

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_c = +25^\circ\text{C}$
30V	4.4mΩ @ $V_{GS} = 10\text{V}$	62A
	5.5mΩ @ $V_{GS} = 4.5\text{V}$	56A

Description

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

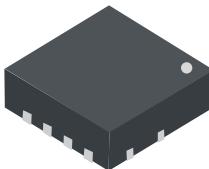
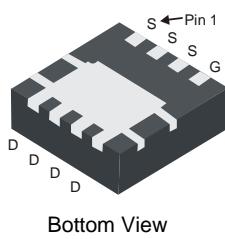
Features and Benefits

- Low $R_{DS(ON)}$ – Ensures on-state losses are minimized
- Small, form factor thermally efficient package enables higher density end products
- Occupies only 33% of the board area occupied by SO-8 enabling smaller end products
- 100% Unclamped Inductive Switch (UIS) test in production
- **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

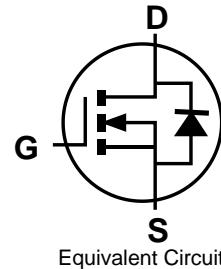
Mechanical Data

- 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 (E3)
- Weight: 0.072 grams (Approximate)

POWERDI®3333-8



Bottom View



Top View

Equivalent Circuit

Ordering Information (Note 4)

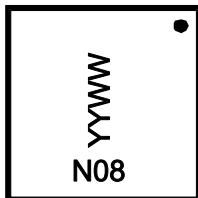
Part Number	Case	Packaging
DMN3008SFG-7	POWERDI®3333-8	2,000/Tape & Reel
DMN3008SFG-13	POWERDI®3333-8	3,000/Tape & Reel

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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

POWERDI®3333-8



N08= Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 15 = 2015)
WW = Week Code (01 ~ 53)

POWERDI is a registered trademark of Diodes Incorporated.

DMN3008SFG
Document number: DS36748 Rev. 6 - 2

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Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	17.6 14.1	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	23.0 18.4	A
	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	I_D	62 50	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	80	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	2	A
Avalanche Current, $L = 0.1\text{mH}$			I_{AS}	45	A
Avalanche Energy, $L = 0.1\text{mH}$			E_{AS}	101	mJ

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P_D	0.9	W
		0.6	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	134	$^\circ\text{C/W}$
		79	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	P_D	2.1	W
		1.3	
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	58	$^\circ\text{C/W}$
		34	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	4.8	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	10	μA	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	2.3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	3.9	4.4	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 13.5\text{A}$
		—	4.6	5.5		$V_{GS} = 4.5\text{V}, I_D = 13.5\text{A}$
Diode Forward Voltage	V_{SD}	—	0.75	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	3.690	—	pF	$V_{DS} = 10\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	530	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	459	—	pF	
Gate resistance	R_g	—	0.9	—	Ω	
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	41	—	nC	$V_{DS} = 24\text{V}, I_D = 27\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	86	—	nC	
Gate-Source Charge	Q_{gs}	—	9.2	—	nC	
Gate-Drain Charge	Q_{gd}	—	18.6	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	5.7	—	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 1.11\Omega, R_G = 4.7\Omega, I_D = 13.5\text{A}$
Turn-On Rise Time	t_r	—	14.0	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	63.7	—	ns	
Turn-Off Fall Time	t_f	—	28.4	—	ns	
Reverse Recovery Time	t_{rr}	—	19.3	—	ns	$I_F = 13.5\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}	—	10.7	—	nC	

