

Product Summary

BV_{DSS}	R_{DSON} max	I_D max T_A = +25°C
-30V	10mΩ @ V _{GS} = -10V	-11.5A
	18mΩ @ V _{GS} = -4.5V	-8.7A

Description

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

Applications

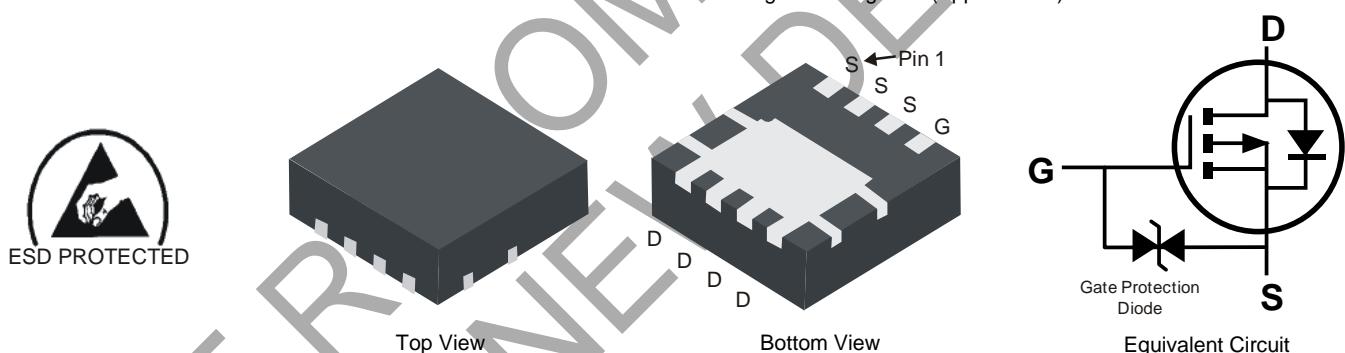
- Backlighting
- Power Management Functions
- DC-DC Converters

Features and Benefits

- Low R_{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 Gate
- **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**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMP3017SFGQ](#))**

Mechanical Data

- Case: PowerDI3333-8
- 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)



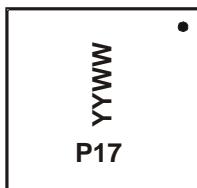
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3017SFG-7	PowerDI3333-8	2,000/Tape & Reel
DMP3017SFG-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) 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



