

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>C</sub> = +25°C
-30V	3.8mΩ @ V <sub>GS</sub> = -10V	-135A
	6.0mΩ @ V <sub>GS</sub> = -5V	-110A

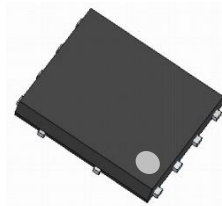
## Description

This new generation MOSFET is designed to minimize R<sub>DS(ON)</sub> and yet maintain superior switching performance. This device is ideal for use in notebook battery power management and load switch.

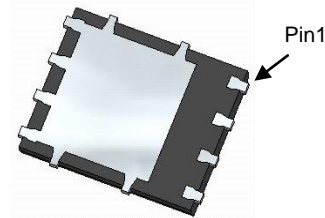
## Applications

- Switch

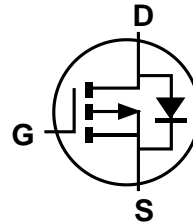
PowerDI5060-8



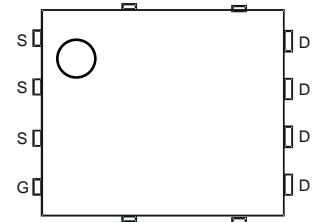
Top View



Bottom View



Internal Schematic


 Top View  
 Pin Configuration

## Features

- 100% Unclamped Inductive Switch (UIS) Test in Production
- Thermally Efficient Package-Cooler Running Applications
- High Conversion Efficiency
- Low R<sub>DS(ON)</sub> – Minimizes On State Losses
- <1.1mm Package Profile – Ideal for Thin Applications
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. “Green” Device (Note 3)**

## Mechanical Data

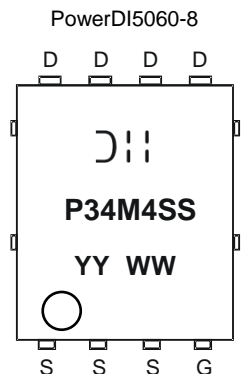
- Case: PowerDI<sup>®</sup> 5060-8
- Case Material: Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208@3
- Weight: 0.097 grams (Approximate)

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP34M4SPS-13	PowerDI5060-8	2,500 / Tape & Reel

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



= Manufacturer's Marking  
 P34M4SS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 18 = 2018)  
 WW = Week Code (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>	-30	V
Gate-Source Voltage	V <sub>GSS</sub>	±25	V
Continuous Drain Current, V <sub>GS</sub> = -10V (Note 7)	I <sub>D</sub>	T <sub>C</sub> = +25°C	-135
		T <sub>C</sub> = +70°C	-110
Continuous Drain Current, V <sub>GS</sub> = -10V (Note 6)	I <sub>D</sub>	T <sub>A</sub> = +25°C	-21
		T <sub>A</sub> = +70°C	-17
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	-350	A
Maximum Continuous Body Diode Forward Current (Note 6)	I <sub>S</sub>	-2.9	A
Pulsed Body Diode Forward Current (380µs Pulse, Duty Cycle = 1%)	I <sub>SM</sub>	-350	A
Avalanche Current, L = 0.1mH (Note 8)	I <sub>AS</sub>	-60	A
Avalanche Energy, L = 0.1mH (Note 8)	E <sub>AS</sub>	180	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	94	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	3.0	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	47	°C/W
Total Power Dissipation (Note 7)	P <sub>D</sub>	100	W
Thermal Resistance, Junction to Case (Note 7)	R <sub>θJC</sub>	1.4	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	µA	V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1.6	—	-2.6	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	2.9	3.8	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A
		—	4.9	6.0		V <sub>GS</sub> = -5V, I <sub>D</sub> = -20A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.7	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>ISS</sub>	—	3,775	—	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>OSS</sub>	—	932	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	500	—	pF	
Gate Resistance	R <sub>g</sub>	—	21	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	127	—	nC	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -20A
Gate-Source Charge	Q <sub>gs</sub>	—	24.5	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	28.5	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	6.9	—	ns	V <sub>DD</sub> = -15V, V <sub>GEN</sub> = -10V, R <sub>GEN</sub> = 3Ω, I <sub>D</sub> = -20A
Turn-On Rise Time	t <sub>r</sub>	—	4.0	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	372	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	160	—	ns	
Reverse Recovery Time	t <sub>RR</sub>	—	26.5	—	ns	I <sub>F</sub> = -20A, di/dt = 500A/µs
Reverse Recovery Charge	Q <sub>RR</sub>	—	37.3	—	nC	

