

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
100V	29mΩ @ V _{GS} = 10V	6.3A
	46mΩ @ V _{GS} = 4.5V	5.3A

Description and Applications

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.


- Power-management functions
- Battery-operated systems and solid-state relays
- Drivers: relays, solenoids, lamps, hammers, displays, memories, transistors, etc.

Features and Benefits

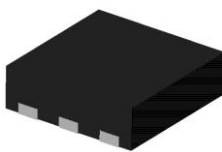
- Rated to +175°C — Ideal for High Ambient Temperature Environments
- 0.6mm Profile — Ideal for Low Profile Applications
- PCB Footprint of 4mm²
- Low On-Resistance
- 100% Unclamped Inductive Switching (UIS) Test in Production — Ensures More Reliable and Robust End Application
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The DMTH10H029LDFWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

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

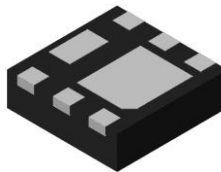
Mechanical Data

- Package: U-DFN2020-6
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 
- Weight: 0.008 grams (Approximate)

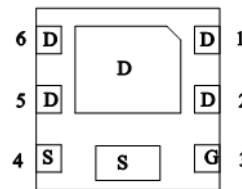
U-DFN2020-6/SWP (Type F)



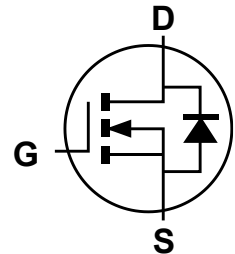
Top View



Bottom View



Pin Out
Bottom View



Internal Schematic

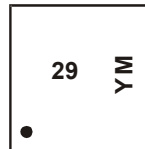
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMTH10H029LDFWQ-7	U-DFN2020-6/SWP (Type F)	3000	Reel
DMTH10H029LDFWQ-13	U-DFN2020-6/SWP (Type F)	10,000	Reel

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 - 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

U-DFN2020-6/SWP (Type F)



29 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: M = 2025)
 M = Month (ex: 9 = September)

Date Code Key

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Code	M	N	P	R	S	T	U	V	W	X	Y	Z

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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = 10V (Note 6)	I _D	6.3 4.4	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	45	A
Maximum Body Diode Continuous Current (Note 6)	I _S	3.3	A
Pulsed Body Diode Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	45	A
Avalanche Current, L = 0.3mH	I _{AS}	13	A
Avalanche Energy, L = 0.3mH	E _{AS}	25	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.22	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	123	°C/W
Total Power Dissipation (Note 6)	P _D	2.5	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	60	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

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.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 80V, V _{GS} = 0
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1.3	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	20	29	mΩ	V _{GS} = 10V, I _D = 6A
		—	31	46		V _{GS} = 4.5V, I _D = 4A
Diode Forward Voltage	V _{SD}	—	0.8	1.0	V	V _{GS} = 0, I _S = 6A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	619	—	pF	V _{DS} = 50V, V _{GS} = 0, f = 1MHz
Output Capacitance	C _{oss}	—	210	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	10	—	pF	
Gate Resistance	R _g	—	1.3	—	Ω	V _{DS} = 0, V _{GS} = 0, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6	—	nC	V _{DS} = 50V, I _D = 6A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	12	—	nC	
Gate-Source Charge	Q _{gs}	—	3	—	nC	
Gate-Drain Charge	Q _{gd}	—	2.7	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	5.4	—	ns	V _{DS} = 50V, R _L = 5.85Ω, V _{GS} = 10V, R _{GEN} = 3Ω
Turn-On Rise Time	t _R	—	3.9	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	12.8	—	ns	
Turn-Off Fall Time	t _F	—	5.2	—	ns	I _F = 6A, di/dt = 500A/μs
Reverse-Recovery Time	t _{RR}	—	18	—	ns	
Reverse-Recovery Charge	Q _{RR}	—	42	—	nC	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

