Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_C = +25°C$ (Note 9)
100V	4.3mΩ @ V_{GS} = 10V	100A

Description

This new generation N-Channel Enhancement Mode MOSFET is designed to minimize $R_{DS(ON)}$, yet maintain superior switching performance. This device is ideal for use in notebook battery power management and load switch.

Applications

- Motor Control
- DC-DC Converters
- Power Management

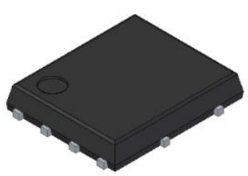
Features

- 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
- Low Input Capacitance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

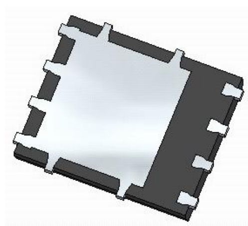
- Case: PowerDI®5060-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.097 grams (Approximate)

PowerDI5060-8 (Standard)

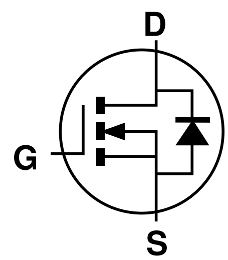


Top View

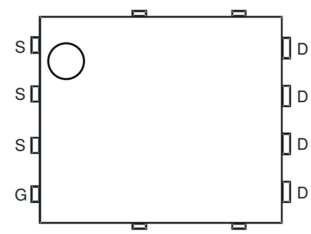
Pin1



Bottom View



Internal Schematic



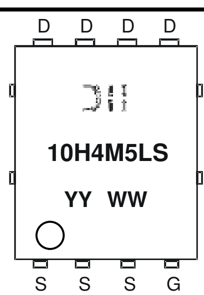
Top View
Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT10H4M5LPS-13	PowerDI5060-8 (Standard)	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 http://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 athttps://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



= Manufacturer's Marking
10H4M5LS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY= Last Two Digits of Year (ex: 19 = 2019)
WW or WW= Week Code (01 to 53)

PowerDI is a registered trademark of Diodes Incorporated.

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	100	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current, V_{GS} = 10V (Note 5)	Steady State	T_A = +25°C	I_D	19	A
		T_A = +70°C		15	
Continuous Drain Current, V_{GS} = 10V (Note 6)	Steady State	T_C = +25°C	I_D	100	A
		T_C = +70°C (Note 9)		100	
Pulsed Drain Current (10µs Pulse, T_C=+25°C, Package Limited)			I_{DM}	400	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	100	A
Pulsed Body Diode Forward Current (10µs Pulse, T_C=+25°C, Package Limited)			I_{SM}	400	A
Avalanche Current (Note 7) L=0.3mH			I_{AS}	40	A
Avalanche Energy (Note 7) L=0.3mH			E_{AS}	240	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	54	°C/W
Total Power Dissipation (Note 6)	T_C = +25°C	P_D	113	W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	1.1	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	V_{GS} = 0V, I_D = 10mA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 80V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.3	—	2.5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	3.5	4.3	mΩ	V_{GS} = 10V, I_D = 30A
		—	4.7	6.2		V_{GS} = 4.5V, I_D = 20A
Diode Forward Voltage	V_{SD}	—	—	1.2	V	V_{GS} = 0V, I_S = 30A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	4843	—	pF	V_{DS} = 50V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	1302	—		
Reverse Transfer Capacitance	C_{rss}	—	25.5	—		
Gate Resistance	R_g	—	2.1	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge	Q_g	—	80	—	nC	V_{DD} = 50V, I_D = 30A, V_{GS} = 10V
Gate-Source Charge	Q_{gs}	—	14	—		
Gate-Drain Charge	Q_{gd}	—	18	—		
Turn-On Delay Time	$t_{D(ON)}$	—	9	—	ns	V_{DD} = 50V, V_{GS} = 10V, I_D = 30A, R_g = 4.7Ω, R_L=1.1Ω
Turn-On Rise Time	t_R	—	26	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	76	—		
Turn-Off Fall Time	t_F	—	50	—		
Reverse Recovery Time	t_{RR}	—	63	—	ns	I_F = 22.5A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	—	133	—	nC	

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
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.
9. Package limited.

