

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:

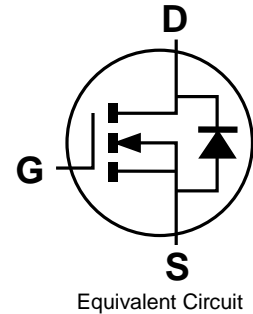
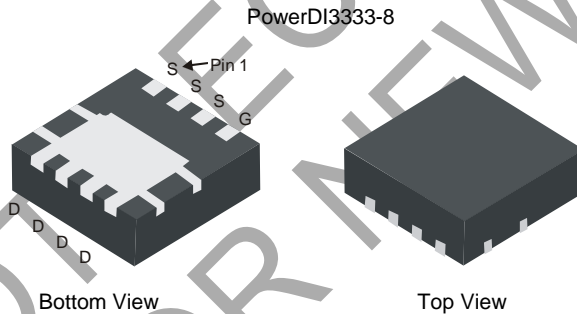
- Backlighting
- Power management functions
- DC-DC converters

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)**
- **The DIODES™ DMN7022LFGQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: PowerDI[®]3333-8
- Package 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)

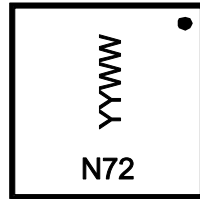


Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
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) & 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



N72 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 22 = 2022)
 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 5) V _{GS} = 10V	Steady State	I _D	T _A = +25°C	7.8	A
			T _A = +70°C	6.2	
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	I _D	T _C = +25°C	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 7)		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 8)		I _{AS}	28.8	A	
Avalanche Energy, L = 0.1mH (Note 8)		E _{AS}	42.2	mJ	

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 7)		P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R _{θJA}	125	°C/W
	t < 10s		67	
Total Power Dissipation (Note 5)		P _D	2	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	62	°C/W
	t < 10s		34	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	6.9	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
- 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).
 - Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°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}	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 9)						
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 10)						
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	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Gate Resistance	R _g	—	0.89	—	Ω	
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	I _F = 5.7A, dI/dt = 100A/μs
Body Diode Reverse Recovery Time	t _{RR}	—	26.2	—	ns	
Body Diode Reverse Recovery Charge	Q _{RR}	—	25.2	—	nC	

Notes: 9. Short duration pulse test used to minimize self-heating effect.
 10. Guaranteed by design. Not subject to product testing.

