

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
80V	25mΩ @ V _{GS} = 10V	6.5A
	38mΩ @ V _{GS} = 4.5V	5.5A

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.

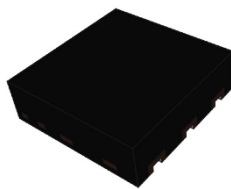
Features and Benefits

- Rated to +175°C — Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching (UIS) Test in Production — Ensures More Reliable and Robust End Application
- 0.6mm Profile — Ideal for Low Profile Applications
- PCB Footprint of 4mm²
- Low On-Resistance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **The DMTH8030LDFWQ 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/>

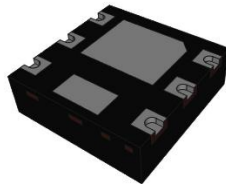
Mechanical Data

- Package: U-DFN2020-6/SWP
- Package 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 Lead frame, Solderable per MIL-STD-202, Method 208⁽⁴⁾
- Weight: 0.007 grams (Approximate)

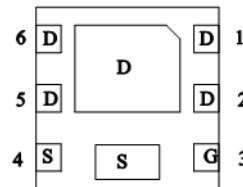
U-DFN2020-6/SWP (Type UXG)



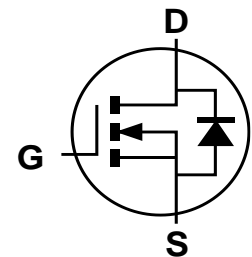
Top View



Bottom View



Pin Out
Bottom View



Equivalent Circuit

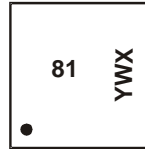
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMTH8030LDFWQ-7	U-DFN2020-6/SWP (Type UXG)	3,000	Reel
DMTH8030LDFWQ-13	U-DFN2020-6/SWP (Type UXG)	10,000	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

U-DFN2020-6/SWP (Type UXG)



81 = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 4 = 2024)
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	4	5	6	7	8	9	0	1	2	3	4	5

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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	80	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = 10V (Note 6)	I _D	T _A = +25°C	6.5
		T _A = +100°C	4.6
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	45	A
Maximum Body Diode Continuous Current (Note 6)	I _S	2.1	A
Pulsed Body Diode Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	45	A
Avalanche Current, L = 0.3mH	I _{AS}	12.5	A
Avalanche Energy, L = 0.3mH	E _{AS}	23.4	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	100	°C/W
Total Power Dissipation (Note 6)	P _D	2.1	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	70	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	9	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

- 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.

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}	80	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 64V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1.2	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	18	25	mΩ	V _{GS} = 10V, I _D = 5A
		—	26	38		V _{GS} = 4.5V, I _D = 4A
Diode Forward Voltage	V _{SD}	—	0.88	1.2	V	V _{GS} = 0V, I _S = 10A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	641	—	pF	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	272	—		
Reverse Transfer Capacitance	C _{rss}	—	32	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Gate Resistance	R _G	—	1.4	—		
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.4	—	nC	V _{DS} = 40V, I _D = 7.5A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	10.4	—		
Gate-Source Charge	Q _{gs}	—	1.8	—		
Gate-Drain Charge	Q _{gd}	—	2.4	—		
Turn-On Delay Time	t _{D(ON)}	—	11.3	—	ns	V _{DD} = 40V, V _{GS} = 4.5V, R _G = 2.7Ω, I _D = 10A
Turn-On Rise Time	t _R	—	14.3	—		
Turn-Off Delay Time	t _{D(OFF)}	—	10.8	—		
Turn-Off Fall Time	t _F	—	8.3	—		
Body Diode Reverse Recovery Time	t _{RR}	—	25.5	—	ns	I _F = 7.5A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	20.6	—	nC	I _F = 7.5A, di/dt = 100A/μs

