

Product Summary

BV _{DSS}	R _{D(S)} Max	I _D 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_{D(S)} yet maintain superior switching performance. This device is ideal for use in notebook battery power management and load switches.

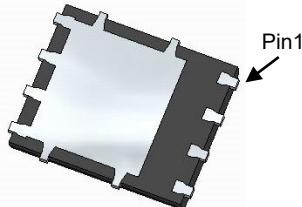
Applications

- Motor control
- DC-DC converters
- Power management

POWERDI5060-8 (Standard)



Top View



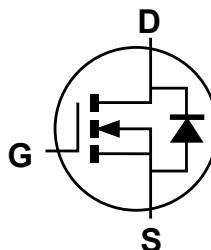
Bottom View

Features

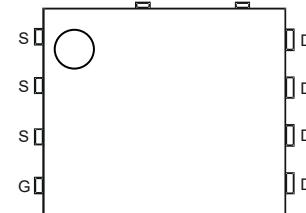
- 100% Unclamped Inductive Switching (UIS) Test in Production Ensures More Reliable and Robust End Application
- High Conversion Efficiency
- Low R_{D(S)}—Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: POWERDI®5060-8
- Package 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)



Internal Schematic



Top View
Pin Configuration

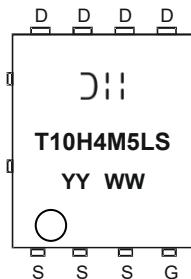
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMTH10H4M5LPS-13	POWERDI5060-8 (Standard)	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

T10H4M5LS = Product Type Marking Code

YYWW = Date Code Marking

YY or YY = Last Two Digits of Year (ex: 25 = 2025)

WW or WW = Week Code (01 to 53)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	100	V
Gate-Source Voltage			V_{GSS}	± 20	V
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 5)	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +100^\circ\text{C}$	I_D	20 14	A
Continuous Drain Current, $V_{GS} = 10\text{V}$ (Note 6)	Steady State	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$ (Note 9)	I_D	100 100	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)			I_{DM}	400	A
Pulsed Body Diode Forward Current (10 μs Pulse, $T_C = +25^\circ\text{C}$, Package Limited)			I_{SM}	400	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	100	A
Avalanche Current (Note 7) $L=0.3\text{mH}$			I_{AS}	40	A
Avalanche Energy (Note 7) $L=0.3\text{mH}$			E_{AS}	240	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	P_D	2.7	W
Thermal Resistance, Junction to Ambient (Note 5)		R_{JA}	54	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)	$T_C = +25^\circ\text{C}$	P_D	136	W
Thermal Resistance, Junction to Case (Note 6)		R_{JC}	1.1	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

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

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

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.