NOT RECOMMENDED FOR NEW DESIGN

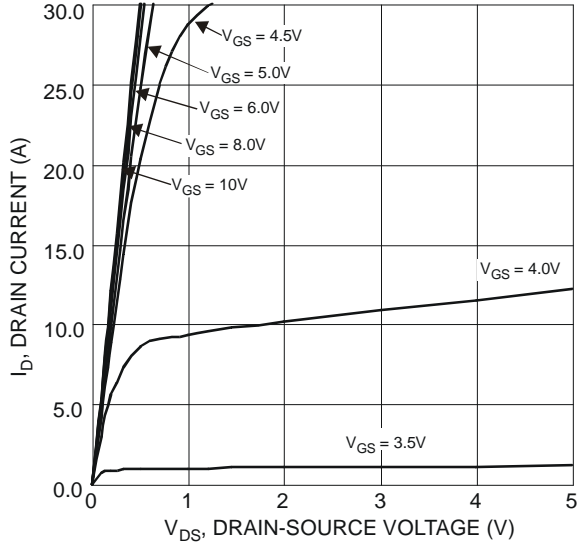


Figure 1 Typical Output Characteristics

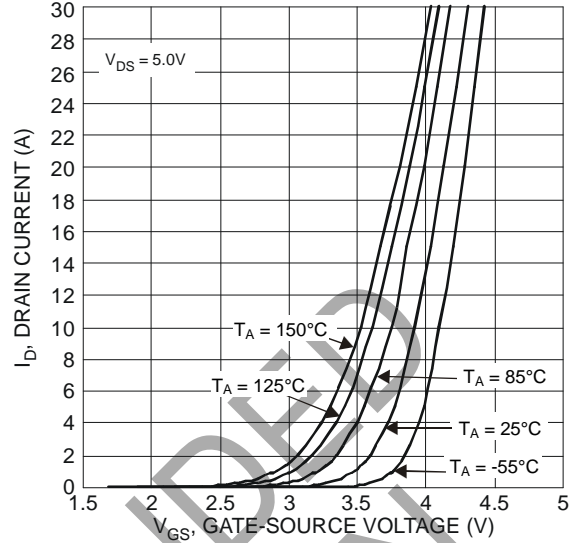


Figure 2 Typical Transfer Characteristics

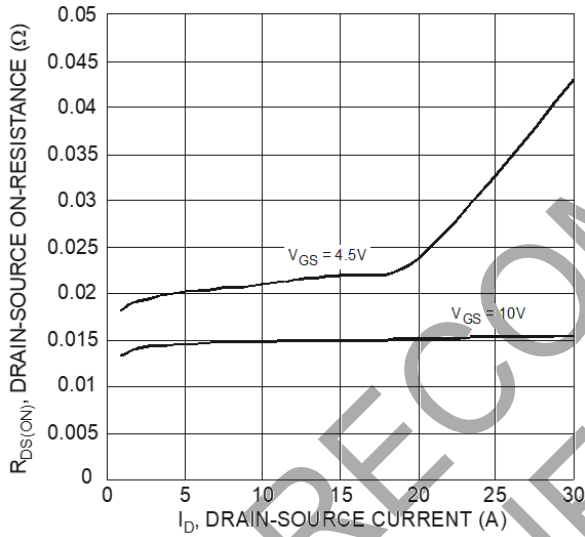


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

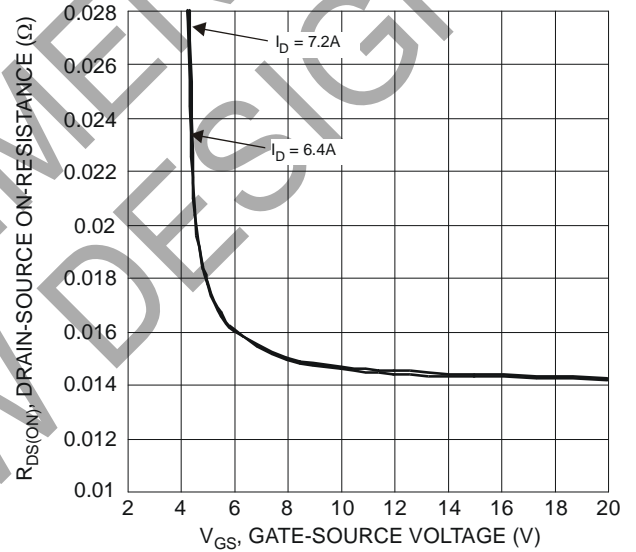


