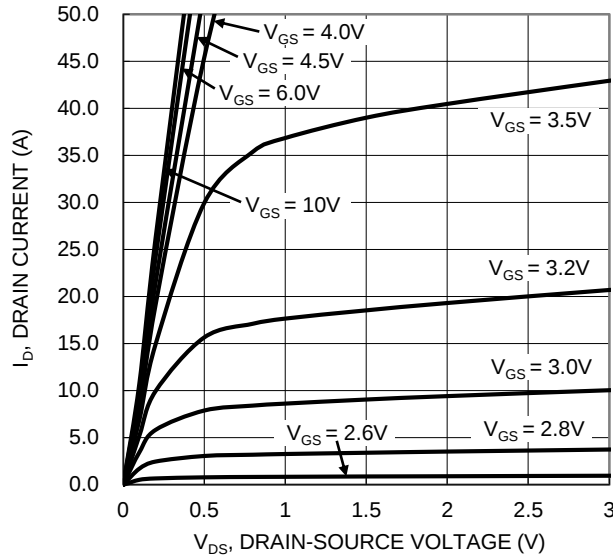


Figure 1. Typical Output Characteristic

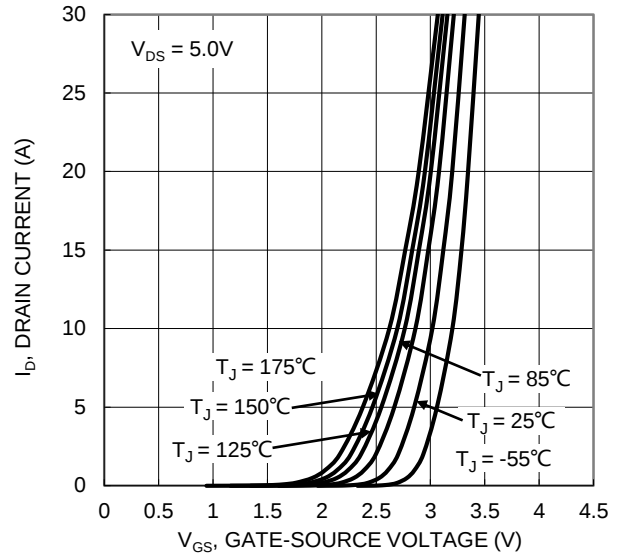


Figure 2. Typical Transfer Characteristic

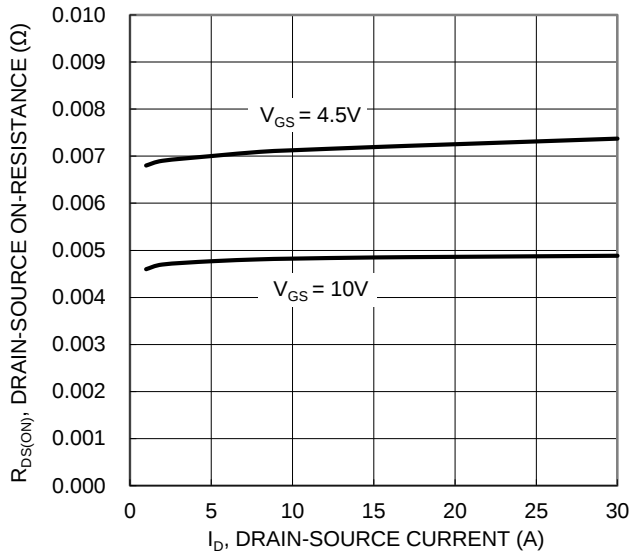


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

