

Single P-Channel MOSFET

DESCRIPTION

SMC2351SQ 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.

PART NUMBER INFORMATION

SMC 2351 SQ - TR G
 a b c d e

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

FEATURES

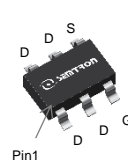
$V_{DS}=-20V$, $I_D=-5.4A$

- $R_{DS(ON)}=33m\Omega(Typ.)@V_{GS}=-10V$
- $R_{DS(ON)}=40m\Omega(Typ.)@V_{GS}=-4.5V$
- $R_{DS(ON)}=54m\Omega(Typ.)@V_{GS}=-2.5V$
- $R_{DS(ON)}=77m\Omega(Typ.)@V_{GS}=-1.8V$

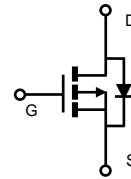
- ◆ Fast switch
- ◆ 1.8V Low gate drive applications
- ◆ High power and current handling capability

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load Switch



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	± 12	V	
I_D	Continuous Drain Current ^A ($V_{GS}=-4.5V$)	$T_A=25^{\circ}C$	-5.4	A
		$T_A=70^{\circ}C$	-4.3	A
I_{DM}	Pulsed Drain Current ^B	21.6	A	
I_{AS}	Avalanche Current ^B	10	A	
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^B	5	mJ	
P_D	Power Dissipation ^A	$T_A=25^{\circ}C$	2.1	W
		$T_A=70^{\circ}C$	1.3	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 ^A	$t \leq 10s$	60	$^{\circ}C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	100	

