

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +25°C
60V	16mΩ @ V _{GS} = 10V	31A
	24mΩ @ V _{GS} = 4.5V	24A

Description

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

Applications

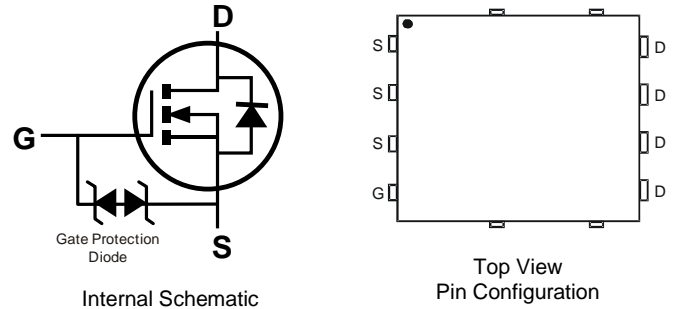
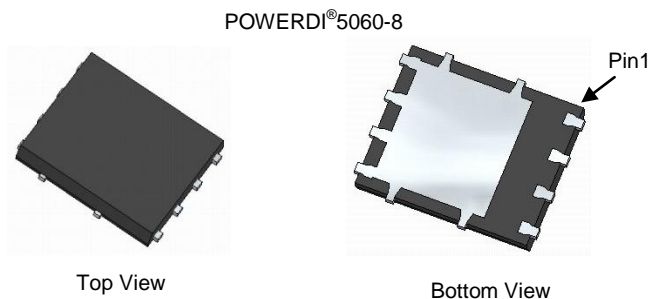
- Motor Control
- DC-DC Converters
- Power Management

Features

- Thermally Efficient Package-Cooler Running Applications
- 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
- **ESD Protected Gate**
- **Totally Lead-Free & Fully 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 Finish - Matte Tin Annealed over Copper Leadframe;
Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.097 grams (Approximate)

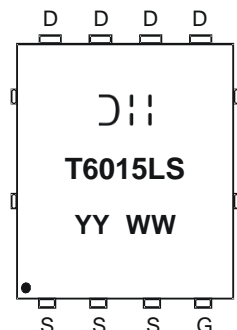



Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6015LPS-13	POWERDI®5060-8	2,500 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 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
 T6015LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 14 = 2014)
 WW = Week Code (01 to 53)

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GSS}	±16	V
Continuous Drain Current (Note 6) V _{GS} = 10V	T _A = +25°C	I _D	10.6	A
	T _A = +70°C		8.5	
	T _C = +25°C	I _D	31	A
T _C = +70°C	25			
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)		I _{DM}	60	A
Maximum Continuous Body Diode Forward Current (Note 6)		I _S	2	A
Avalanche Current (Note 7) L=0.1mH		I _{AS}	10	A
Avalanche Energy (Note 7) L=0.1mH		E _{AS}	5	mJ
V _{DS} Spike	t=10μs	V _{SPIKE}	75	V

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P _D	1.16	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	108	°C/W
	t<10s		56	
Total Power Dissipation (Note 6)		P _D	2.7	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R _{θJA}	46	°C/W
	t<10s		24	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	4.4	°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 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 48V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	14.2	16	mΩ	V _{GS} = 10V, I _D = 10A
		—	18	24		V _{GS} = 4.5V, I _D = 6A
Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	1103	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{OSS}	—	251.3	—		
Reverse Transfer Capacitance	C _{RSS}	—	19.7	—		
Gate Resistance	R _G	—	1.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	8.9	—	nC	V _{DS} = 30V, I _D = 10A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	18.9	—		
Gate-Source Charge	Q _{gs}	—	3.0	—		
Gate-Drain Charge	Q _{gd}	—	2.8	—		
Turn-On Delay Time	t _{D(ON)}	—	4.1	—	ns	V _{GS} = 10V, V _{DS} = 30V, R _G = 6Ω, I _D = 10A
Turn-On Rise Time	t _R	—	7.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	19.5	—		
Turn-Off Fall Time	t _F	—	8.6	—		
Reverse Recovery Time	t _{RR}	—	21.2	—	ns	I _F = 10A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{RR}	—	13.2	—	nC	

- Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
7. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

