

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	11.5 9.2	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	14.2 11.4	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	80	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	2	A
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	27	A
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	37	mJ

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P _D	0.93	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	137	°C/W
	t < 10s		89	
Total Power Dissipation (Note 6)		P _D	2.45	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R _{θJA}	52	°C/W
	t < 10s		34	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	3	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- 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} rating are based on low frequency and duty cycles to keep T_J = +25°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}	40	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	1	μA	V _{DS} = 32V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	3.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	12	mΩ	V _{GS} = 10V, I _D = 14A
		—	—	15		V _{GS} = 4.5V, I _D = 11A
Diode Forward Voltage	V _{SD}	—	0.72	—	V	V _{GS} = 0V, I _S = 14A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	1,810	—	pF	V _{DS} = 20V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	135	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	112	—	pF	
Gate Resistance	R _g	—	1.7	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	17	—	nC	V _{DS} = 20V, I _D = 14A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	37	—	nC	
Gate-Source Charge	Q _{gs}	—	5.6	—	nC	
Gate-Drain Charge	Q _{gd}	—	7.1	—	nC	
Turn-On Delay Time	t _{D(on)}	—	5.1	—	ns	V _{GS} = 10V, V _{DS} = 20V, R _G = 6Ω, I _D = 14A
Turn-On Rise Time	t _r	—	13	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	36	—	ns	
Turn-Off Fall Time	t _f	—	13	—	ns	
Body Diode Reverse Recovery Time	t _{rr}	—	12.2	—	nS	I _F = 3A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	—	5.4	—	nC	I _F = 3A, di/dt = 100A/μs

