

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ max}$	$I_D \text{ max}$ $T_A = +25^\circ\text{C}$
-30V	19m Ω @ $V_{GS} = -10\text{V}$	-8.7A
	45m Ω @ $V_{GS} = -4.5\text{V}$	-5.5A

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.

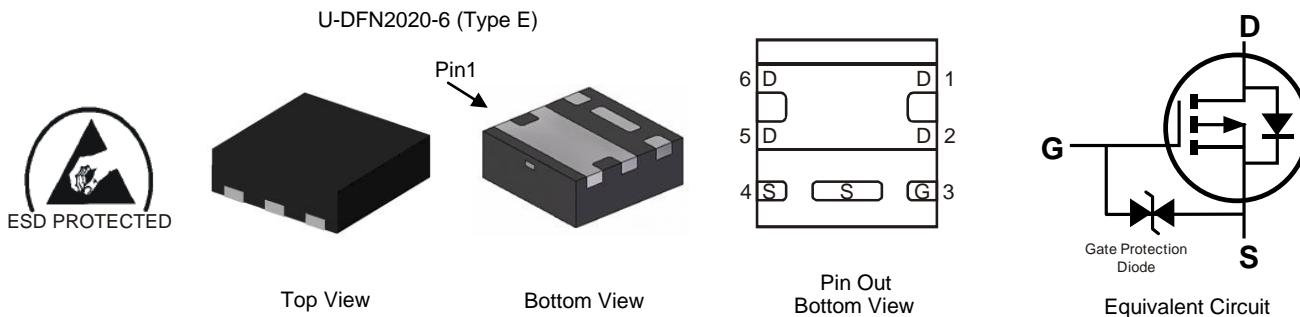
- Battery Management Application
- Power Management Functions
- DC-DC Converters

Features and Benefits

- 0.6mm profile – ideal for low profile applications
- Low Gate Threshold Voltage
- Low On-Resistance
- 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

Mechanical Data

- Case: U-DFN2020-6 (Type E)
- 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 (4)
- Weight: 0.007 grams (Approximate)



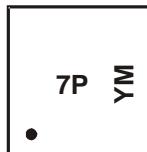
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3026SFDE-7	U-DFN2020-6 (Type E)	3,000/Tape & Reel
DMP3026SFDE-13	U-DFN2020-6 (Type E)	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 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



7P = 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Units
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	-8.7 -6.9	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	-10.4 -8.4	A
Pulsed Drain Current (10 μs pulse, duty cycle = 1%)			I_{DM}	-50	A
Continuous Source-Drain Diode Current (Note 6)		$T_A = +25^\circ\text{C}$	I_S	-2.0	A
Avalanche Current (Note 7) $L = 0.1\text{mH}$			I_{AS}	-23	A
Avalanche Energy (Note 7) $L = 0.1\text{mH}$			E_{AS}	27	mJ

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	P_D	0.72	W
	$T_A = +70^\circ\text{C}$		0.46	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	175	$^\circ\text{C/W}$
	$t < 10\text{s}$		121	
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	P_D	2.0	W
	$T_A = +70^\circ\text{C}$		1.3	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	61	$^\circ\text{C/W}$
	$t < 10\text{s}$		42	
Thermal Resistance, Junction to Case (Note 6)	Steady state	$R_{\theta JC}$	9.3	
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	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	-1	μA	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current $T_J = +150^\circ\text{C}$ (Note 9)		—	—	-100		
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(\text{th})}$	-1	—	-3	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	15	19	$\text{m}\Omega$	$V_{GS} = -10\text{V}, I_D = -4.5\text{A}$
			28	45		$V_{GS} = -4.5\text{V}, I_D = -3.5\text{A}$
			34	54		$V_{GS} = -4.0\text{V}, I_D = -3.0\text{A}$
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	$V_{GS} = 0\text{V}, I_S = -1.0\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1,204	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	154	—		
Reverse Transfer Capacitance	C_{rss}	—	112	—		
Gate Resistance	R_g	—	16	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($V_{GS} = -10\text{V}$)	Q_g	—	19.6	—	nC	$V_{DS} = -15\text{V}, I_D = -9.5\text{A}$
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	—	9.2	—		
Gate-Source Charge	Q_{gs}	—	4.3	—		
Gate-Drain Charge	Q_{gd}	—	3.9	—	ns	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V}, R_G = 6\Omega, I_D = -9.5\text{A}$
Turn-On Delay Time	$t_{D(\text{on})}$	—	5.3	—		
Turn-On Rise Time	t_r	—	23	—		
Turn-Off Delay Time	$t_{D(\text{off})}$	—	34	—		
Turn-Off Fall Time	t_f	—	26	—		
Reverse Recovery Time	t_{rr}	—	10	—	ns	$I_F = -9.5\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}	—	3.3	—	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_{AS} and E_{AS} rating 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.