- 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.
  - Thermal resistance from junction to soldering point (on the exposed drain pad).
  - I<sub>AS</sub> and E<sub>AS</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

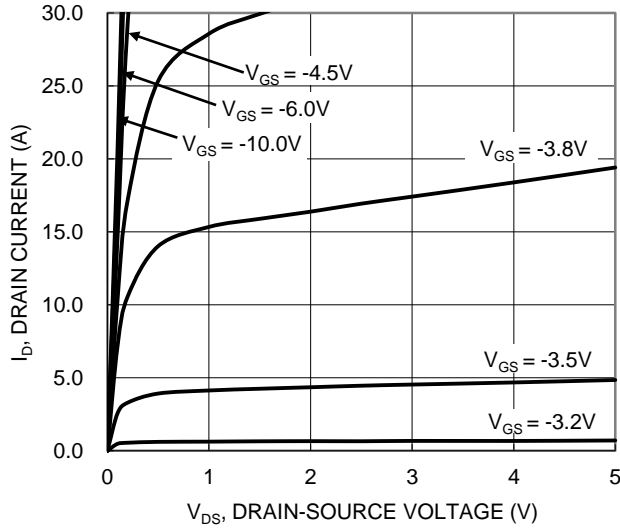


Figure 1. Typical Output Characteristic

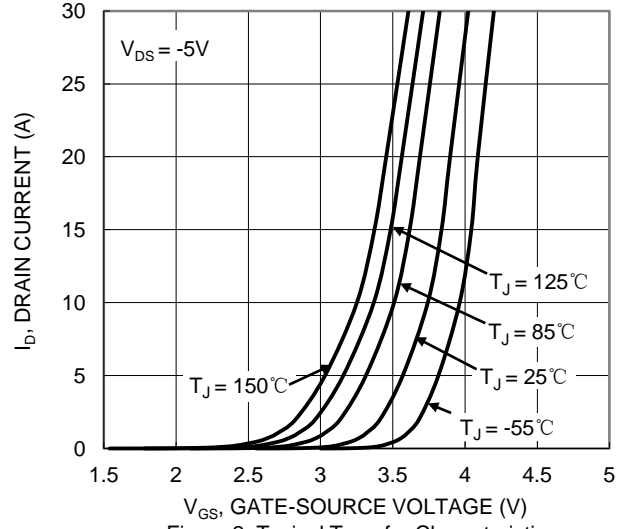


Figure 2. Typical Transfer Characteristic

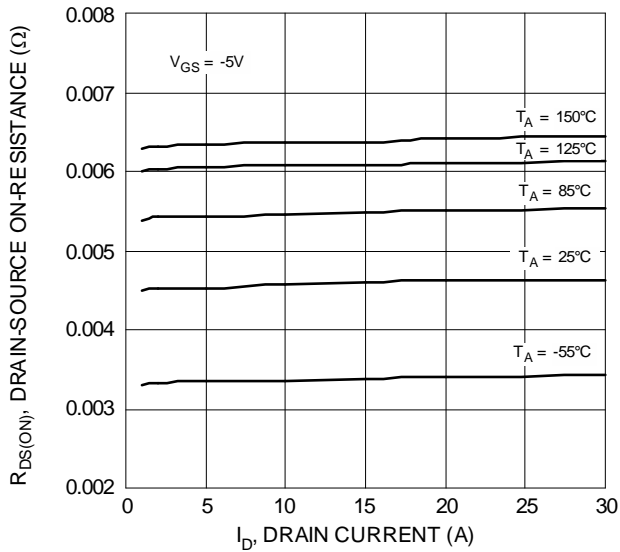


Figure 3 Typical On-Resistance vs. Drain Current and Junction Temperature