P17 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 17 = 2017)
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}	-30	V
Gate-Source Voltage			V_{GSS}	± 25	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	-11.5 -9.4	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-15.2 -12.1	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	-3.0	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)			I_{DM}	-80	A
Avalanche Current (Note 7) $L = 1\text{mH}$			I_{AR}	-14	A
Repetitive Avalanche Energy (Note 7) $L = 1\text{mH}$			E_{AR}	104	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	P_D	0.94	W
	$T_A = +70^\circ\text{C}$		0.6	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	137	$^\circ\text{C/W}$
	$t < 10\text{s}$		82	
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	P_D	2.2	W
	$T_A = +70^\circ\text{C}$		1.3	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	60	$^\circ\text{C/W}$
	$t < 10\text{s}$		36	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	3.0	$^\circ\text{C/W}$
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 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	$\text{V}_{\text{DS}} = -24\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$\text{V}_{\text{GS}} = \pm 25\text{V}$, $\text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{TH})}$	-1.0	—	-3.0	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}$, $\text{I}_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	—	8.5	10	$\text{m}\Omega$	$\text{V}_{\text{GS}} = -10\text{V}$, $\text{I}_D = -11.5\text{A}$
		—	15	18		$\text{V}_{\text{GS}} = -4.5\text{V}$, $\text{I}_D = -8.5\text{A}$
Forward Transfer Admittance	$ \text{Y}_{\text{fs}} $	—	24	—	S	$\text{V}_{\text{DS}} = -5\text{V}$, $\text{I}_D = -11.5\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	2246	—	pF	$\text{V}_{\text{DS}} = -15\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	352	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	294	—	pF	$\text{V}_{\text{DS}} = 0\text{V}$, $\text{V}_{\text{GS}} = 0\text{V}$, $f = 1.0\text{MHz}$
Gate Resistance	R_{g}	—	5.1	12	Ω	
Total Gate Charge ($\text{V}_{\text{GS}} = -5\text{V}$)	Q_{g}	—	20.5	—	nC	$\text{V}_{\text{DS}} = -15\text{V}$, $\text{I}_D = -11.5\text{A}$
Total Gate Charge ($\text{V}_{\text{GS}} = -10\text{V}$)	Q_{g}	—	41	—	nC	
Gate-Source Charge	Q_{gs}	—	7.6	—	nC	$\text{V}_{\text{DS}} = -15\text{V}$, $\text{I}_D = -11.5\text{A}$
Gate-Drain Charge	Q_{gd}	—	8.0	—	nC	
Turn-On Delay Time	$\text{t}_{\text{D}(\text{ON})}$	—	7.5	—	ns	$\text{V}_{\text{DD}} = -15\text{V}$, $\text{V}_{\text{GS}} = -10\text{V}$, $\text{R}_{\text{G}} = 6\Omega$, $\text{I}_D = -11.5\text{A}$
Turn-On Rise Time	t_{R}	—	15.4	—	ns	
Turn-Off Delay Time	$\text{t}_{\text{D}(\text{OFF})}$	—	45.6	—	ns	$\text{V}_{\text{DD}} = -15\text{V}$, $\text{V}_{\text{GS}} = -10\text{V}$, $\text{R}_{\text{G}} = 6\Omega$, $\text{I}_D = -11.5\text{A}$
Turn-Off Fall Time	t_{F}	—	36.8	—	ns	
BODY DIODE CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	—	-0.7	—	V	$\text{V}_{\text{GS}} = 0\text{V}$, $\text{I}_S = -1\text{A}$
Reverse Recovery Time (Note 9)	t_{RR}	—	20	—	ns	$\text{I}_S = -11.5\text{A}$, $d\text{I}/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge (Note 9)	Q_{RR}	—	9.5	—	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. I_{AR} and E_{AR} ratings are based on low frequency and duty cycles to keep $\text{T}_J = +25^\circ\text{C}$.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

