Product Summary

BV_{DSS}	$R_{DS(on)}$ Max	I_D Max T_A = +25°C
30V	11mΩ @ V_{GS} = 10V	10.5A
	15mΩ @ V_{GS} = 4.5V	9.2A

Features and Benefits

- Low $R_{DS(on)}$ – Ensures On State Losses Are Minimized
- 100% Unclamped Inductive Switching, Test in Production – Ensures More Reliable And Robust End Application
- 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 DMG7430LFGQ 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/

Description and Applications

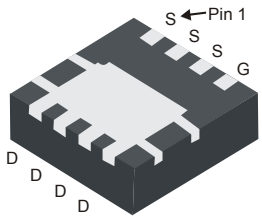
This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

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

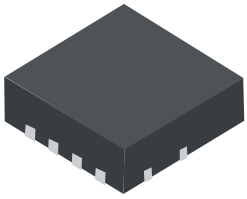
Mechanical Data

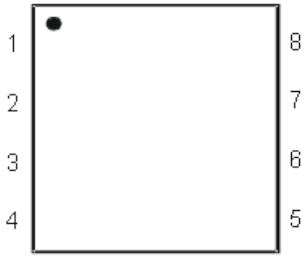
- Case: PowerDI®3333-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.072 grams (Approximate)

PowerDI3333-8

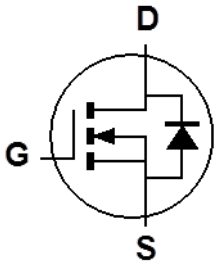


Bottom View


Top View



Top View



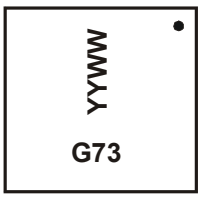
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMG7430LFGQ-7	PowerDI3333-8	2000/Tape & Reel
DMG7430LFGQ-13	PowerDI3333-8	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



G73 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 21 = 2021)
WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	10.5 8.5	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	14 11	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	90	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	3.0	A
Avalanche Current (Note 7) L = 0.1mH			I_{AR}	22	A
Repetitive Avalanche Energy (Note 7) L = 0.1mH			E_{AR}	24	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	Steady State	P_D	0.9	W
	t<10s		1.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	142	°C/W
	t<10s		78	
Total Power Dissipation (Note 6)	Steady State	P_D	2.2	W
	t<10s		3.5	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	59	°C/W
	t<10s		33	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	11	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. I_{AR} and E_{AR} ratings are based on low frequency and duty cycles to keep T_J = +25°C.

