

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
75V	22mΩ @ V _{GS} = 10V	7.8A
	28mΩ @ V _{GS} = 4.5V	6.9A

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:

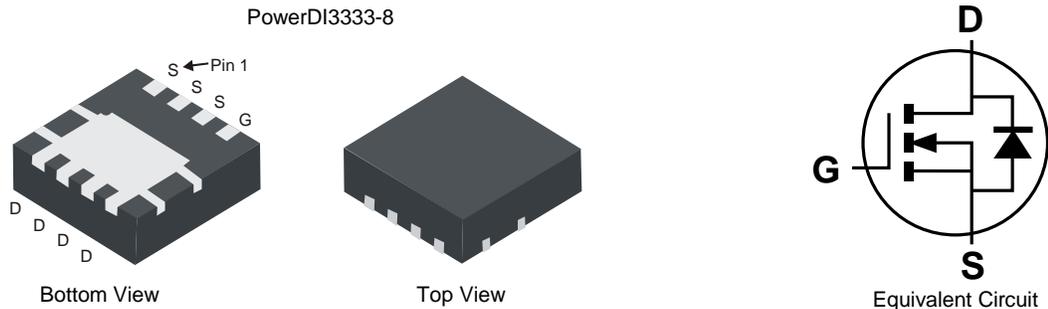
- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

- 100% Unclamped Inductive Switching – Ensures More Reliable and Robust End Application
- Low R_{DS(ON)} – Ensures On-state Losses are Minimized
- 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
- **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**
- **PPAP Capable (Note 4)**

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)

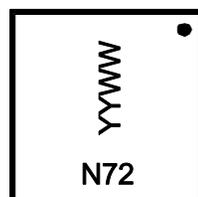


Ordering Information (Note 5)

Part Number	Case	Packaging
DMN7022LFGQ-7	PowerDI3333-8	2,000/Tape & Reel
DMN7022LFGQ-13	PowerDI3333-8	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



N72= Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 17 = 2017)
 WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	75	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 7) V _{GS} = 10V	Steady State	T _A = +25°C	I _D	7.8	A
		T _A = +70°C		6.2	
Continuous Drain Current (Note 8) V _{GS} = 10V	Steady State	T _C = +25°C	I _D	23	A
		T _C = +70°C		18	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	56	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	2.1	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)			I _{SM}	50	A
Avalanche Current, L = 0.1mH (Note 9)			I _{AS}	28.8	A
Avalanche Energy, L = 0.1mH (Note 9)			E _{AS}	42.2	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)		P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	125	°C/W
	t < 10s		67	
Total Power Dissipation (Note 7)		P _D	2	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R _{θJA}	62	°C/W
	t < 10s		34	
Thermal Resistance, Junction to Case (Note 8)		R _{θJC}	6.9	
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 10)						
Drain-Source Breakdown Voltage	BV _{DSS}	75	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current (T _J = +25°C)	I _{DSS}	—	—	1	µA	V _{DS} = 75V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 10)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	14.6	22	mΩ	V _{GS} = 10V, I _D = 7.2A
		—	20.5	28		V _{GS} = 4.5V, I _D = 6.4A
Diode Forward Voltage	V _{SD}	—	0.72	—	V	V _{GS} = 0V, I _S = 3.2A
DYNAMIC CHARACTERISTICS (Note 11)						
Input Capacitance	C _{iss}	—	2737	—	pF	V _{DS} = 35V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	126	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	96.1	—	pF	
Gate Resistance	R _g	—	0.89	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	26.4	—	nC	V _{DS} = 38V, I _D = 7.2A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	56.5	—	nC	
Gate-Source Charge	Q _{gs}	—	12	—	nC	
Gate-Drain Charge	Q _{gd}	—	11.8	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	6.1	—	ns	
Turn-On Rise Time	t _R	—	5.7	—	ns	V _{GS} = 10V, V _{DS} = 38V, R _g = 1Ω, I _D = 5.7A
Turn-Off Delay Time	t _{D(OFF)}	—	19.6	—	ns	
Turn-Off Fall Time	t _F	—	3.9	—	ns	
Body Diode Reverse Recovery Time	t _{RR}	—	26.2	—	ns	I _F = 5.7A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	25.2	—	nC	

- Notes:
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 8. Thermal resistance from junction to soldering point (on the exposed drain pad).
 9. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 10. Short duration pulse test used to minimize self-heating effect.
 11. Guaranteed by design. Not subject to product testing.

