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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	40	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	14.4 11.6	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	19.2 15.4	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	90	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	3	A
Avalanche Current, L = 0.1mH			I_{AS}	38	A
Avalanche Energy, L = 0.1mH			E_{AS}	75	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P_D	1.0	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	119	°C/W
	t<10s		66	
Total Power Dissipation (Note 6)		P_D	2.3	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	53	°C/W
	t<10s		30	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	6.1	
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}	40	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1	µA	V_{DS} = 40V, 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	—	3	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	5.5	7.5	mΩ	V_{GS} = 10V, I_D = 10A
		—	7	10		V_{GS} = 4.5V, I_D = 8A
		—	—	20		V_{GS} = 3.3V, I_D = 6A
Diode Forward Voltage	V_{SD}	—	0.7	1.1	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	3537	—	pF	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	257	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	215	—	pF	
Gate Resistance	R_g	—	0.9	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	34	—	nC	V_{DS} = 20V, I_D = 10A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	74	—	nC	
Gate-Source Charge	Q_{gs}	—	10.2	—	nC	
Gate-Drain Charge	Q_{gd}	—	12.5	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	8.2	—	ns	V_{GS} = 10V, V_{DS} = 20V, R_G = 6Ω, I_D = 10A
Turn-On Rise Time	t_r	—	14.1	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	69.7	—	ns	
Turn-Off Fall Time	t_f	—	24.4	—	ns	
Body Diode Reverse Recovery Time	t_{rr}	—	18.5	—	nS	I_F = 10A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{rr}	—	12.0	—	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. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

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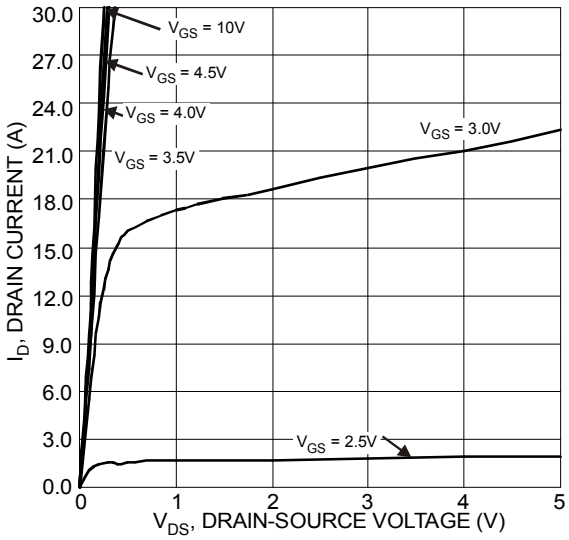