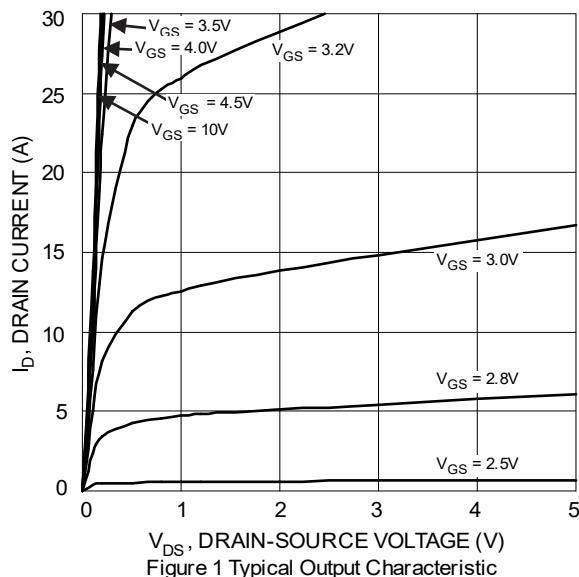


Figure 1 Typical Output Characteristic

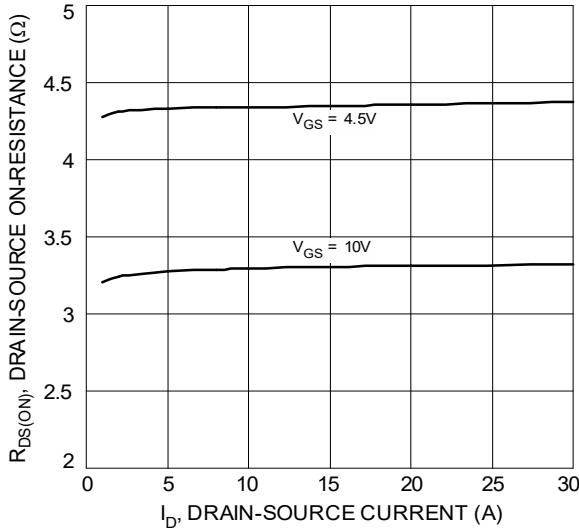


Figure 3 Typical On-Resistance vs.
Drain Current and Gate Voltage

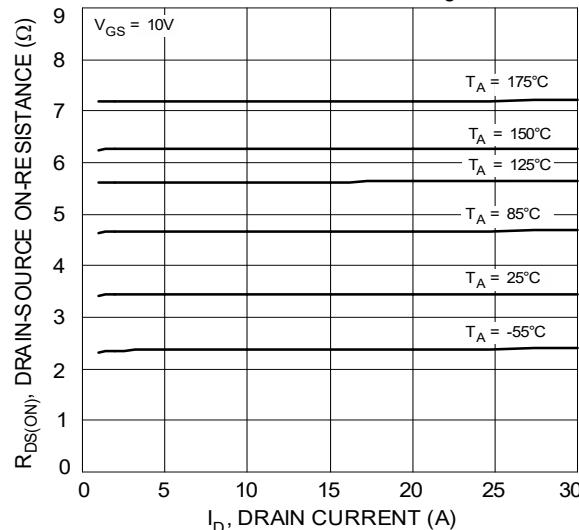


Figure 5 Typical On-Resistance vs.
Drain Current and Temperature

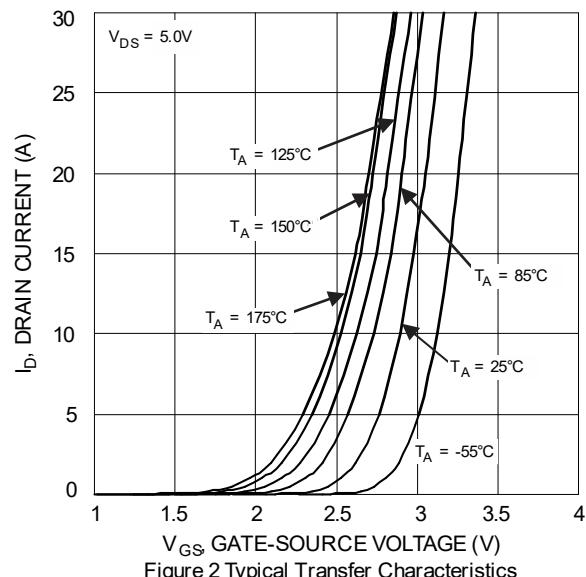


Figure 2 Typical Transfer Characteristics

