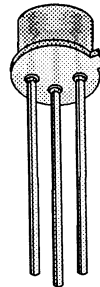


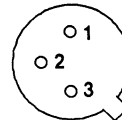
MOSPOWER

PRODUCT SUMMARY

PART NUMBER	$V_{(BR)DSS}$ (VOLTS)	$r_{DS(on)}$ (OHMS)	I_D (AMPS)
SML2P20	200	3.0	1.6
SML2P15	150	4.5	1.3



BOTTOM VIEW



- 1 DRAIN
- 2 GATE
- 3 SOURCE

TO-205

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

PARAMETERS/TEST CONDITIONS		Symbol	SML		Units
			2P20	2P15	
Drain-Source Voltage		V_{DS}	200	150	V
Gate-Source Voltage		V_{GS}	± 40	± 40	
Continuous Drain Current	$T_C = 25^\circ\text{C}$	I_D	1.6	1.3	A
	$T_C = 100^\circ\text{C}$		1.0	0.8	
Pulsed Drain Current ¹		I_{DM}	6.5	5.5	
Avalanche Current (see figure 9)		I_A	1.6	1.3	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	15	15	W
	$T_C = 100^\circ\text{C}$		8	8	
Operating Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150		$^\circ\text{C}$
Lead Temperature (1/16" from case for 10 secs.)		T_L	300		

4

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	Symbol	Typ.	Max.	Units
Junction-to-Case	R_{thJC}	-	8.33	K/W
Junction-to-Ambient	R_{thJA}	-	175	

¹Pulse width limited by maximum junction temperature (refer to transient thermal impedance data, figure 11)

²Negative signs for current and voltage values have been omitted for the sake of clarity

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted) **P-Channel Device**
 Negative signs have been omitted for clarity

PARAMETERS/TEST CONDITIONS		Symbol	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage $V_{GS} = 0, I_D = 250 \mu\text{A}$	SML2P20 SML2P15	$V_{(BR)DSS}$	200 150	- -	- -	V
Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$		$V_{GS(th)}$	2.0	-	4.0	
Gate-Body Leakage $V_{DS} = 0, V_{GS} = \pm 20 \text{V}$		I_{GSS}	-	-	100	nA
Zero Gate Voltage Drain Current $V_{DS} = V_{(BR)DSS}, V_{GS} = 0$		I_{DSS}	-	-	250	μA
Zero Gate Voltage Drain Current $V_{DS} = 0.8 \times V_{(BR)DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$		I_{DSS}	-	-	1000	
On-State Drain Current ² $V_{DS} = 10 \text{V}, V_{GS} = 10 \text{V}$	SML2P20 SML2P15	$I_{D(on)}$	1.6 1.3	- -	- -	A
Drain-Source On-State Resistance ² $V_{GS} = 10 \text{V}, I_D = 0.8 \text{A}$	SML2P20 SML2P15	$r_{DS(on)}$	- -	2.3 3.5	3.0 4.5	Ω
Drain-Source On-State Resistance ² $V_{GS} = 10 \text{V}, I_D = 0.8 \text{A}, T_J = 125^\circ\text{C}$	SML2P20 SML2P15	$r_{DS(on)}$	- -	4.0 5.4	5.4 8.1	
Forward Transconductance ² $V_{DS} = 15 \text{V}, I_D = 0.8 \text{A}$		g_{fs}	0.5	0.8	-	$\text{S}(\text{V})$
Input Capacitance	$V_{GS} = 0$ $V_{DS} = 25 \text{V}$ $f = 1 \text{MHz}$	C_{iss}	-	170	300	pF
Output Capacitance		C_{oss}	-	70	100	
Reverse Transfer Capacitance		C_{rss}	-	25	35	
Total Gate Charge	$V_{DS} = 0.5 \times V_{(BR)DSS},$ $V_{GS} = 10 \text{V}, I_D = 1.6 \text{A}$ (Gate charge is essentially independent of operating temperature)	Q_g	-	5.8	11	nC
Gate-Source Charge		Q_{gs}	-	0.9	-	
Gate-Drain Charge		Q_{gd}	-	3.2	-	
Turn-On Delay Time	$V_{DD} = 100 \text{V}, R_L = 120\Omega$ $I_D = 0.8 \text{A}, V_{GEN} = 10 \text{V}$ $R_G = 25\Omega$ (Switching time is essentially independent of operating temperature)	$t_{d(on)}$	-	7.5	15	ns
Rise Time		t_r	-	12	25	
Turn-Off Delay Time		$t_{d(off)}$	-	48	60	
Fall Time		t_f	-	28	45	