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DMT6015LPS

Document number: DS37321 Rev. 3 - 2

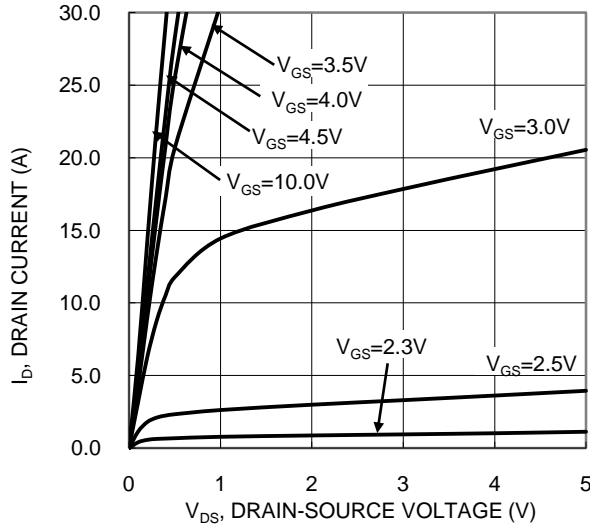


Figure 1. Typical Output Characteristic

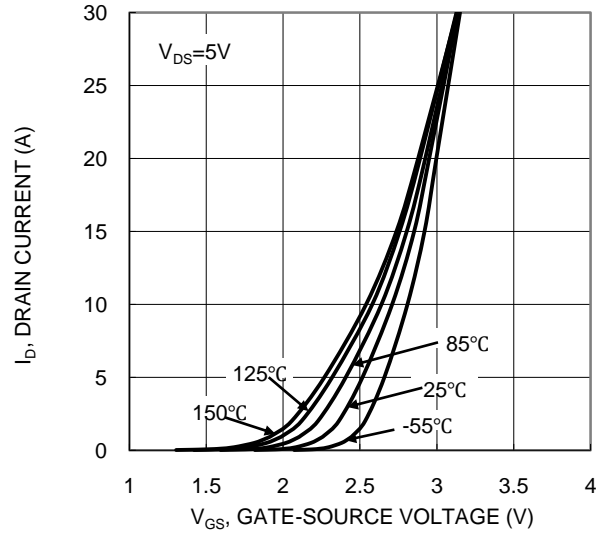


Figure 2. Typical Transfer Characteristic