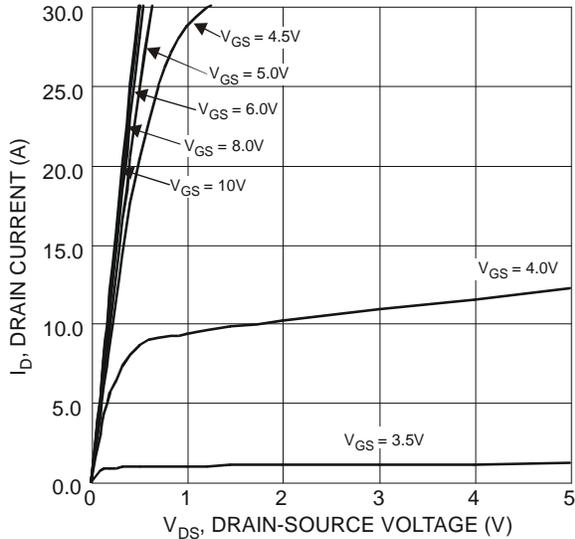


Figure 1 Typical Output Characteristics

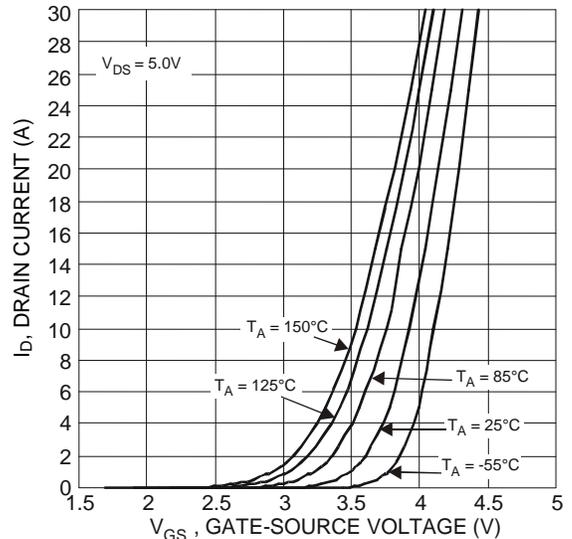


Figure 2 Typical Transfer Characteristics

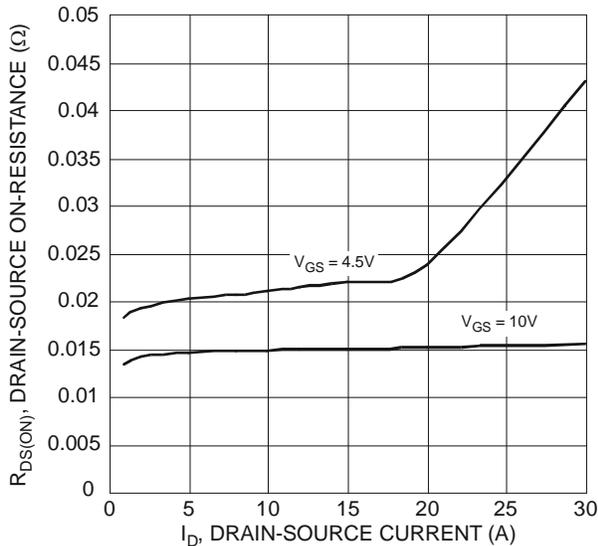


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

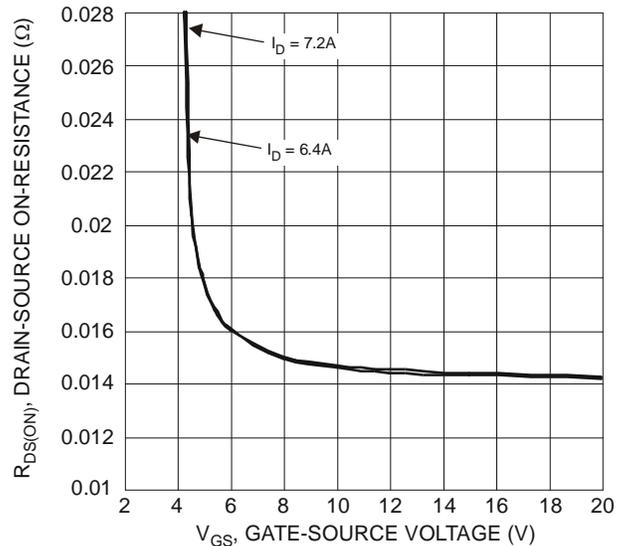


