

Product Summary

BV _{DSS}	R _{DSON} Max	I _D Max T _C = +25°C
-12V	11.7mΩ @ V _{GS} = -4.5V	-19A
	18.6mΩ @ V _{GS} = -2.5V	-15A

Description

This MOSFET is designed to minimize the on-state resistance (R_{DSON}) yet maintain superior switching performance, making it ideal for high efficiency power management applications. It is qualified to AEC-Q101, supported by a PPAP.

Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

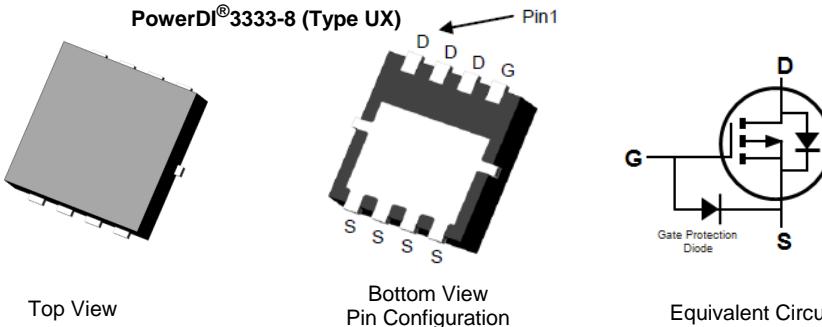
Features and Benefits

- Low R_{DSON} – 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
- ESD Protected Up to 3kV
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The DMP1011LFVQ 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

- 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 ④3
- Weight: 0.072 grams (Approximate)



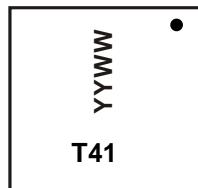
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP1011LFVQ-7	PowerDI®3333-8 (Type UX)	2,000/Tape & Reel
DMP1011LFVQ-13	PowerDI®3333-8 (Type UX)	3,000/Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



T41 = Product Type Marking Code

YYWW = Date Code Marking

YY = Last Two Digits of Year (ex: 21 for 2021)

WW = Week Code 01 to 53

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-12	V
Gate-Source Voltage			V_{GSS}	-6	V
Continuous Drain Current (Note 6) $V_{GS} = 4.5\text{V}$	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-13 -10	A
	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	I_D	-19 -15	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	3	A
Pulsed Drain Current (380 μs Pulse, Duty Cycle = 1%)			I_{DM}	70	A
Avalanche Current (Note 7) $L = 0.3\text{mH}$			I_{AS}	24	A
Avalanche Energy (Note 7) $L = 0.3\text{mH}$			E_{AS}	86	mJ

Thermal Characteristics

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P_D	1.05	W
Thermal Resistance, Junction to Ambient (Note 5)		Steady State	$R_{\theta JA}$	118	°C/W
		$t < 10\text{s}$		83.5	
Total Power Dissipation (Note 6)			P_D	2.16	W
Thermal Resistance, Junction to Ambient (Note 6)		Steady State	$R_{\theta JA}$	57	°C/W
		$t < 10\text{s}$		40.3	
Thermal Resistance, Junction to Case (Note 6)			$R_{\theta JC}$	11.7	
Operating and Storage Temperature Range			T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-12	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	-1	μA	$V_{DS} = -9.6\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	-100	nA	$V_{GS} = -6\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.6	—	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	9.8	11.7	$\text{m}\Omega$	$V_{GS} = -4.5\text{V}, I_D = -12\text{A}$
		—	14.6	18.6		$V_{GS} = -2.5\text{V}, I_D = -9\text{A}$
Diode Forward Voltage	V_{SD}	—	-0.8	-1.0	V	$V_{GS} = 0\text{V}, I_S = -16\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	913	—	pF	$V_{DS} = -6\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	458	—		
Reverse Transfer Capacitance	C_{rss}	—	53	—		
Gate Resistance	R_g	—	1.85	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ($V_{GS} = -6\text{V}$)	Q_g	—	9.5	—	nC	$V_{DS} = -6\text{V}, I_D = -12\text{A}$
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	—	7.1	—		
Gate-Source Charge	Q_{gs}	—	1.4	—		
Gate-Drain Charge	Q_{gd}	—	1.1	—		
Turn-On Delay Time	$t_{D(ON)}$	—	6.3	—	ns	$V_{DS} = -6\text{V}, V_{GS} = -4.5\text{V}, R_L = 1\Omega, R_g = 4.7\Omega, I_D = -12\text{A}$
Turn-On Rise Time	t_R	—	2.6	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	14.4	—		
Turn-Off Fall Time	t_F	—	3.9	—		
Body Diode Reverse Recovery Time	t_{RR}	—	13.5	—	ns	$I_F = -12\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	Q_{RR}	—	2.5	—	nC	$I_F = -12\text{A}, dI/dt = 100\text{A}/\mu\text{s}$

