

## Product Summary

BV <sub>DSS</sub>	R <sub>DSON</sub> Max	I <sub>D</sub> T <sub>C</sub> = +25°C
60V	5.0mΩ @ V <sub>GS</sub> = 10V	90A
	7.8mΩ @ V <sub>GS</sub> = 4.5V	74A

## Description and Applications

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.

- Wireless charging
- DC-DC converters
- Power managements

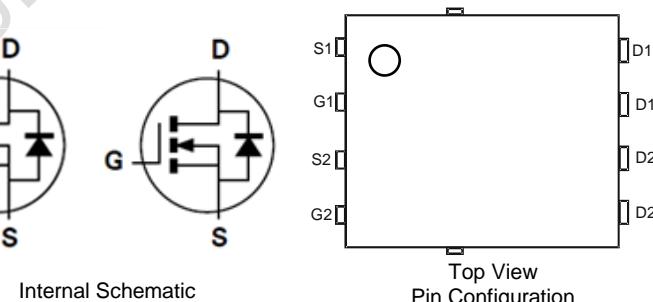


## Features and Benefits

- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- Thermally Efficient Package – Cooler Running Applications
- High Conversion Efficiency
- Low R<sub>DSON</sub> – Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- <1.1mm Package Profile – Ideal for Thin Applications
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact_us) or your local Diodes representative.  
<https://www.diodes.com/quality/product-definitions/>

## 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
- Terminal Finish – Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.097 grams (Approximate)



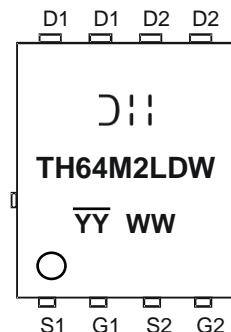
## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMTH64M2LPDW-13	PowerDI5060-8/SWP (Type UXD)	2500	Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 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



DII = Manufacturer's Marking  
TH64M2LDW = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Two Digits of Year (ex: 25 = 2025)  
WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	$V_{DSS}$	60	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 5)	$T_A = +25^\circ\text{C}$ $T_A = +100^\circ\text{C}$	$I_D$	18 13	A
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 6)	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	$I_D$	90 64	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	360	A	
Maximum Continuous Body Diode Forward Current (Note 6)	$I_S$	90	A	
Pulsed Body Diode Forward Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{SM}$	360	A	
Avalanche Current, $L = 0.1\text{mH}$	$I_{AS}$	49	A	
Avalanche Energy, $L = 0.1\text{mH}$	$E_{AS}$	125	mJ	

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	2.9	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	51	°C/W
Total Power Dissipation (Note 6)	$P_D$	74	W
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	2.04	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	—	—	V	$V_{GS} = 0\text{V}$ , $I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 48\text{V}$ , $V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	1.2	—	2.2	V	$V_{DS} = V_{GS}$ , $I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	3.9	5.0	$\text{m}\Omega$	$V_{GS} = 10\text{V}$ , $I_D = 20\text{A}$
		—	5.4	7.8		$V_{GS} = 4.5\text{V}$ , $I_D = 20\text{A}$
Diode Forward Voltage	$V_{SD}$	—	—	1.2	V	$V_{GS} = 0\text{V}$ , $I_S = 20\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	2963	—	$\text{pF}$	$V_{DS} = 30\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	1070	—		
Reverse Transfer Capacitance	$C_{rss}$	—	68	—		
Gate Resistance	$R_g$	—	0.97	—	$\Omega$	$V_{DS} = 0\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	48	—	$\text{nC}$	$V_{DD} = 30\text{V}$ , $I_D = 13.5\text{A}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	25	—		
Gate-Source Charge	$Q_{gs}$	—	8.5	—		
Gate-Drain Charge	$Q_{gd}$	—	7.2	—		
Turn-On Delay Time	$t_{D(ON)}$	—	5.2	—	$\text{ns}$	$V_{GS} = 10\text{V}$ , $V_{DD} = 30\text{V}$ , $R_G = 6\Omega$ , $I_D = 13.5\text{A}$
Turn-On Rise Time	$t_R$	—	22	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	55	—		
Turn-Off Fall Time	$t_F$	—	38	—		
Reverse Recovery Time	$t_{RR}$	—	56	—	$\text{ns}$	$I_F = 13.5\text{A}$ , $di/dt = 400\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	141	—	$\text{nC}$	

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz. copper, with thermal bias to bottom layer 1inch square copper plate.