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

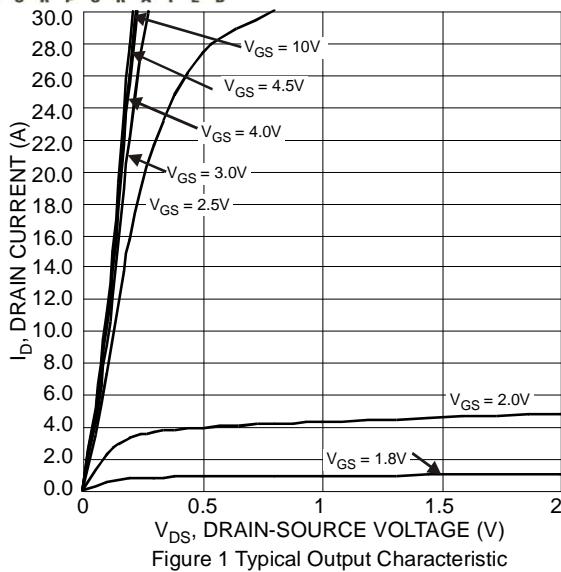


Figure 1 Typical Output Characteristic

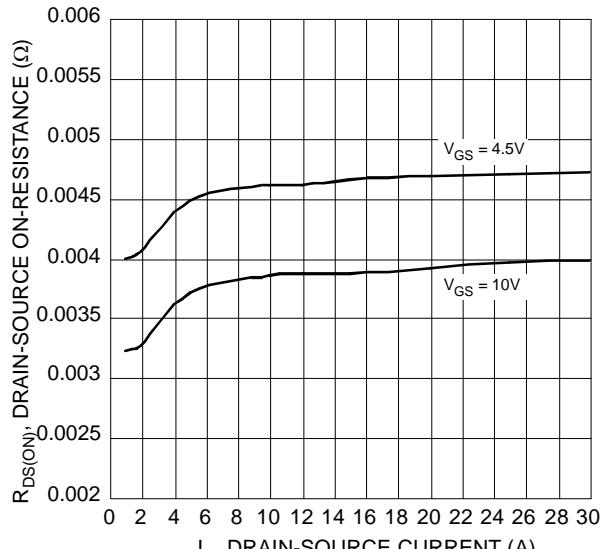


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

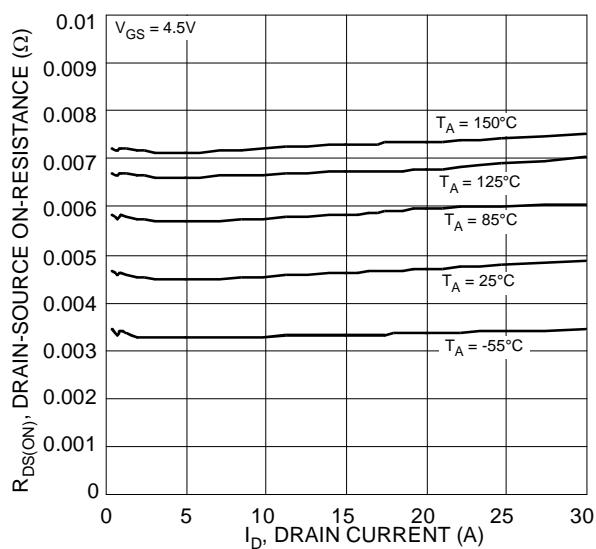


Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

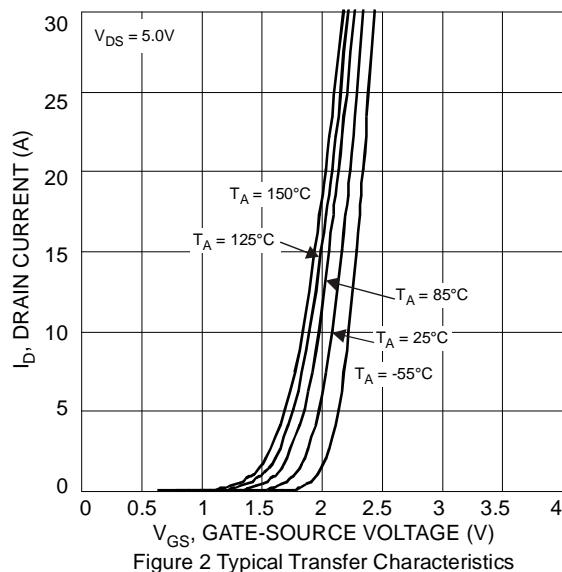


Figure 2 Typical Transfer Characteristics

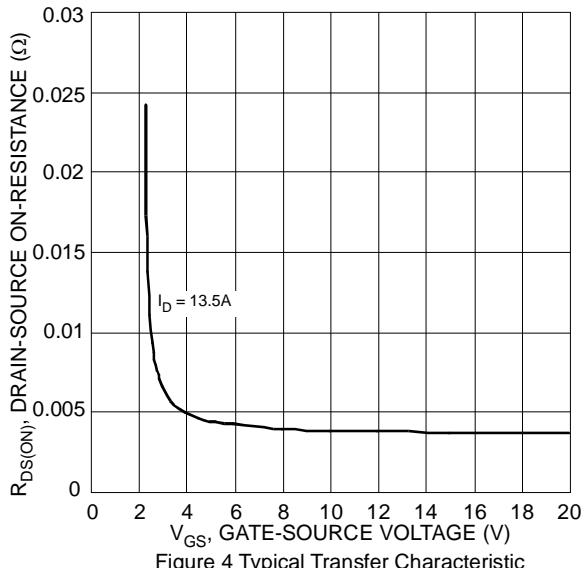


Figure 4 Typical Transfer Characteristic

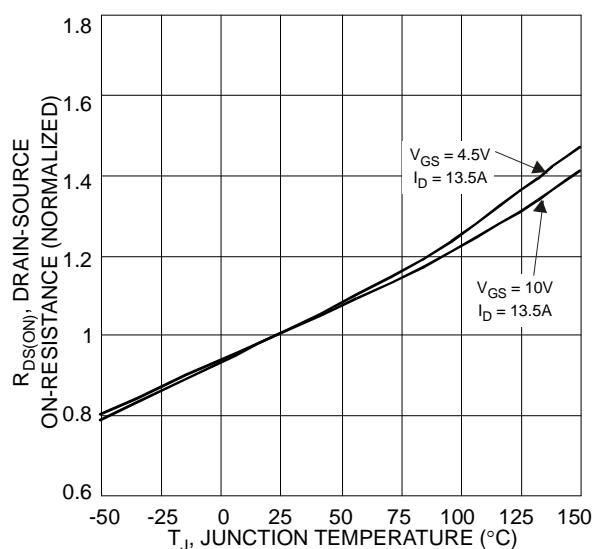


Figure 6 On-Resistance Variation with Temperature

