



**THE DATASHEET OF
DMP32M6SPS-13**



Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +25°C
-30V	2.6mΩ @ V _{GS} = -10V	-100A
	3.75mΩ @ V _{GS} = -4.5V	-70A

Description

This new generation 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

- Switch

Features

- 100% Unclamped Inductive Switch (UIS) Test in Production
- Thermally Efficient Package-Cooler Running Applications
- High Conversion Efficiency
- Low R_{DS(ON)} – 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[®] 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 ^(e3)
- Weight: 0.097 grams (Approximate)

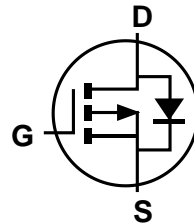
PowerDI5060-8 (Type K)



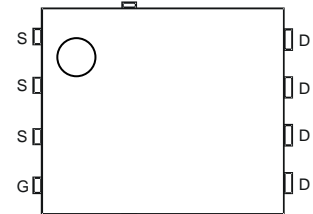
Top View



Pin1
Bottom View



Internal Schematic



Top View
Pin Configuration

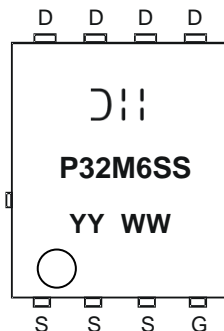
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP32M6SPS-13	PowerDI5060-8 (Type K)	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

PowerDI5060-8 (Type K)



= Manufacturer's Marking
 P32M6SS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 19 = 2019)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-30	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = -10V (Note 7) (Package Limited)	I _D	T _C = +25°C -100 T _C = +70°C -70	A
Continuous Drain Current, V _{GS} = -10V (Note 6)	I _D	t ≤ 10s T _A = +25°C -37 T _A = +70°C -30	A
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)	I _{DM}	-400	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	-2.7	A
Pulsed Body Diode Forward Current (380µs Pulse, Duty Cycle = 1%)	I _{SM}	-400	A
Avalanche Current, L = 0.1mH (Note 8)	I _{AS}	-80	A
Avalanche Energy, L = 0.1mH (Note 8)	E _{AS}	250	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.3	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	98
		t ≤ 10s	49
Total Power Dissipation (Note 6)	P _D	2.3	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	Steady State	54
		t ≤ 10s	27
Thermal Resistance, Junction to Case (Note 7)	R _{θJC}	0.9	°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 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	µA	V _{DS} = -24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-2.5	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	1.8	2.6	mΩ	V _{GS} = -10V, I _D = -20A
		—	2.4	3.75		V _{GS} = -4.5V, I _D = -20A
Diode Forward Voltage	V _{SD}	—	-0.6	-1.2	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{ISS}	—	8594	—	pF	V _{DS} = -15V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{OSS}	—	1491	—	pF	
Reverse Transfer Capacitance	C _{RSS}	—	874	—	pF	
Gate Resistance	R _g	—	6.38	—	Ω	V _{DS} = 0V, V _{GS} = -15mV, f = 1MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	75	—	nC	V _{DS} = -15V, I _D = -25A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	158	—	nC	
Gate-Source Charge	Q _{gs}	—	23.0	—	nC	
Gate-Drain Charge	Q _{gd}	—	25.5	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	6.74	—	ns	V _{DS} = -15V, V _{GS} = -10V, R _{GS} = 2.7Ω, I _D = -1A
Turn-On Rise Time	t _R	—	5.46	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	227	—	ns	
Turn-Off Fall Time	t _F	—	108	—	ns	
Reverse Recovery Time	t _{RR}	—	37.4	—	ns	I _F = -25A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	36.8	—	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_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

