SemTron Microtech Corporation

SMC3322S

Single N-Channel MOSFET

■DESCRIPTION

SMC3322 is the N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology devices are well suited for high efficiency fast switching applications, low in-line power loss are needed in small outline surface mount package.

■PART NUMBER INFORMATION

SMC	3322	S	-	TR	G
a	b	c		d	e

a : Company name.
b : Product Serial number.
c : Package code S: SOT-23L
d : Handling code TR: Tape&Reel
e : Green produce code G: *RoHS Compliant*

■FEATURES

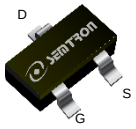
V_{DS} = 30V, I_D = 6.2A

$R_{DS(ON)}$ =20mΩ(Typ.)@V_{GS} = 10V
$R_{DS(ON)}$ =23mΩ(Typ.)@V_{GS} = 4.5V
$R_{DS(ON)}$ =27mΩ(Typ.)@V_{GS} = 2.5V

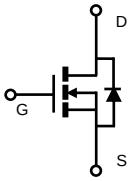
◆Fast switch
◆Low gate drive applications
◆High power and current handlingcapability

■APPLICATIONS

◆Hend-Held Instruments
◆Load Switch
◆PWM Applications



SOT-23L



■ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise noted)

Symbol	Parameter		Rating	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current	T_A=25°C	6.2	A
		T_A=70°C	5	A
I_{DM}	Pulsed Drain Current [A]		24.8	A
P_D	Power Dissipation [B]	T_A=25°C	1.5	W
		T_A=70°C	0.9	W
T_J	Operation Junction Temperature		-55/150	°C
T_{STG}	Storage Temperature Range		-55/150	°C

■THERMAL RESISTANCE

Symbol	Parameter		Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient [C]	t≦10s		85	°C/W
	Thermal Resistance Junction to Ambient [C]	Steady-State		120	

■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} =0V,I_D =250μA	30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D =250μA	0.4	0.7	1	V
I_{GSS}	Gate Leakage Current	V_{DS} =0V,V_{GS}=±12V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =30V,V_{GS} =0V T_J =25°C			1	μA
		V_{DS} =24V,V_{GS} =0V T_J =75°C			10	
$R_{DS(ON)}$	Drain-source On-Resistance [D]	V_{GS} =10V,I_D=6.2A V_{GS} =4.5V,I_D=5A V_{GS} =2.5V,I_D=3.6A		20 23 27	24 26 32	mΩ
G_{fs}	Forward Transconductance	V_{DS} =10V,I_D=3A		7		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage[B]	I_S=1A,V_{GS}=0V		0.7	1.0	V
I_S	Continuous Source Current				2.1	A
Dynamic and Switching Parameters						
Q_g(10V)	Total Gate Charge	V_{DS} =15V,V_{GS} =10V I_D =5A		17	23	nC
Q_g(4.5V)	Total Gate Charge			8.7	11.7	
Q_{gs}	Gate-Source Charge			1.2	1.6	
Q_{gd}	Gate-Drain Charge			2	2.7	
C_{iss}	Input Capacitance	V_{DS} =15V,V_{GS} =0V f =1MHz		670	938	pF
C_{oss}	Output Capacitance			54	76	
C_{rss}	Reverse Transfer Capacitance			45	63	
$t_{d(on)}$	Turn-On Time [E]	V_{DD}=15V, V_{GEN}=10V, R_G=3Ω, I_D=1A		4.2		nS
t_r				14		
$t_{d(off)}$	Turn-Off Time [E]			22		
t_f				6.6		

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. The value of $R_{\theta JA}$ is measured with the device in a still air environment with maximum junction temperature $T_{J(MAX)}$= 150°C (initial temperature T_A=25°C).

