

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>C</sub> = +25°C
100V	17.4mΩ @ V <sub>GS</sub> = 10V	54.7A
	30.3mΩ @ V <sub>GS</sub> = 4.5V	41.4A

## Description and Applications

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

- Synchronous Rectifier
- DC-DC Converters
- Primary Side Switching

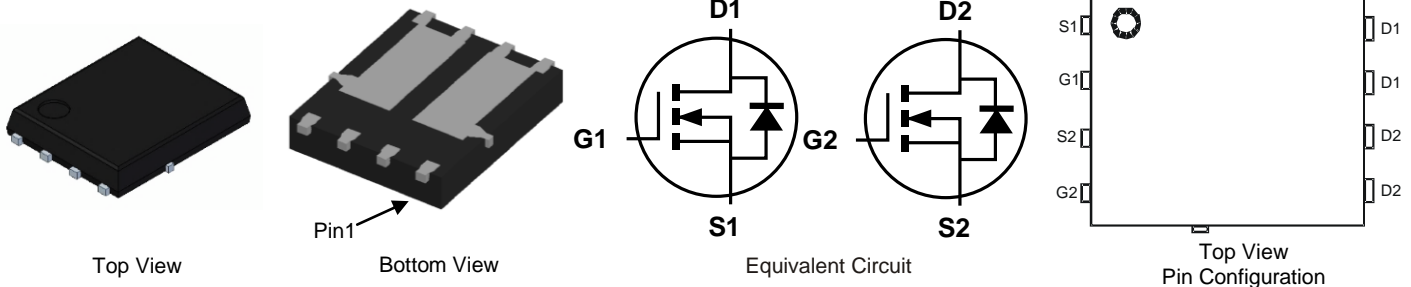
## Features and Benefits

- 100% Unclamped Inductive Switching—Ensures More Reliable and Robust End Application
- High-Conversion Efficiency
- Low R<sub>DS(ON)</sub>—Minimizes On State Losses
- Low-Input Capacitance
- Fast Switching Speed
- **Lead-Free Finish; 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- Q100/101/200, 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

- Case: PowerDI<sup>®</sup> 5060-8
- Case 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<sup>(e3)</sup>
- Weight: 0.097 grams (Approximate)

PowerDI5060-8 (Type E)

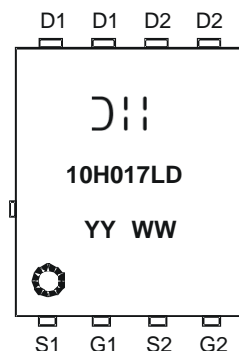


## Ordering Information (Note 4)

Part Number	Case	Packaging
DMT10H017LPD-13	PowerDI5060-8 (Type E)	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



- DII = Manufacturer's Marking
- 10H017LD = Product Type Marking Code
- YYWW = Date Code Marking
- YY = Year (ex: 19 = 2019)
- WW = Week (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V <sub>DSS</sub>	100	V	
Gate-Source Voltage	V <sub>GSS</sub>	±20	V	
Continuous Drain Current, V <sub>GS</sub> = 10V (Note 6)	I <sub>D</sub>	T <sub>C</sub> = +25°C	54.7	A
		T <sub>C</sub> = +70°C	43.7	
Maximum Body Diode Forward Current (Note 6)	I <sub>S</sub>	60	A	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	60	A	
Avalanche Current, L = 3mH (Note 8)	I <sub>AS</sub>	10	A	
Avalanche Energy, L = 3mH (Note 8)	E <sub>AS</sub>	150	mJ	
Avalanche Current, L = 1mH	I <sub>AS</sub>	10	A	
Avalanche Energy, L = 1mH	E <sub>AS</sub>	50	mJ	

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit	
Total Power Dissipation	P <sub>D</sub>	T <sub>A</sub> = +25°C	2.2	W
Thermal Resistance, Junction to Ambient (Note 5)		R <sub>θJA</sub>	56	
Total Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = +25°C	78	W
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	1.6	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C	