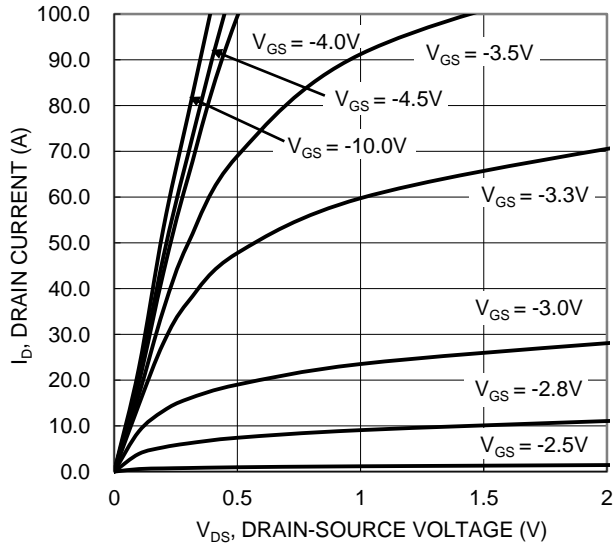


Figure 1. Typical Output Characteristic

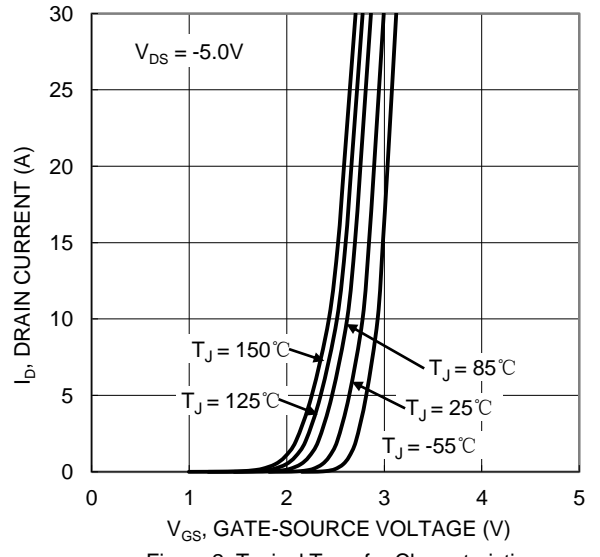


Figure 2. Typical Transfer Characteristic