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

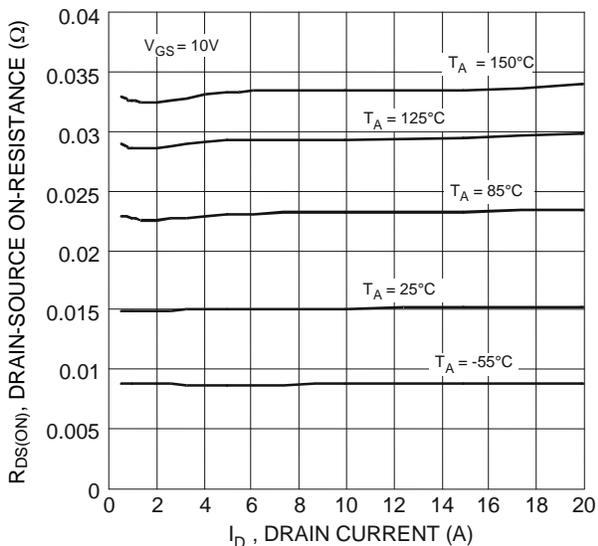


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

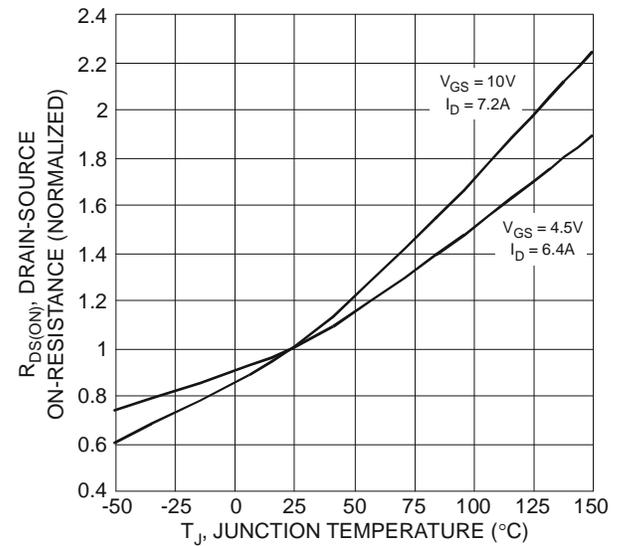


Figure 6 On-Resistance Variation with Temperature

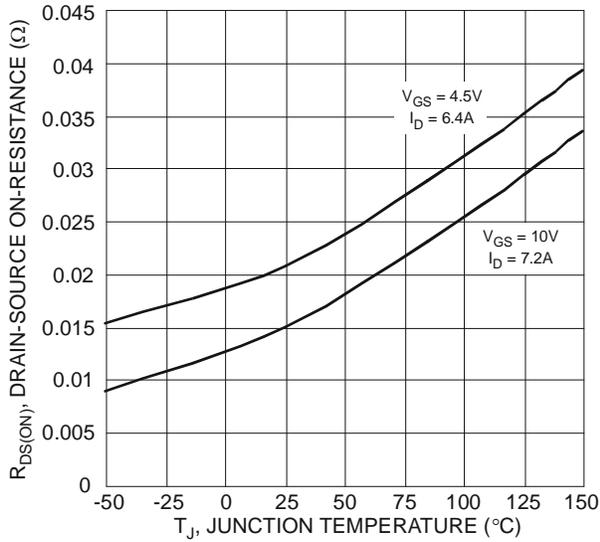


Figure 7 On-Resistance Variation with Temperature