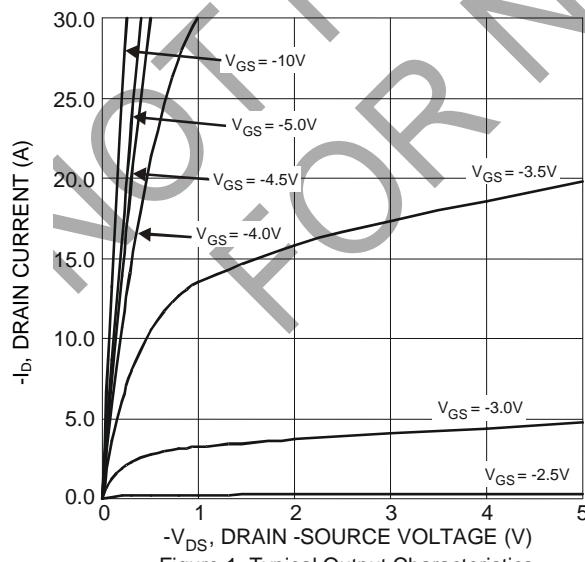


Figure 1 Typical Output Characteristics

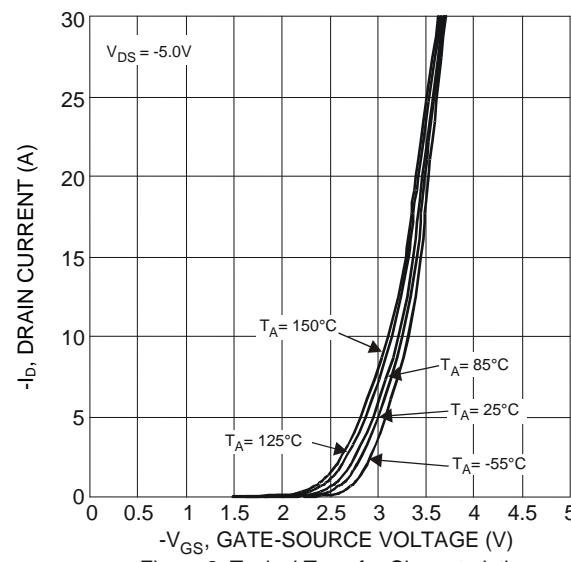


Figure 2 Typical Transfer Characteristics

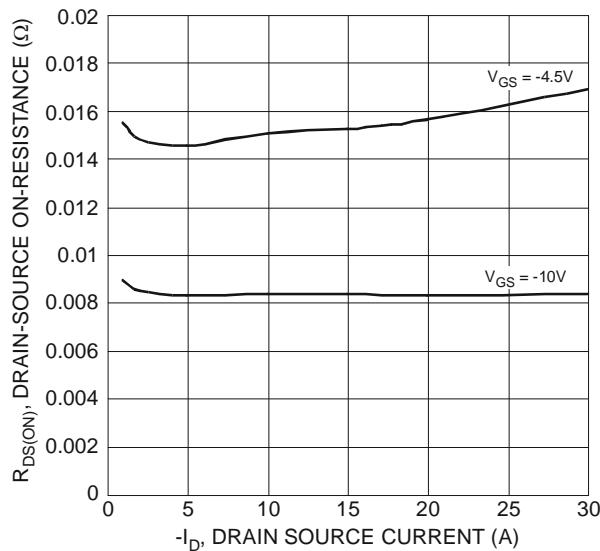


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

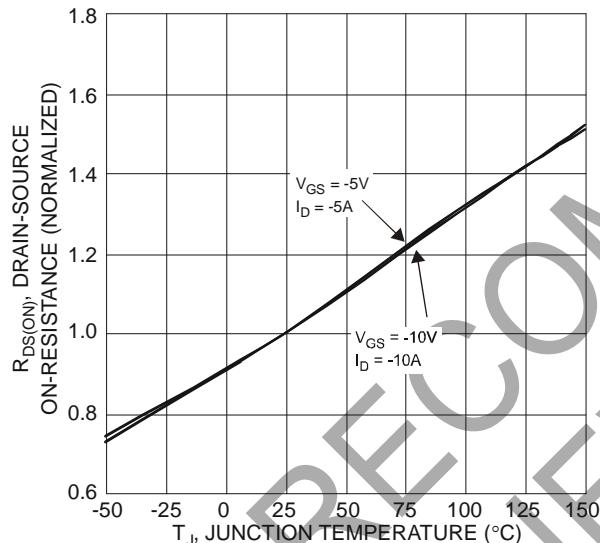