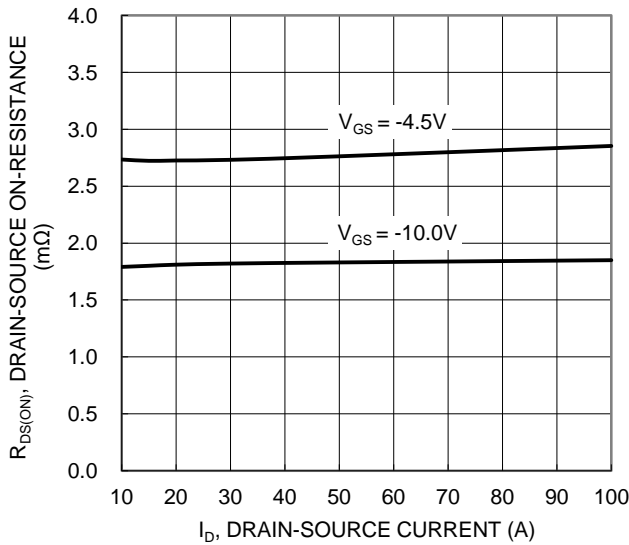


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

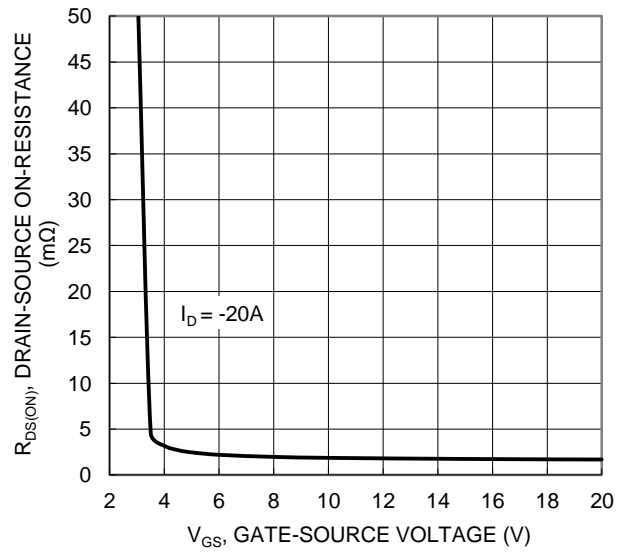


Figure 4. Typical Transfer Characteristic

