Maximum Ratings N-CHANNEL– Q2 (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 5) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	6.5 5.1	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	8.5 6.8	A
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	5.3 4.1	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	7.0 5.5	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	60	A
Pulsed Body Diode Current (10µs pulse, duty cycle = 1%)			I_{SM}	60	A
Avalanche Current (Note 7) L = 0.1mH			I_{AS}	14	A
Avalanche Energy (Note 7) L = 0.1mH			E_{AS}	10	mJ

Maximum Ratings P-CHANNEL– Q1 (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 5) V_{GS} = -10V	Steady State	T_A = +25°C T_A = +70°C	I_D	-4.2 -3.2	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	-5.5 -4.3	A
Continuous Drain Current (Note 5) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-3.5 -2.3	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	-4.1 -3.2	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	-2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-30	A
Pulsed Body Diode Current (10µs pulse, duty cycle = 1%)			I_{SM}	-30	A
Avalanche Current (Note 7) L = 0.1mH			I_{AS}	-14	A
Avalanche Energy (Note 7) L = 0.1mH			E_{AS}	10	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.2	W
	T_A = +70°C		0.77	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	104	°C/W
	t<10s		62	
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	1.5	W
	T_A = +70°C		0.95	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	83	°C/W
	t<10s		49	
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta JC}$	15	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Electrical Characteristics N-CHANNEL– Q2 (@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}	30	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±1	μA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.0	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	15	20	mΩ	V_{GS} = 10V, I_D = 7.4A
		—	23	32		V_{GS} = 4.5V, I_D = 6A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	8	—	S	V_{DS} = 5V, I_D = 10A
Diode Forward Voltage	V_{SD}	—	0.70	1.2	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	501	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	72	—		
Reverse Transfer Capacitance	C_{rss}	—	57	—		
Gate Resistance	R_g	—	1.84	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	4.6	—	nC	V_{DS} = 15V, I_D = 10A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	9.8	—		
Gate-Source Charge	Q_{gs}	—	1.6	—		
Gate-Drain Charge	Q_{gd}	—	2.0	—		
Turn-On Delay Time	$t_{D(on)}$	—	3.9	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_G = 6Ω, I_D = 1A
Turn-On Rise Time	t_r	—	4.2	—		
Turn-Off Delay Time	$t_{D(off)}$	—	16.6	—		
Turn-Off Fall Time	t_f	—	5.8	—		
Reverse Recovery Time	t_{rr}	—	5.5	—	ns	I_F = 12A, di/dt = 500A/μs
Reverse Recovery Charge	Q_{rr}	—	2.6	—	nC	

Electrical Characteristics P-CHANNEL – Q1 (@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}	-30	—	—	V	V_{GS} = 0V, I_D = -250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	V_{DS} = -30V, 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	—	-2.0	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	38	45	mΩ	V_{GS} = -10V, I_D = -5.2A
		—	65	85		V_{GS} = -4.5V, I_D = -4A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	5	—	S	V_{DS} = -5V, I_D = -5.2A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	590	—	pF	V_{DS} = -25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	69	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	53	—	pF	
Gate Resistance	R_g	—	11	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	5.1	—	nC	V_{DS} = -15V, I_D = -6A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	10.5	—	nC	
Gate-Source Charge	Q_{gs}	—	1.8	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.9	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	6.8	—	ns	V_{DD} = -15V, V_{GS} = -10V, R_G = 6Ω, I_D = -1A
Turn-On Rise Time	t_r	—	4.9	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	28.4	—	ns	
Turn-Off Fall Time	t_f	—	12.4	—	ns	
Reverse Recovery Time	t_{rr}	—	14	—	ns	I_F = 12A, di/dt = 500A/μs
Reverse Recovery Charge	Q_{rr}	—	11	—	nC	

