

## Product Summary

BV <sub>DSS</sub>	R <sub>Ds(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
-20V	75mΩ @ V <sub>GS</sub> = -4.5V	-3.8A
	137mΩ @ V <sub>GS</sub> = -2.5V	-3.0A

## Description

This MOSFET is designed to minimize on-state resistance (R<sub>Ds(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

- Load Switch
- Power Management Functions
- Portable Power Adaptors

## Features

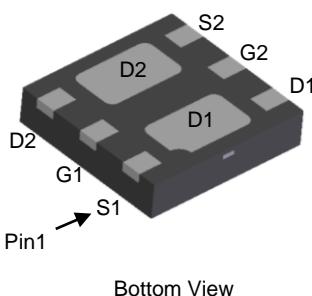
- Low On-Resistance
- Low Input Capacitance
- Low Profile, 0.6mm Max Height
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.**

<https://www.diodes.com/quality/product-definitions/>

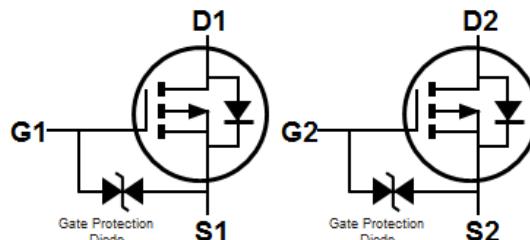
## Mechanical Data

- Case: U-DFN2020-6
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>④</sup>
- Terminals Connections: See Diagram Below
- Weight: 0.0065 grams (Approximate)

U-DFN2020-6 (Type B)



Bottom View



Q1 P-CHANNEL MOSFET

Q2 P-CHANNEL MOSFET

Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2075UFDB -7	U-DFN2020-6 (Type B)	3,000/Tape & Reel
DMP2075UFDB -13	U-DFN2020-6 (Type B)	10,000/Tape & Reel

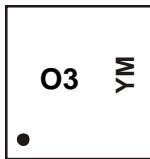
Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. 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.
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

Site 1

U-DFN2020-6 (Type B)



O3 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

Date Code Key

Year	2017	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	E	...	H	I	J	K	L	M	N	O	P	R
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

Site 2



O3 = Product Type Marking Code  
 YWX = Date Code Marking  
 Y = Year (ex: 0 = 2020)  
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)  
 X = Internal Code (ex: U = Monday)

Date Code Key

Year	2017	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	7	...	0	1	2	3	4	5	6	7	8	9

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	-20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 8$	V
Continuous Drain Current (Note 5) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-3.8 -3.0	A
Maximum Continuous Body Diode Forward Current (Note 5)			$I_S$	-1.0	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{DM}$	-25	A
Avalanche Current (Note 7) $L = 0.1\text{mH}$			$I_{AS}$	-13	A
Avalanche Energy (Note 7) $L = 0.1\text{mH}$			$E_{AS}$	8.5	$\text{mJ}$

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	$P_D$	0.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	178	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	$P_D$	1.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	92	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	22	
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
<b>OFF CHARACTERISTICS</b> (Note 8)						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-20	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	$I_{DSS}$	—	—	-1.0	$\mu\text{A}$	$V_{DS} = -20\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 6.4\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS</b> (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.35	—	-1.4	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	53	75	$\text{m}\Omega$	$V_{GS} = -4.5\text{V}, I_D = -2.9\text{A}$
		—	64	137		$V_{GS} = -2.5\text{V}, I_D = -2.3\text{A}$
Diode Forward Voltage	$V_{SD}$	—	-0.7	-1.2	V	$V_{GS} = 0\text{V}, I_S = -3.0\text{A}$
<b>DYNAMIC CHARACTERISTICS</b> (Note 9)						
Input Capacitance	$C_{iss}$	—	642	—	pF	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	98	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	87	—	pF	
Gate Resistance	$R_g$	—	26.5	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = -4.5\text{V}$ )	$Q_g$	—	8.8	—	nC	$V_{DS} = -10\text{V}, I_D = -3.7\text{A}$
Total Gate Charge ( $V_{GS} = -8\text{V}$ )		—	15	—	nC	
Gate-Source Charge	$Q_{gs}$	—	0.9	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	2.9	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	5.5	—	ns	$V_{DD} = -10\text{V}, V_{GS} = -4.5\text{V}, R_L = 3.3\Omega, R_g = 1\Omega$
Turn-On Rise Time	$t_R$	—	22.6	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	34.1	—	ns	
Turn-Off Fall Time	$t_F$	—	34.3	—	ns	
Body Diode Reverse Recovery Time	$t_{RR}$	—	13	—	ns	$I_S = -3.0\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	$Q_{RR}$	—	3.3	—	nC	$I_S = -3.0\text{A}, dI/dt = 100\text{A}/\mu\text{s}$