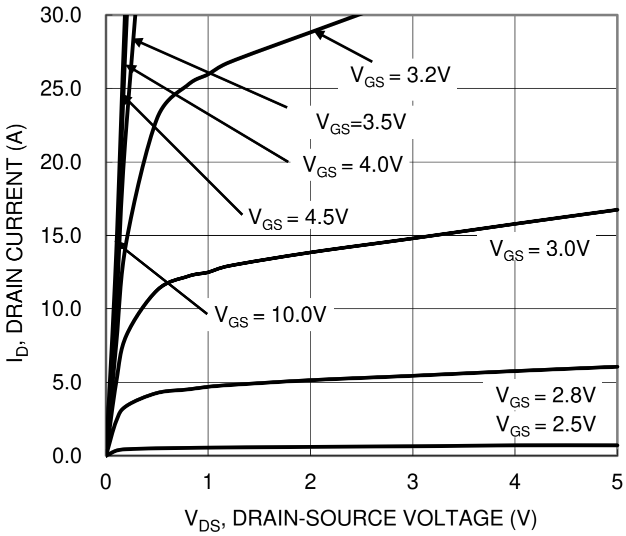


Figure 1. Typical Output Characteristic

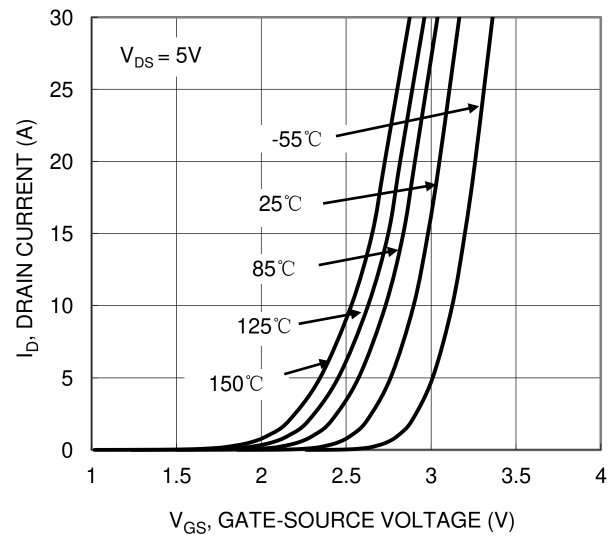


Figure 2. Typical Transfer Characteristic

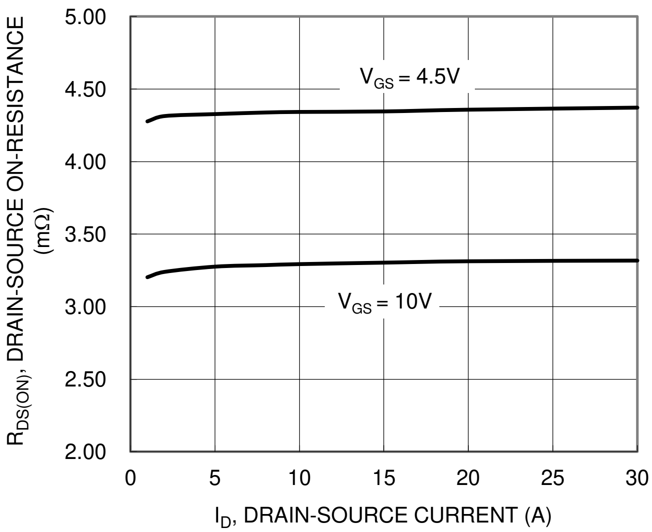


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