Notes: 7. I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

N-CHANNEL

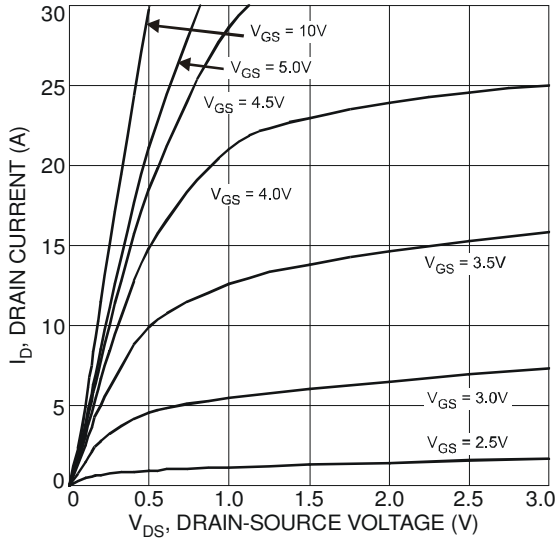


Figure 1. Typical Output Characteristic

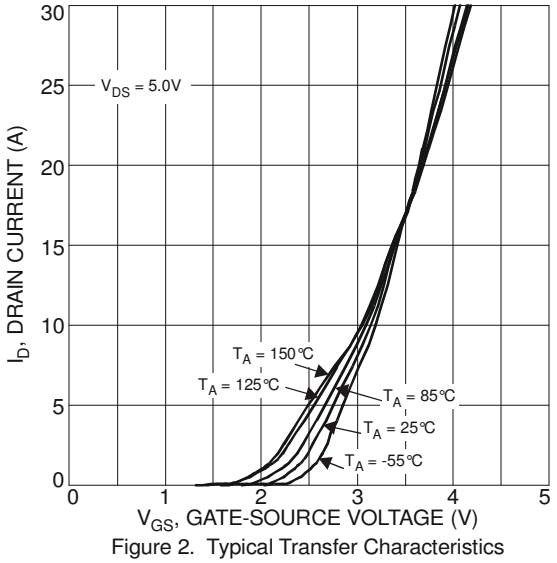


Figure 2. Typical Transfer Characteristics

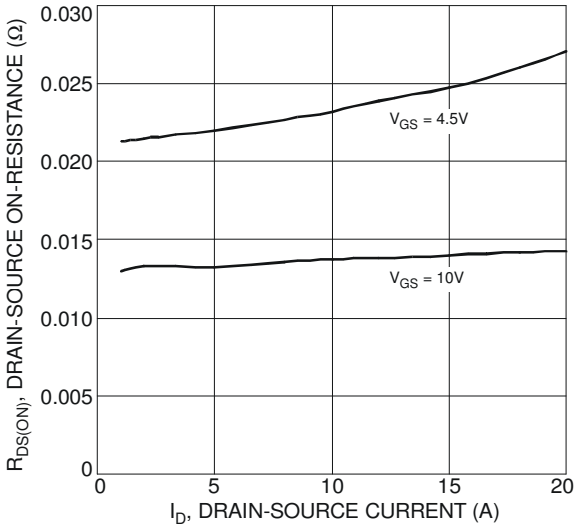


Figure. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

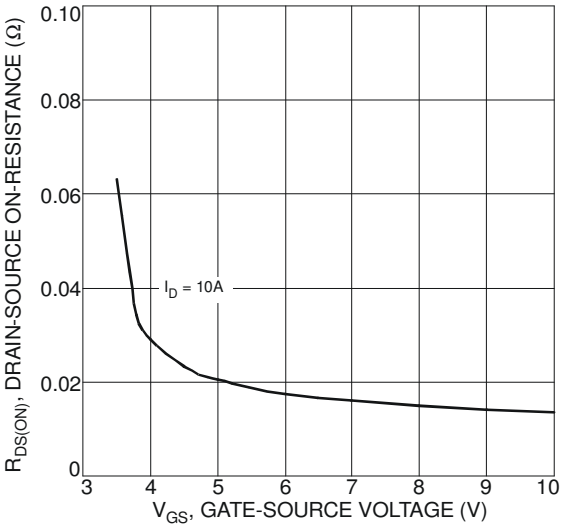


