SemTron Microtech Corporation

SMC3401GSN

Single P-Channel MOSFET

■DESCRIPTION

SMC3401G is the P-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 needed in small outline surface mount package.

■FEATURES

V_{DS} = -30V, I_D = -3.8A

$R_{DS(ON)}$=54mΩ(Typ.)@V_{GS}=-10V
$R_{DS(ON)}$=64mΩ(Typ.)@V_{GS}=-4.5V
$R_{DS(ON)}$=83mΩ(Typ.)@V_{GS}=-2.5V

◆Fast switch
◆2.5V Low gate drive applications

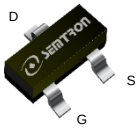
■PART NUMBER INFORMATION

SMC	3401G	SN	-	TR	G
a	b	c		d	e

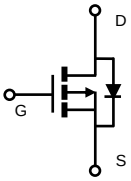
a : Company name.
b : Product Serial number.
c : Package code SN: SOT-23
d : Handling code TR: Tape&Reel
e : Green produce code G: *RoHS Compliant*

■APPLICATIONS

◆Portable Equipment
◆Power Management



SOT-23



■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	-3.8	A
		T_A=70°C	-3.0	A
I_{DM}	Pulsed Drain Current [A]		-15.2	A
P_D	Power Dissipation [B]	T_A=25°C	1.3	W
		T_A=70°C	0.8	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		95	°C/W
	Thermal Resistance Junction to Ambient [BC]	Steady-State		130	

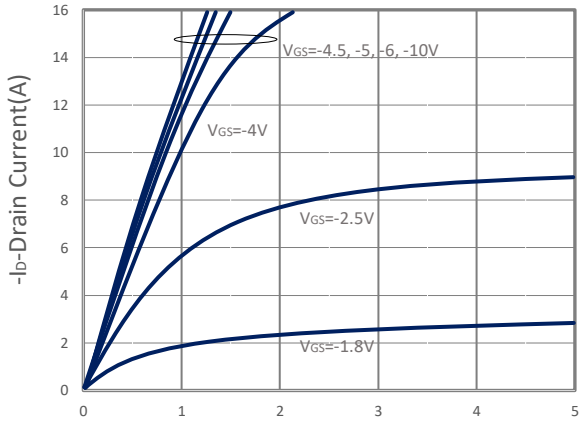
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

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	-0.5	-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	V_{GS}=-10V, I_D=-3.8A V_{GS}=-4.5V, I_D=-3.2A V_{GS}=-2.5V, I_D=-2.2A		54 64 83	60 75 95	mΩ
G_{fs}	Forward Transconductance	V_{DS} =-10V, I_D=-3.8A		15		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V		-0.7	-1	V
I_S	Continuous Source Current				-1.9	A
Dynamic and Switching Parameters						
Q_g(10V)	Total Gate Charge	V_{DS}=-15V, V_{GS}=-10V I_D=-3.8A		14.5	20	nC
Q_g(4.5V)	Total Gate Charge			7	9.8	
Q_{gs}	Gate-Source Charge			1.55	2.2	
Q_{gd}	Gate-Drain Charge			2	2.8	
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz		630		pF
C_{oss}	Output Capacitance			71		
C_{rss}	Reverse Transfer Capacitance			42		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V, V_{GEN}=-10V, R_G=6Ω, I_D=-1A		4.8	9	nS
t_r				8.2	16	
$t_{d(off)}$	Turn-Off Time			36	68	
t_f				9.6	18	

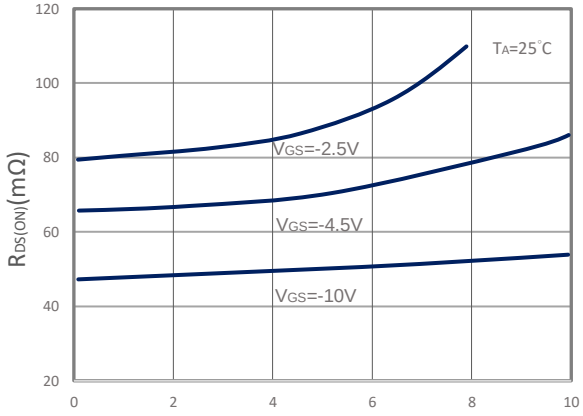
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

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.

