

Product Summary

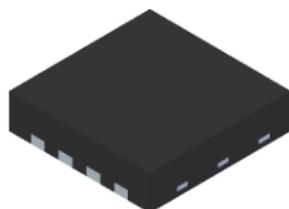
BV_{DSS}	$R_{DS(ON)} \text{ Max}$	$I_D \text{ Max}$ $T_c = +25^\circ\text{C}$
-30V	6.8m Ω @ $V_{GS} = -10\text{V}$	-50A
	13m Ω @ $V_{GS} = -4.5\text{V}$	-36A

Description

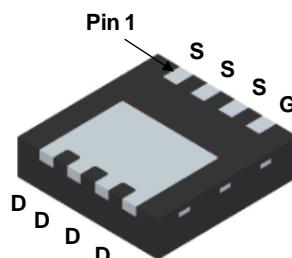
This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

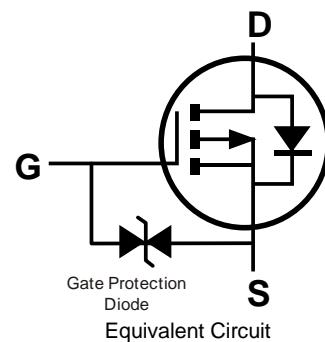
- Backlighting
- Power Management Functions
- DC-DC Converters



Top View



Bottom View



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 Just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- HBM ESD Protection Level of 8kV Typical
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)

Mechanical Data

- Case: V-DFN3333-8 (Type B)
- 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 Below Diagram
- Terminals: Finish -NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.030 grams (Approximate)

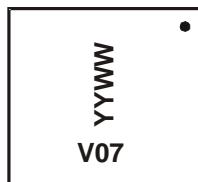
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3007SCG-7	V-DFN3333-8 (Type B)	2,000/Tape & Reel
DMP3007SCG-13	V-DFN3333-8 (Type B)	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



V07= Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 16 = 2016)
 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 7) $V_{GS} = -10\text{V}$	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	I_D	-50 -40	A
Maximum Continuous Body Diode Forward Current (Note 7)			I_S	-40	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)			I_{DM}	-100	A
Avalanche Current (Note 8) $L = 1\text{mH}$			I_{AS}	-16	A
Avalanche Energy (Note 8) $L = 1\text{mH}$			E_{AS}	130	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	1.0	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	124	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	P_D	2.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	52	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	4.0	$^\circ\text{C/W}$
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 9)						
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}	—	—	-1	μA	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	-1.0	—	-3.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	5.7	6.8	$\text{m}\Omega$	$V_{GS} = -10\text{V}, I_D = -11.5\text{A}$
		—	8.0	13		$V_{GS} = -4.5\text{V}, I_D = -8.5\text{A}$
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	2,826	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	606	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	305	—	pF	
Gate Resistance	R_g	—	23	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	—	31.2	—	nC	$V_{DS} = -15\text{V}, I_D = -11.5\text{A}$
Total Gate Charge ($V_{GS} = -10\text{V}$)	Q_g	—	64.2	—	nC	
Gate-Source Charge	Q_{gs}	—	10.6	—	nC	
Gate-Drain Charge	Q_{gd}	—	11.6	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.8	—	ns	
Turn-On Rise Time	t_R	—	4.3	—	ns	$V_{DD} = -15\text{V}, V_{GS} = -10\text{V}, R_g = 6\Omega, I_D = -11.5\text{A}$
Turn-Off Delay Time	$t_{D(OFF)}$	—	306	—	ns	
Turn-Off Fall Time	t_F	—	125	—	ns	
Reverse Recovery Time	t_{RR}	—	19	—	ns	$I_S = -11.5\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{RR}	—	9.8	—	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. Thermal resistance from junction to soldering point (on the exposed drain pad).