Figure 4. Typical On-Resistance vs. Drain Current and Gate Voltage

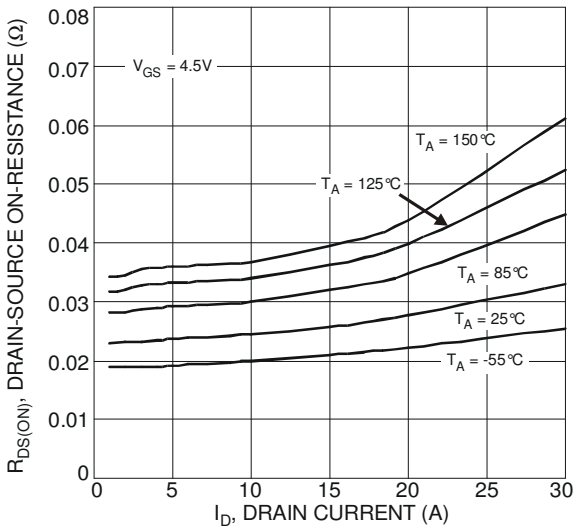


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

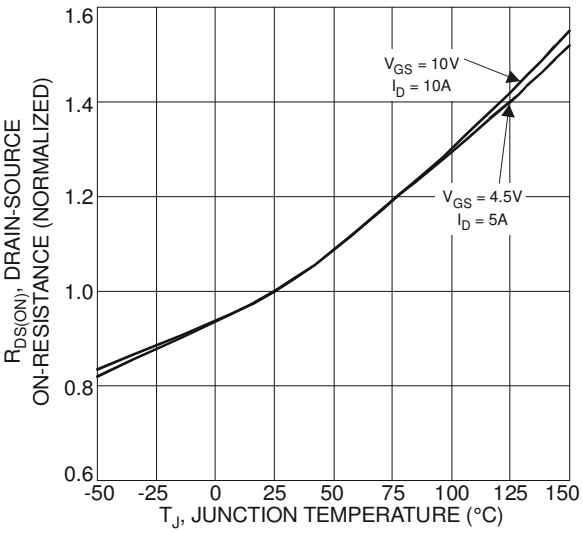


Figure 6. On-Resistance Variation with Temperature

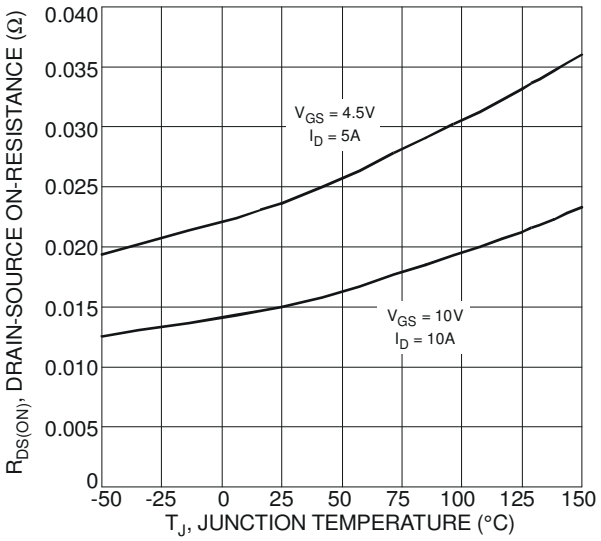


Figure 7. On-Resistance Variation with Temperature

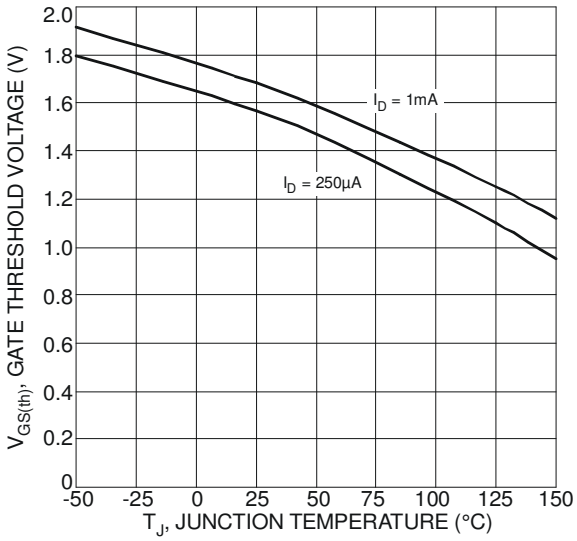