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

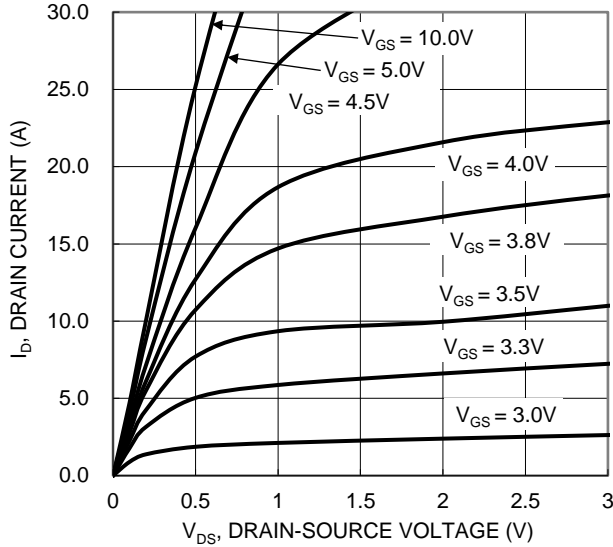


Figure 1. Typical Output Characteristic

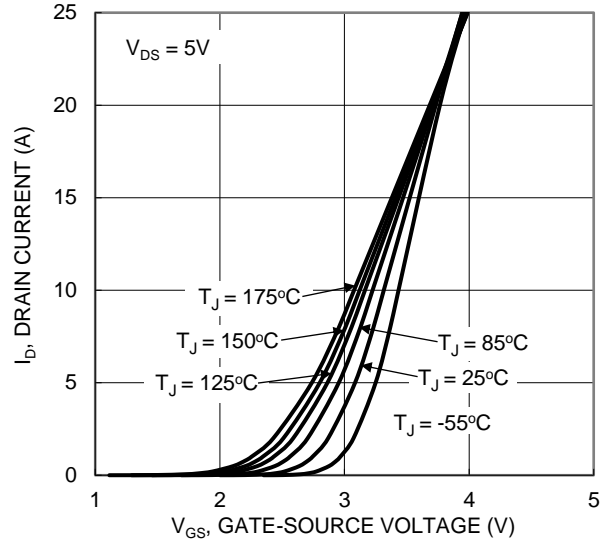


Figure 2. Typical Transfer Characteristic

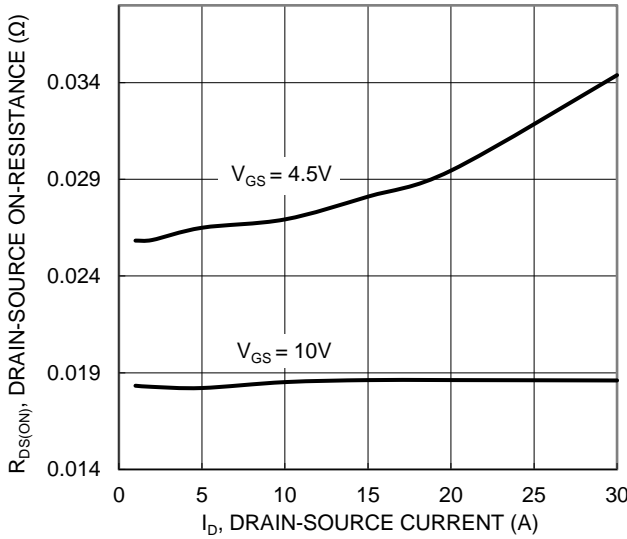


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

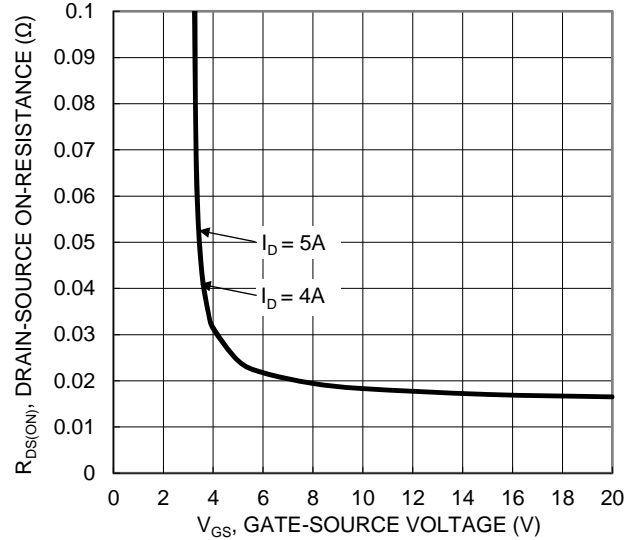


