

Single P-Channel MOSFET

DESCRIPTION

SMC3217S is the P-Channel 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 3217 S - TR G
 a b c d e

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

FEATURES

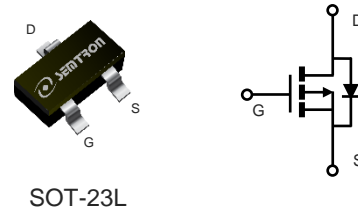
$V_{DS}=-30V$, $I_D=-4.8A$

$R_{DS(ON)}=40m\Omega(Typ.)@V_{GS}=-10V$

$R_{DS(ON)}=60m\Omega(Typ.)@V_{GS}=-4.5V$

APPLICATIONS

- ◆ Portable Equipment
- ◆ Power Management
- ◆ Load Switch



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 ^A	$T_A=25^\circ C$	-4.8
		$T_A=70^\circ C$	-3.8
I_{DM}	Pulsed Drain Current ^B	-19	A
P_D	Power Dissipation ^A	$T_A=25^\circ C$	1.6
		$T_A=70^\circ C$	1
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	$t \leq 10s$	80	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	120	

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

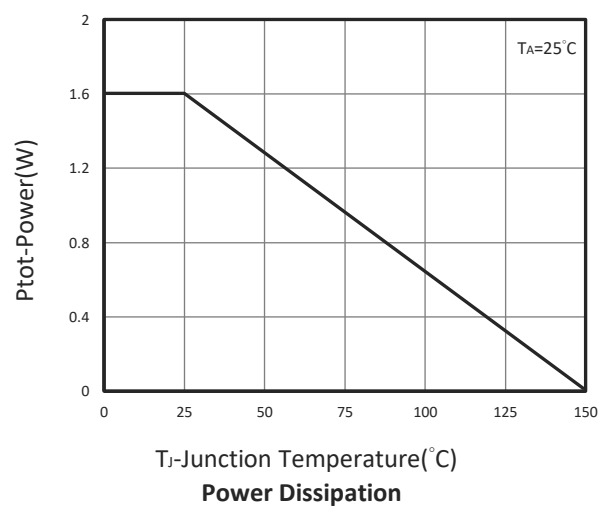
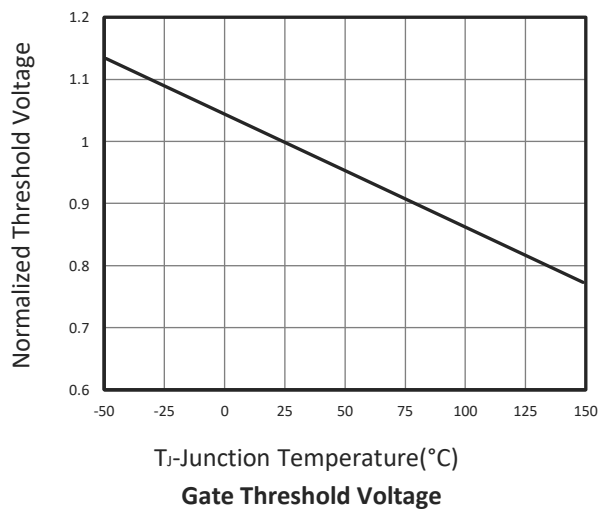
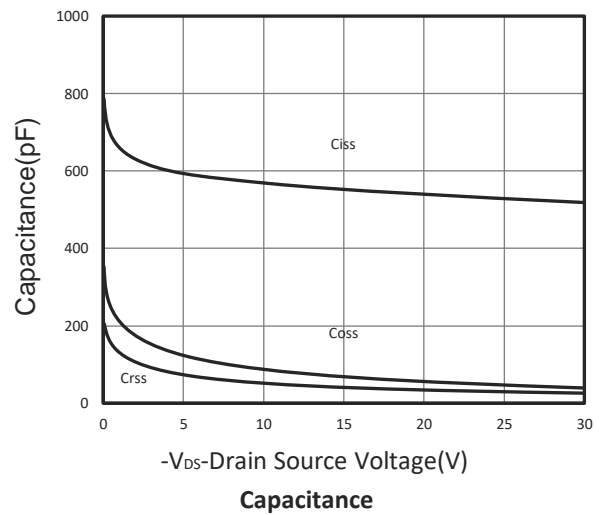
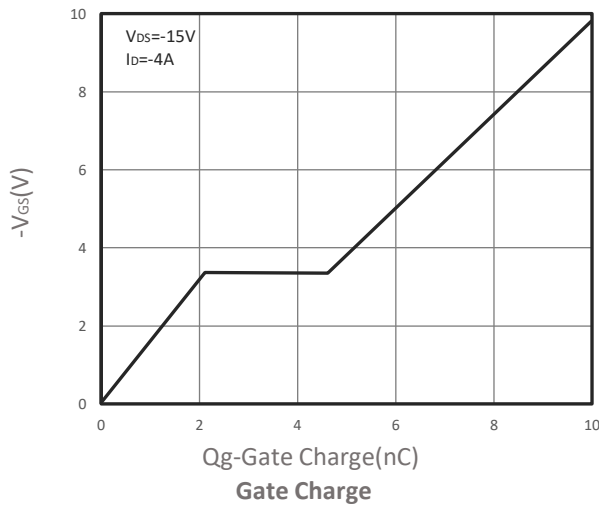
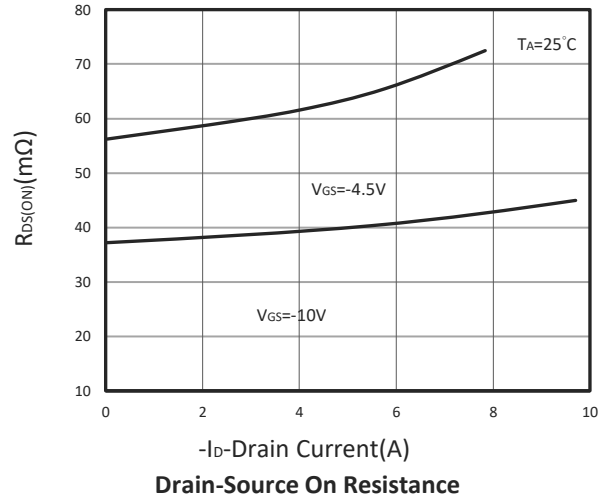
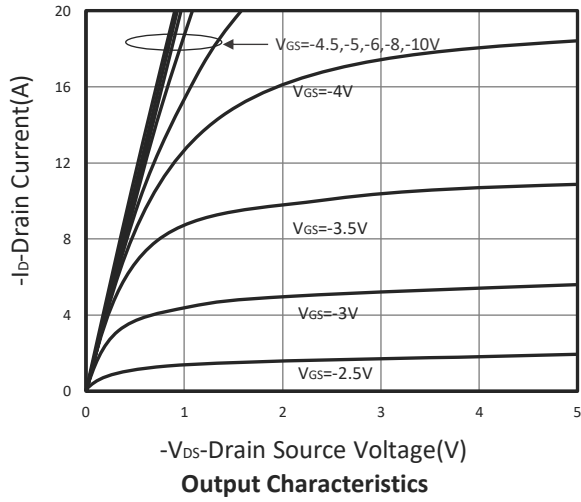
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250 μ A	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250 μ A	-1.2	-1.6	-2	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 20V			\pm 100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V, T _J =25 $^\circ$ C			-1	μ A
		V _{DS} =-24V, V _{GS} =0V, T _J =75 $^\circ$ C			-10	
R _{DS(ON)}	Drain-source On-Resistance ^D	V _{GS} =-10V, I _D =-4.8A V _{GS} =-4.5V, I _D =-3.5A		40 60	46 70	m Ω
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-4A		3.6		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Forward Current				-4.8	A
Dynamic and Switching Parameters ^E						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _D =-4A		10.3	14.4	nC
Q _g	Total Gate Charge(4.5V)			5	7	
Q _{gs}	Gate-Source Charge			2.1	2.9	
Q _{gd}	Gate-Drain Charge			2.4	3.4	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		565		pF
C _{oss}	Output Capacitance			58		
C _{rss}	Reverse Transfer Capacitance			42		
t _{d(on)}	Turn-On Time	V _{DD} =-15V, V _{GEN} =-10V R _G =6 Ω , I _D =-1A		3.6	6.8	nS
t _r				11	21	
t _{d(off)}	Turn-Off Time			24	45.6	
t _f				6.8	12.9	