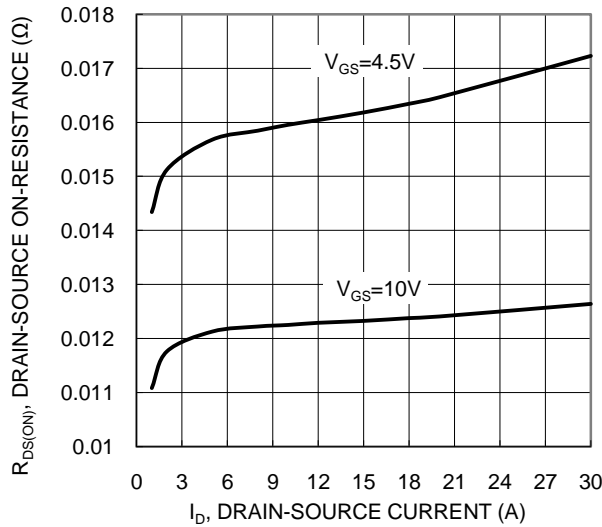


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

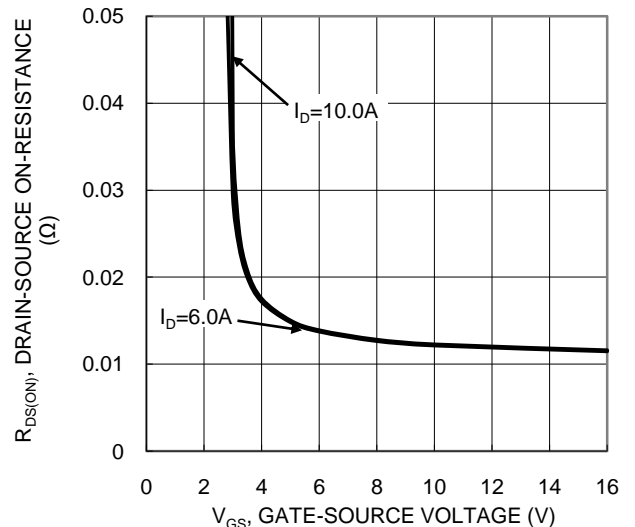


Figure 4. Typical Transfer Characteristic

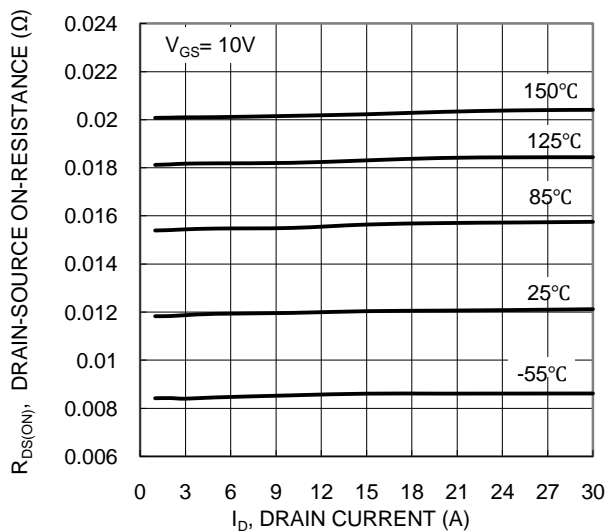


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