Figure 8 Gate Threshold Variation vs. Ambient Temperature

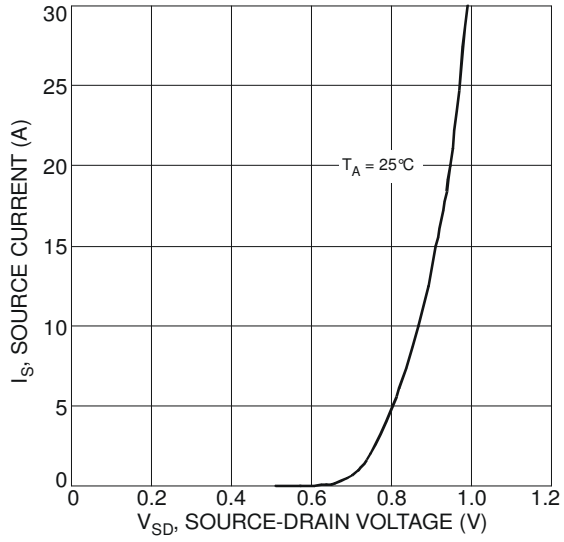


Figure 9. Diode Forward Voltage vs. Current

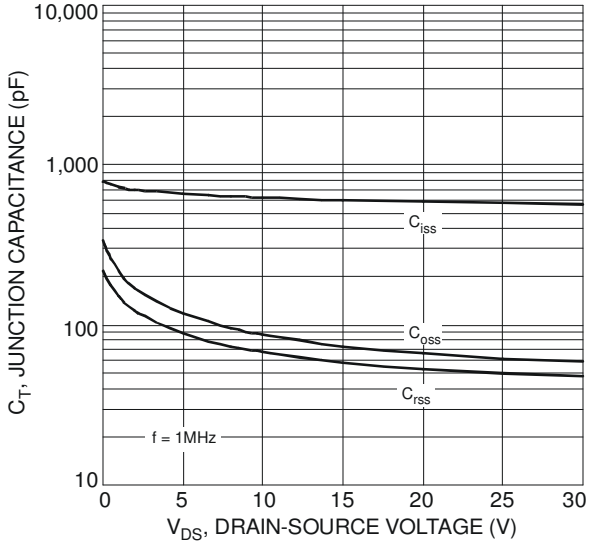


Figure 10. Typical Junction Capacitance

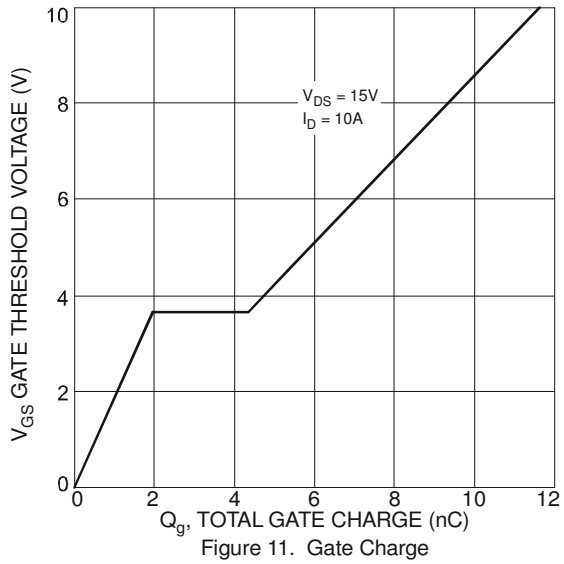


Figure 11. Gate Charge

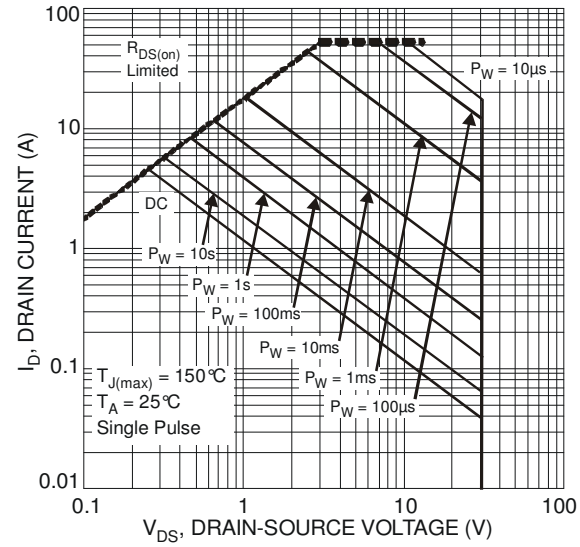


Figure 12. SOA, Safe Operation Area

P-CHANNEL