8. I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep $T_J = +25^\circ\text{C}$.

9. Short duration pulse test used to minimize self-heating effect.

10. Guaranteed by design. Not subject to product testing.

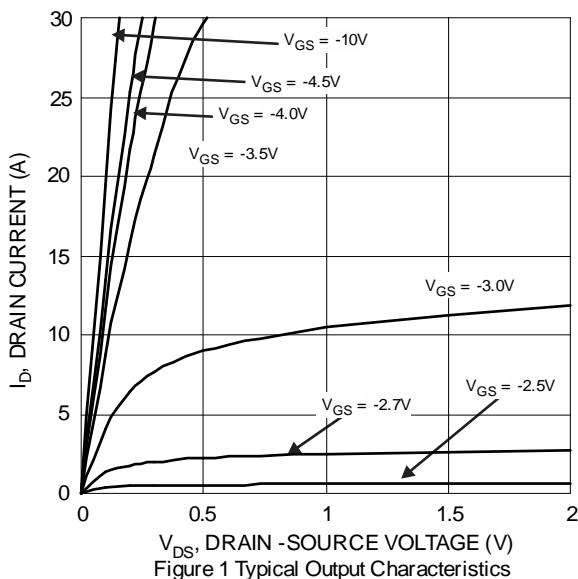


