



**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V <sub>DSS</sub>	60	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6)	T <sub>A</sub> = +25°C	I <sub>D</sub>	20.6	A
	T <sub>A</sub> = +70°C		17.2	
Continuous Drain Current (Note 7)	T <sub>C</sub> = +25°C (Note 5)	I <sub>D</sub>	100	A
	T <sub>C</sub> = +100°C		90	
Maximum Continuous Body Diode Forward Current (Note 7)		I <sub>S</sub>	100	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I <sub>DM</sub>	160	A
Avalanche Current, L = 1mH		I <sub>AS</sub>	14.8	A
Avalanche Energy, L = 1mH		E <sub>AS</sub>	98	mJ

**Thermal Characteristics**

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)	T <sub>A</sub> = +25°C	P <sub>D</sub>	3.2	W
Thermal Resistance, Junction to Ambient (Note 6)		R <sub>θJA</sub>	47	°C/W
Total Power Dissipation (Note 7)	T <sub>C</sub> = +25°C	P <sub>D</sub>	150	W
Thermal Resistance, Junction to Case (Note 7)		R <sub>θJC</sub>	1	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 48V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1	—	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	4.4	5.5	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 50A
		—	5.7	7.2		V <sub>GS</sub> = 6V, I <sub>D</sub> = 20A
		—	7.7	10		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 12.5A
Diode Forward Voltage	V <sub>SD</sub>	—	0.9	—	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 50A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	2962	—	pF	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	965.2	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	59.8	—		
Gate Resistance	R <sub>g</sub>	—	0.66	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	47.1	—	nC	V <sub>DD</sub> = 30V, I <sub>D</sub> = 50A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	23.1	—		
Gate-Source Charge	Q <sub>gs</sub>	—	10.2	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	12.5	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	8.3	—	ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A, R <sub>G</sub> = 3.3Ω
Turn-On Rise Time	t <sub>r</sub>	—	9.4	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	22	—		
Turn-Off Fall Time	t <sub>f</sub>	—	8.9	—		
Body Diode Reverse-Recovery Time	t <sub>RR</sub>	—	40.4	—	ns	I <sub>F</sub> = 30A, di/dt = 100A/µs
Body Diode Reverse-Recovery Charge	Q <sub>RR</sub>	—	49.7	—	nC	

