

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ C$
30V	11m Ω @ $V_{GS} = 10V$	10.5A
	15m Ω @ $V_{GS} = 4.5V$	9.2A

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

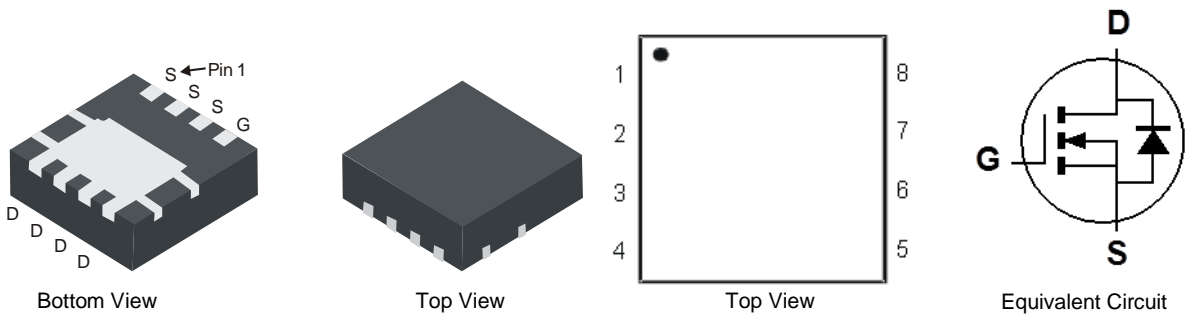
Features and Benefits

- 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)**
- **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 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[Ⓔ]
- Weight: 0.072 grams (Approximate)

PowerDI3333-8

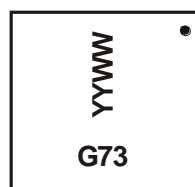


Ordering Information (Note 5)

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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 5. 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: 18 = 2018)
 WW = Week Code (01 to 53)

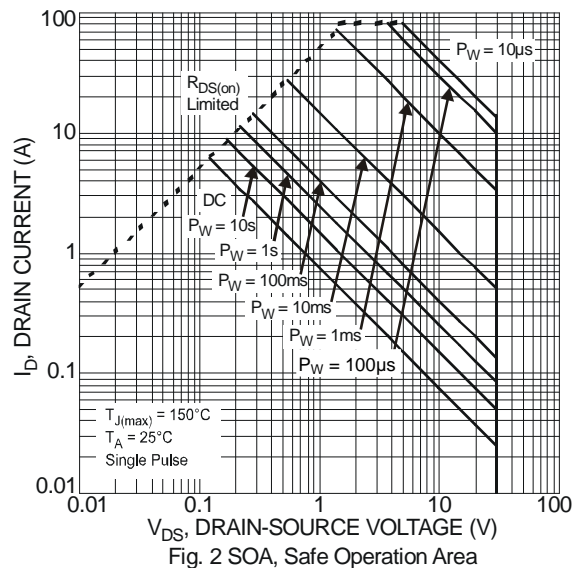
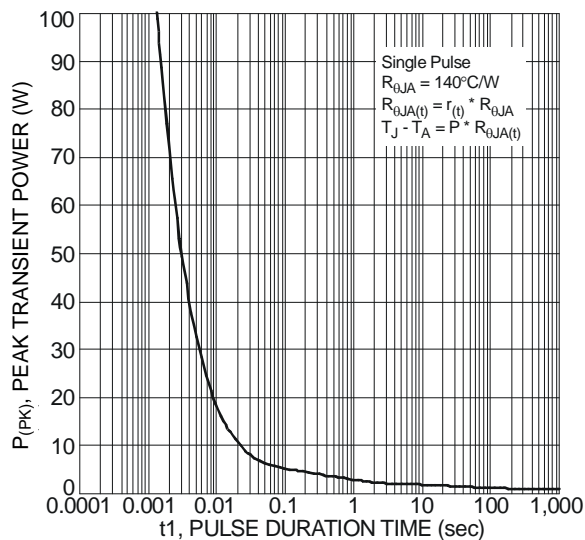
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

