

## Common-Drain Dual N-Channel MOSFET

### DESCRIPTION

SMC8205AGS6 is the Dual N-Channel MOSFET, this advanced trench technology to provide excellent  $R_{DS(ON)}$ , facilitated by its common-drain as a Unidirectional or bidirectional load switch applications.

### PART NUMBER INFORMATION

**SMC 8205AG S6 - TR G**  
 a      b      c      d      e

- a : Company name.
- b : Product Serial number.
- c : Package code            S6:SOT-23-6L
- d : Handling code            TR:Tape&Reel
- e : Green produce code    G:RoHS Compliant

### FEATURES

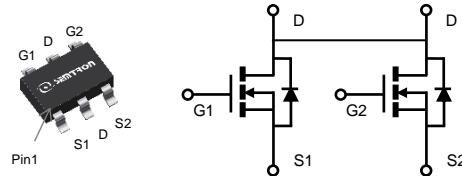
**$V_{DS}=20V, I_D=6A$**

$R_{DS(ON)}=22m\Omega(Typ.)@V_{GS}=4.5V$   
 $R_{DS(ON)}=25m\Omega(Typ.)@V_{GS}=2.5V$

- ◆ Fast switch
- ◆ High power and current handling capability
- ◆ Exceptional on-resistance

### APPLICATIONS

- ◆ Power Management in Notebook Computer
- ◆ Portable Equipment and Battery Powered.



SOT-23-6L

### 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	$\pm 12$	V	
$I_D$	Continuous Drain Current ( $V_{GS}=4.5V$ )	$T_A=25^\circ C$	6	A
		$T_A=70^\circ C$	4.7	A
$I_{DM}$	Pulsed Drain Current <sup>B</sup>	24	A	
$P_D$	Power Dissipation <sup>A</sup>	$T_A=25^\circ C$	1.4	W
		$T_A=70^\circ C$	0.9	W
$T_J$	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 <sup>A</sup>	$t \leq 10s$	90	$^\circ C/W$
	Thermal Resistance Junction to Ambient <sup>AC</sup>	Steady-State	130	