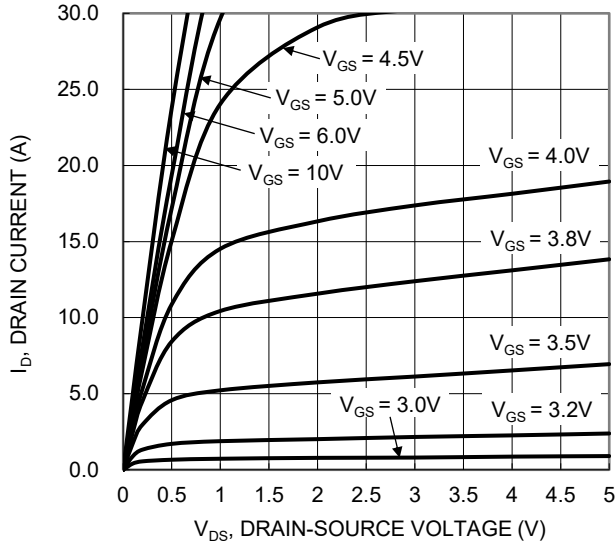


Figure 1. Typical Output Characteristic

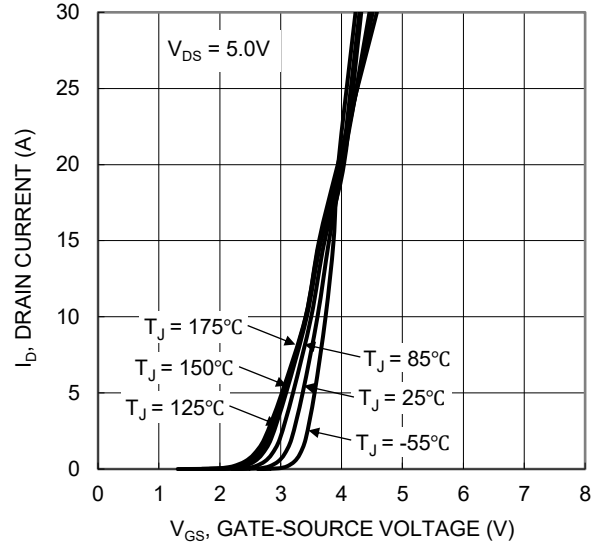


Figure 2. Typical Transfer Characteristic

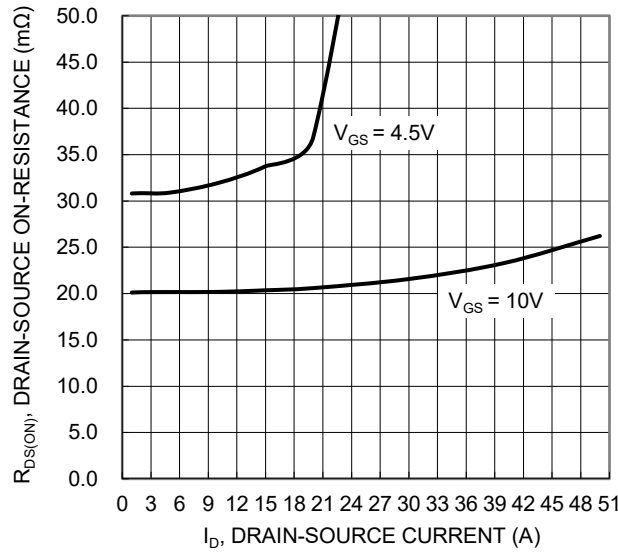


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

