

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +25°C
80V	17mΩ @ V _{GS} = 10V	65A
	21mΩ @ V _{GS} = 4.5V	59A

Description and Applications

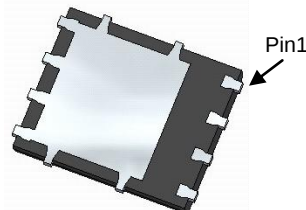
This MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Synchronous Rectifier
- Backlighting
- Power Management Functions
- DC-DC Converters

POWERDI®5060-8



Top View



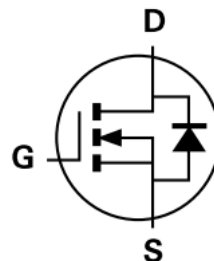
Bottom View

Features

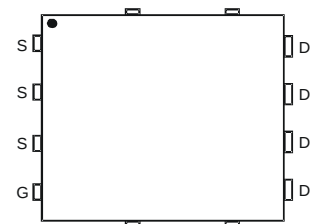
- High Conversion Efficiency
- Low R_{DS(ON)} – Minimizes On State Losses
- Low Input Capacitance
- Fast Switching Speed
- <1.1mm Package Profile – Ideal for Thin Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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



Internal Schematic



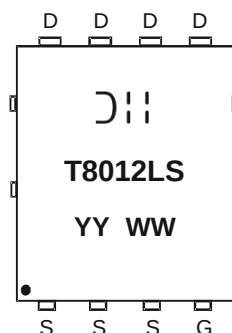
Top View
Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT8012LPS-13	POWERDI®5060-8	2,500 / Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html 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 <http://www.diodes.com/products/packages.html>.

Marking Information



 = Manufacturer's Marking
 T8012LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Digit of Year (ex: 14 = 2014)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	80	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = 10V (Note 5)	I _D	9	A
		7.2	
Continuous Drain Current, V _{GS} = 10V (Note 6)	I _D	65	A
		51	
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	80	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I _{DM}	80	A
Avalanche Current, L=0.1mH	I _{AS}	11.6	A
Avalanche Energy, L=0.1mH	E _{AS}	10.2	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	2.1	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	56	°C/W
Total Power Dissipation (Note 6)	P _D	113	W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	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}	80	-	-	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1	μA	V _{DS} = 64V, 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	1.3	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	14	17	mΩ	V _{GS} = 10V, I _D = 12A
		-	16.5	21		V _{GS} = 4.5V, I _D = 6A
Diode Forward Voltage	V _{SD}	-	0.9	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	-	1,949	-	pF	V _{DS} = 40V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{OSS}	-	177	-		
Reverse Transfer Capacitance	C _{rss}	-	10	-		
Gate Resistance	R _g	-	0.7	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	-	15	-	nC	V _{DS} = 40V, I _D = 12A
Total Gate Charge (V _{GS} = 10V)	Q _g	-	34	-		
Gate-Source Charge	Q _{gs}	-	6	-		
Gate-Drain Charge	Q _{gd}	-	4.5	-		
Turn-On Delay Time	t _{D(ON)}	-	4.9	-	ns	V _{DD} = 40V, V _{GS} = 10V, I _D = 12A, R _G = 1.6Ω
Turn-On Rise Time	t _R	-	3.8	-		
Turn-Off Delay Time	t _{D(OFF)}	-	16.5	-		
Turn-Off Fall Time	t _F	-	3.5	-		
Body Diode Reverse Recovery Time	t _{RR}	-	30.2	-	ns	I _F = 12A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	-	34.6	-	nC	