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

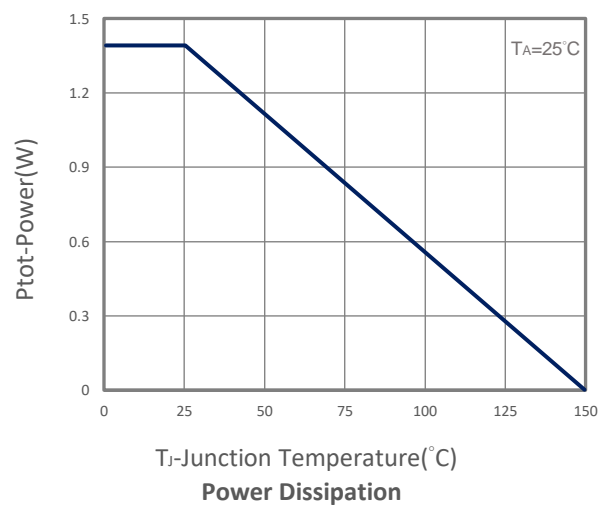
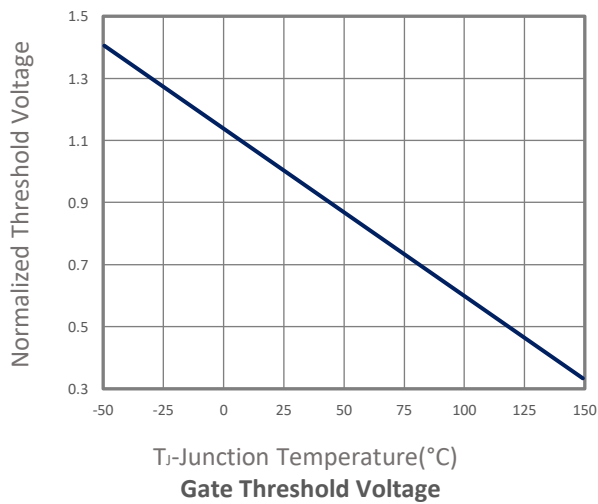
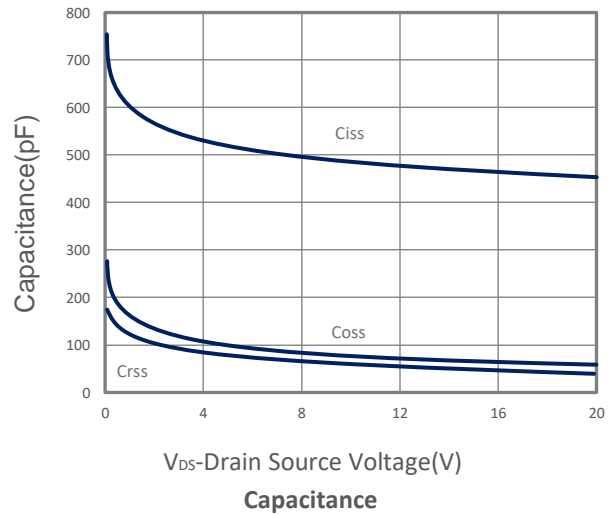
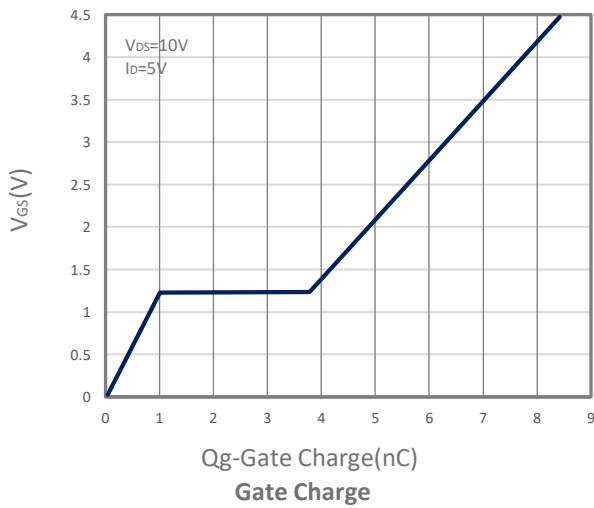
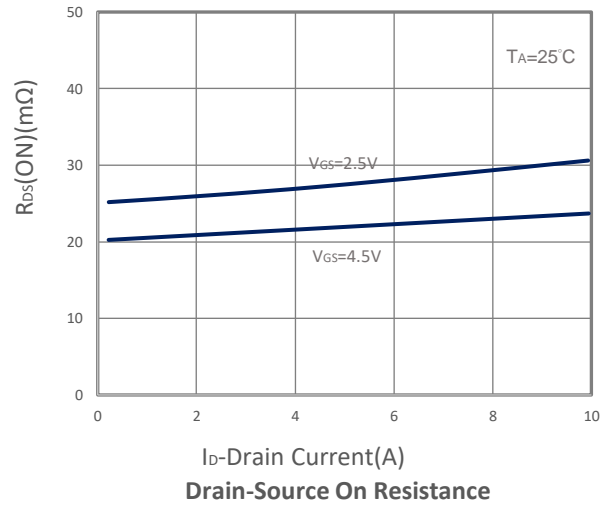
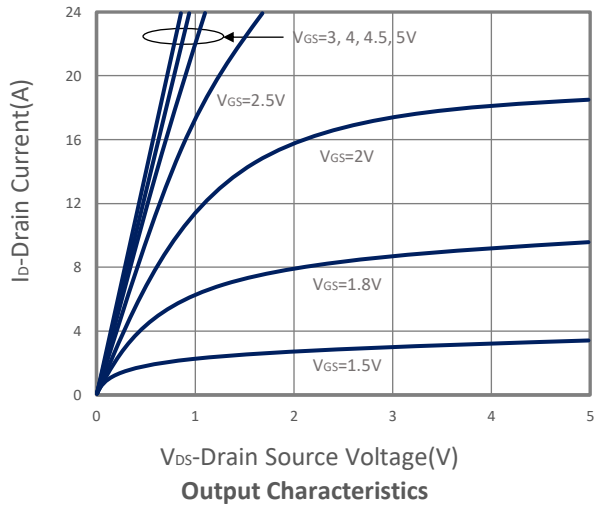
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250 $\mu$ A	20			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 $\mu$ A	0.4	0.7	1.0	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = $\pm$ 12V			$\pm$ 100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =25 $^\circ$ C			1	$\mu$ A
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =75 $^\circ$ C			10	
R <sub>DS(ON)</sub>	Drain-source On-Resistance <sup>D</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		22	26	m $\Omega$
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A		25	30	
G <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =5A		7		S
<b>Diode Characteristics</b>						
V <sub>SD</sub>	Diode Forward Voltage <sup>D</sup>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V
I <sub>S</sub>	Diode Continuous Forward Current				6	A
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =5A, di/dt=100A/ $\mu$ s		8.5		ns
Q <sub>rr</sub>	Reverse Recovery Charge			2.7		nC
<b>Dynamic and Switching Parameters <sup>E</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		8.4	11.8	nC
Q <sub>gs</sub>	Gate-Source Charge			1	1.4	
Q <sub>gd</sub>	Gate-Drain Charge			2.8	3.9	
C <sub>iSS</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		492		pF
C <sub>oss</sub>	Output Capacitance			82		
C <sub>rSS</sub>	Reverse Transfer Capacitance			70		
R <sub>g</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		1.6		$\Omega$
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =10V, V <sub>GEN</sub> =4.5V R <sub>G</sub> =3.3 $\Omega$ , I <sub>D</sub> =1A		4.7	9	nS
t <sub>r</sub>				14	27	
t <sub>d(off)</sub>	Turn-Off Time			23.6	45	
t <sub>f</sub>				8.5	16	