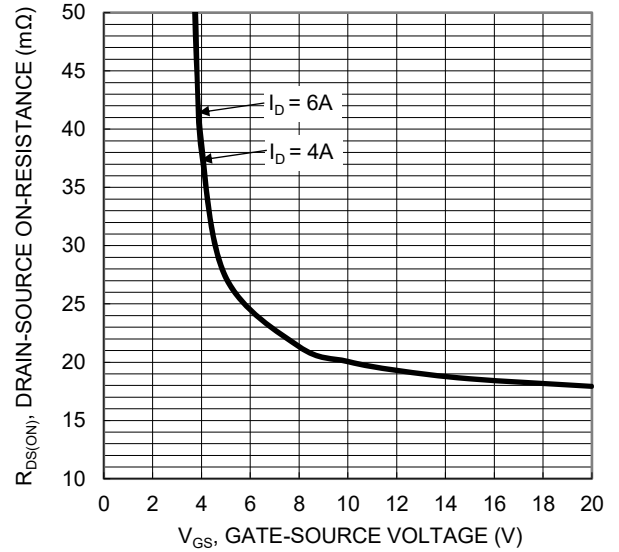


Figure 4. Typical Transfer Characteristic

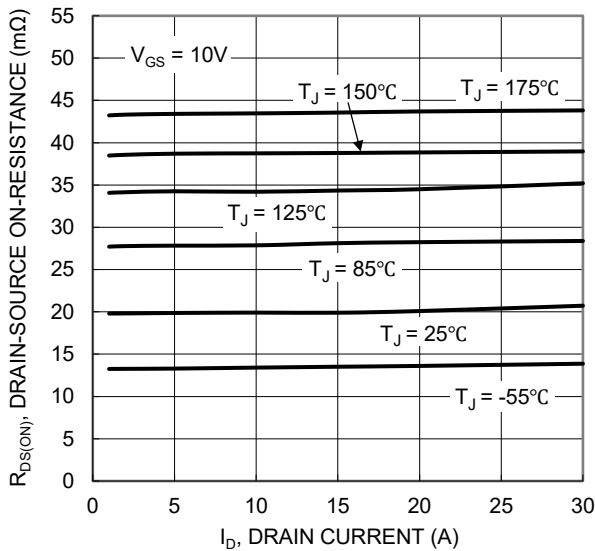


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

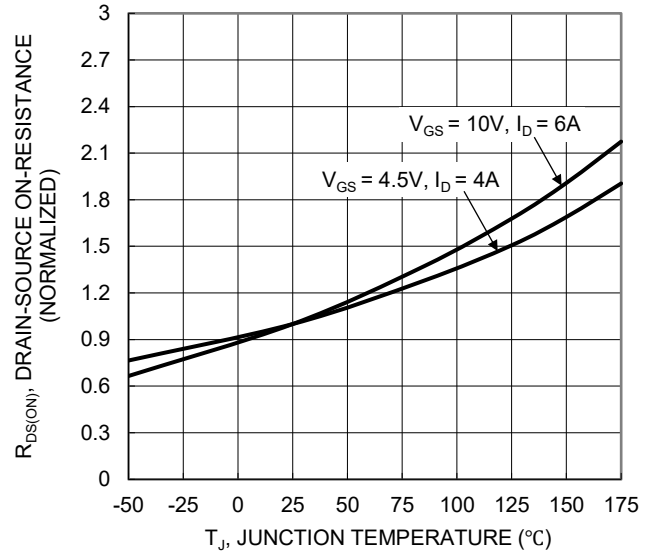


Figure 6. On-Resistance Variation with Temperature

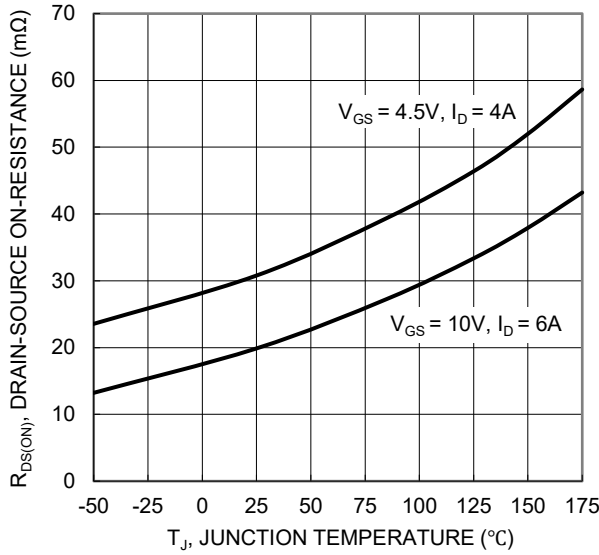