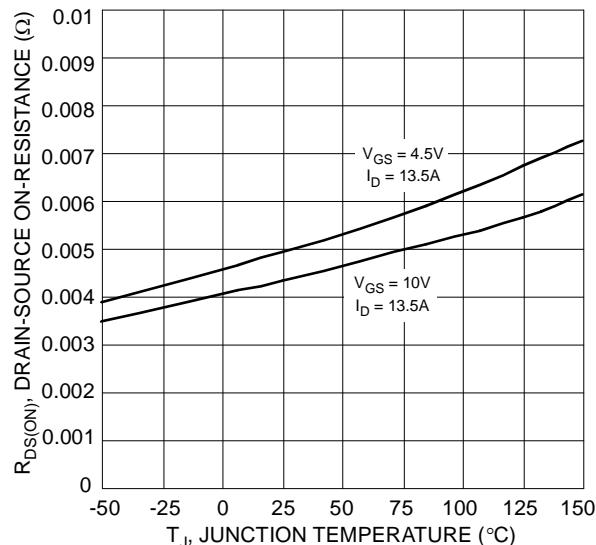


Figure 7 On-Resistance Variation with Temperature

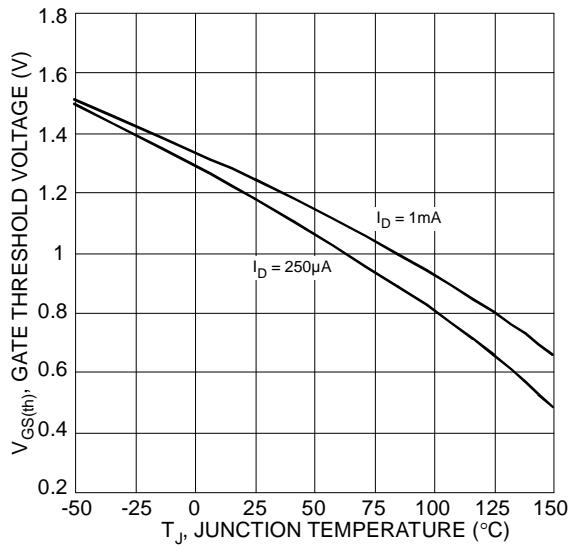


Figure 8 Gate Threshold Variation vs. Ambient Temperature

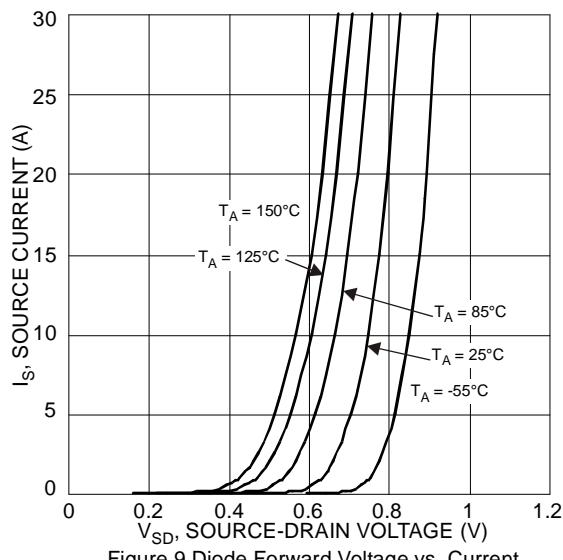


Figure 9 Diode Forward Voltage vs. Current