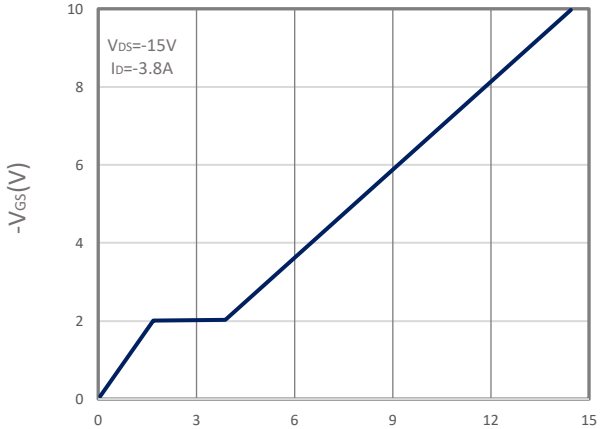
TYPICAL CHARACTERISTICS



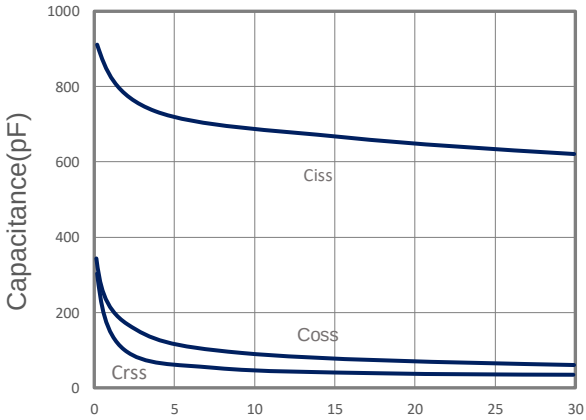
Output Characteristics



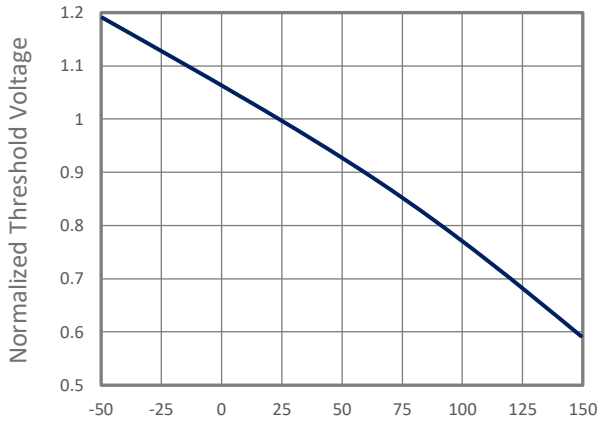
Drain-Source On Resistance



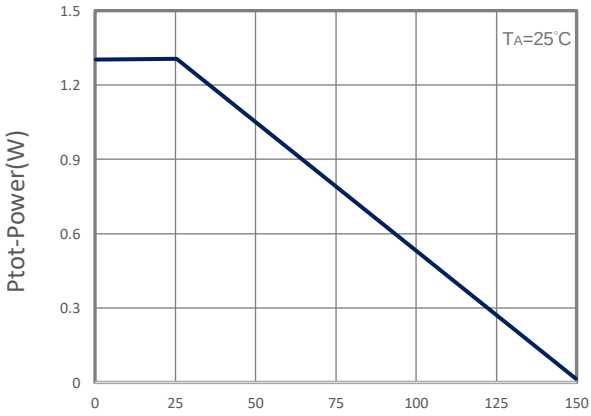
Gate Charge



Capacitance

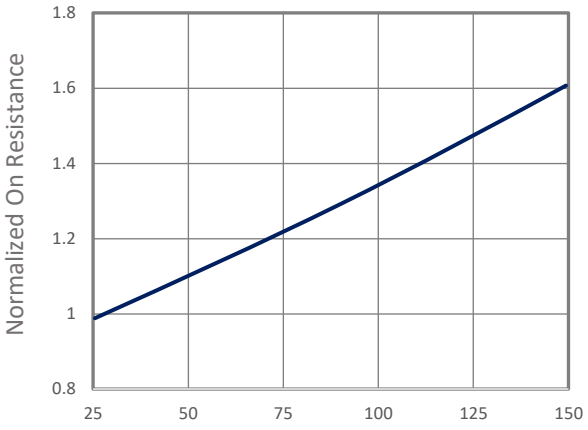


Gate Threshold Voltage

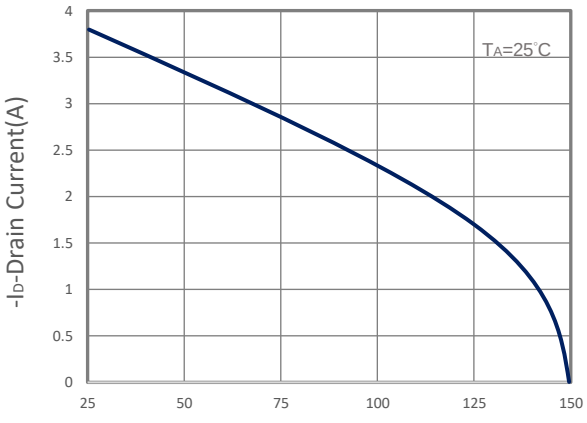


Power Dissipation

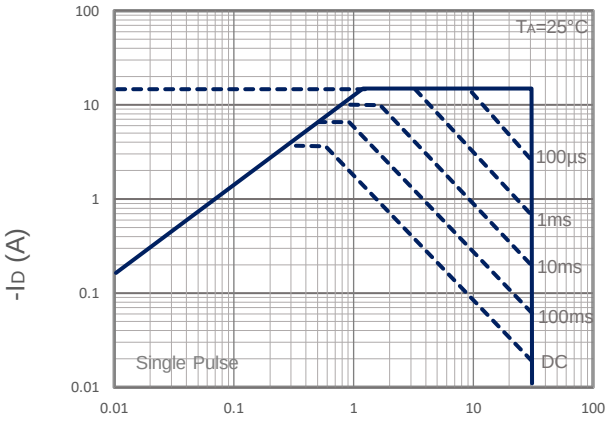
TYPICAL CHARACTERISTICS