6. Thermal resistance from junction to soldering point (on the exposed drain pad).

7. Short duration pulse test used to minimize self-heating effect.

8. Guaranteed by design. Not subject to product testing.

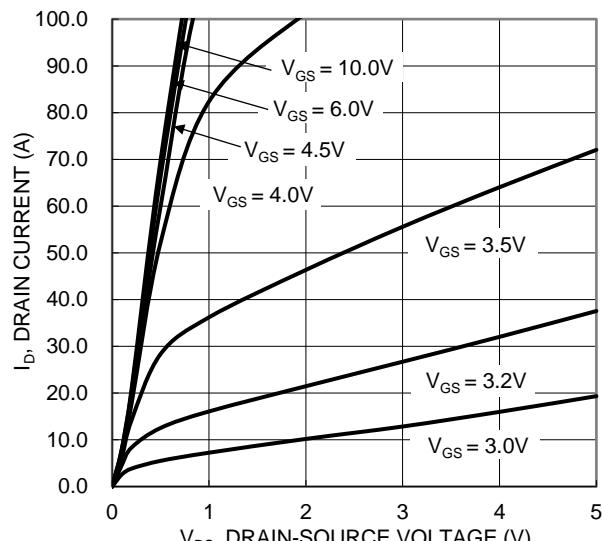


Figure 1. Typical Output Characteristic

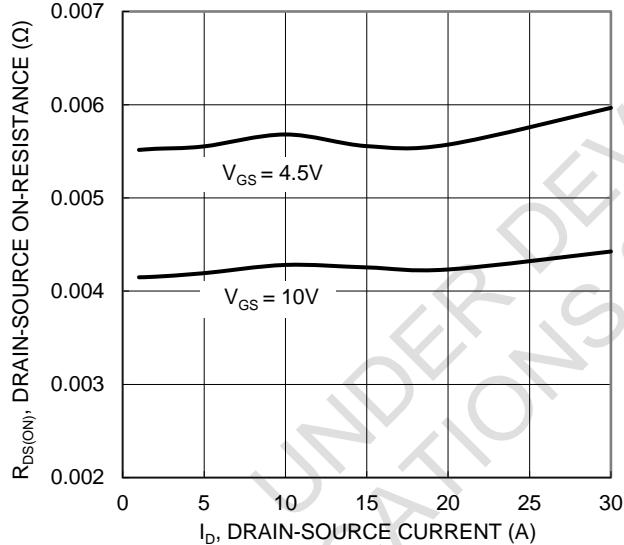