**Electrical Characteristics** (@T<sub>C</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	100	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 80V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±16V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1	—	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	13.7	17.4	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 17A
		—	23.5	30.3		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A
Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.3	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 17A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	1986	—	pF	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	333	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	20	—		
Gate Resistance	R <sub>G</sub>	—	1.17	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	14.4	—	nC	V <sub>DS</sub> = 50V, I <sub>D</sub> = 20A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	28.6	—		
Gate-Source Charge	Q <sub>gs</sub>	—	5.2	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	8.2	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	9.8	—	ns	V <sub>DD</sub> = 50V, V <sub>GS</sub> = 10V, R <sub>G</sub> = 11Ω, I <sub>D</sub> = 20A
Turn-On Rise Time	t <sub>R</sub>	—	16.3	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	32.6	—		
Turn-Off Fall Time	t <sub>F</sub>	—	21.6	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	40.6	—	ns	I <sub>F</sub> = 17A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	58.1	—	nC	I <sub>F</sub> = 17A, di/dt = 100A/µs

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

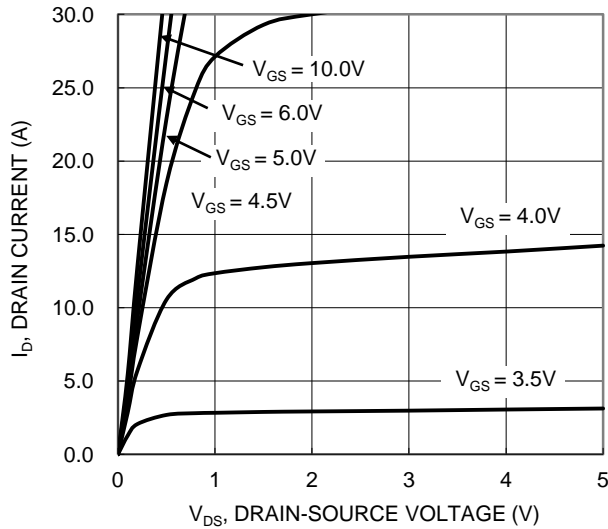


Figure 1. Typical Output Characteristic

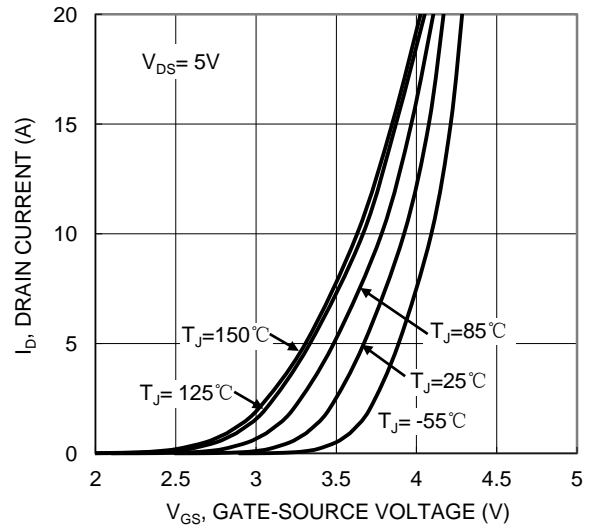


Figure 2. Typical Transfer Characteristic

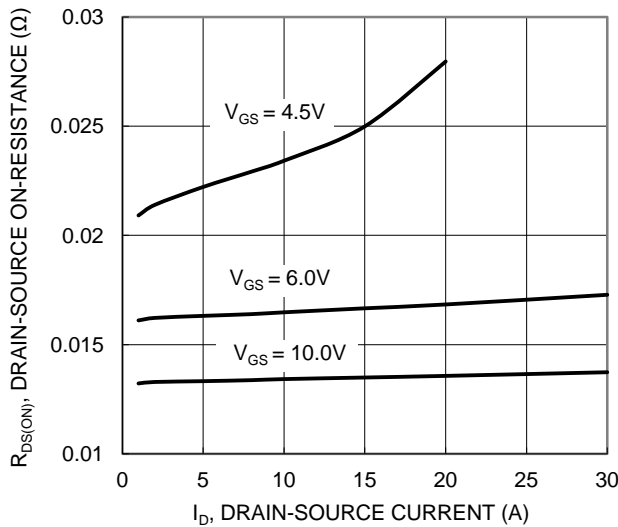


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

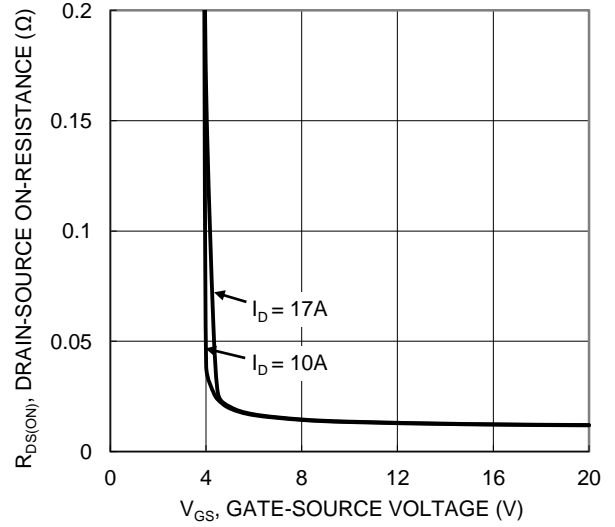


Figure 4. Typical Transfer Characteristic

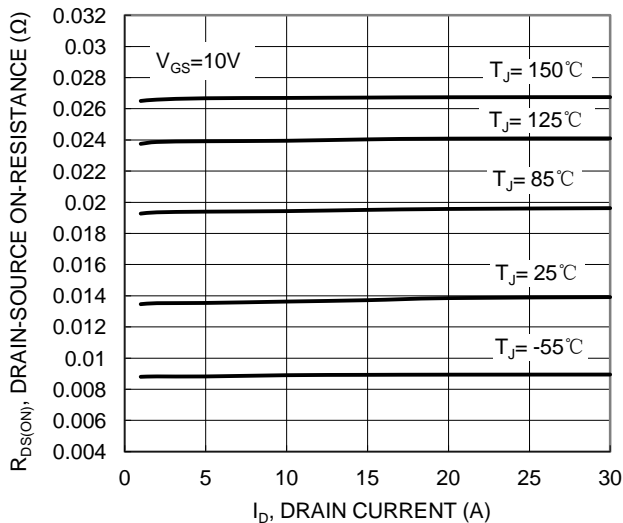