Notes: 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

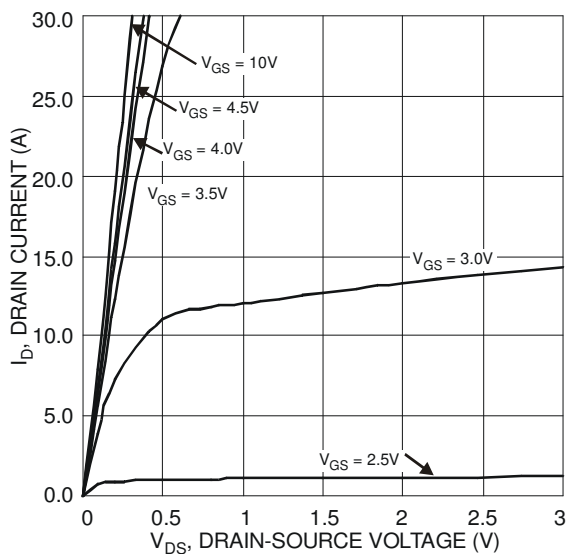


Figure 1 Typical Output Characteristic

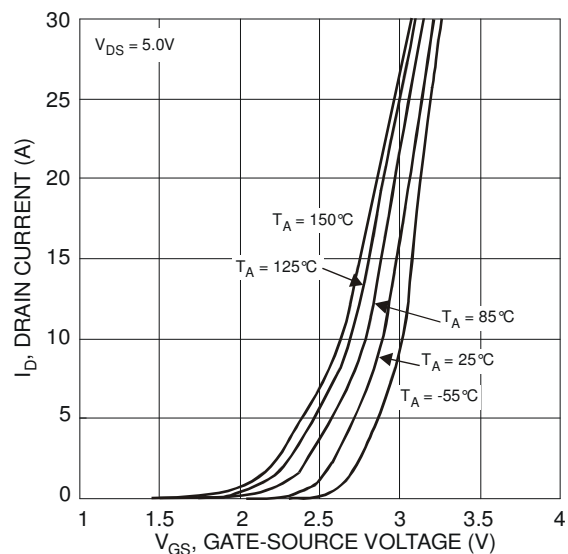


Figure 2 Typical Transfer Characteristics

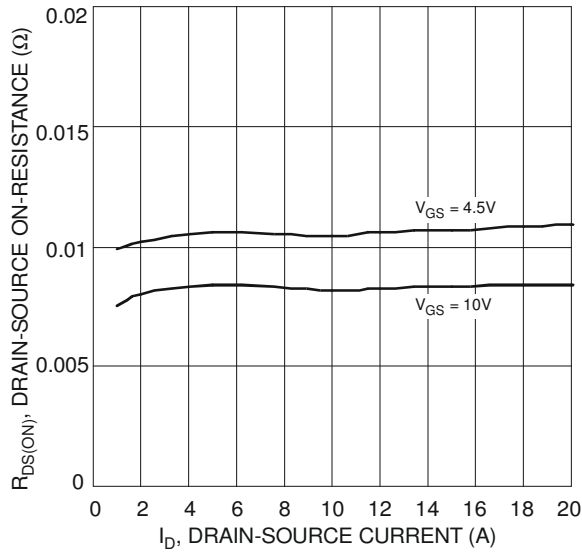


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

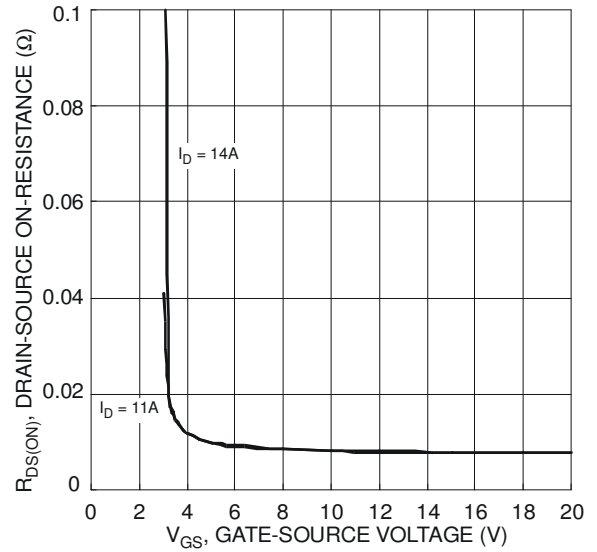


Figure 4 Typical Transfer Characteristic

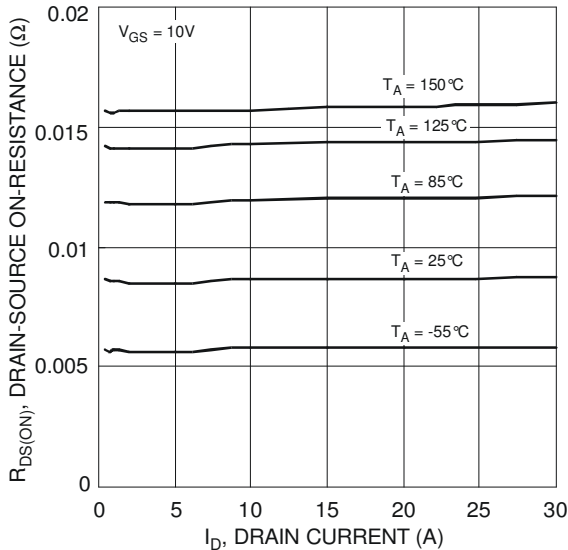