Figure 4. Typical Transfer Characteristic

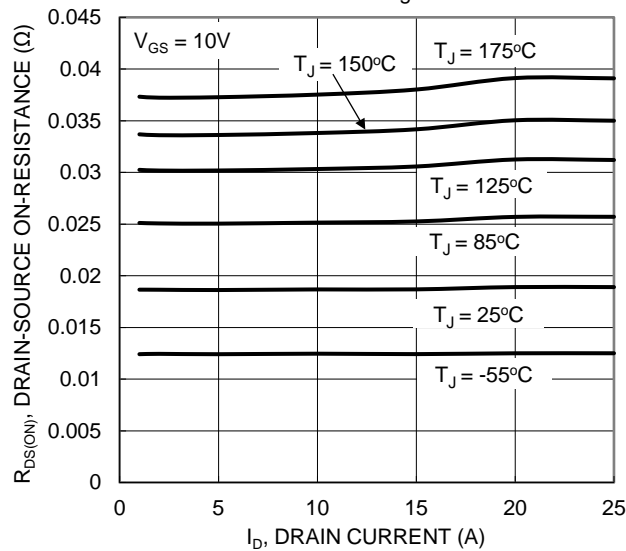


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

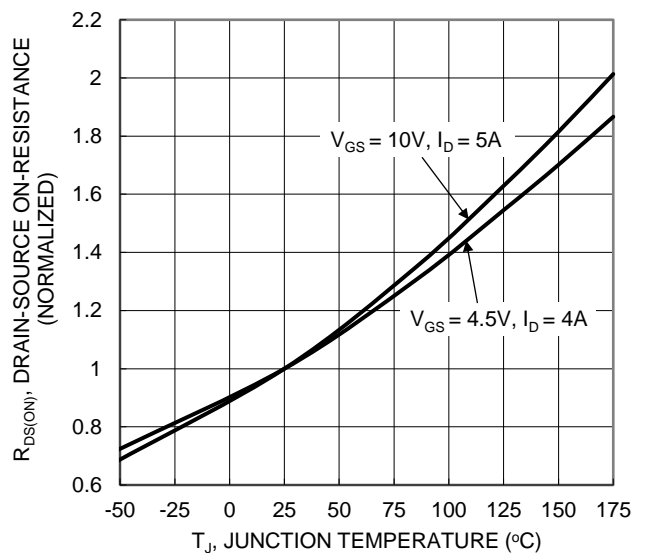


Figure 6. On-Resistance Variation with Junction Temperature

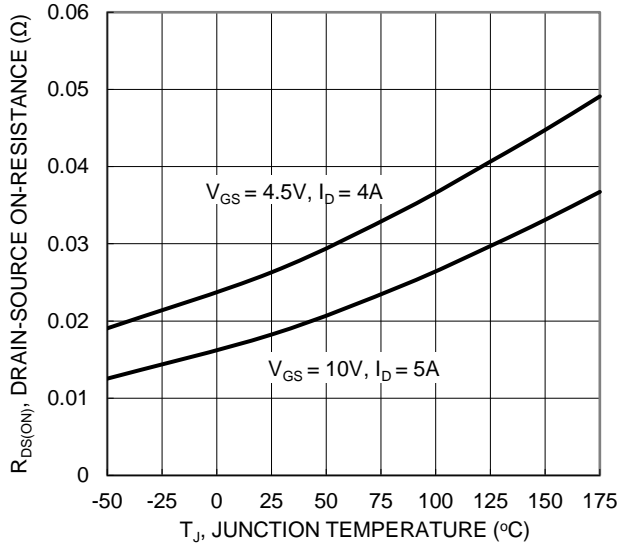


Figure 7. On-Resistance Variation with Junction Temperature

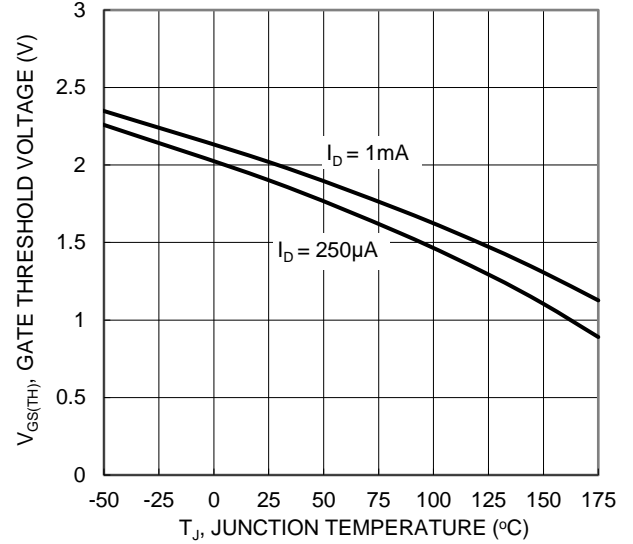