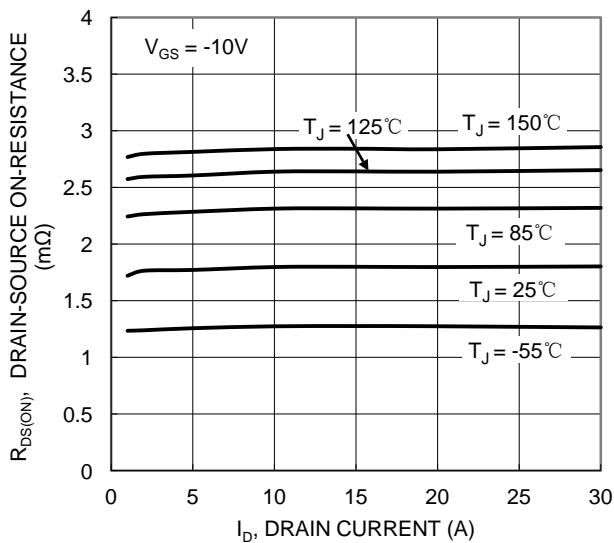


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

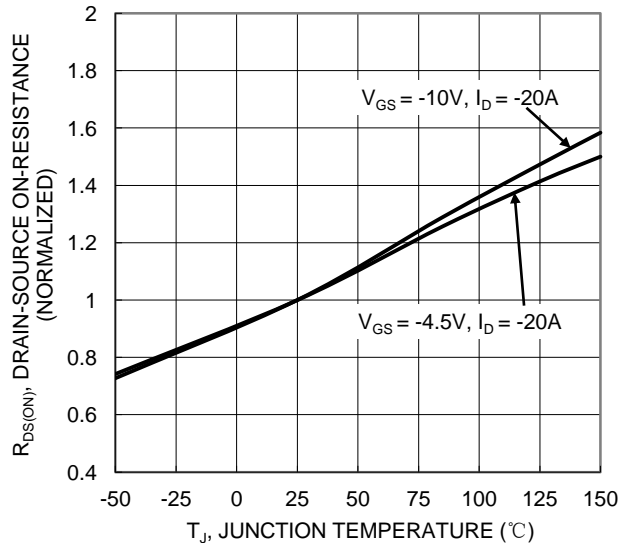
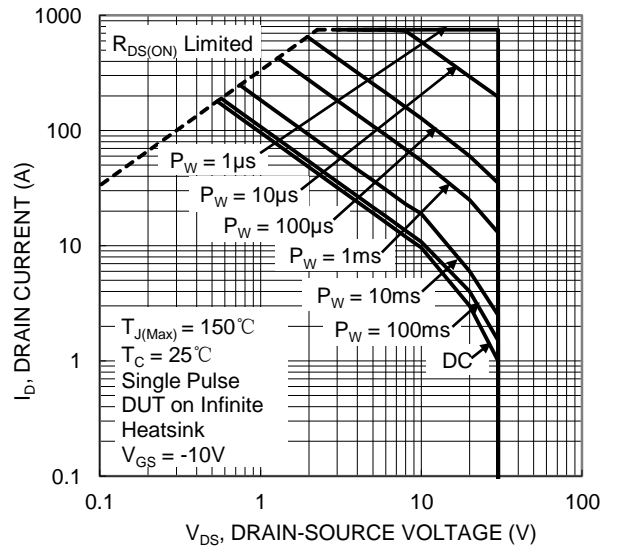
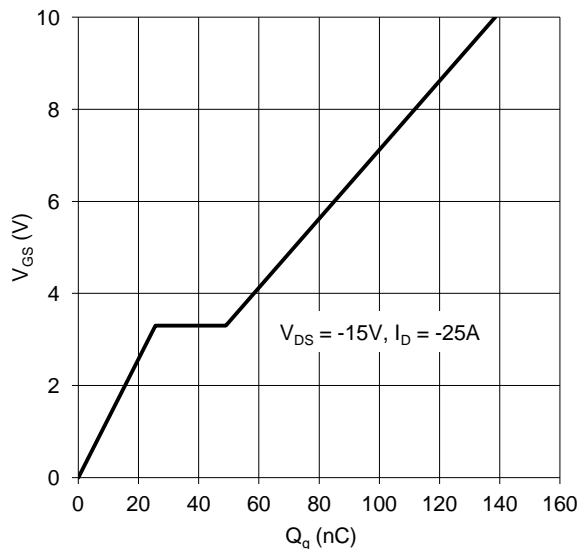
