

### Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>C</sub> = +25°C
80V	3.9mΩ @ V <sub>GS</sub> = 10V	100A
	6mΩ @ V <sub>GS</sub> = 6V	82A

### Features and Benefits

- 100% Unclamped Inductive Switching – Ensures More Reliable and Robust End Application
- Thermally Efficient Package – Cooler Running Applications
- High Conversion Efficiency
- Low R<sub>DS(ON)</sub> – Minimizes On-State Losses
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMT8003SPSWQ 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/>

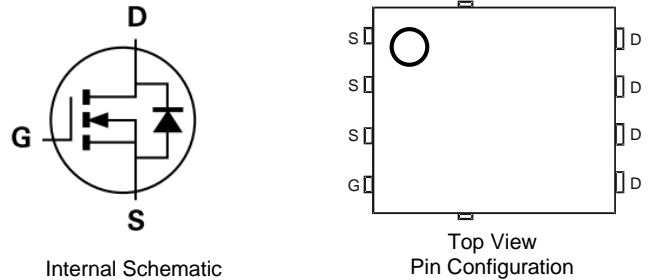
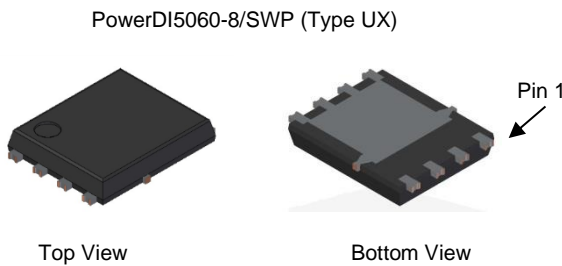
### Description and Applications

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

- Switching
- Synchronous rectification
- DC-DC converters

### Mechanical Data

- Package: PowerDI<sup>®</sup>5060-8
- 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 Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.097 grams (Approximate)

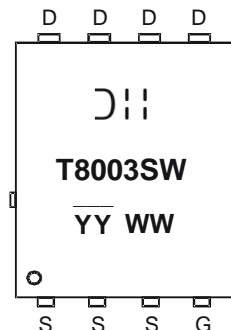


### Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMT8003SPSWQ-13	PowerDI5060-8/SWP (Type UX)	2,500	Tape & Reel

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



DII = Manufacturer's Marking  
T8003SW = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Two Digits of Year (ex: 24 = 2024)  
WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	80	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 5)	$I_D$	$T_C = +25^\circ\text{C}$ 100	A
		$T_C = +70^\circ\text{C}$ 80	
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	400	A
Continuous Body Diode Forward Current (Note 5)	$I_S$	$T_C = +25^\circ\text{C}$ 100	A
Pulsed Body Diode Forward Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)		400	
Avalanche Current, $L = 3\text{mH}$ (Note 6)	$I_{AS}$	15.8	A
Avalanche Energy, $L = 3\text{mH}$ (Note 6)	$E_{AS}$	375.4	mJ
Avalanche Current, $L = 0.1\text{mH}$	$I_{AS}$	65	A
Avalanche Energy, $L = 0.1\text{mH}$	$E_{AS}$	211.4	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 7)	$P_D$	3.1	W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	40	$^\circ\text{C/W}$
Total Power Dissipation (Note 5)	$P_D$	83	W
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	1.51	$^\circ\text{C/W}$
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	$BV_{DSS}$	80	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 64\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	2.5	3.9	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 30\text{A}$
		—	2.7	6		$V_{GS} = 6\text{V}, I_D = 30\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.8	1.3	V	$V_{GS} = 0\text{V}, I_S = 30\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	$C_{iss}$	—	9081	—	pF	$V_{DS} = 40\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	556	—		
Reverse Transfer Capacitance	$C_{rss}$	—	80	—		
Gate Resistance	$R_G$	—	0.8	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	$Q_g$	—	136	—	nC	$V_{DS} = 40\text{V}, I_D = 30\text{A}, V_{GS} = 10\text{V}$
Gate-Source Charge	$Q_{gs}$	—	41	—		
Gate-Drain Charge	$Q_{gd}$	—	32	—		
Turn-On Delay Time	$t_{D(ON)}$	—	19	—	ns	$V_{DD} = 40\text{V}, V_{GS} = 10\text{V}$ $I_D = 30\text{A}, R_G = 2.5\Omega$
Turn-On Rise Time	$t_r$	—	31	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	63	—		
Turn-Off Fall Time	$t_f$	—	27	—		
Reverse-Recovery Time	$t_{RR}$	—	58	—	ns	$I_F = 30\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse-Recovery Charge	$Q_{RR}$	—	114	—	nC	