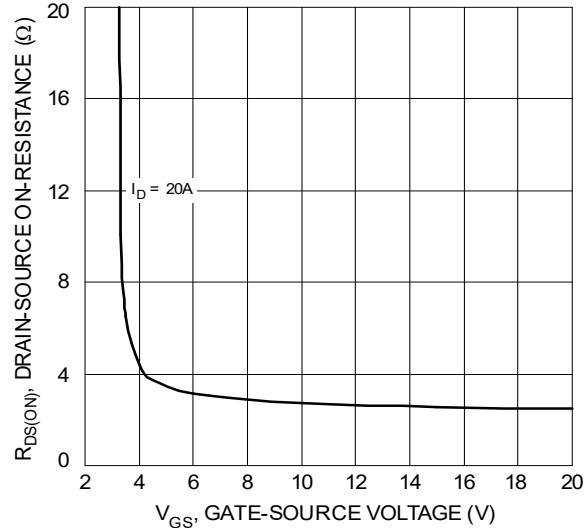


Figure 4 Typical Drain-Source On-Resistance
vs. Gate-Source Voltage

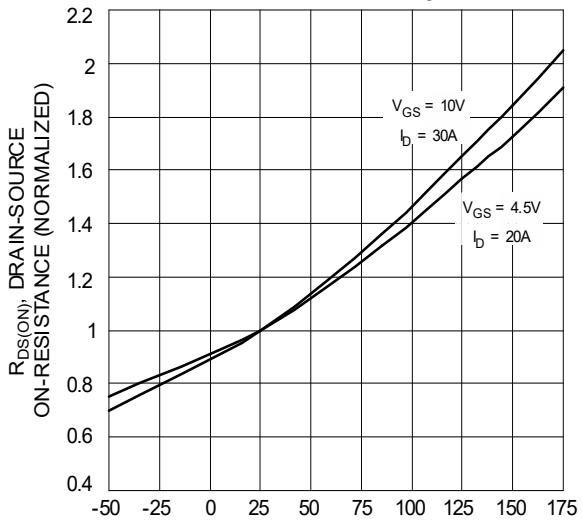


Figure 6 On-Resistance Variation with Temperature

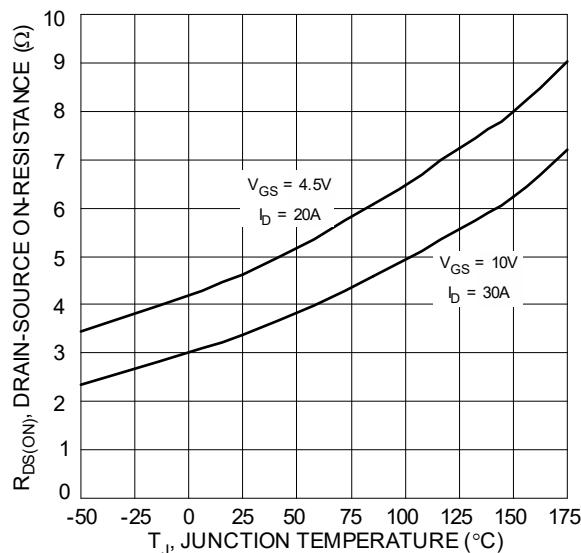


Figure 7 On-Resistance Variation with Temperature

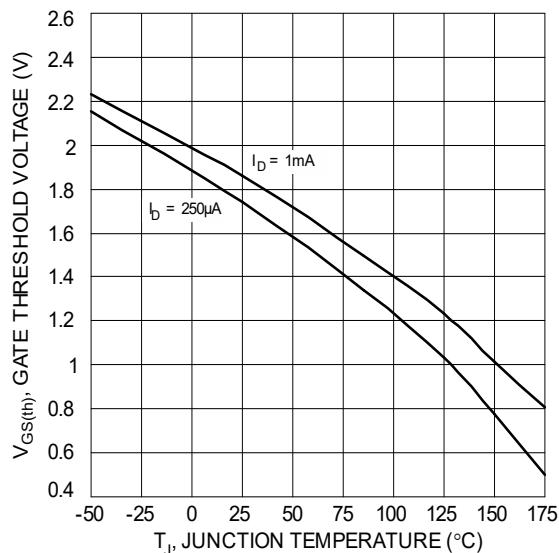