Figure 5 On-Resistance Variation with Temperature

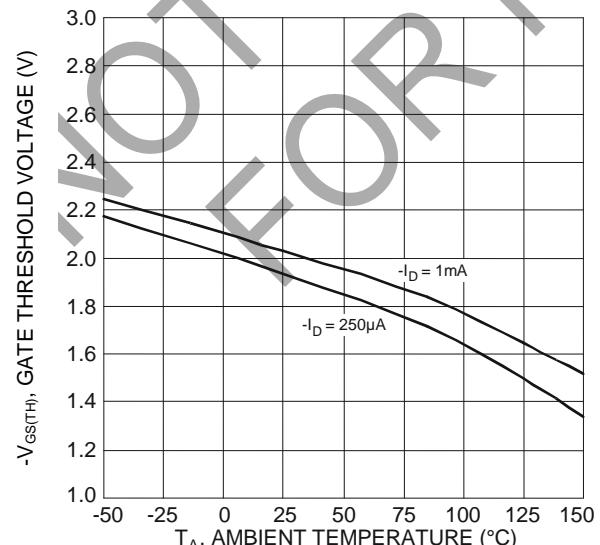


Figure 7 Gate Threshold Variation vs. Ambient Temperature

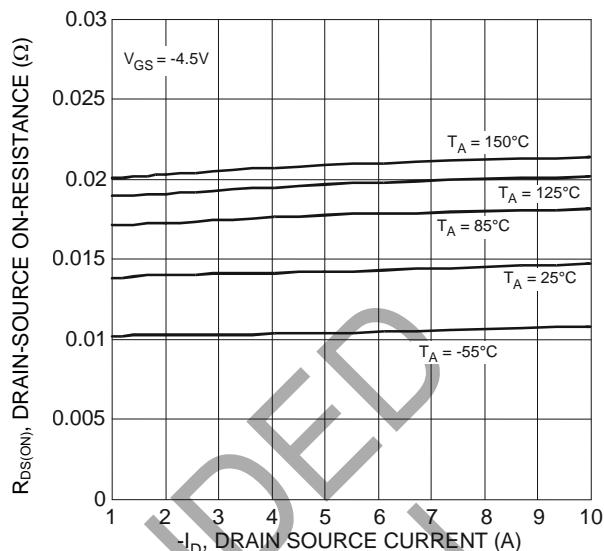


Figure 4 Typical On-Resistance vs.
Drain Current and Temperature