Figure 8. Gate Threshold Variation vs. Junction Temperature

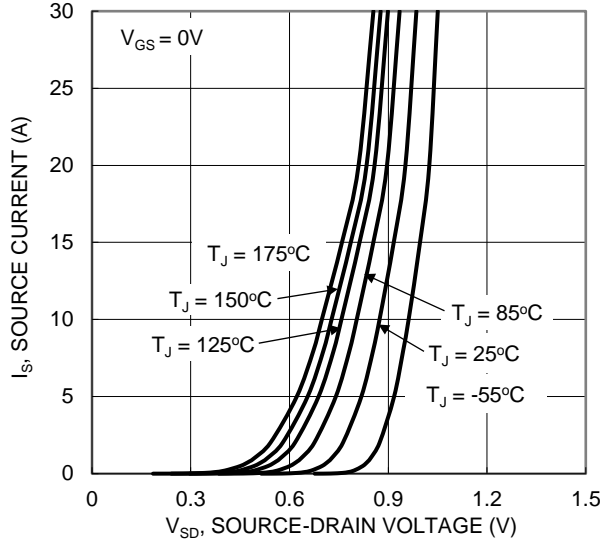


Figure 9. Diode Forward Voltage vs. Current

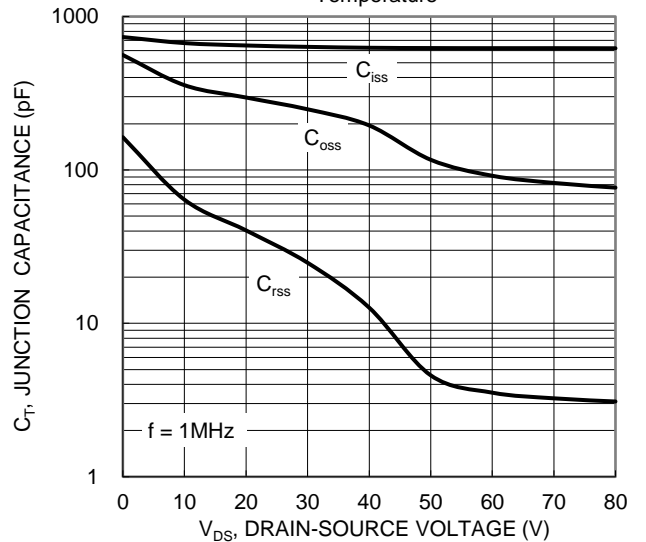


Figure 10. Typical Junction Capacitance

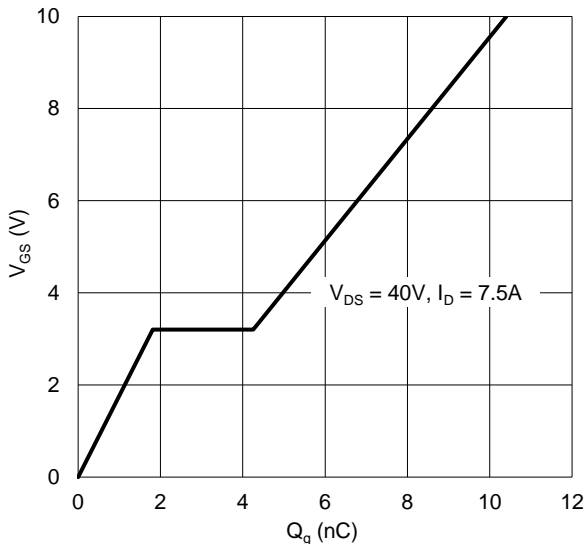


Figure 11. Gate Charge

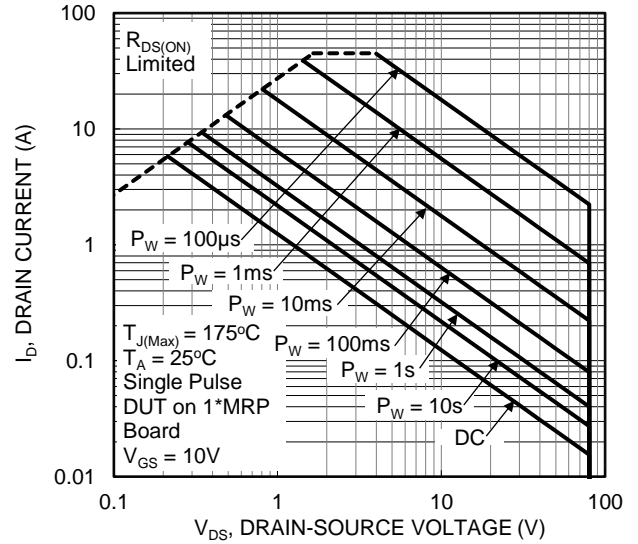


Figure 12. SOA, Safe Operation Area

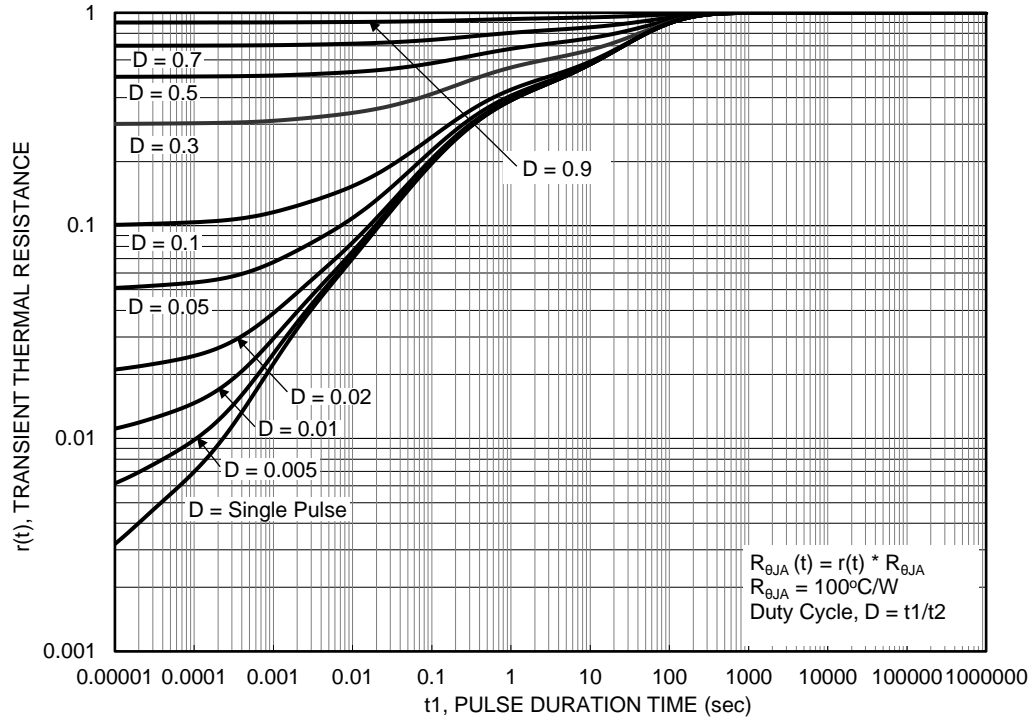