- Notes:
5. Thermal resistance from junction to soldering point (on the exposed drain pad).
  6. Guaranteed by design. Not subject to product testing.
  7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
  8. Short duration pulse test used to minimize self-heating effect.

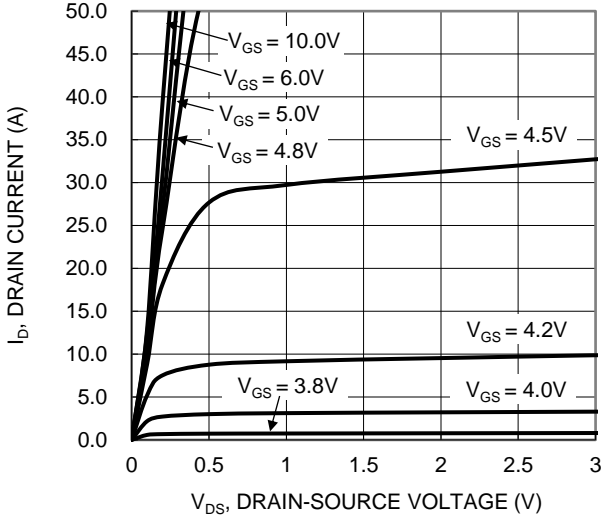


Figure 1. Typical Output Characteristic

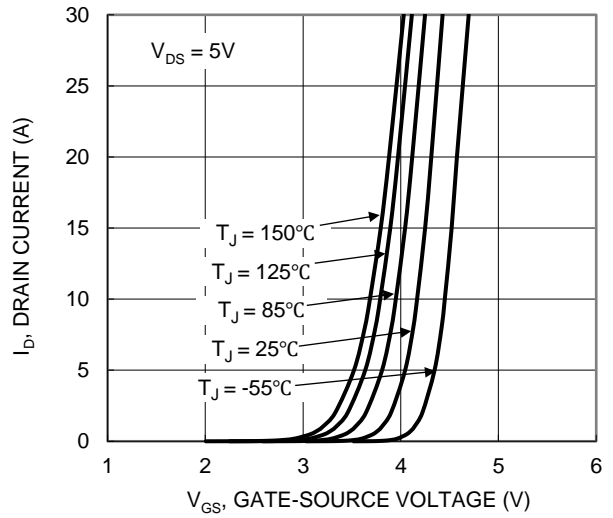


Figure 2. Typical Transfer Characteristic

