

Single P-Channel MOSFET

DESCRIPTION

SMC2207E 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.

PART NUMBER INFORMATION

SMC 2207 E SC - TR G
 a b c d e f

a : Company name.
 b : Product Serial number.
 c : ESD
 d : Package code SC: SOT-523
 e : Handling code TR: Tape&Reel
 f : Green produce code G: *RoHS Compliant*

FEATURES

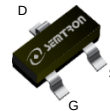
$V_{DS} = -20V$, $I_D = -0.6A$

$R_{DS(ON)} = 450m\Omega(Typ.)@V_{GS} = -4.5V$
 $R_{DS(ON)} = 630m\Omega(Typ.)@V_{GS} = -2.5V$
 $R_{DS(ON)} = 850m\Omega(Typ.)@V_{GS} = -1.8V$
 $R_{DS(ON)} = 1060m\Omega(Typ.)@V_{GS} = -1.5V$
 $R_{DS(ON)} = 1700m\Omega(Typ.)@V_{GS} = -1.2V$

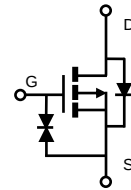
- ◆ Fast switch
- ◆ 1.2V Low gate drive applications
- ◆ Improved dv/dt capability

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load Switch
- ◆ Battery Protection



SOT-523



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ Unless otherwise noted)

Symbol	Parameter		Rating	Units
V _{DSS}	Drain-Source Voltage		-20	V
V _{GSS}	Gate-Source Voltage		±8	V
I _D	Continuous Drain Current	T _A =25°C	-0.6	A
		T _A =70°C	-0.48	A
I _{DM}	Pulsed Drain Current ^A		-1.6	A
P _D	Power Dissipation ^B	T _A =25°C	0.3	W
		T _A =70°C	0.2	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	$t \leq 10s$	-	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^C	Steady-State	420	
$R_{\theta JC}$	Thermal Resistance Junction to Case ^C		-	

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 ^D	V _{GS} =0V, I _D =-250μA	-20			V
V _{GS(th)}	Gate Threshold Voltage ^D	V _{DS} =V _{GS} , I _D =-250μA	-0.3	-0.6	-1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±8V			±20	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _J =25°C			-1	μA
		V _{DS} =-16V, V _{GS} =0V T _J =75°C			-10	
R _{DS(ON)}	Drain-source On-Resistance ^D	V _{GS} =-4.5V, I _D =-0.4A V _{GS} =-2.5V, I _D =-0.3A V _{GS} =-1.8V, I _D =-0.15A V _{GS} =-1.5V, I _D =-0.1A V _{GS} =-1.2V, I _D =-0.1A		450 630 850 1060 1700	580 840 1150 1600 2700	mΩ
Source-Drain Diode						
V _{SD}	Diode Forward Voltage ^B	I _S =-1A, V _{GS} =0V			-1.0	V
I _S	Continuous Source Current				-0.4	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V I _D =-0.6A		1		nC
Q _{gs}	Gate-Source Charge			0.14		
Q _{gd}	Gate-Drain Charge			0.18		
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V f =1MHz		60		pF
C _{oss}	Output Capacitance			18		
C _{rss}	Reverse Transfer Capacitance			15		
t _{d(on)}	Turn-On Time ^E	V _{DD} =-10V, V _{GEN} =-4.5V, R _G =10Ω, I _D =-0.2A		6.2		nS
t _r				5.6		
t _{d(off)}	Turn-Off Time ^E			30		
t _f				18		

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 $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_A=25^\circ\text{C}$).