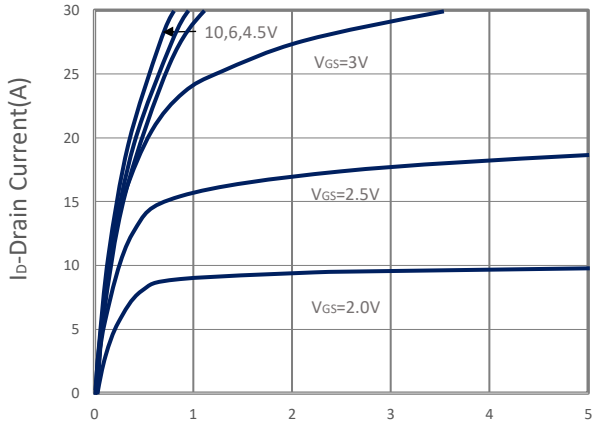
B. The $T_{J(MAX)}$=150°C, using junction-to-ambient thermal resistance.

C. Surface−mounted on FR-4 board using 1 sq−in pad, 2 oz Cu, in a still air environment with T_A=25°C.

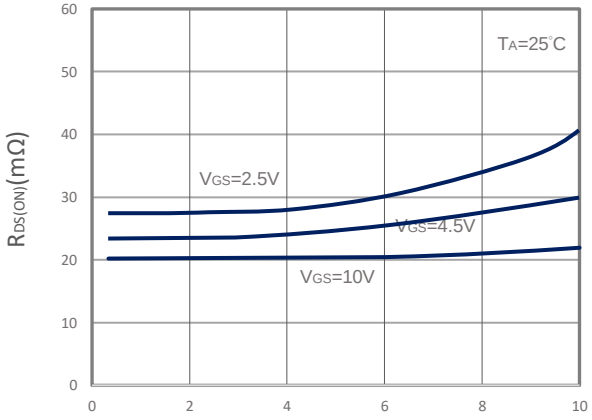
D. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