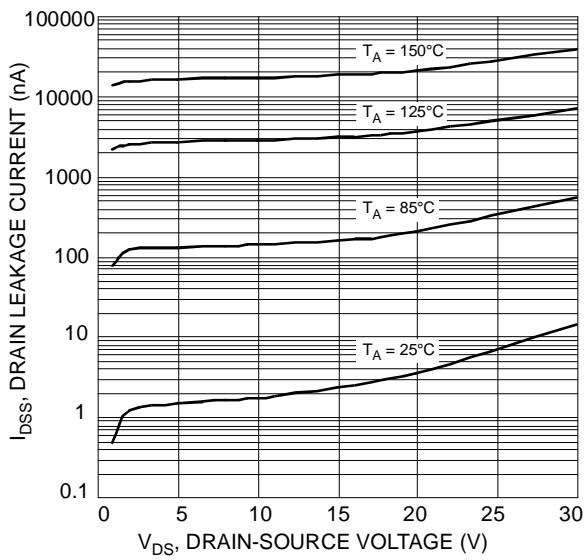


Figure 10 Typical Drain-Source Leakage Current vs. Voltage

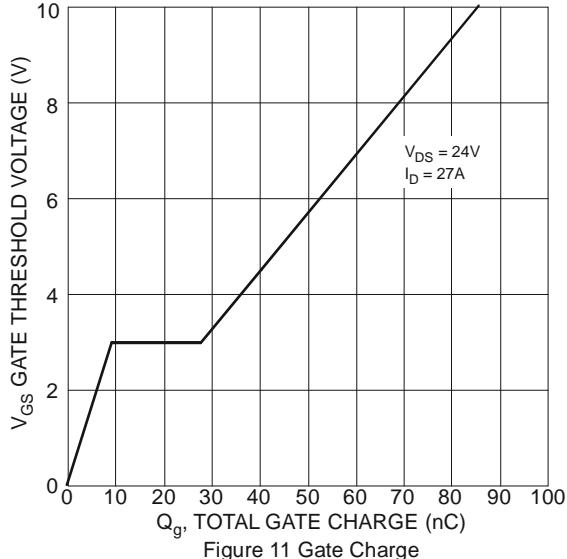
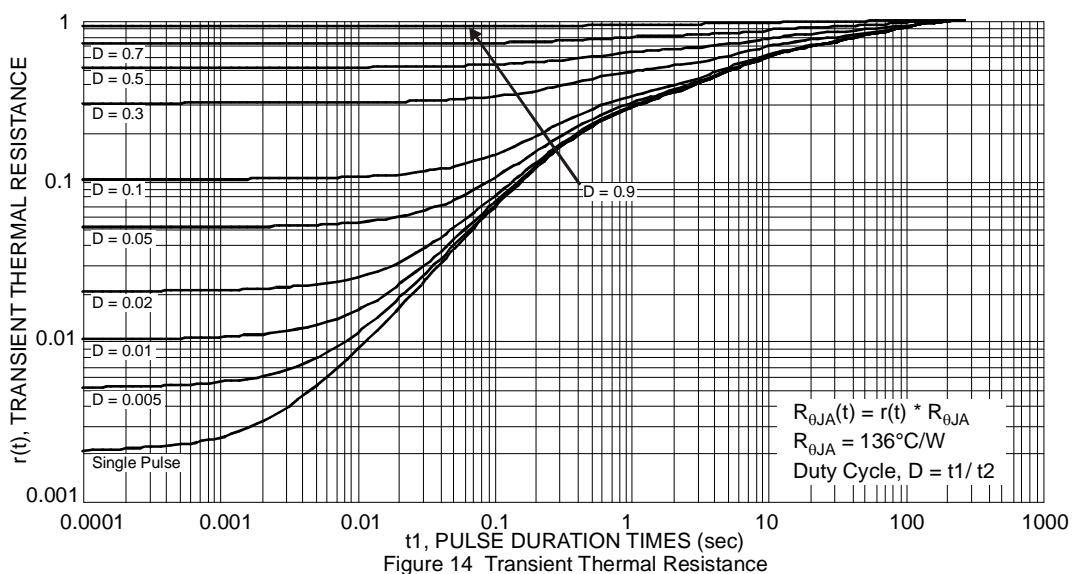
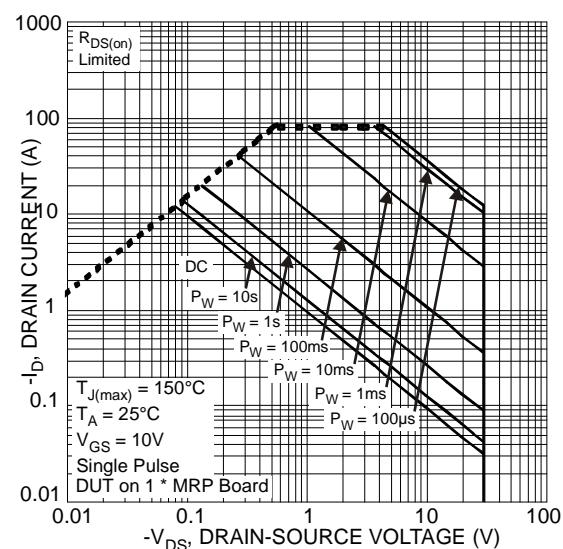
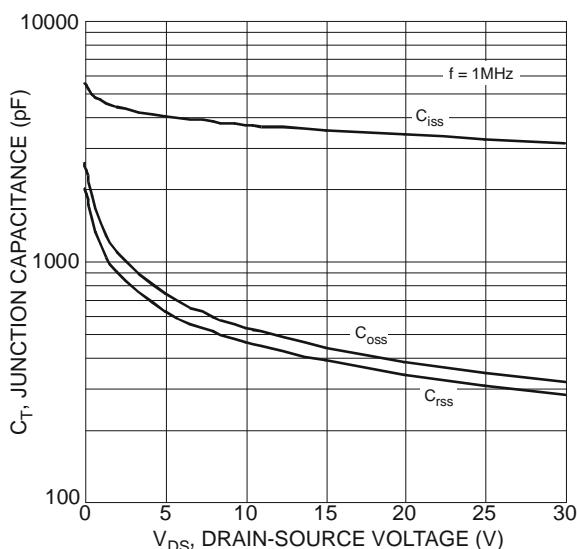
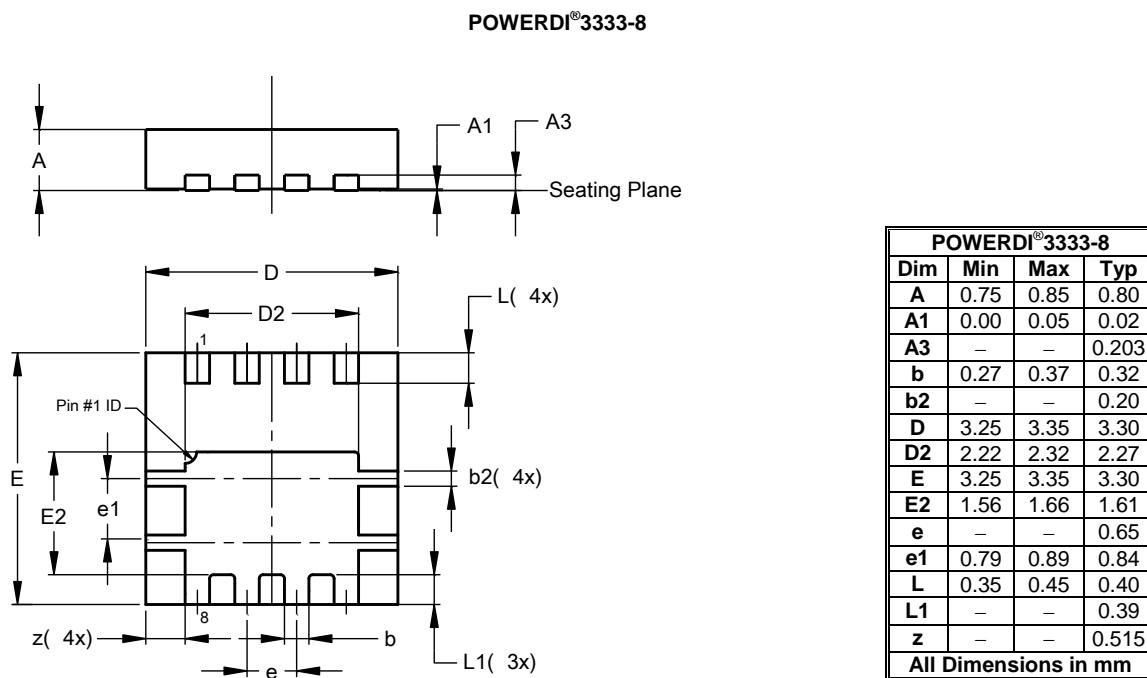