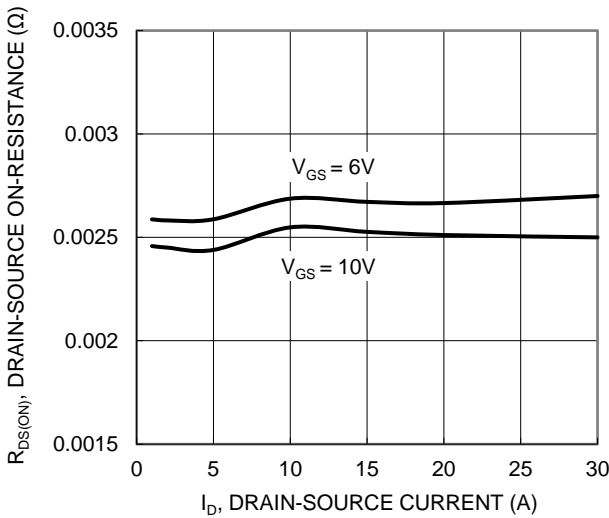


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

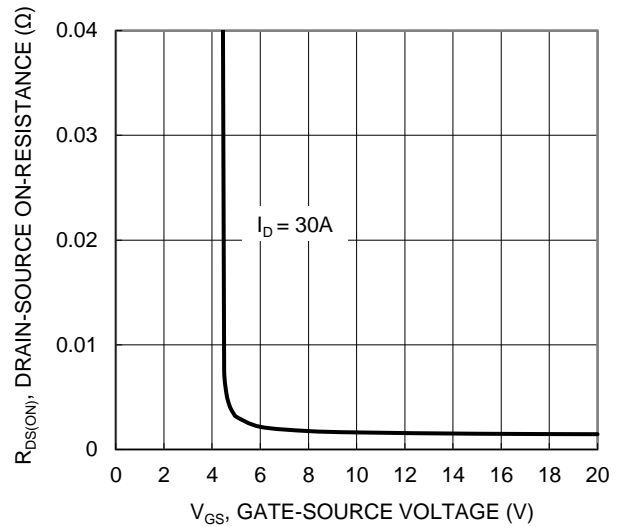


Figure 4. Typical Transfer Characteristic

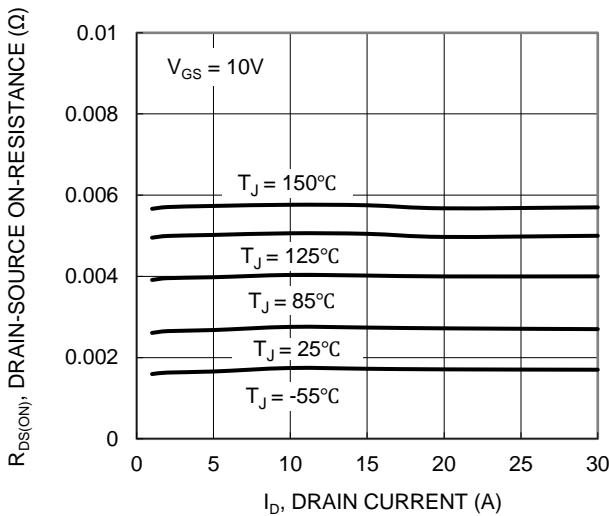


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

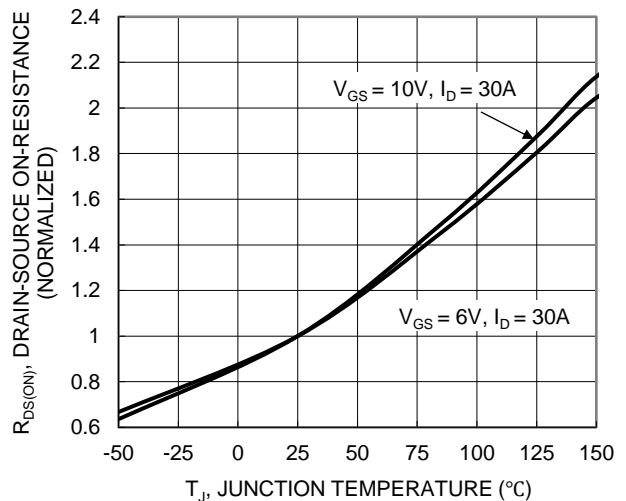


Figure 6. On-Resistance Variation with Junction Temperature

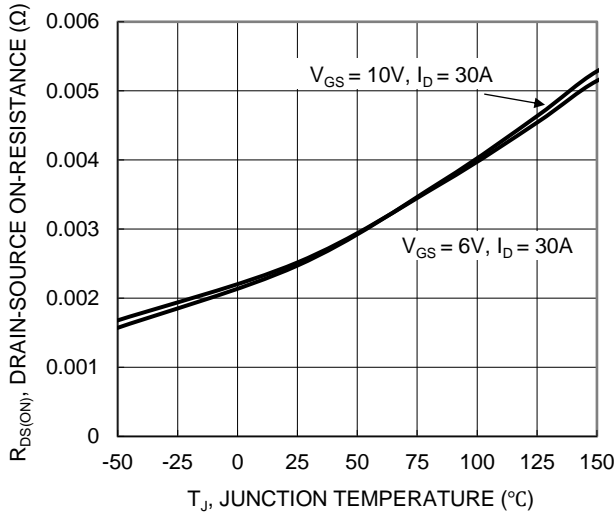


Figure 7. On-Resistance Variation with Junction Temperature