Figure 1 Typical Output Characteristic

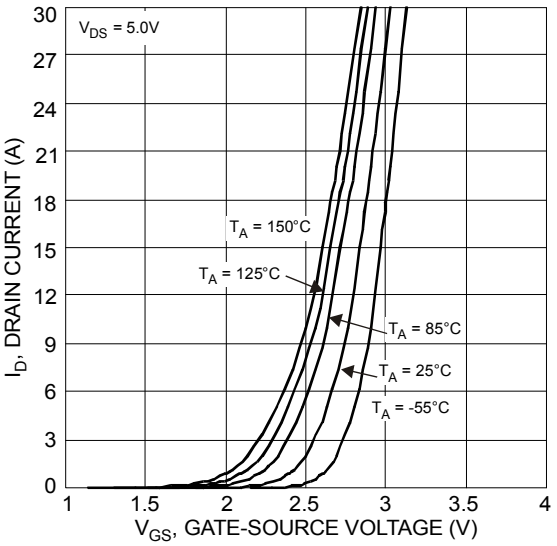

Figure 2 Typical Transfer Characteristics

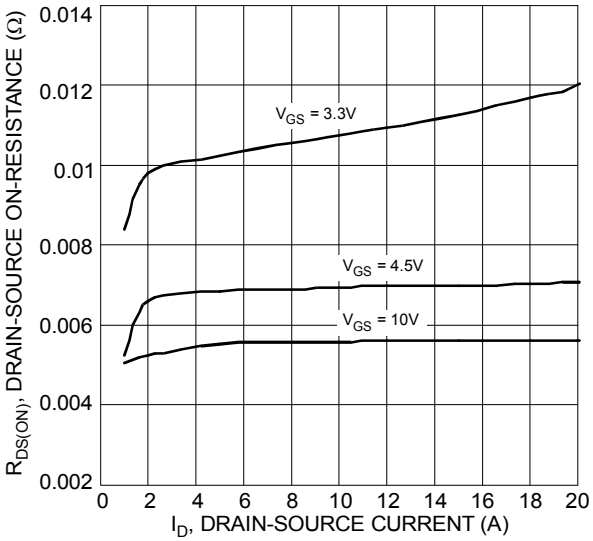

Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

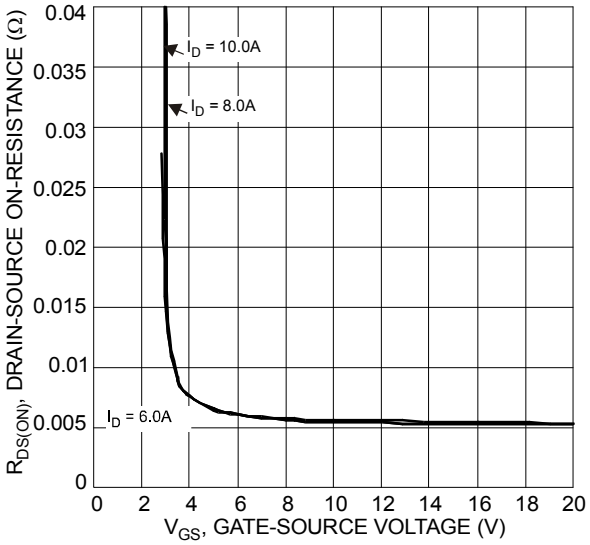

Figure 4 Typical Transfer Characteristics

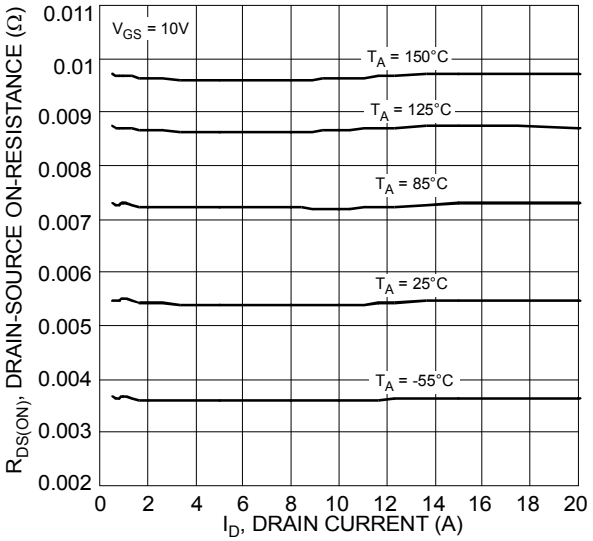

Figure 5 Typical On-Resistance vs. Drain Current and Temperature

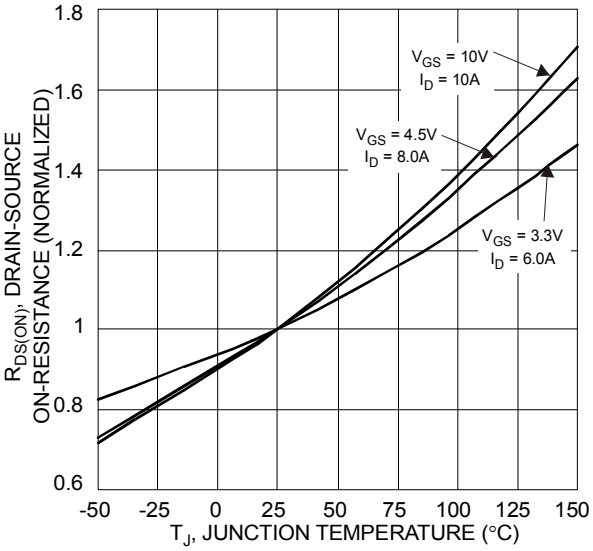

Figure 6 On-Resistance Variation with Temperature

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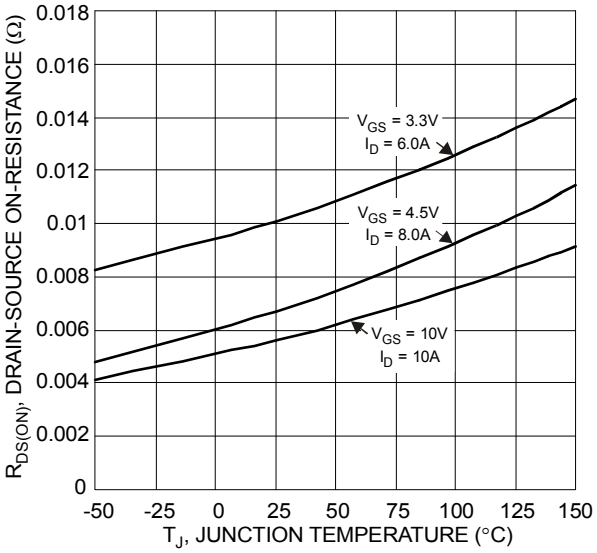