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

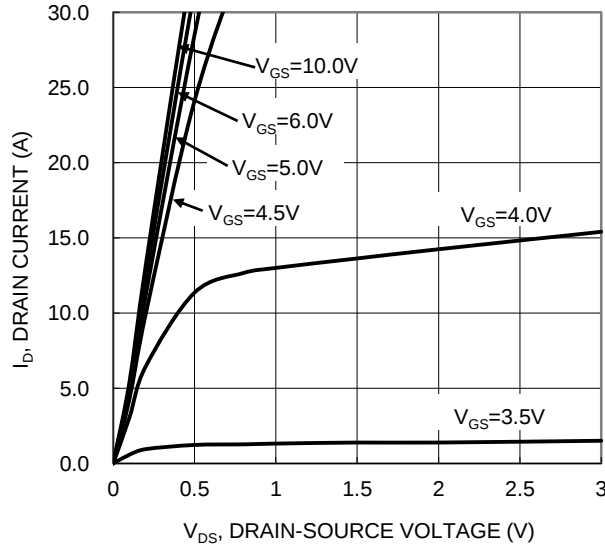


Figure 1. Typical Output Characteristic

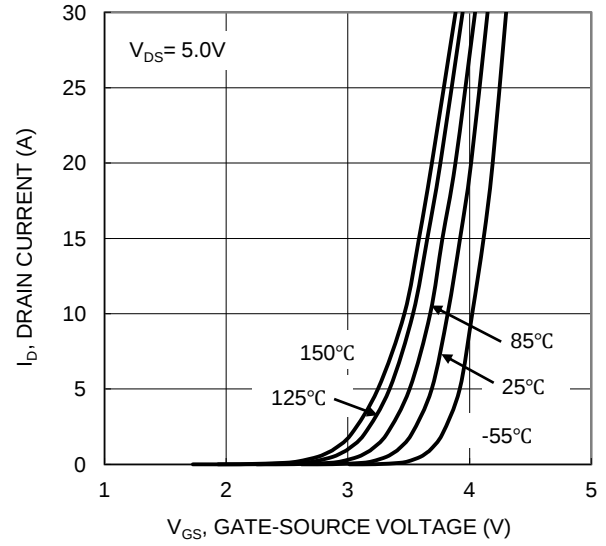


