

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
100V	17.4mΩ @ V _{GS} = 10V	54.7A
	30.3mΩ @ V _{GS} = 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

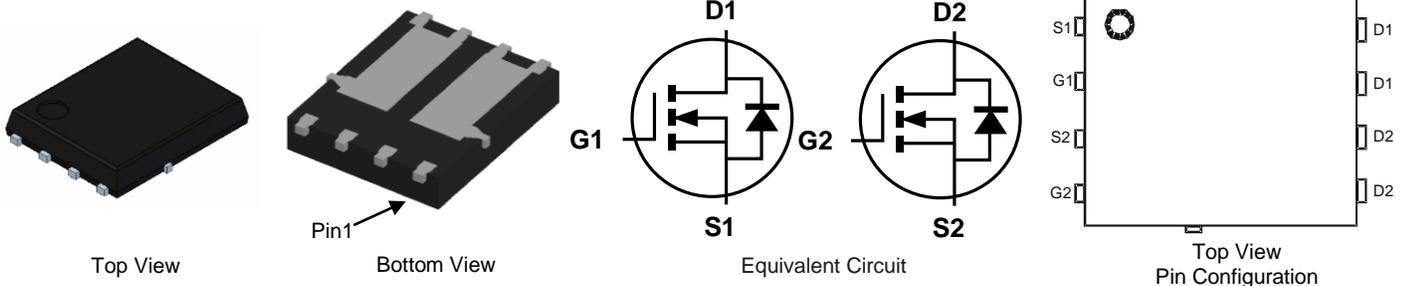
Features and Benefits

- 100% Unclamped Inductive Switching—Ensures More Reliable and Robust End Application
- High-Conversion Efficiency
- Low R_{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)**
- **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[®] 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 208③
- Weight: 0.097 grams (Approximate)

PowerDI5060-8 (Type E)

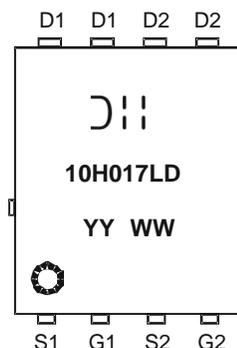


Ordering Information (Note 4)

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_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 6)	I _D	T _C = +25°C	54.7	A
		T _C = +70°C	43.7	
Maximum Body Diode Forward Current (Note 6)	I _S	60	A	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	60	A	
Avalanche Current, L = 3mH (Note 8)	I _{AS}	10	A	
Avalanche Energy, L = 3mH (Note 8)	E _{AS}	150	mJ	
Avalanche Current, L = 1mH	I _{AS}	10	A	
Avalanche Energy, L = 1mH	E _{AS}	50	mJ	

Thermal Characteristics

Characteristic	Symbol	Value	Unit	
Total Power Dissipation	P _D	T _A = +25°C	2.2	W
Thermal Resistance, Junction to Ambient (Note 5)		R _{θJA}	56	
Total Power Dissipation	P _D	T _C = +25°C	78	W
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	1.6	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

Electrical Characteristics (@T_C = +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 = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	13.7	17.4	mΩ	V _{GS} = 10V, I _D = 17A
		—	23.5	30.3		V _{GS} = 4.5V, I _D = 10A
Diode Forward Voltage	V _{SD}	—	0.8	1.3	V	V _{GS} = 0V, I _S = 17A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	1986	—	pF	V _{DS} = 50V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	333	—		
Reverse Transfer Capacitance	C _{rss}	—	20	—		
Gate Resistance	R _G	—	1.17	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	14.4	—	nC	V _{DS} = 50V, I _D = 20A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	28.6	—		
Gate-Source Charge	Q _{gs}	—	5.2	—		
Gate-Drain Charge	Q _{gd}	—	8.2	—		
Turn-On Delay Time	t _{D(ON)}	—	9.8	—	ns	V _{DD} = 50V, V _{GS} = 10V, R _G = 11Ω, I _D = 20A
Turn-On Rise Time	t _R	—	16.3	—		
Turn-Off Delay Time	t _{D(OFF)}	—	32.6	—		
Turn-Off Fall Time	t _F	—	21.6	—		
Body Diode Reverse Recovery Time	t _{RR}	—	40.6	—	ns	I _F = 17A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	58.1	—	nC	I _F = 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.