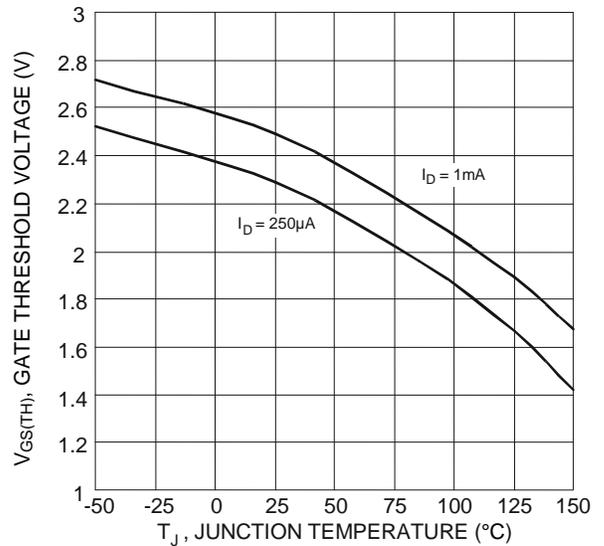


Figure 8 Gate Threshold Variation vs Junction Temperature

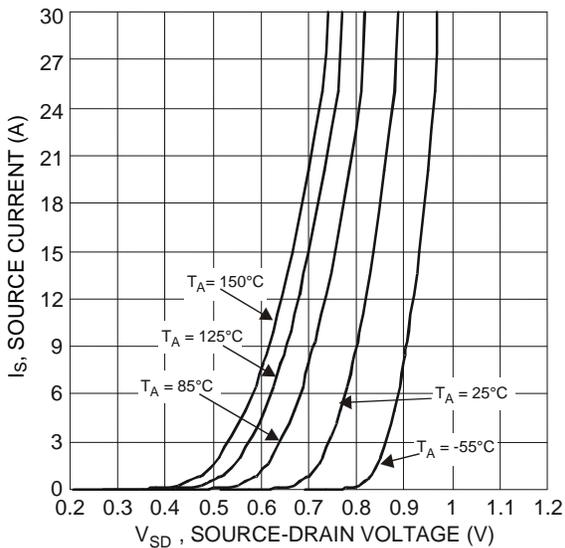


Figure 9 Diode Forward Voltage vs. Current

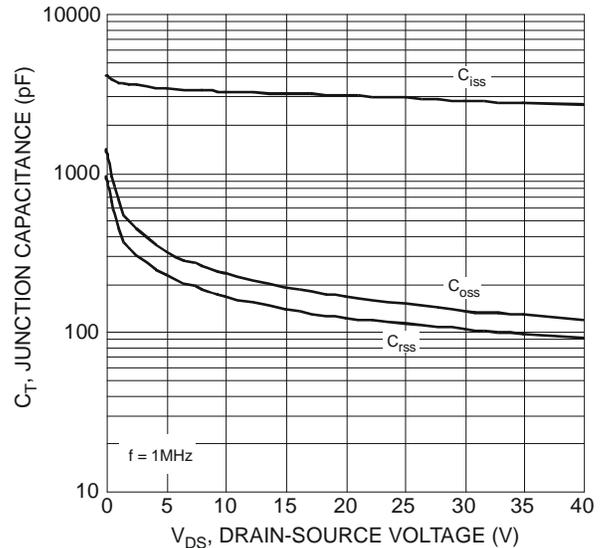


Figure 10 Typical Junction Capacitance

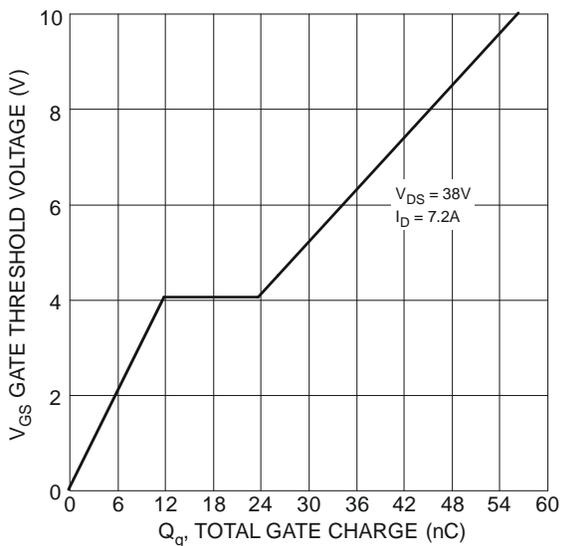


Figure 11 Gate Charge