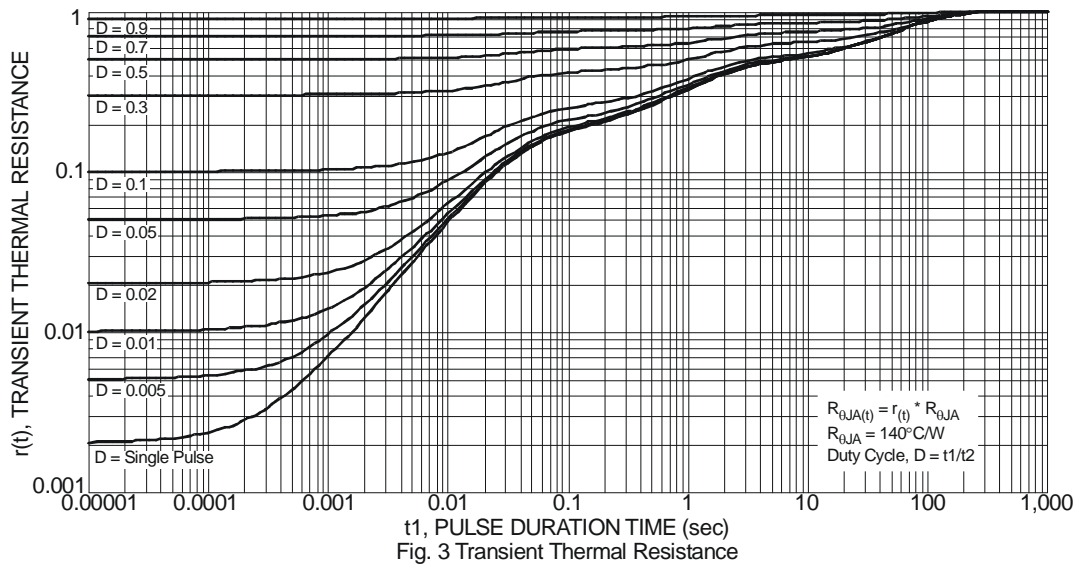
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	30	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current (Note 7) V _{GS} = 10V	Steady State	I _D	10.5 8.5	A
	t < 10s	I _D	14 11	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I _{DM}	90	A
Maximum Continuous Body Diode Forward Current (Note 7)		I _S	3.0	A
Avalanche Current (Note 8) L = 0.1mH		I _{AR}	22	A
Repetitive Avalanche Energy (Note 8) L = 0.1mH		E _{AR}	24	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)	Steady State	P _D	0.9	W
	t < 10s		1.5	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	142	°C/W
	t < 10s		78	
Total Power Dissipation (Note 7)	Steady State	P _D	2.2	W
	t < 10s		3.5	
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R _{θJA}	59	°C/W
	t < 10s		33	
Thermal Resistance, Junction to Case (Note 7)		R _{θJC}	11	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