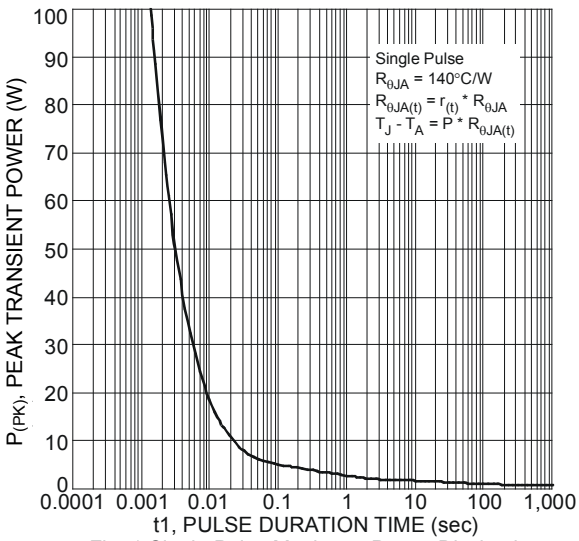

Fig. 1 Single Pulse Maximum Power Dissipation

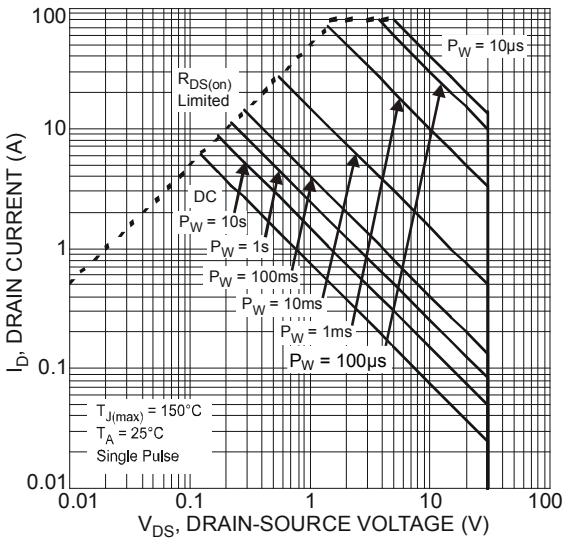

Fig. 2 SOA, Safe Operation Area

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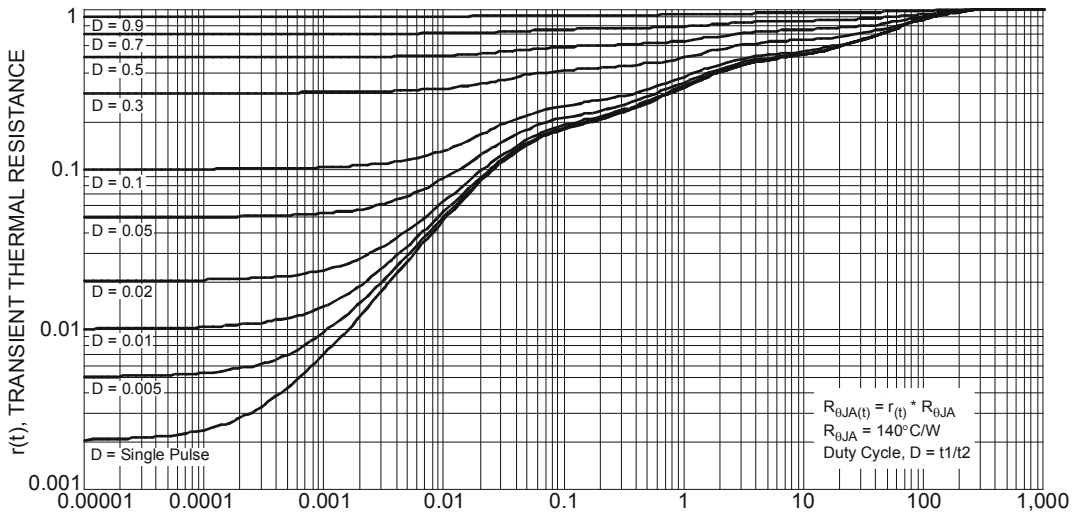

Fig. 3 Transient Thermal Resistance

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} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1.4	—	2.5	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	7	11	mΩ	V_{GS} = 10V, I_D = 20A
		—	11	15		V_{GS} = 4.5V, I_D = 20A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	74	—	S	V_{DS} = 5V, I_D = 20A
Diode Forward Voltage	V_{SD}	—	0.75	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1281	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	145	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	125	—	pF	
Gate Resistance	R_g	—	1.2	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	12.5	—	nC	V_{DS} = 15V, I_D = 12A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	26.7	—	nC	
Gate-Source Charge	Q_{gs}	—	3.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	4.4	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	5.2	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_L = 1.25Ω, R_G = 3Ω
Turn-On Rise Time	t_R	—	21.2	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	22.3	—	ns	
Turn-Off Fall Time	t_F	—	5.1	—	ns	
Reverse Recovery Time	t_{RR}	—	8.5	—	ns	I_F = 12A, di/dt = 500A/μs
Reverse Recovery Charge	Q_{RR}	—	7.0	—	nC	I_F = 12A, di/dt = 500A/μs

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

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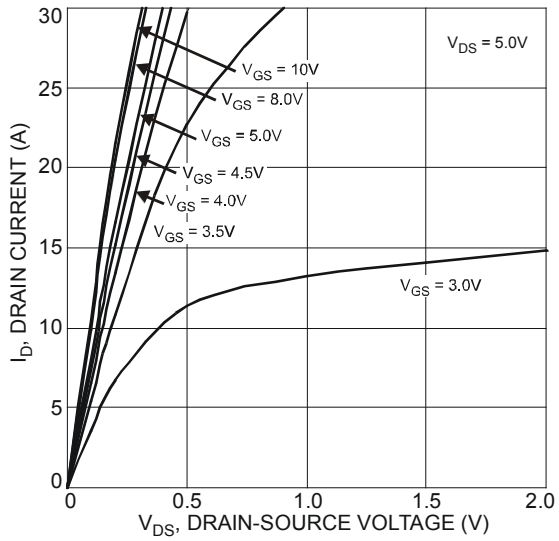