Notes:

5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
7. IAS and EAS ratings are based on low frequency and duty cycles to keep $T_J = +25^\circ\text{C}$.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

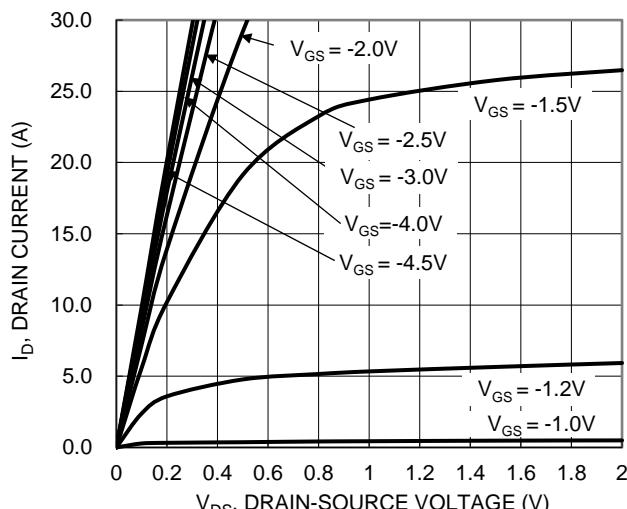


Figure 1. Typical Output Characteristic

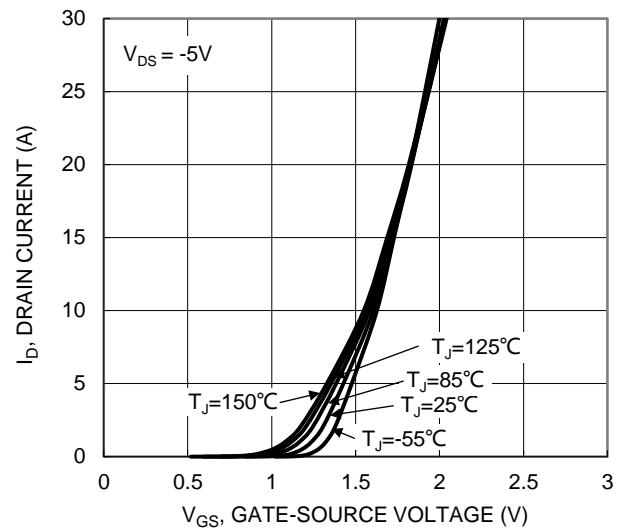


