

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
-12V	18mΩ@ V _{GS} = -4.5V	-7.2A
	22mΩ@ V _{GS} = -2.5V	-6.5A

Description and Applications

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.

- Power Management Functions

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

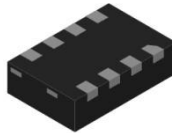
Mechanical Data

- Case: V-DFN3020-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.011 grams (Approximate)

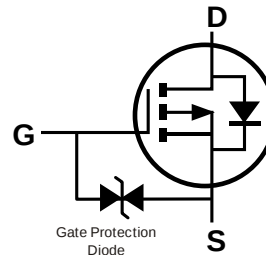
V-DFN3020-8



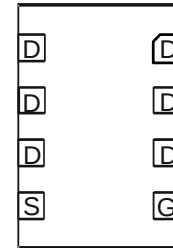
Top View



Bottom View



Equivalent Circuit



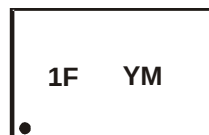
Bottom View
Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP1022UWS-7	V-DFN3020-8	3000/Tape & Reel
DMP1022UWS-13	V-DFN3020-8	10000/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



1F = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: F = 2018)
M = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Code	F	G	H	I	J	K	L	M	N	O	P

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings – P-CHANNEL MOSFET (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-12	V
Gate-Source Voltage			V _{GSS}	±8	V
Continuous Drain Current (Note 6) V _{GS} = -4.5V	Steady State	T _A = +25°C T _A = +70°C	I _D	-7.2 -5.3	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	-9.4 -7.6	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	-1.8	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	-60	A
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	-13	A
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	9	mJ

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R _{θJA}	135	°C/W
	t < 10s			78	
Total Power Dissipation (Note 6)			P _D	1.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R _{θJA}	90	°C/W
	t < 10s			52	
Thermal Resistance, Junction to Case (Note 6)			R _{θJC}	15.6	
Operating and Storage Temperature Range			T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics – P-CHANNEL MOSFET (@T_A = +25°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} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	µA	V _{DS} = -10V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-0.35	—	-1	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	12	18	mΩ	V _{GS} = -4.5V, I _D = -9A
			15	22		V _{GS} = -2.5V, I _D = -8.5A
			23	28		V _{GS} = -1.8V, I _D = -7.5A
Diode Forward Voltage	V _{SD}	—	-0.8	-1.2	V	V _{GS} = 0V, I _S = -8A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	2847	—	pF	V _{DS} = -4V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	808	—		
Reverse Transfer Capacitance	C _{rss}	—	731	—		
Gate Resistance	R _g	—	9	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	30	—	nC	V _{GS} = -5V, V _{DS} = -4V, I _D = -10A
Total Gate Charge	Q _g	—	27	—		
Gate-Source Charge	Q _{gs}	—	4.1	—		
Gate-Drain Charge	Q _{gd}	—	6.4	—		
Turn-On Delay Time	t _{D(ON)}	—	20	—	ns	V _{DS} = -4V, V _{GS} = -4.5V, R _g = 1Ω, I _D = -9.8A
Turn-On Rise Time	t _r	—	28	—		
Turn-Off Delay Time	t _{D(OFF)}	—	117	—		
Turn-Off Fall Time	t _f	—	93	—		
Body Diode Reverse Recovery Time	t _{RR}	—	28	—	ns	I _S = -9.8A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	13	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