Figure 2. Typical Transfer Characteristic

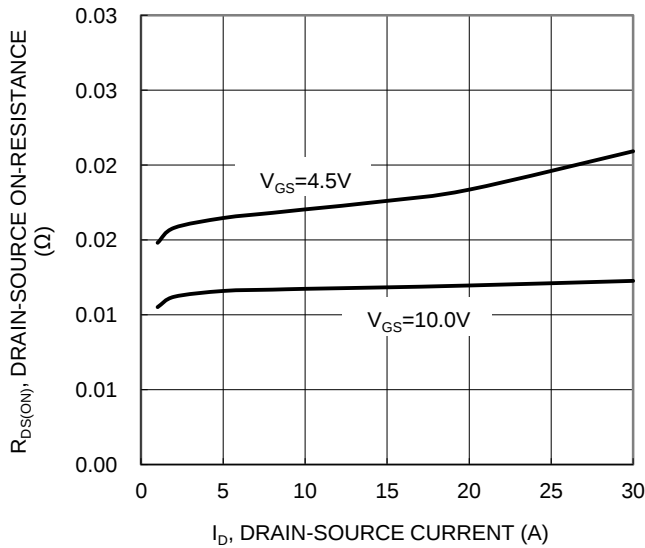


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

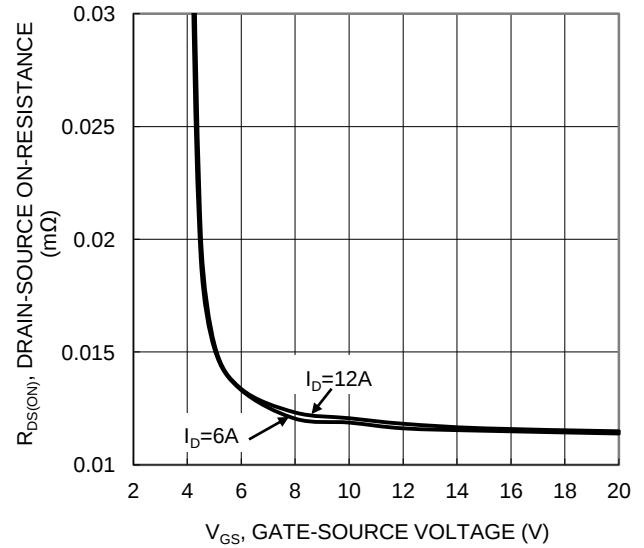


Figure 4. Typical Transfer Characteristic