Figure 1 Typical Output Characteristics

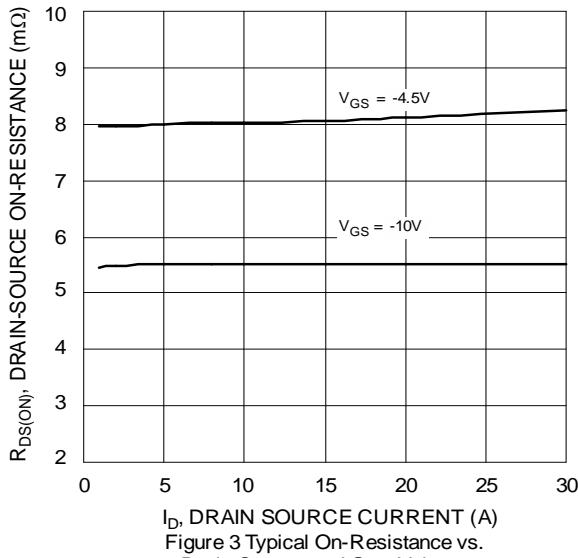


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

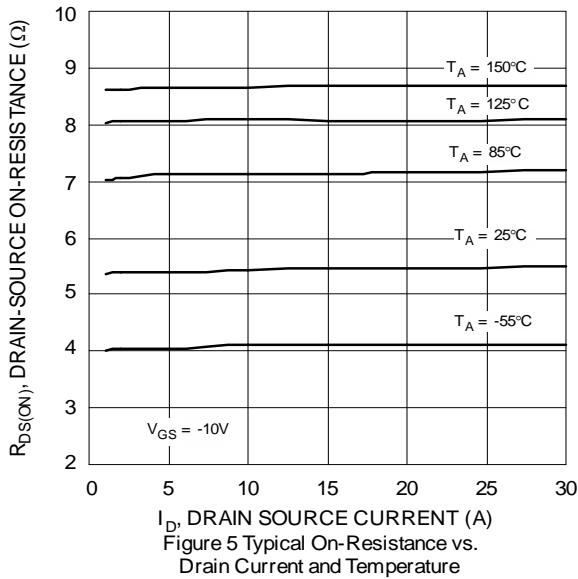


Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

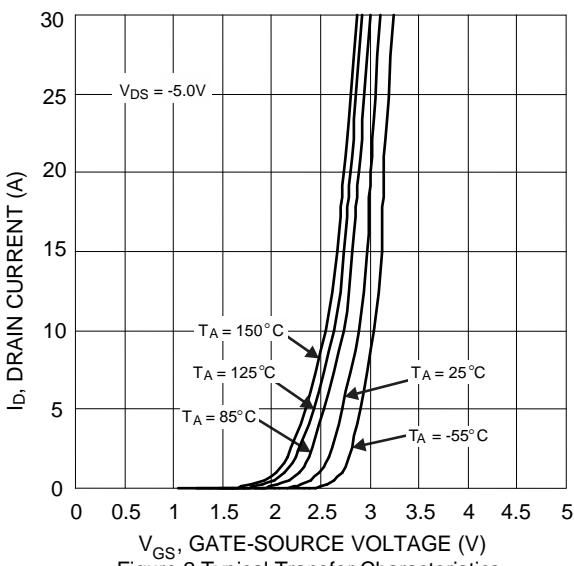