Figure 2. Typical Transfer Characteristic

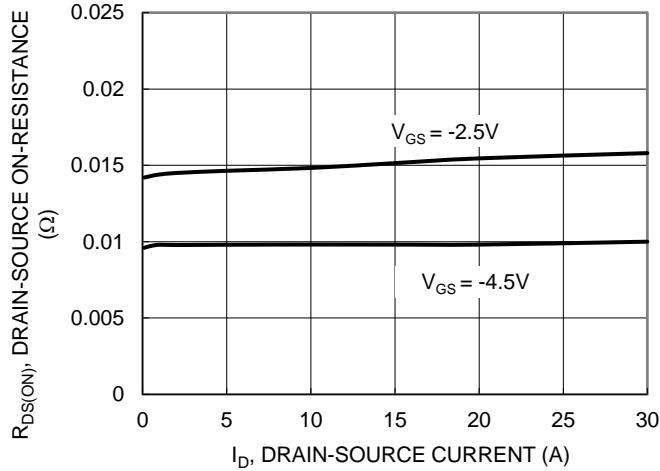


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

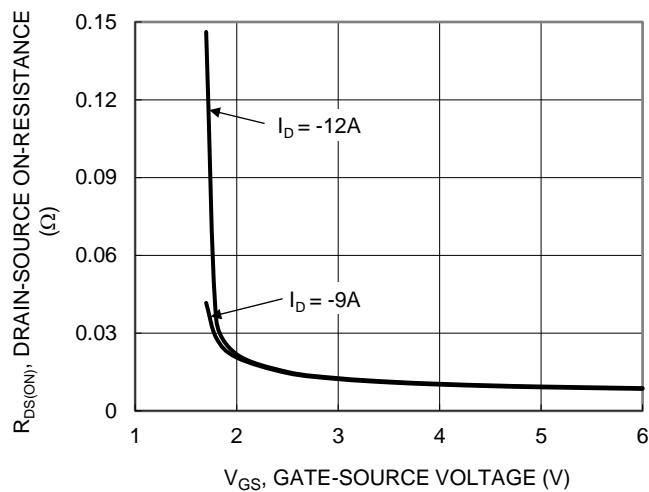


Figure 4. Typical Transfer Characteristic

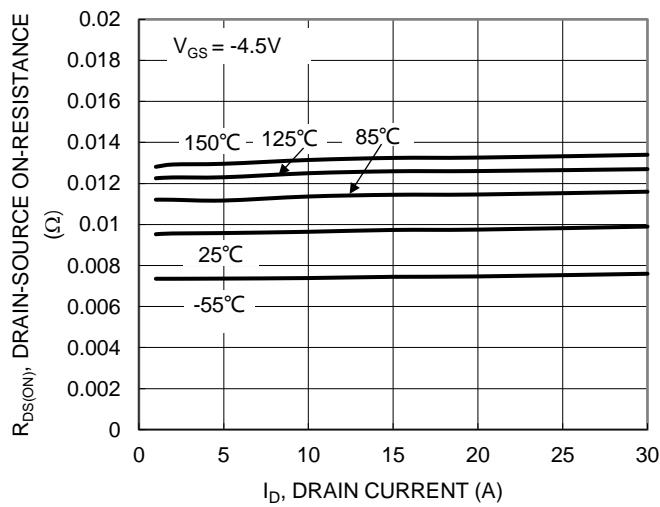


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