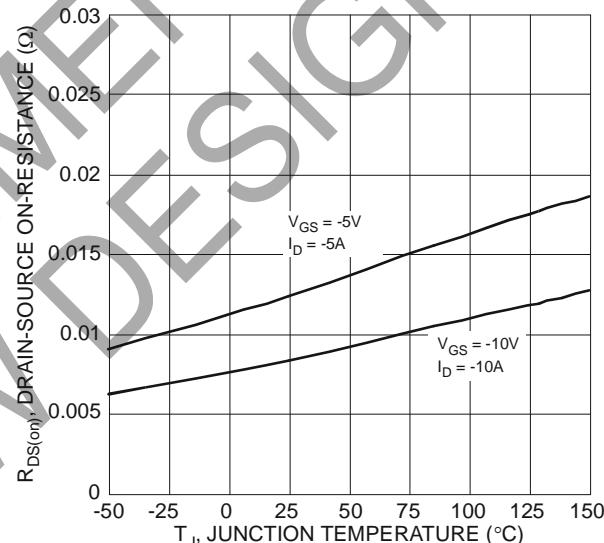


Figure 6 On-Resistance Variation with Temperature

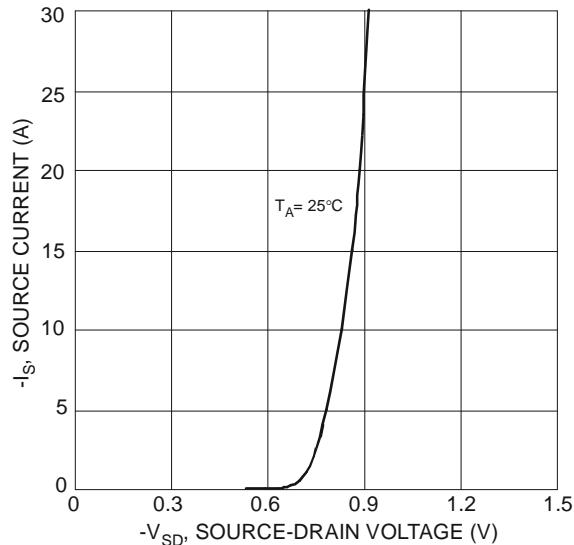
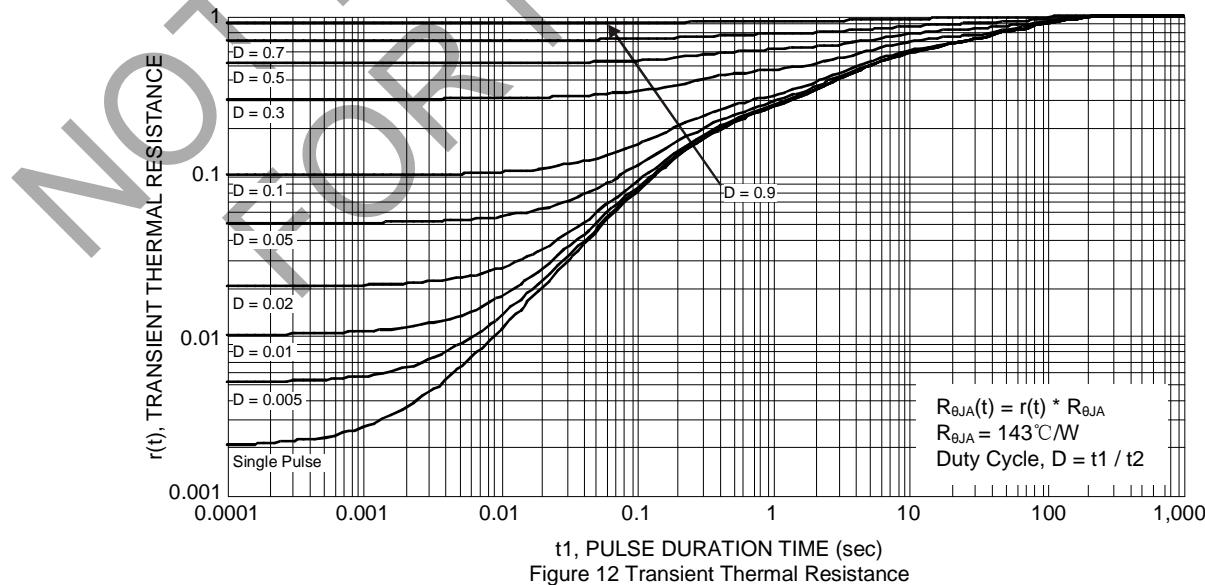
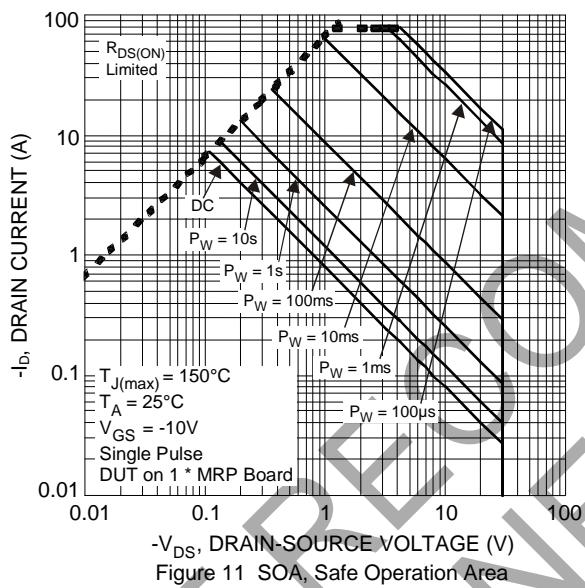
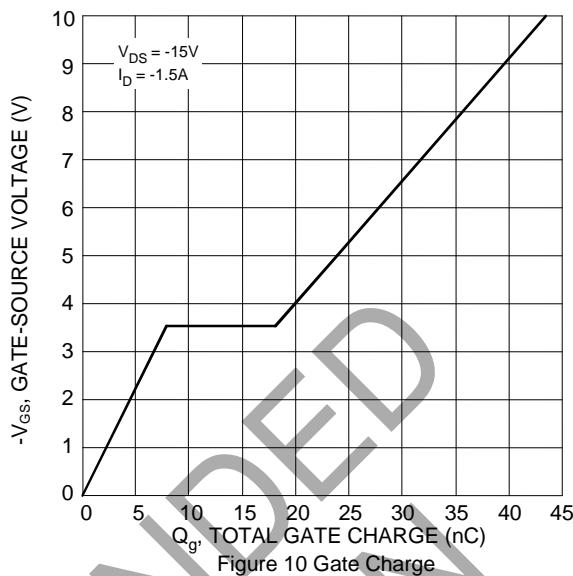
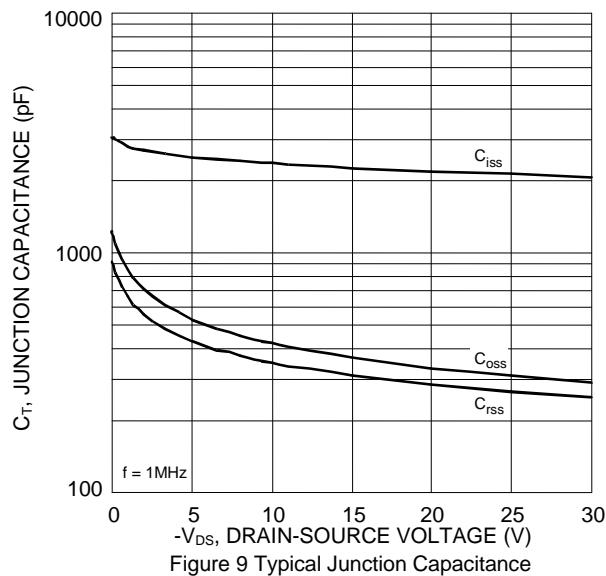


