

## Product Summary

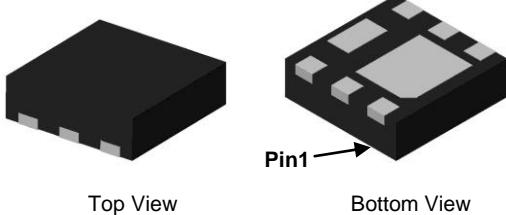
BV <sub>DSS</sub>	R <sub>DSON</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
30V	7mΩ @ V <sub>GS</sub> = 10V	14.1A
	10mΩ @ V <sub>GS</sub> = 4.5V	11.8A
	15mΩ @ V <sub>GS</sub> = 3.7V	9.6A

## Description

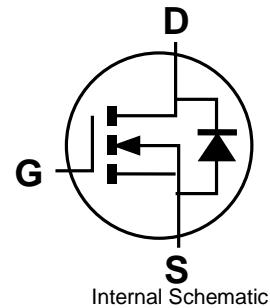
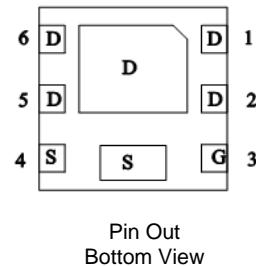
This MOSFET is designed to minimize the on-state resistance (R<sub>DSON</sub>), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

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



U-DFN2020-6 (Type F)



Internal Schematic

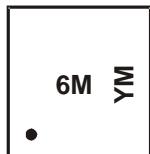
## Ordering Information (Note 4)

Part Number	Reel Size (inches)	Quantity per Reel
DMT3006LFDF-7	7	3,000
DMT3006LFDF-13	13	10,000

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.
- 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



6M = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: E = 2017)

M = Month (ex: 9 = September)

### Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021					
Code	C	D	E	F	G	H	I					
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	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	14.1 12.5	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{DM}$	80	A
Continuous Source-Drain Diode Current (Note 6)			$I_S$	2	A
Avalanche Current (Note 7) $L = 0.1\text{mH}$			$I_{AS}$	25	A
Avalanche Energy (Note 7) $L = 0.1\text{mH}$			$E_{AS}$	31	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	0.8	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	155	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)	$P_D$	2.1	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	60	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	6.9	$^\circ\text{C}/\text{W}$
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
<b>OFF CHARACTERISTICS (Note 8)</b>						
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	$\mu\text{A}$	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = +20\text{V}, V_{DS} = 0\text{V}$ $V_{GS} = -16\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 8)</b>						
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	$R_{DS(ON)}$	—	5.8	7	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 9\text{A}$
			7.8	10		$V_{GS} = 4.5\text{V}, I_D = 8\text{A}$
			9.3	15		$V_{GS} = 3.7\text{V}, I_D = 5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.7	1.0	V	$V_{GS} = 0\text{V}, I_S = 2\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	$C_{iss}$	—	1,155	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	456	—		
Reverse Transfer Capacitance	$C_{rss}$	—	72	—		
Gate Resistance	$R_G$	—	1.6	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_G$	—	16.7	—		
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_G$	—	8.4	—		
Gate-Source Charge	$Q_{GS}$	—	2.2	—	nC	$V_{DD} = 15\text{V}, I_D = 9\text{A}$
Gate-Drain Charge	$Q_{GD}$	—	3.5	—		
Turn-On Delay Time	$t_{D(ON)}$	—	3.5	—		
Turn-On Rise Time	$t_R$	—	5.5	—	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_G = 3\Omega, I_D = 9\text{A}$
Turn-Off Delay Time	$t_{D(OFF)}$	—	13.5	—		
Turn-Off Fall Time	$t_F$	—	4.6	—		
Reverse Recovery Time	$t_{RR}$	—	19.3	—	ns	$I_F = 1.5\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	8.6	—		

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 EAS 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.