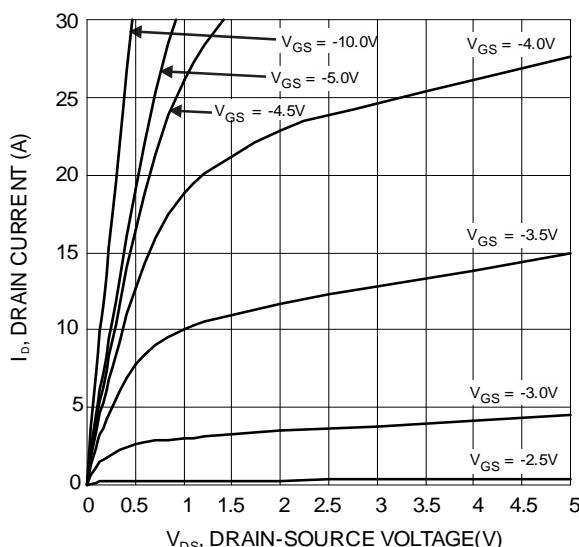


Figure 1 Typical Output Characteristic

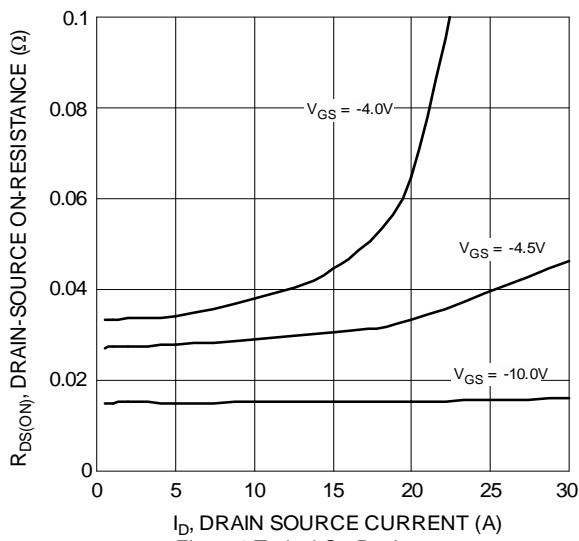


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

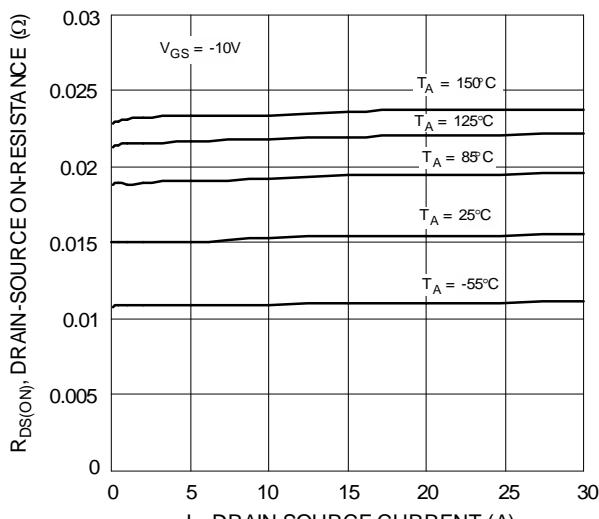


Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