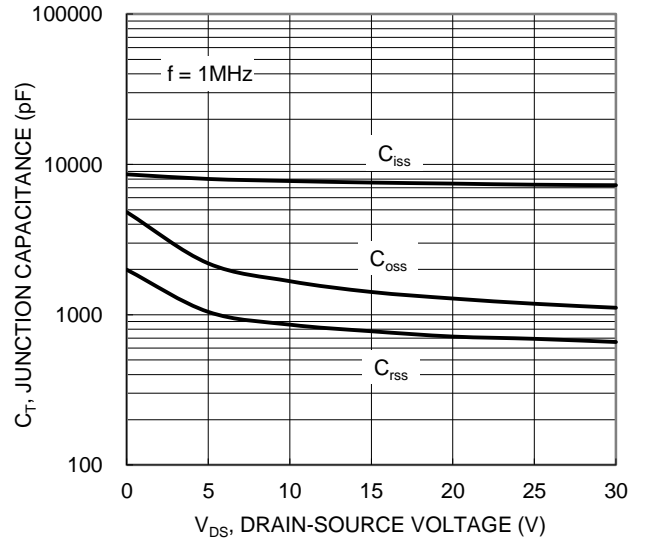
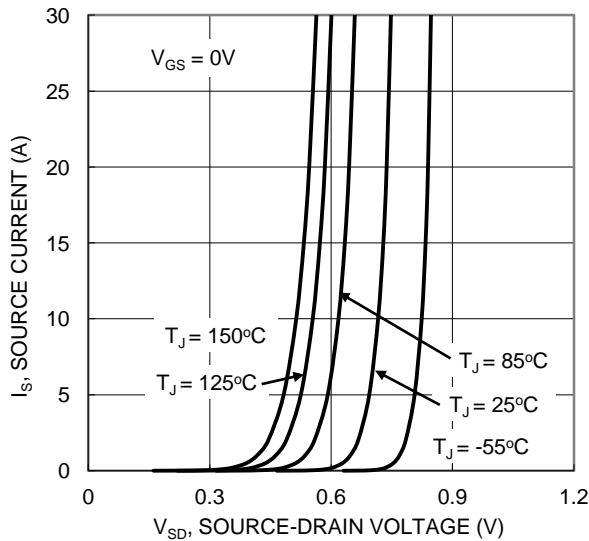
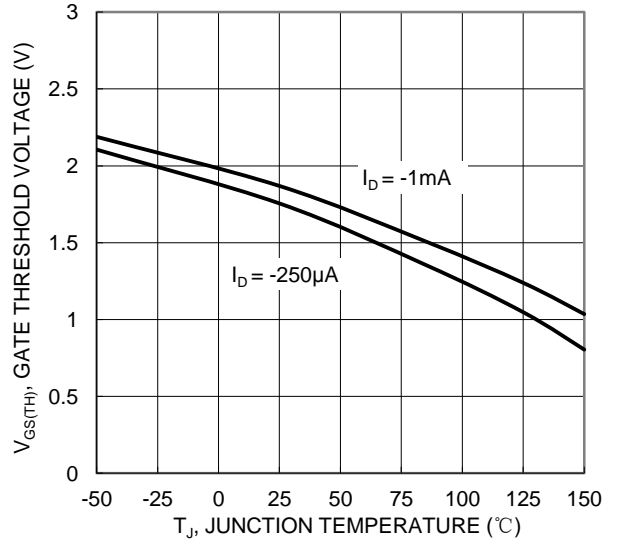
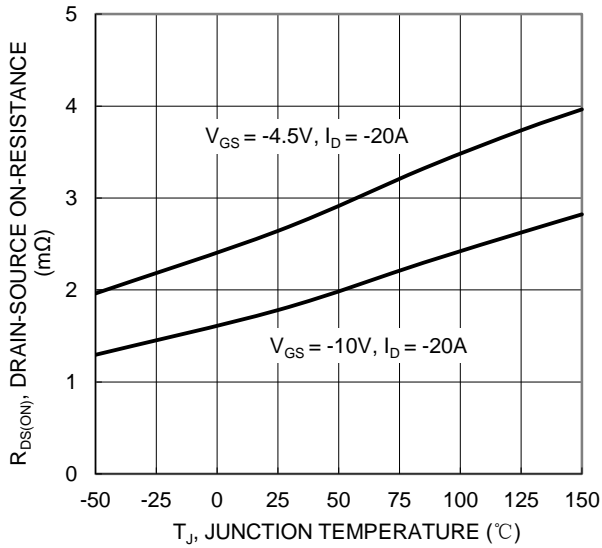