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

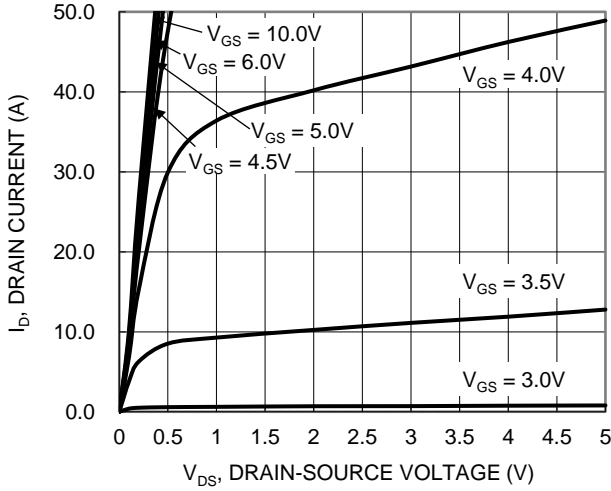


Figure 1. Typical Output Characteristic

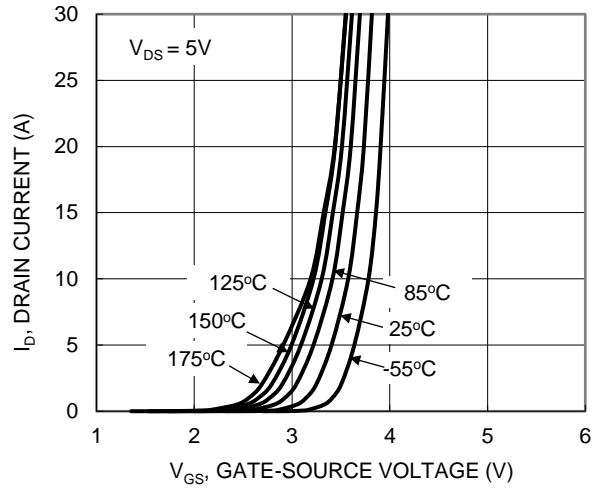


Figure 2. Typical Transfer Characteristic

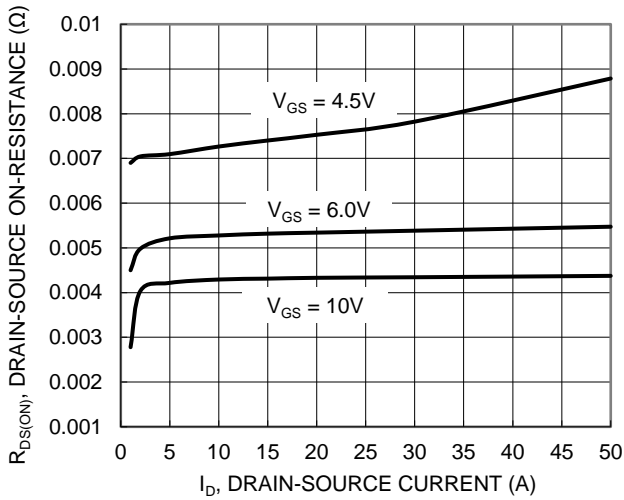


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

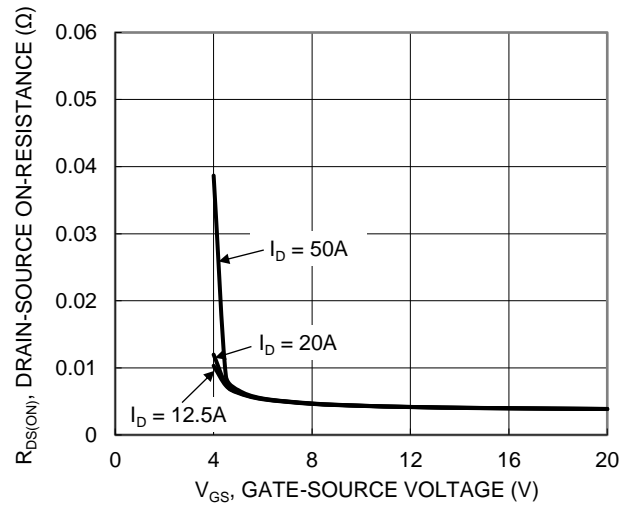


Figure 4. Typical Transfer Characteristic

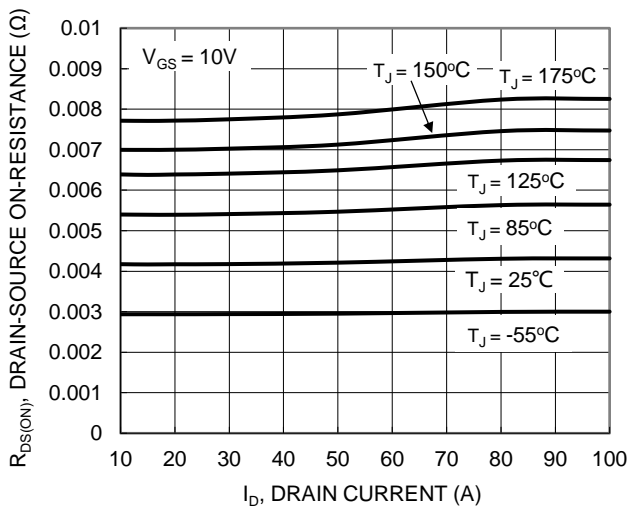


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