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

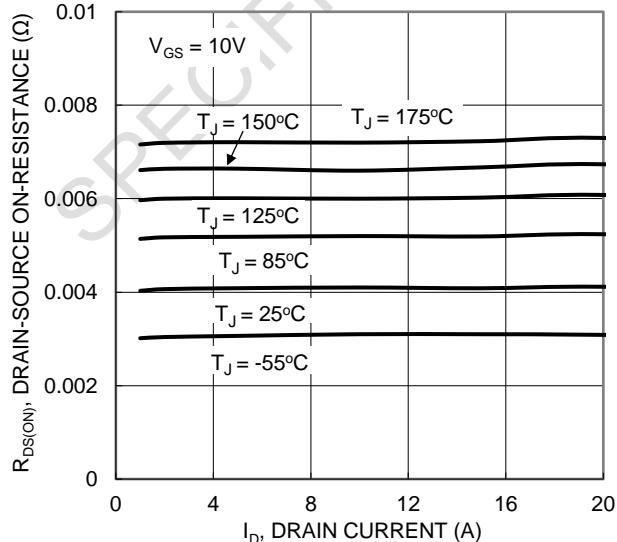


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

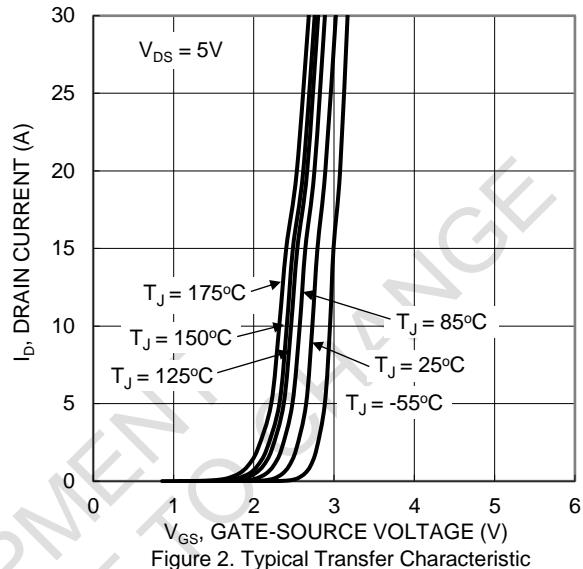


Figure 2. Typical Transfer Characteristic

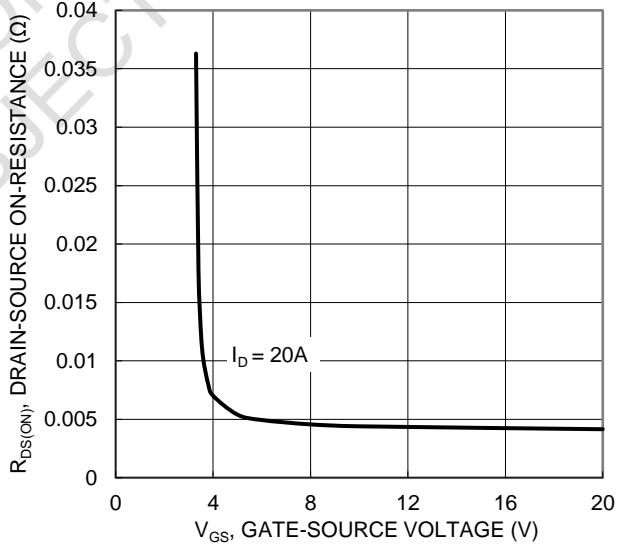


Figure 4. Typical Transfer Characteristic

