

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +25°C
80V	7.8mΩ @ V _{GS} = 10V	92A

Description and Applications


This new generation MOSFET is designed to minimize R_{DS(ON)} yet maintain superior switching performance. This device is ideal for use in power management and load switches.

- DC-DC converters
- Load switches

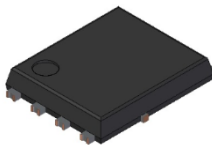
Features

- 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
- High Conversion Efficiency
- Low R_{DS(ON)} — Minimizes On-State Losses
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet ([DMTH8008SPSWQ](#))**

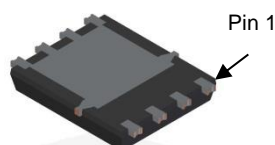
Mechanical Data

- Package: PowerDI[®]5060-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.097 grams (Approximate)

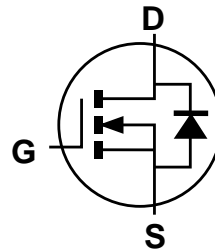
PowerDI5060-8/SWP (Type UX)



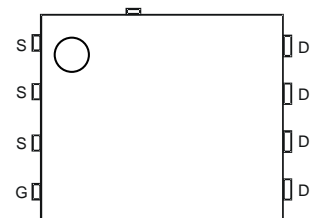
Top View



Bottom View



Internal Schematic



Top View
Pin Configuration

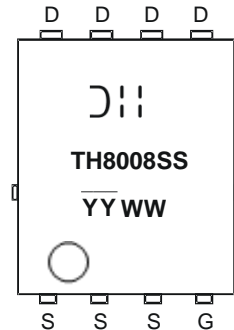
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMTH8008SPSW-13	PowerDI5060-8/SWP (Type UX)	2500	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

PowerDI5060-8/SWP (Type UX)



D = Manufacturer's Marking
 TH8008SS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 24 = 2024)
 WW = Week (01 to 53)

Maximum Ratings (@T_C = +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 5)	Steady State	T _C = +25°C T _C = +100°C	I _D	92 65	A
Maximum Continuous Body Diode Forward Current (Note 5)			I _S	83	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	360	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)			I _{SM}	360	A
Avalanche Current, L = 0.1mH (Note 6)			I _{AS}	40	A
Avalanche Energy, L = 0.1mH (Note 6)			E _{AS}	80	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 7)	T _A = +25°C	P _D	1.6	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R _{θJA}	95	°C/W
Total Power Dissipation (Note 8)	T _A = +25°C	P _D	3.4	W
Thermal Resistance, Junction to Ambient (Note 8)	Steady State	R _{θJA}	44	°C/W
Total Power Dissipation (Note 5)	T _C = +25°C	P _D	100	W
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	1.5	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +175	°C

- Notes:
- Thermal resistance from junction to soldering point (on the exposed drain pad).
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Device mounted on FR-4 PCB, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PCB, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
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 9)						
Gate Threshold Voltage	V _{GS(TH)}	2	—	4	V	V _{DS} = V _{GS} , I _D = 1mA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	6.5	7.8	mΩ	V _{GS} = 10V, I _D = 14A
		—	7.8	11		V _{GS} = 6V, I _D = 12A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 14A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	1950	—	pF	V _{DS} = 40V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	826	—		
Reverse Transfer Capacitance	C _{rss}	—	56	—		
Gate Resistance	R _g	—	1.7	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 6V)	Q _g	—	23	—	nC	V _{DS} = 40V, I _D = 14A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	34	—		
Gate-Source Charge	Q _{gs}	—	6	—		
Gate-Drain Charge	Q _{gd}	—	12	—		
Turn-On Delay Time	t _{D(ON)}	—	8	—	ns	V _{DD} = 40V, V _{GS} = 10V I _D = 14A, R _g = 6Ω
Turn-On Rise Time	t _R	—	15	—		
Turn-Off Delay Time	t _{D(OFF)}	—	29	—		
Turn-Off Fall Time	t _F	—	21	—		
Body Diode Reverse-Recovery Time	t _{RR}	—	43	—	ns	I _S = 14A, di/dt = 100A/μs
Body Diode Reverse-Recovery Charge	Q _{RR}	—	49	—	nC	