Figure 8 Gate Threshold Variation vs. Junction Temperature

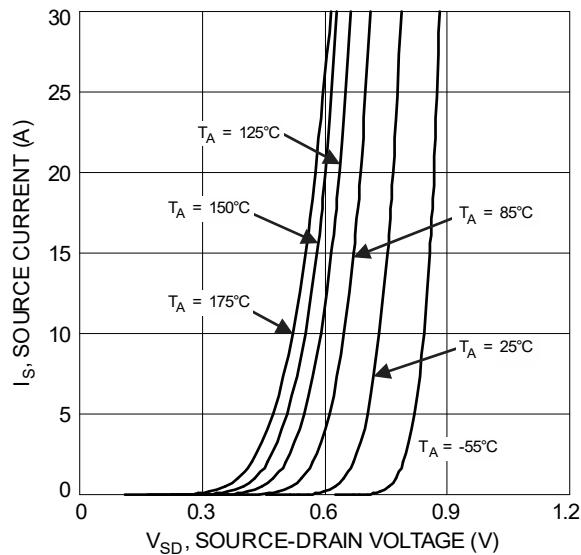


Figure 9 Diode Forward Voltage vs. Current

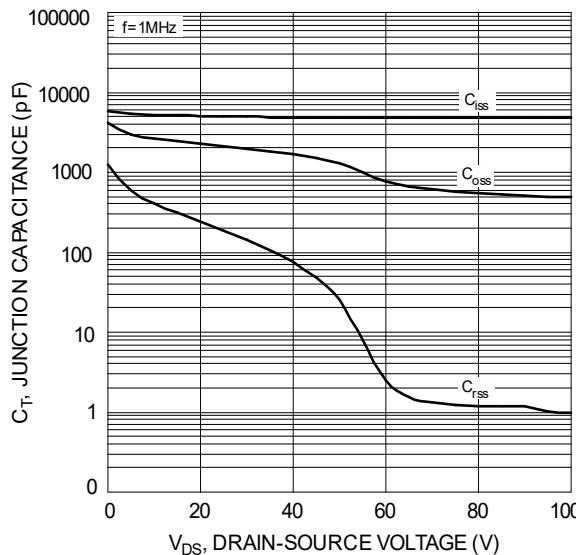


Figure 10 Typical Junction Capacitance

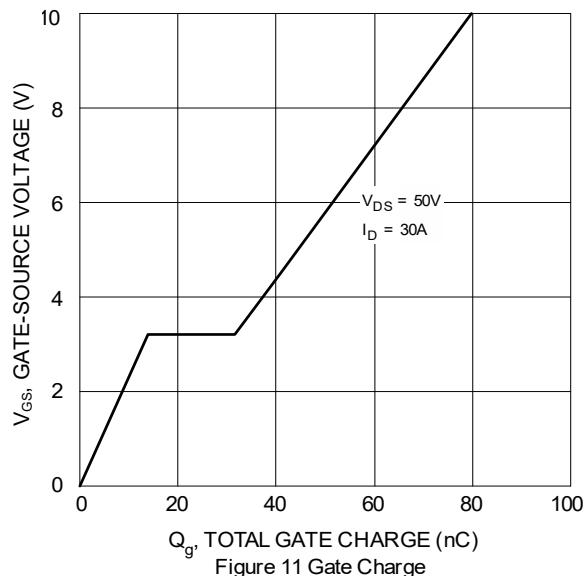


Figure 11 Gate Charge

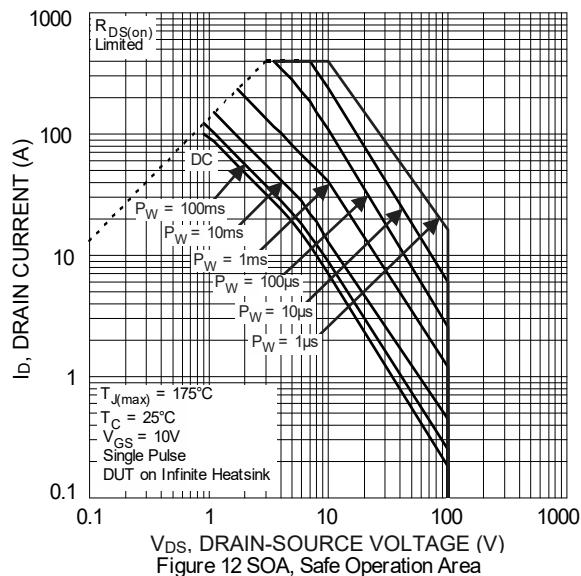
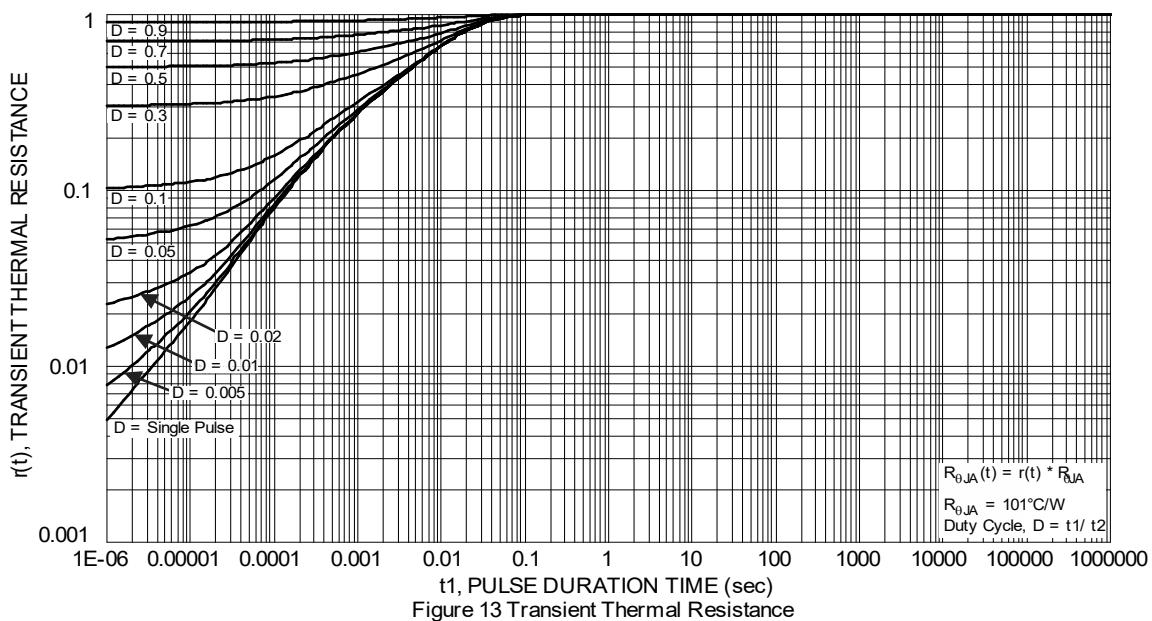


