

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

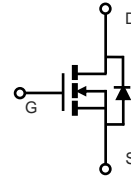
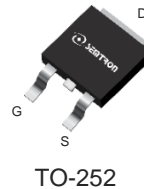
$V_{DS}=30V, I_D=100A$

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

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

APPLICATIONS

- ◆DC/DC Converter
- ◆Power Management



ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$ 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 [*]	$T_C=25^\circ C$	100
		$T_C=100^\circ C$	72.5
I_{DM}	Pulsed Drain Current ^B	280	A
I_D	Continuous Drain Current	$T_A=25^\circ C$	22
		$T_A=70^\circ C$	17.5
P_D	Power Dissipation ^A	$T_A=25^\circ C$	2.5
		$T_A=70^\circ C$	1.6
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	$T_C=25^\circ C$	69
		$T_C=100^\circ C$	28
T_J	Operation Junction Temperature	-55/150	$^\circ C$
T_{STG}	Storage Temperature Range	-55/150	$^\circ C$

THERMAL RESISTANCE

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ^A		20	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{AC}	$t \leq 10s$	50	
$R_{\theta JC}$	Thermal Resistance Junction to Case	Steady-State	1.8	

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

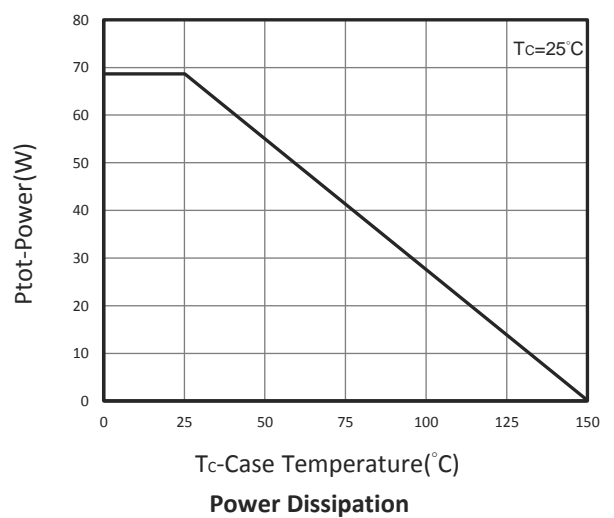
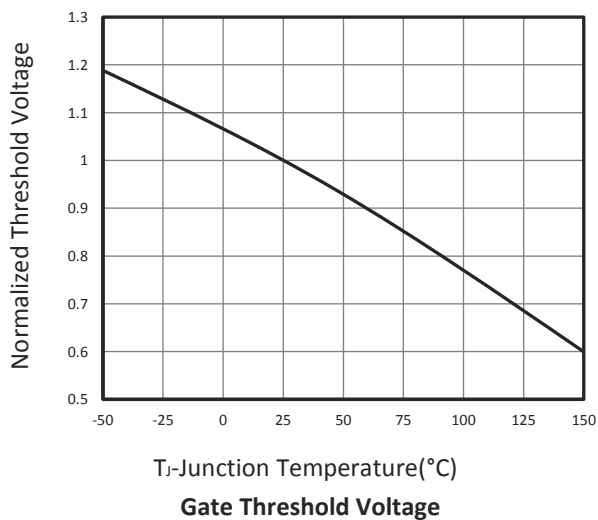
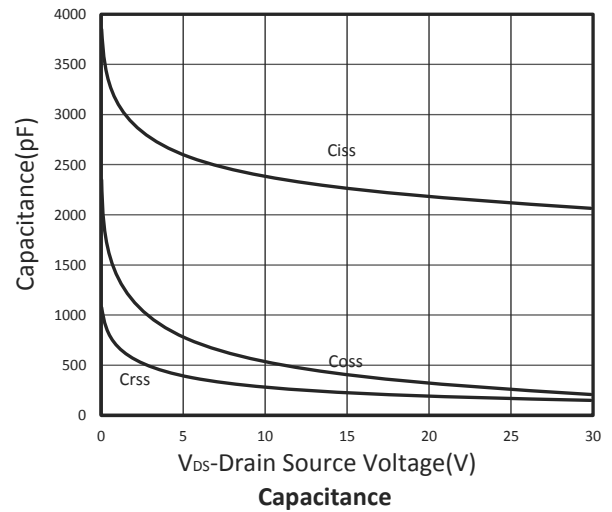
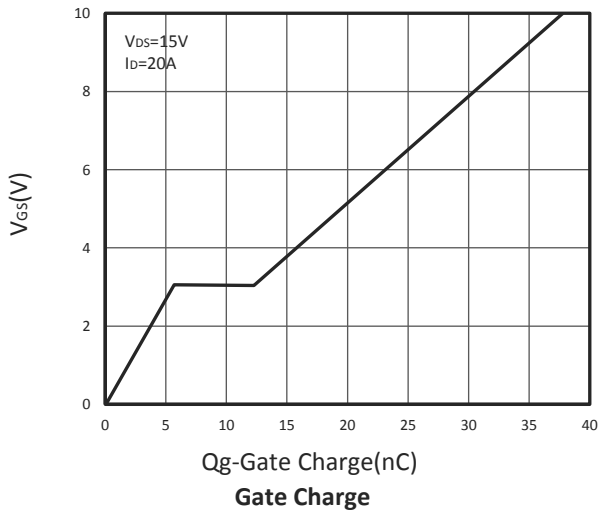
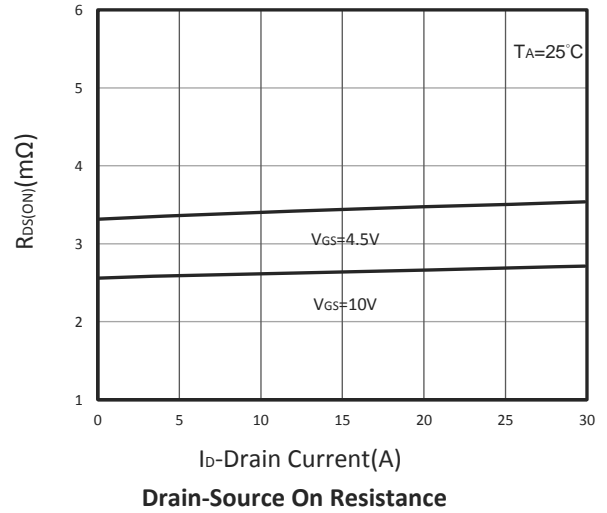
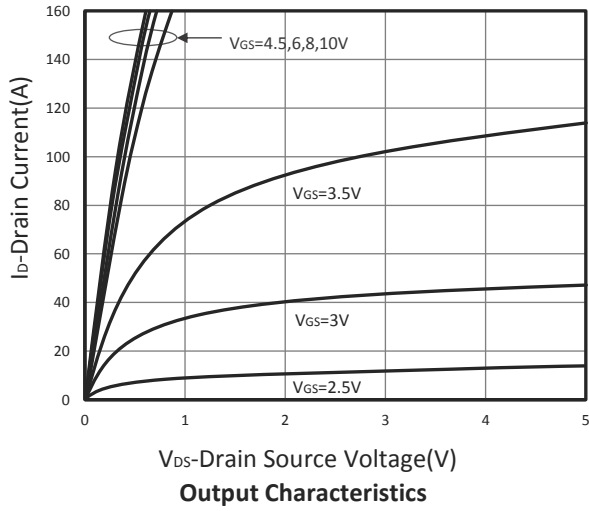
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.6	2.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$			-1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=75^{\circ}\text{C}$			-10	
$R_{DS(ON)}$	Drain-source On-Resistance ^D	$V_{GS}=10V, I_D=20A$		2.7	3.2	m Ω
		$V_{GS}=4.5V, I_D=15A$		3.4	4.2	
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	$I_S=20A, di/dt=100A/\mu s$		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	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$		2250		pF
C_{oss}	Output Capacitance			315		
C_{rss}	Reverse Transfer Capacitance			168		
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$		2		Ω
$t_{d(on)}$	Turn-On Time	$V_{DD}=15V, V_{GS}=10V, R_G=3\Omega, I_D=1A$		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.