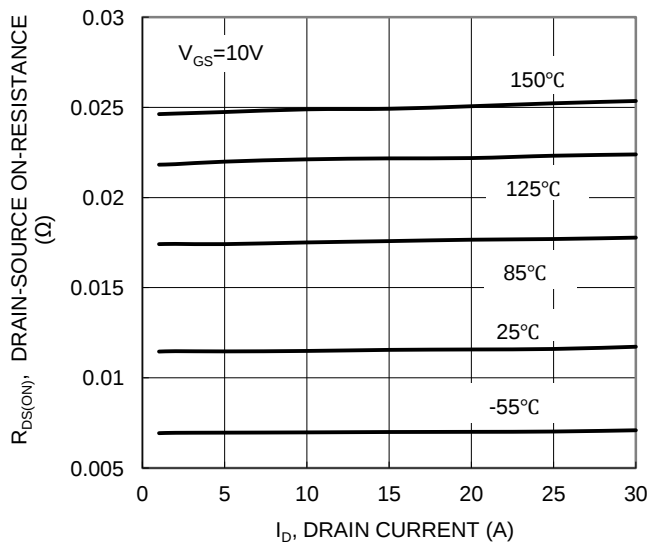


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

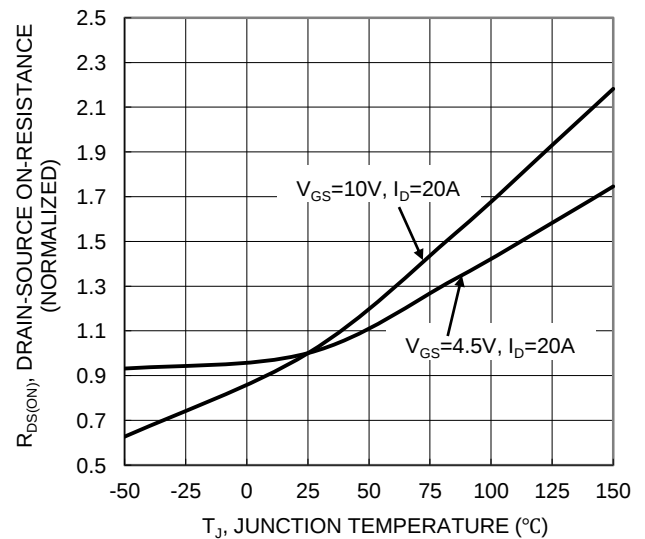
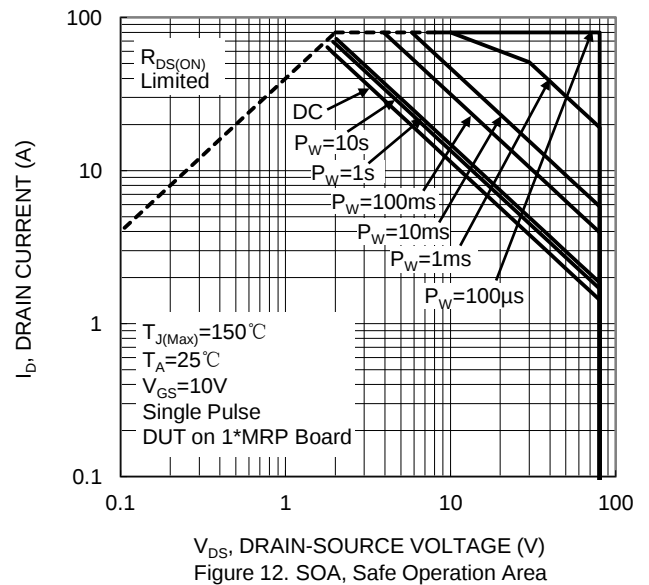