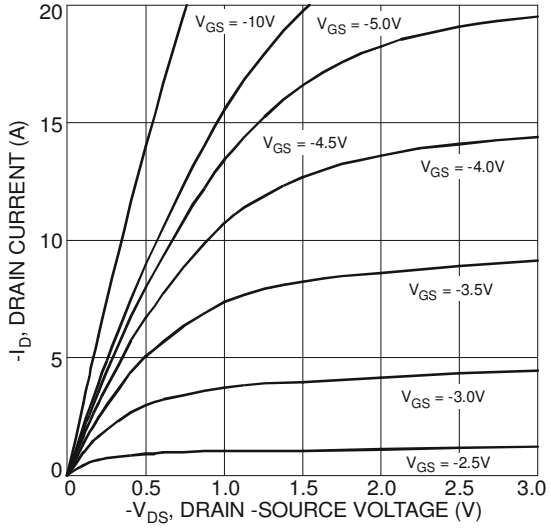


Figure 13. Typical Output Characteristics

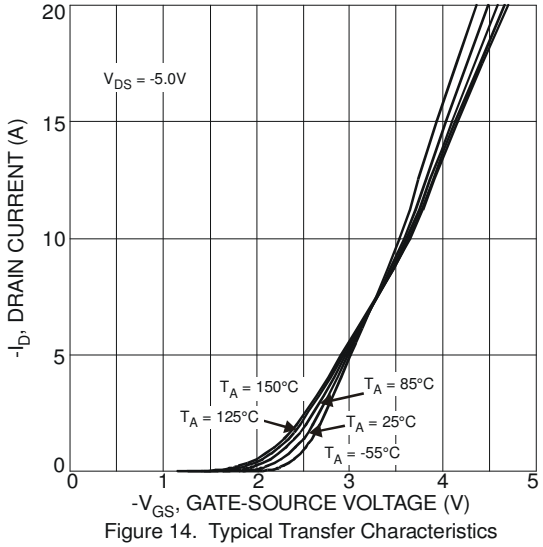


Figure 14. Typical Transfer Characteristics

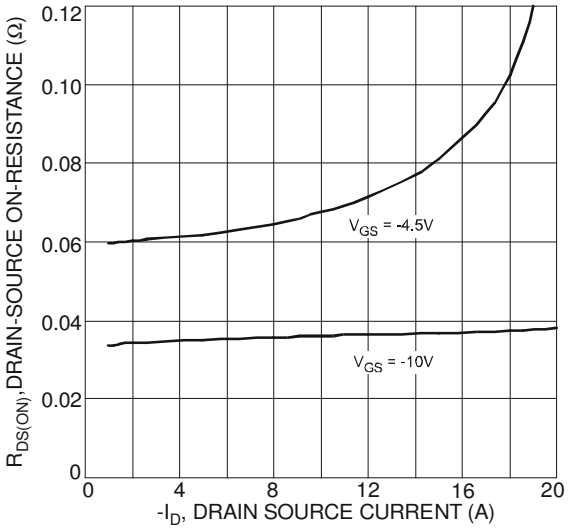


Figure 15. Typical On-Resistance vs. Drain Current and Gate Voltage

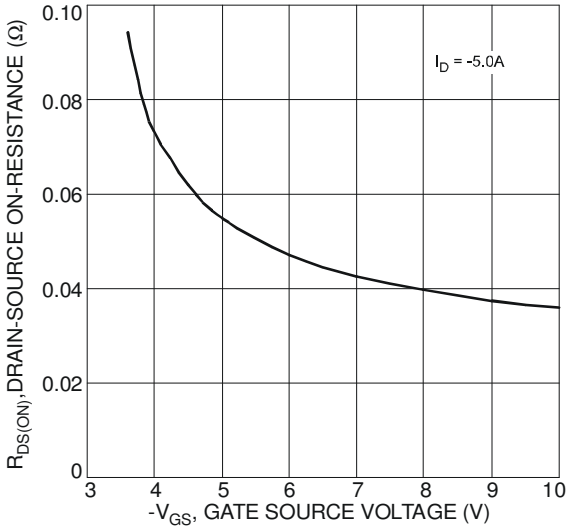


Figure 16. Typical On-Resistance vs. Drain Current and Gate Voltage