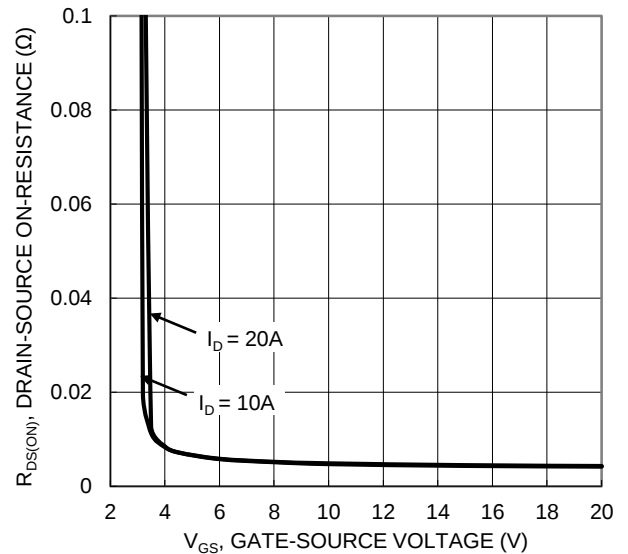


Figure 4. Typical Transfer Characteristic

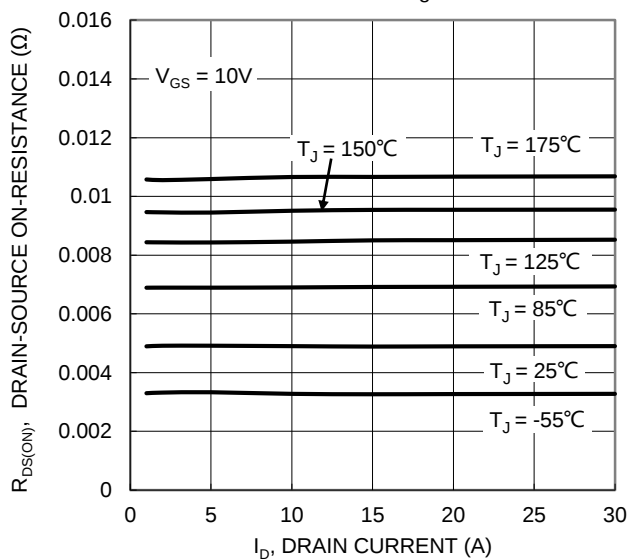


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

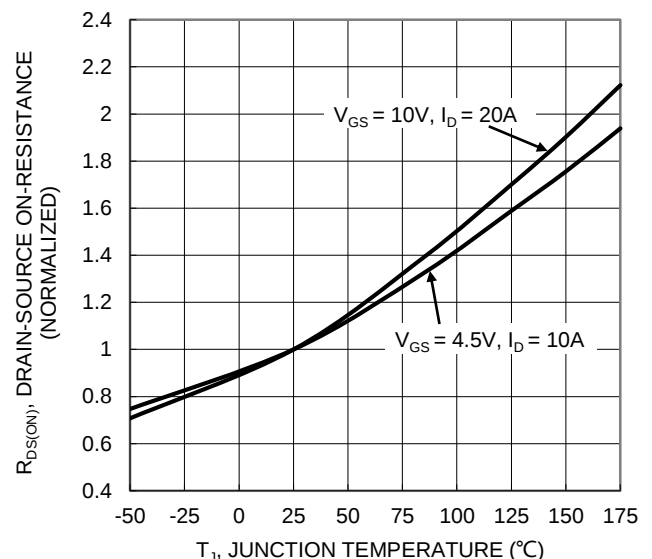