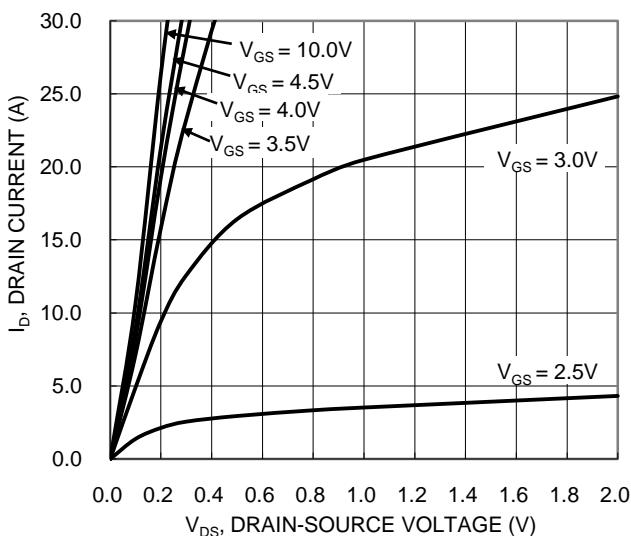


Figure 1. Typical Output Characteristic

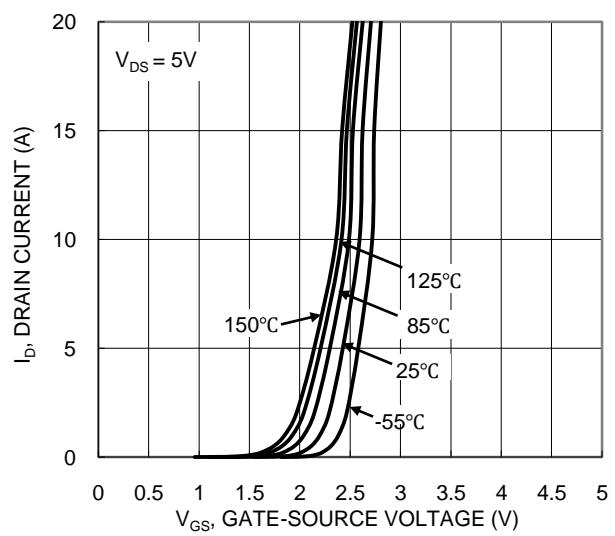


Figure 2. Typical Transfer Characteristic

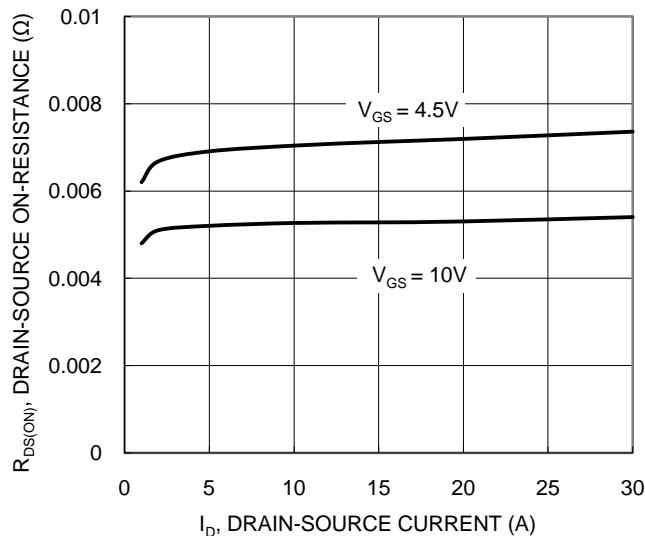


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