E. Pulsed width limited by maximum junction temperature.

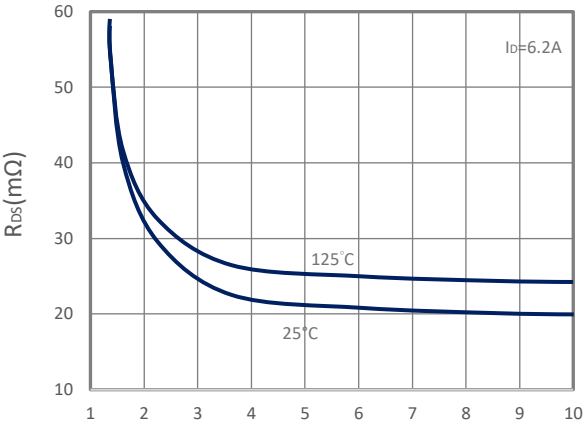
TYPICAL CHARACTERISTICS



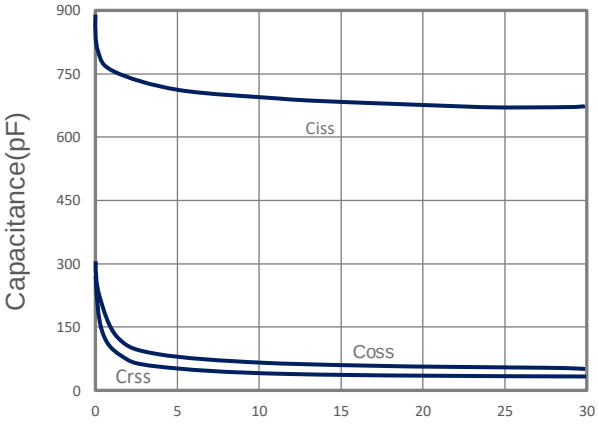
Output Characteristics



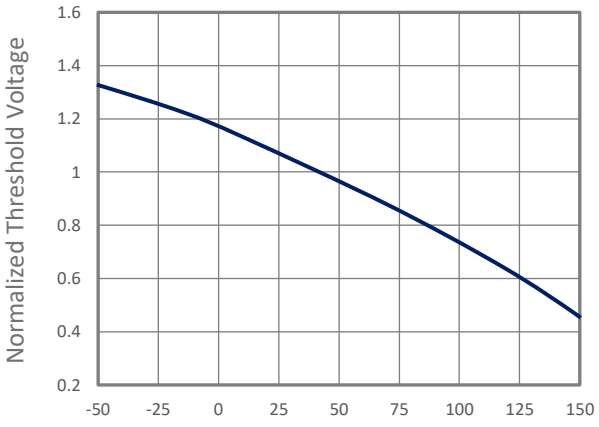
Drain-Source On Resistance



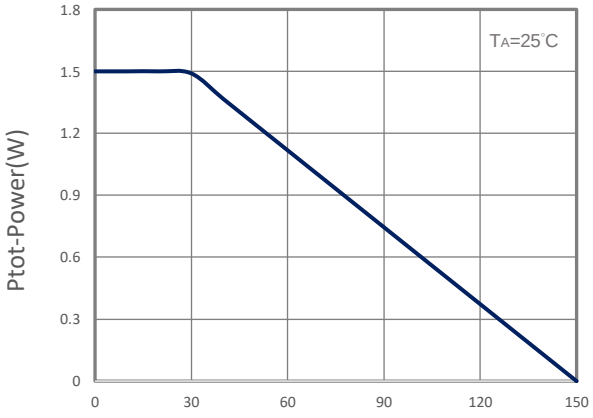
Gate-Source vs On Resistance



Capacitance

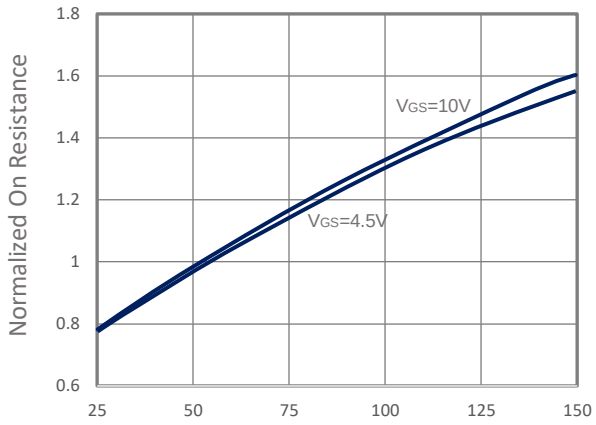


Gate Threshold Voltage

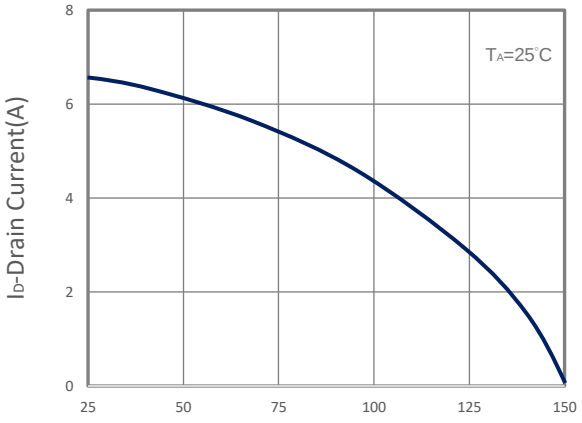


Power Dissipation

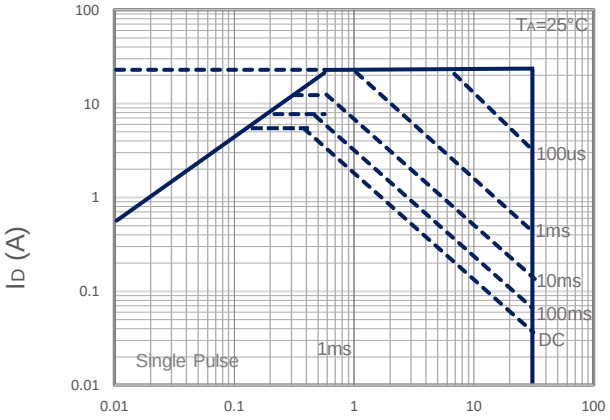
TYPICAL CHARACTERISTICS



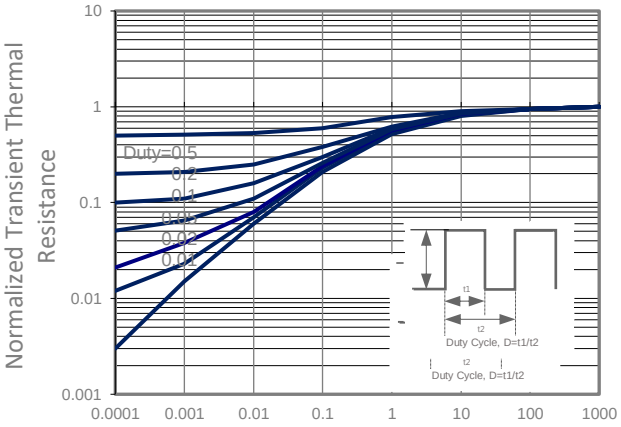
RDS(ON) vs Junction Temperature



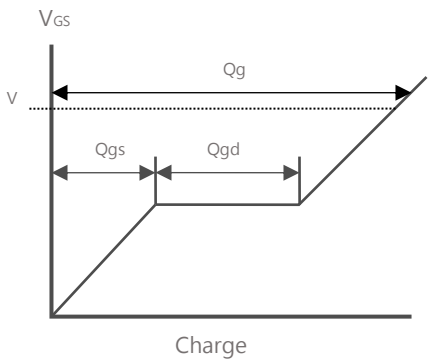