Fig.4 Typical Output Characteristic

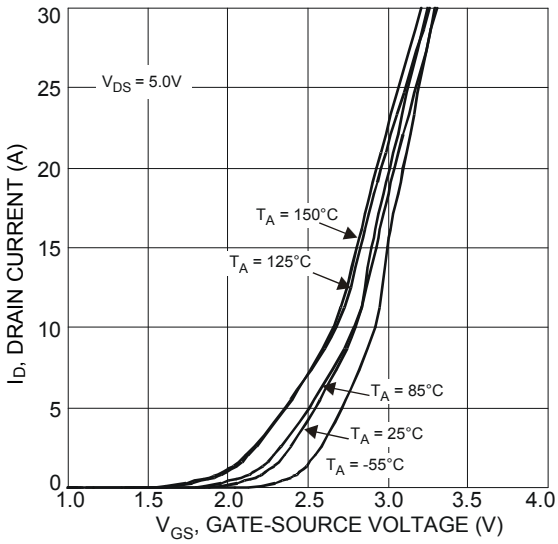

Fig. 5 Typical Transfer Characteristics

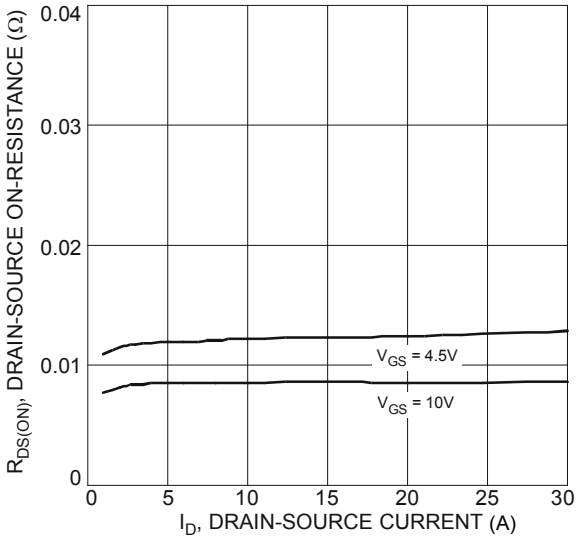

Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

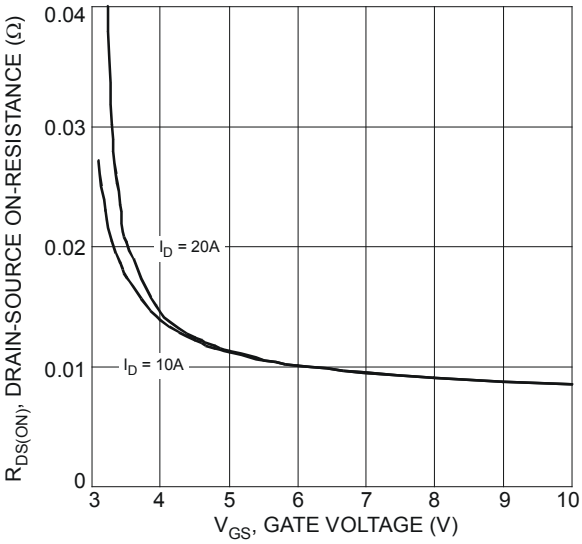

Fig. 7 Typical On-Resistance vs. Gate Voltage

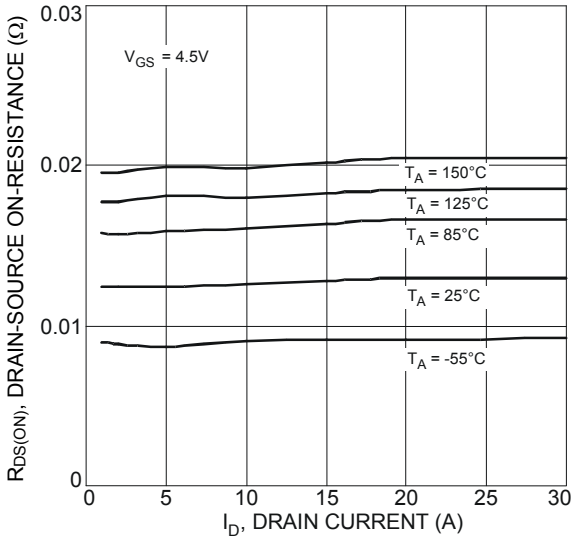

Fig. 8 Typical On-Resistance vs. Drain Current and Temperature

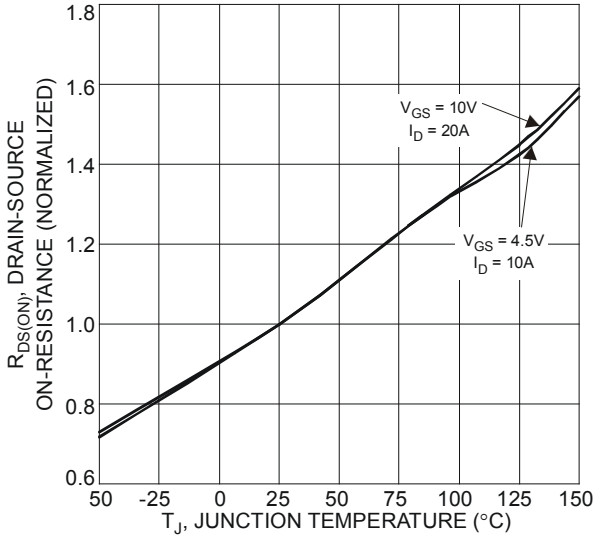

Fig. 9 On-Resistance Variation with Temperature

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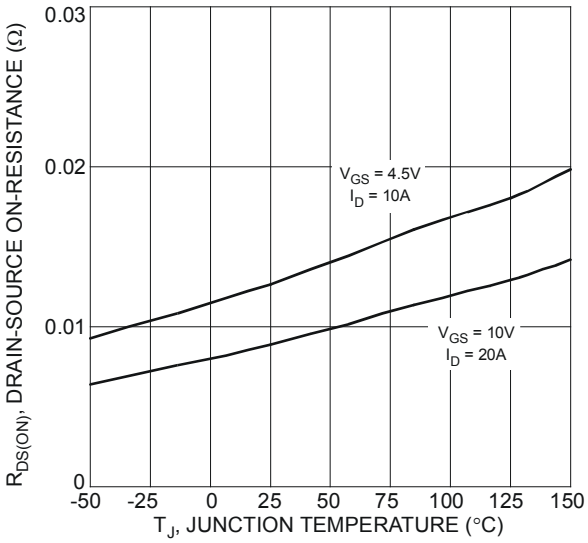