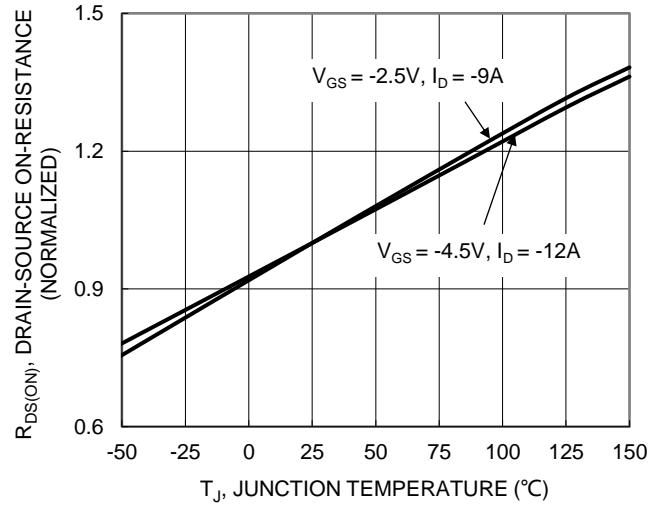


Figure 6. On-Resistance Variation with Temperature

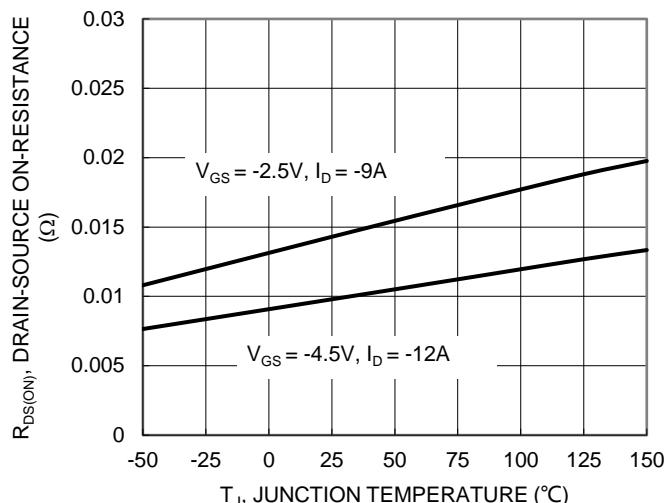


Figure 7. On-Resistance Variation with Temperature

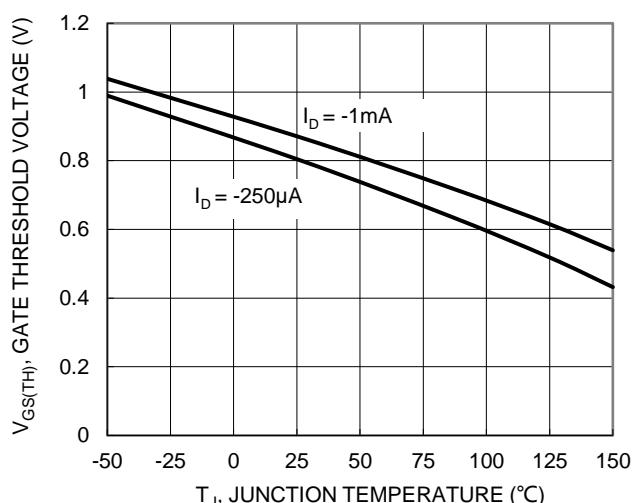


Figure 8. Gate Threshold Variation vs. Junction Temperature

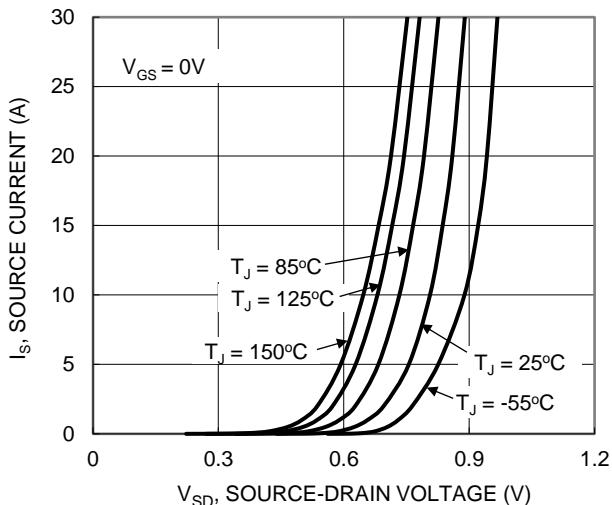