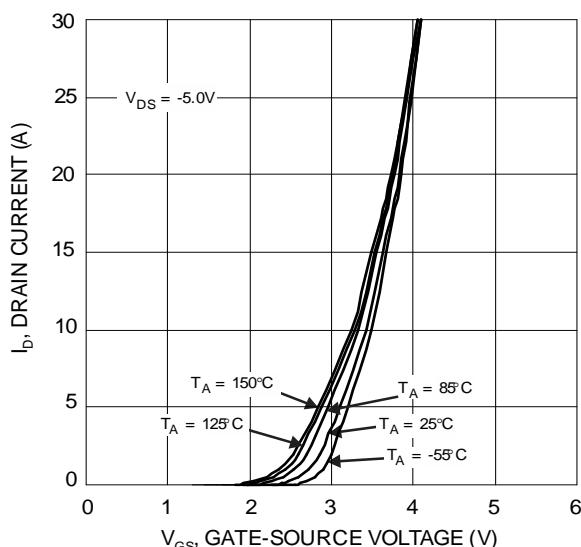


Figure 2 Typical Transfer Characteristic

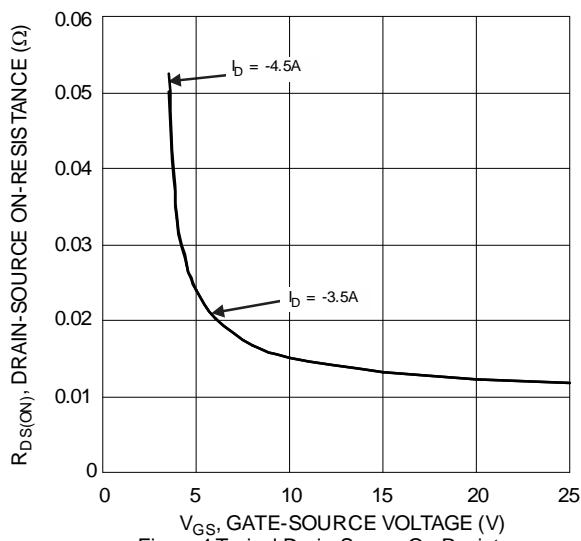


Figure 4 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

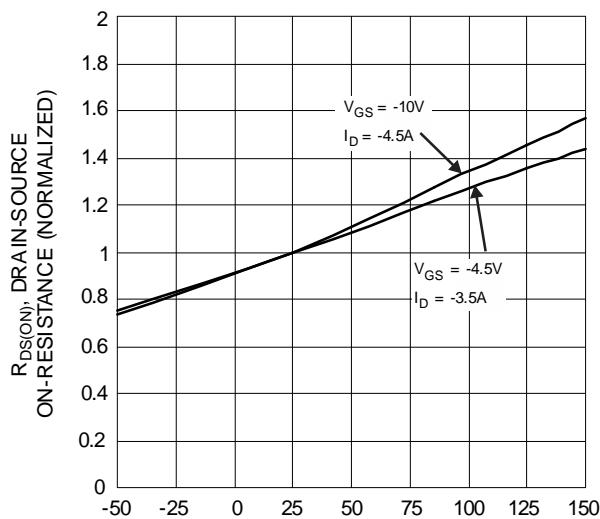