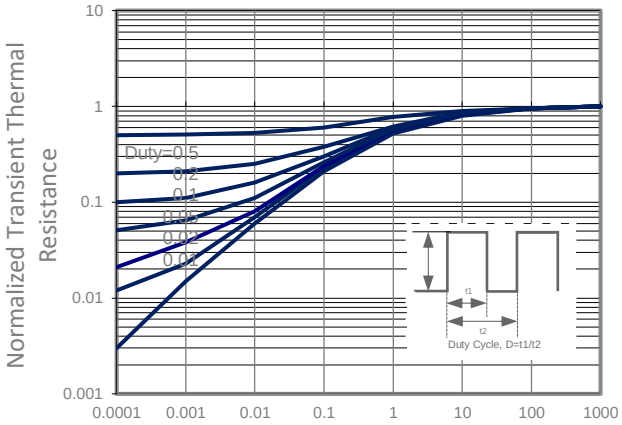
RDS(ON) vs Junction Temperature



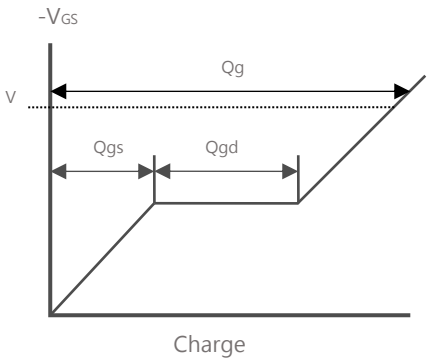
Drain Current vs TJ



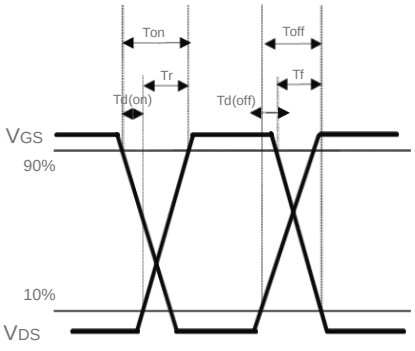
Maximum Safe Operation Area



Thermal Transient Impedance

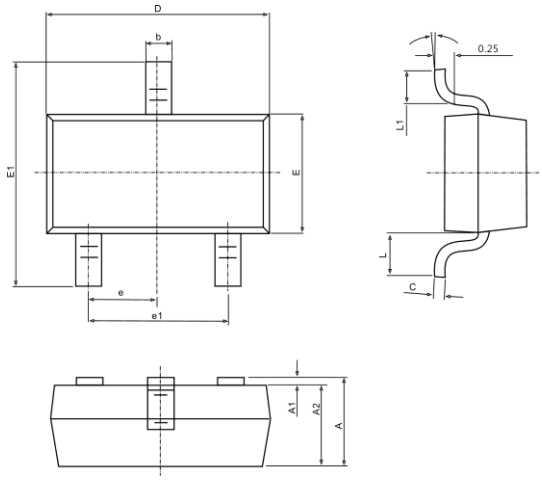


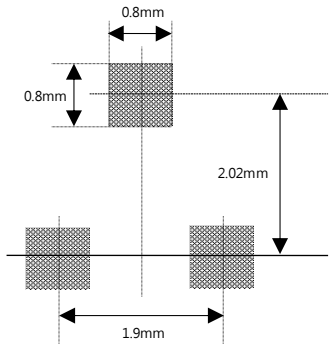
Gate Chrge Waveform



Switching Time Waveform

■SOT-23 PACKAGE DIMENSIONS





Recommended Land Pattern

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°