Figure 9. Diode Forward Voltage vs. Current

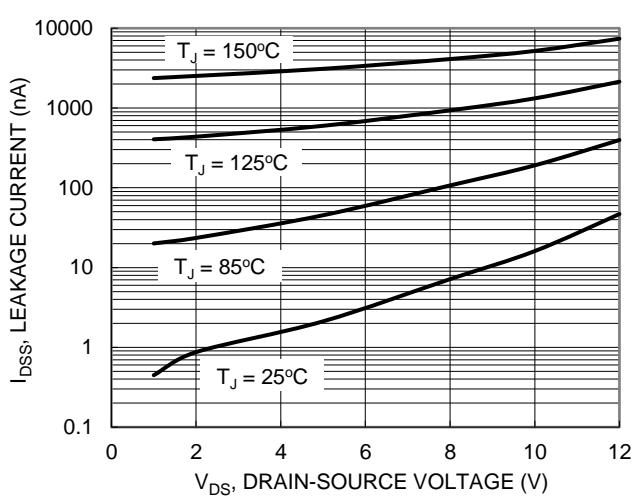


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

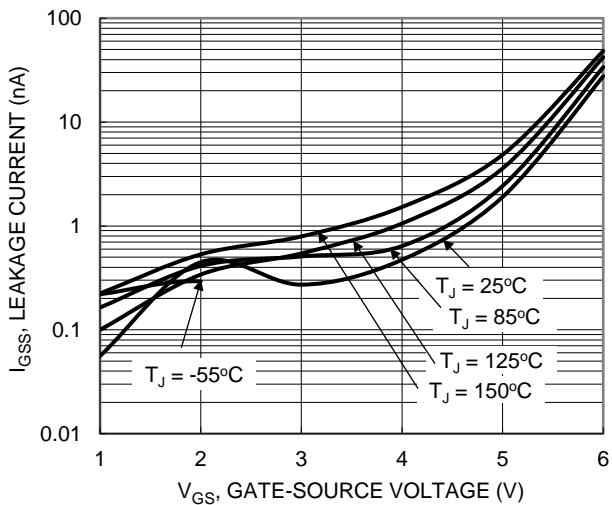


Figure 11. Gate-Source Leakage Current vs. Voltage

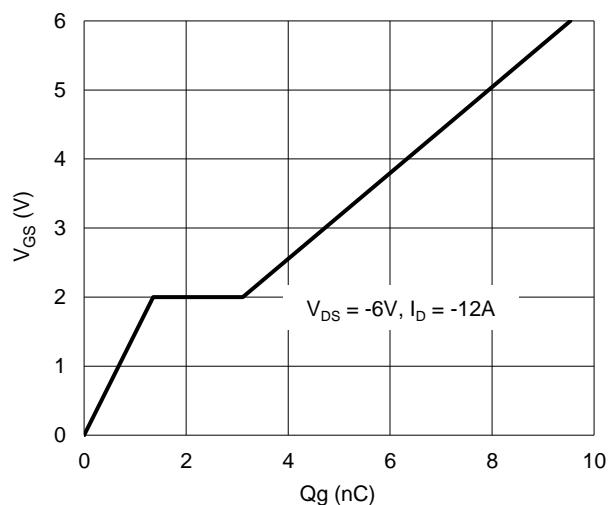
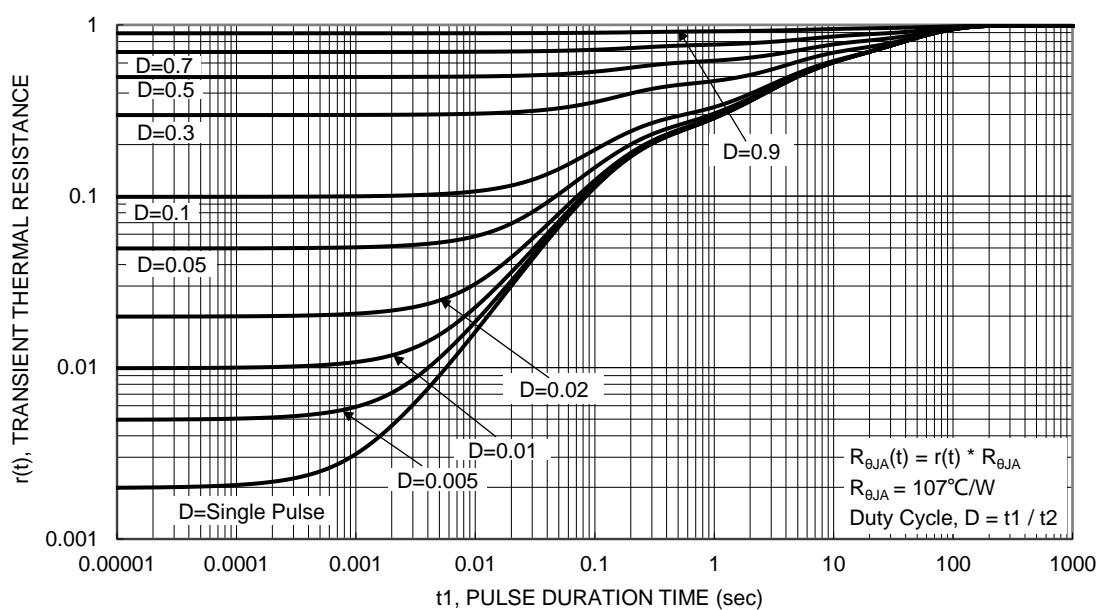
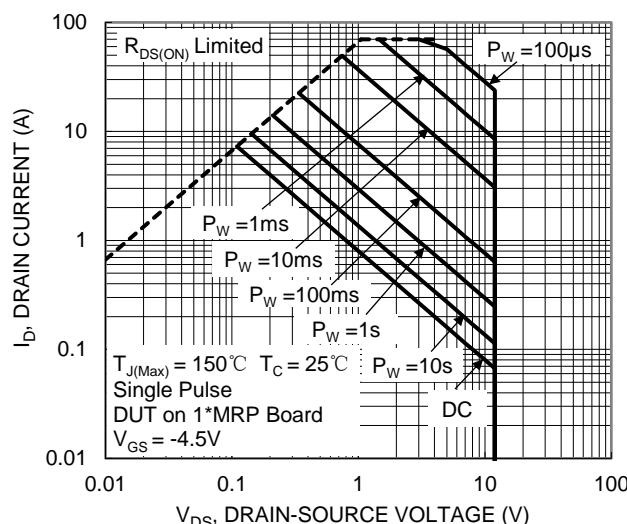