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided

6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.

 7.  $I_{AS}$  and  $E_{AS}$  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 product testing.

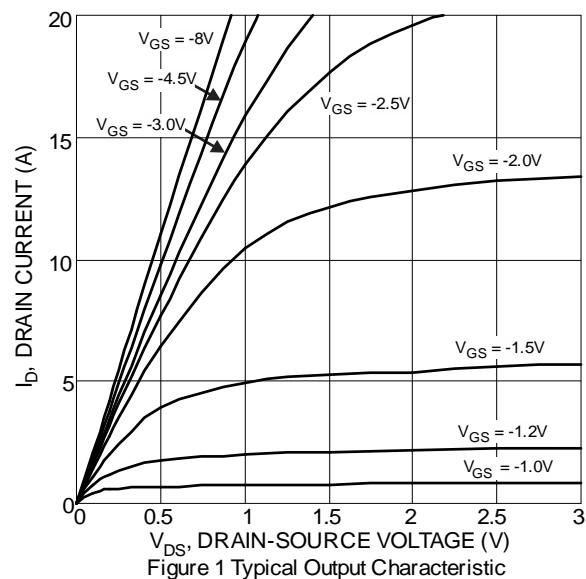


Figure 1 Typical Output Characteristic

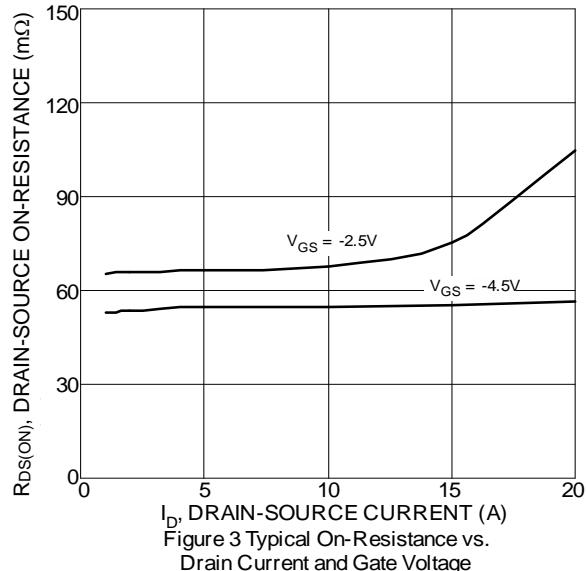