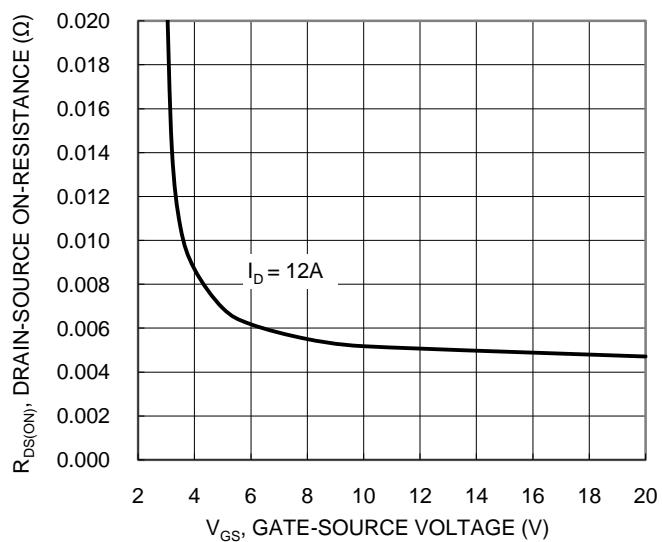


Figure 4. Typical Transfer Characteristic

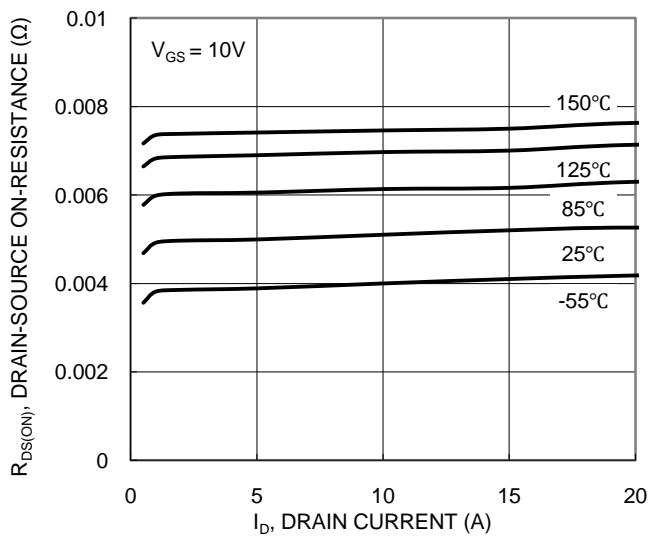


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

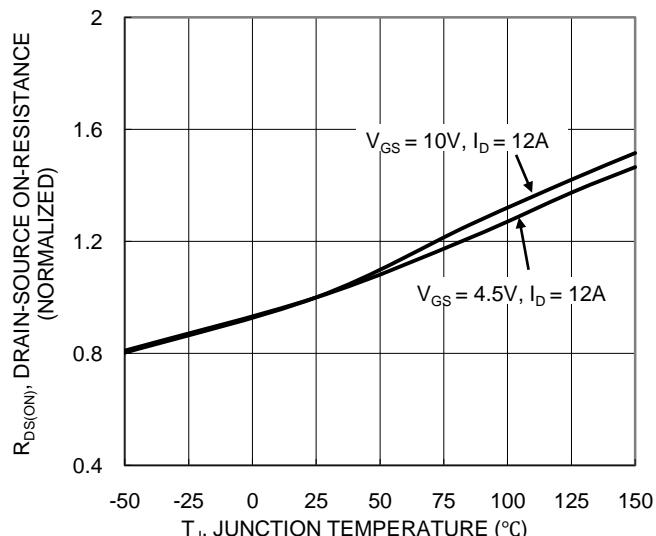