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

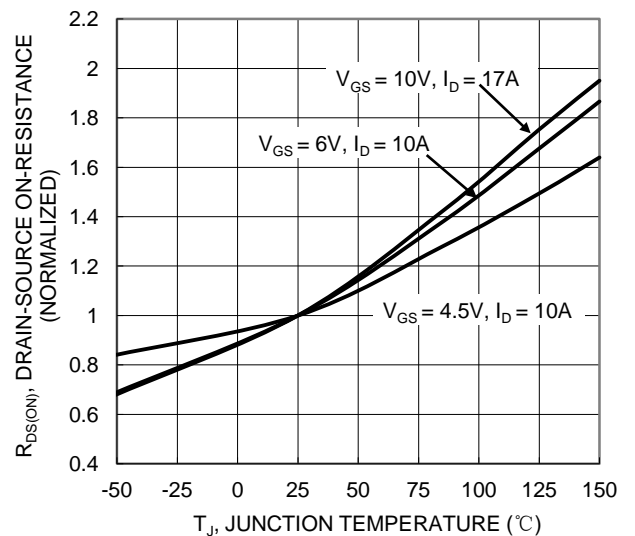


Figure 6. On-Resistance Variation with Temperature

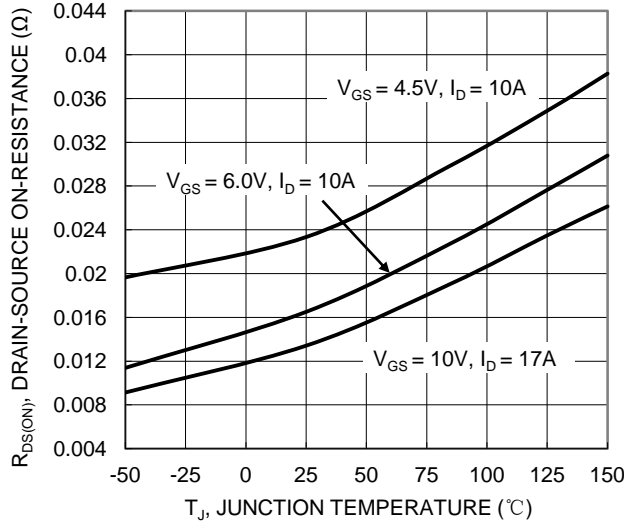


Figure 7. On-Resistance Variation with Temperature

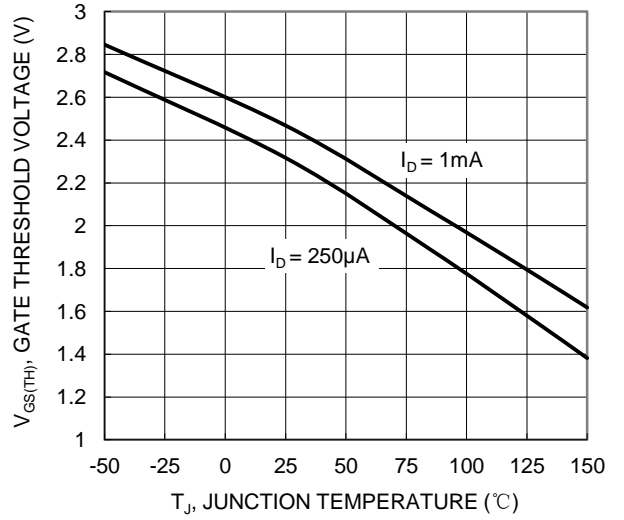


Figure 8. Gate Threshold Variation vs. Junction Temperature

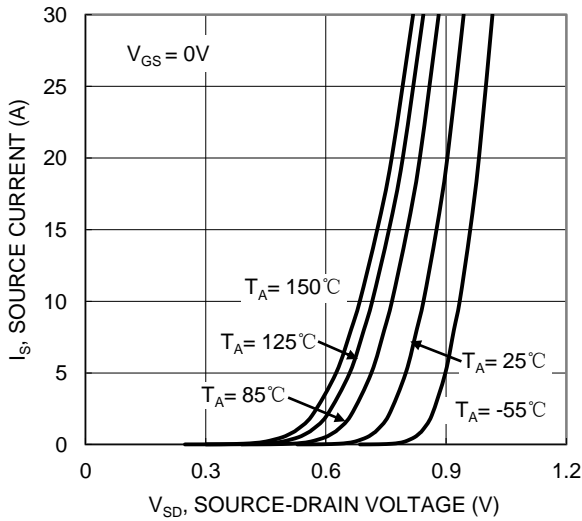


Figure 9. Diode Forward Voltage vs. Current

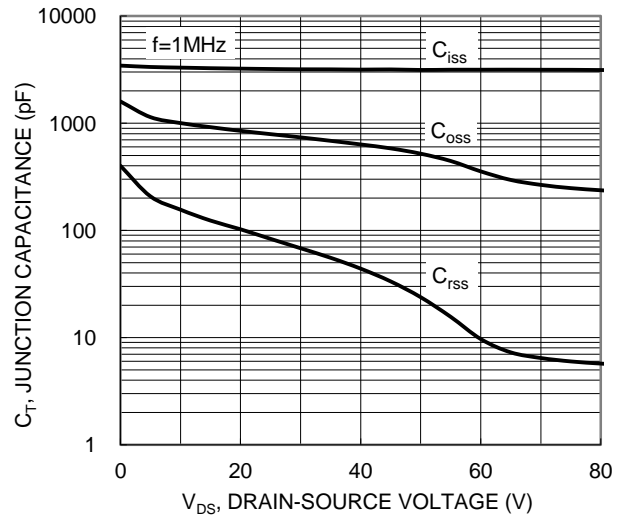


Figure 10. Typical Junction Capacitance

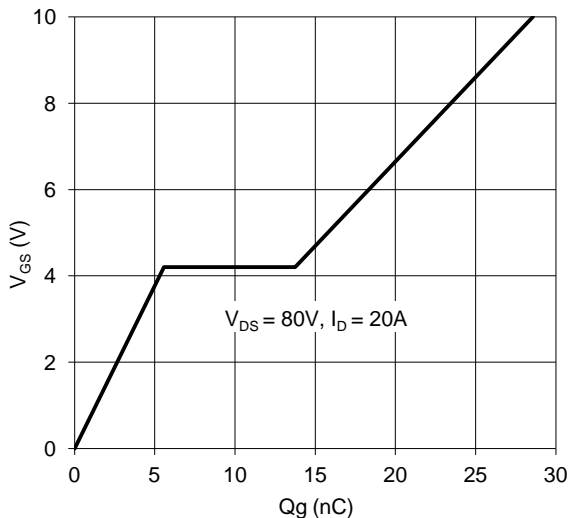


Figure 11. Gate Charge

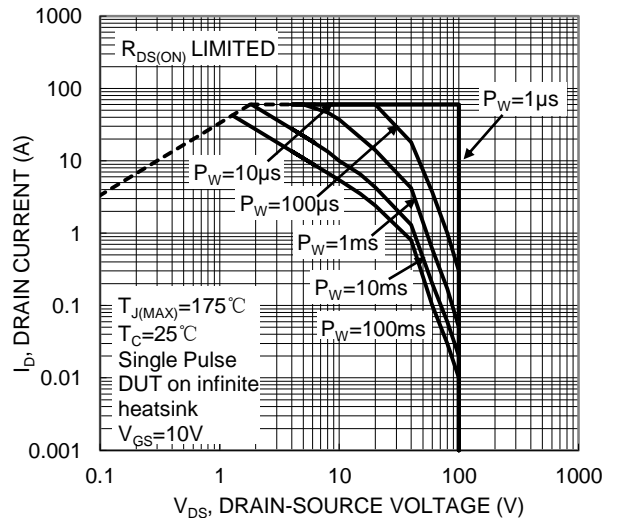
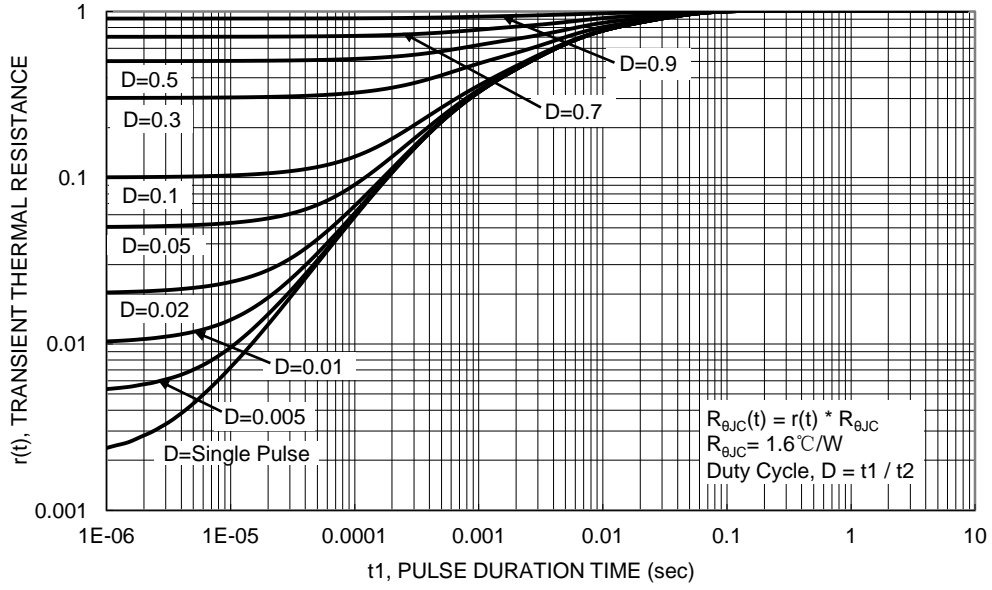