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

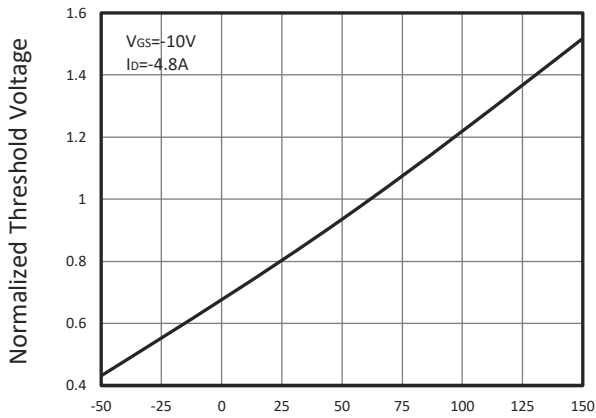
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^\circ$ C.
- C. Using \leq 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150 $^\circ$ C.
- D. Pulse test width \leq 300 μ s and duty cycle \leq 2%.
- E. Guaranteed by design, not subject to production testing.

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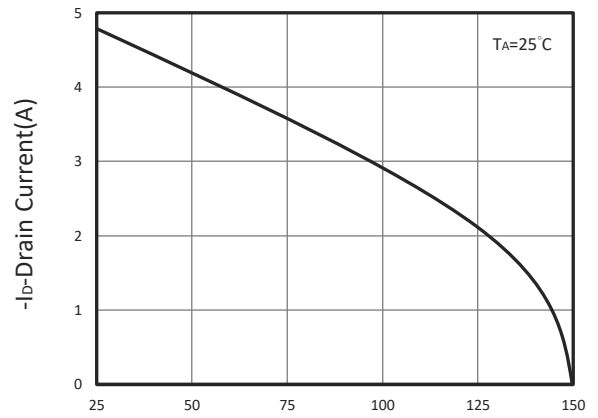
TYPICAL CHARACTERISTICS