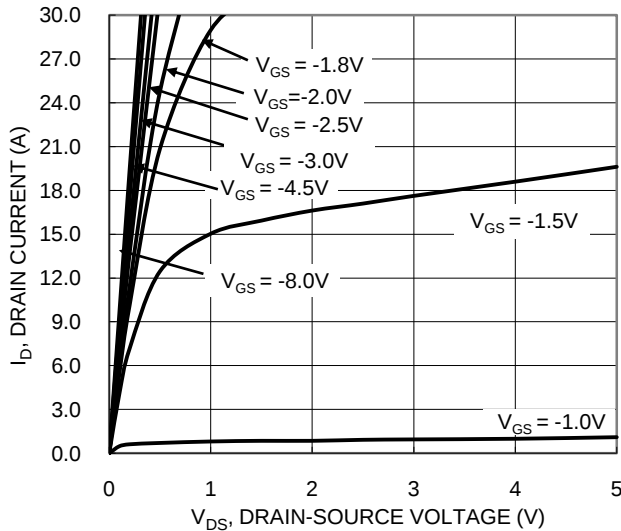


Figure 1. Typical Output Characteristic

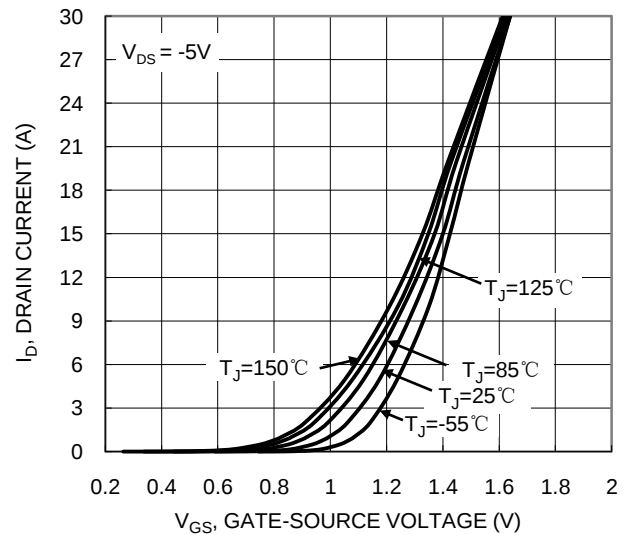


Figure 2. Typical Transfer Characteristic

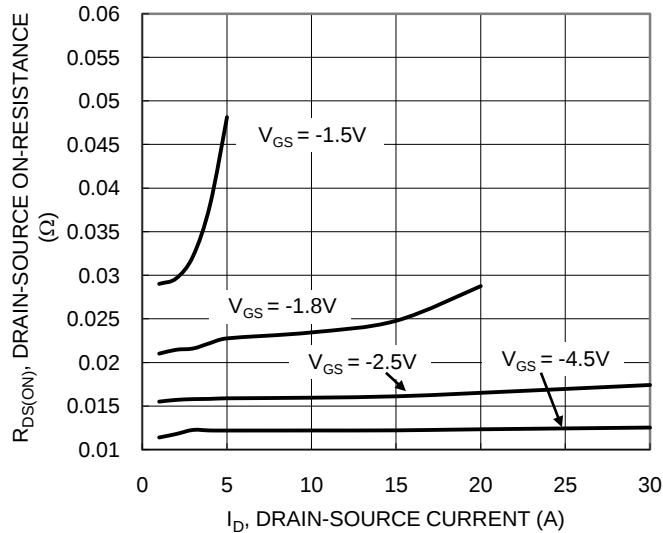


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

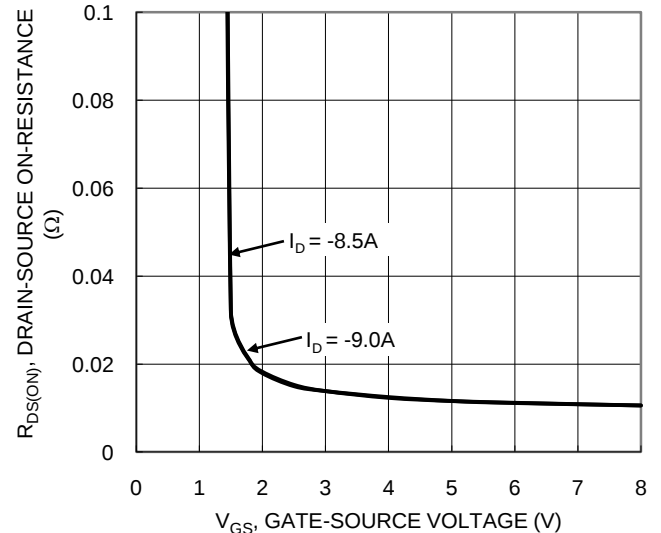


Figure 4. Typical Transfer Characteristic

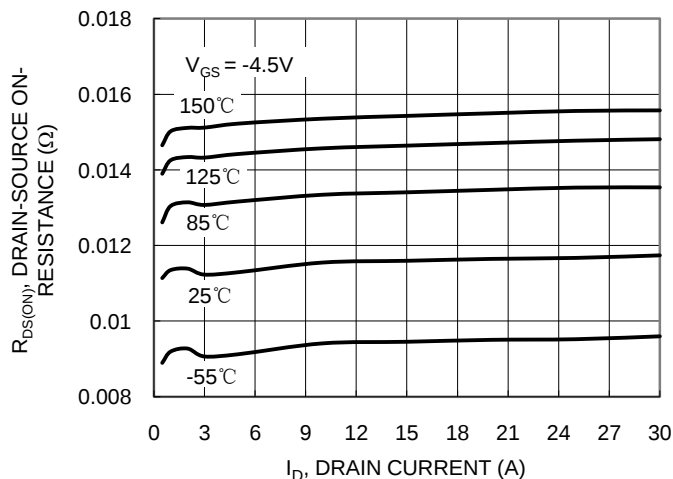