Figure 2 Typical Transfer Characteristics

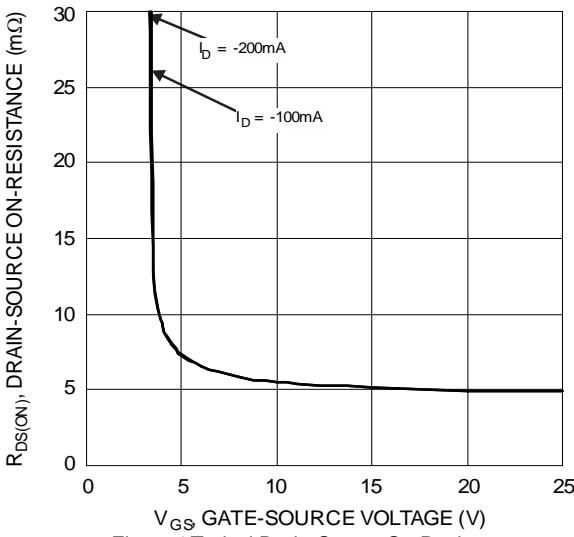


Figure 4 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

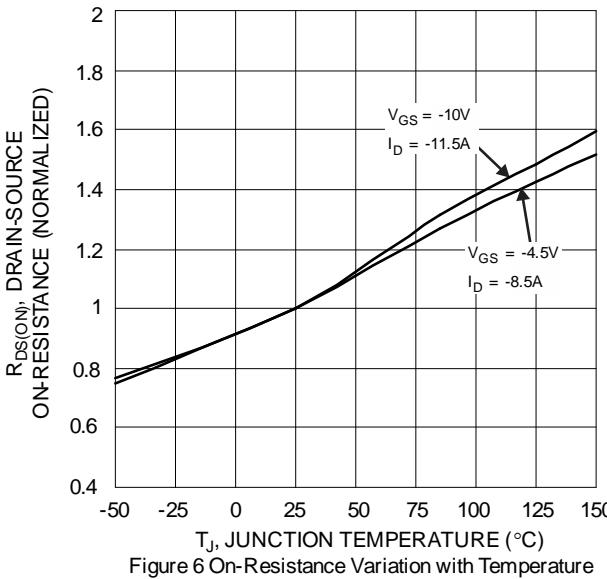


Figure 6 On-Resistance Variation with Temperature

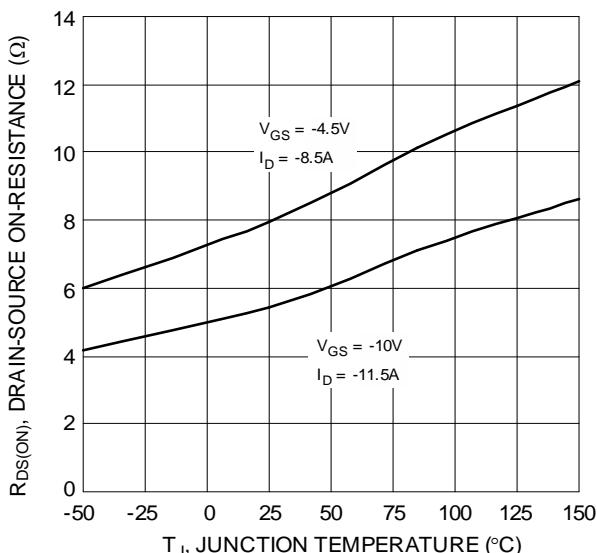