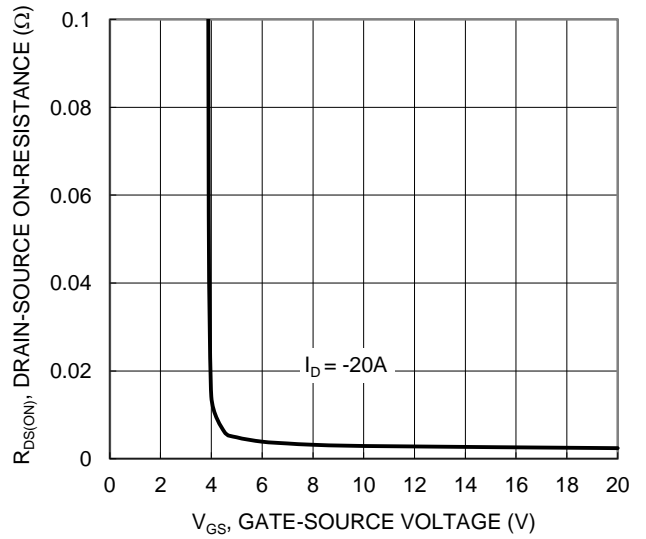


Figure 4. Typical Transfer Characteristic

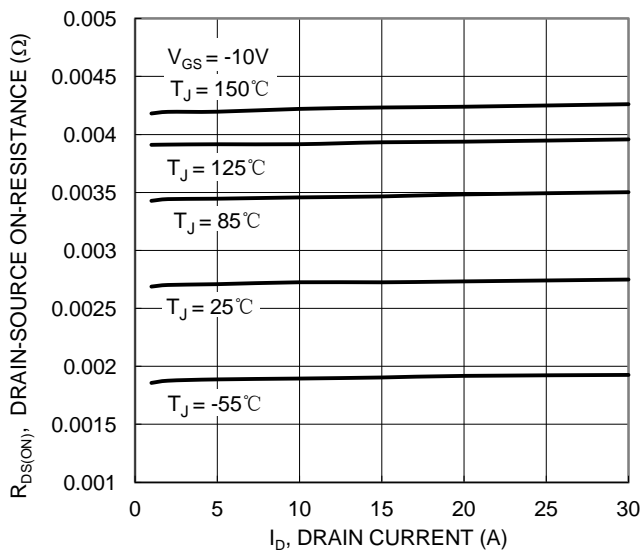


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

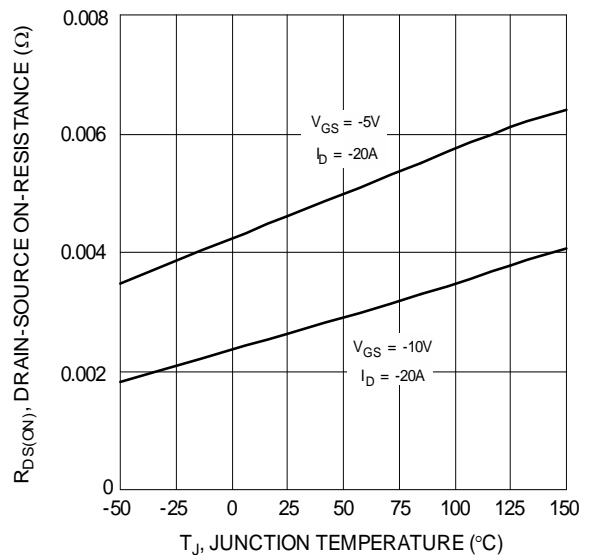