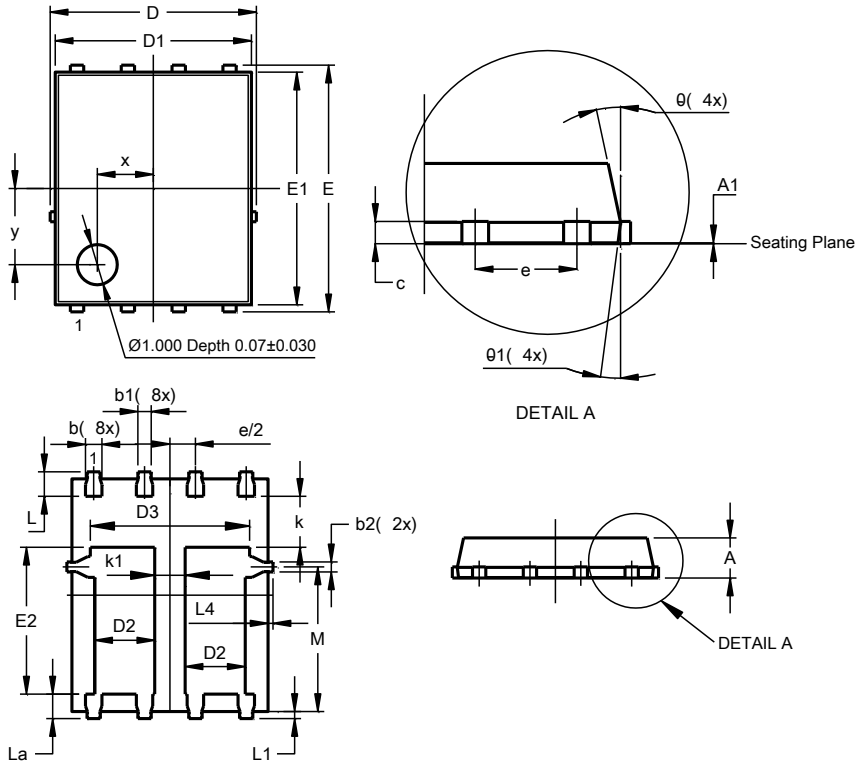
Figure 12. SOA, Safe Operation Area



**Package Outline Dimensions**

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

**PowerDI5060-8 (Type E)**

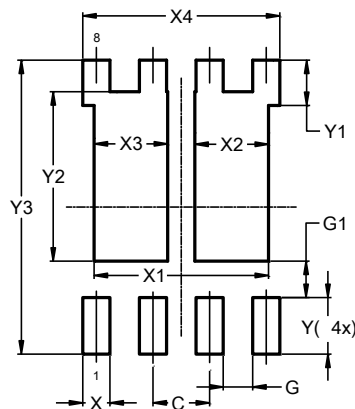


PowerDI5060-8 (Type E)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	0.02
b	0.33	0.51	0.41
b1	0.300	0.366	0.333
b2	0.20	0.35	0.25
c	0.23	0.33	0.277
D	5.15 BSC		
D1	4.85	4.95	4.90
D2	1.40	1.60	1.50
D3	-	-	3.98
E	6.15 BSC		
E1	5.75	5.85	5.80
E2	3.56	3.76	3.66
e	1.27BSC		
k	-	-	1.27
k1	0.56	-	-
L	0.51	0.71	0.61
La	0.51	0.71	0.61
L1	0.05	0.20	0.175
L4	-	-	0.125
M	3.50	3.71	3.605
x	-	-	1.400
y	-	-	1.900
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 (Type E)**



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	3.910
X2	1.650
X3	1.650
X4	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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