SOURCE-DRAIN DIODE RATINGS & CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

PARAMETERS/TEST CONDITIONS		Symbol	Min.	Typ.	Max.	Units
Continuous Current	SML2P20 SML2P15	I_S	- -	- -	1.6 1.3	A
Pulsed Current ¹	SML2P20 SML2P15	I_{SM}	- -	- -	6.5 5.5	
Forward Voltage ² $I_F = I_S, V_{GS} = 0$	SML2P20 SML2P15	V_{SD}	- -	- -	5.8 5.5	V
Reverse Recovery Time $I_F = I_S, dI_F/dt = 100 \text{A}/\mu\text{s}$		t_{rr}	-	100	-	ns
Reverse Recovered Charge $I_F = I_S, dI_F/dt = 100 \text{A}/\mu\text{s}$		Q_{rr}	-	0.36	-	μC

¹ Pulse width limited by maximum junction temperature (refer to transient thermal impedance data, figure 11)

² Pulse test: Pulse width $\leq 300 \mu\text{sec}$, Duty Cycle $\leq 2\%$

PERFORMANCE CURVES (25°C Unless otherwise noted)

FIGURE 1: Typical Output Characteristics

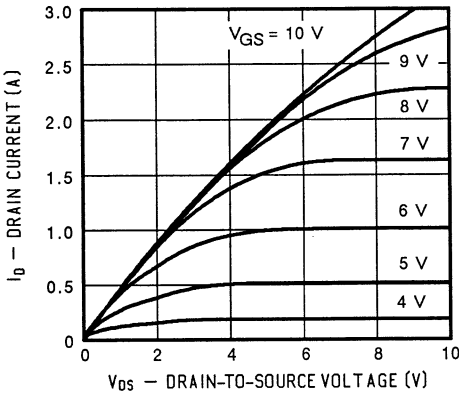


FIGURE 2: Typical Transfer Characteristics

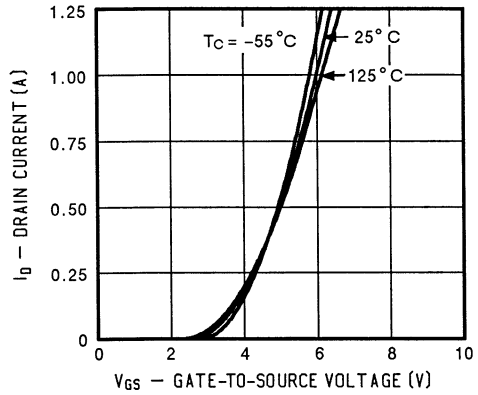


FIGURE 3: Typical Transconductance

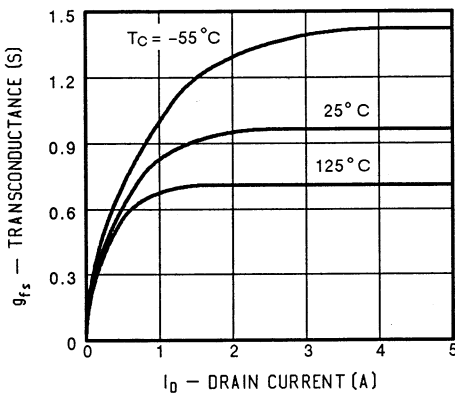


FIGURE 4: Typical On-Resistance

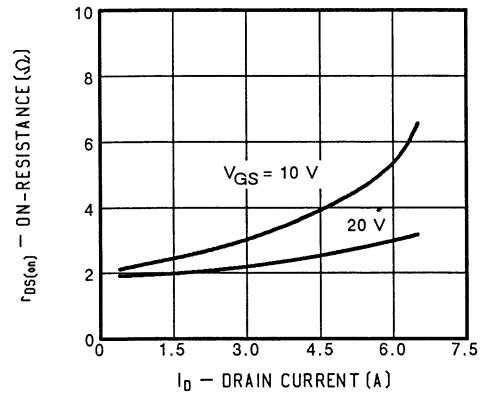


FIGURE 5: Typical Capacitance

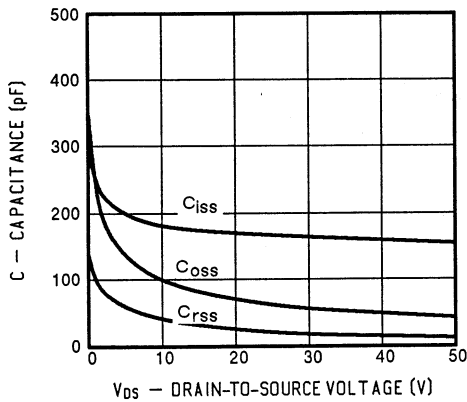
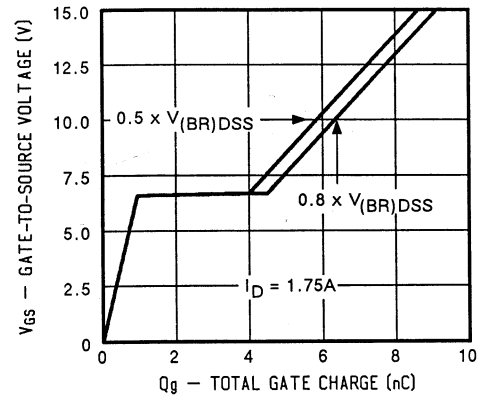


FIGURE 6: Typical Gate Charge



PERFORMANCE CURVES (25°C Unless otherwise noted)

