

**30V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET**

**Product Summary**

$BV_{DSS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX $T_A = +25^\circ\text{C}$
30V	35m $\Omega$ @ $V_{GS} = 10\text{V}$	5.5A
	45m $\Omega$ @ $V_{GS} = 4.5\text{V}$	4.9A

**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**

- DC Motor Control
- DC-AC Inverters

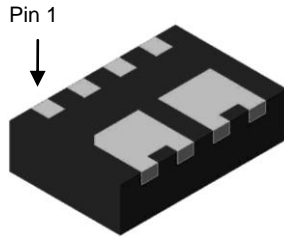
**Features**

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **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**

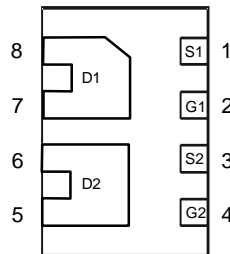
**Mechanical Data**

- Case: V-DFN3020-8 (Type N)
- 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 <sup>(e4)</sup>
- Weight: 0.011 grams (Approximate)

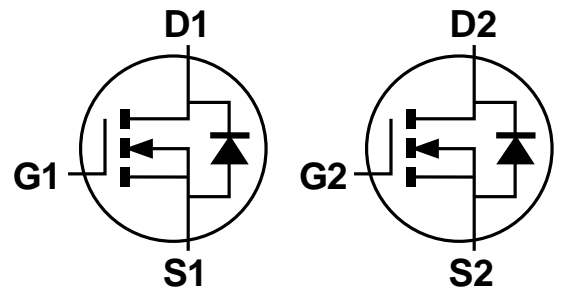
V-DFN3020-8 (Type N)



Bottom View



Bottom View  
Pin Configuration



Q1 N-Channel MOSFET

Q2 N-Channel MOSFET

Equivalent Circuit

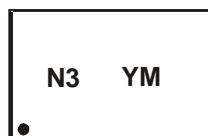
**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMN3035LWN-7	V-DFN3020-8 (Type N)	3,000/Tape & Reel
DMN3035LWN-13	V-DFN3020-8 (Type N)	10,000/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](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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html).

**Marking Information**

V-DFN3020-8 (Type N)



N3 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: D = 2016)  
M = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022	2023
Code	D	E	F	G	H	I	J	K

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** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	I <sub>D</sub>	5.5 4.4	A
Maximum Continuous Body Diode Forward Current (Note 6)	I <sub>S</sub>	1	A
Pulsed Drain Current	I <sub>DM</sub>	30	A
Avalanche Current (Note 7) L = 0.1mH	I <sub>AS</sub>	13	A
Avalanche Energy (Note 7) L = 0.1mH	E <sub>AS</sub>	9.0	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.77 0.49	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	162 116	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.78 1.10	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	71 50	°C/W
Thermal Resistance, Junction to Case (Note 6)	R <sub>θJC</sub>	10.7	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	1.0	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	—	2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	26 34	35 45	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.8A V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.3A
Diode Forward Voltage	V <sub>SD</sub>	—	0.75	1.1	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	399	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	57	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	50	—	pF	
Gate Resistance	R <sub>g</sub>	—	1.36	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	4.5	—	nC	V <sub>DS</sub> = 15V, I <sub>D</sub> = 5.8A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	9.9	—	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	1.2	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	1.8	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	3.0	—	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 2.6Ω, R <sub>G</sub> = 3Ω
Turn-On Rise Time	t <sub>R</sub>	—	3.3	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	10.6	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	2.0	—	ns	
Reverse Recovery Time	t <sub>RR</sub>	—	7.9	—	ns	I <sub>F</sub> = 4.8A, di/dt = 100A/μs
Reverse Recovery Charge	Q <sub>RR</sub>	—	2.4	—	nC	I <sub>F</sub> = 4.8A, di/dt = 100A/μs

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - I<sub>AS</sub> and E<sub>AS</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

