SemTron Microtech Corporation

SMC3404S

Single N-Channel MOSFET

■DESCRIPTION

SMC3404 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	3404	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

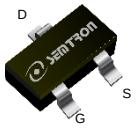
V_{DS} = 30V, I_D = 6.7A

$R_{DS(ON)}$=18mΩ(Typ.)@V_{GS}=10V
$R_{DS(ON)}$=23mΩ(Typ.)@V_{GS}=4.5V

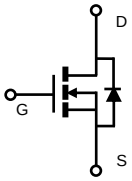
◆Fast switch
◆Low gate drive applications
◆High power and current handlingcapability

■APPLICATIONS

◆Power Management in Note book
◆Portable Equipment
◆DC/DC Converter



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		±20	V
I_D	Continuous Drain Current	T_A=25°C	6.7	A
		T_A=70°C	5.3	A
I_{DM}	Pulsed Drain Current [A]		26.8	A
P_D	Power Dissipation [B]	T_A=25°C	1.6	W
		T_A=70°C	1.0	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 [B]	t≦10s		80	°C/W
	Thermal Resistance Junction to Ambient [BC]	Steady-State		120	

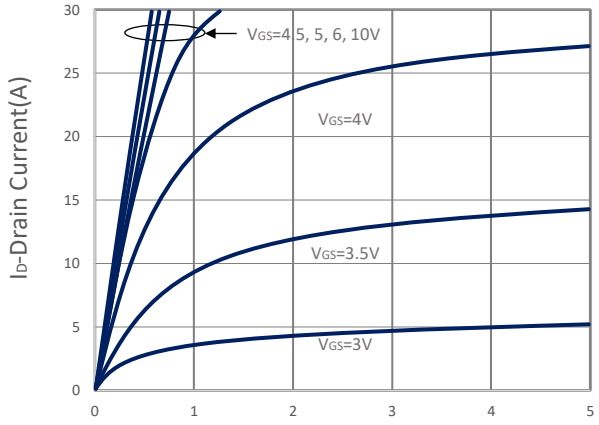
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

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	1	1.5	2	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±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	V_{GS}=10V, I_D=6.7A V_{GS}=4.5V, I_D=4.8A V_{GS}=3.5V, I_D=2A		18 23 27	22 30 34	mΩ
G_{fs}	Forward Transconductance	V_{DS}=15V, I_D=6A		6		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_S=1A, V_{GS}=0V		0.7	1.0	V
I_S	Continuous Source Current				6.7	A
t_{rr}	Reverse Recovery Time	I_S=6A, dI/dt=100A/μs T_J=25°C		20		ns
Q_{rr}	Reverse Recovery Charge			1.2		nC
Dynamic and Switching Parameters						
Q_g	Total Gate Charge	V_{DS}=15V,V_{GS}=10V, I_D=6A		12.7	17.8	nC
Q_g	Total Gate Charge(4.5V)			6.2	8.7	
Q_{gs}	Gate-Source Charge			2.4	3.4	
Q_{gd}	Gate-Drain Charge			2	2.8	
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz		550		pF
C_{oss}	Output Capacitance			78		
C_{rss}	Reverse Transfer Capacitance			62		
R_g	Gate Resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz		2.4		Ω
$t_{d(on)}$	Turn-On Time	V_{DD}=15V, V_{GEN}=10V, R_G=6Ω, I_D=1A		2.5	5	nS
t_r				7.6	14	
$t_{d(off)}$	Turn-Off Time			19.8	38	
t_f				4.2	8	

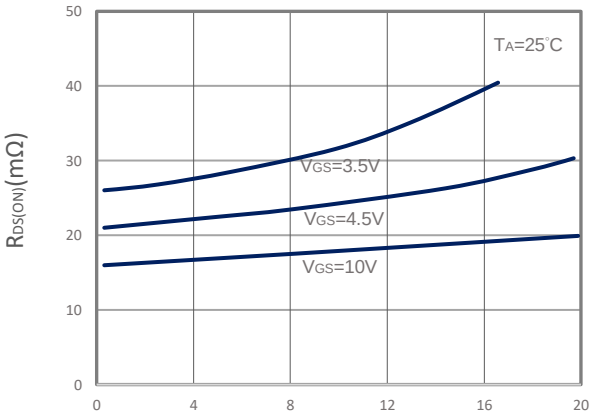
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.
B. Measure the value in a still air environment at T_A=25°C, using an installation mounted on a 1 in2 FR-4 board, maximum junction temperature $T_{J(MAX)}$=150°C.
C. $T_{J(MAX)}$=150°C,using junction-to-case thermal resistance ($R_{θJC}$) is more useful in additional heat sinking is used.