FIGURE 7: On-Resistance vs. Junction Temperature

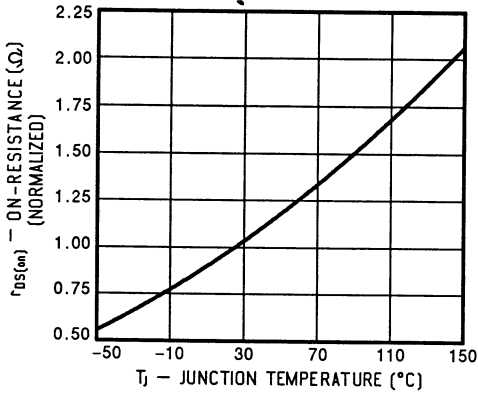


FIGURE 8: Typical Source-Drain Diode Forward Voltage

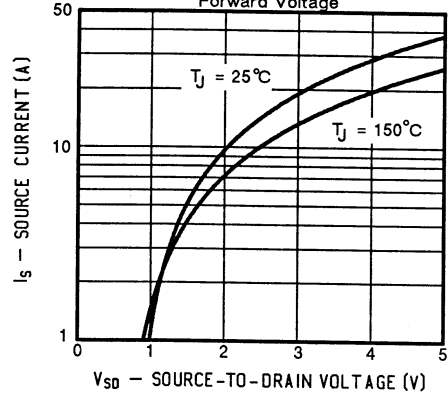


FIGURE 9: Maximum Avalanche and Drain Current vs. Case Temperature

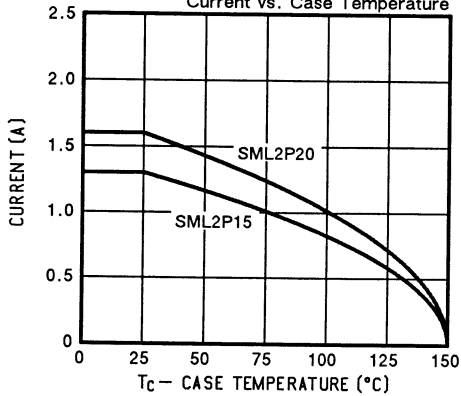


FIGURE 10: Safe Operating Area

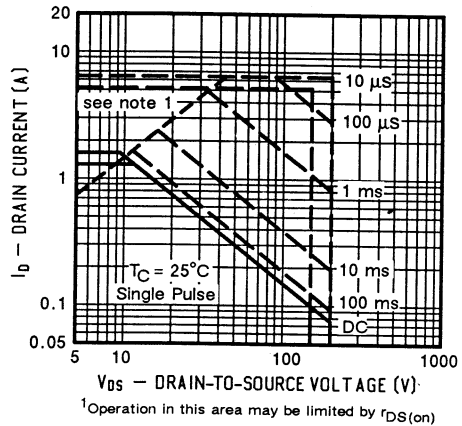
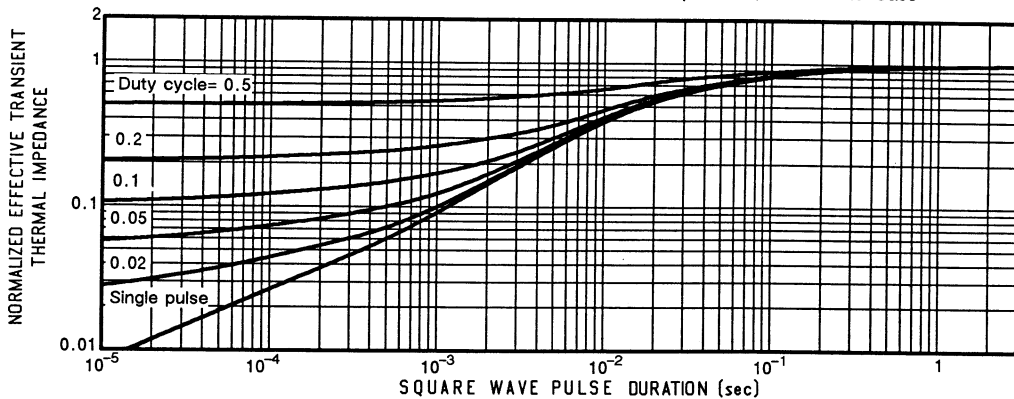


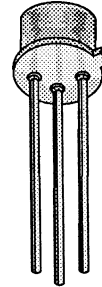
FIGURE 11: Normalized Effective Transient Thermal Impedance, Junction-to-Case



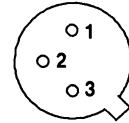
MOSPOWER

PRODUCT SUMMARY

PART NUMBER	V _{(BR)DSS} (VOLTS)	r _{DS(on)} (OHMS)	I _D (AMPS)
SML3P10	100	1.2	2.6
SML3P06	60	1.6	2.3



BOTTOM VIEW



- 1 DRAIN
- 2 GATE
- 3 SOURCE

TO-205AF

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

PARAMETERS/TEST CONDITIONS	Symbol	SML		Units
		3P10	3P06	
Drain-Source Voltage	V _{DS}	100	60	V
Gate-Source Voltage	V _{GS}	± 40	± 40	V
Continuous Drain Current	I _D	T _C = 25°C	2.6	2.3
		T _C = 100°C	1.6	1.5
Pulsed Drain Current ¹	I _{DM}	10	9.0	A
Avalanche Current (see figure 9)	I _A	2.6	2.3	A
Power Dissipation	P _D	T _C = 25°C	15	15
		T _C = 100°C	6	6
Operating Junction & Storage Temperature Range	T _J , T _{stg}	-55 to 150		°C
Lead Temperature (1/16" from case for 10 secs.)	T _L	300		°C