Figure 7. On-Resistance Variation with Temperature

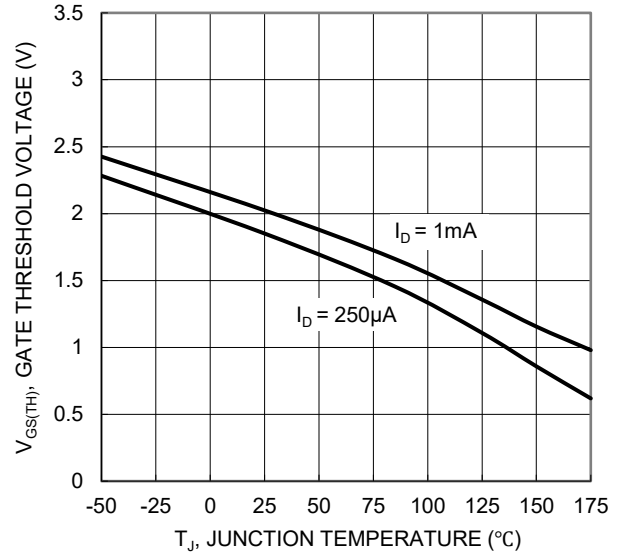


Figure 8. Gate Threshold Variation vs. Junction Temperature

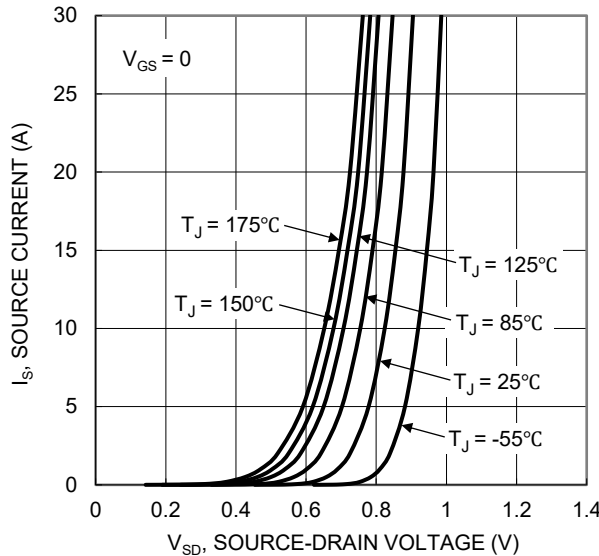


Figure 9. Diode Forward Voltage vs. Current

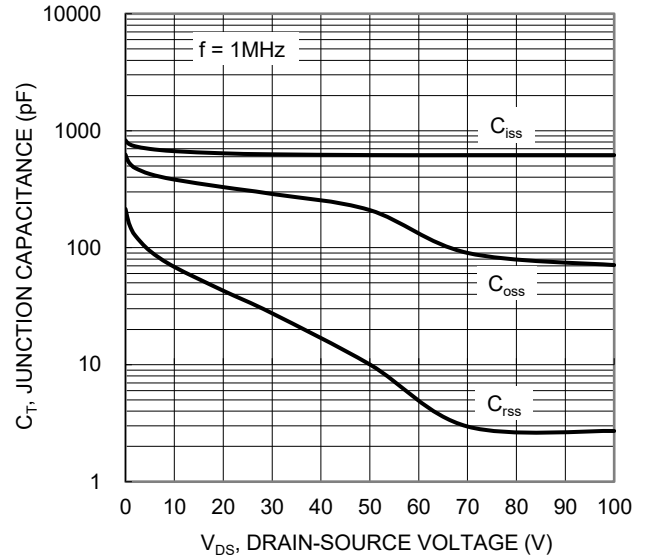