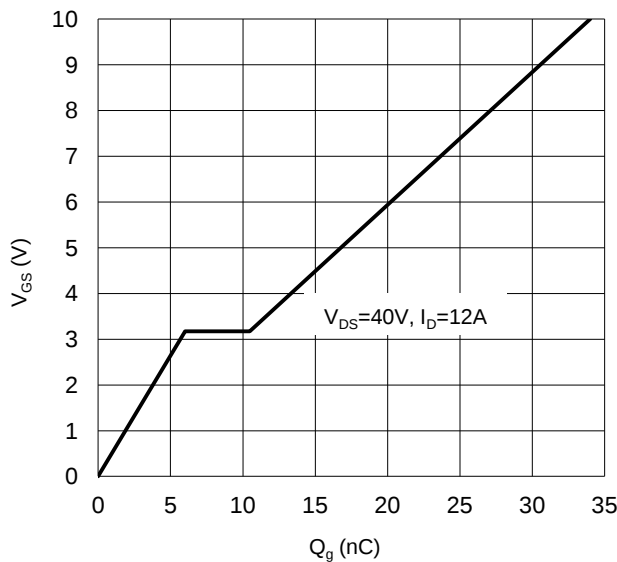
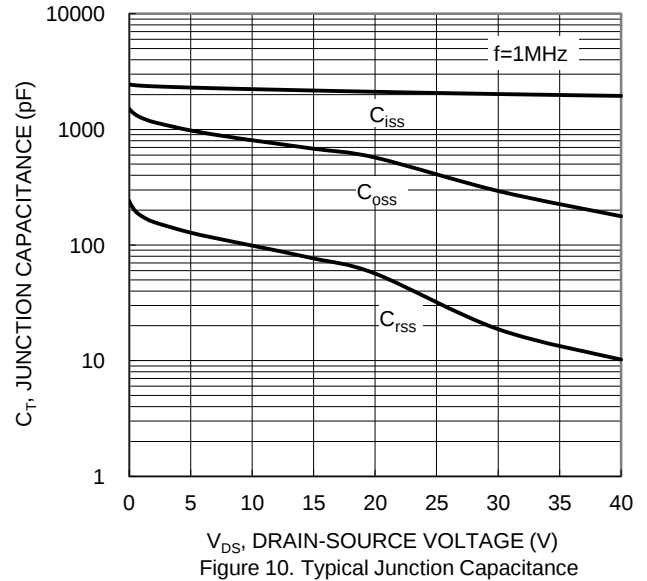
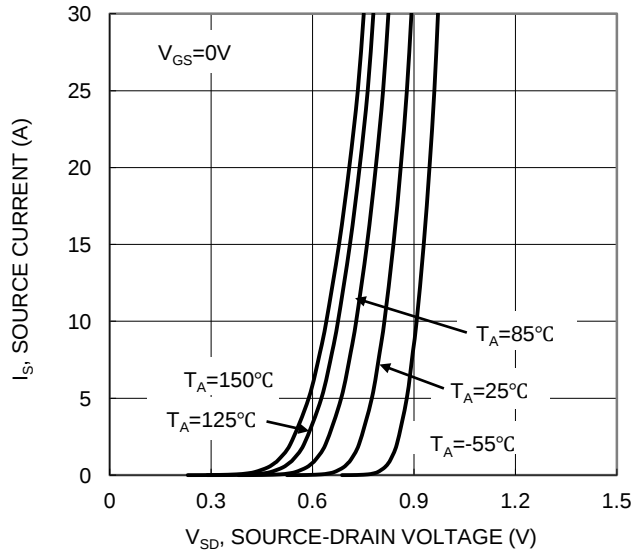
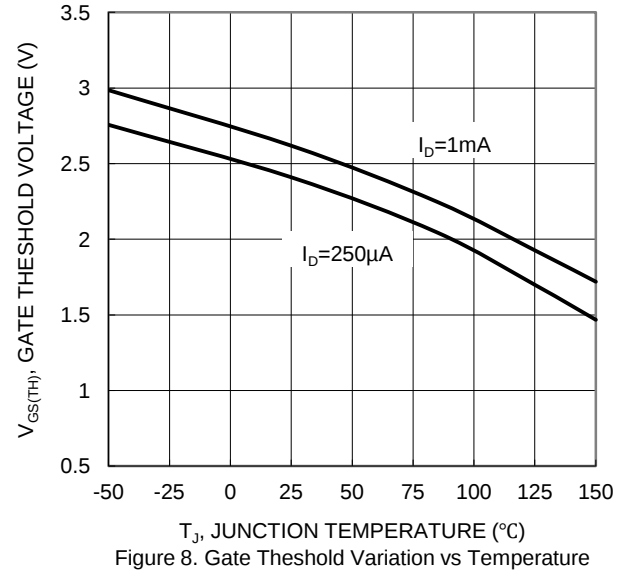
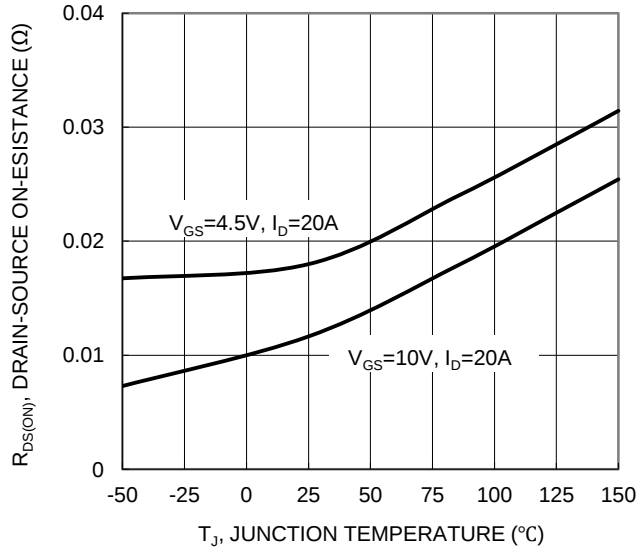