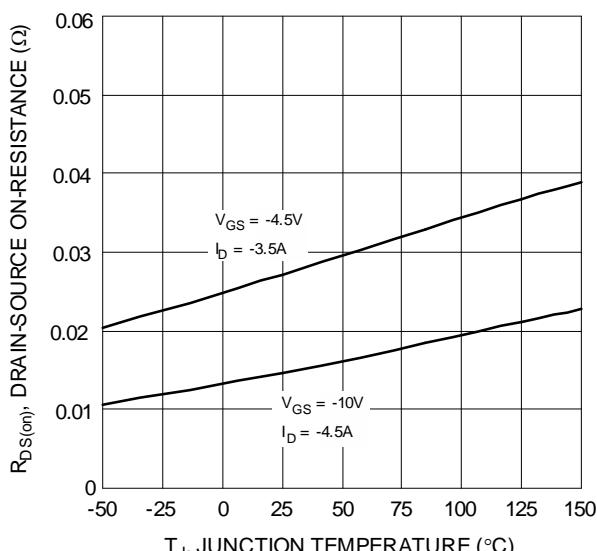
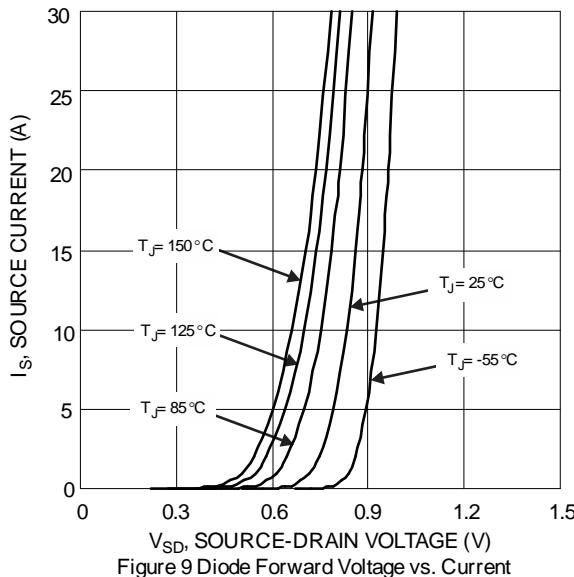


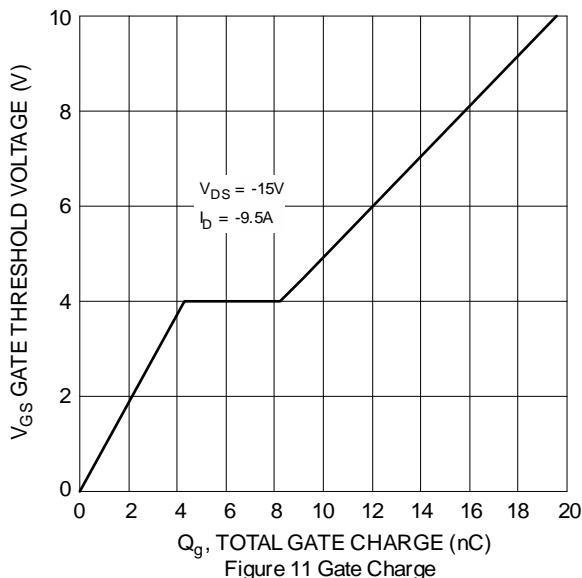
Figure 6 On-Resistance Variation with Temperature



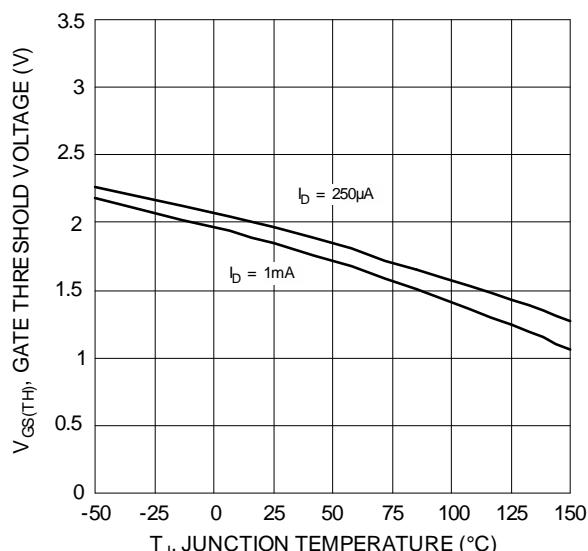
$V_{GS} = -4.5V$
 $b = -3.5A$
 $V_{GS} = -10V$
 $I_D = -4.5A$



