SemTron Microtech Corporation

SMC3206H

Single N-Channel MOSFET

■DESCRIPTION

SMC3206H is the N-Channel enhancement mode power field effect transistors, provide superior fast switching performance and withstand high energy pulse in the avalanche and commutation mode.

■PART NUMBER INFORMATION

SMC 3206 H - TR G
a b c d e

a : Company name.
b : Product Serial number.
c : Package code H:TO-252
d : Handling code TR:Tape&Reel
e : Green produce code G:*RoHS Compliant*

■FEATURES

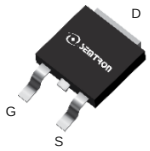
V_{DS}=30V, I_D=100A

$R_{DS(ON)}$=2.7mΩ(Typ.)@V_{GS}=10V
$R_{DS(ON)}$=3.4mΩ(Typ.)@V_{GS}=4.5V

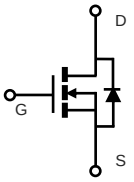
◆High power and current handling capability
◆100% EAS Guaranteed

■APPLICATIONS

◆DC/DC Converter
◆Power Management



TO-252



■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_C=25°C	100	A
		T_C=100°C	72.5	A
I_{DM}	Pulsed Drain Current B		280	A
I_D	Continuous Drain Current	T_A=25°C	22	A
		T_A=70°C	17.5	A
P_D	Power Dissipation A	T_A=25°C	2.5	W
		T_A=70°C	1.6	W
I_{AS}	Single Pulse Avalanche Current B		45	A
E_{AS}	Single Pulse Avalanche energy L=0.1mH BE		101	mJ
P_D	Power Dissipation C	T_C=25°C	69	W
		T_C=100°C	28	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 A	t≦10s		20	°C/W
	Thermal Resistance Junction to Ambient AC	Steady-State		50	
$R_{\theta JC}$	Thermal Resistance Junction to Case			1.8	

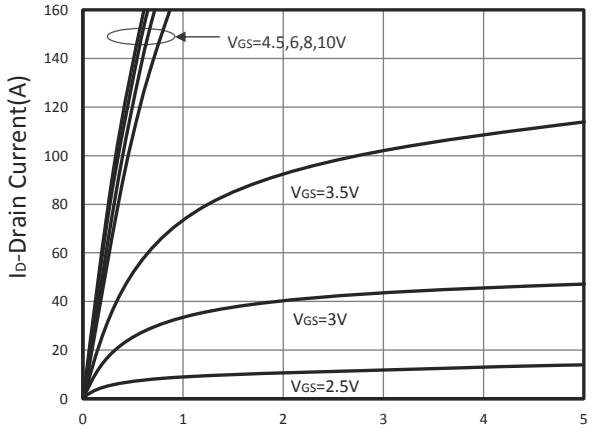
■ELECTRICAL CHARACTERISTICS(T_A=25°C Unless otherwise noted)

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	1.2	1.6	2.5	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 [D]	V_{GS}=10V, I_D=20A V_{GS}=4.5V, I_D=15A		2.7 3.4	3.2 4.2	mΩ
G_{fs}	Forward Transconductance	V_{DS}=5V, I_D=20A		72		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	I_S=1A, V_{GS}=0V			1	V
I_S	Diode Continuous Forward Current				80	A
t_{rr}	Reverse Recovery Time	I_S=20A, dI/dt=100A/μs		34		ns
Q_{rr}	Reverse Recovery Charge			25		nC
Dynamic and Switching Parameters [F]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_D=20A		37.5	52.5	nC
Q_g	Total Gate Charge (4.5V)			17.5	24.5	
Q_{gs}	Gate-Source Charge			5.4	7.6	
Q_{gd}	Gate-Drain Charge			6.7	9.4	
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz		2250		pF
C_{oss}	Output Capacitance			315		
C_{rss}	Reverse Transfer Capacitance			168		
R_g	Gate Resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		2		Ω
$t_{d(on)}$	Turn-On Time	V_{DD}=15V, V_{GS}=10V, R_G=3Ω I_D=1A		8		nS
t_r				5		
$t_{d(off)}$	Turn-Off Time			23		
t_f				9		