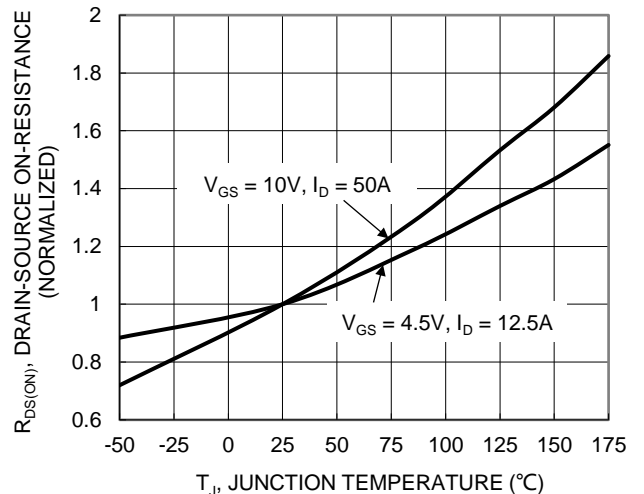


Figure 6. On-Resistance Variation with Junction Temperature

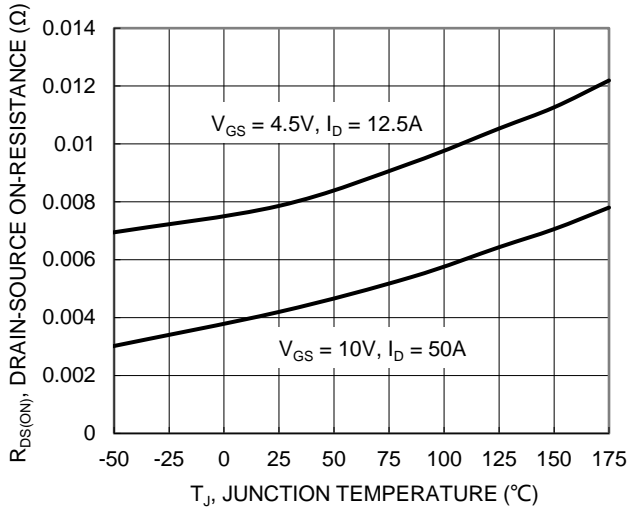


Figure 7. On-Resistance Variation with Junction Temperature

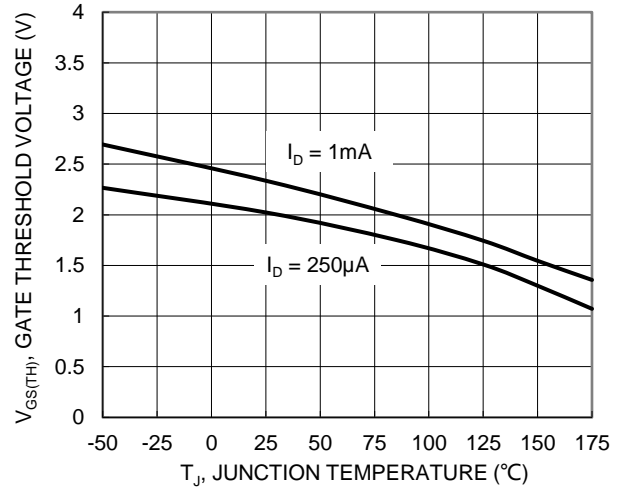


Figure 8. Gate Threshold Variation vs. Junction Temperature

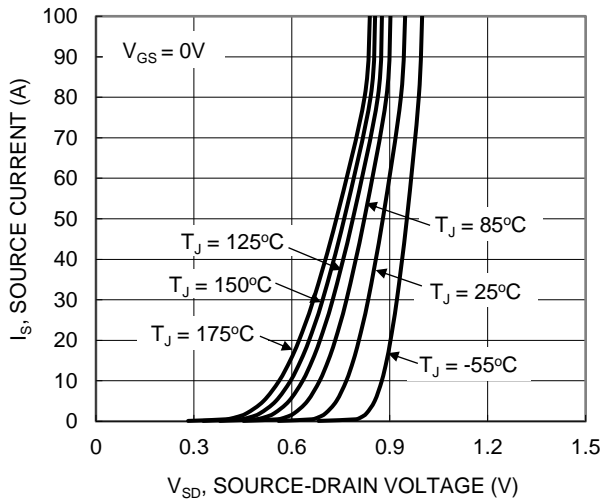


Figure 9. Diode Forward Voltage vs. Current

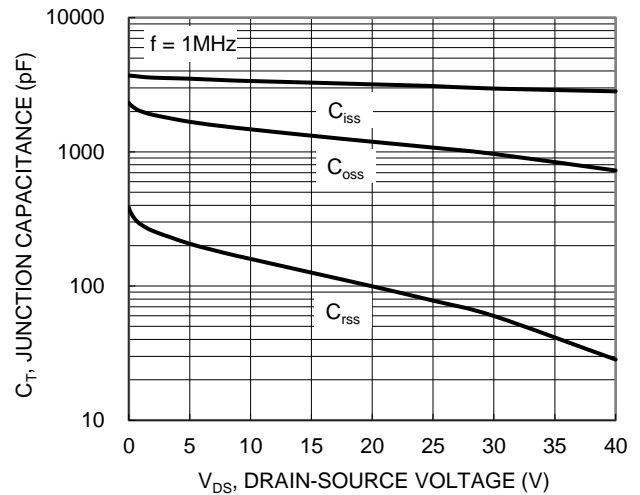


Figure 10. Typical Junction Capacitance

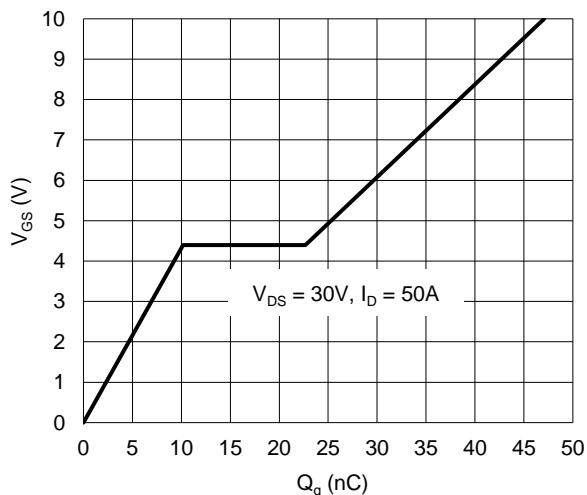