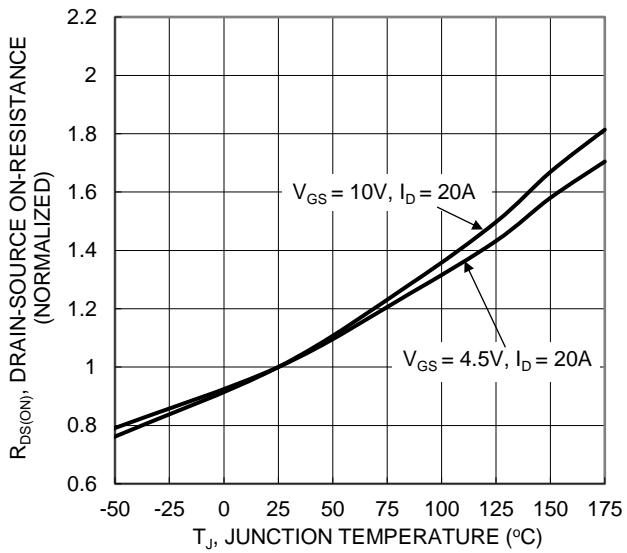


Figure 6. On-Resistance Variation with Junction Temperature

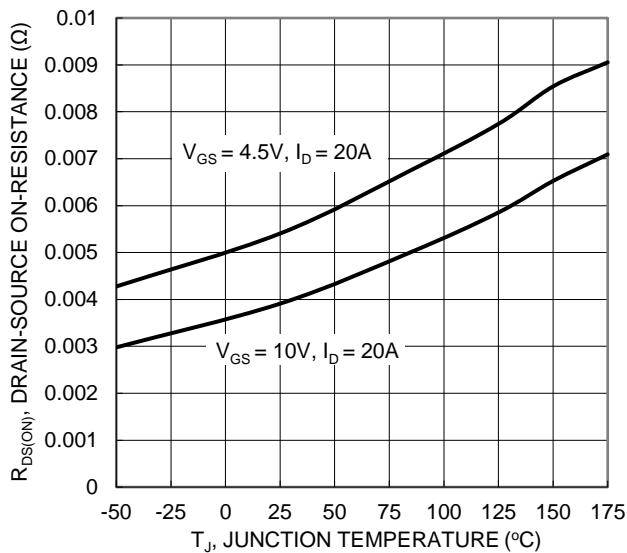


Figure 7. On-Resistance Variation with Junction Temperature

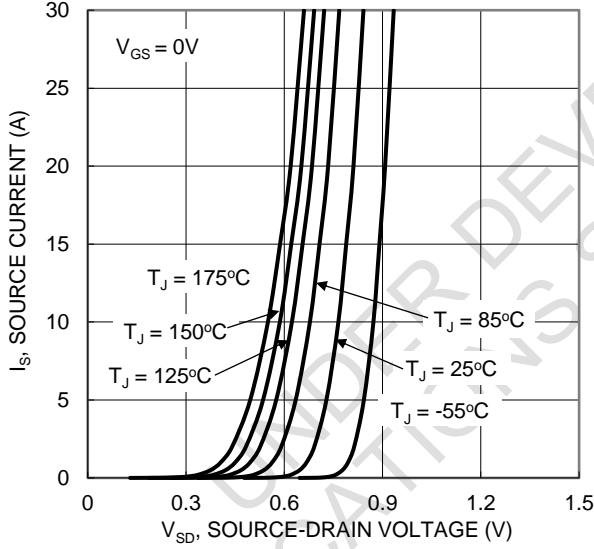


Figure 9. Diode Forward Voltage vs. Current