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

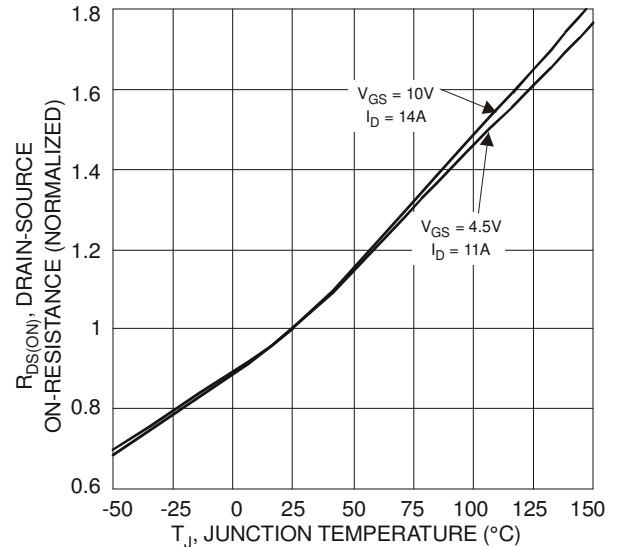


Figure 6 On-Resistance Variation with Temperature

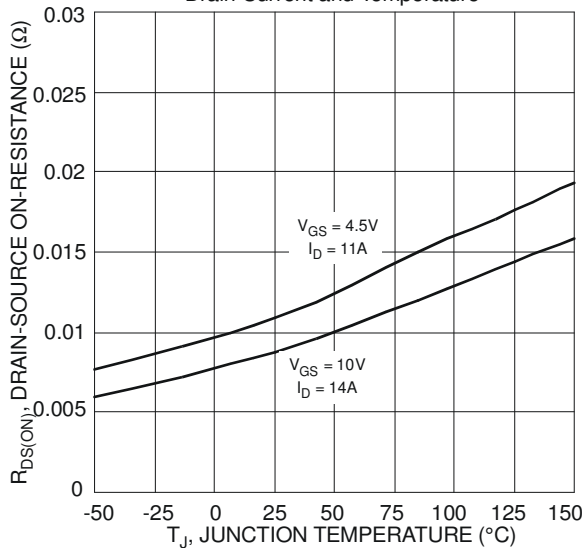


Figure 7 On-Resistance Variation with Temperature

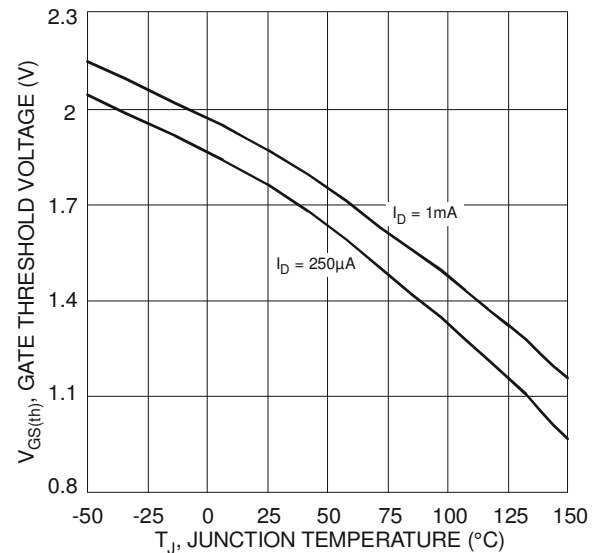


Figure 8 Gate Threshold Variation vs. Ambient Temperature

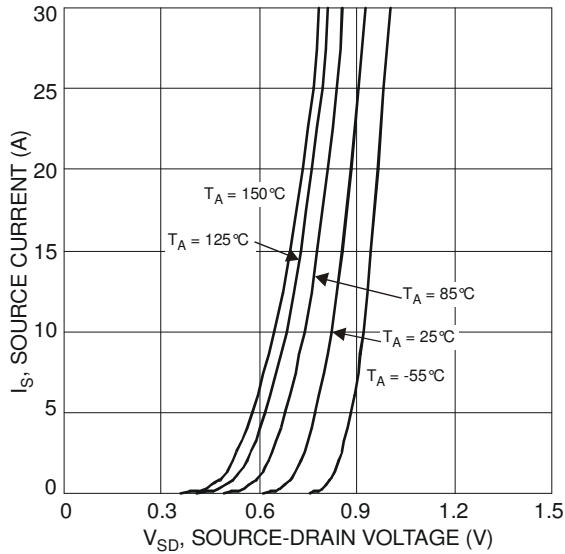


Figure 9 Diode Forward Voltage vs. Current

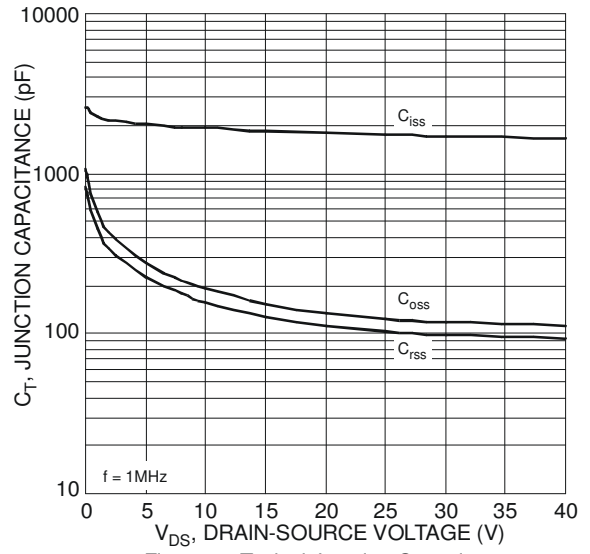