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

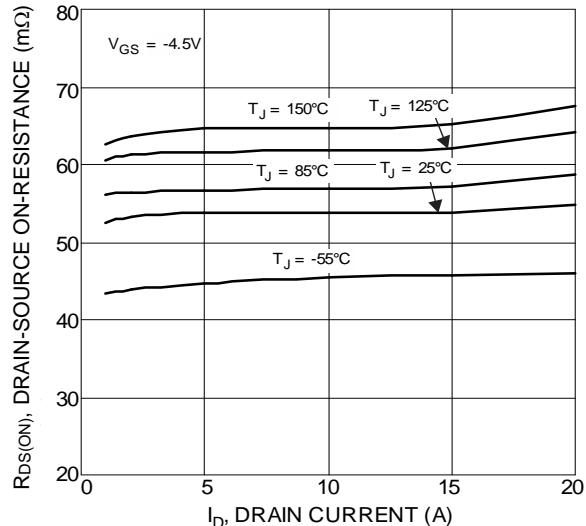


Figure 5 Typical On-Resistance vs.  
Drain Current and Temperature

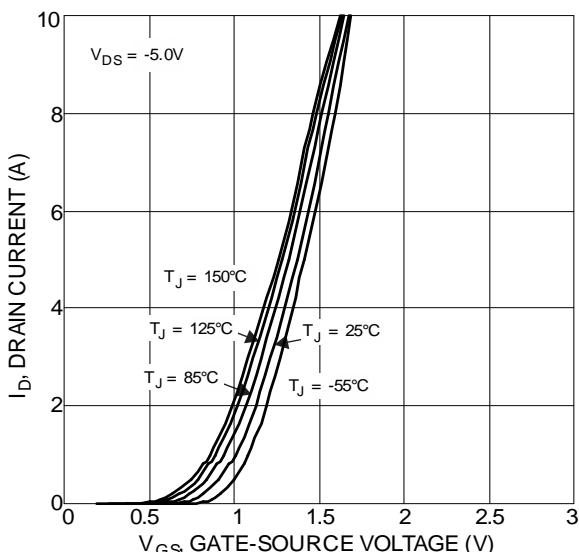


Figure 2 Typical Transfer Characteristics

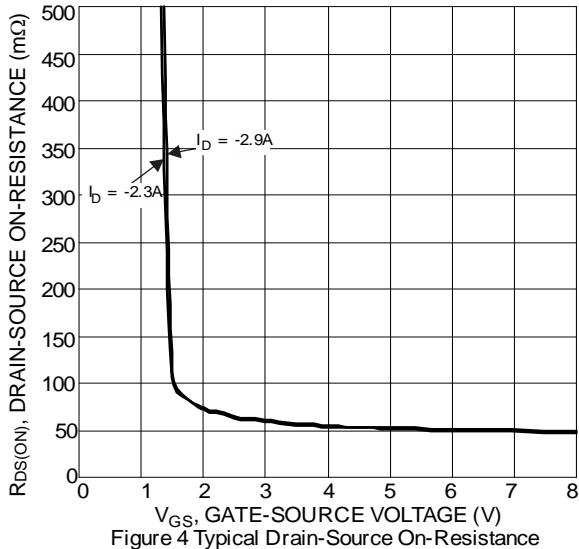


Figure 4 Typical Drain-Source On-Resistance  