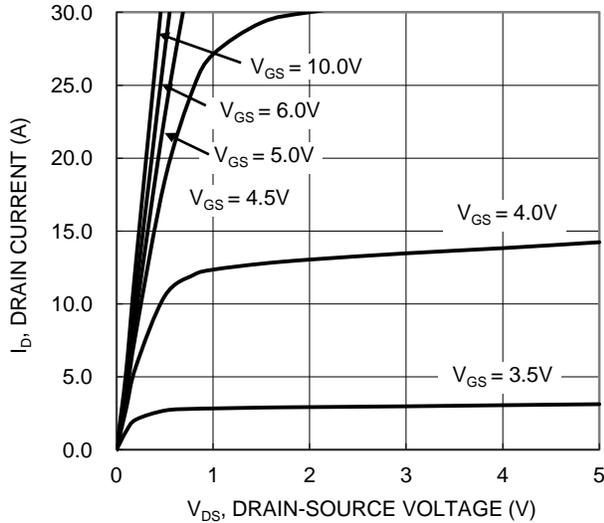


Figure 1. Typical Output Characteristic

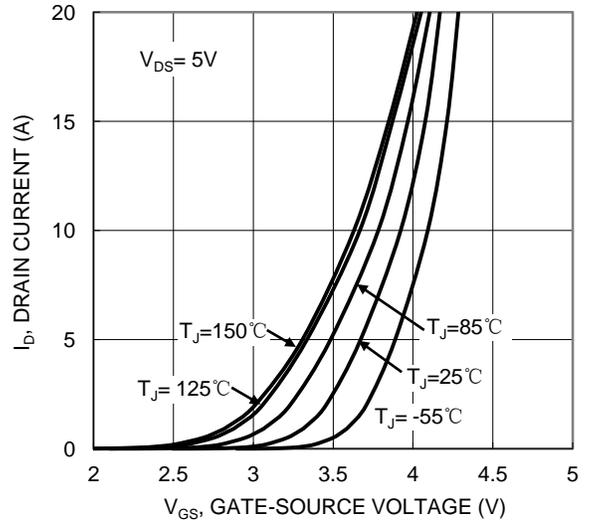


Figure 2. Typical Transfer Characteristic

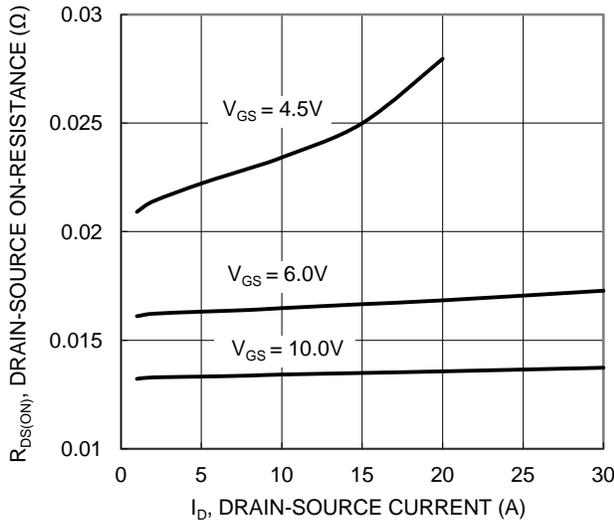


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