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

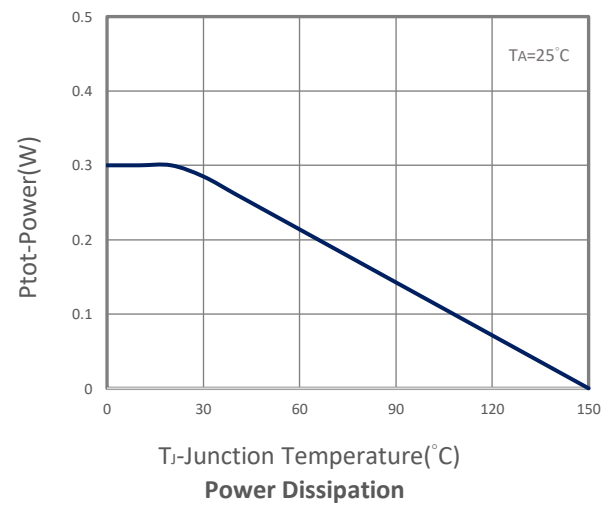
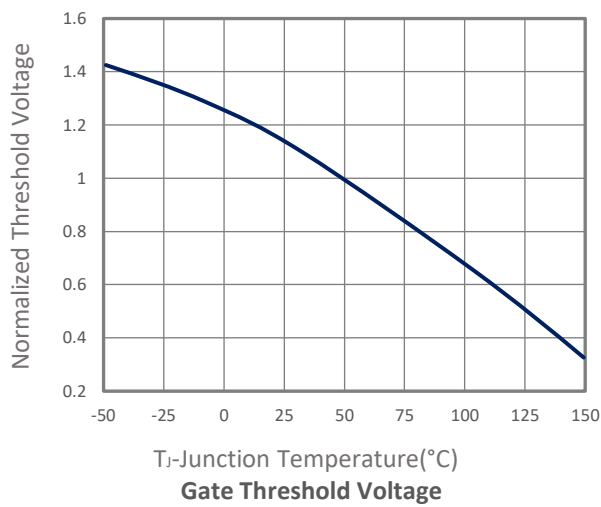
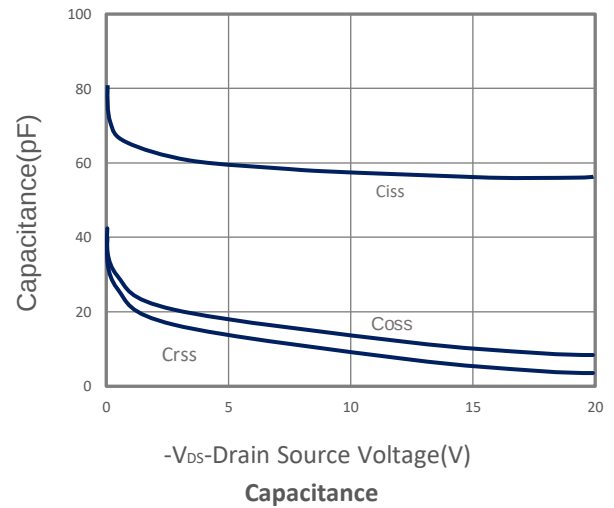
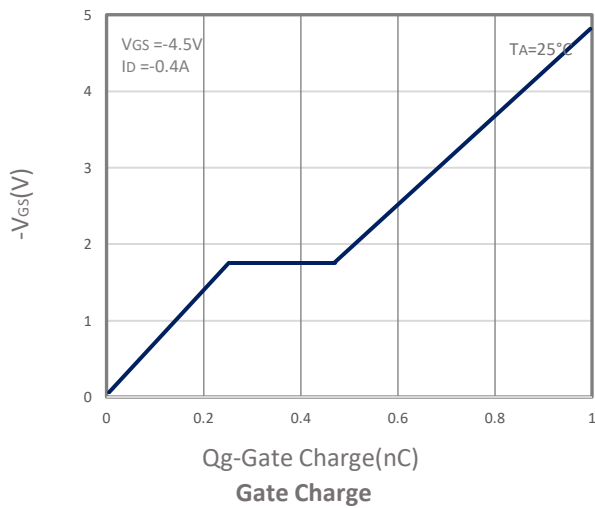
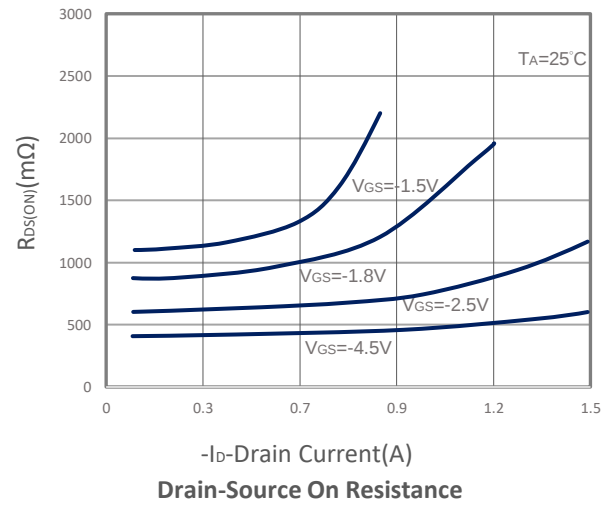
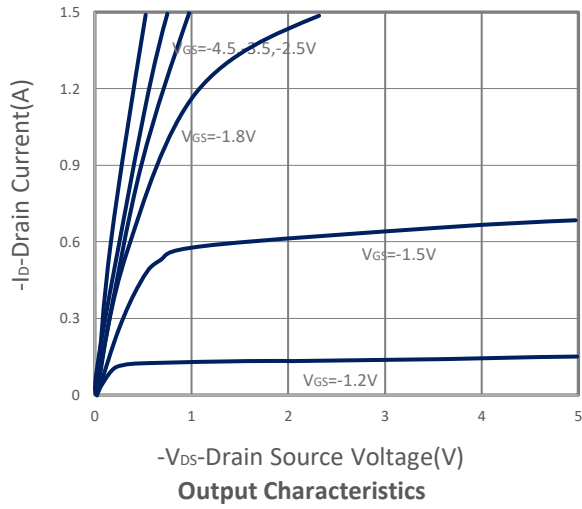
C. Surface-mounted on FR-4 board using 1 sq-in pad, 2 oz Cu, in a still air environment with $T_A=25^\circ\text{C}$.

D. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

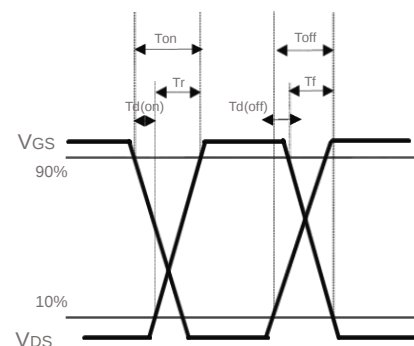
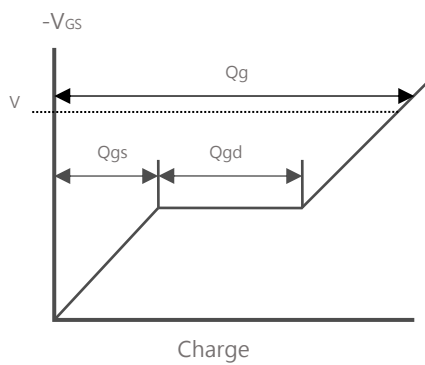
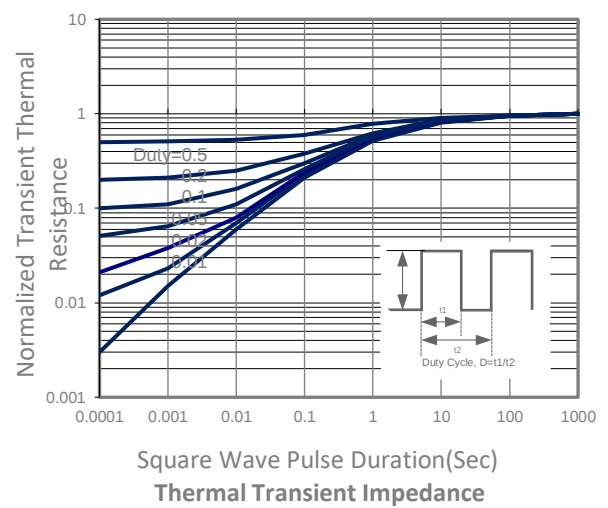
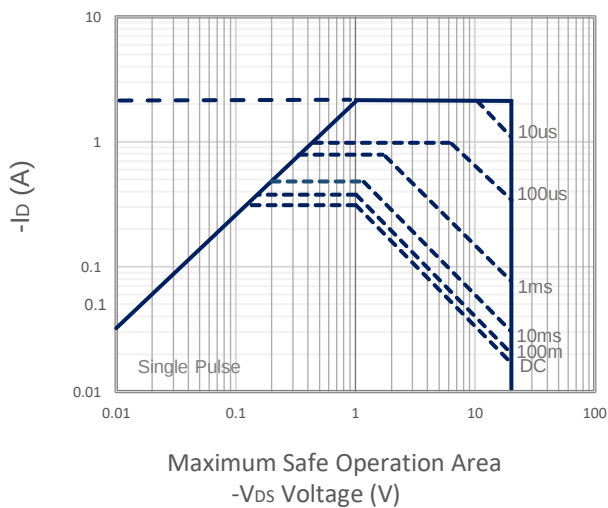
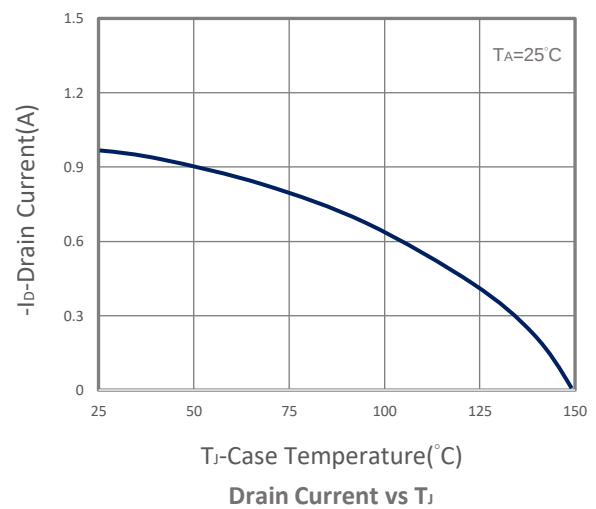
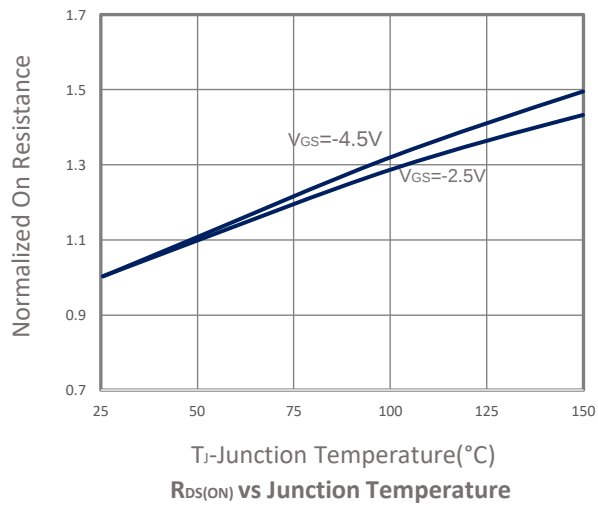
E. Pulsed width limited by maximum junction temperature.