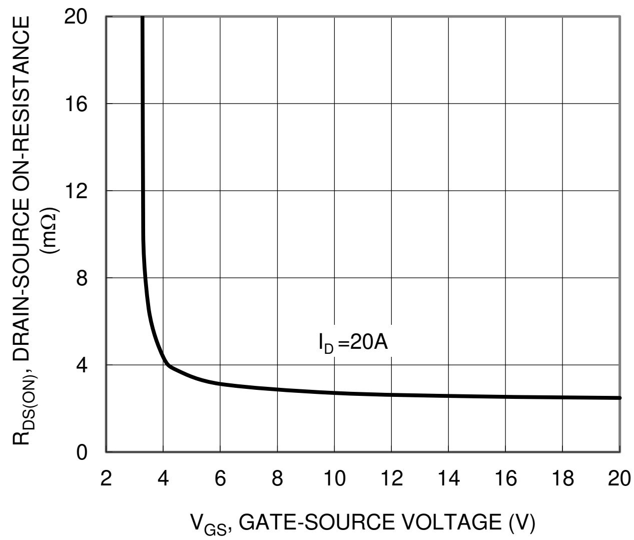


Figure 4. Typical Transfer Characteristic

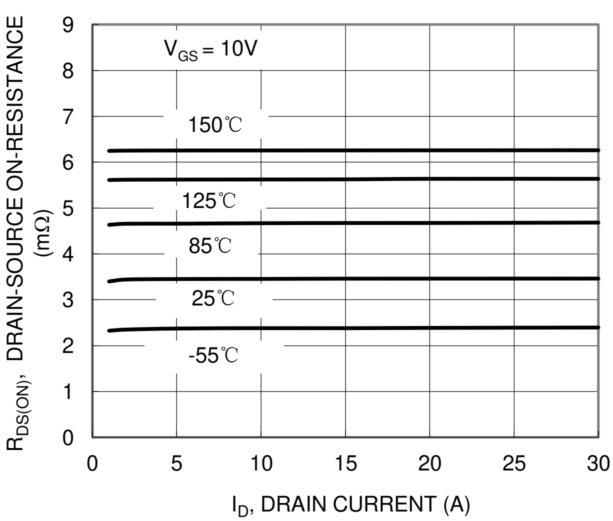


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

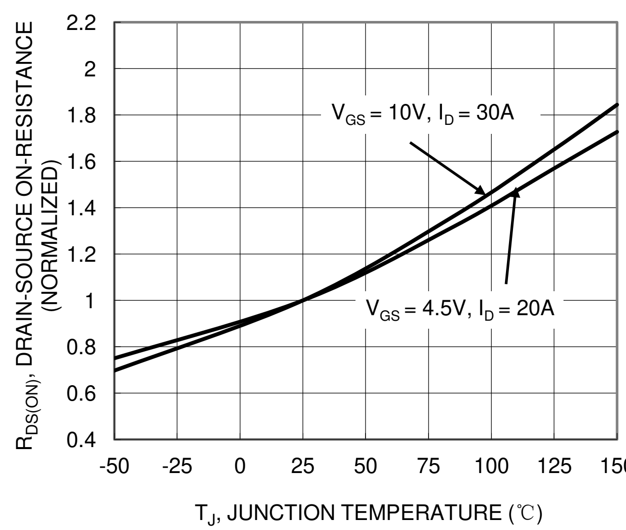


Figure 6. On-Resistance Variation with Temperature

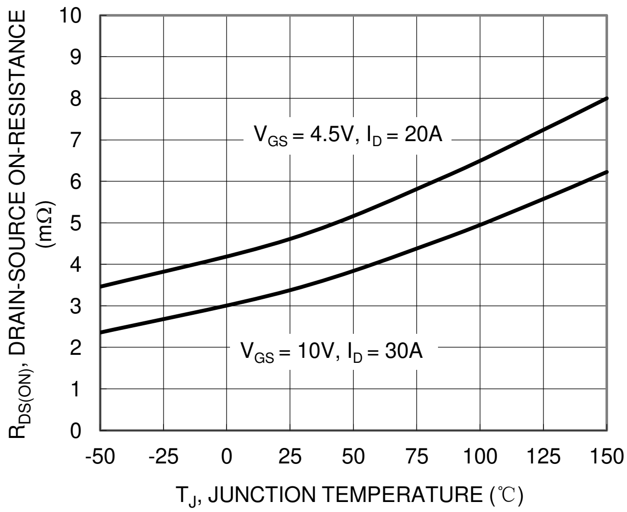