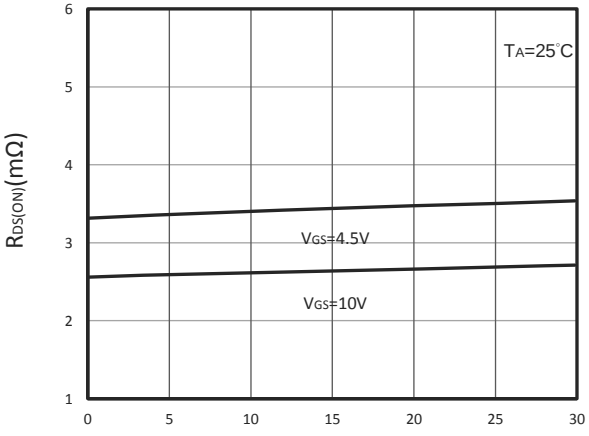
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Surface mounted on FR4 board using 1 in^2 pad size.
B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C (initial temperature T_J=25°C).
C. Using ≤ 10s junction-to-ambient thermal resistance is base on $T_{J(MAX)}$=150°C.
D. Pulse test width ≤300μs and duty cycle ≤ 2%.
E. The EAS data shows maximum, The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=45A
F. Guaranteed by design, not subject to production testing.
* . The maximum rating current limited by package.