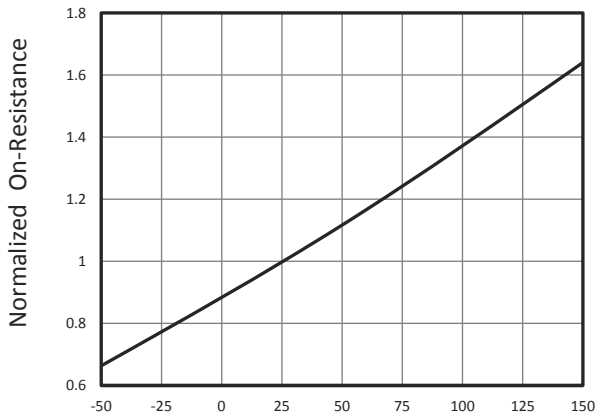
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^{\circ}\text{C}$ (initial temperature $T_J=25^{\circ}\text{C}$).
- C. Using $\leq 10\text{s}$ junction-to-ambient thermal resistance is base on $T_{J(MAX)}=150^{\circ}\text{C}$.
- D. Pulse test width $\leq 300\mu\text{s}$ and duty cycle $\leq 2\%$.
- E. The EAS data shows maximum, The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=45A$
- F. Guaranteed by design, not subject to production testing.
- * . The maximum rating current limited by package.