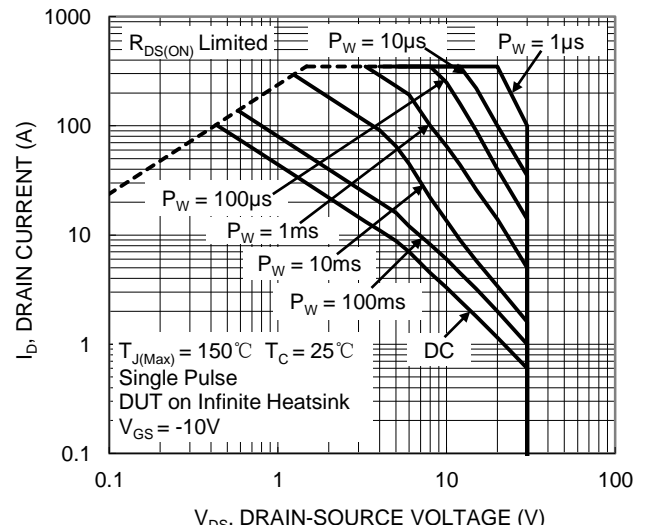
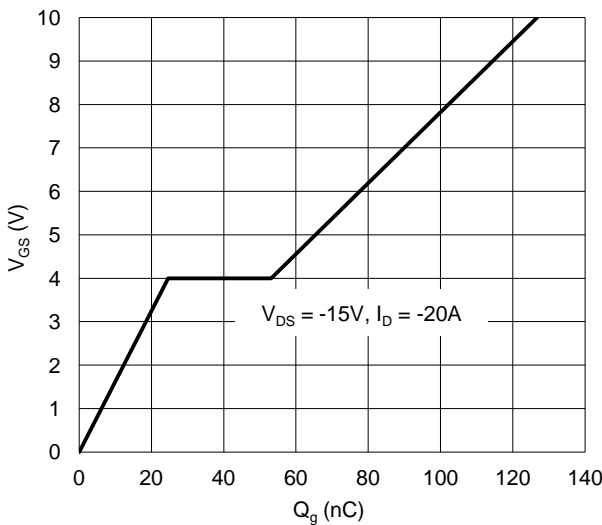
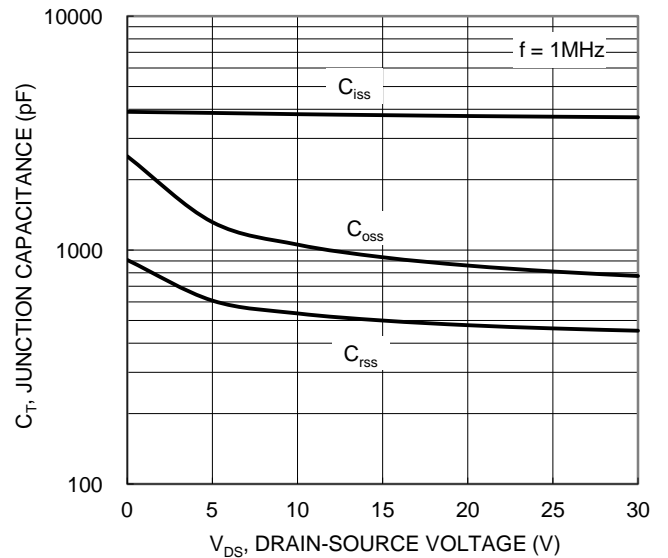
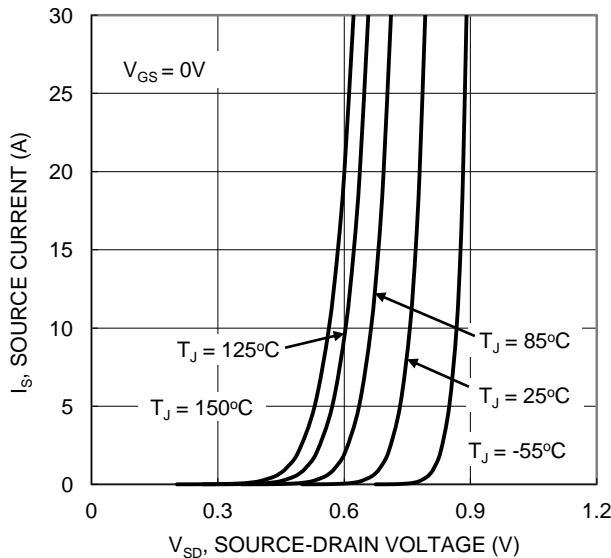
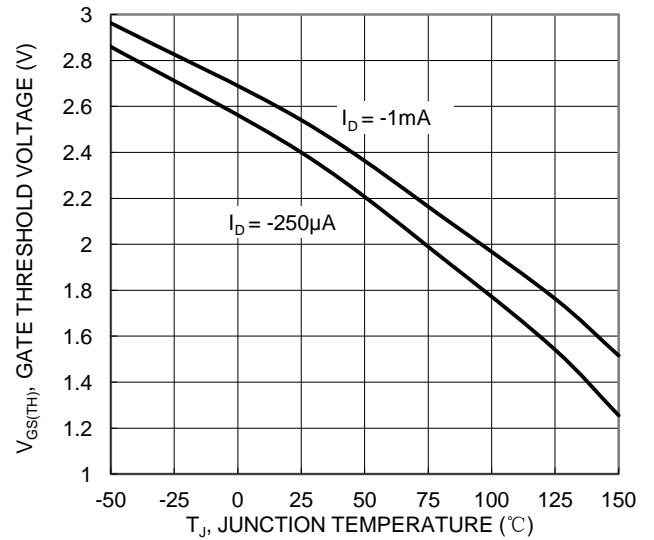
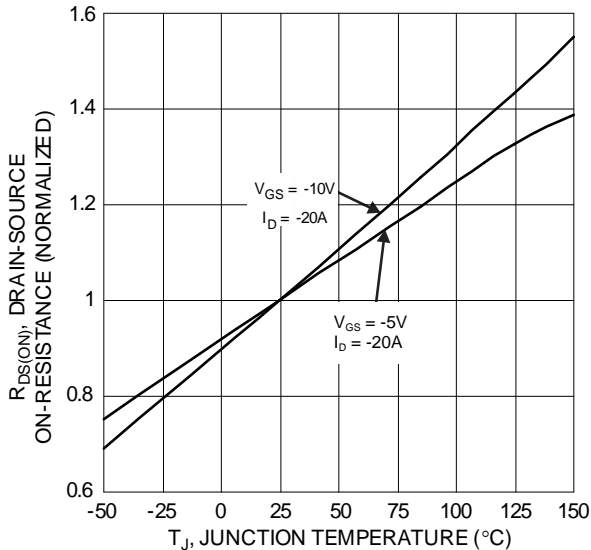