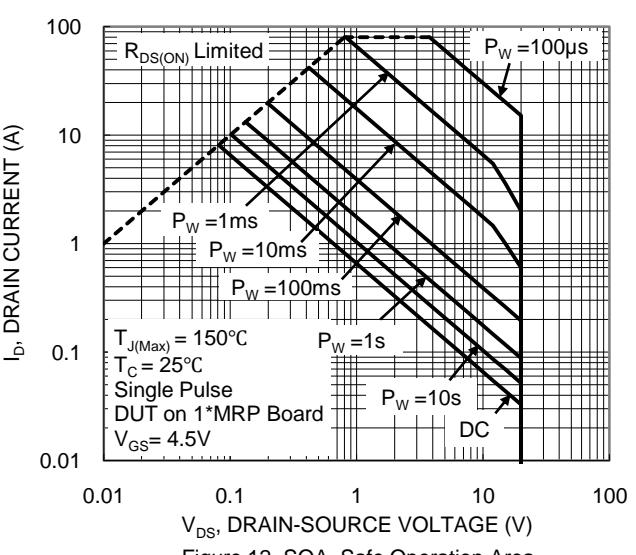
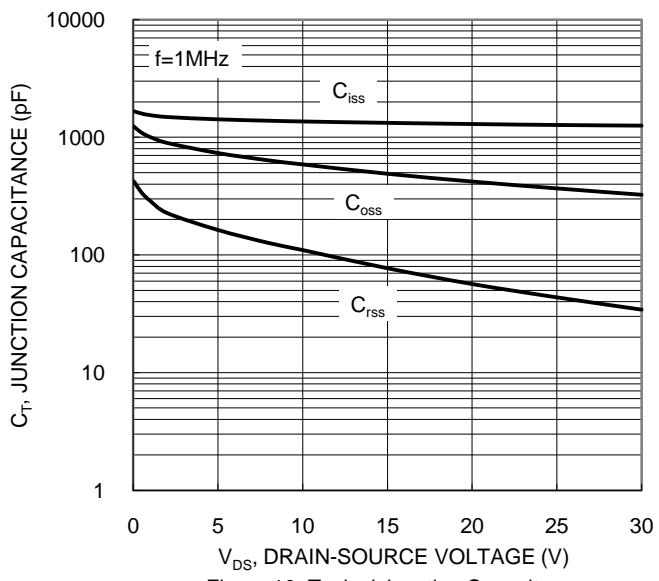
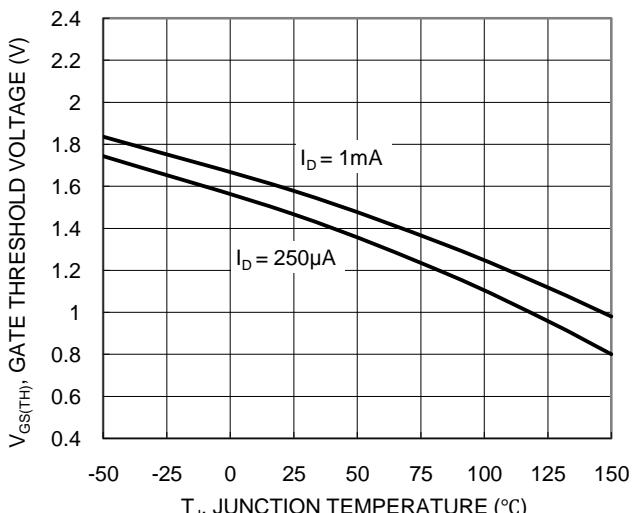
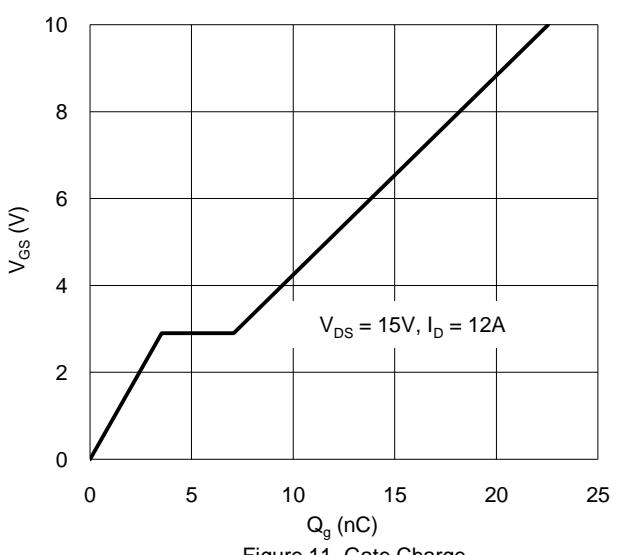
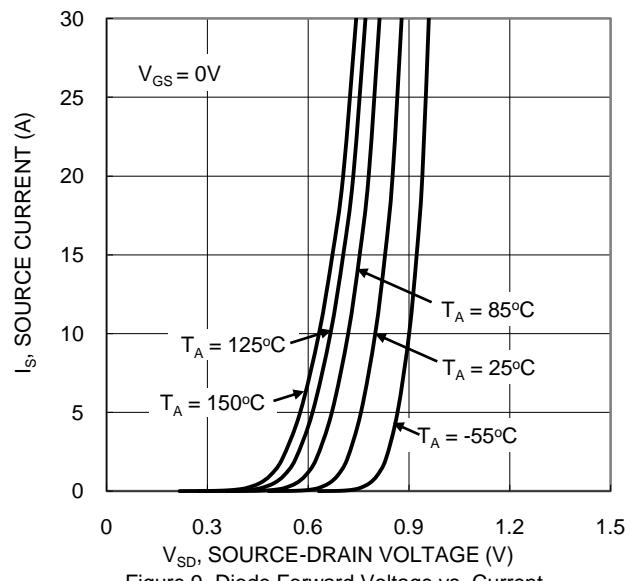
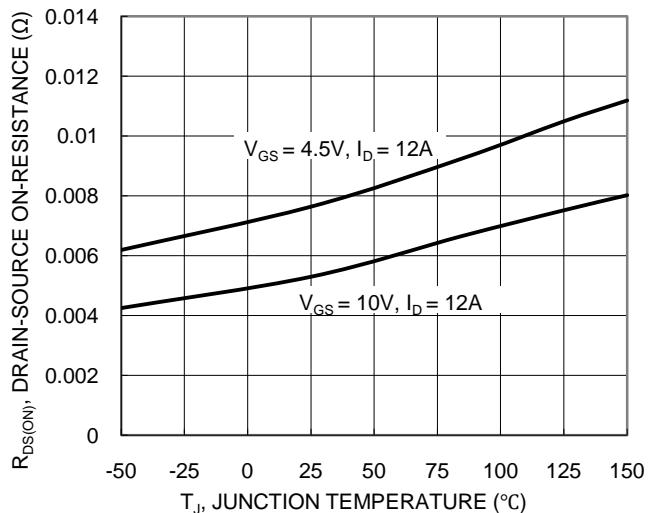