Figure 7 On-Resistance Variation with Temperature

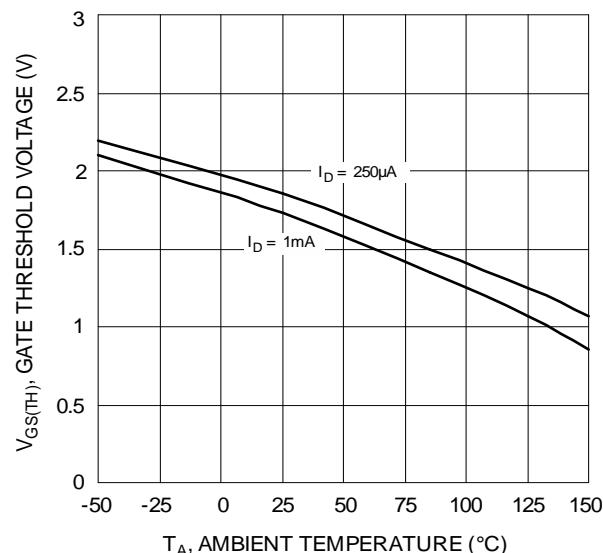
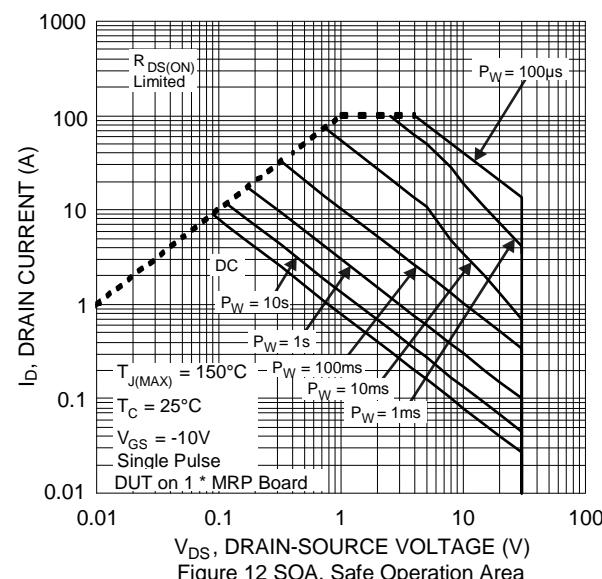
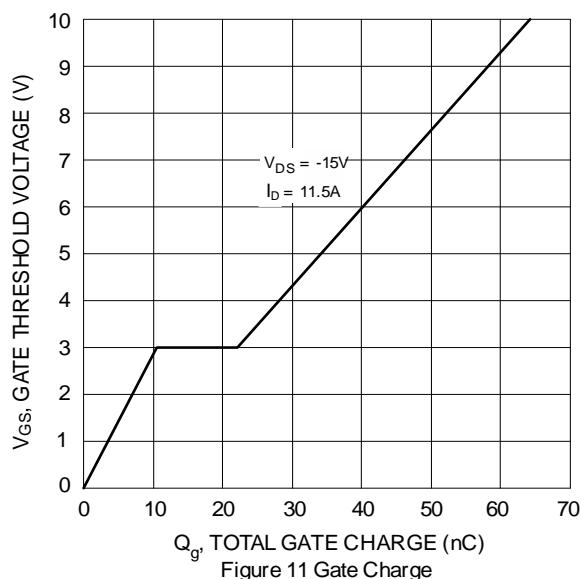
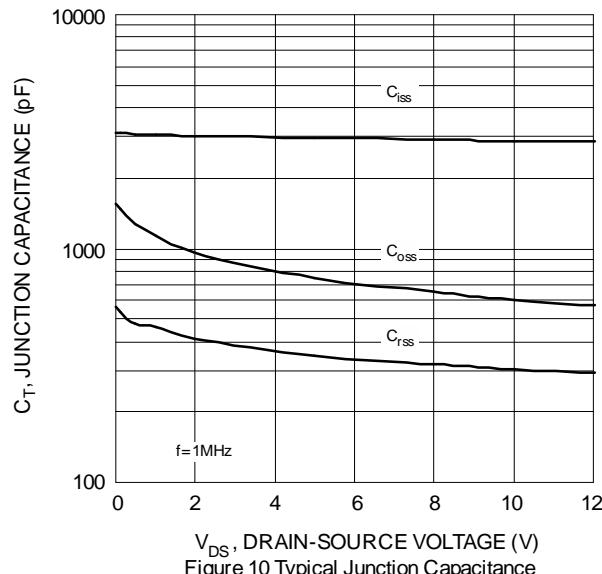
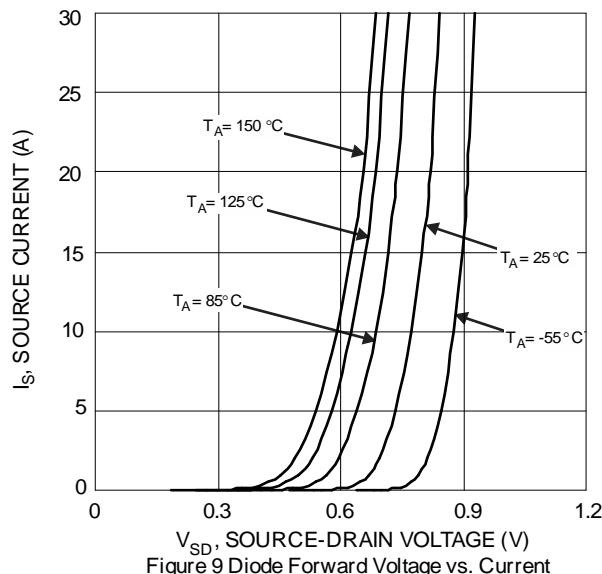