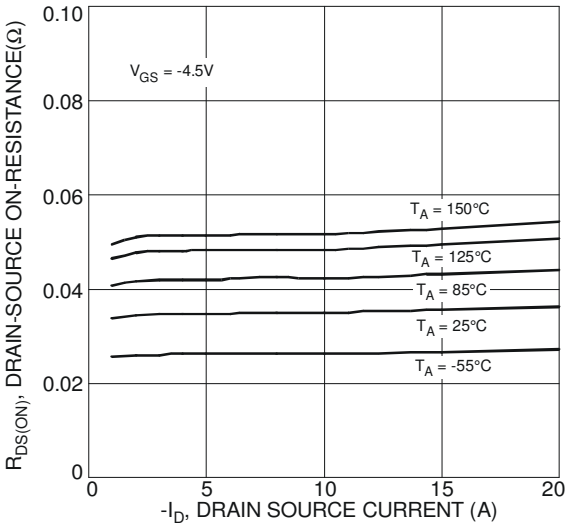


Figure 17. Typical On-Resistance vs. Drain Current and Temperature

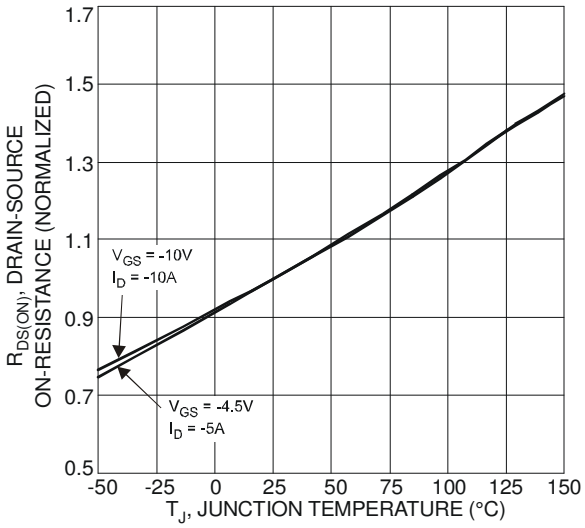


Figure 18. On-Resistance Variation with Temperature

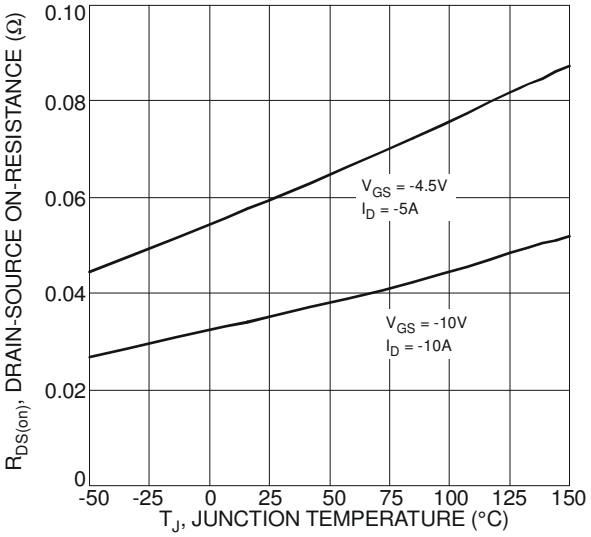


Figure 19. On-Resistance Variation with Temperature

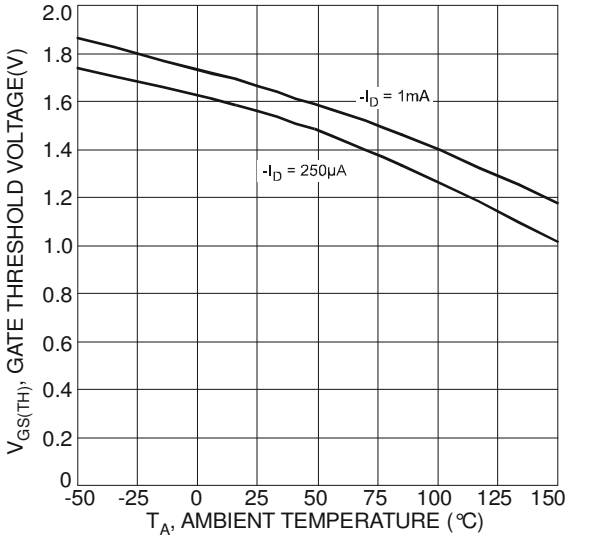


Figure 20. Gate Threshold Variation vs. Ambient Temperature