Figure 6. On-Resistance Variation with Temperature



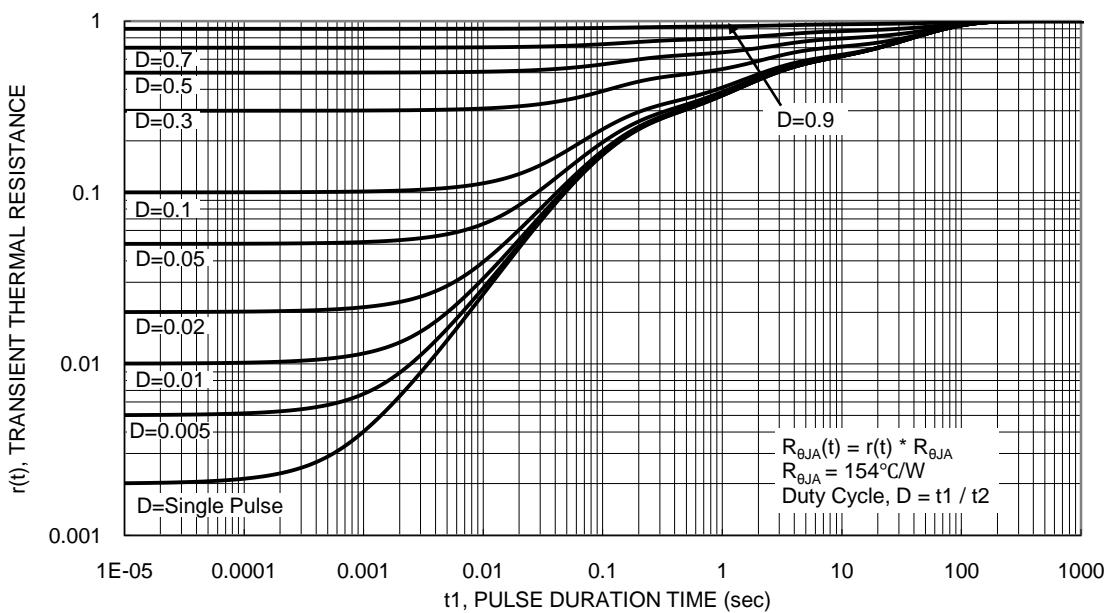
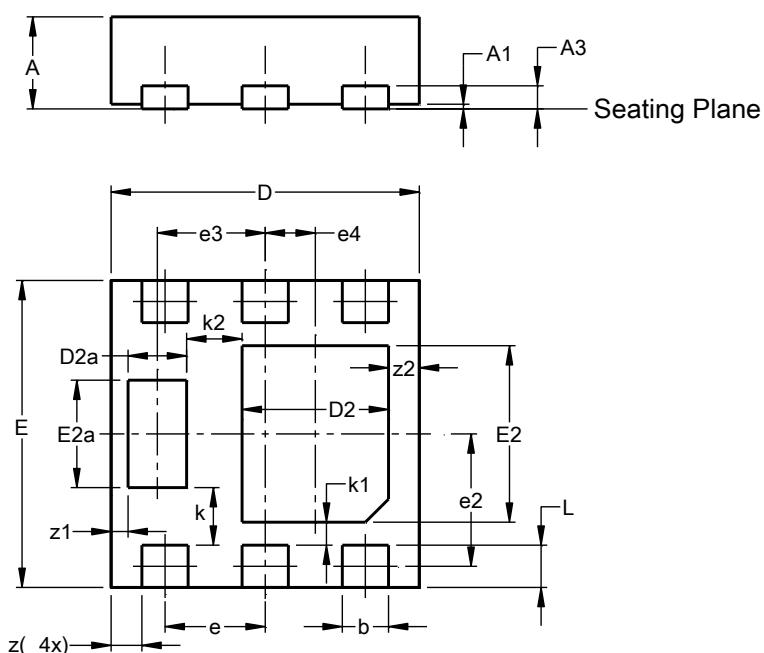