Notes: 9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

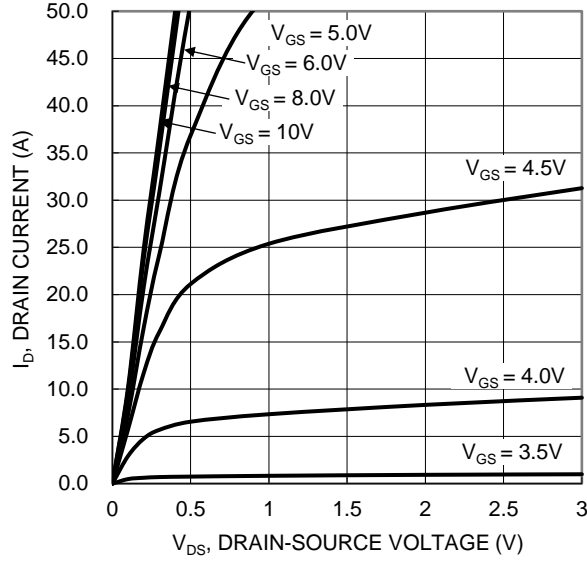


Figure 1. Typical Output Characteristic

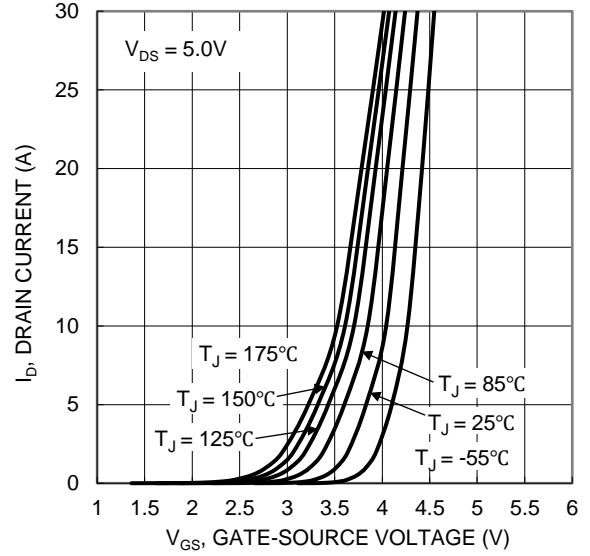


Figure 2. Typical Transfer Characteristic

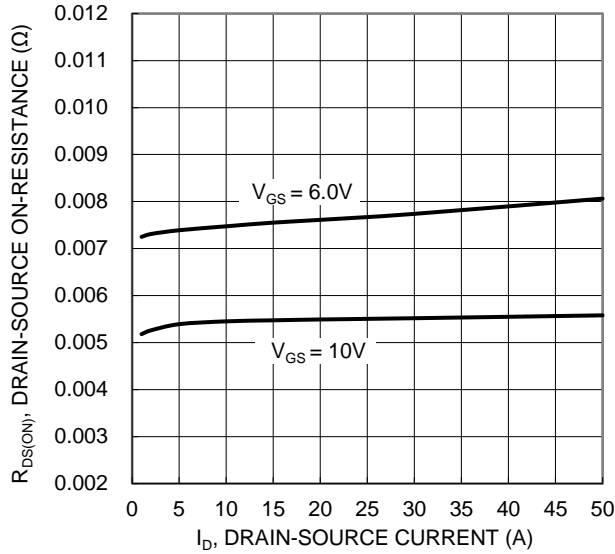