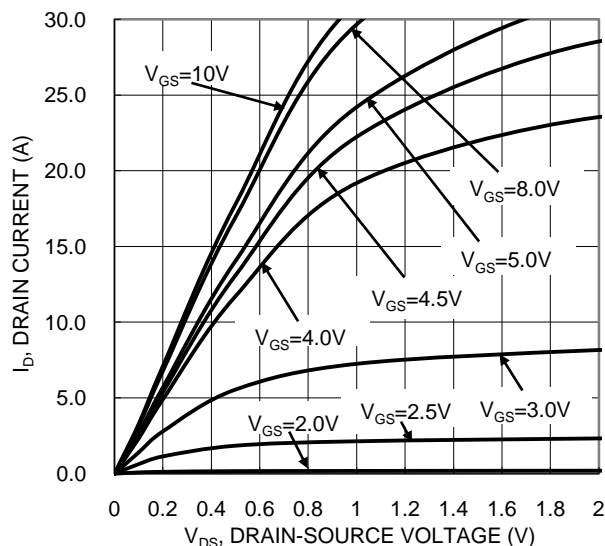


Figure 1. Typical Output Characteristic

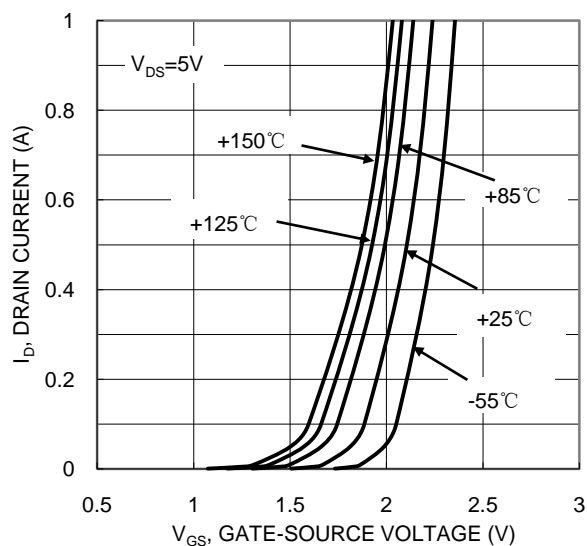


Figure 2. Typical Transfer Characteristic

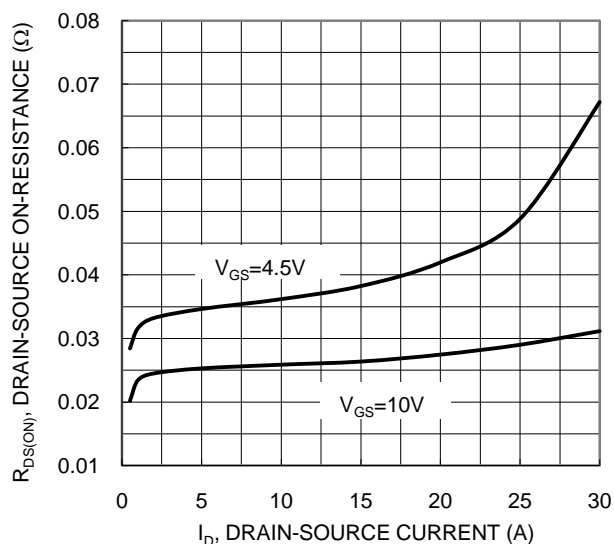


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