Figure 11 Gate Charge



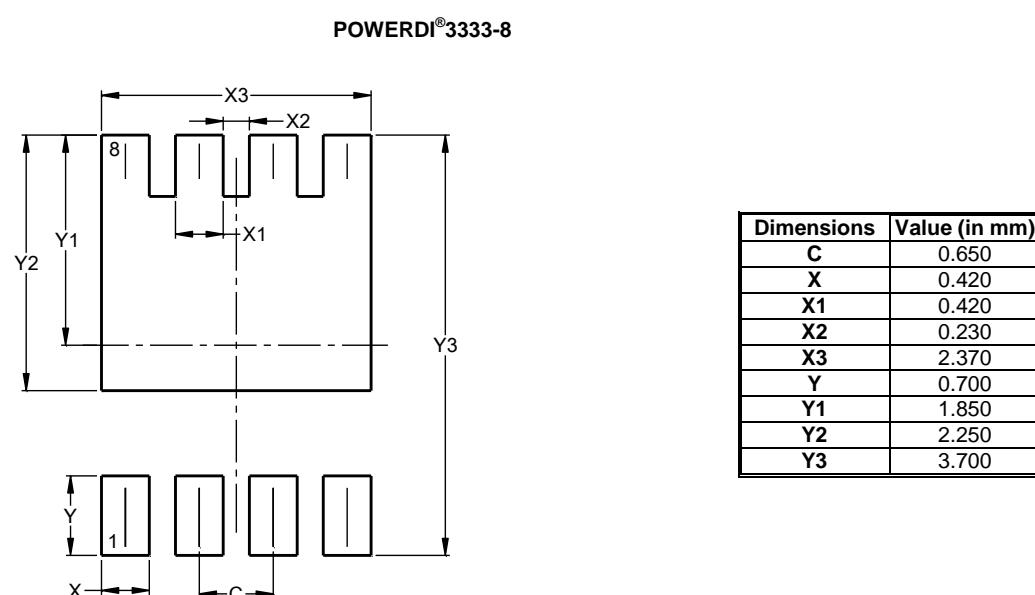
Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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