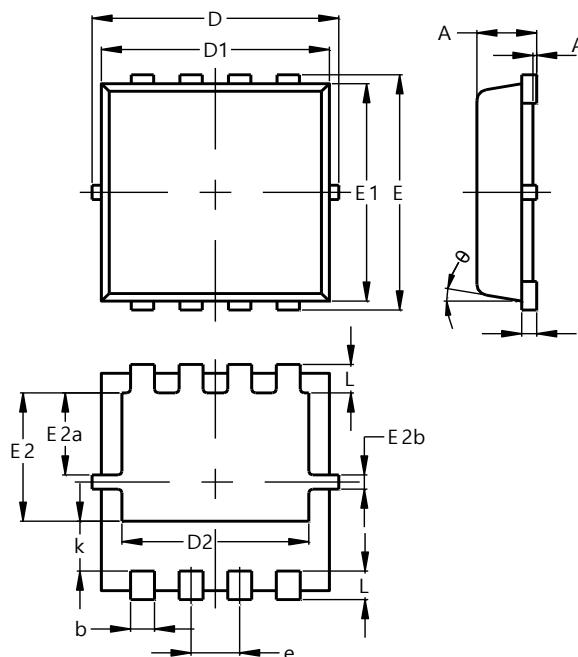
Figure 12. Gate Charge



Package Outline Dimensions

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

PowerDI®3333-8 (Type UX)



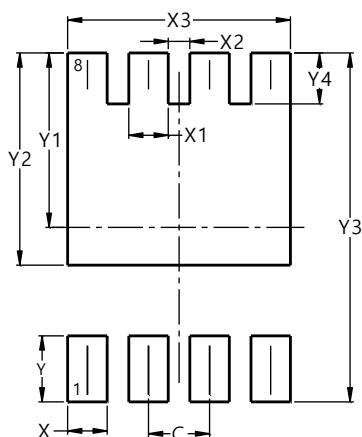
PowerDI3333-8 (Type UX)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	--
b	0.25	0.40	0.32
c	0.10	0.25	0.15
D	3.20	3.40	3.30
D1	2.95	3.15	3.05
D2	2.30	2.70	2.50
E	3.20	3.40	3.30
E1	2.95	3.15	3.05
E2	1.60	2.00	1.80
E2a	0.95	1.35	1.15
E2b	0.10	0.30	0.20
e	0.65 BSC		
k	0.50	0.90	0.70
L	0.30	0.50	0.40
θ	0°	12°	10°

All Dimensions in mm

Suggested Pad Layout

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

PowerDI®3333-8 (Type UX)



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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