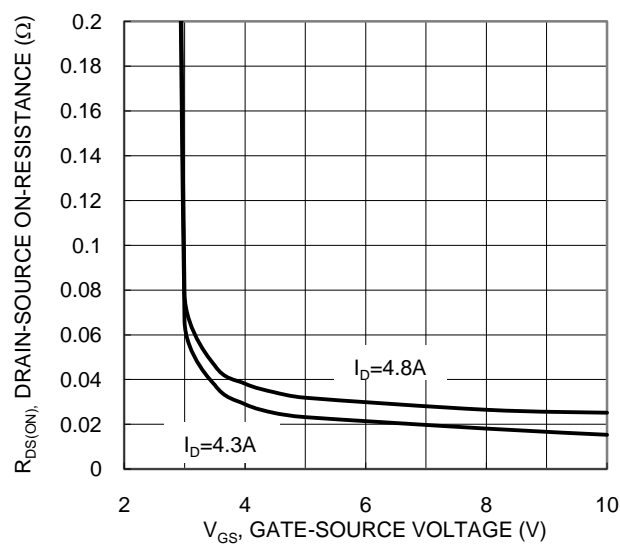


Figure 4. Typical Transfer Characteristic

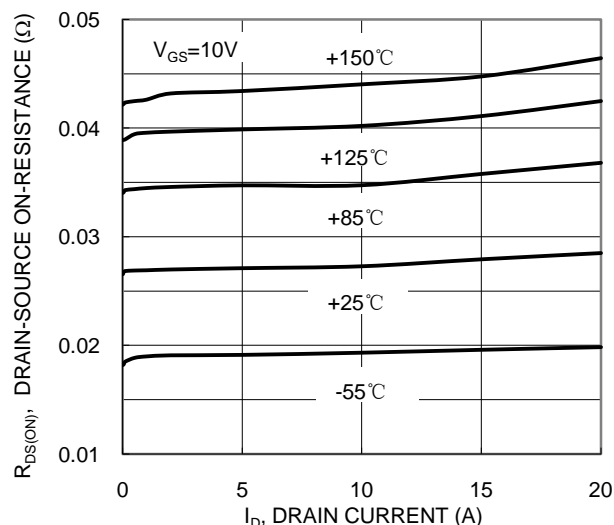


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

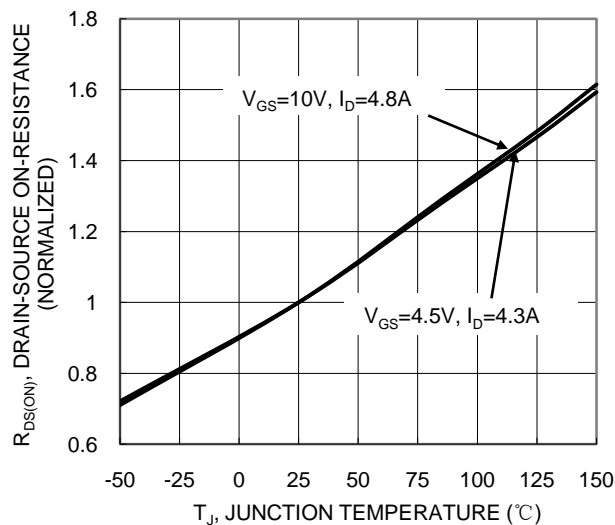