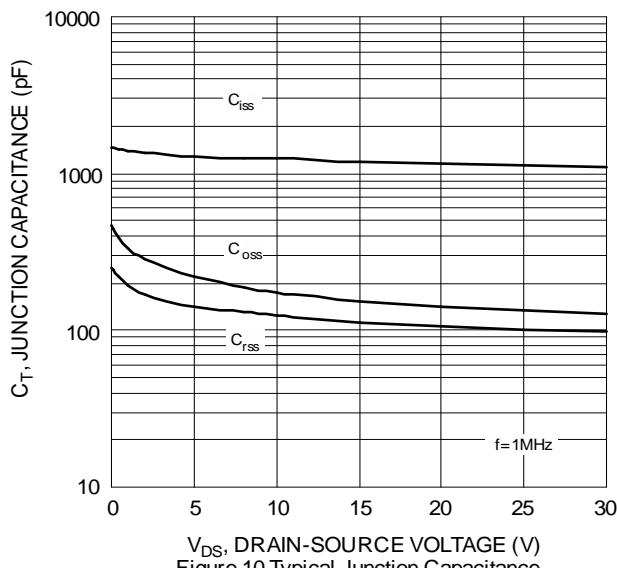
$T_J = 150^\circ C$
 $T_J = 125^\circ C$
 $T_J = 85^\circ C$
 $T_J = -55^\circ C$



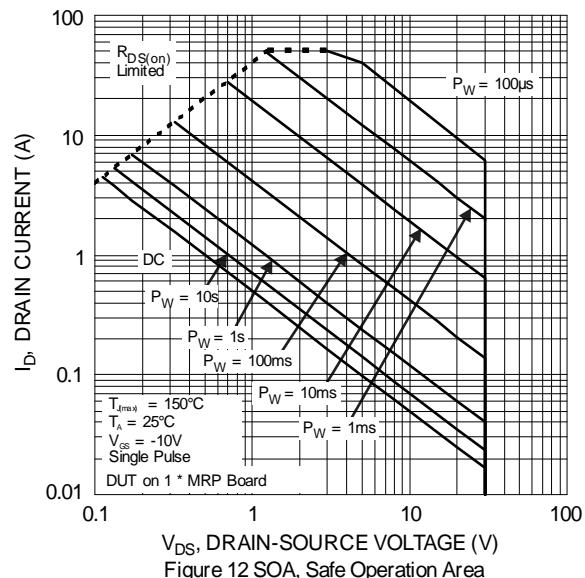
$V_{DS} = -15V$
 $I_D = -9.5A$



$I_D = 250\mu A$
 $I_D = 1mA$



C_{iss}
 C_{oss}
 C_{rss}
 $f = 1MHz$



$T_{Jmax} = 150^\circ C$
 $T_A = 25^\circ C$
 $V_{GS} = -10V$
Single Pulse
DUT on 1 * MRP Board