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

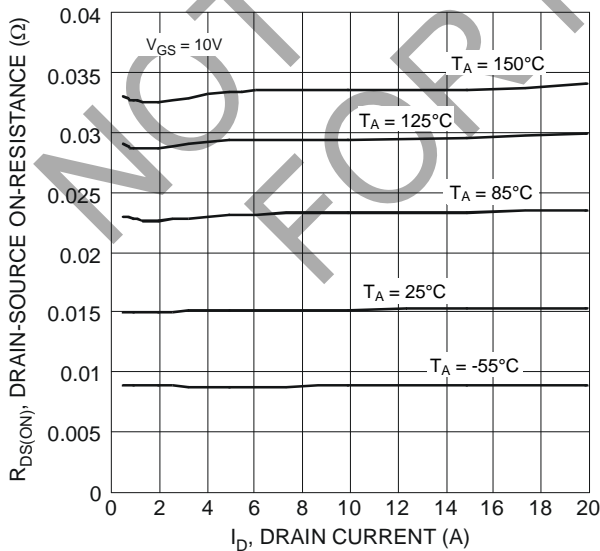


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

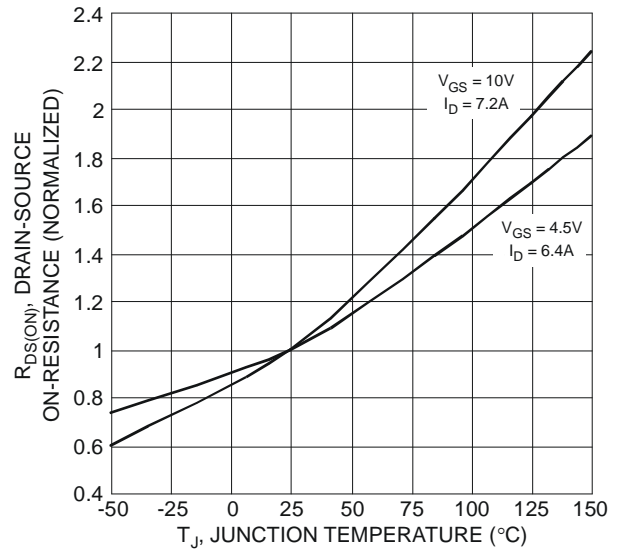


Figure 6 On-Resistance Variation with Temperature

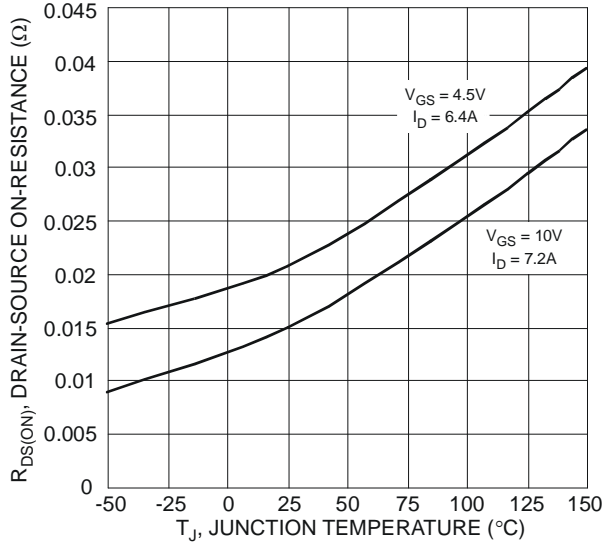


Figure 7 On-Resistance Variation with Temperature

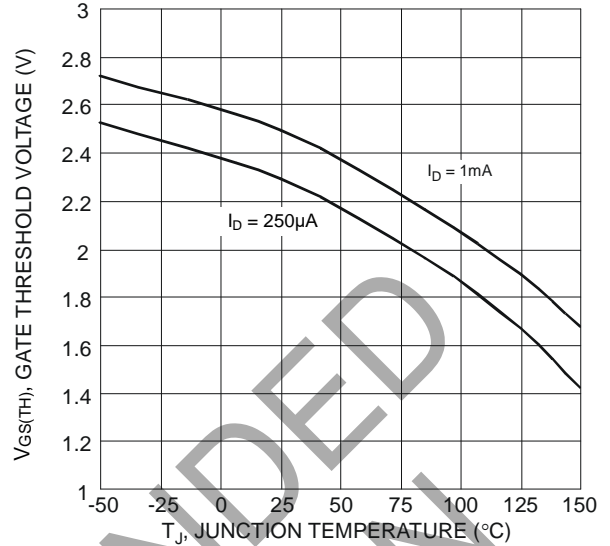