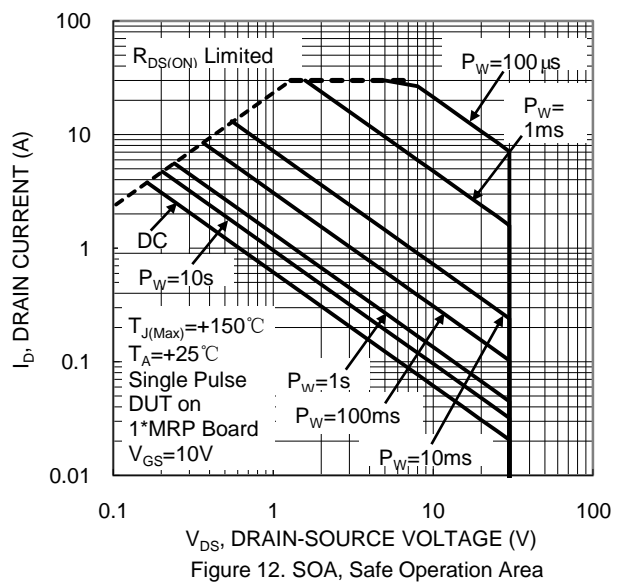
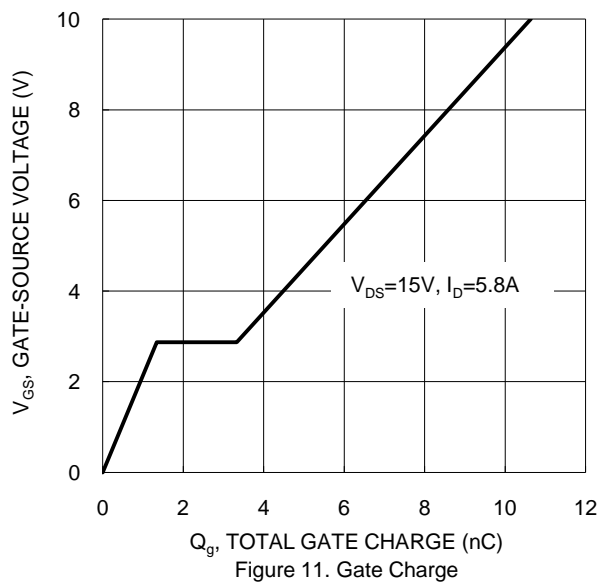
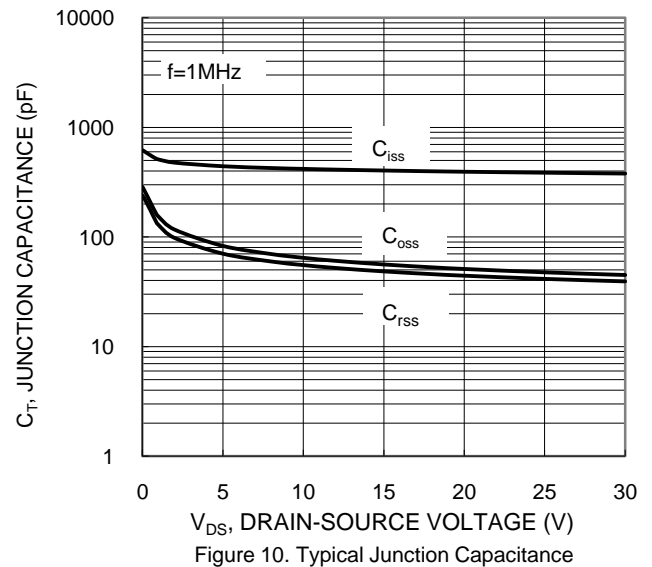
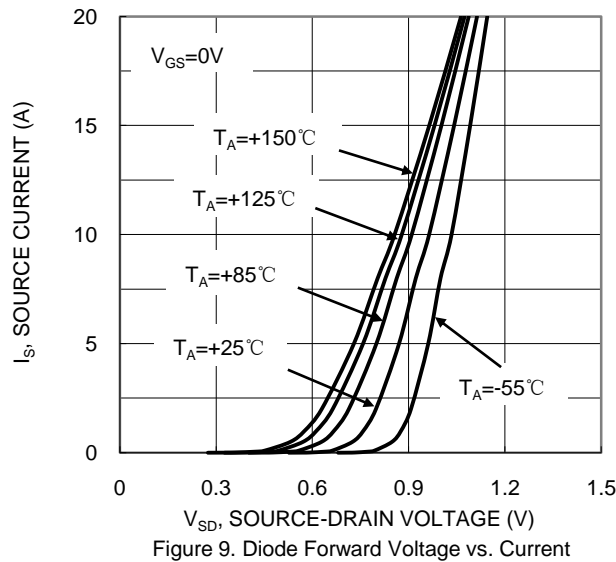
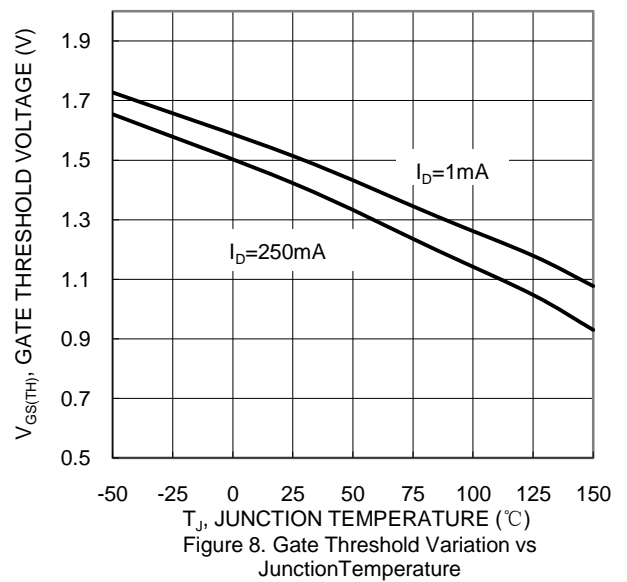
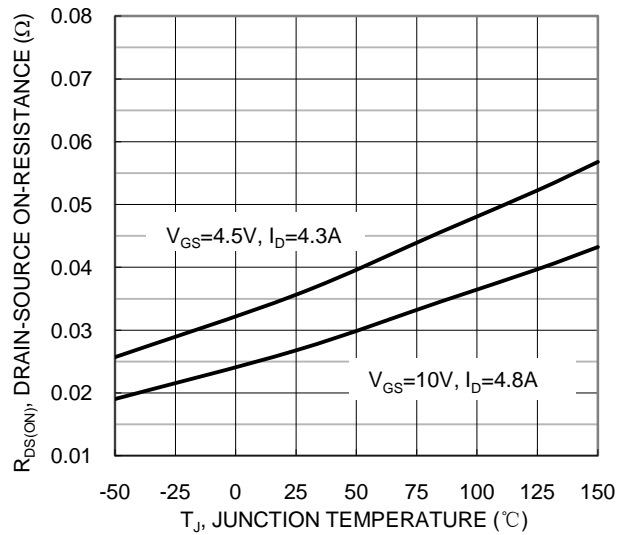