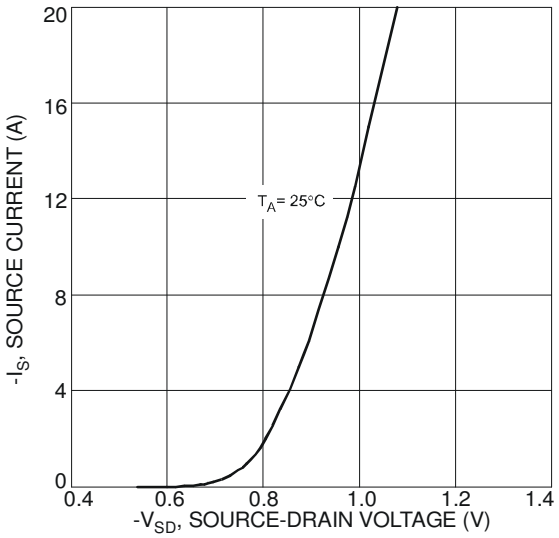


Figure 21. Diode Forward Voltage vs. Current

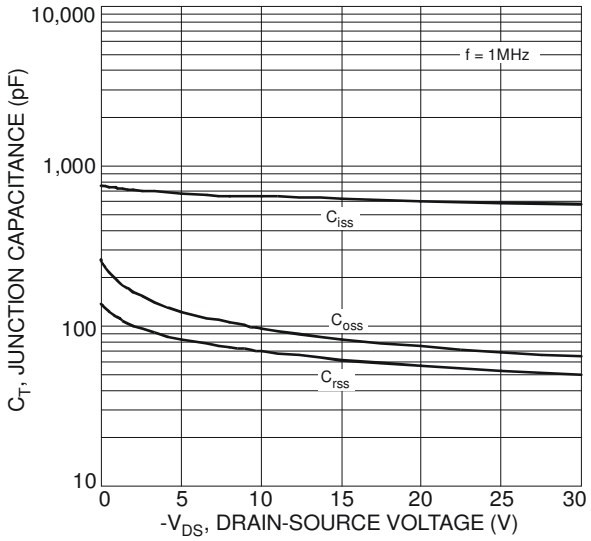


Figure 22. Typical Junction Capacitance

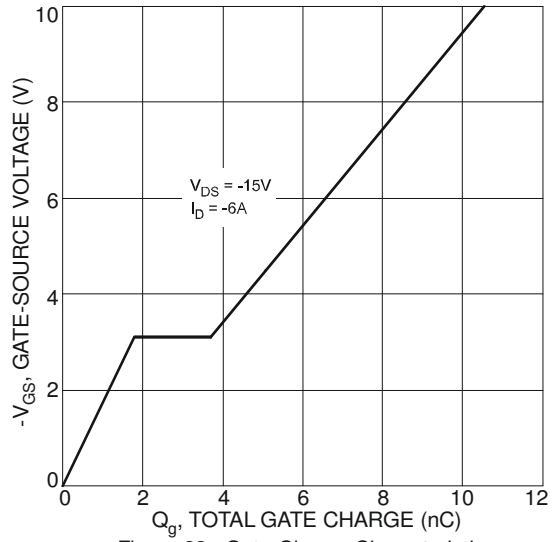


Figure 23. Gate-Charge Characteristics

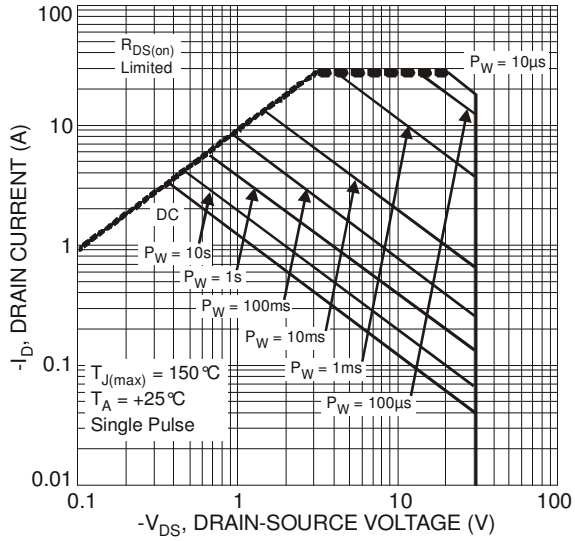


Figure 24. SOA, Safe Operation Area

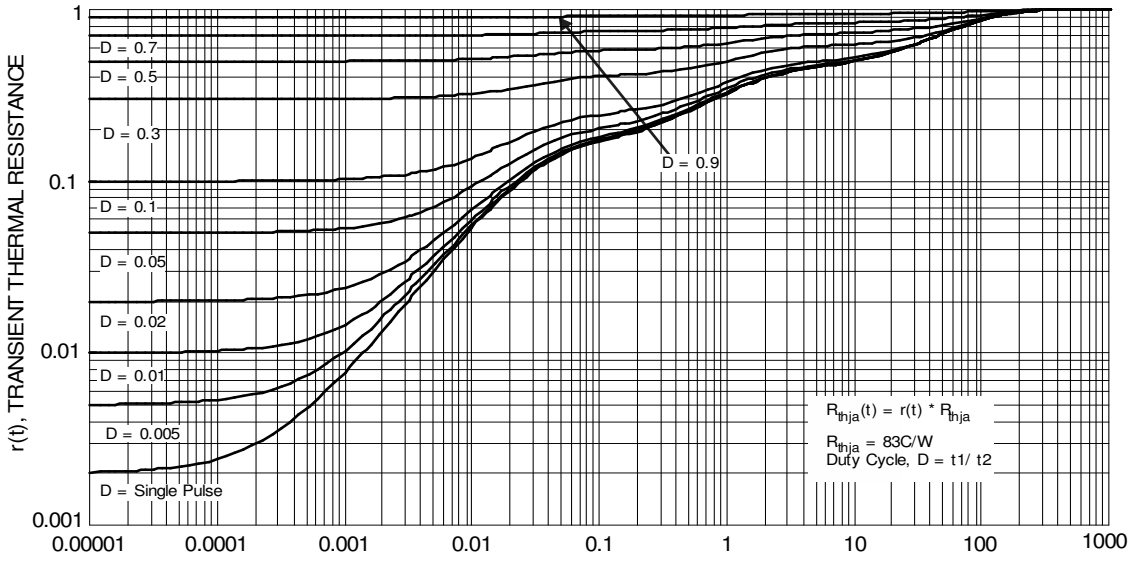