Figure 7. On-Resistance Variation with Temperature

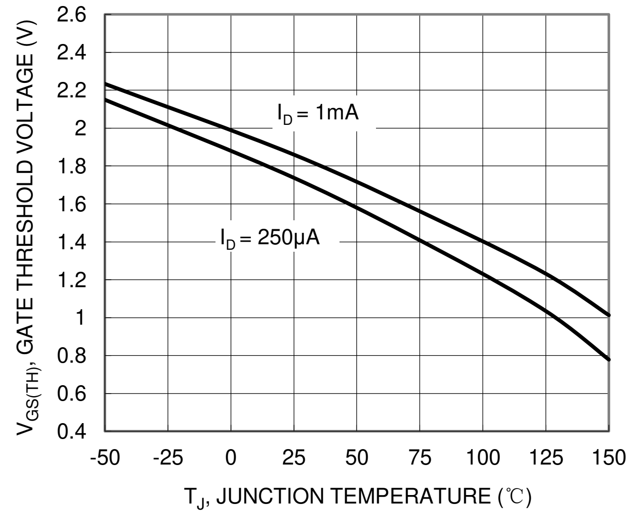


Figure 8. Gate Threshold Variation vs. JunctionTemperature

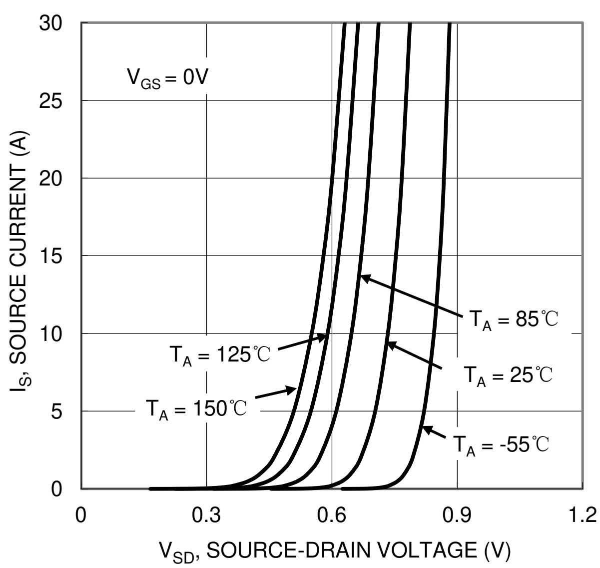


Figure 9. Diode Forward Voltage vs. Current

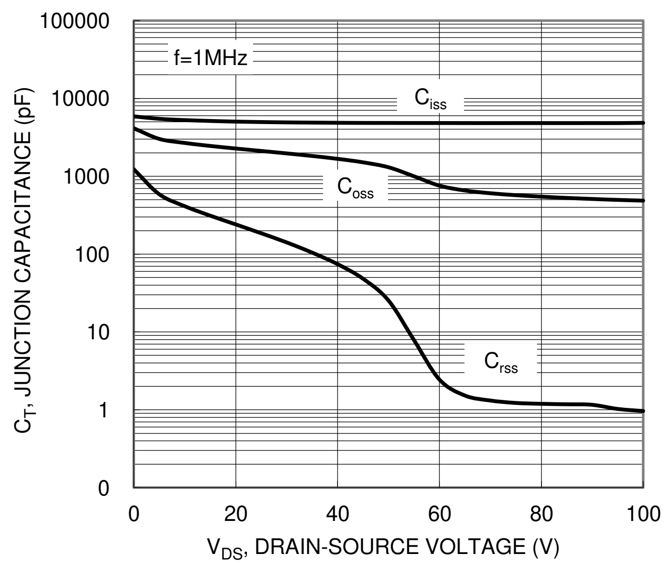