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

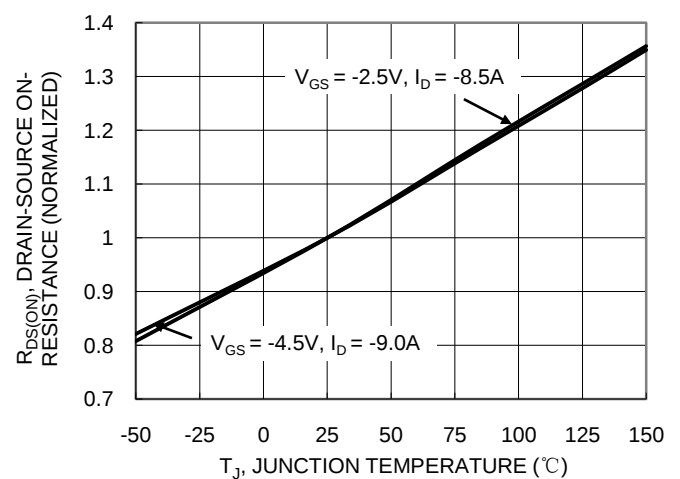


Figure 6. On-Resistance Variation with Temperature

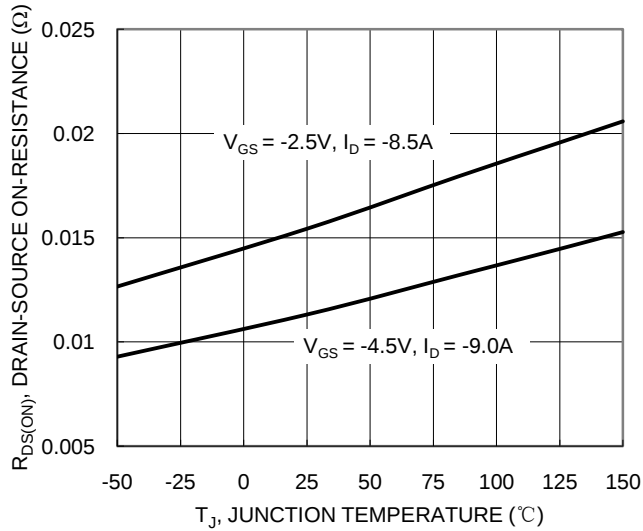


Figure 7. On-Resistance Variation with Temperature

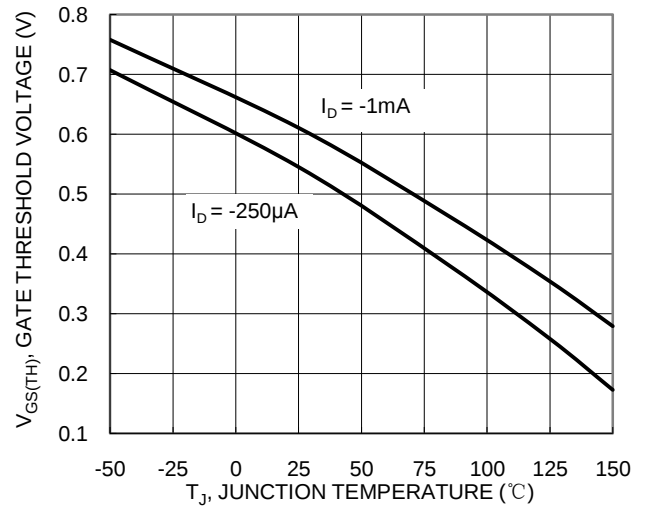


Figure 8. Gate Threshold Variation vs. Temperature

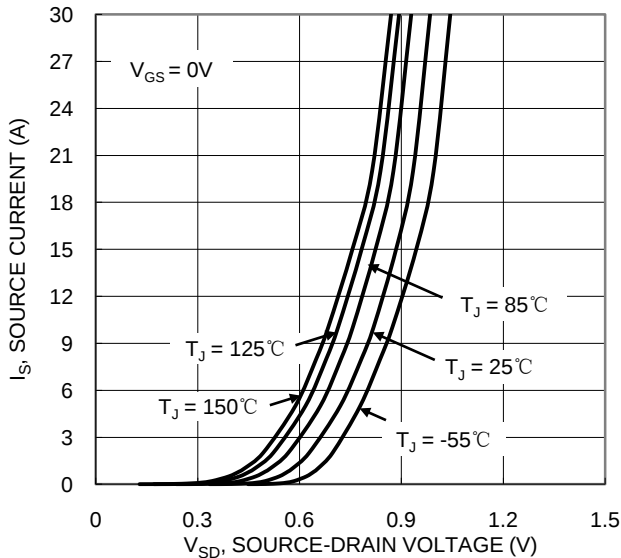