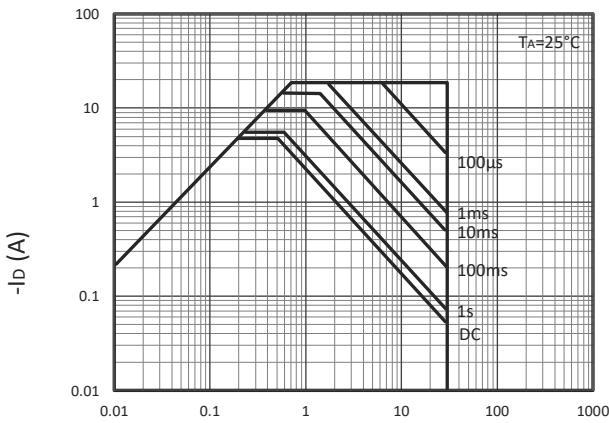
TYPICAL CHARACTERISTICS



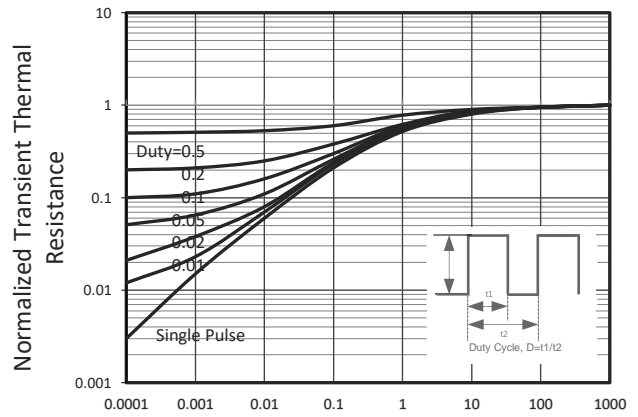
T_J-Junction Temperature(°C)
Gate Threshold Voltage



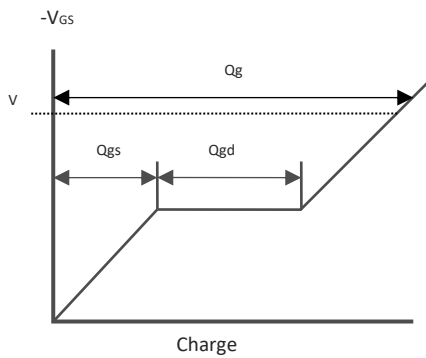
T_J-Junction Temperature(°C)
Drain Current vs T_J



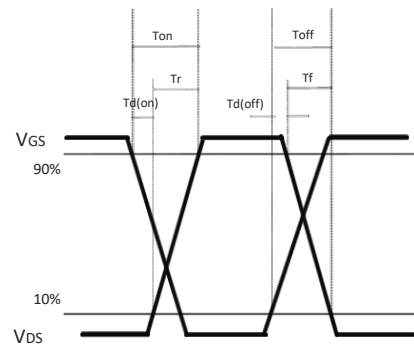
- V_{DS} Voltage (V)
Maximum Safe Operation Area



Square Wave Pulse Duration(Sec)
Thermal Transient Impedance

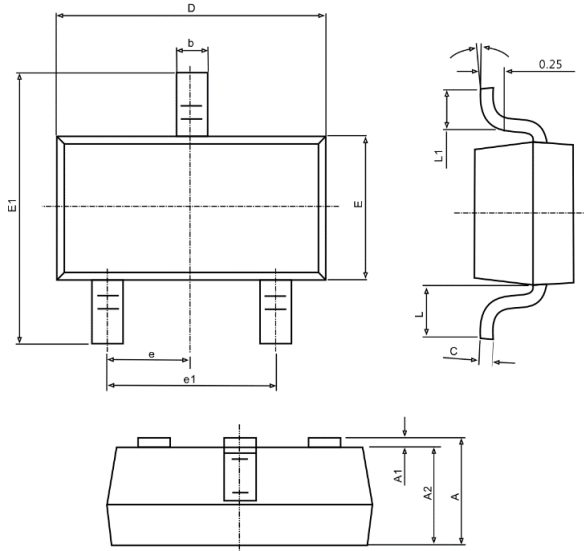


Gate Charge Waveform

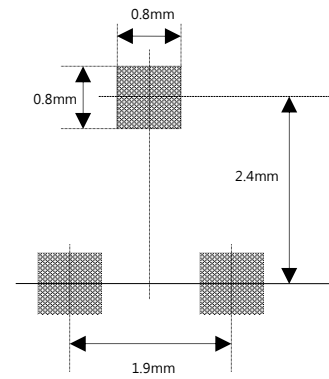


Switching Time Waveform

■ SOT-23L PACKAGE DIMENSIONS



Recommended Minimum Pad(mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.000	1.300	0.039	0.049
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.039	0.047
b	0.300	0.500	0.012	0.020
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E	1.500	1.700	0.059	0.067
E1	2.600	3.000	0.102	0.118
e	0.950 TYP.		0.037 TYP.	
e1	1.900 TYP.		0.075 TYP.	
L1	0.250	0.550	0.010	0.022
θ	0°	8°	0°	8°