4

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	Symbol	Typ.	Max.	Units
Junction-to-Case	R _{thJC}	-	8.33	K/W
Junction-to-Ambient	R _{thJA}	-	175	

¹Pulse width limited by maximum junction temperature (refer to transient thermal impedance data, figure 11)

²Negative signs for current and voltage values have been omitted for the sake of clarity

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted) **P-Channel Device**
 Negative signs have been omitted for clarity

PARAMETERS/TEST CONDITIONS		Symbol	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage $V_{GS} = 0, I_D = 250 \mu\text{A}$	SML3P10 SML3P06	$V_{(BR)DSS}$	100 60	- -	- -	V
Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$		$V_{GS(th)}$	2.0	-	4.0	
Gate-Body Leakage $V_{DS} = 0, V_{GS} = \pm 20 \text{ V}$		I_{GSS}	-	-	100	nA
Zero Gate Voltage Drain Current $V_{DS} = V_{(BR)DSS}, V_{GS} = 0$		I_{DSS}	-	-	250	μA
Zero Gate Voltage Drain Current $V_{DS} = 0.8 \times V_{(BR)DSS}, V_{GS} = 0, T_J = 125^\circ\text{C}$		I_{DSS}	-	-	1000	
On-State Drain Current ² $V_{DS} = 10 \text{ V}, V_{GS} = 10 \text{ V}$	SML3P10 SML3P06	$I_{D(on)}$	2.6 2.3	- -	- -	A
Drain-Source On-State Resistance ² $V_{GS} = 10 \text{ V}, I_D = 1.5 \text{ A}$	SML3P10 SML3P06	$r_{DS(on)}$	-	1.0 1.2	1.2 1.6	Ω
Drain-Source On-State Resistance ² $V_{GS} = 10 \text{ V}, I_D = 1.5 \text{ A}, T_J = 125^\circ\text{C}$	SML3P10 SML3P06	$r_{DS(on)}$	-	1.6 2.0	2.0 2.6	
Forward Transconductance ² $V_{DS} = 15 \text{ V}, I_D = 1.5 \text{ A}$		g_{fs}	0.5	0.9	-	S(V)
Input Capacitance	$V_{GS} = 0$ $V_{DS} = 25 \text{ V}$ $f = 1 \text{ MHz}$	C_{iss}	-	150	250	pF
Output Capacitance		C_{oss}	-	65	120	
Reverse Transfer Capacitance		C_{rss}	-	25	45	
Total Gate Charge	$V_{DS} = 0.5 \times V_{(BR)DSS},$ $V_{GS} = 10 \text{ V}, I_D = 2.6 \text{ A}$ (Gate charge is essentially independent of operating temperature)	Q_g	-	6.6	11	nC
Gate-Source Charge		Q_{gs}	-	1.5	-	
Gate-Drain Charge		Q_{gd}	-	3.8	-	
Turn-On Delay Time	$V_{DD} = 50 \text{ V}, R_L = 33 \Omega$ $I_D = 1.5 \text{ A}, V_{GEN} = 10 \text{ V}$ $R_G = 25 \Omega$ (Switching time is essentially independent of operating temperature)	$t_{d(on)}$	-	7	30	ns
Rise Time		t_r	-	42	60	
Turn-Off Delay Time		$t_{d(off)}$	-	40	60	
Fall Time		t_f	-	55	75	

SOURCE-DRAIN DIODE RATINGS & CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

PARAMETERS/TEST CONDITIONS		Symbol	Min.	Typ.	Max.	Units
Continuous Current	SML3P10 SML3P06	I_S	- -	- -	2.6 2.3	A
Pulsed Current ¹	SML3P10 SML3P06	I_{SM}	- -	- -	10 9.0	
Forward Voltage ² $I_F = I_S, V_{GS} = 0$	SML3P10 SML3P06	V_{SD}	- -	- -	5.5 5.3	V
Reverse Recovery Time $I_F = I_S, dI_F/dt = 100 \text{ A}/\mu\text{s}$		t_{rr}	-	70	-	ns
Reverse Recovered Charge $I_F = I_S, dI_F/dt = 100 \text{ A}/\mu\text{s}$		Q_{rr}	-	0.20	-	μC