Drain Current vs TJ



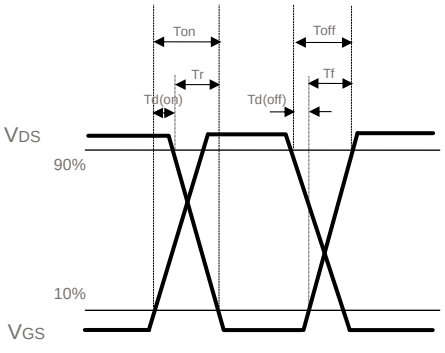
Maximum Safe Operation Area



Thermal Transient Impedance

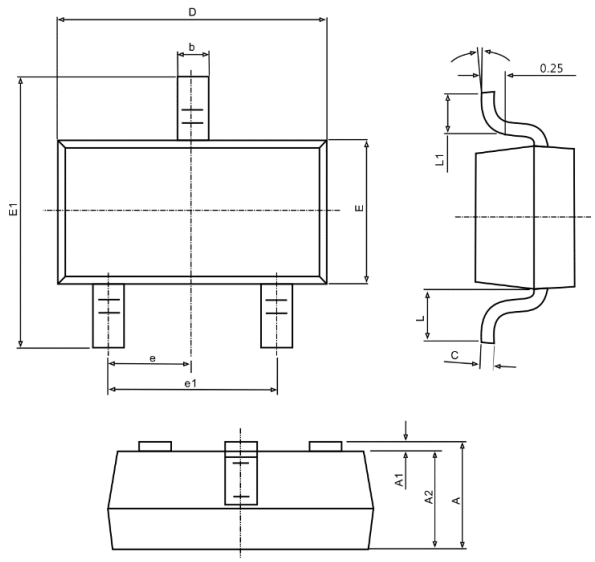


Gate Chrge Waveform

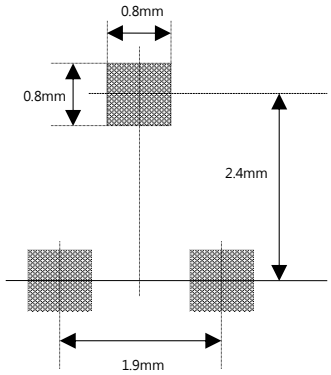


Switching Time Waveform

■SOT-23L PACKAGE DIMENSIONS



Recommended Minimum Pad(mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.000	1.300	0.039	0.049
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.039	0.047
b	0.300	0.500	0.012	0.020
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E	1.500	1.700	0.059	0.067
E1	2.600	3.000	0.102	0.118
e	0.950 TYP.		0.037 TYP.	
e1	1.900 TYP.		0.075 TYP.	
L1	0.250	0.550	0.010	0.022
θ	0°	8°	0°	8°