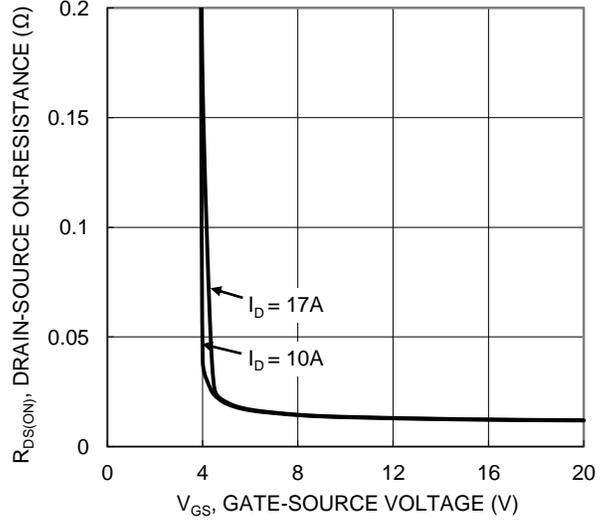


Figure 4. Typical Transfer Characteristic

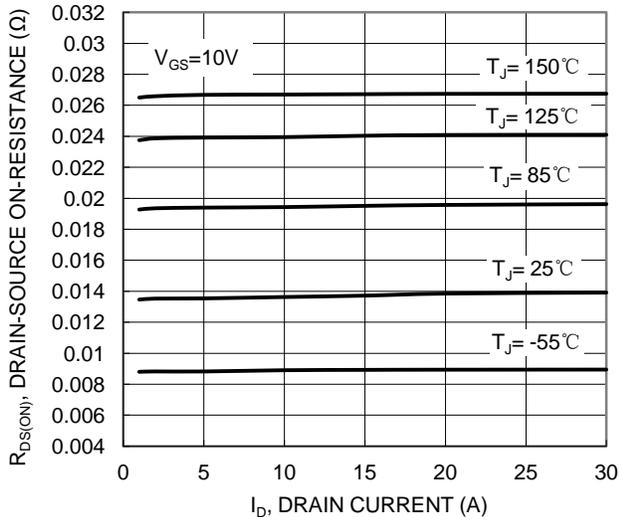


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

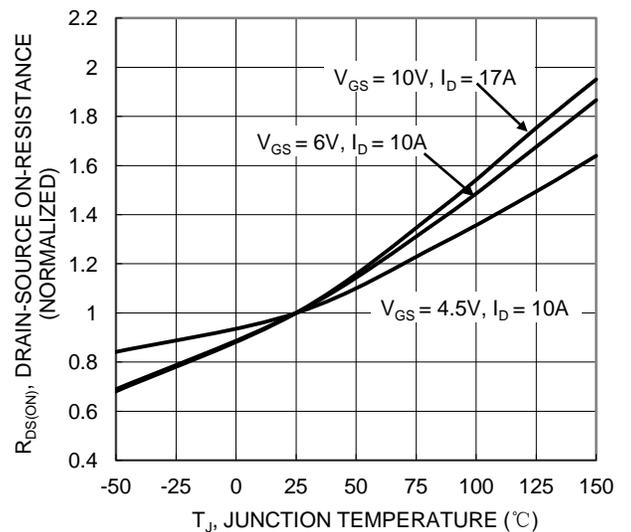