¹ Pulse width limited by maximum junction temperature (refer to transient thermal impedance data, figure 11)

² Pulse test: Pulse width $\leq 300 \mu\text{sec}$, Duty Cycle $\leq 2\%$

PERFORMANCE CURVES (25°C Unless otherwise noted)

FIGURE 1: Typical Output Characteristics

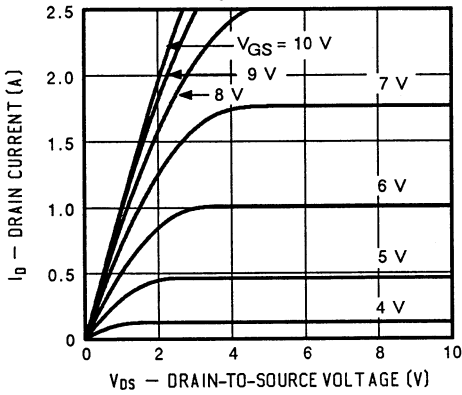


FIGURE 2: Typical Transfer Characteristics

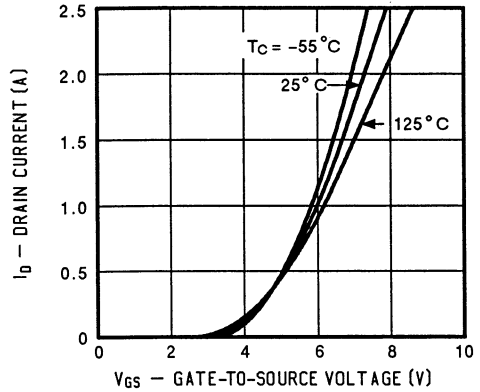


FIGURE 3: Typical Transconductance

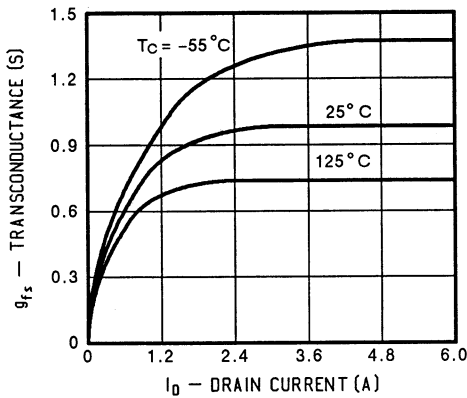


FIGURE 4: Typical On-Resistance

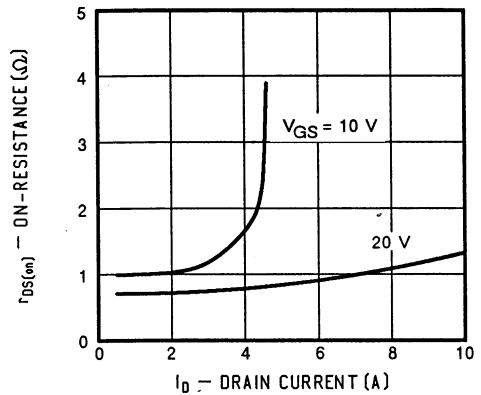


FIGURE 5: Typical Capacitance