Figure 7 On-Resistance Variation with Temperature

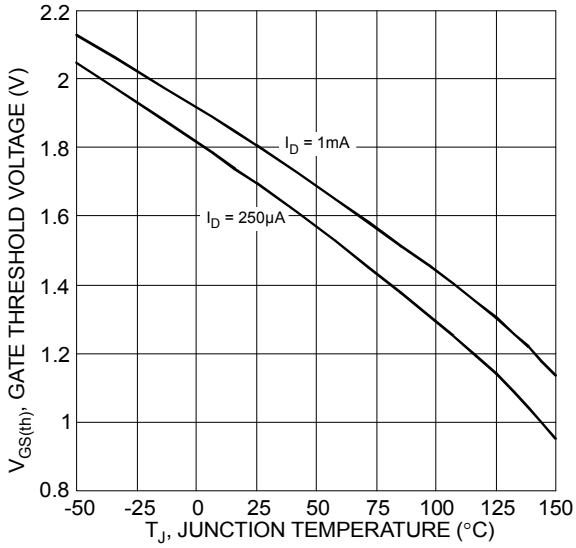

Figure 8 Gate Threshold Variation vs. Ambient Temperature

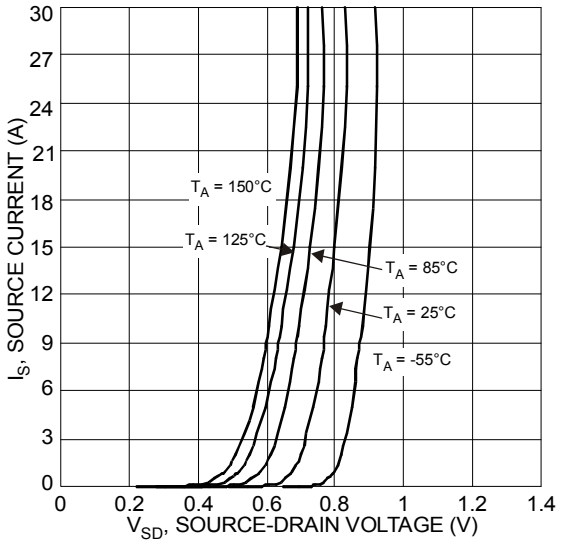

Figure 9 Diode Forward Voltage vs. Current

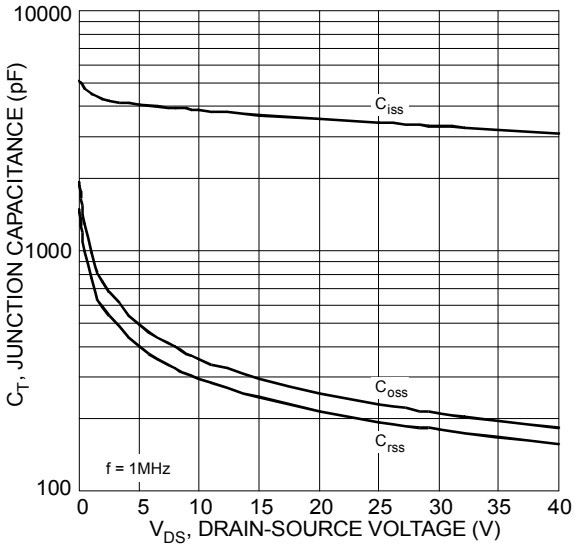

Figure 10 Typical Junction Capacitance

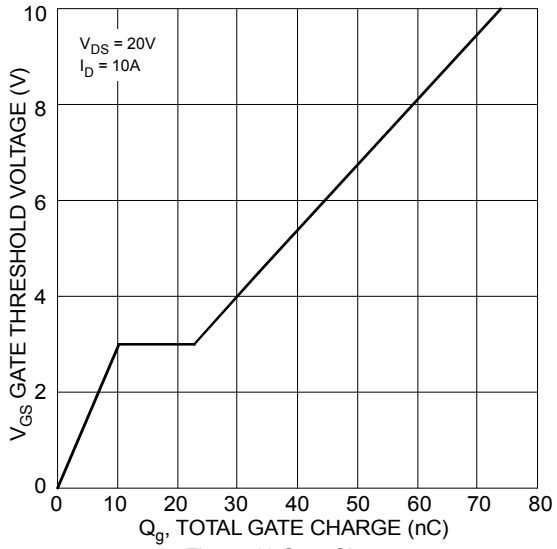

Figure 11 Gate Charge

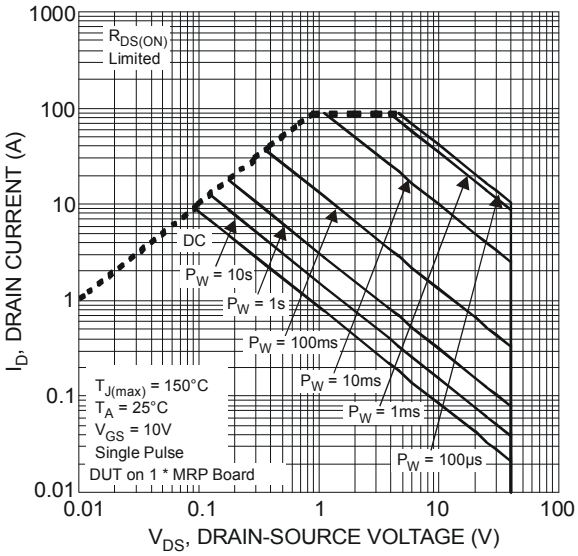

Figure 12 SOA, Safe Operation Area

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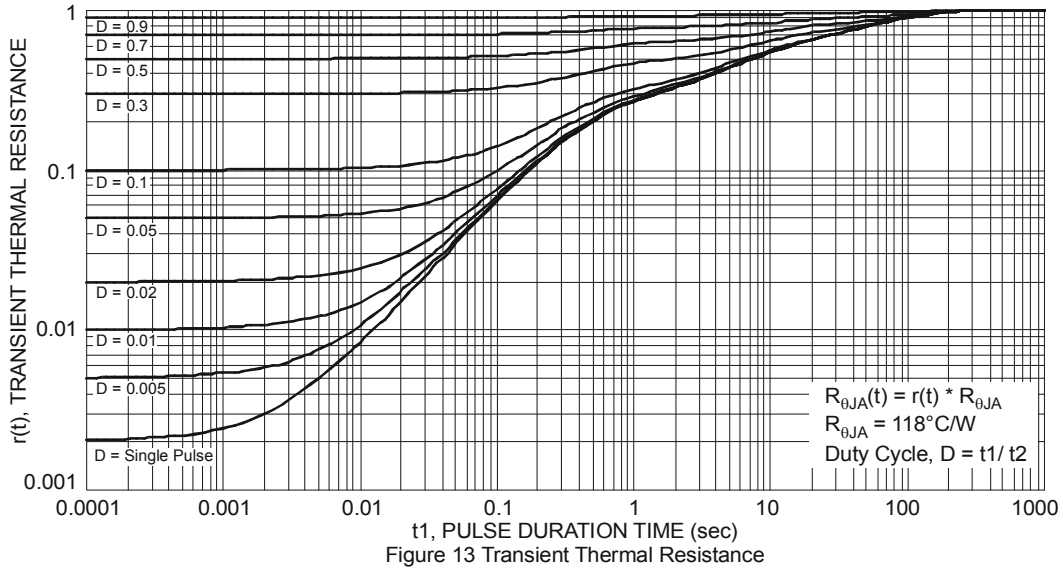