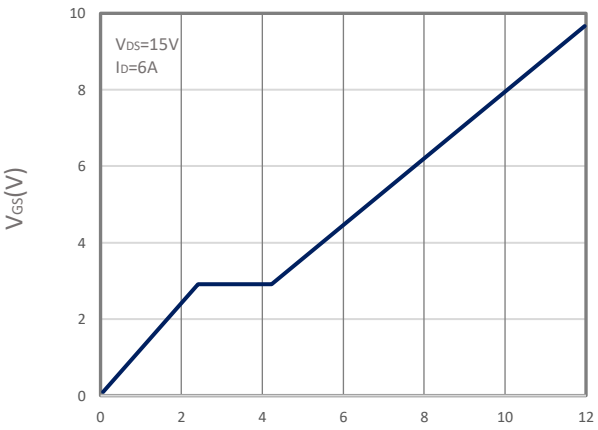
TYPICAL CHARACTERISTICS



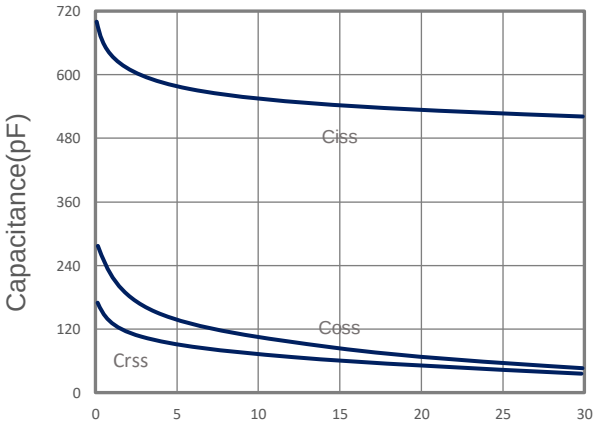
Output Characteristics



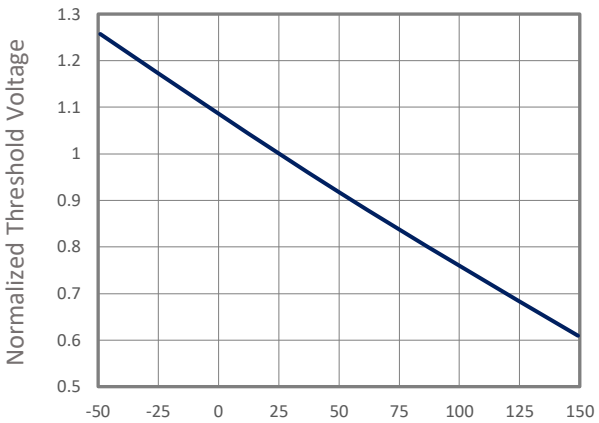
Drain-Source On Resistance



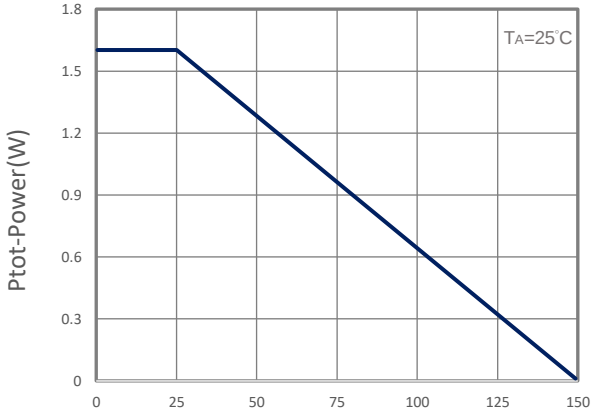
Gate Charge



Capacitance

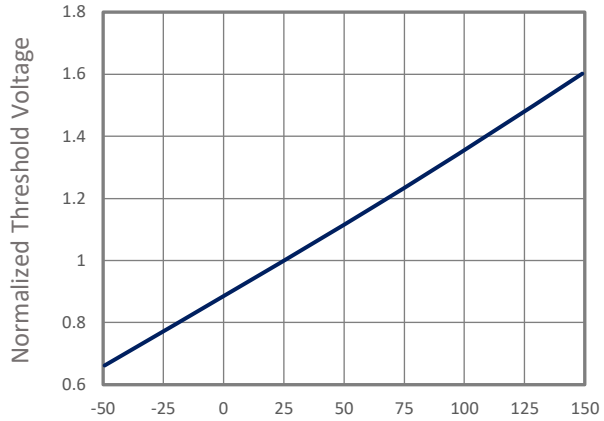


Gate Threshold Voltage

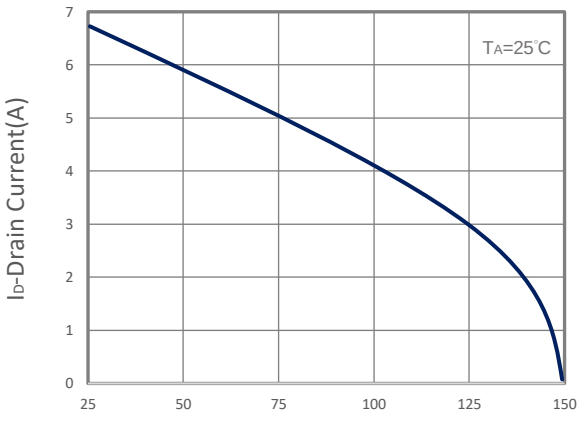


Power Dissipation

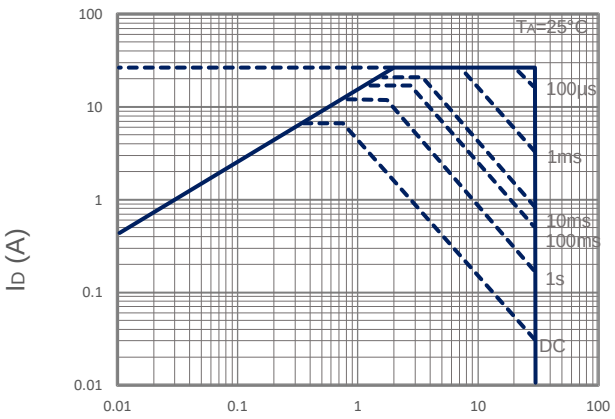