Figure 6 On-Resistance Variation with Junction Temperature



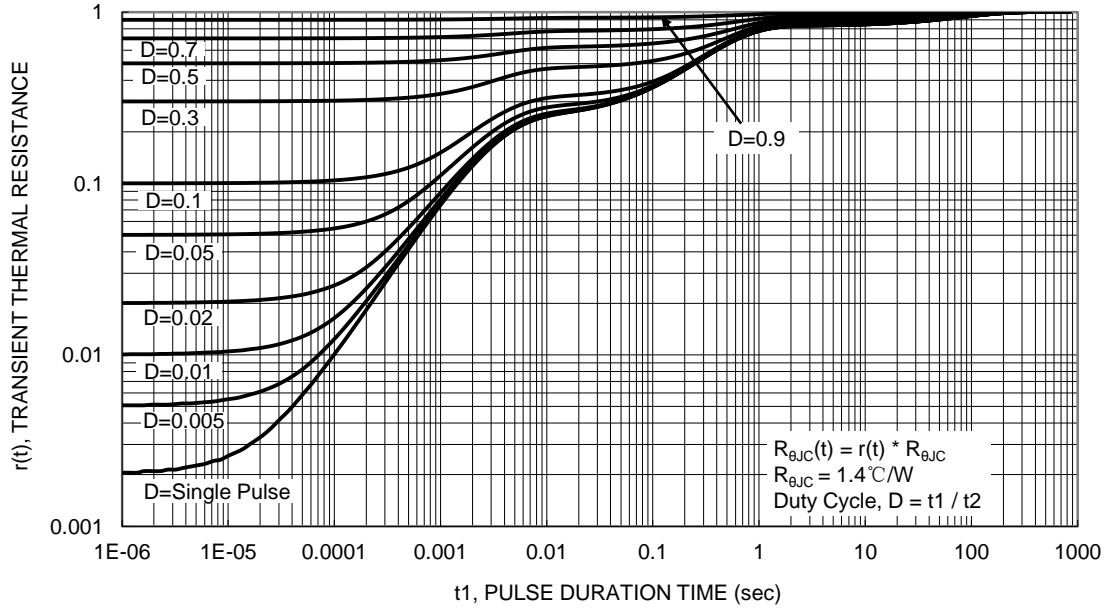
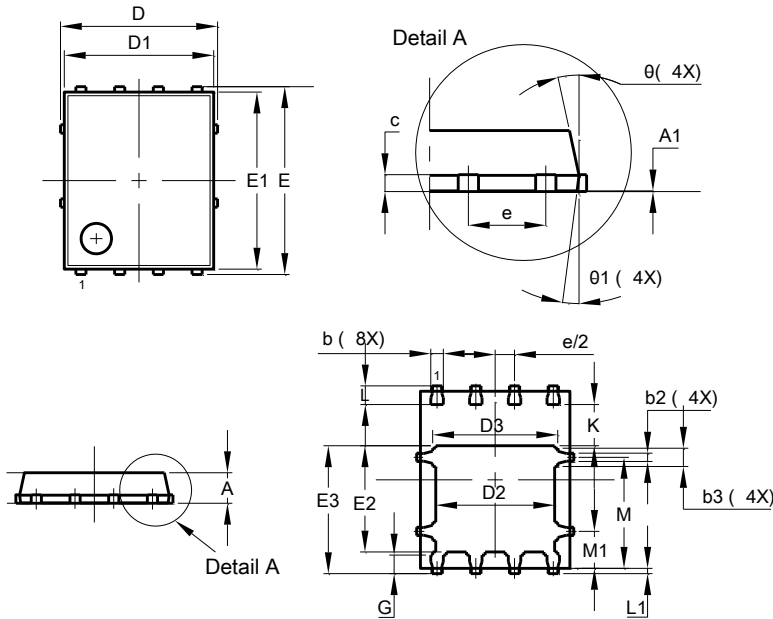


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**PowerDI5060-8**

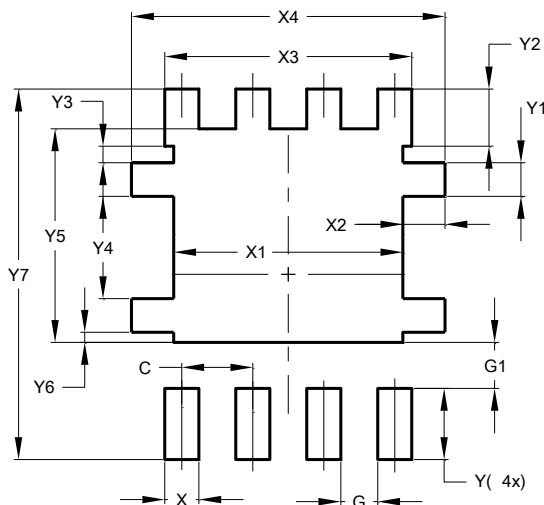


PowerDI5060-8			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0.00	0.05	-
b	0.33	0.51	0.41
b2	0.200	0.350	0.273
b3	0.40	0.80	0.60
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.70	4.10	3.90
D3	3.90	4.30	4.10
E	6.15 BSC		
E1	5.60	6.00	5.80
E2	3.28	3.68	3.48
E3	3.99	4.39	4.19
e	1.27 BSC		
G	0.51	0.71	0.61
K	0.51	-	-
L	0.51	0.71	0.61
L1	0.100	0.200	0.175
M	3.235	4.035	3.635
M1	1.00	1.40	1.21
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**



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.100
X2	0.755
X3	4.420
X4	5.610
Y	1.270
Y1	0.600
Y2	1.020
Y3	0.295
Y4	1.825
Y5	3.810
Y6	0.180
Y7	6.610

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