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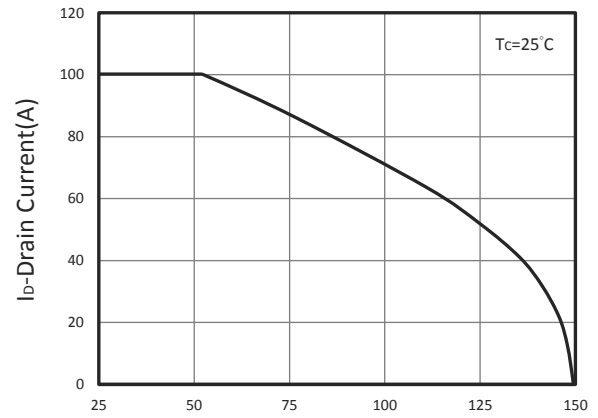
TYPICAL CHARACTERISTICS



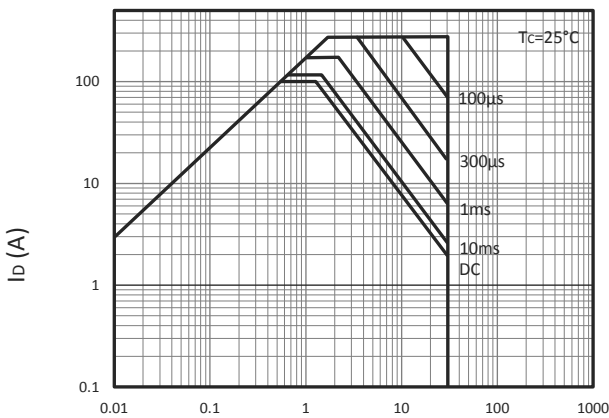
TYPICAL CHARACTERISTICS



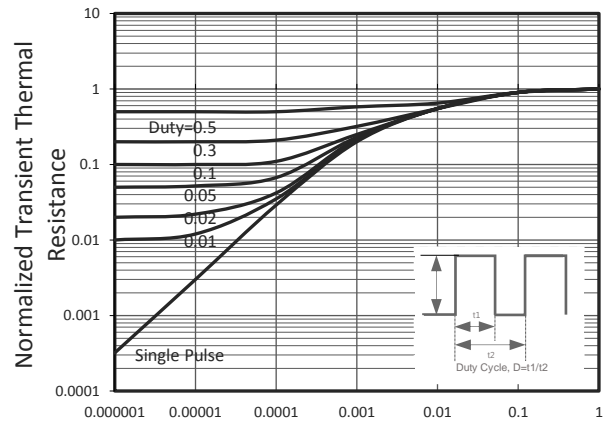
T_J-Junction Temperature(°C)
Drain-Source On Resistance



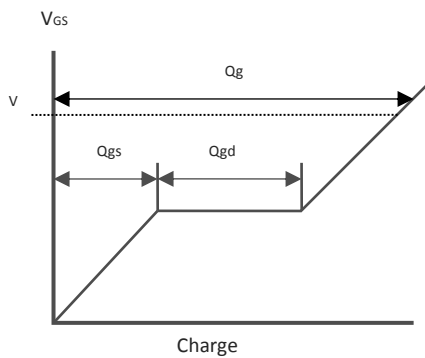
T_C-Case Temperature(°C)
Drain Current vs T_C



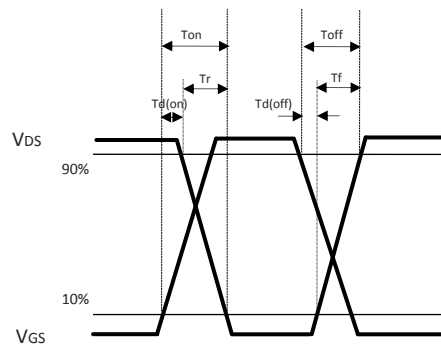
V_{DS} Voltage (V)
Maximum Safe Operation Area



Square Wave Pulse Duration(Sec)
Thermal Transient Impedance

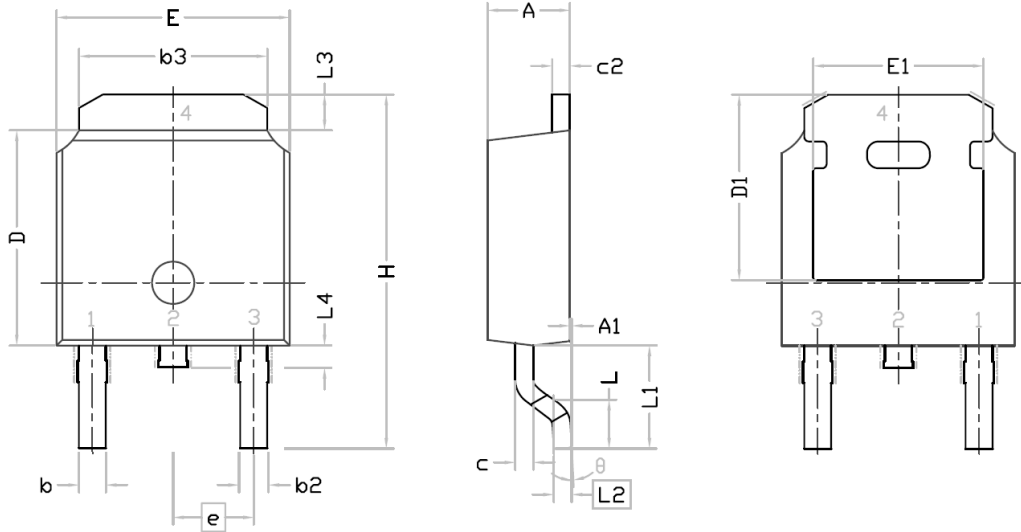


Gate Charge Waveform



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