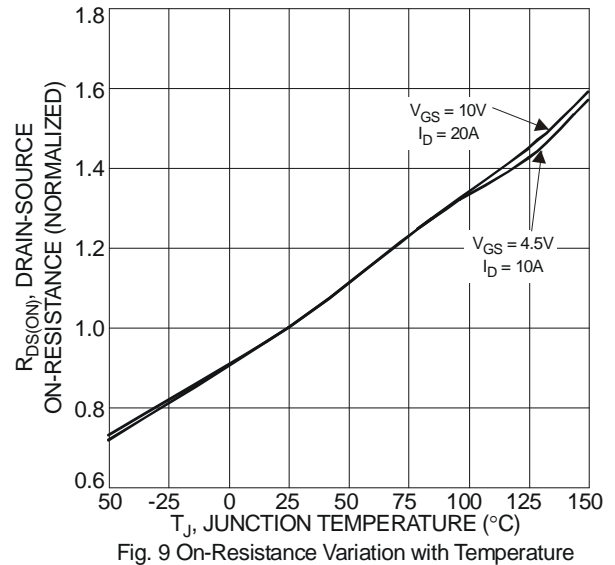
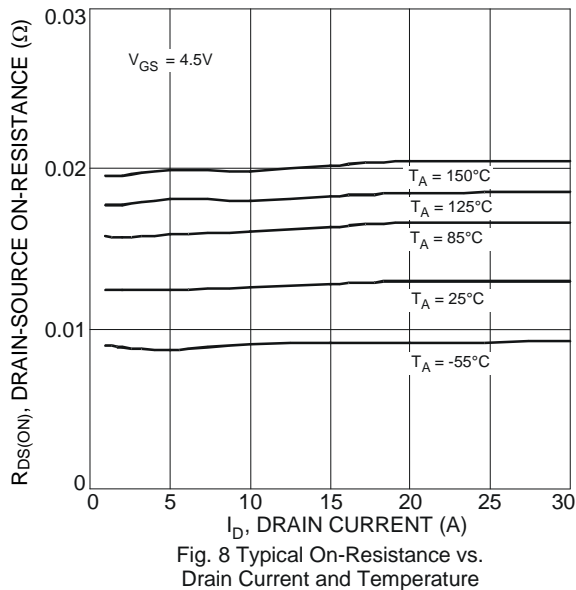
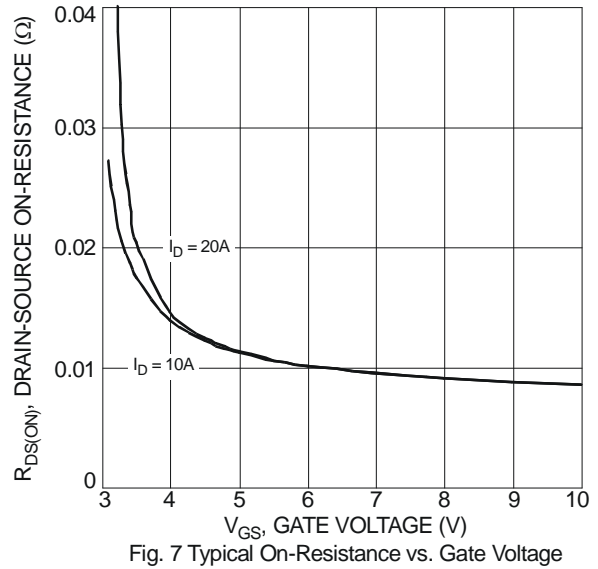
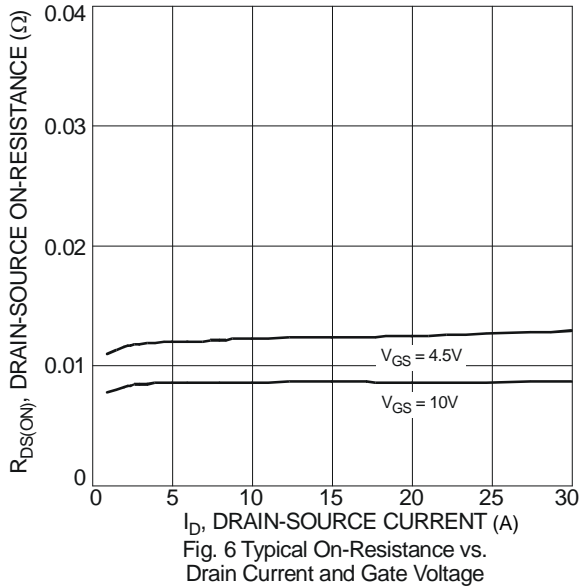
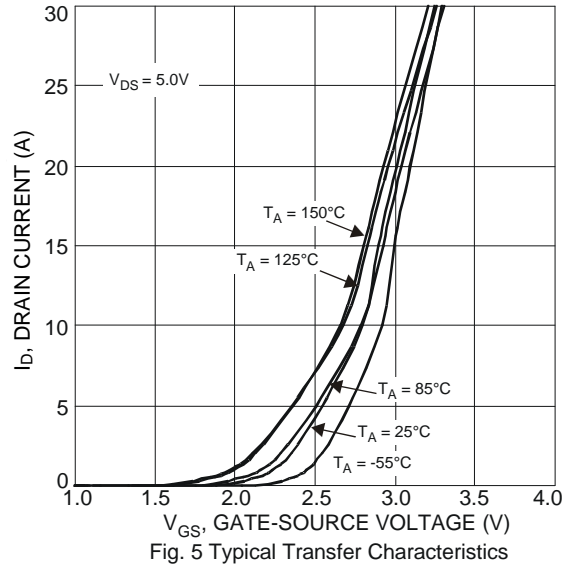
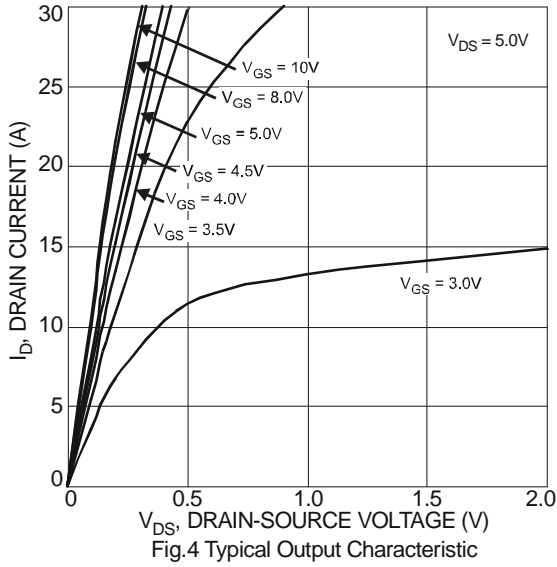
- Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 8. I_{AR} and E_{AR} ratings are based on low frequency and duty cycles to keep T_J = +25°C.