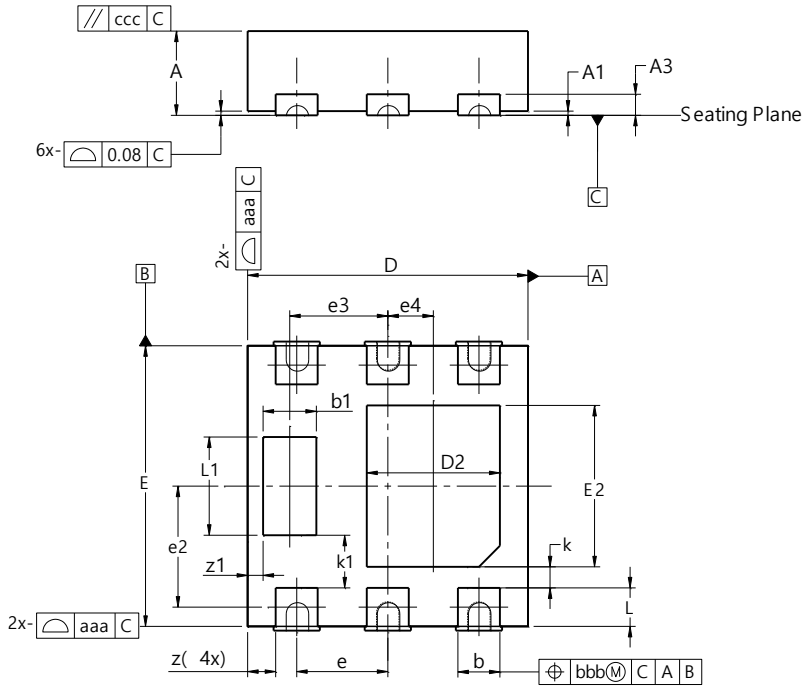


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

U-DFN2020-6/SWP (Type UXG)

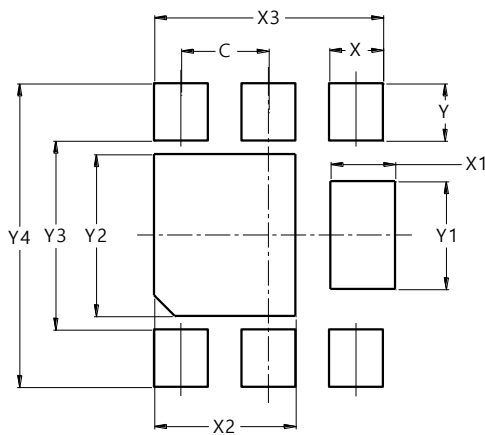


U-DFN2020-6/SWP (Type UXG)			
Dim	Min	Max	Typ
A	0.59	0.65	0.62
A1	0.00	0.05	0.03
A3	—	—	0.152
b	0.28	0.38	0.33
b1	0.35	0.45	0.40
D	1.95	2.05	2.00
D2	0.87	1.07	0.97
E	1.95	2.05	2.00
E2	1.07	1.27	1.17
e	0.65 BSC		
e3	0.70 BSC		
e4	0.325 BSC		
L	0.225	0.325	0.275
L1	0.67	0.77	0.72
k	—	—	0.15
k1	—	—	0.375
z	—	—	0.20
z1	—	—	0.11
aaa	0.25		
bbb	0.10		
ccc	0.10		
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 UXG)



Dimensions	Value (in mm)
C	0.650
X	0.350
X1	0.480
X2	1.050
X3	1.700
Y	0.425
Y1	0.800
Y2	1.200
Y3	1.400
Y4	2.250

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