Figure 8 Gate Threshold Variation vs. Junction Temperature



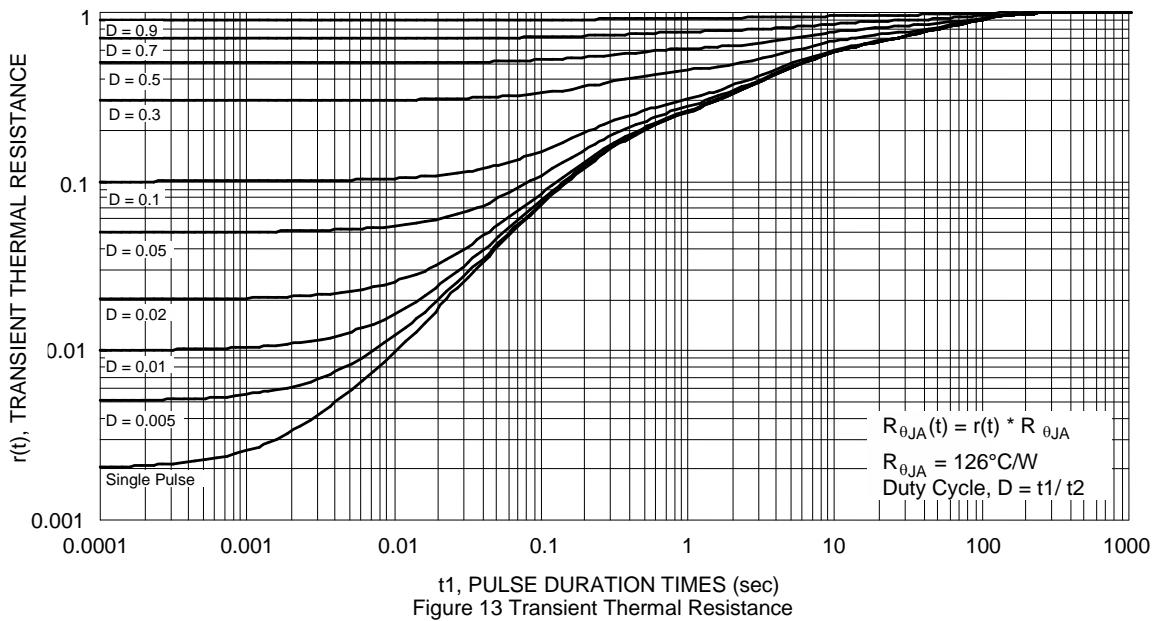
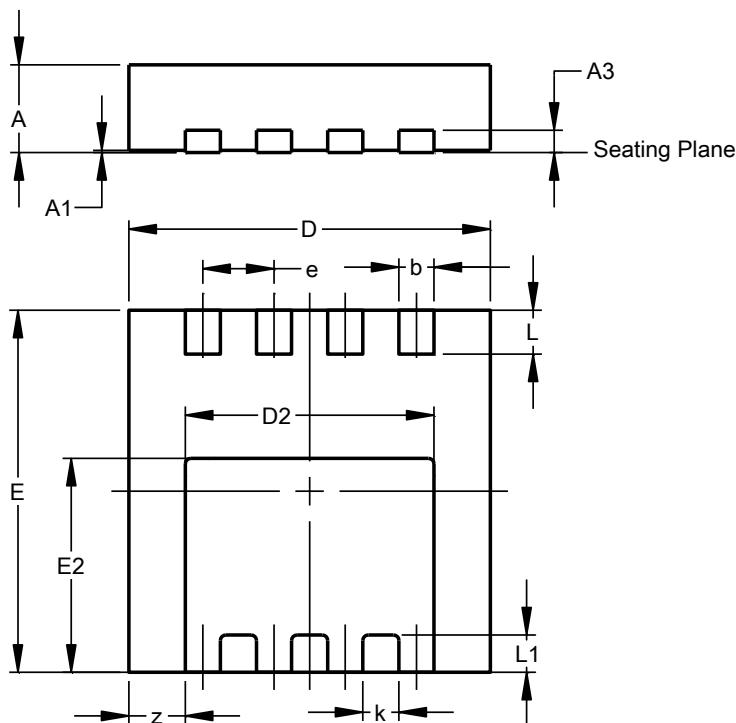


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3333-8 (Type B)



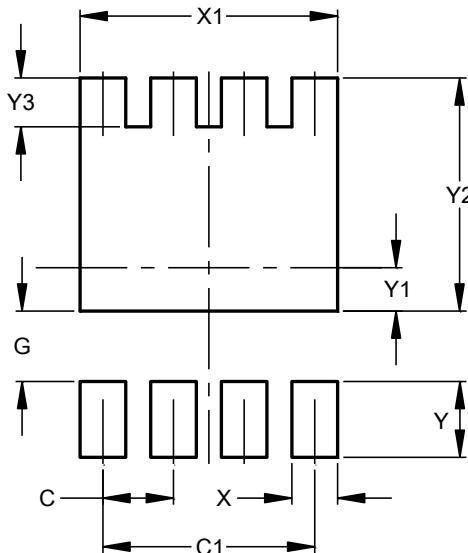
V-DFN3333-8 (Type B)			
Dim	Min	Max	Typ
A	0.75	0.85	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.27	0.37	0.32
D	3.25	3.35	3.30
D2	2.17	2.37	2.27
E	3.25	3.35	3.30
E2	1.85	2.05	1.95
e	--	--	0.65
k	--	--	0.33
L	0.35	0.45	0.40
L1	--	--	0.34
z	--	--	0.515

All Dimensions in mm

Suggested Pad Layout

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

V-DFN3333-8 (Type B)



Dimensions	Value (in mm)
C	0.650
C1	1.950
G	0.650
X	0.420
X1	2.370
Y	0.700
Y1	0.400
Y2	2.150
Y3	0.450

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