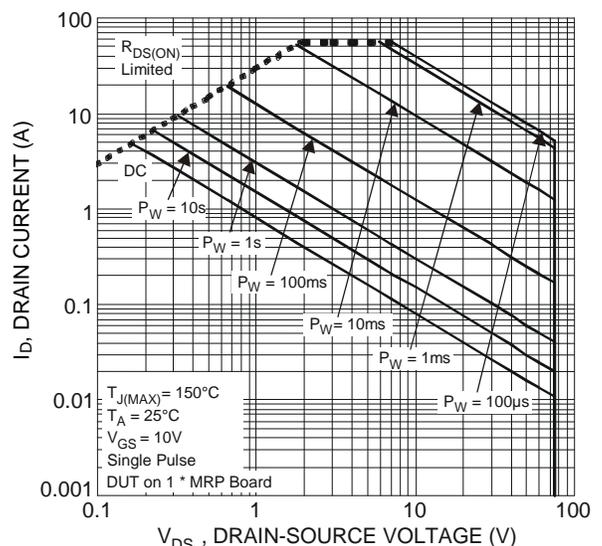
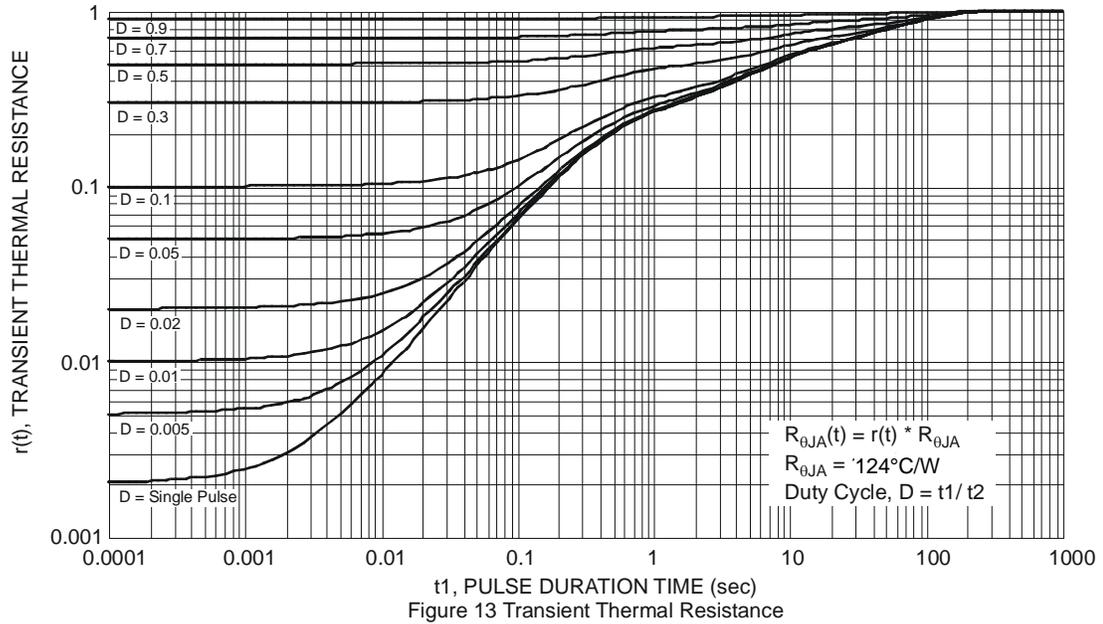


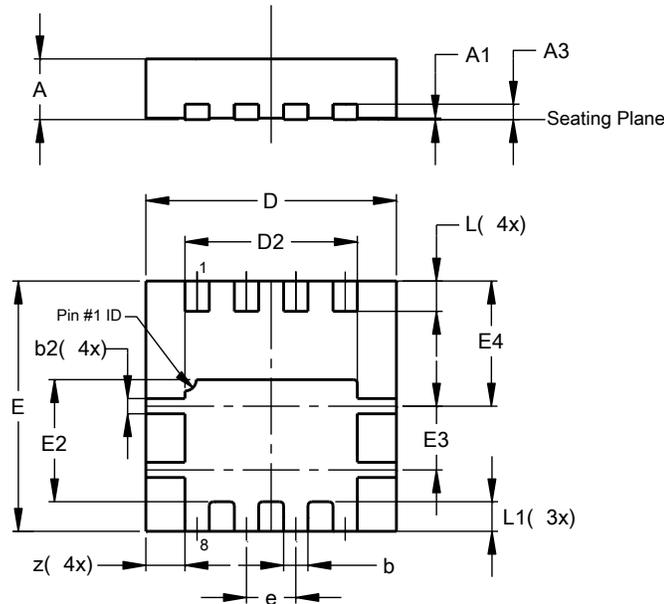
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

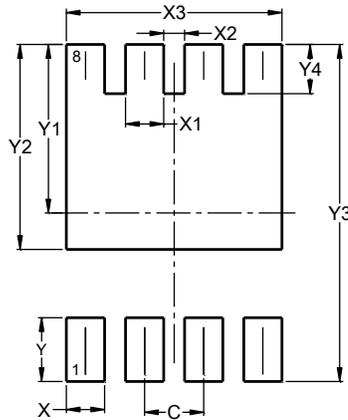
PowerDI3333-8



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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