Figure 10. Typical Junction Capacitance

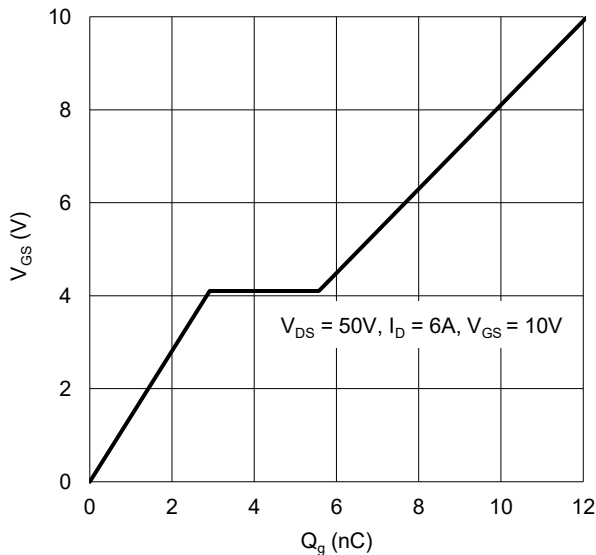


Figure 11. Gate Charge

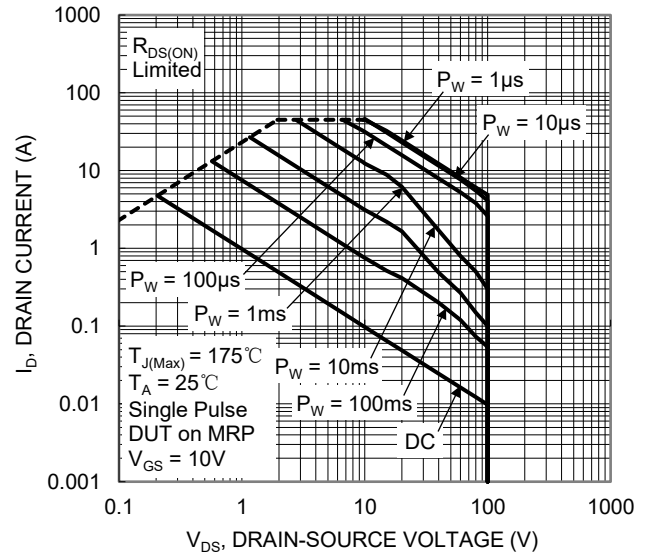


Figure 12. SOA, Safe Operation Area

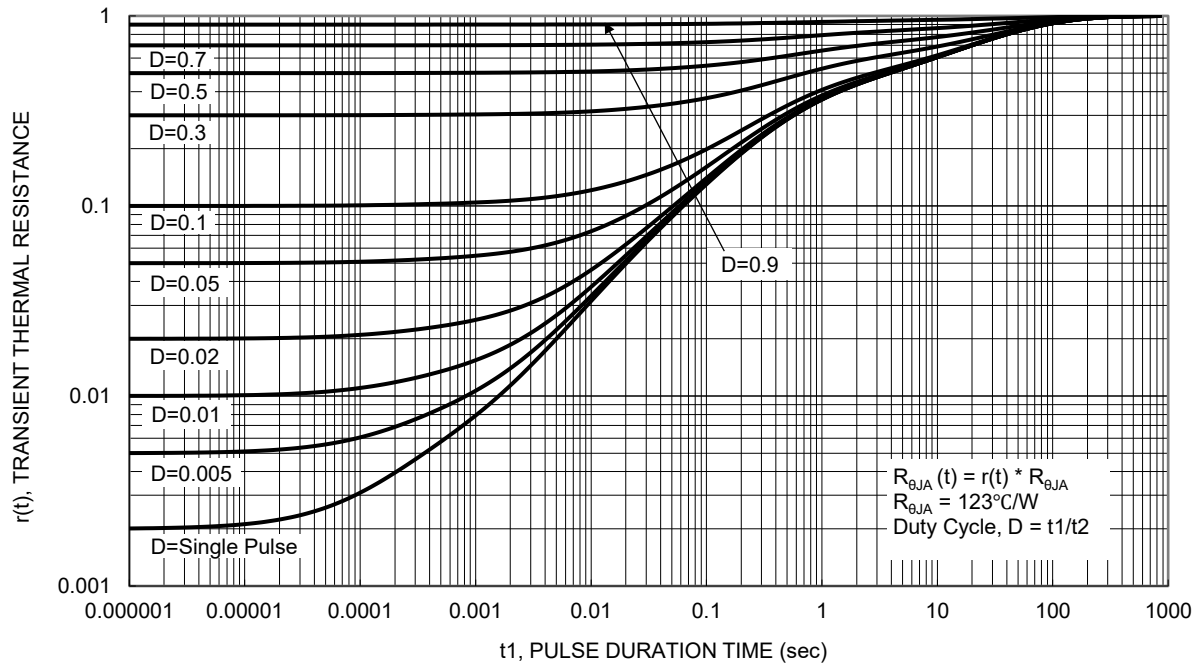
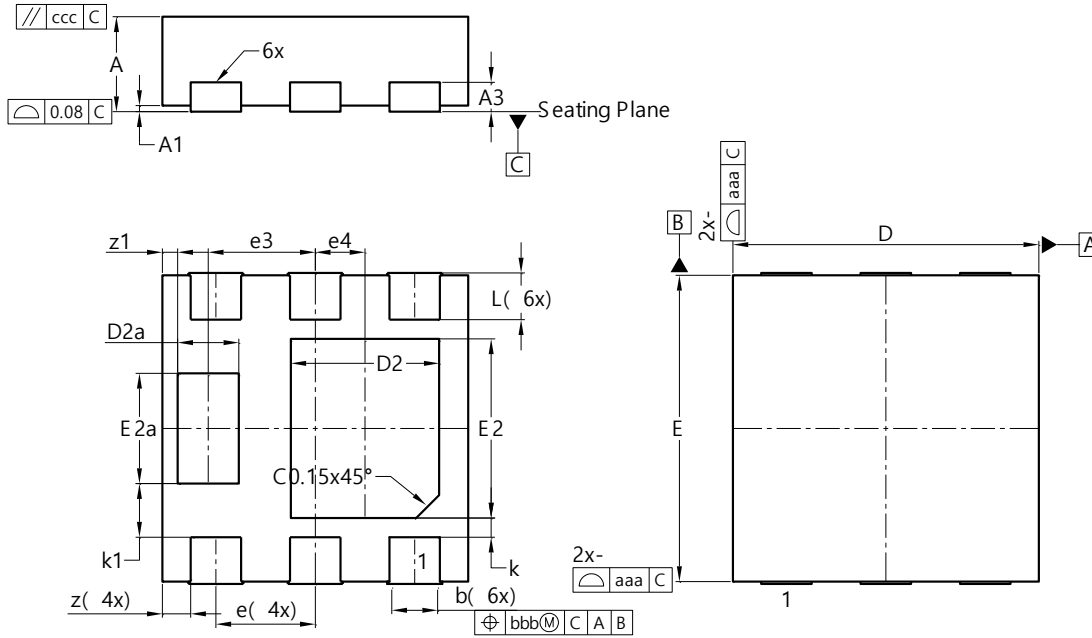