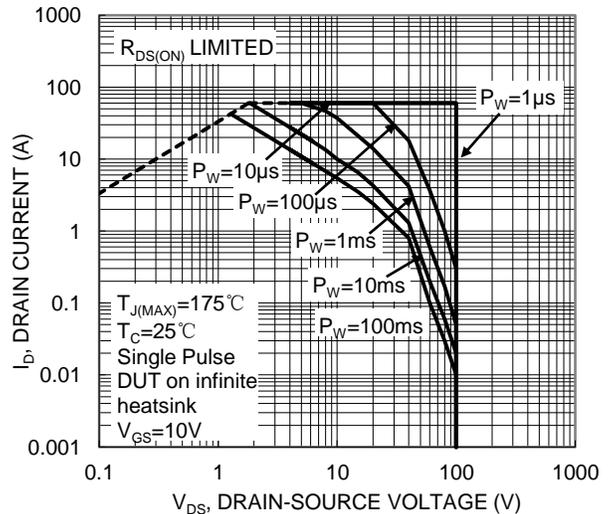
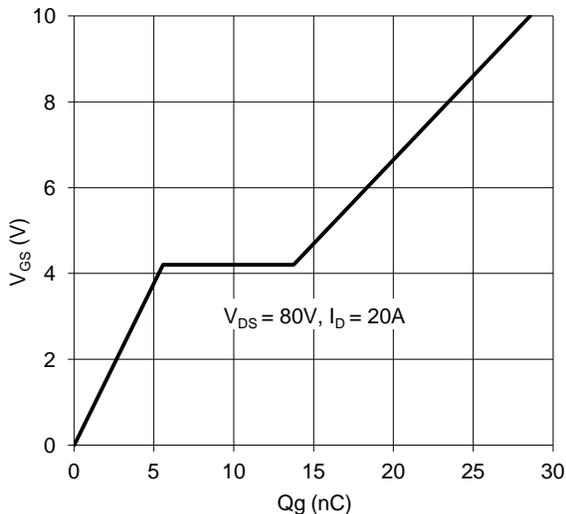
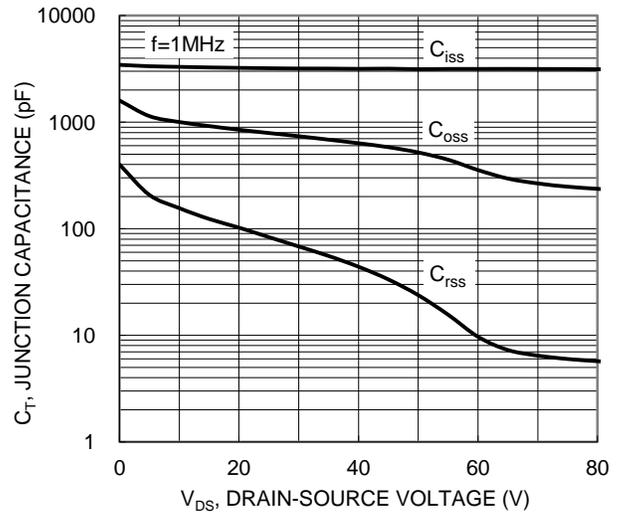
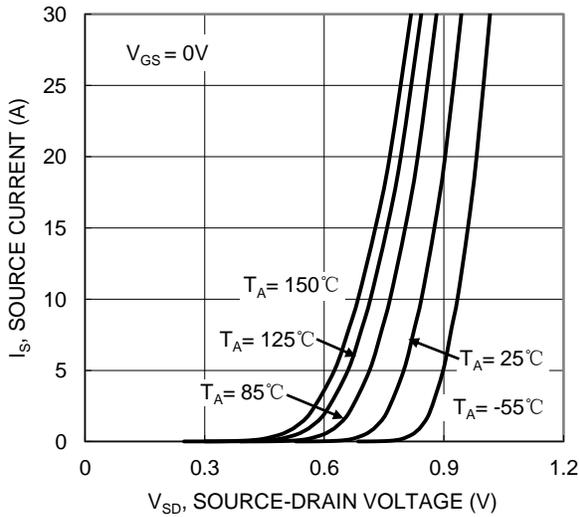
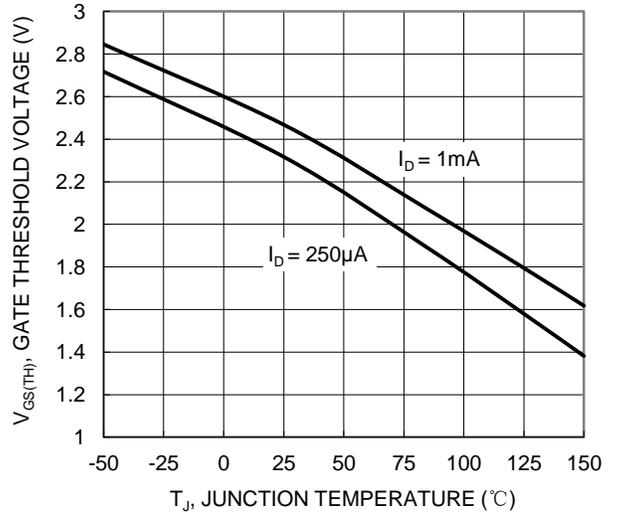
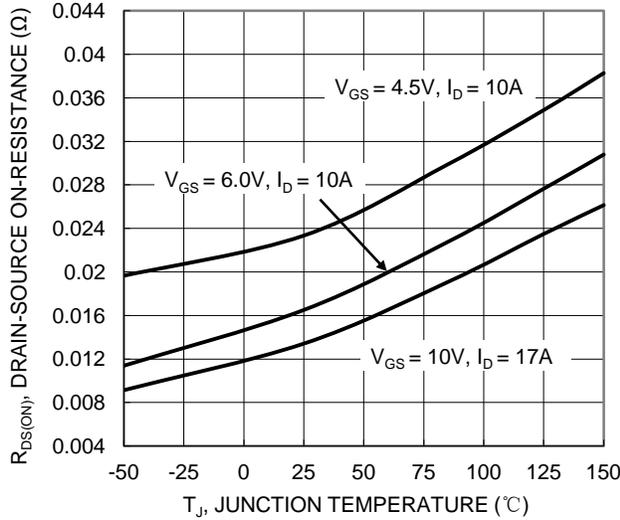