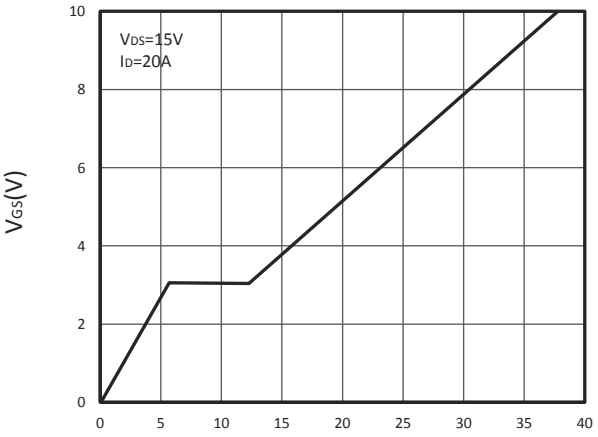
TYPICAL CHARACTERISTICS



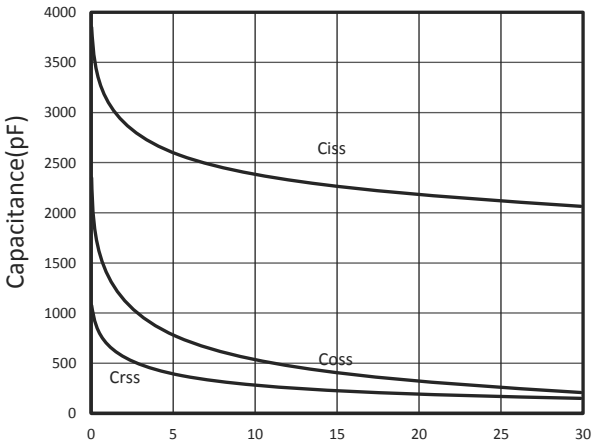
Output Characteristics



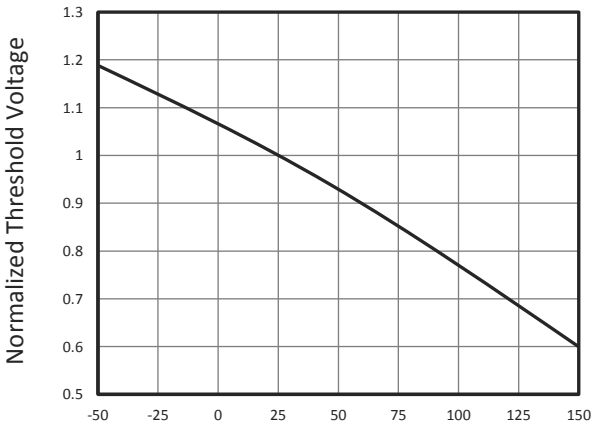
Drain-Source On Resistance



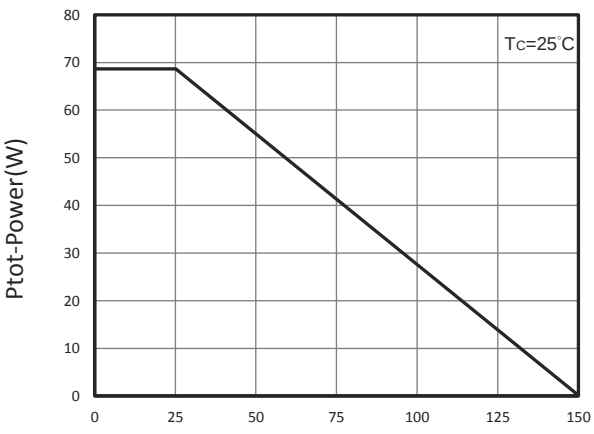
Gate Charge



Capacitance

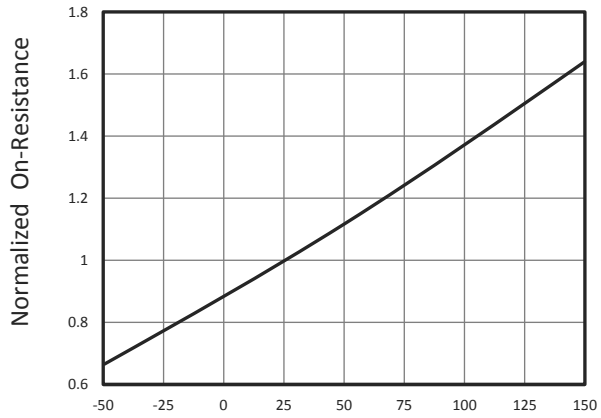


Gate Threshold Voltage



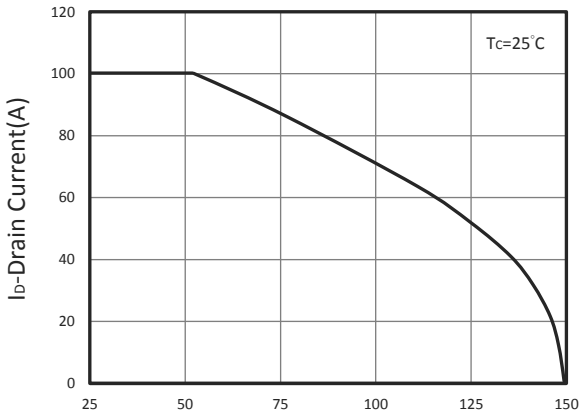
Power Dissipation

TYPICAL CHARACTERISTICS



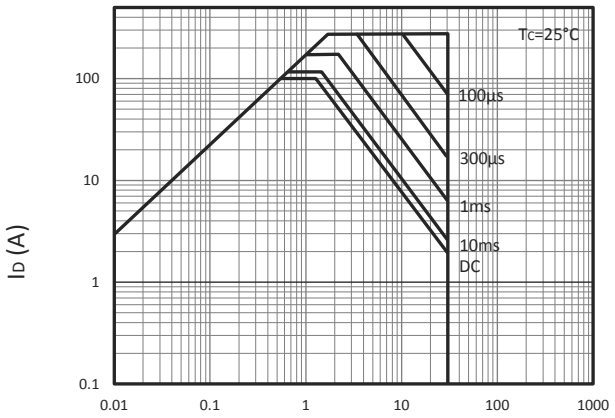
T_J-Junction Temperature(°C)

Drain-Source On Resistance



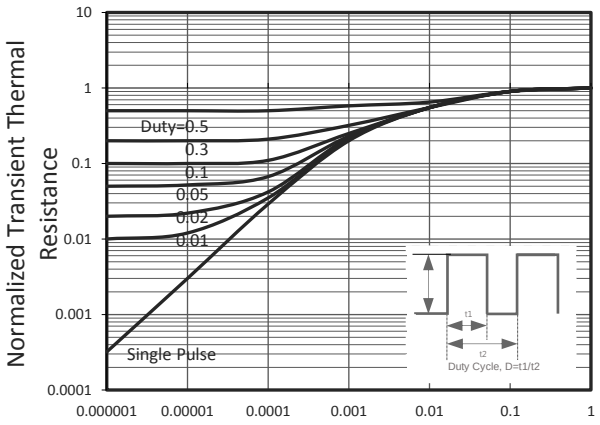
T_C-Case Temperature(°C)