Figure 13. Transient Thermal Resistance

Package Outline Dimension

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

U-DFN2020-6/SWP (Type F)

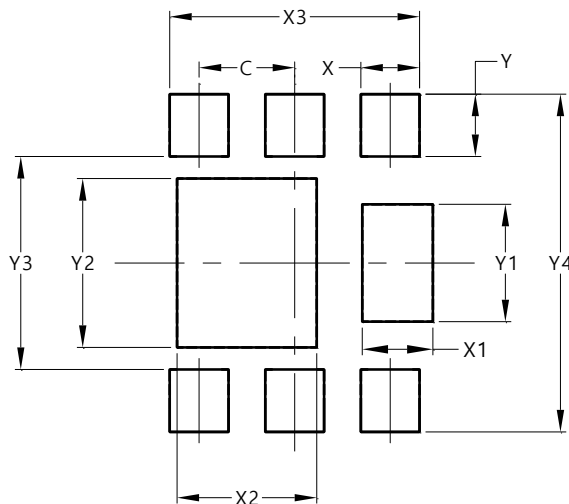


U-DFN2020-6/SWP (Type F)			
Dim	Min	Max	Typ
A	0.59	0.65	0.62
A1	0.00	0.05	0.03
A3	--	--	0.192
b	0.28	0.38	0.33
D	1.95	2.05	2.00
D2	0.87	1.07	0.97
D2a	0.35	0.45	0.40
E	1.95	2.05	2.00
E2	1.07	1.27	1.17
E2a	0.67	0.77	0.72
e	0.65 BSC		
e3	0.70 BSC		
e4	0.325 BSC		
k	--	--	0.125
k1	--	--	0.35
L	0.225	0.355	0.305
z	--	--	0.185
z1	--	--	0.10
aaa	0.250		
bbb	0.100		
ccc	0.100		
All Dimensions in mm			

Suggested Pad Layout

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

U-DFN2020-6/SWP (Type F)



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

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