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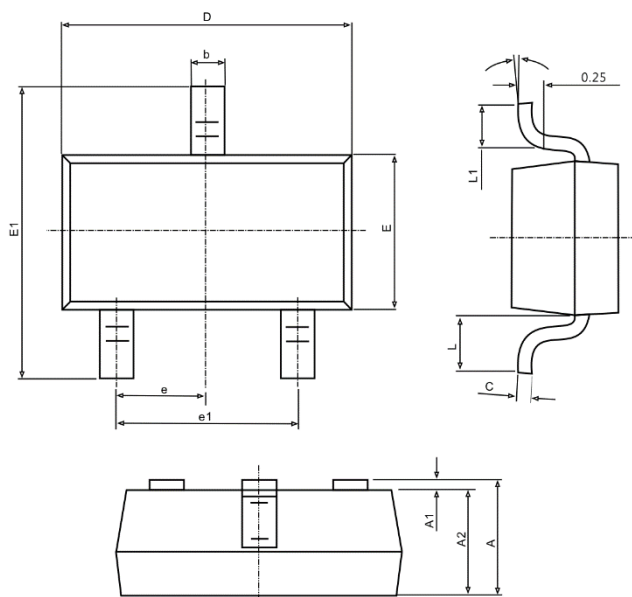
TYPICAL CHARACTERISTICS



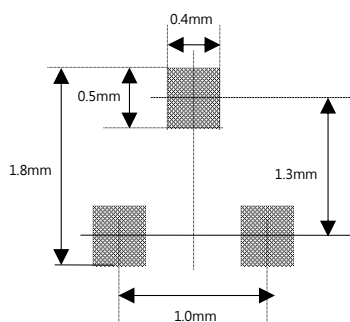
TYPICAL CHARACTERISTICS



■ SOT-523 PACKAGE DIMENSIONS



Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.750	0.059	0.069
E	0.700	0.900	0.028	0.035
E1	1.400	1.750	0.055	0.069
e	0.500 TYP.		0.020 TYP..	
e1	0.900	1.100	0.035	0.043
L	0.300	0.460	0.012	0.018
L1	0.260	0.460	0.010	0.018
Θ	0°	8°	0°	8°