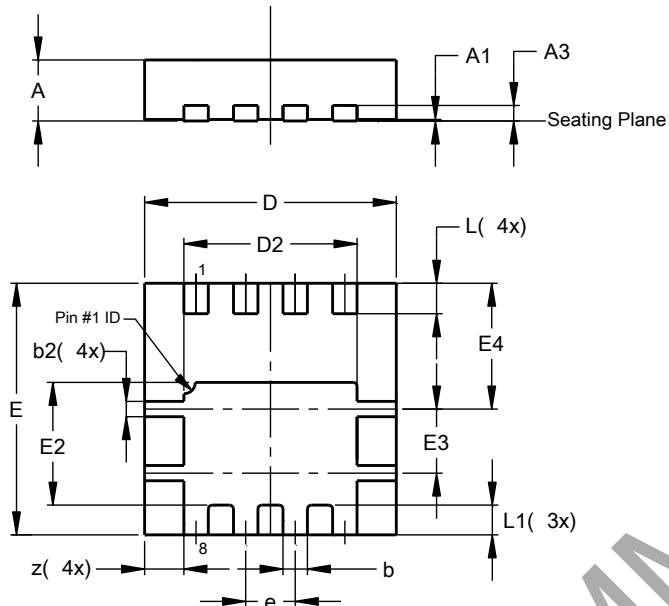
Figure 8 Diode Forward Voltage vs. Current



Package Outline Dimensions

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

PowerDI3333-8



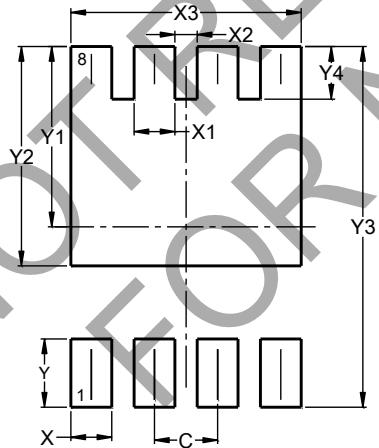
PowerDI3333-8			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	—	—	0.203
b	0.27	0.37	0.32
b2	0.15	0.25	0.20
D	3.25	3.35	3.30
D2	2.22	2.32	2.27
E	3.25	3.35	3.30
E2	1.56	1.66	1.61
E3	0.79	0.89	0.84
E4	1.60	1.70	1.65
e	—	—	0.65
L	0.35	0.45	0.40
L1	—	—	0.39
z	—	—	0.515

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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