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

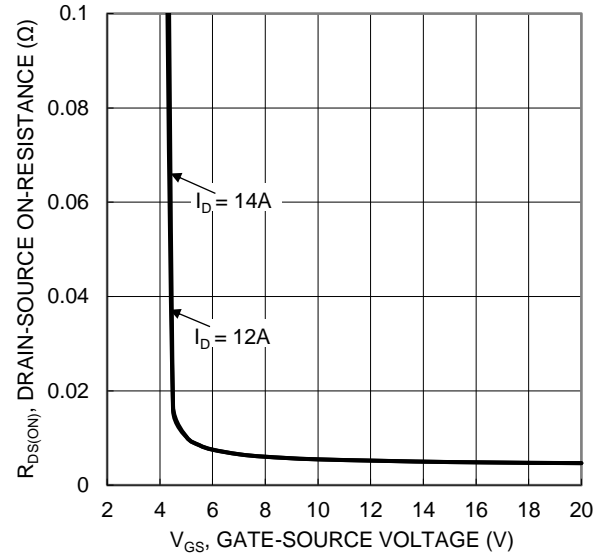


Figure 4. Typical Transfer Characteristic

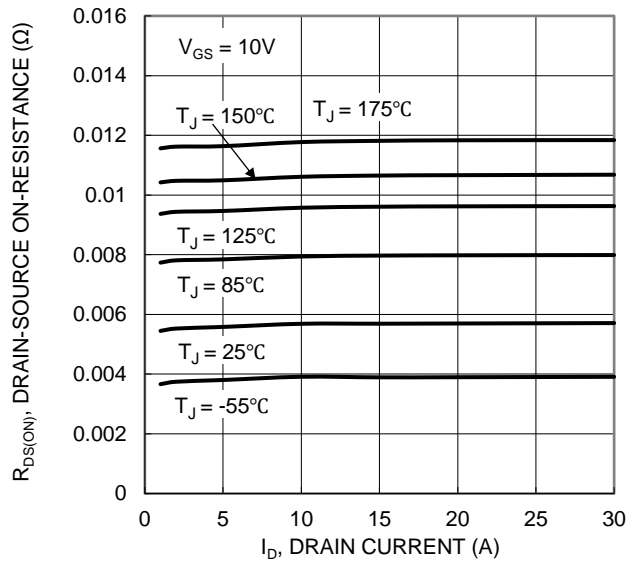


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

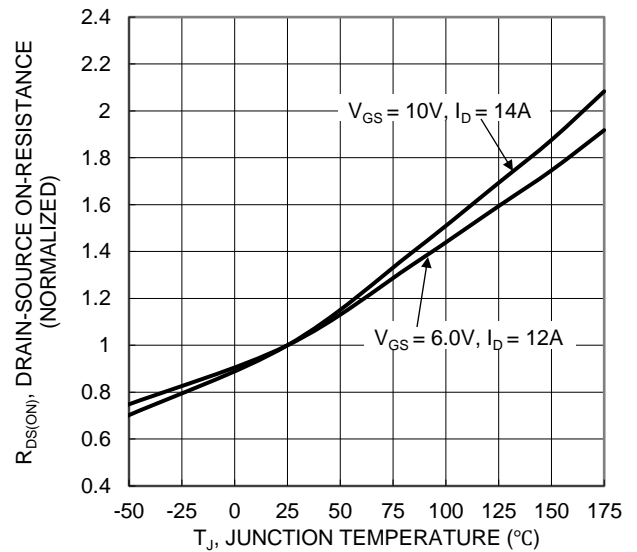