vs. Gate-Source Voltage

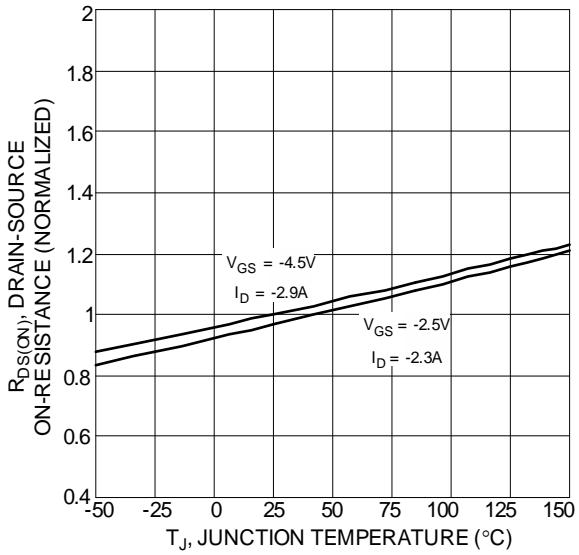
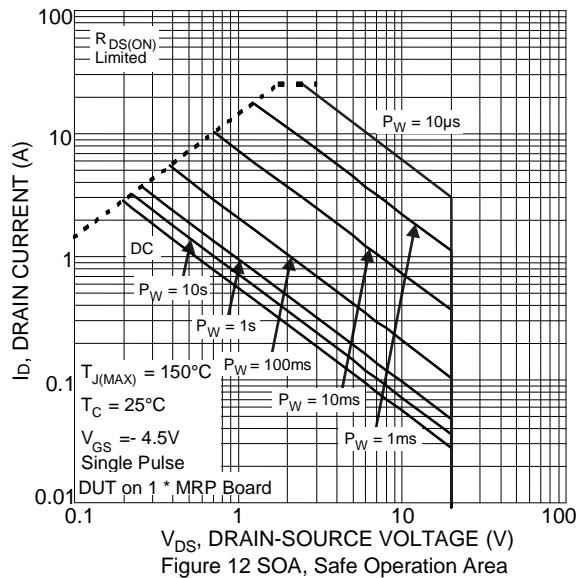
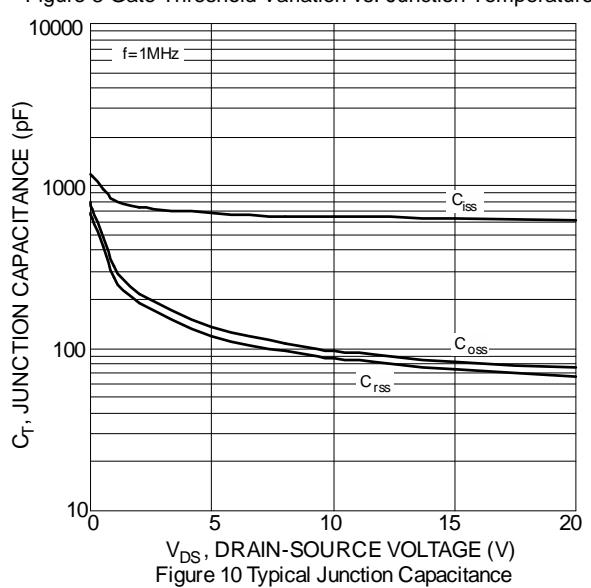
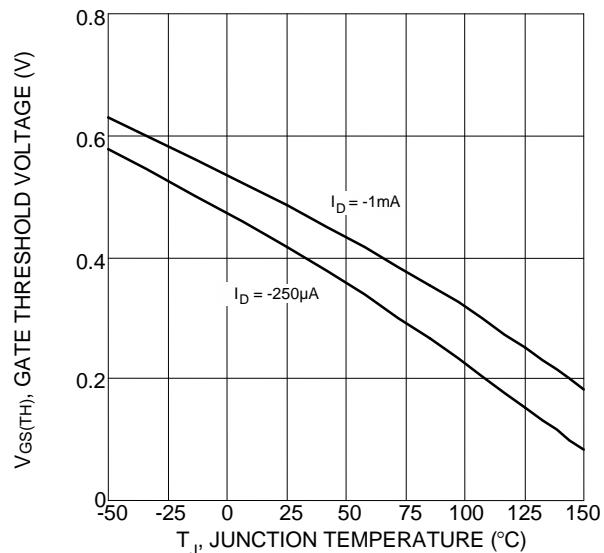
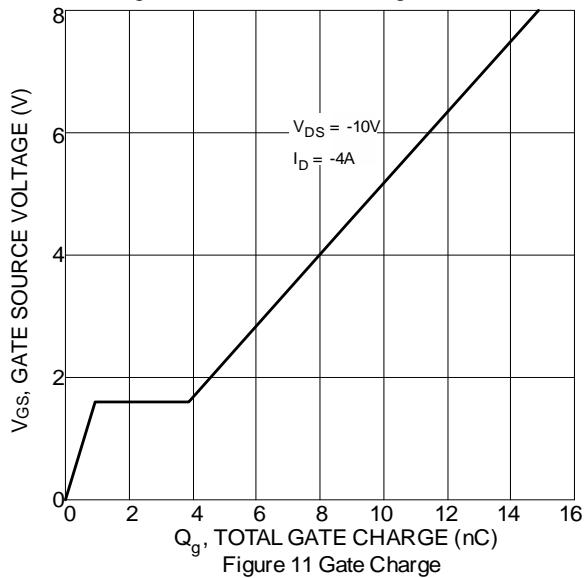
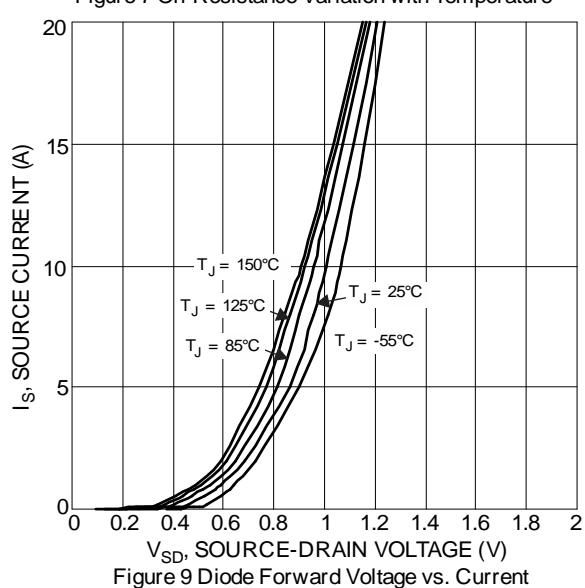
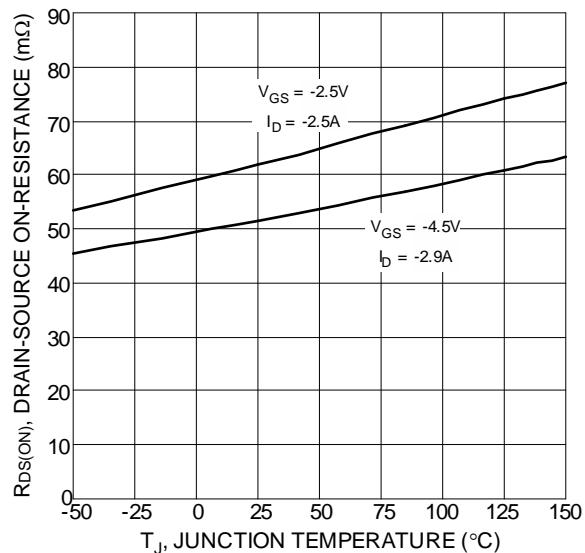