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}	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 9)						
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 10)						
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	
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	
Reverse Recovery Charge	Q _{RR}	-	7.0	-	nC	

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



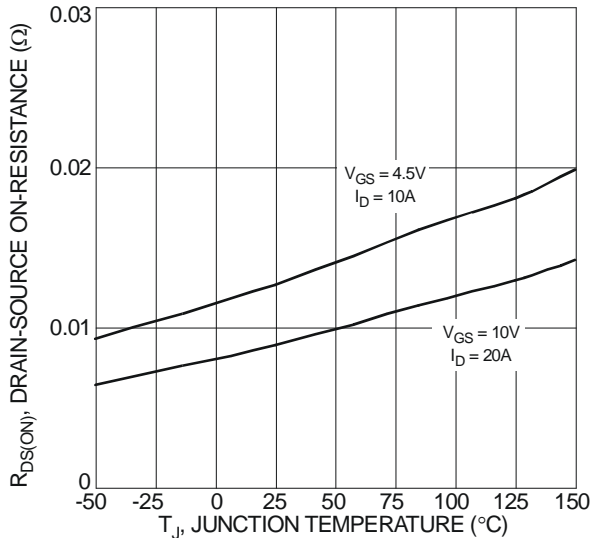


Fig. 10 On-Resistance Variation with Temperature

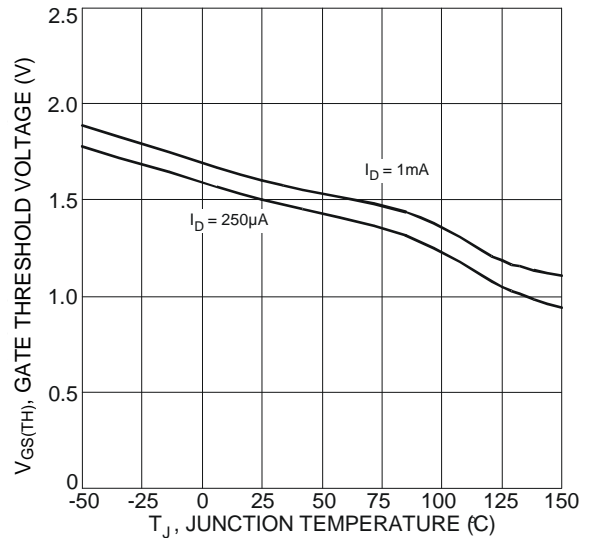


Fig. 11 Gate Threshold Variation vs. Junction Temperature

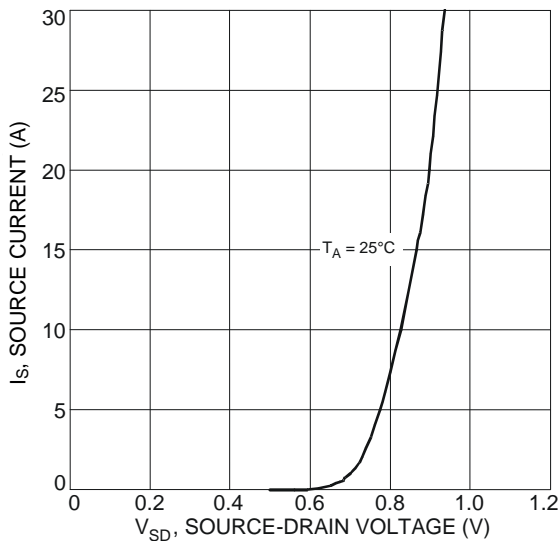


Fig.12 Diode Forward Voltage vs. Current

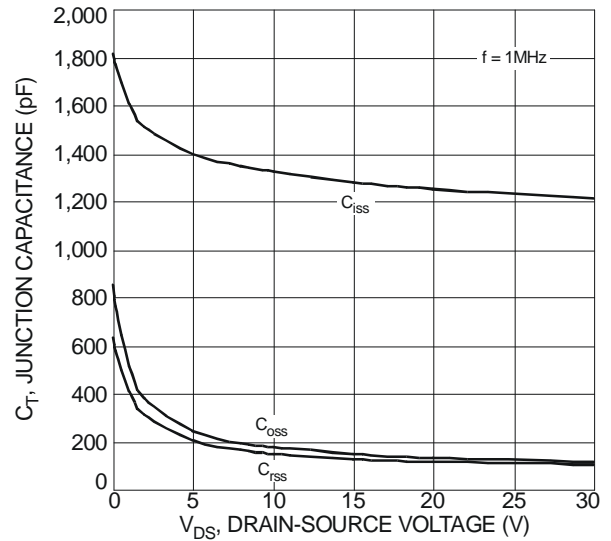


Fig. 13 Typical Junction Capacitance

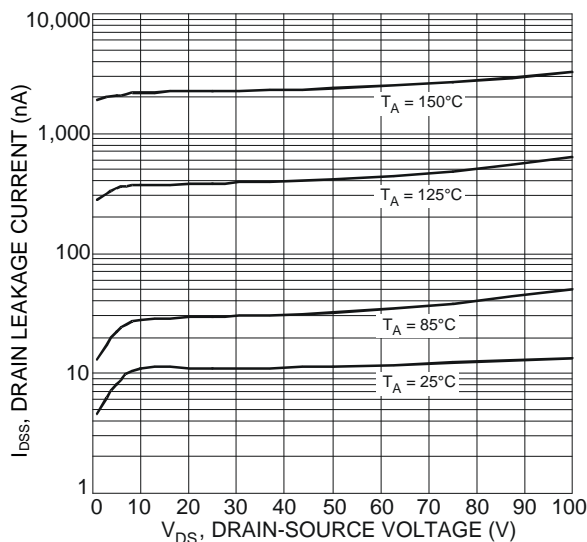