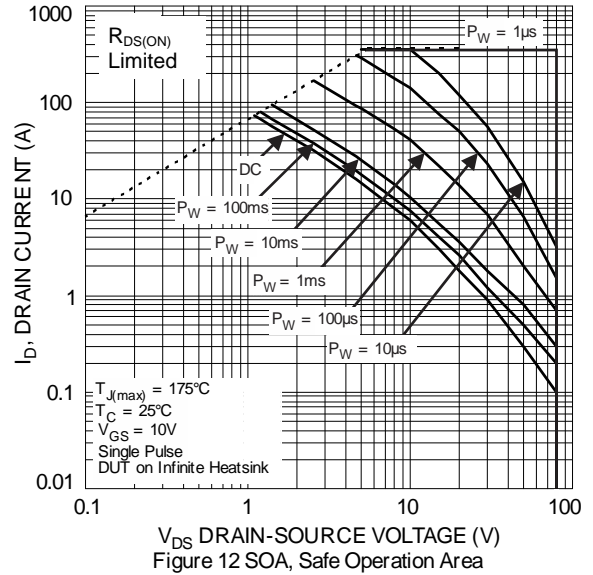
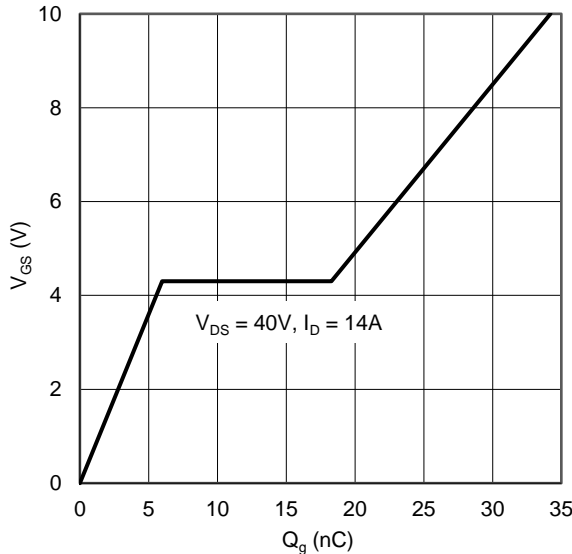
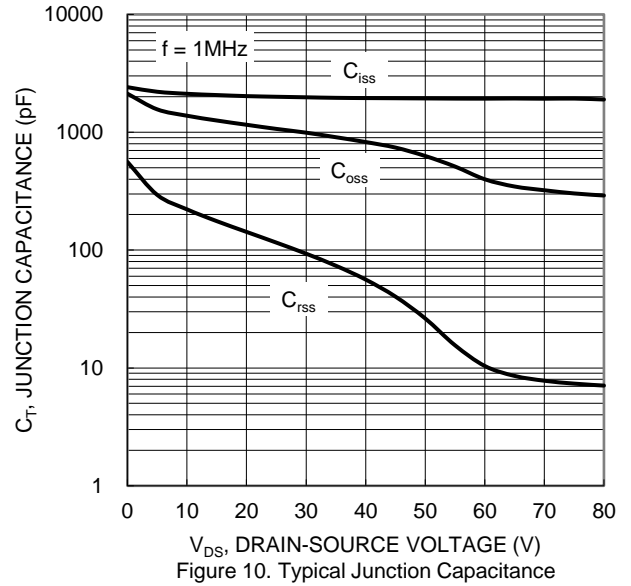
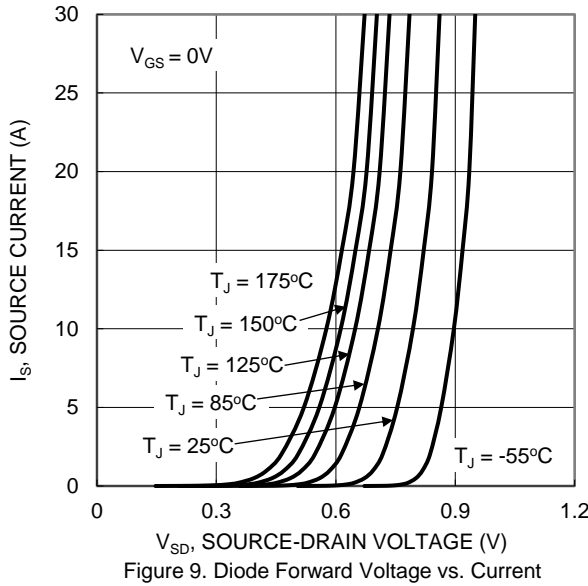
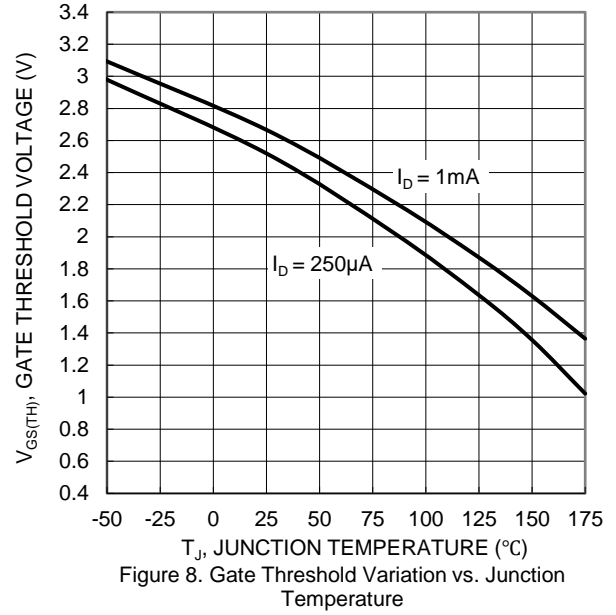
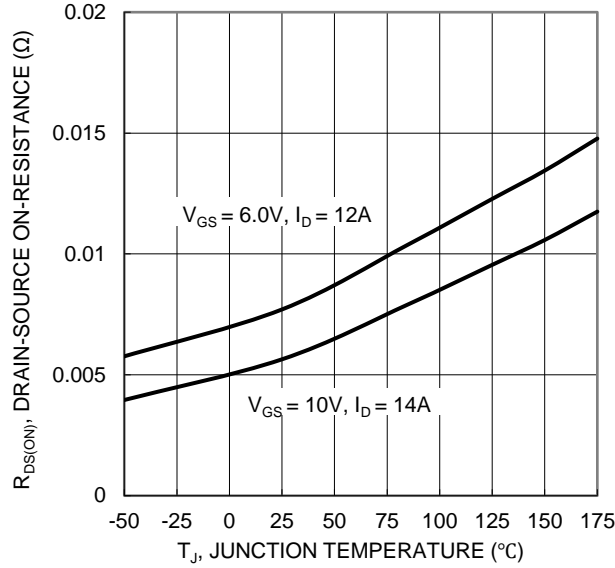