Drain Current vs T_C



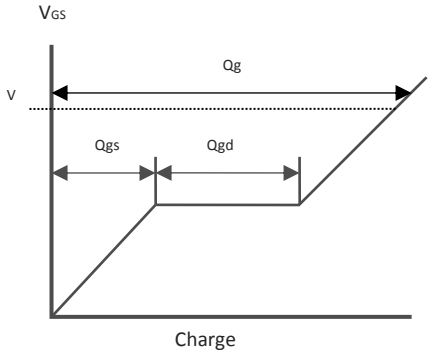
V_{DS} Voltage (V)

Maximum Safe Operation Area

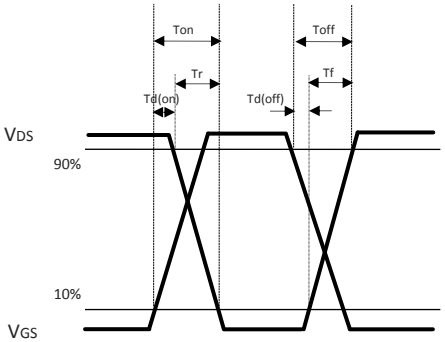


Square Wave Pulse Duration(Sec)

Thermal Transient Impedance

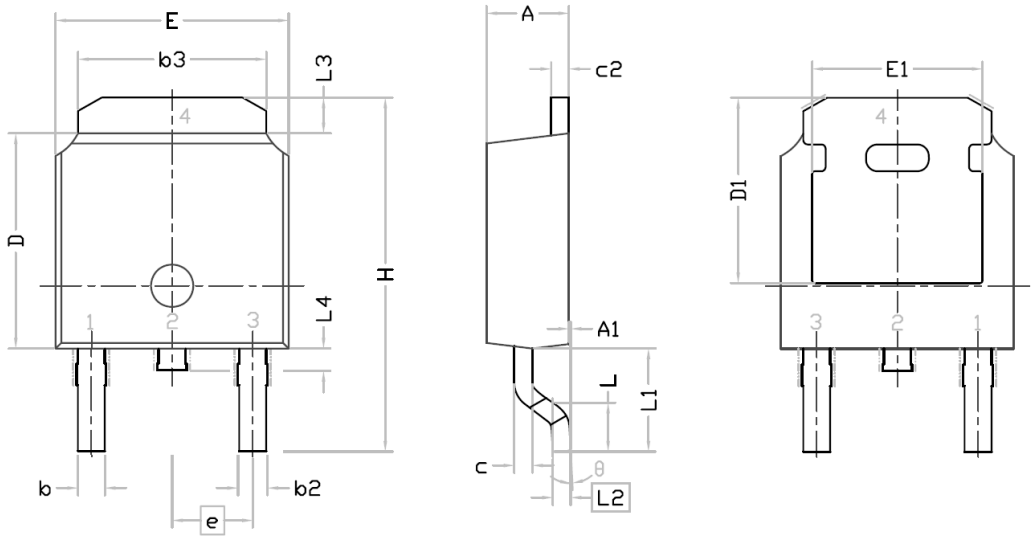


Gate Chrge Waveform



Switching Time Waveform

■TO-252 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.640	0.880	0.025	0.035
b2	0.770	1.140	0.030	0.045
b3	5.210	5.460	0.205	0.215
c	0.460	0.600	0.018	0.024
c2	0.460	0.580	0.018	0.023
D	6.000	6.223	0.236	0.245
D1	5.210	-	0.205	-
E	6.400	6.731	0.252	0.265
E1	4.400	-	0.173	-
e	2.286 BSC.		0.090 BSC.	
H	9.400	10.40	0.370	0.409
L	1.400	1.770	0.055	0.070
L1	2.743 REF.		0.108 REF.	
L2	0.508 BSC.		0.020 BSC.	
L3	0.890	1.270	0.035	0.050
L4	0.640	1.010	0.025	0.040
θ	0°	10°	0°	10°

Recommended Land Pattern