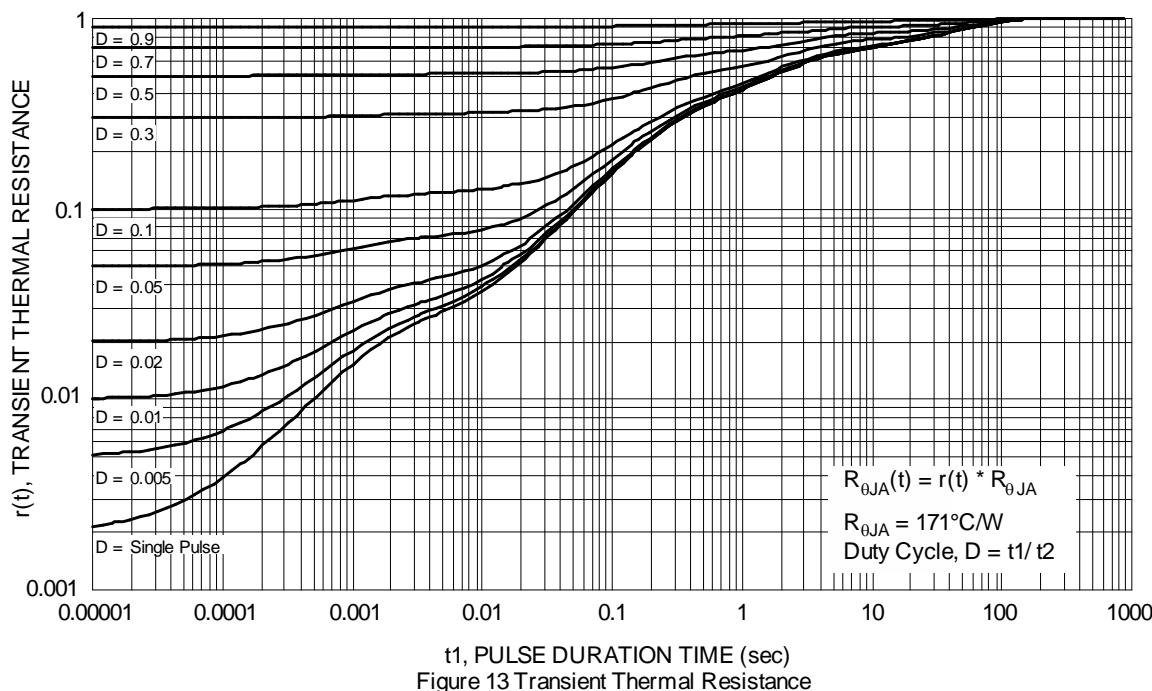
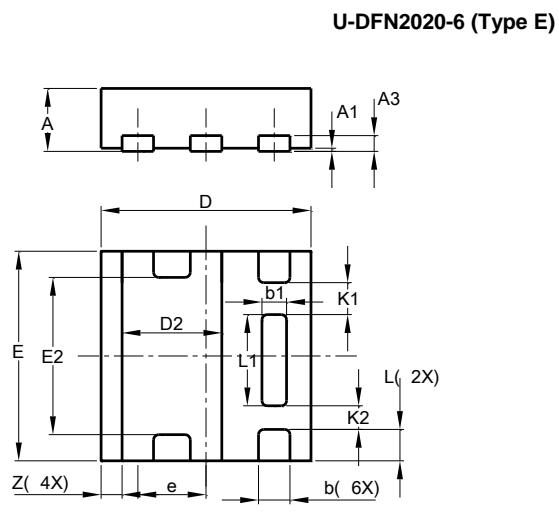


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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



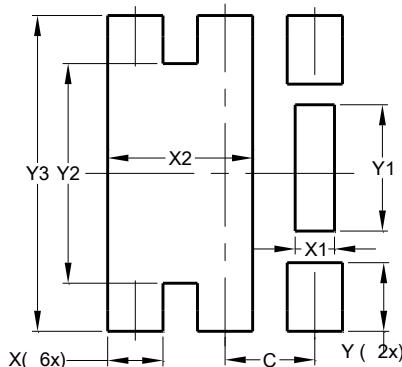
U-DFN2020-6 Type E			
Dim	Min	Max	Typ
A	0.57	0.63	0.60
A1	0	0.05	0.03
A3	—	—	0.15
b	0.25	0.35	0.30
b1	0.185	0.285	0.235
D	1.95	2.05	2.00
D2	0.85	1.05	0.95
E	1.95	2.05	2.00
E2	1.40	1.60	1.50
e	—	—	0.65
L	0.25	0.35	0.30
L1	0.82	0.92	0.87
K1	—	—	0.305
K2	—	—	0.225
Z	—	—	0.20

All Dimensions in mm

Suggested Pad Layout

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

U-DFN2020-6 (Type E)



Dimensions	Value (in mm)
C	0.650
X	0.400
X1	0.285
X2	1.050
Y	0.500
Y1	0.920
Y2	1.600
Y3	2.300

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