Figure 6. On-Resistance Variation with Temperature



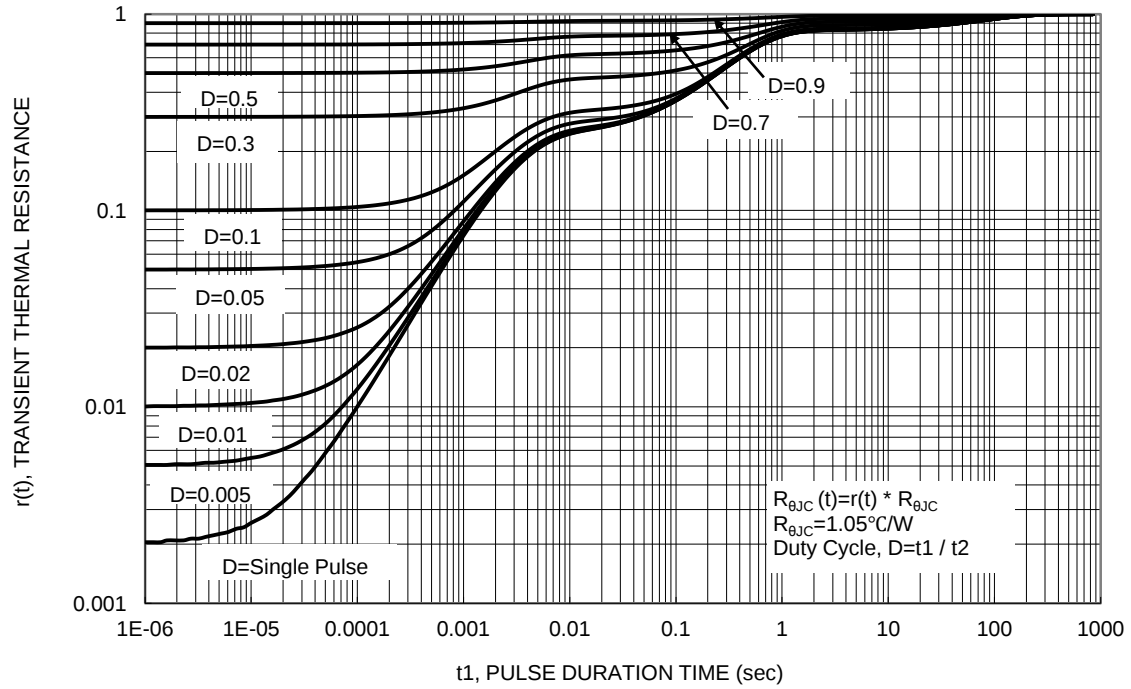
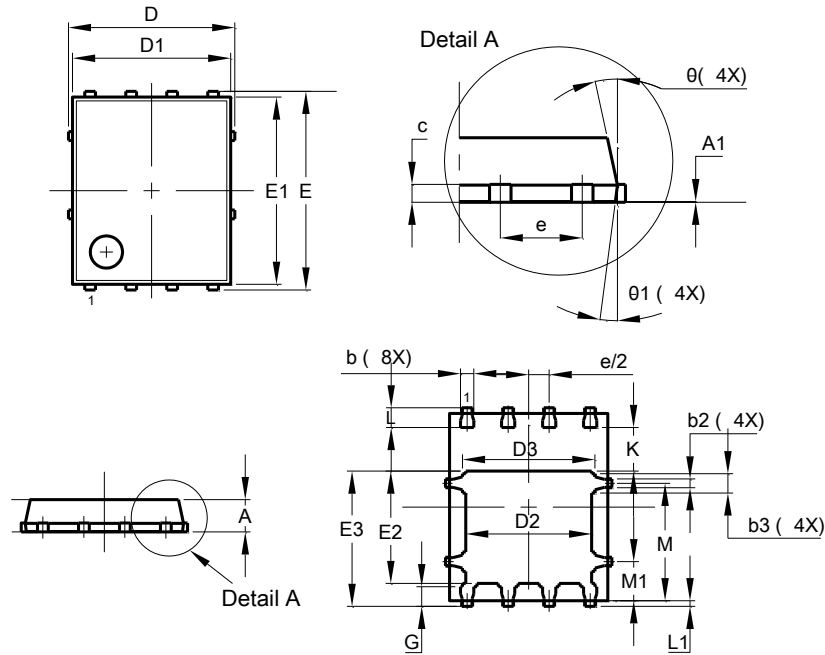


Figure 13. Transient Thermal Resistance

Package Outline

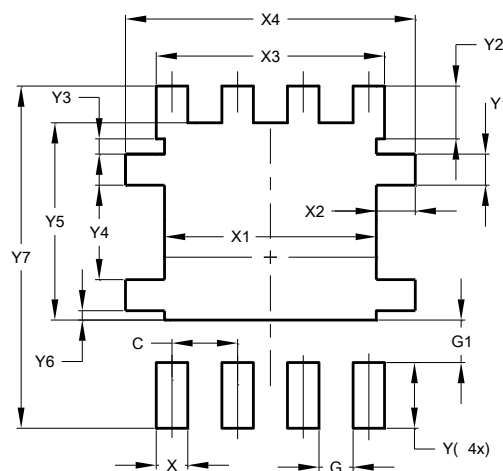
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



POWERDI®5060-8			
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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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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