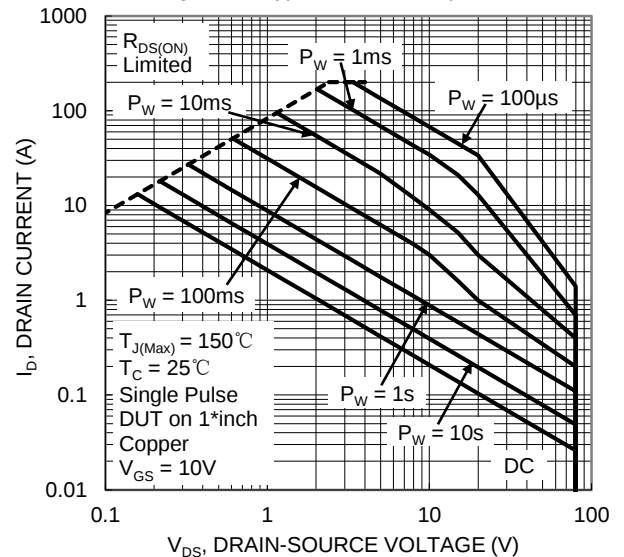
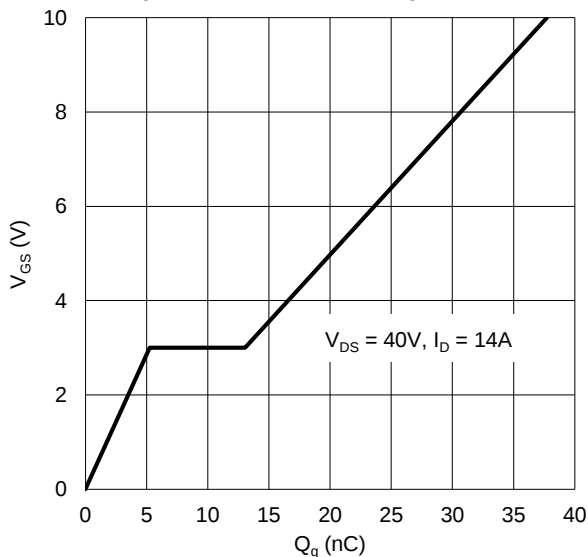
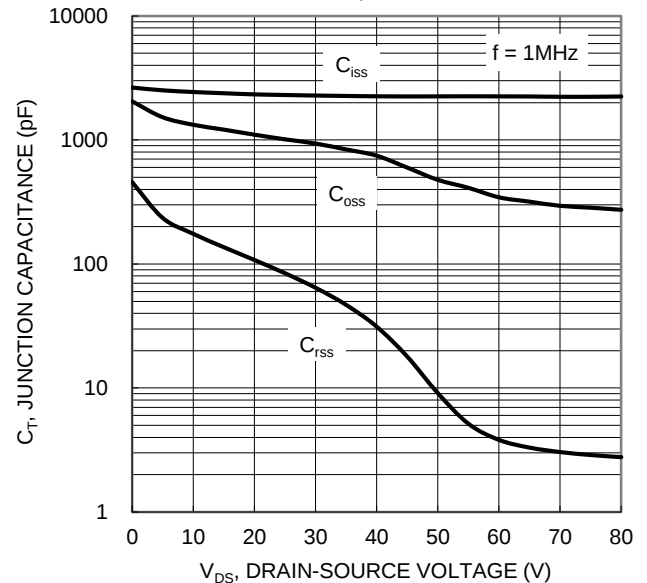
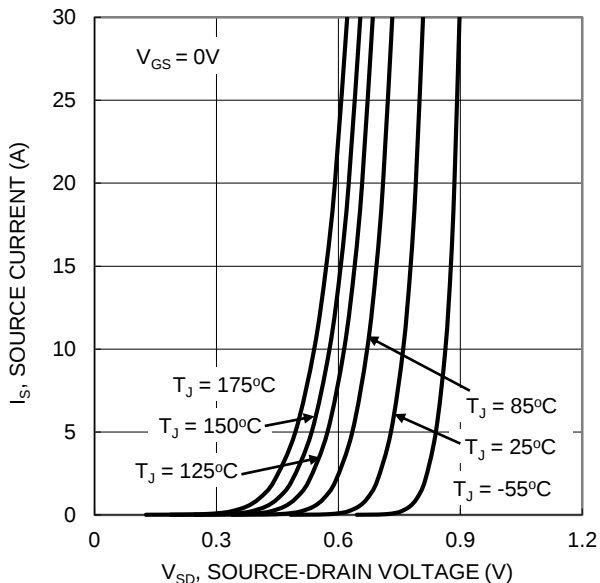
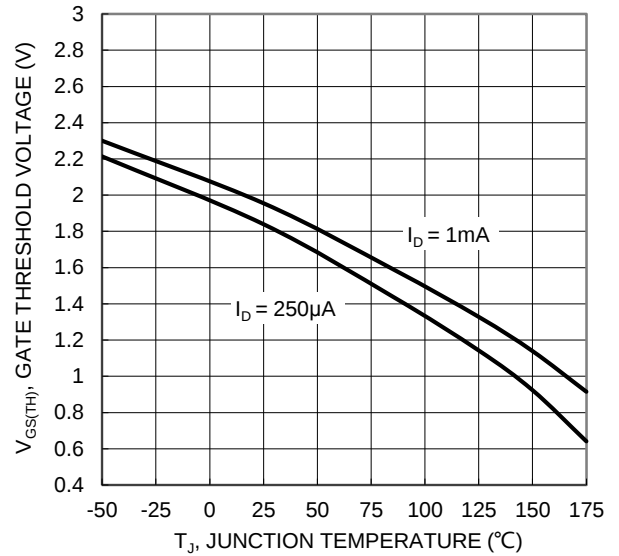
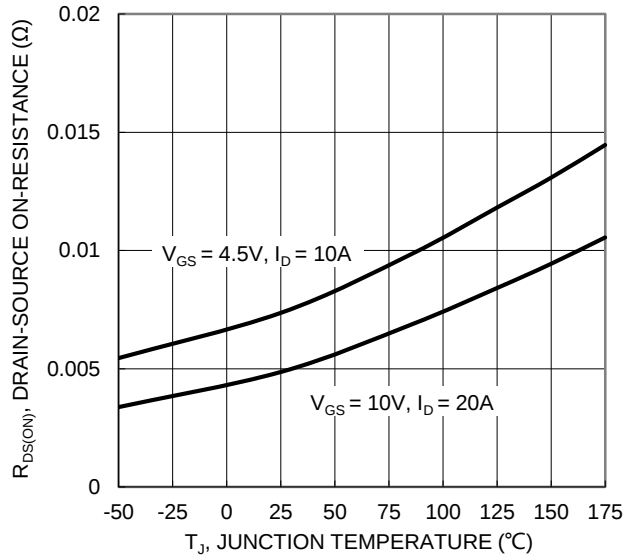