Figure 10 Typical Junction Capacitance

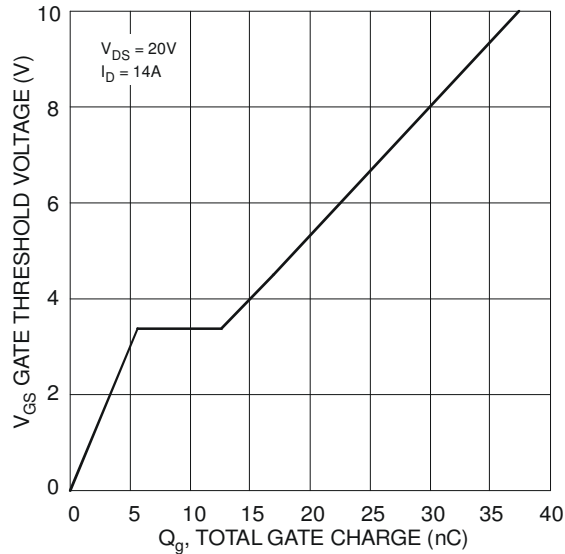


Figure 11 Gate Charge

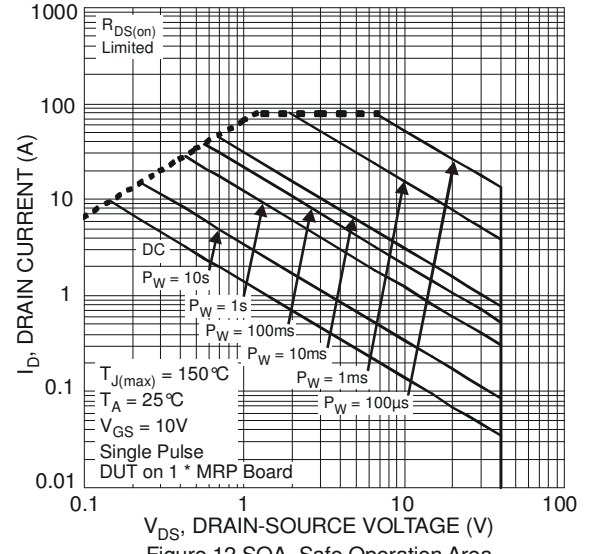


Figure 12 SOA, Safe Operation Area

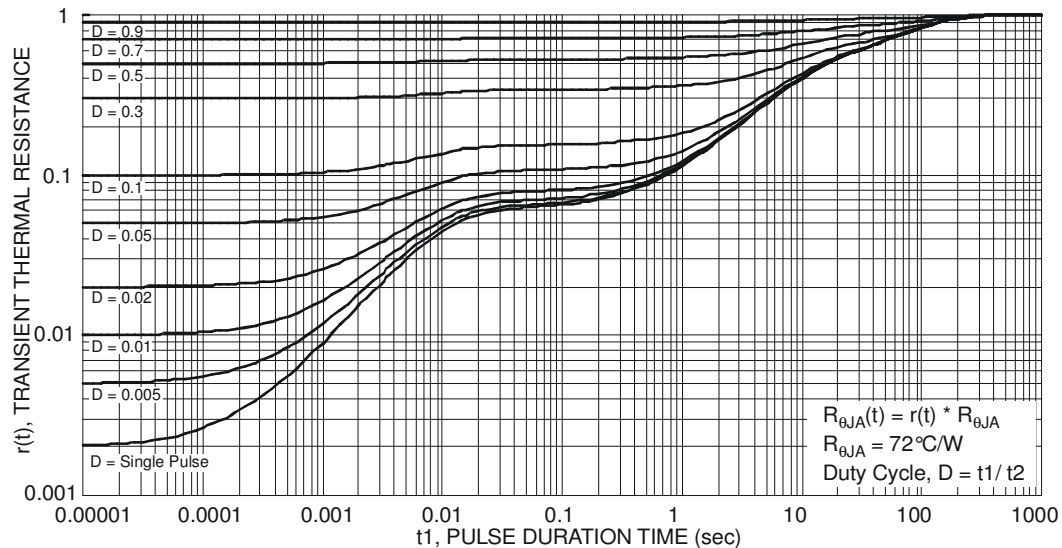
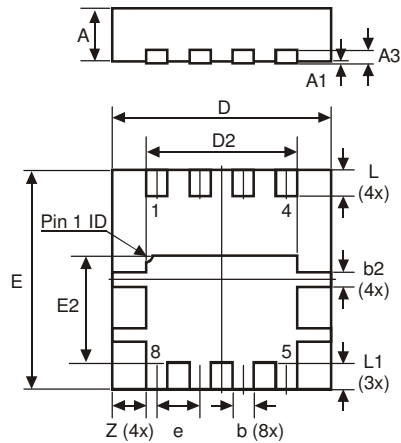


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

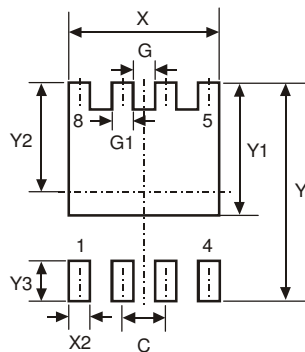
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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