Figure 11. Gate Charge

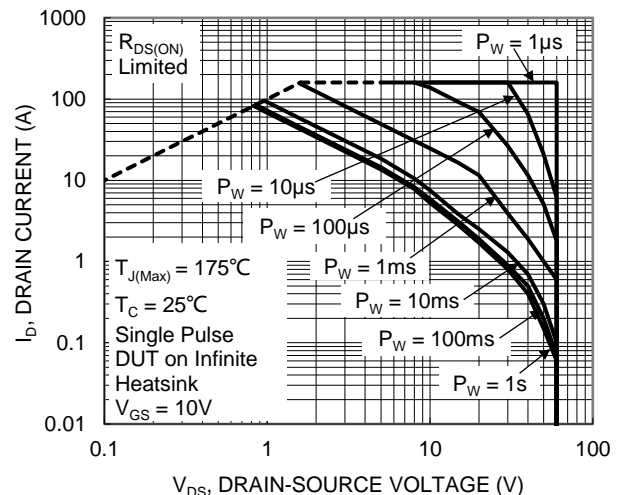


Figure 12. SOA, Safe Operation Area

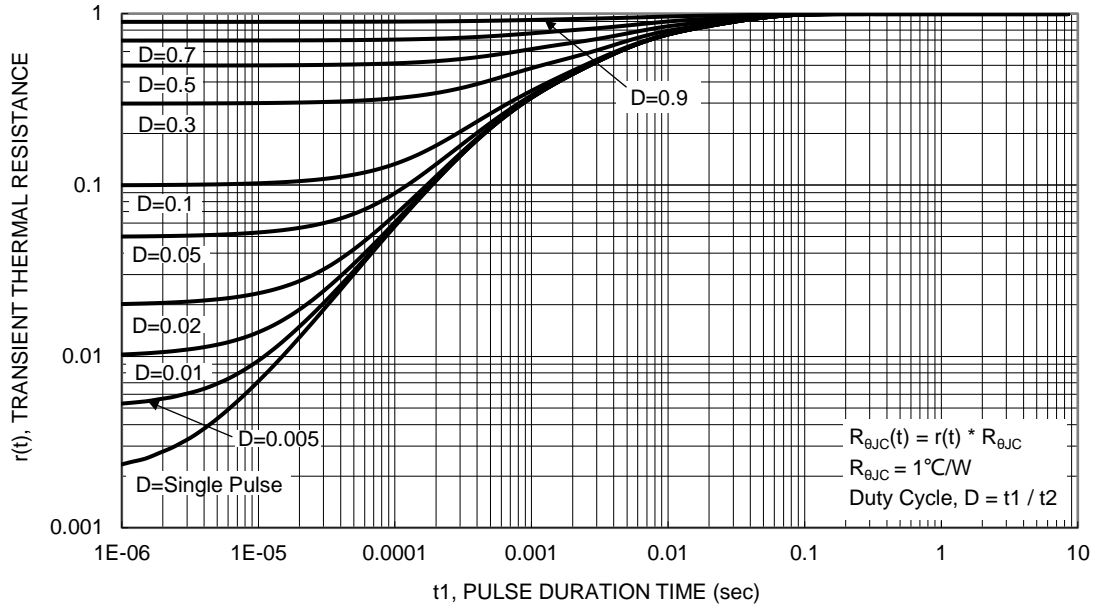
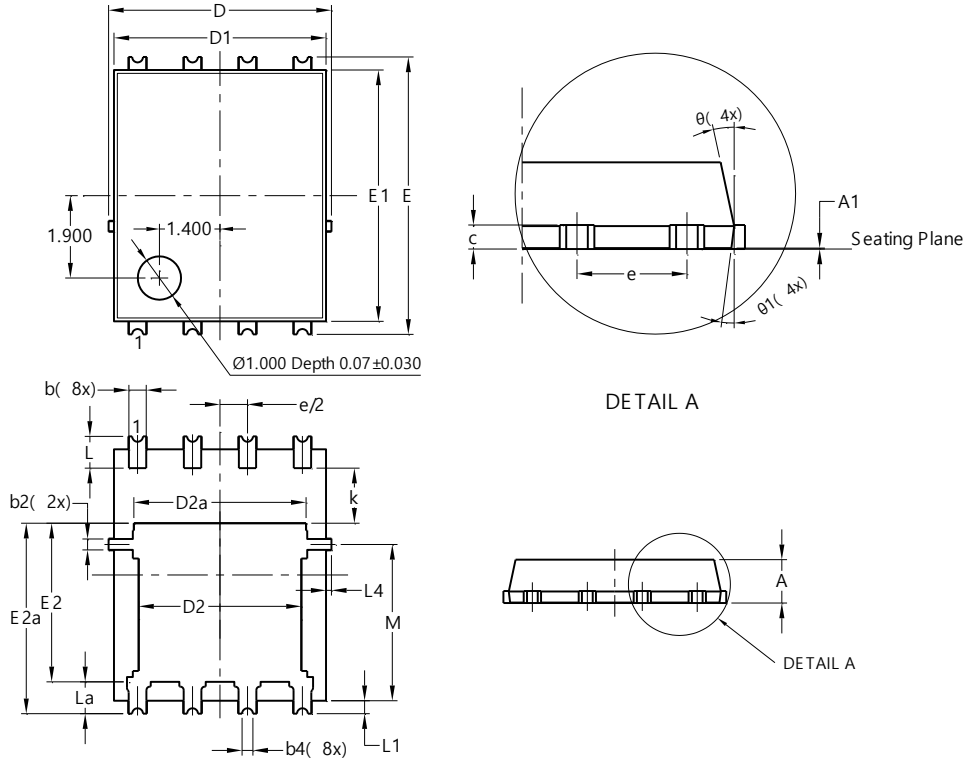


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**PowerDI5060-8/SWP (Type UX)**

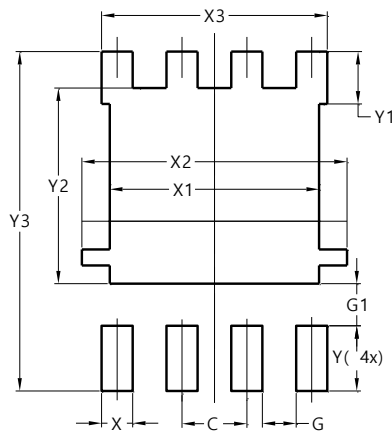


PowerDI5060-8/SWP (Type UX)			
Dim	Min	Max	Typ
A	0.90	1.10	1.00
A1	0	0.05	--
b	0.30	0.50	0.41
b2	0.20	0.35	0.25
b4	0.25REF		
c	0.230	0.330	0.277
D	5.15 BSC		
D1	4.70	5.10	4.90
D2	3.56	3.96	3.76
D2a	3.78	4.18	3.98
E	6.40 BSC		
E1	5.60	6.00	5.80
E2	3.46	3.86	3.66
E2a	4.195	4.595	4.395
e	1.27BSC		
k	1.05	--	--
L	0.635	0.835	0.735
La	0.635	0.835	0.735
L1	0.200	0.400	0.300
L1a	0.050REF		
L4	0.025	0.225	0.125
M	3.205	4.005	3.605
θ	10°	12°	11°
θ1	6°	8°	7°
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**PowerDI5060-8/SWP (Type UX)**



Dimensions	Value (in mm)
C	1.270
G	0.660
G1	0.820
X	0.610
X1	4.100
X2	5.190
X3	4.420
Y	1.270
Y1	1.020
Y2	3.810
Y3	6.610

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