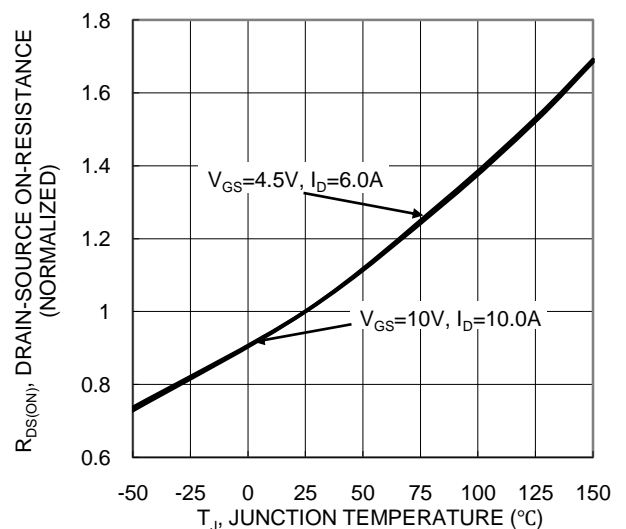
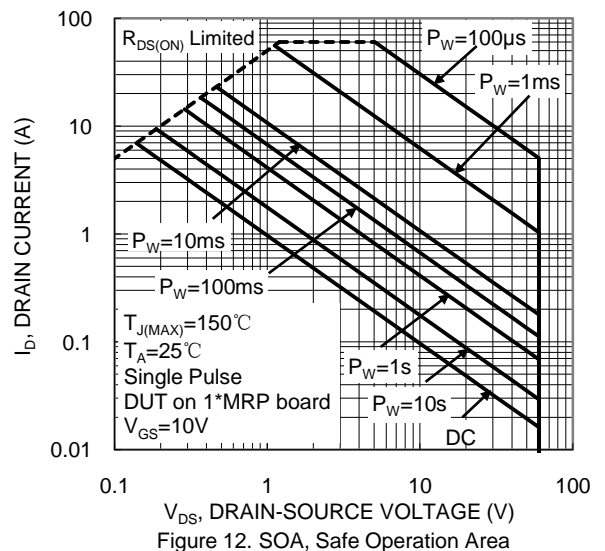
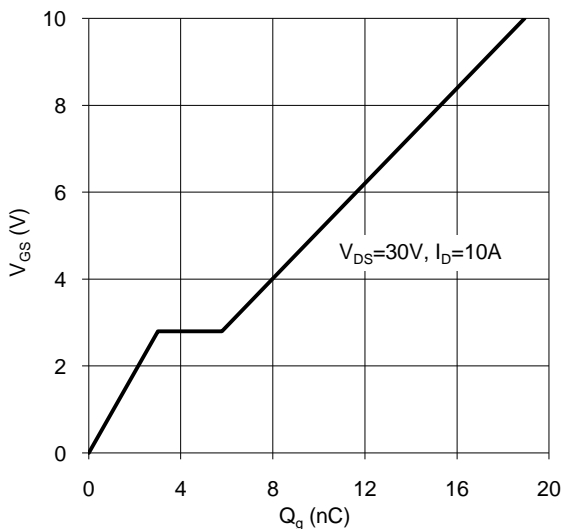
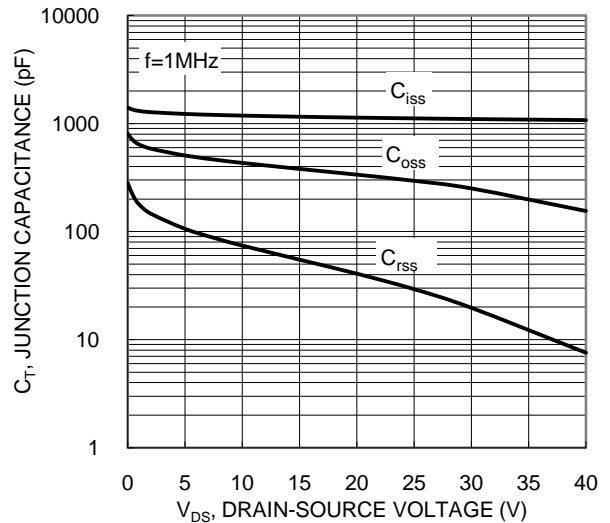
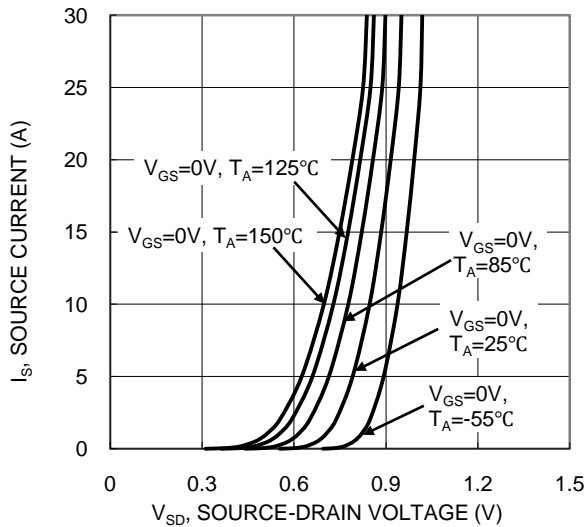
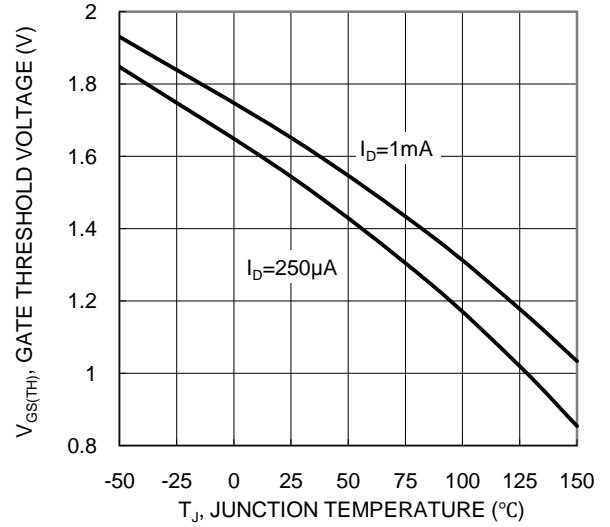
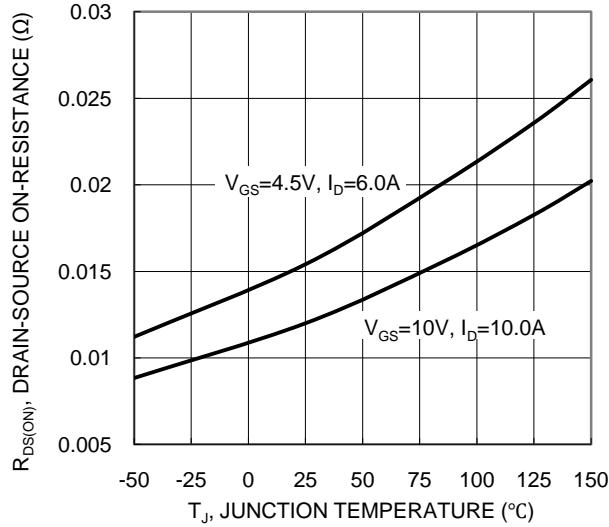