Figure 6. On-Resistance Variation with Junction Temperature



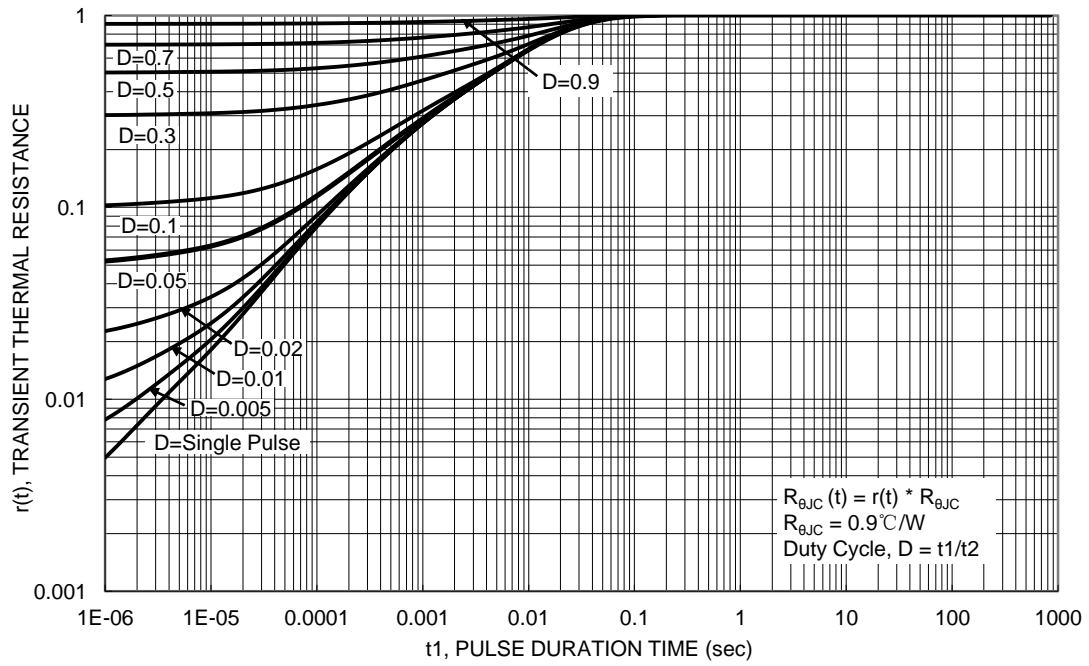
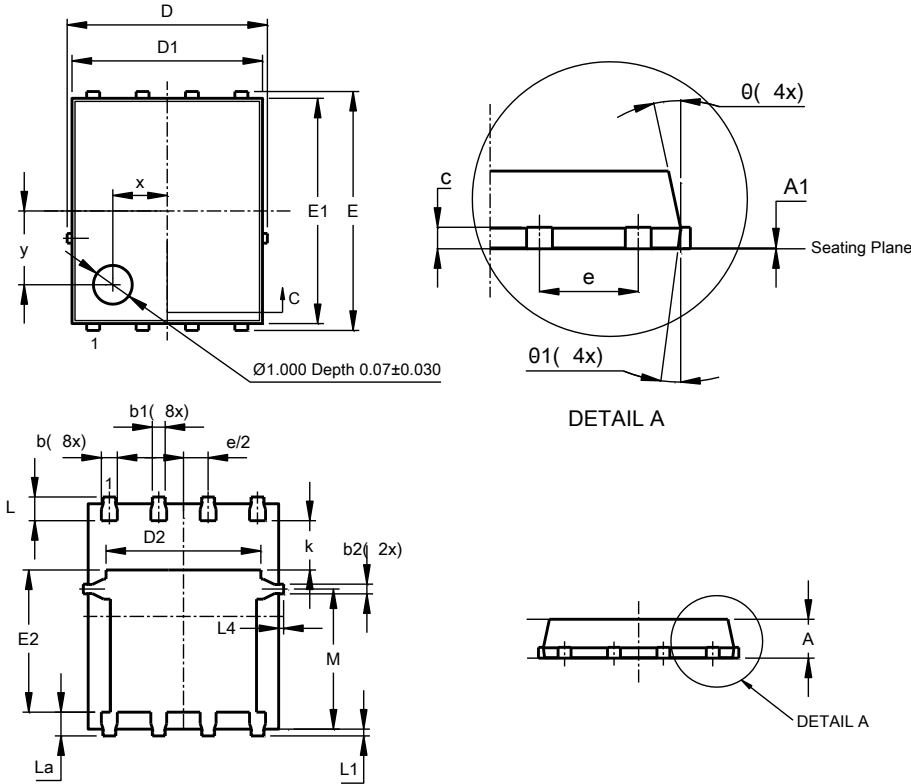


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI5060-8 (Type K)

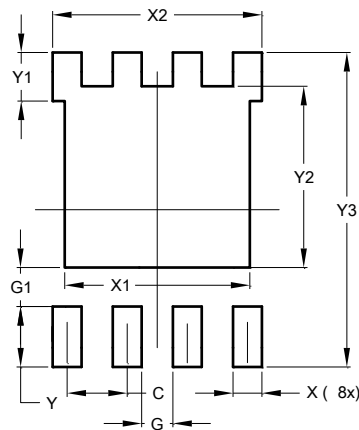


PowerDI5060-8 (Type K)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	0.02
b	0.33	0.51	0.41
b1	0.300	0.366	0.333
b2	0.20	0.35	0.25
c	0.23	0.33	0.277
D	5.15 BSC		
D1	4.85	4.95	4.90
D2	-	-	3.98
E	6.15 BSC		
E1	5.75	5.85	5.80
E2	3.56	3.725	3.66
e	1.27BSC		
k	-	-	1.27
L	0.51	0.71	0.61
La	0.51	0.675	0.61
L1	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 K)



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	3.910
X2	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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