Figure 6 On-Resistance Variation with Temperature



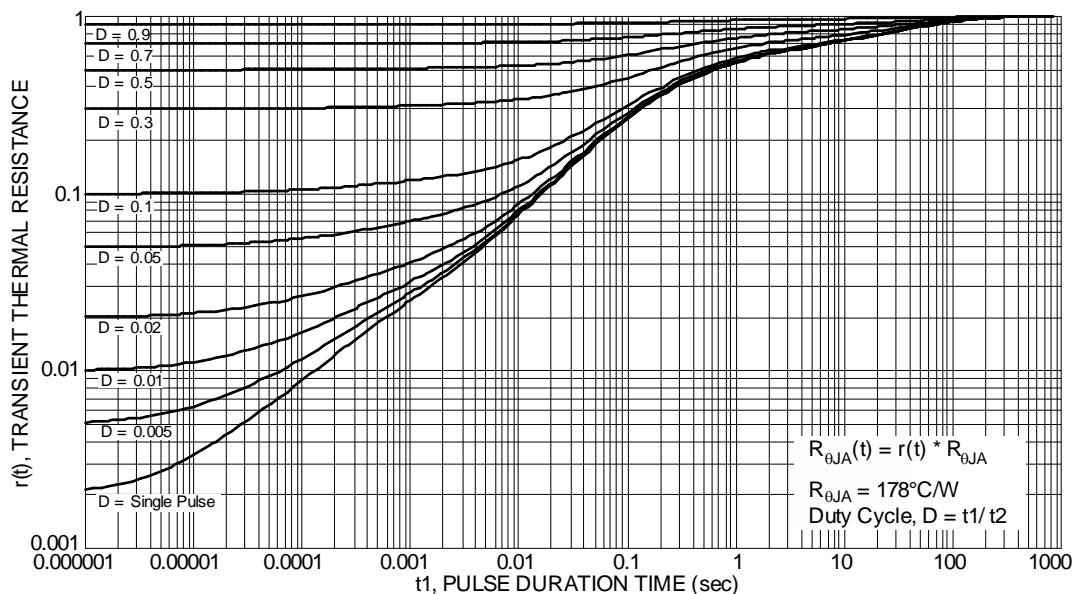
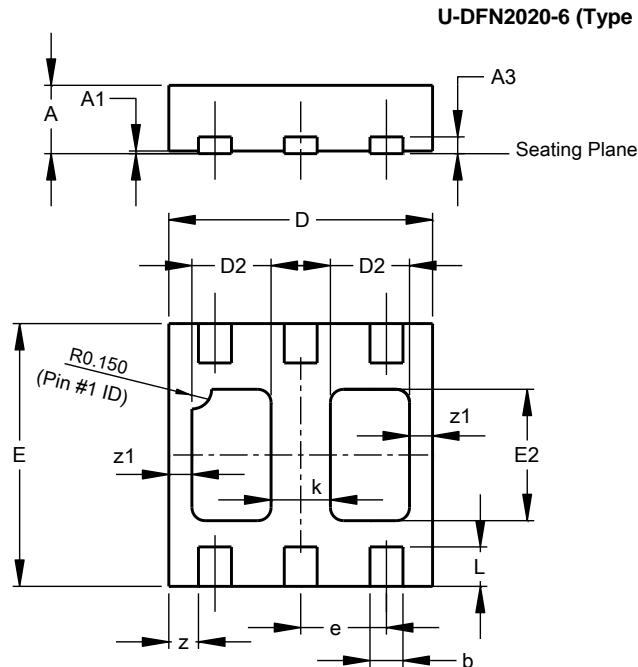


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

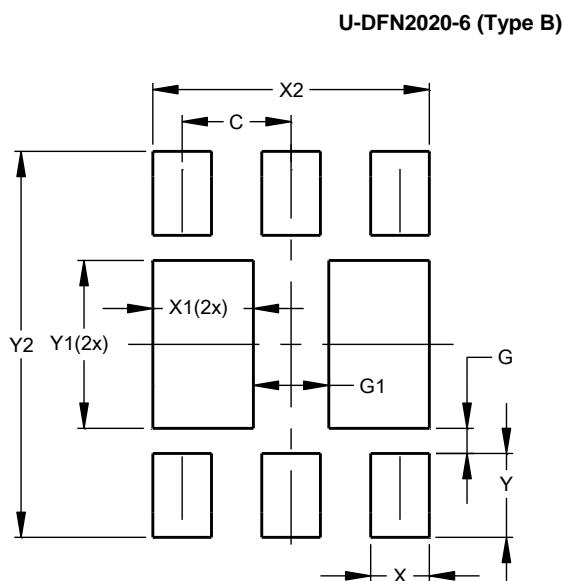


U-DFN2020-6 (Type B)			
Dim	Min	Max	Typ
<b>A</b>	0.545	0.605	0.575
<b>A1</b>	0.00	0.05	0.02
<b>A3</b>	-	-	0.13
<b>b</b>	0.20	0.30	0.25
<b>D</b>	1.95	2.075	2.00
<b>D2</b>	0.50	0.70	0.60
<b>e</b>	-	-	0.65
<b>E</b>	1.95	2.075	2.00
<b>E2</b>	0.90	1.10	1.00
<b>k</b>	-	-	0.45
<b>L</b>	0.25	0.35	0.30
<b>z</b>	-	-	0.225
<b>z1</b>	-	-	0.175

All Dimensions in mm

## Suggested Pad Layout

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



Dimensions	Value (in mm)
<b>C</b>	0.650
<b>G</b>	0.150
<b>G1</b>	0.450
<b>X</b>	0.350
<b>X1</b>	0.600
<b>X2</b>	1.650
<b>Y</b>	0.500
<b>Y1</b>	1.000
<b>Y2</b>	2.300

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