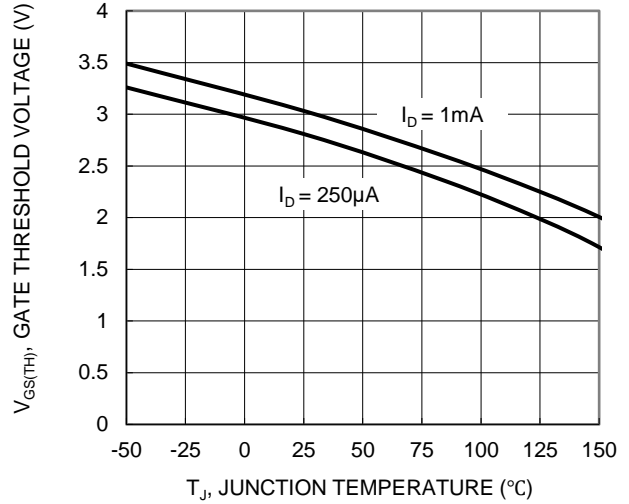


Figure 8. Gate Threshold Variation vs. Junction Temperature

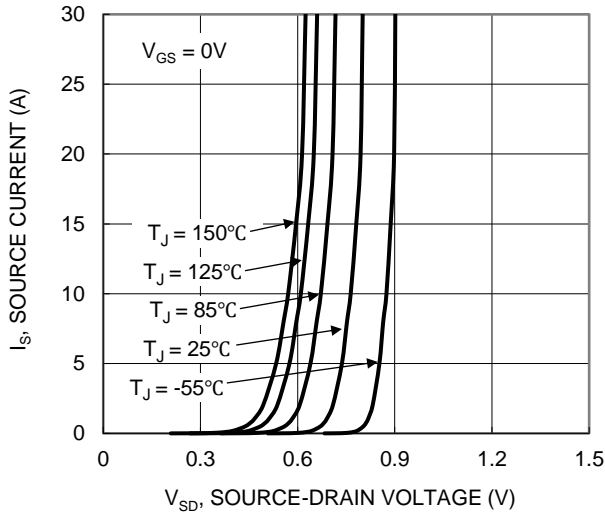


Figure 9. Diode Forward Voltage vs. Current

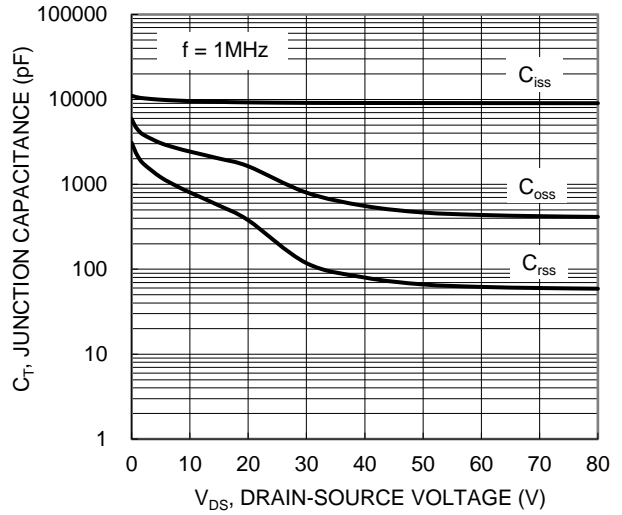


Figure 10. Typical Junction Capacitance

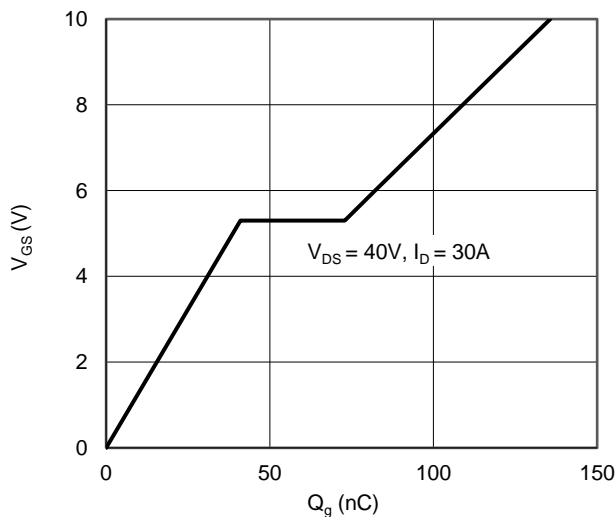


Figure 11. Gate Charge

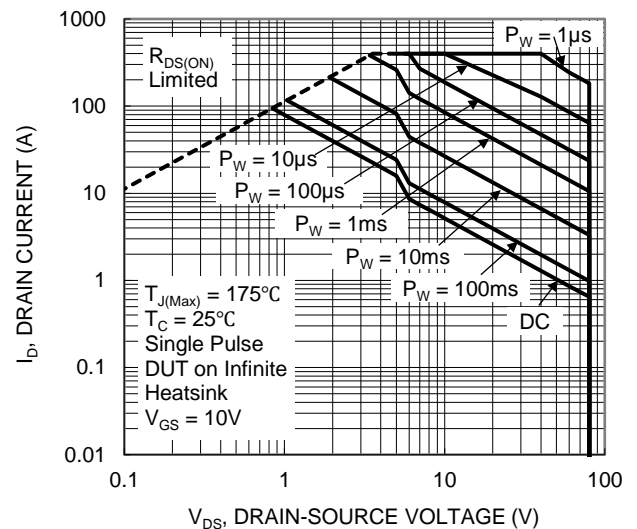


Figure 12. SOA, Safe Operation Area

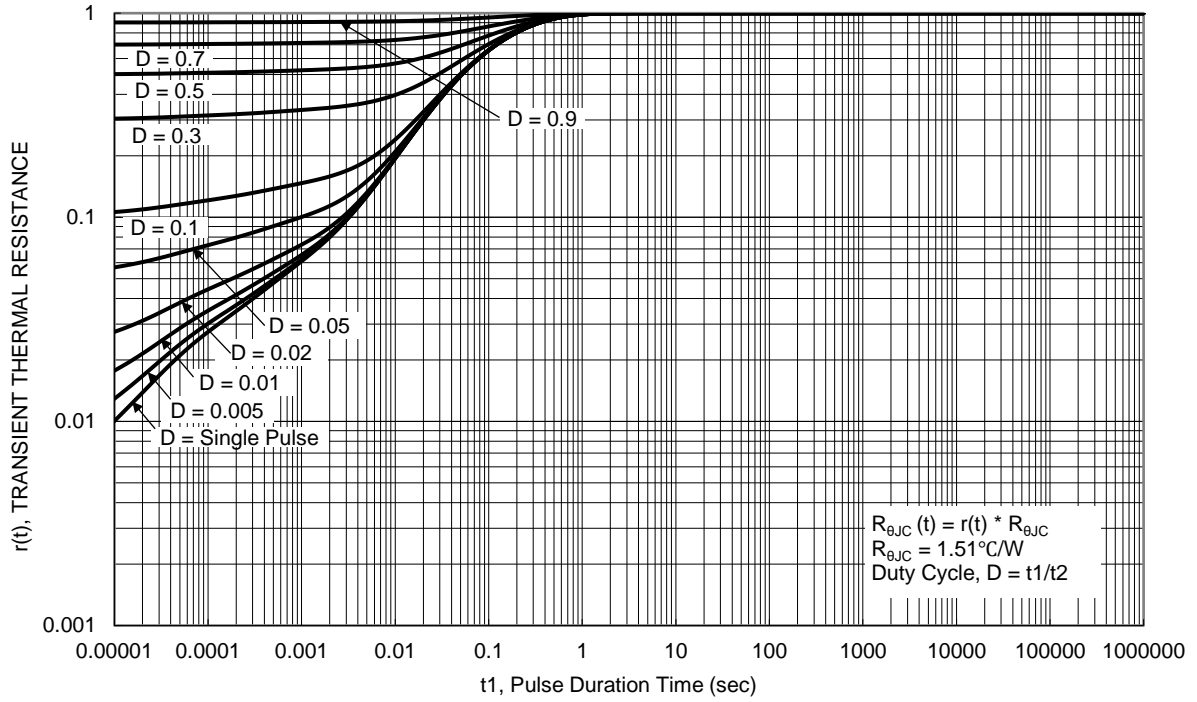