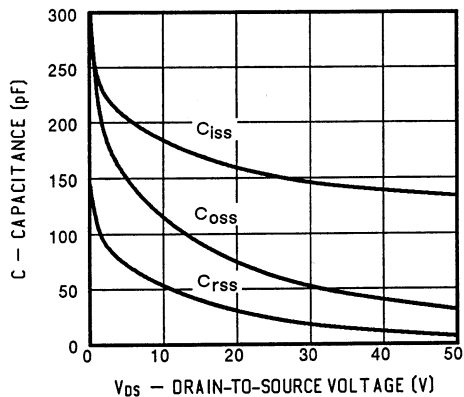
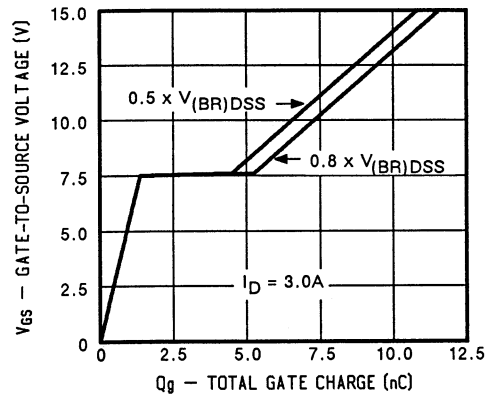


FIGURE 6: Typical Gate Charge



PERFORMANCE CURVES (25°C Unless otherwise noted)

FIGURE 7: On-Resistance vs. Junction Temperature

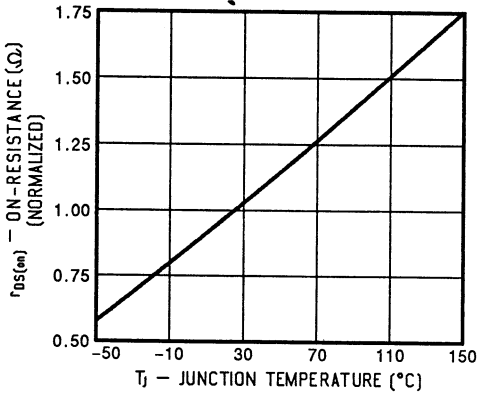


FIGURE 8: Typical Source-Drain Diode Forward Voltage

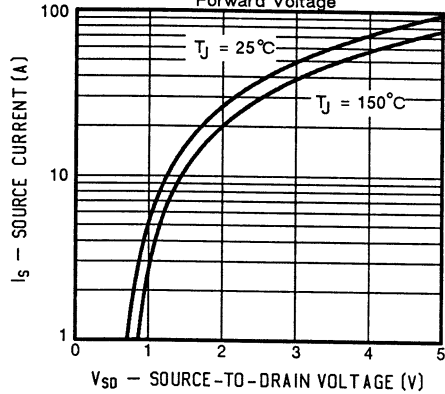


FIGURE 9: Maximum Avalanche and Drain Current vs. Case Temperature

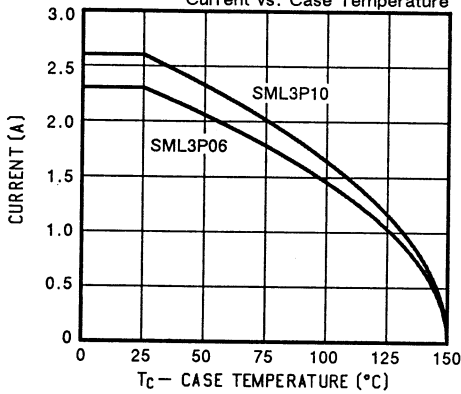


FIGURE 10: Safe Operating Area

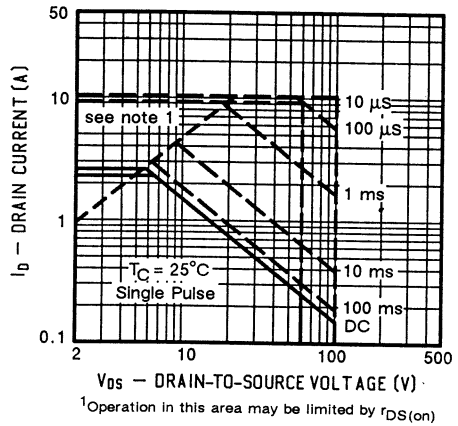


FIGURE 11: Normalized Effective Transient Thermal Impedance, Junction-to-Case