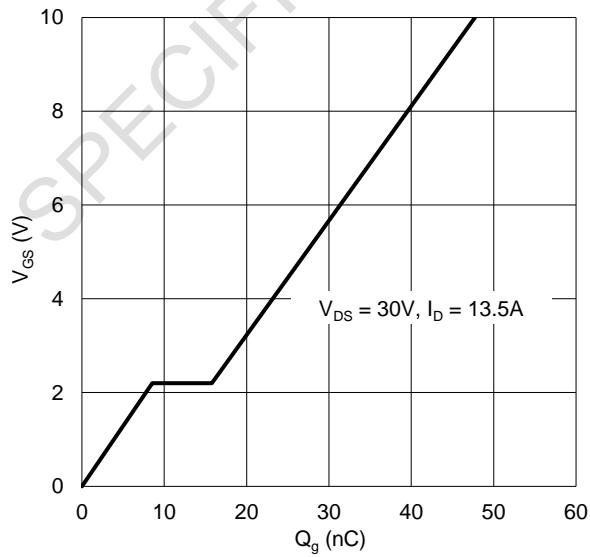


Figure 11. Gate Charge

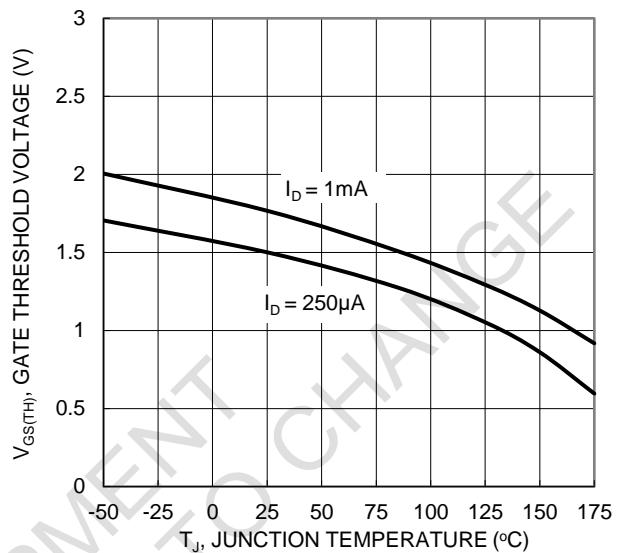


Figure 8. Gate Threshold Variation vs. Junction Temperature

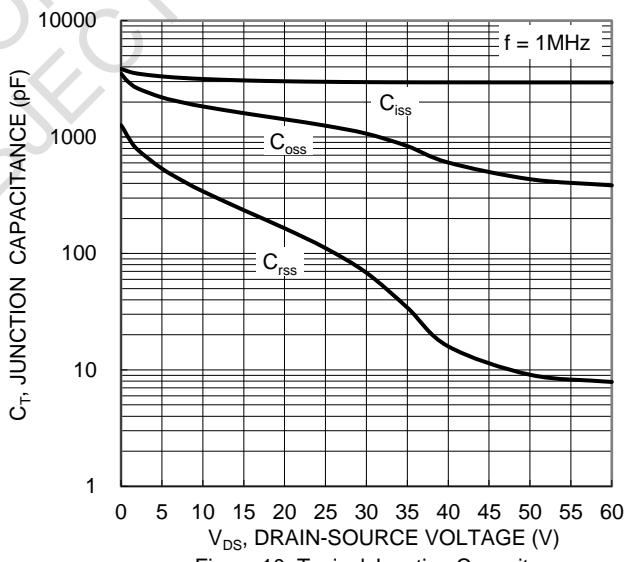


Figure 10. Typical Junction Capacitance

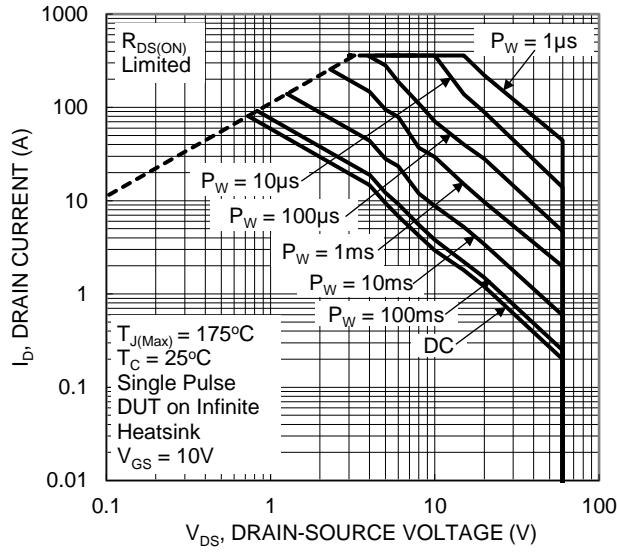
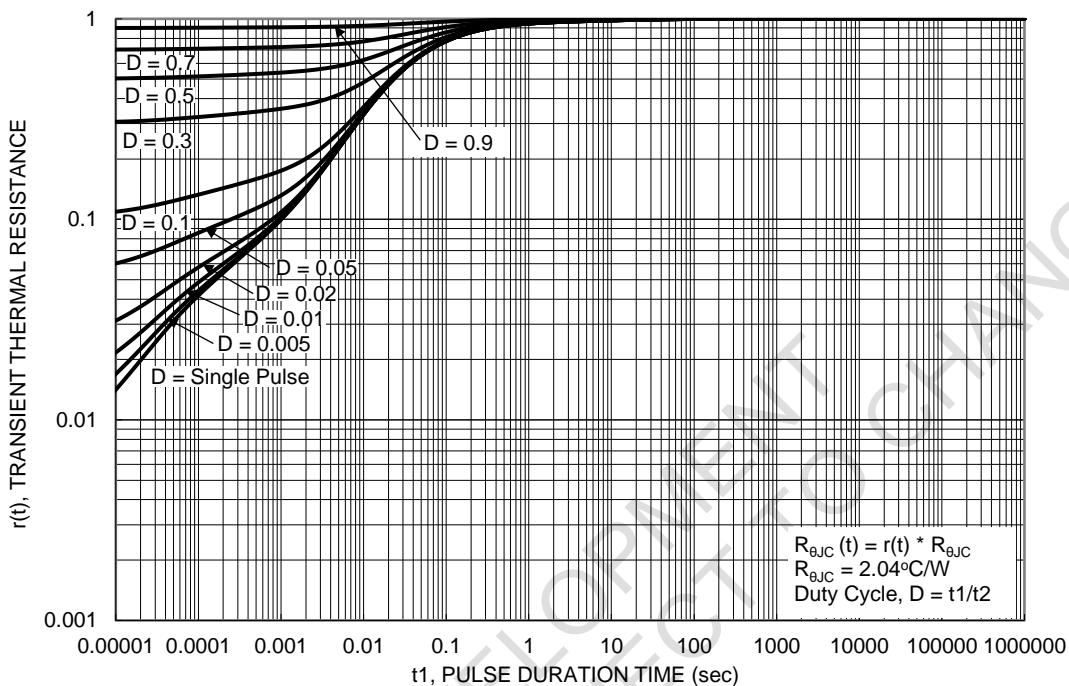