Figure 10. Typical Junction Capacitance

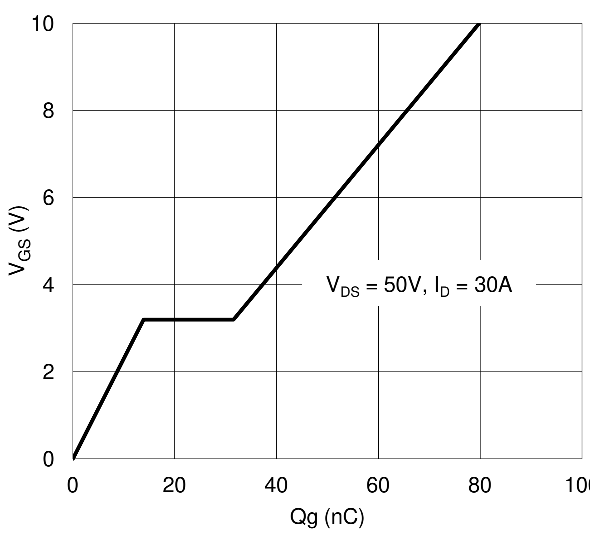


Figure 11. Gate Charge

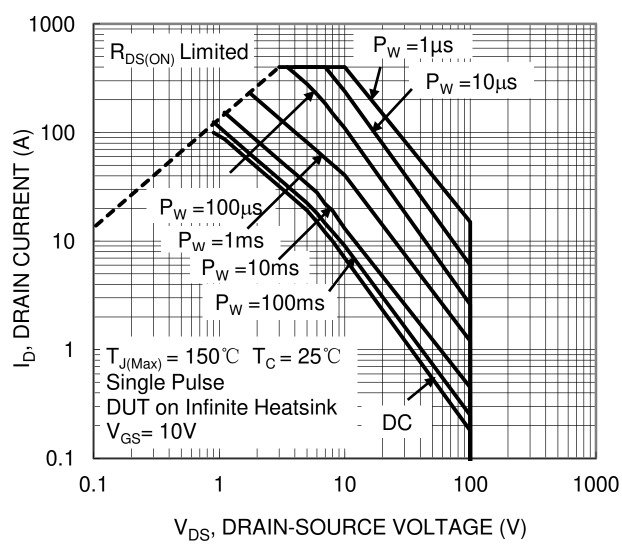


Figure 12. SOA, Safe Operation Area

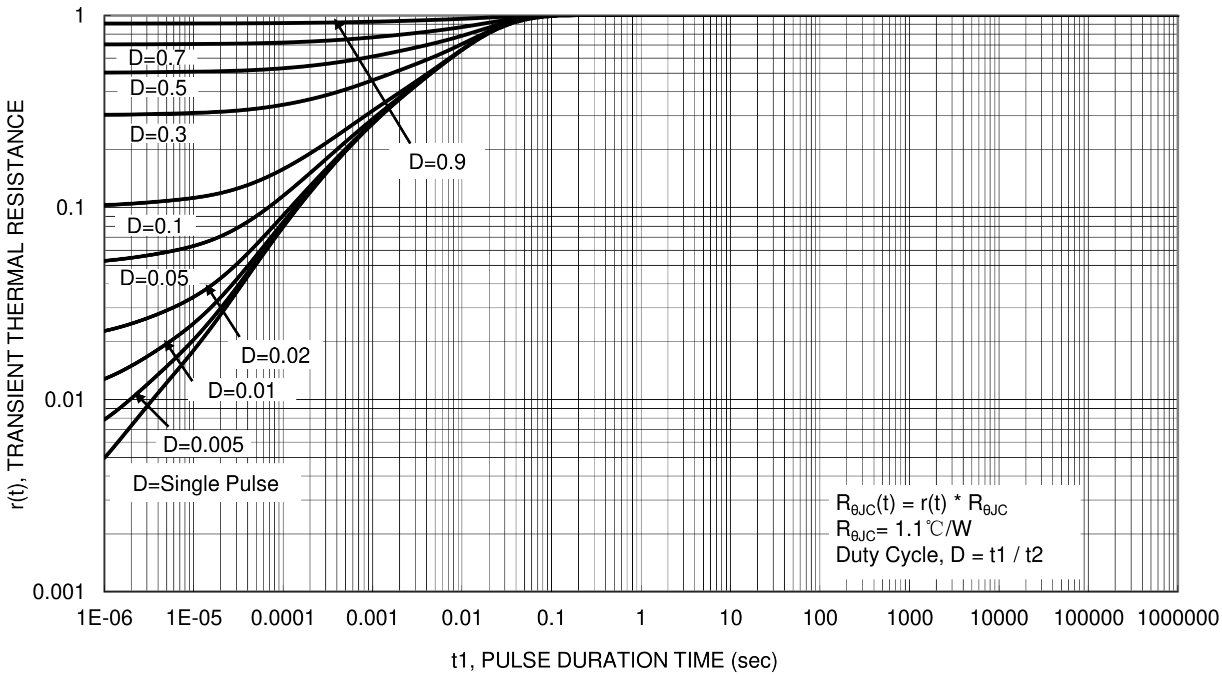
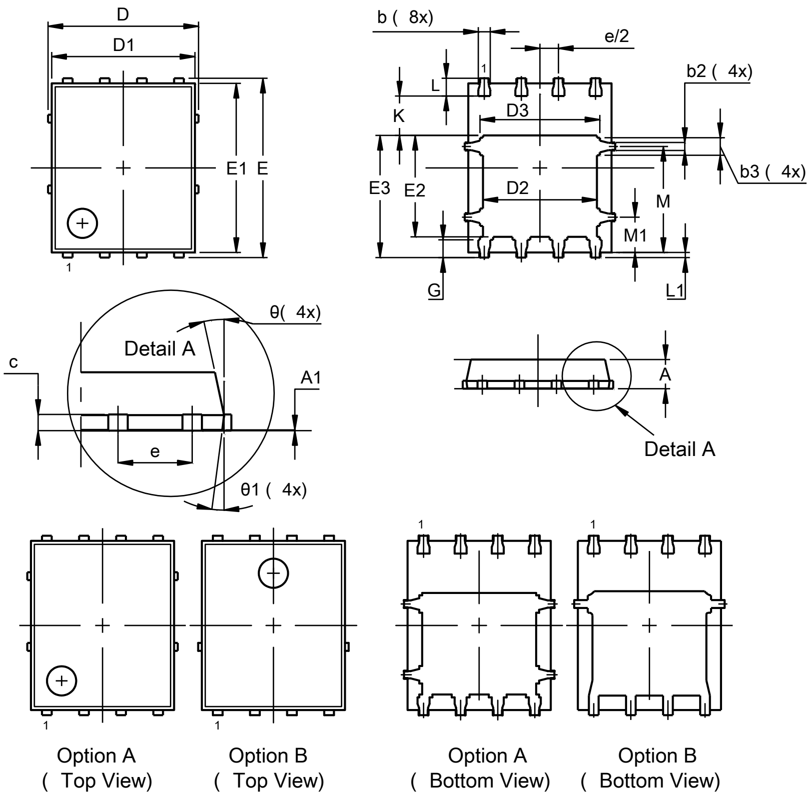