Fig. 14 Typical Drain-Source Leakage Current vs. Voltage

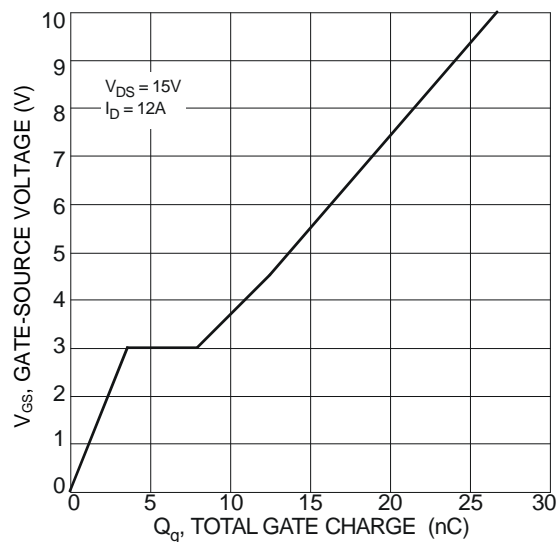
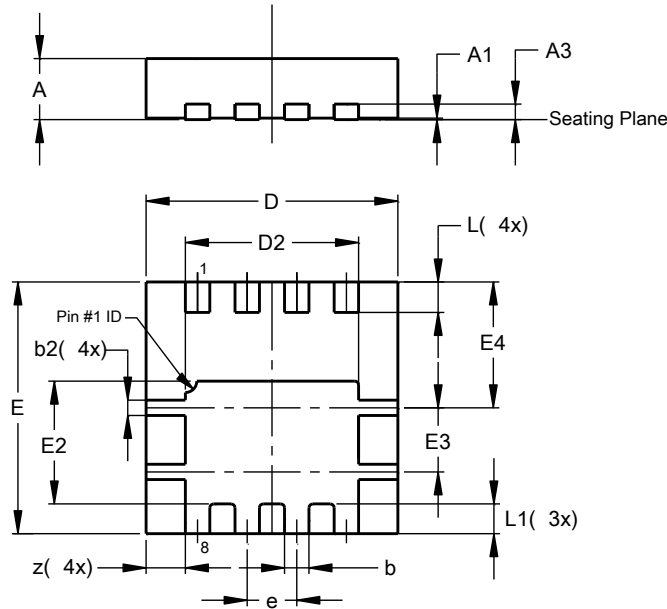


Fig. 15 Gate Charge

Package Outline Dimensions

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

PowerDI3333-8

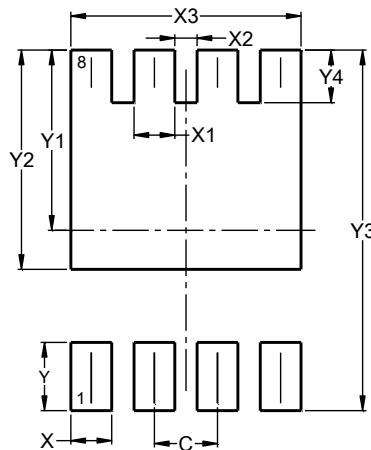


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Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	-	-	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	-	-	0.65
L	0.35	0.45	0.40
L1	-	-	0.39
z	-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

Suggested Pad Layout

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

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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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