Fig. 10 On-Resistance Variation with Temperature

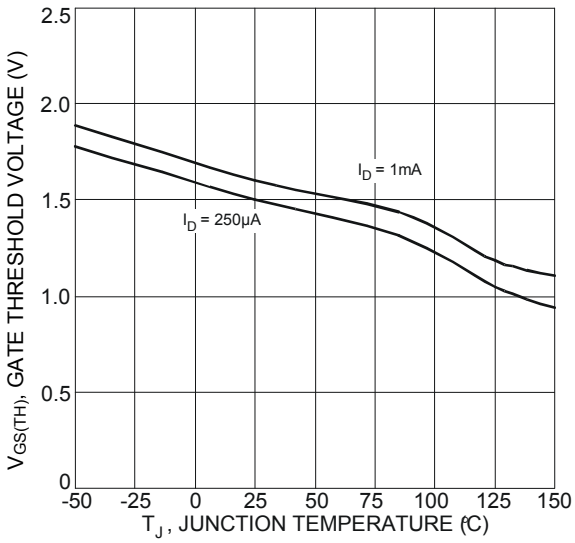

Fig. 11 Gate Threshold Variation vs. Junction Temperature

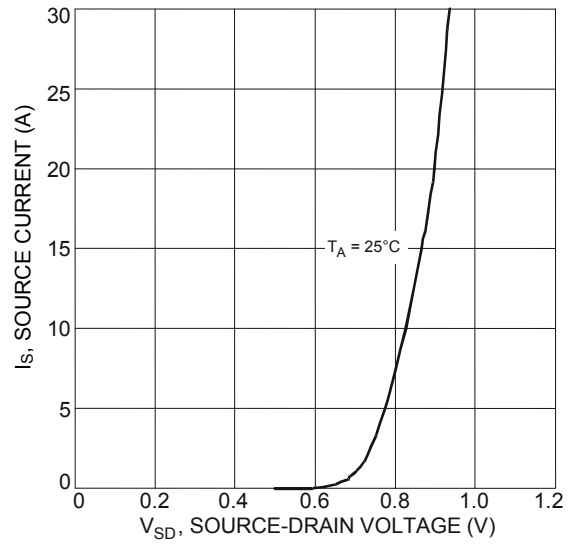

Fig.12 Diode Forward Voltage vs. Current

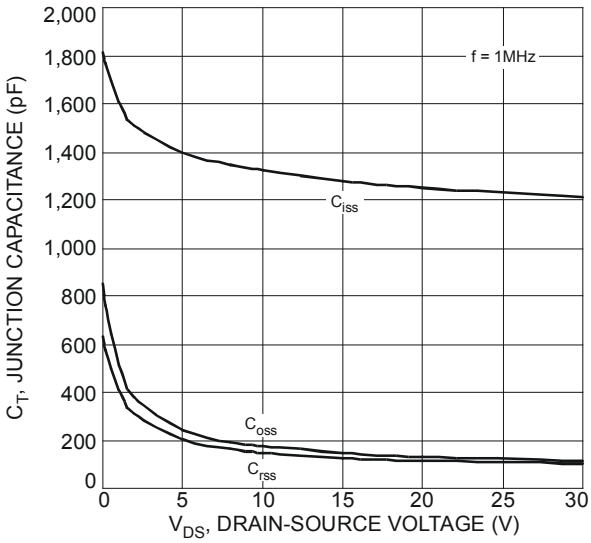

Fig. 13 Typical Junction Capacitance

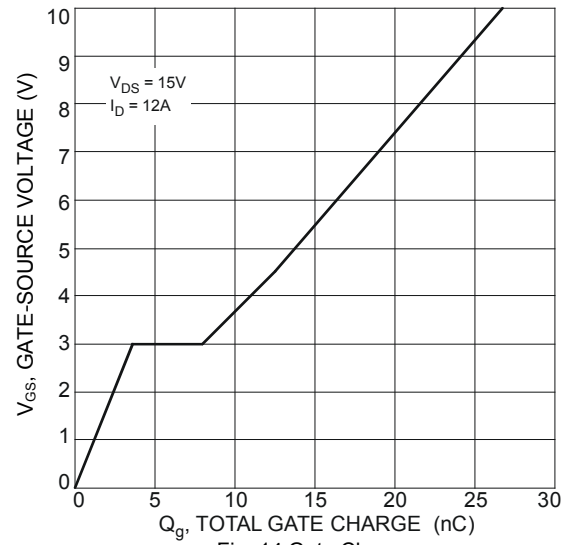

Fig. 14 Gate Charge

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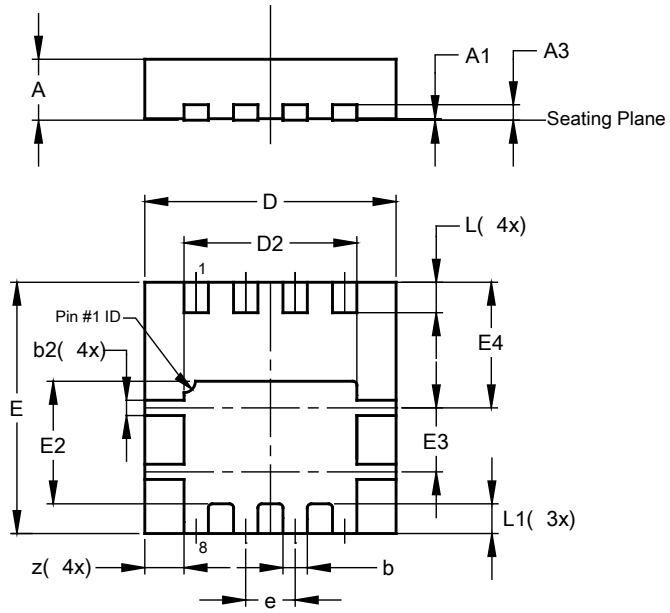
Package Outline Dimensions

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

PowerDI3333-8

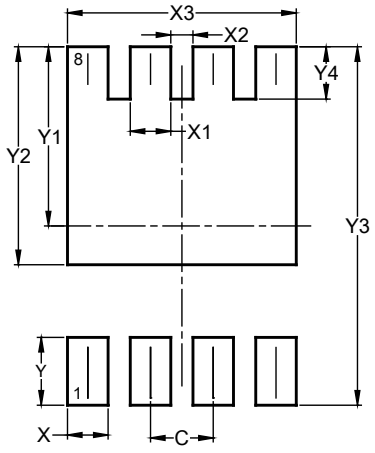


PowerDI3333-8			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	–	–	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	–	–	0.65
L	0.35	0.45	0.40
L1	–	–	0.39
z	–	–	0.515
All Dimensions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