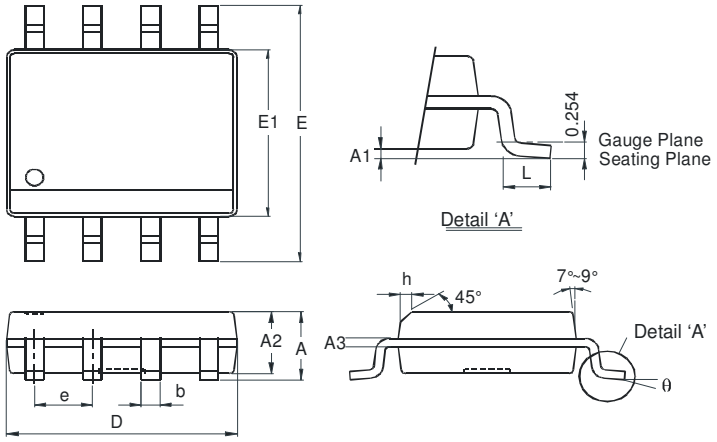


Figure 25 Transient Thermal Resistance

Package Outline Dimensions

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

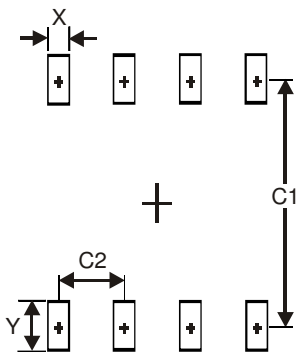


SO-8		
Dim	**Min**	**Max**
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

SO-8



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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