Figure 6. On-Resistance Variation with Temperature



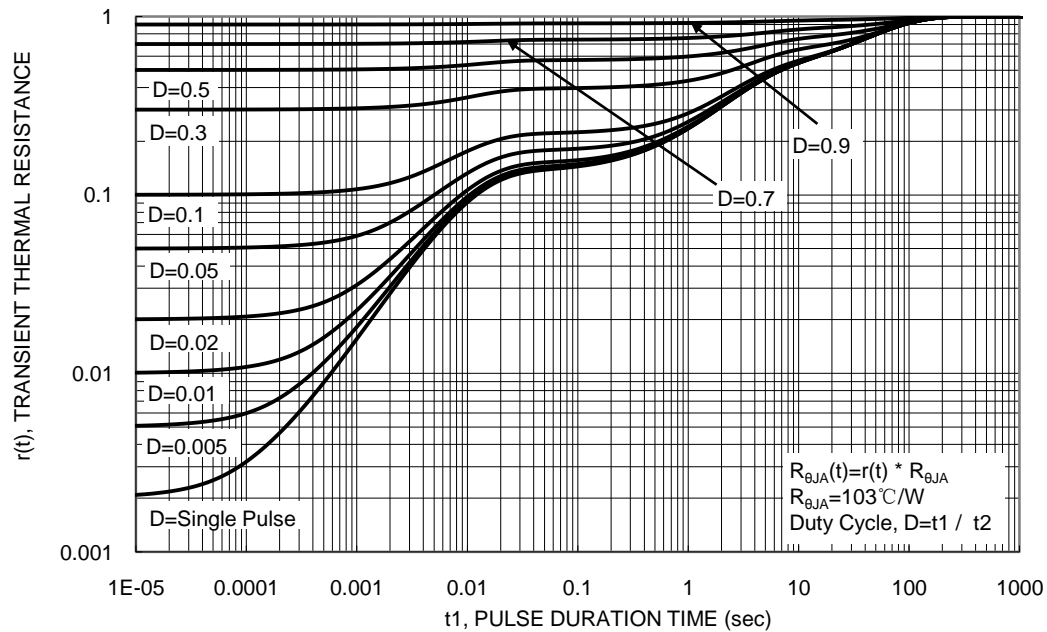
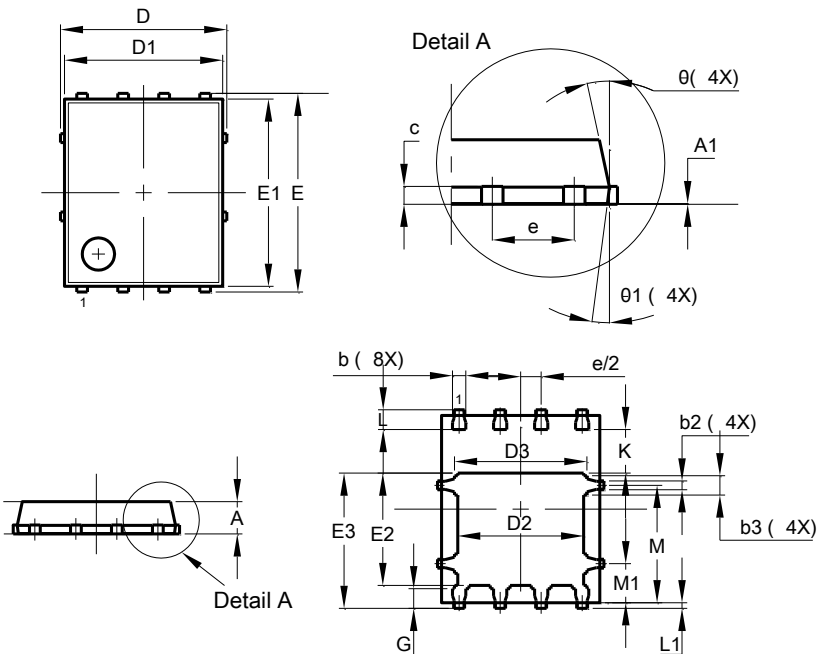


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

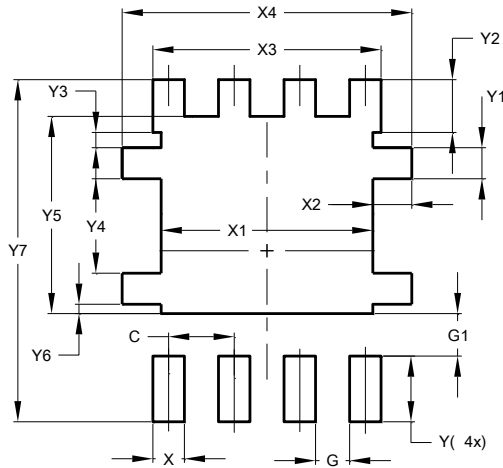
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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