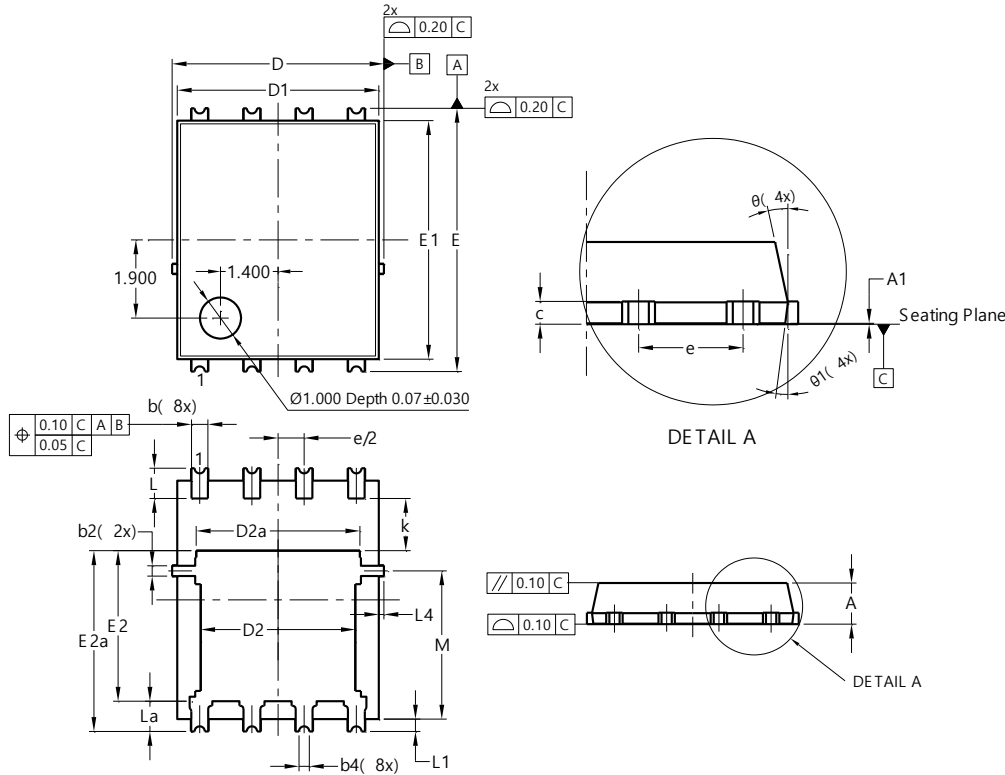


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**PowerDI5060-8/SWP (Type UX)**

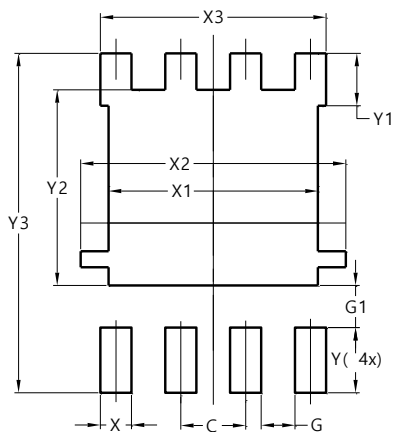


PowerDI5060-8/SWP (Type UX)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	--
b	0.30	0.50	0.41
b2	0.20	0.35	0.25
b4	0.25REF		
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.56	3.96	3.76
D2a	3.78	4.18	3.98
E	6.40 BSC		
E1	5.60	6.00	5.80
E2	3.46	3.86	3.66
E2a	4.195	4.595	4.395
e	1.27BSC		
k	1.05	--	--
L	0.635	0.835	0.735
La	0.635	0.835	0.735
L1	0.200	0.400	0.300
L4	0.025	0.225	0.125
M	3.205	4.005	3.605
theta	10°	12°	11°
theta1	6°	8°	7°
All Dimensions in mm			

**Suggested Pad Layout**

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

**PowerDI5060-8/SWP (Type UX)**



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.100
X2	5.190
X3	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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