Figure 6. On-Resistance Variation with Temperature



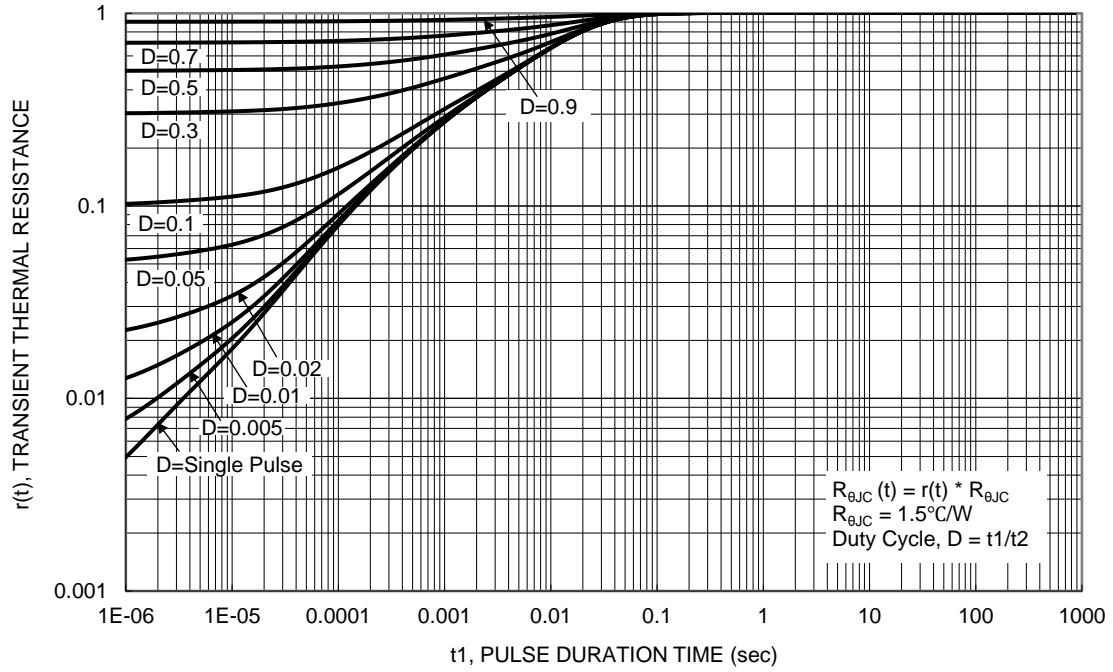
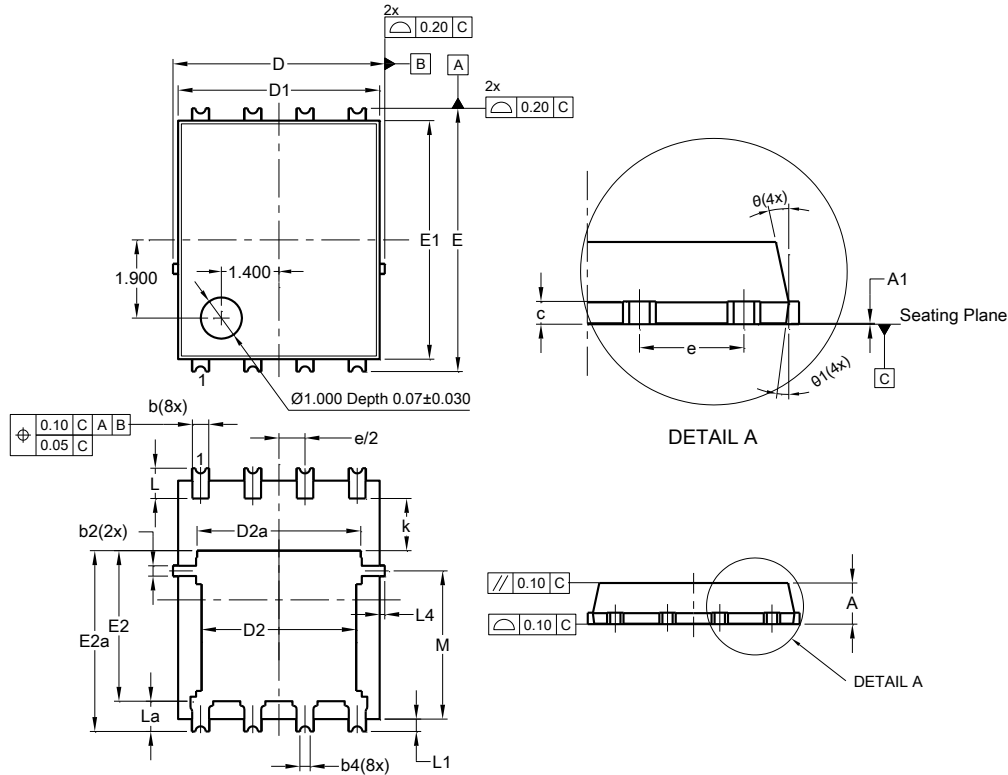


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI5060-8/SWP (Type UX)

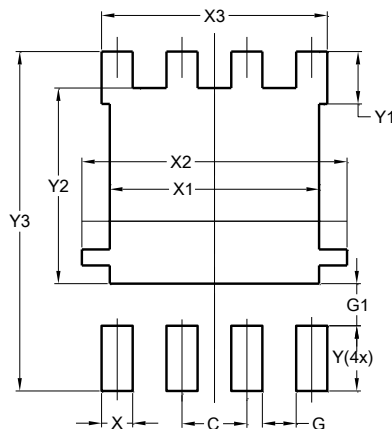


PowerDI5060-8/SWP (Type UX)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	--
b	0.30	0.50	0.41
b2	0.20	0.35	0.25
b4	0.25REF		
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.56	3.96	3.76
D2a	3.78	4.18	3.98
E	6.40 BSC		
E1	5.60	6.00	5.80
E2	3.46	3.86	3.66
E2a	4.195	4.595	4.395
e	1.27BSC		
k	1.05	--	--
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
θ	10°	12°	11°
θ1	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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