TYPICAL CHARACTERISTICS



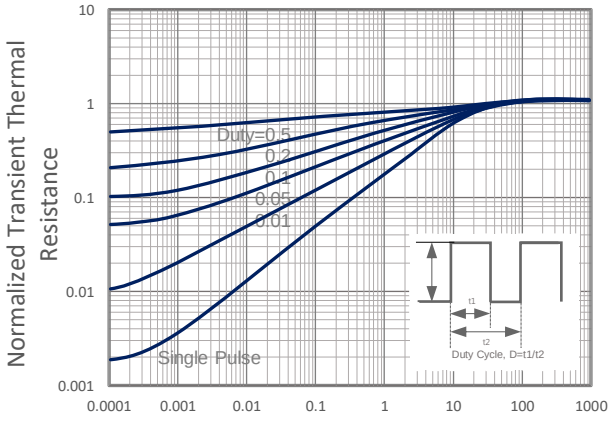
Gate Threshold Voltage



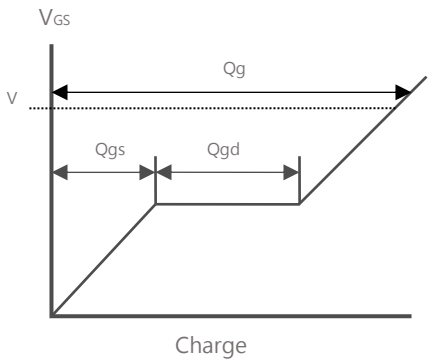
Drain Current vs TJ



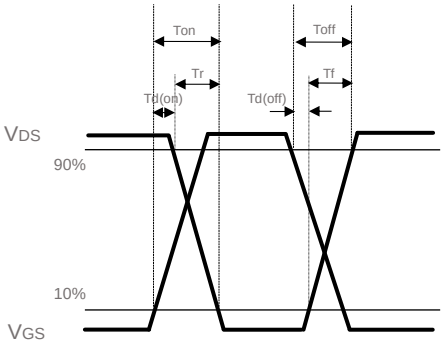
Maximum Safe Operation Area



Maximum Safe Operation Area

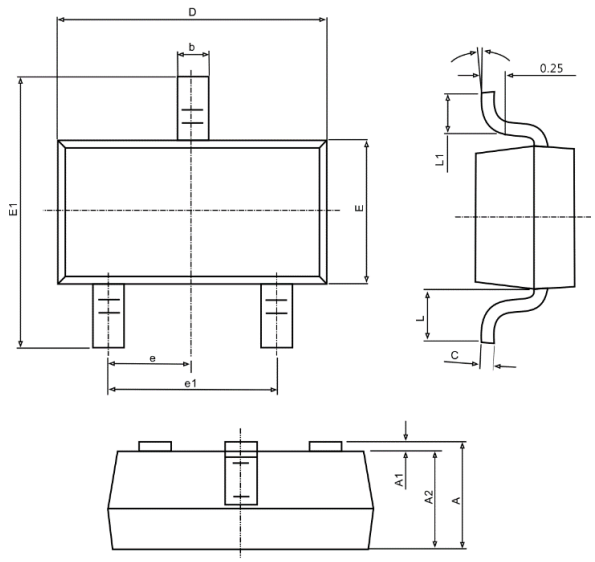


Gate Chrge Waveform

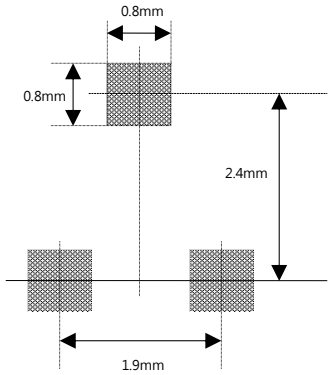


Switching Time Waveform

■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°