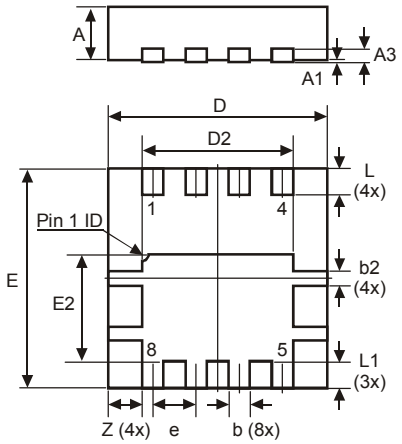


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

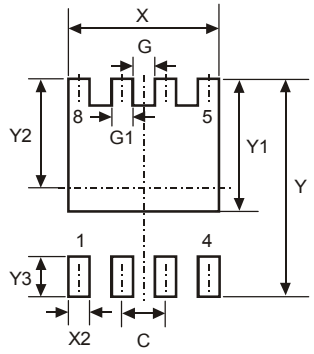
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI®3333-8			
Dim	Min	Max	Typ
D	3.25	3.35	3.30
E	3.25	3.35	3.30
D2	2.22	2.32	2.27
E2	1.56	1.66	1.61
A	0.75	0.85	0.80
A1	0	0.05	0.02
A3	–	–	0.203
b	0.27	0.37	0.32
b2	–	–	0.20
L	0.35	0.45	0.40
L1	–	–	0.39
e	–	–	0.65
Z	–	–	0.515
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	0.650
G	0.230
G1	0.420
Y	3.700
Y1	2.250
Y2	1.850
Y3	0.700
X	2.370
X2	0.420

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