Figure 8 Gate Threshold Variation vs. Junction Temperature

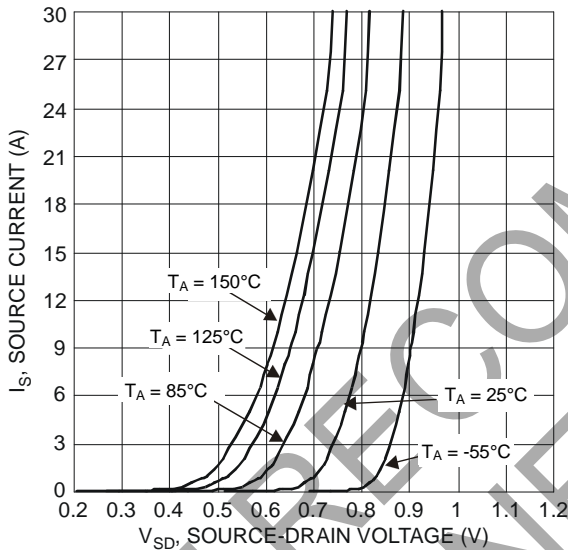


Figure 9 Diode Forward Voltage vs. Current

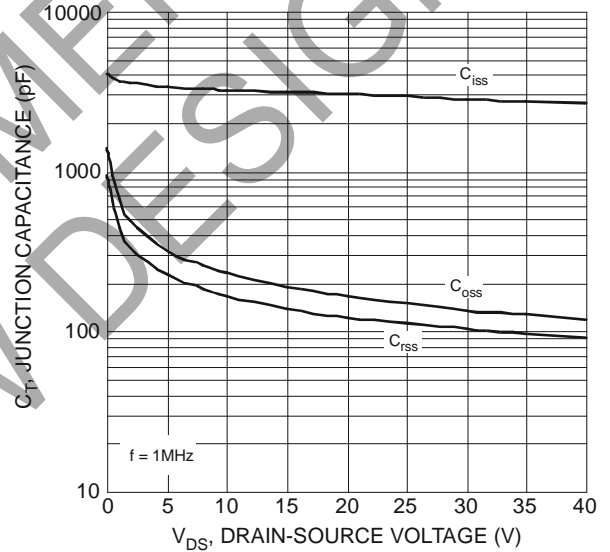


Figure 10 Typical Junction Capacitance

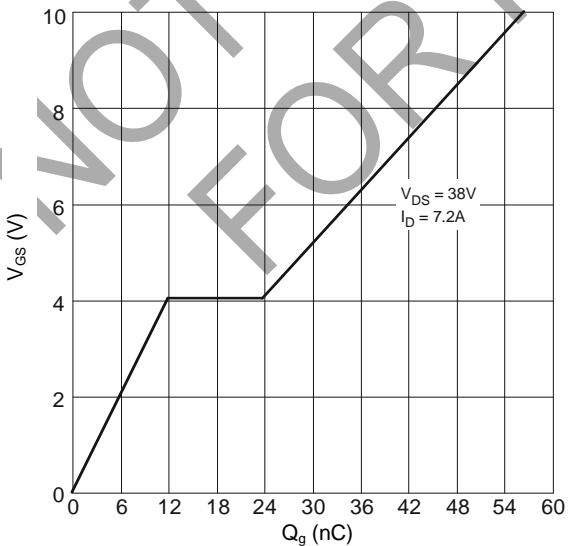


Figure 11 Gate Charge

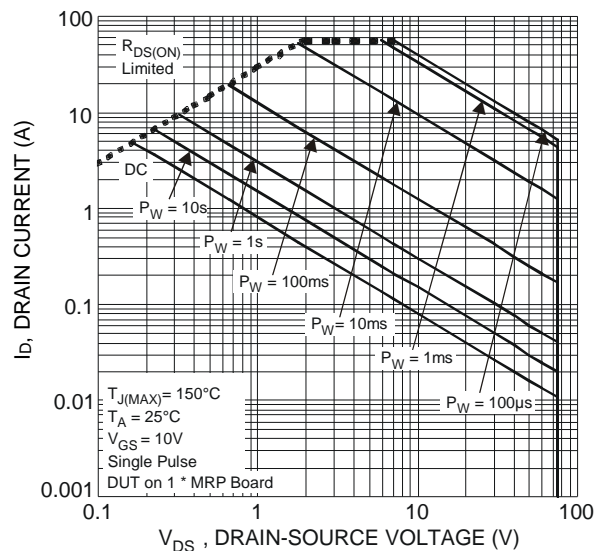
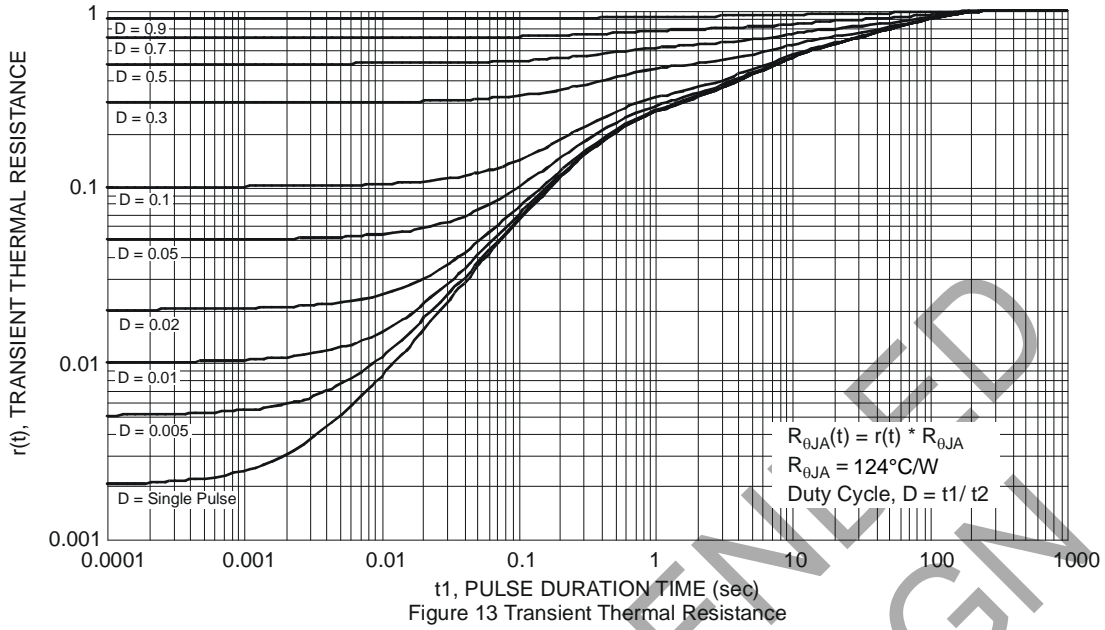