Figure 6. On-Resistance Variation with Temperature



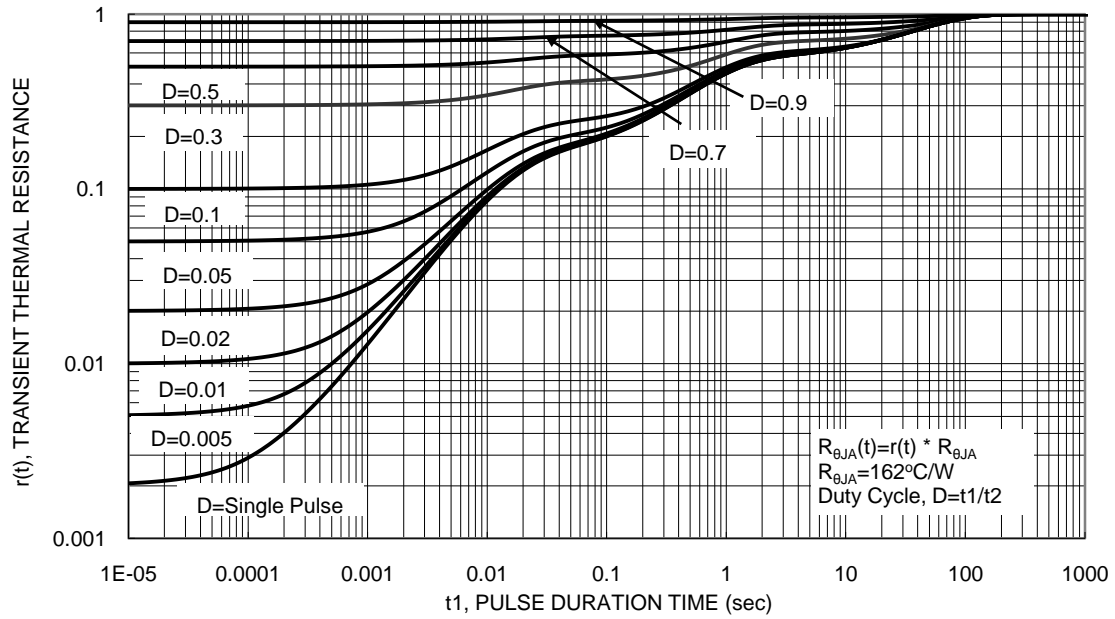
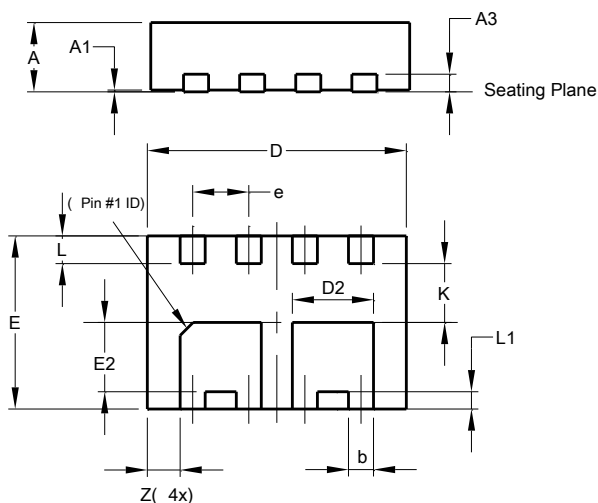


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

### V-DFN3020-8 (Type N)

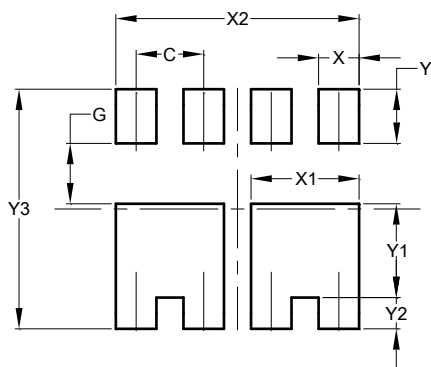


V-DFN3020-8 (Type N)			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.203
b	0.24	0.34	0.29
D	2.95	3.05	3.00
D2	0.84	1.04	0.94
e	-	-	0.65
E	1.95	2.05	2.00
E2	0.70	0.90	0.80
L	0.27	0.37	0.32
L1	0.15	0.25	0.20
K	-	-	0.68
Z	-	-	0.38
All Dimensions in mm			

## Suggested Pad Layout

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

### V-DFN3020-8 (Type N)



Dimensions	Value (in mm)
C	0.650
G	0.580
X	0.390
X1	1.040
X2	2.340
Y	0.520
Y1	0.900
Y2	0.300
Y3	2.300

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