Figure 6. On-Resistance Variation with Temperature



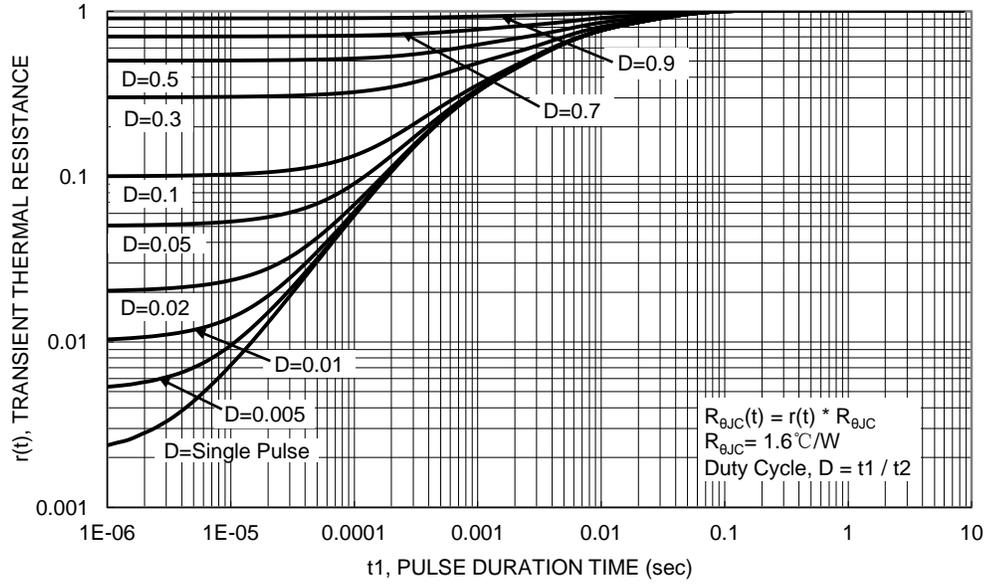
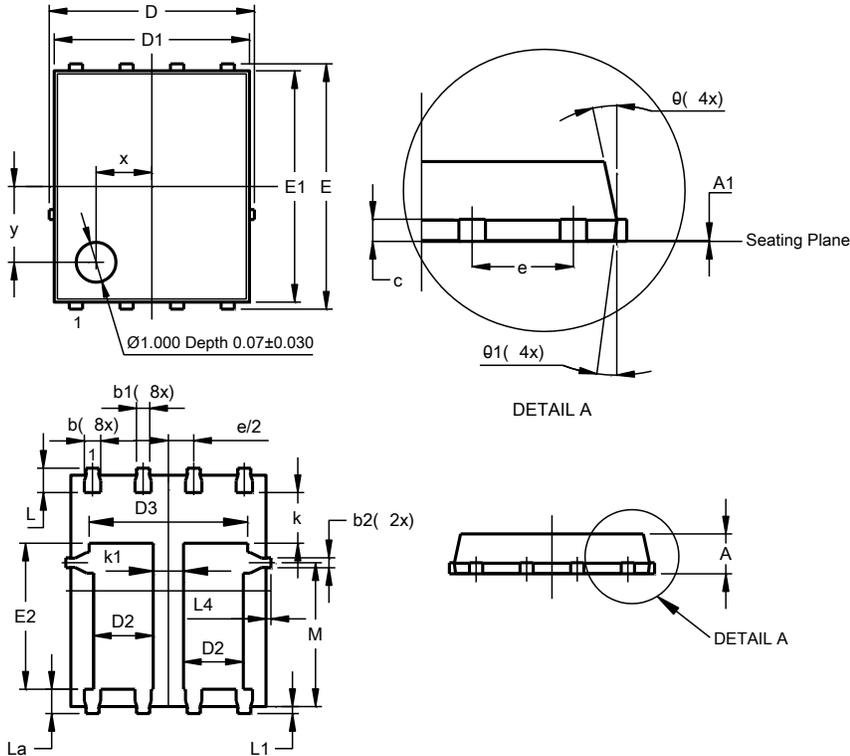


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI5060-8 (Type E)

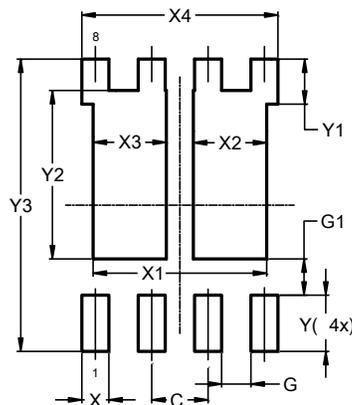


PowerDI5060-8 (Type E)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	0.02
b	0.33	0.51	0.41
b1	0.300	0.366	0.333
b2	0.20	0.35	0.25
c	0.23	0.33	0.277
D	5.15 BSC		
D1	4.85	4.95	4.90
D2	1.40	1.60	1.50
D3	-	-	3.98
E	6.15 BSC		
E1	5.75	5.85	5.80
E2	3.56	3.76	3.66
e	1.27BSC		
k	-	-	1.27
k1	0.56	-	-
L	0.51	0.71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