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI5060-8 (Standard)

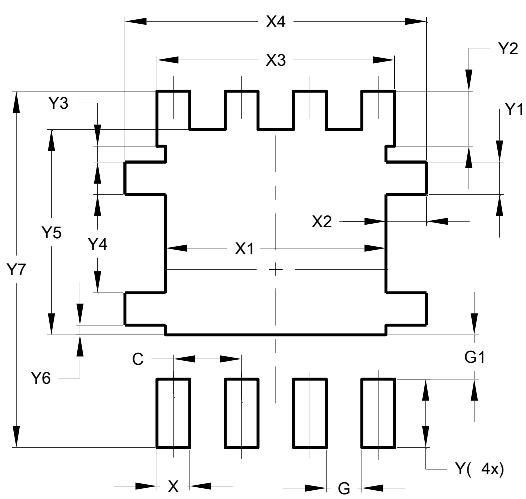


PowerDI5060-8 (Standard)			
Dim	**Min**	**Max**	**Typ**
A	0.90	1.20	--
A1	0.00	0.05	–
b	0.33	0.51	--
b2	0.200	0.350	--
b3	0.40	0.80	0.60
c	0.230	0.354	--
D (Option A)	5.15 BSC		
D (Option B)	5.30 BSC		
D1	4.70	5.40	--
D2	3.70	4.25	--
D3	3.90	4.70	--
E	6.15 BSC		
E1	5.60	6.06	--
E2	3.28	3.92	--
E3	3.99	4.39	--
e	1.27 BSC		
G	0.40	0.71	--
K	0.51	1.45	–
L	0.38	0.71	--
L1	0.100	0.200	--
M	3.235	4.035	--
M1	1.00	1.40	1.21
θ	8º	12º	--
θ1	6º	8º	7º
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI5060-8 (Standard)



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.300
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	4.100
Y6	0.180
Y7	6.610