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

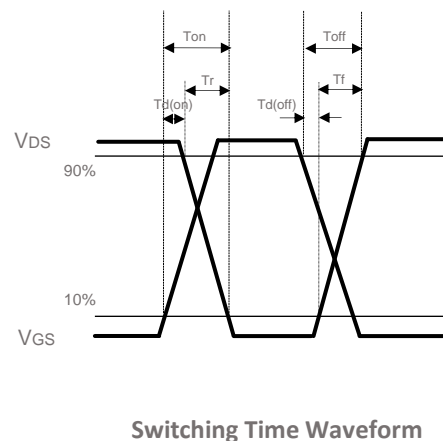
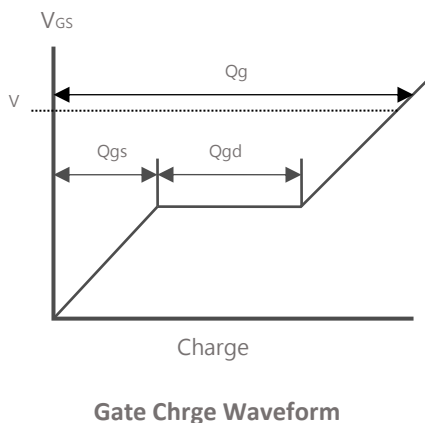
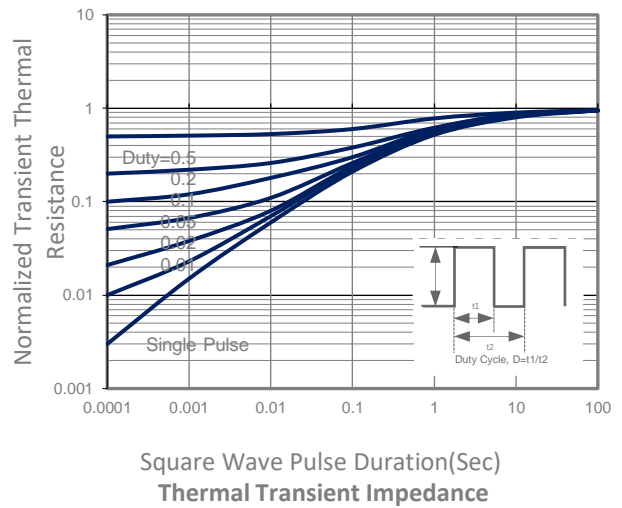
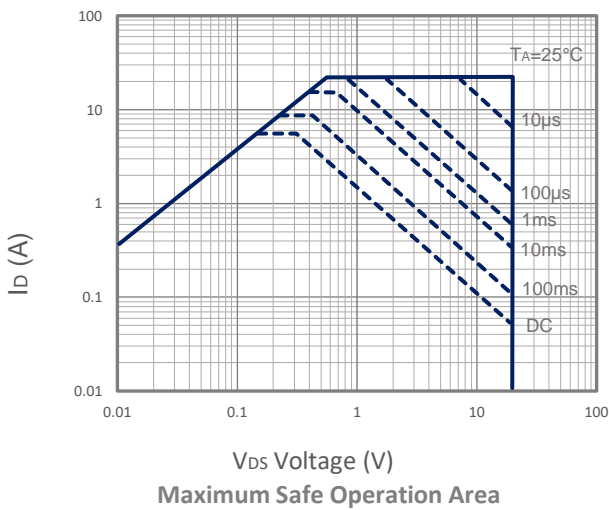
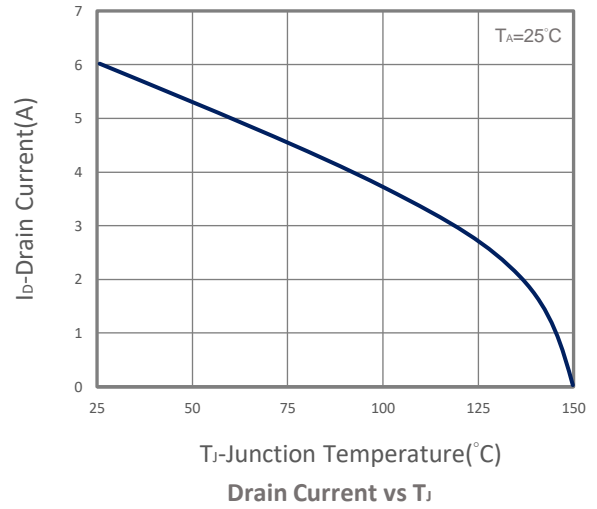
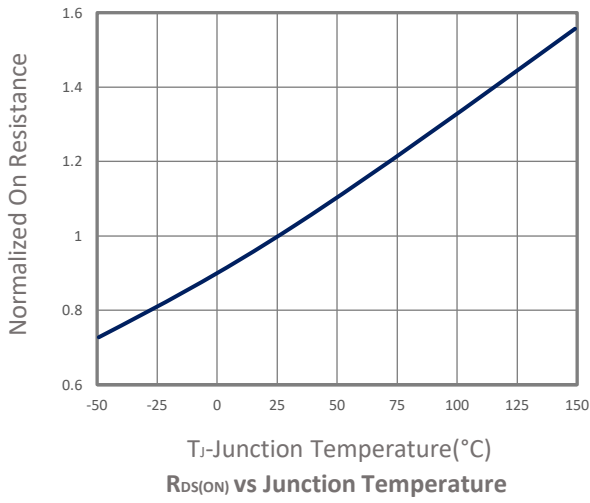
- A. Surface mounted on FR4 board using 1 in<sup>2</sup> pad size.
- B. Pulsed width limited by maximum junction temperature, T<sub>J(MAX)</sub>=150 $^\circ$ C.
- C. Using  $\leq$  10s junction-to-ambient thermal resistance is base on T<sub>J(MAX)</sub>=150 $^\circ$ C.
- D. Pulse test width  $\leq$ 300 $\mu$ s and duty cycle  $\leq$  2%.
- E. Guaranteed by design, not subject to production testing.