Figure 6. On-Resistance Variation with Temperature



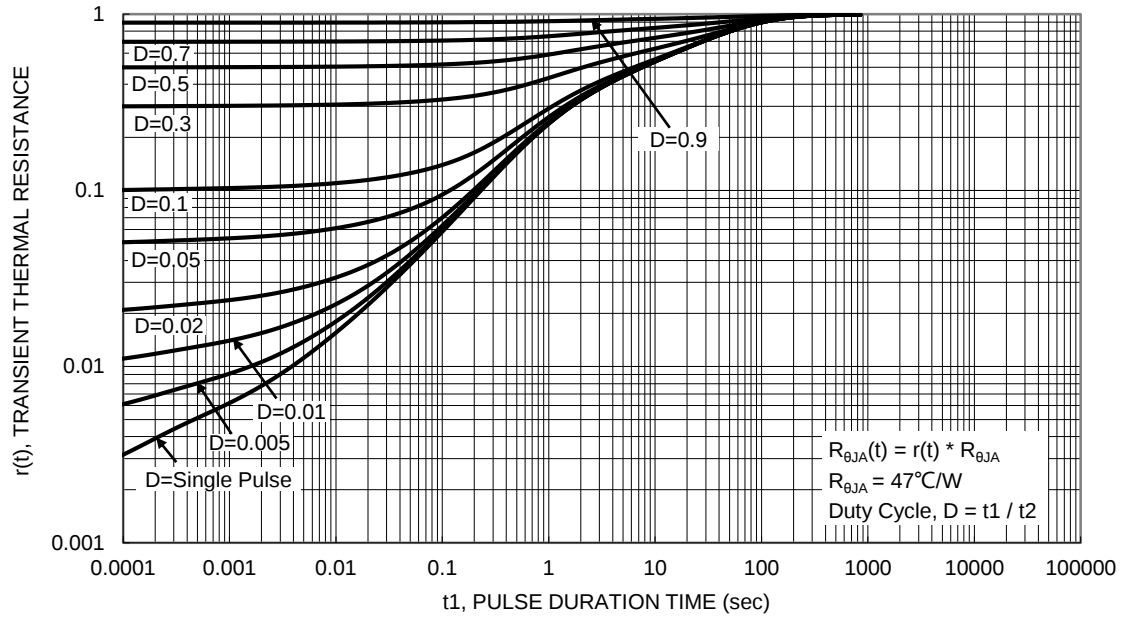
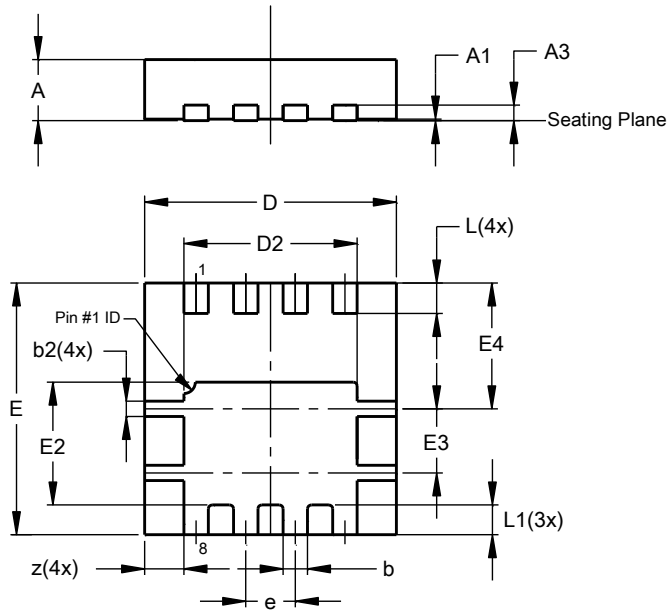


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI3333-8

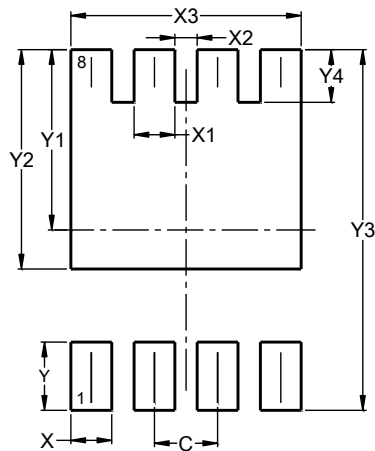


PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	—	—	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	—	—	0.65
L	0.35	0.45	0.40
L1	—	—	0.39
z	—	—	0.515
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI3333-8



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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