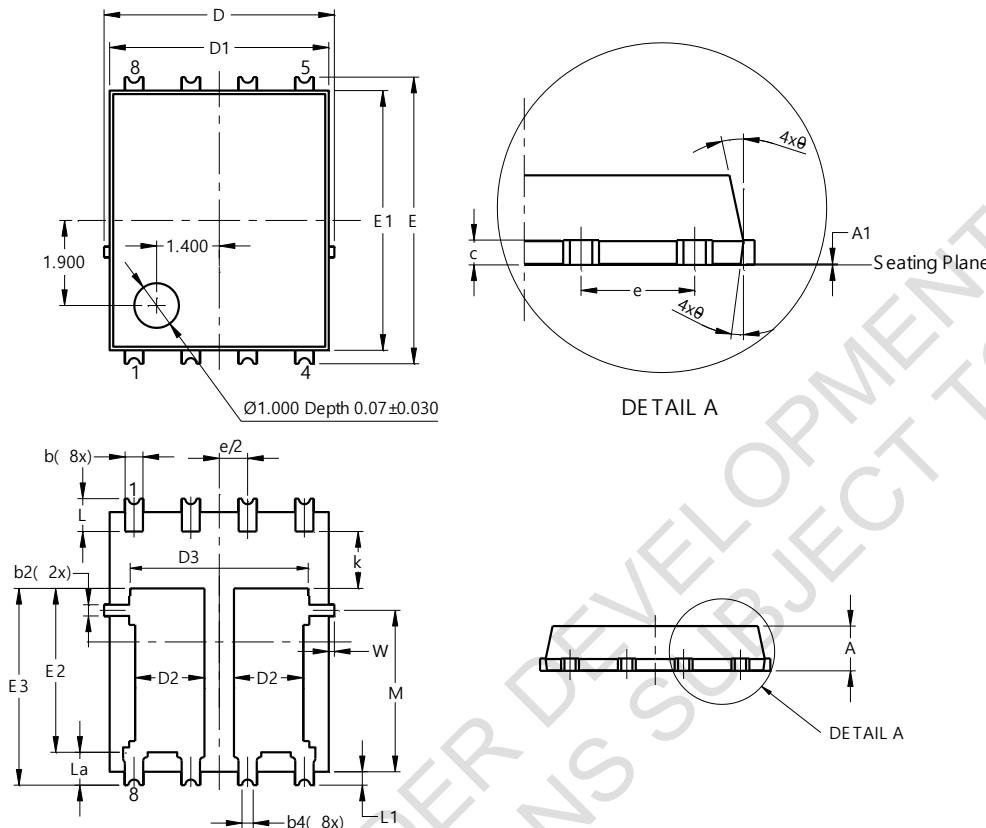
Figure 12. SOA, Safe Operation Area



## Package Outline Dimensions

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

PowerDI5060-8/SWP (Type UXD)

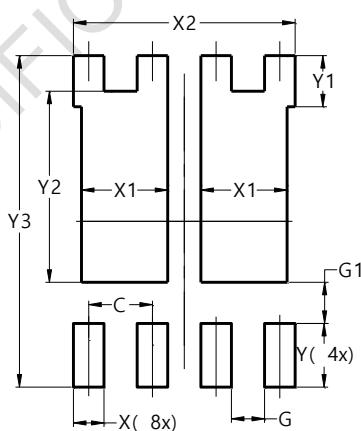


PowerDI5060-8/SWP (Type UXD)			
Dim	Min	Max	Typ
<b>A</b>	0.90	1.10	1.00
<b>A1</b>	0.00	0.05	--
<b>b</b>	0.30	0.50	0.41
<b>b2</b>	0.20	0.35	0.25
<b>b4</b>	0.25REF		
<b>c</b>	0.230	0.330	0.277
<b>D</b>	5.15 BSC		
<b>D1</b>	4.70	5.10	4.90
<b>D2</b>	1.46	1.66	1.55
<b>D3</b>	3.78	4.18	3.98
<b>E</b>	6.40 BSC		
<b>E1</b>	5.60	6.00	5.80
<b>E2</b>	3.46	3.86	3.66
<b>E2a</b>	4.195	4.595	4.395
<b>e</b>	1.27BSC		
<b>k</b>	1.05	--	--
<b>L</b>	0.635	0.835	0.735
<b>La</b>	0.635	0.835	0.735
<b>L1</b>	0.200	0.400	0.300
<b>M</b>	3.205	4.005	3.605
<b>W</b>	0.025	0.225	0.125
<b>θ</b>	10°	12°	11°
<b>θ1</b>	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 UXD)



Dimensions	Value (in mm)
<b>C</b>	1.270
<b>G</b>	0.660
<b>G1</b>	0.820
<b>X</b>	0.610
<b>X1</b>	1.720
<b>X2</b>	4.420
<b>Y</b>	1.270
<b>Y1</b>	1.020
<b>Y2</b>	3.810
<b>Y3</b>	6.610

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