Figure 9. Diode Forward Voltage vs. Current

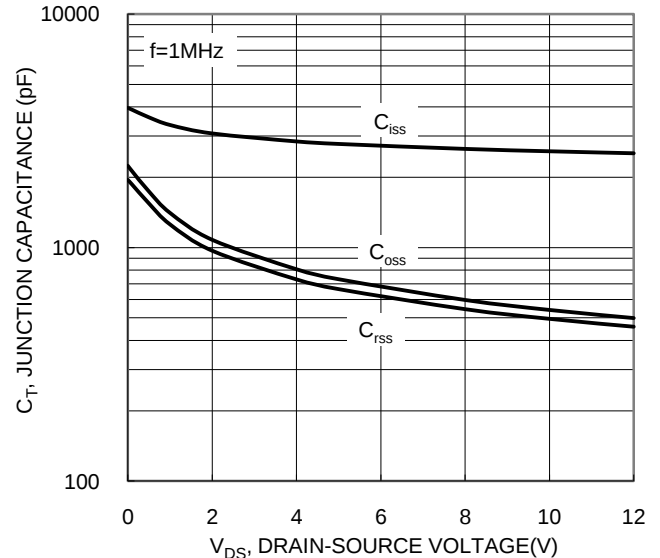


Figure 10. Typical Junction Capacitance

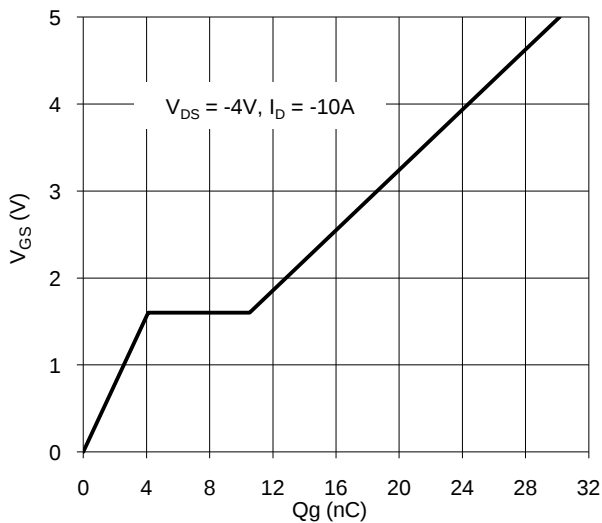


Figure 11. Gate Charge

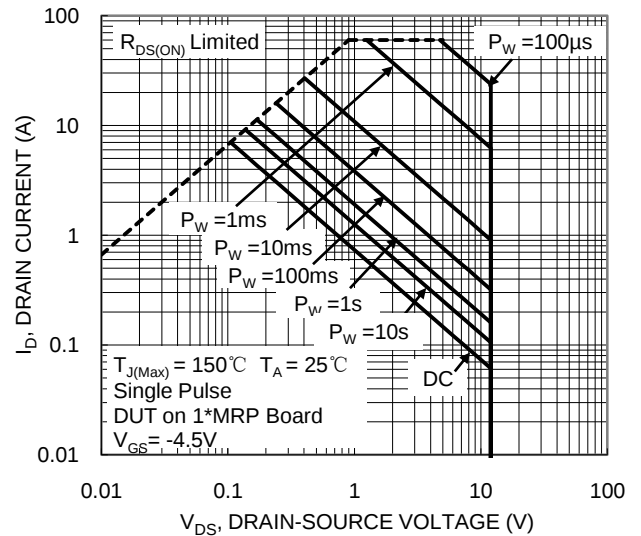


Figure 12. SOA, Safe Operation Area

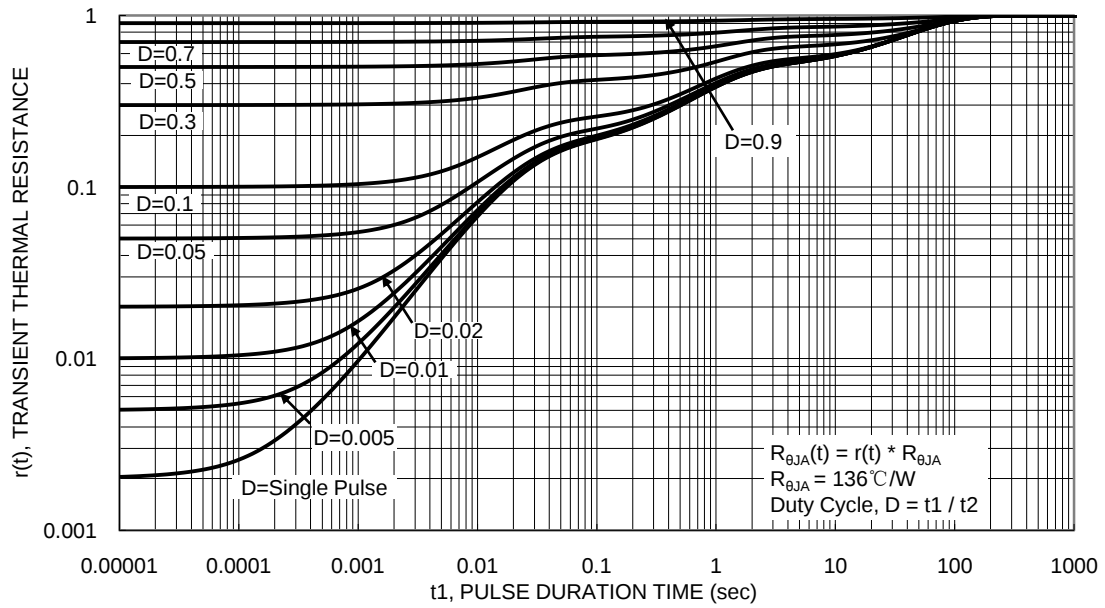
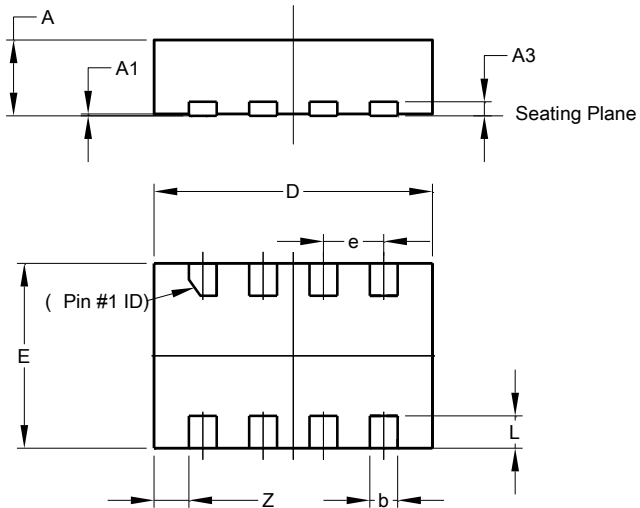


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3020-8

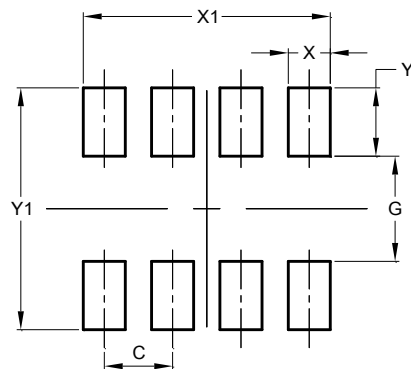


V-DFN3020-8			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.203
b	0.25	0.35	0.30
D	2.95	3.05	3.00
e	-	-	0.65
E	1.95	2.05	2.00
L	0.30	0.40	0.35
Z	-	-	0.375
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN3020-8



Dimensions	Value (in mm)
C	0.650
G	1.000
X	0.400
X1	2.350
Y	0.650
Y1	2.300

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