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

U-DFN2020-6 (Type F)

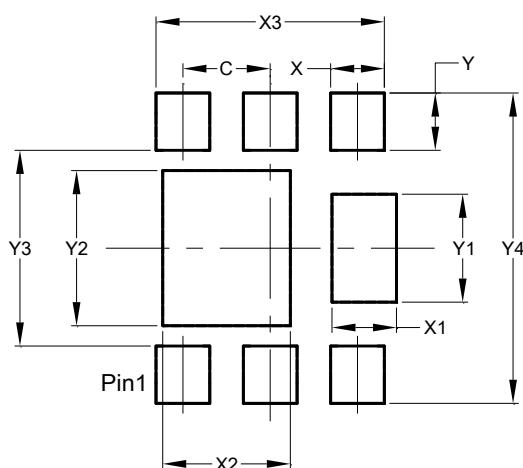


U-DFN2020-6 (Type F)			
Dim	Min	Max	Typ
<b>A</b>	0.57	0.63	0.60
<b>A1</b>	0.00	0.05	0.03
<b>A3</b>	-	-	0.15
<b>b</b>	0.25	0.35	0.30
<b>D</b>	1.95	2.05	2.00
<b>D2</b>	0.85	1.05	0.95
<b>D2a</b>	0.33	0.43	0.38
<b>E</b>	1.95	2.05	2.00
<b>E2</b>	1.05	1.25	1.15
<b>E2a</b>	0.65	0.75	0.70
<b>e</b>	0.65	BSC	
<b>e2</b>	0.863	BSC	
<b>e3</b>	0.70	BSC	
<b>e4</b>	0.325	BSC	
<b>k</b>	0.37	BSC	
<b>k1</b>	0.15	BSC	
<b>k2</b>	0.36	BSC	
<b>L</b>	0.225	0.325	0.275
<b>z</b>	0.20	BSC	
<b>z1</b>	0.110	BSC	
<b>z2</b>	0.20	BSC	
All Dimensions in mm			

## Suggested Pad Layout

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

U-DFN2020-6 (Type F)



Dimensions	Value (in mm)
<b>C</b>	0.650
<b>X</b>	0.400
<b>X1</b>	0.480
<b>X2</b>	0.950
<b>X3</b>	1.700
<b>Y</b>	0.425
<b>Y1</b>	0.800
<b>Y2</b>	1.150
<b>Y3</b>	1.450
<b>Y4</b>	2.300

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