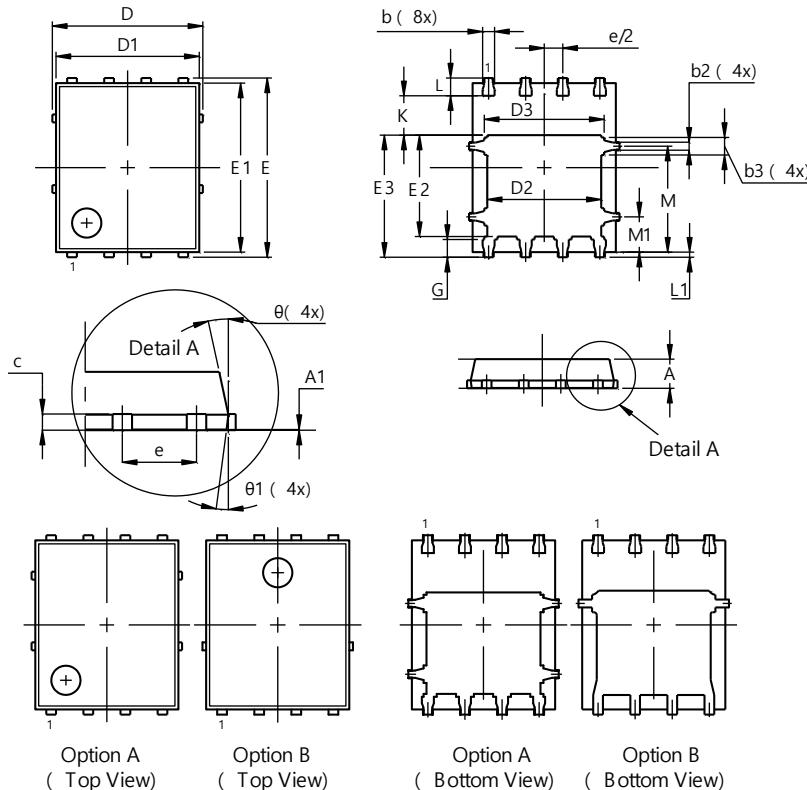
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

POWERDI5060-8 (Standard)

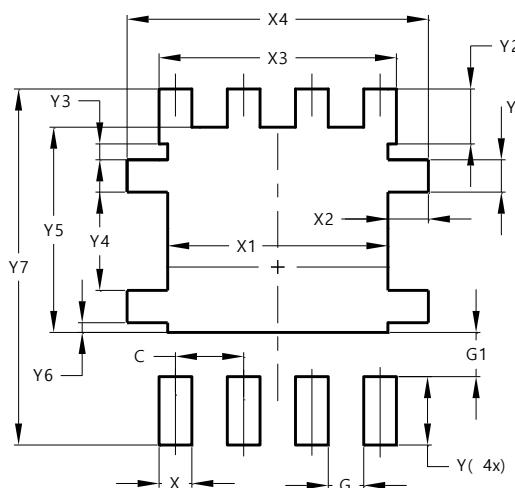


POWERDI5060-8 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.20	--
A1	0.00	0.05	--
b	0.33	0.51	--
b2	0.200	0.350	--
b3	0.40	0.80	0.60
c	0.230	0.354	--
D (Option A)	5.15 BSC		
D (Option B)	5.30 BSC		
D1	4.70	5.40	--
D2	3.70	4.25	--
D3	3.90	4.70	--
E	6.15 BSC		
E1	5.60	6.06	--
E2	3.28	3.92	--
E3	3.99	4.39	--
e	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
theta	8°	12°	--
theta1	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 (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

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