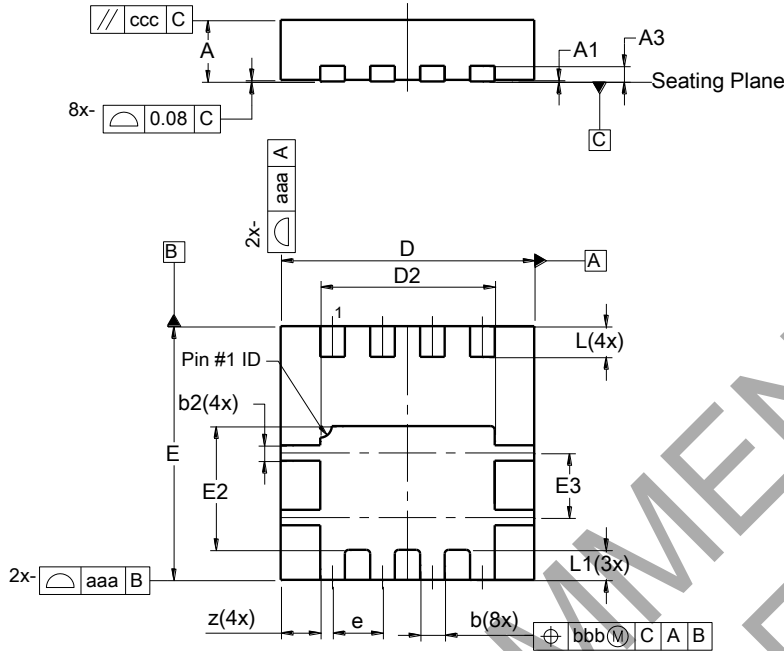
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

PowerDI3333-8

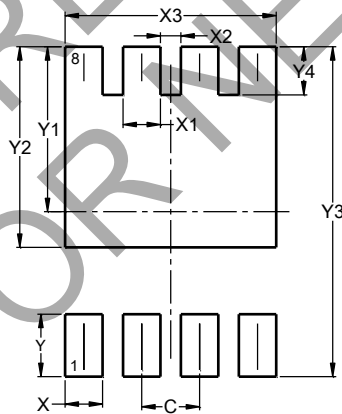


PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	-	-	0.203
b	0.27	0.37	0.32
b2	-	-	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
e	-	-	0.65
L	0.35	0.45	0.40
L1	-	-	0.39
z	-	-	0.515
aaa	0.25		
bbb	0.10		
ccc	0.10		
All Dimensions in 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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