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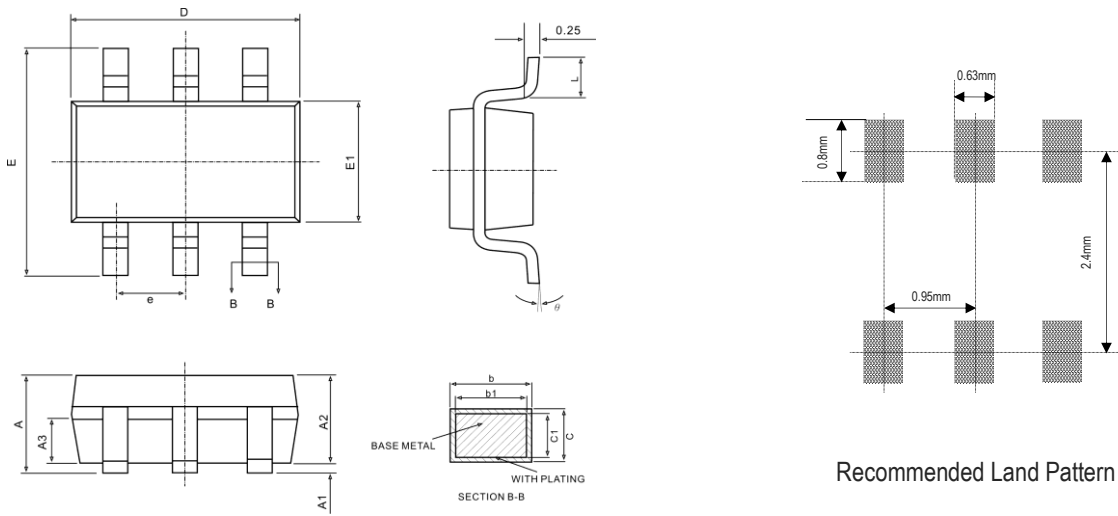
## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS



## ■ SOT-23-6L PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	-	1.300	-	0.051
A1	0.040	0.100	0.002	0.004
A2	1.000	1.200	0.039	0.047
A3	0.550	0.750	0.022	0.030
b	0.340	0.430	0.013	0.017
b1	0.330	0.380	0.013	0.015
c	0.150	0.210	0.006	0.008
c1	0.140	0.160	0.006	0.006
D	2.720	3.120	0.107	0.123
E	2.600	3.000	0.102	0.118
E1	1.400	1.800	0.055	0.071
e	0.950 BSC		0.066 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°