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

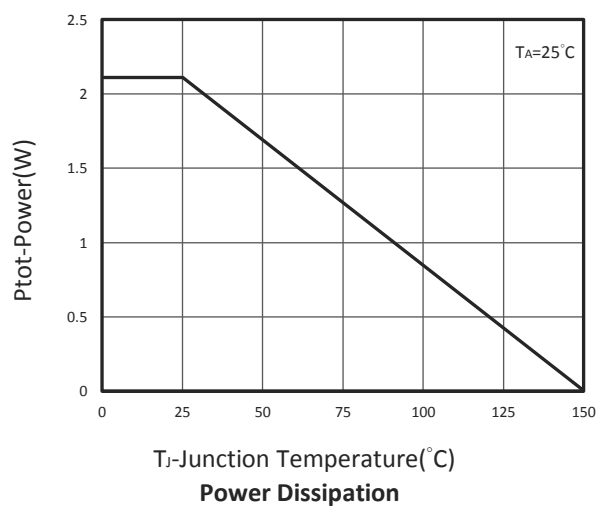
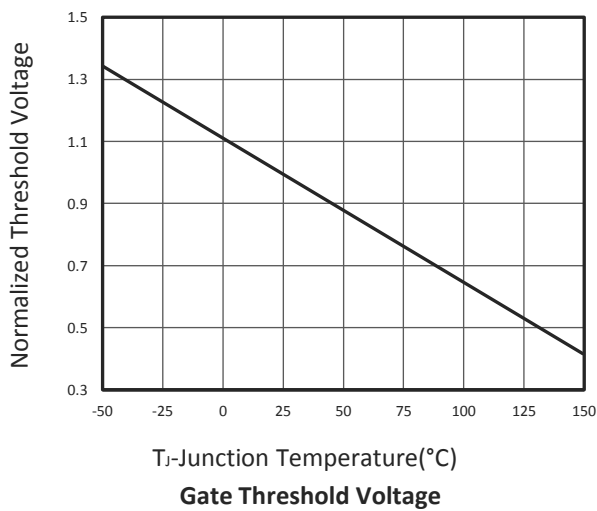
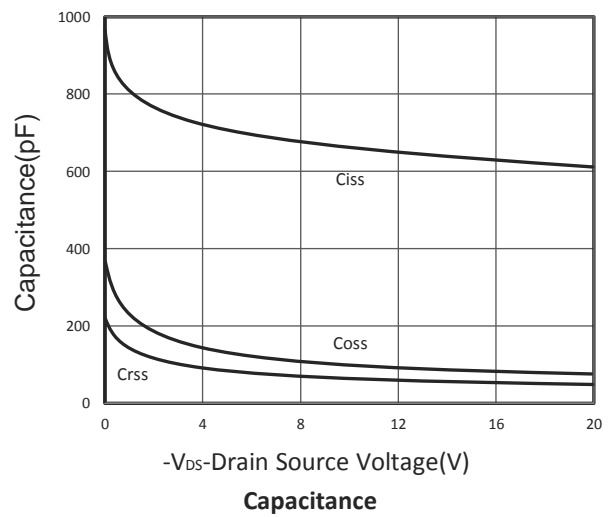
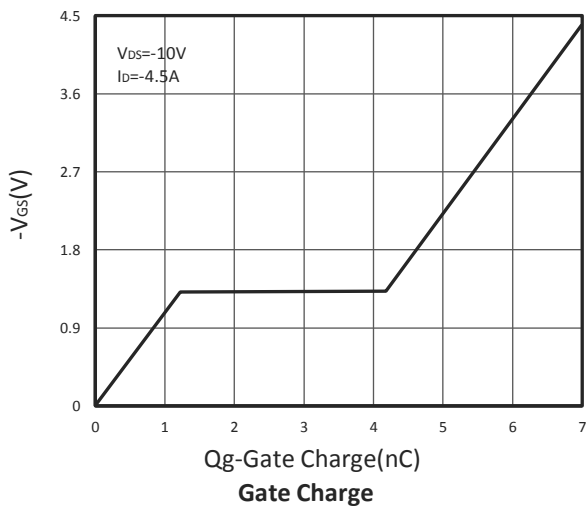
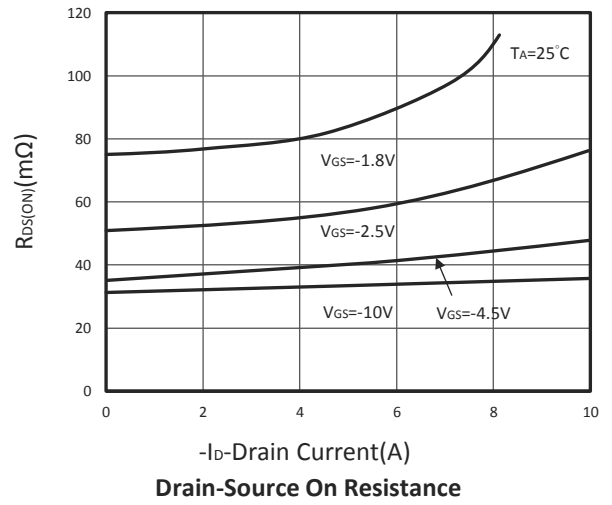
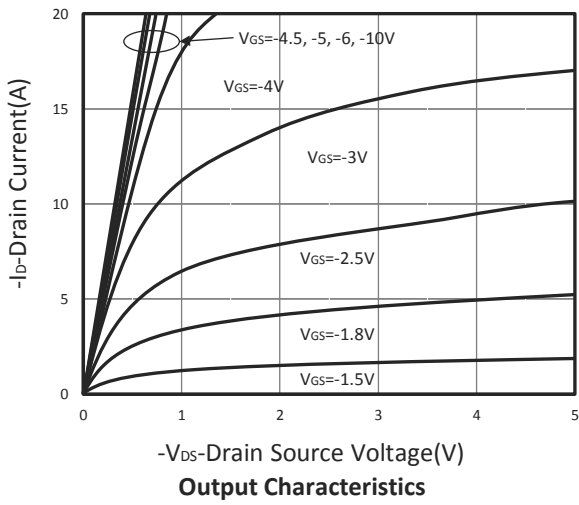
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	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} =-10V, I _D =-6A		33	40	mΩ
		V _{GS} =-4.5V, I _D =-5.4A		40	48	
		V _{GS} =-2.5V, I _D =-3A		54	65	
		V _{GS} =-1.8V, I _D =-2A		77	95	
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-3A		8		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Forward Current				-1.8	A
Dynamic and Switching Parameters^E						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V I _D =-4.2A		7.2	10.1	nC
Q _{gs}	Gate-Source Charge			1.2	1.7	
Q _{gd}	Gate-Drain Charge			3	4.2	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz		650		pF
C _{oss}	Output Capacitance			95		
C _{rss}	Reverse Transfer Capacitance			62		
t _{d(on)}	Turn-On Time	V _{DD} =-10V, V _{GEN} =-4.5V R _G =6Ω, I _D =-1A		8.5	16	nS
t _r				13.3	25	
t _{d(off)}	Turn-Off Time			32	61	
t _f				25	48	

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

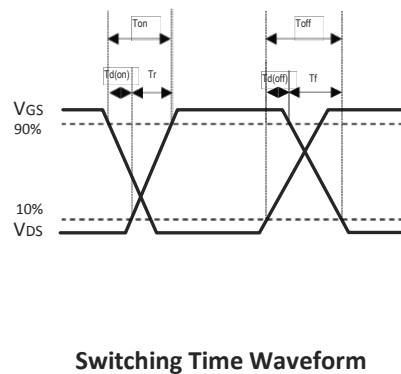
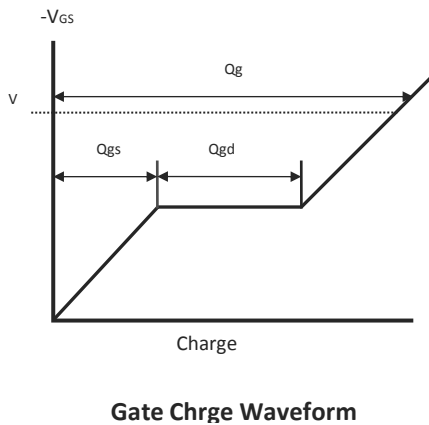
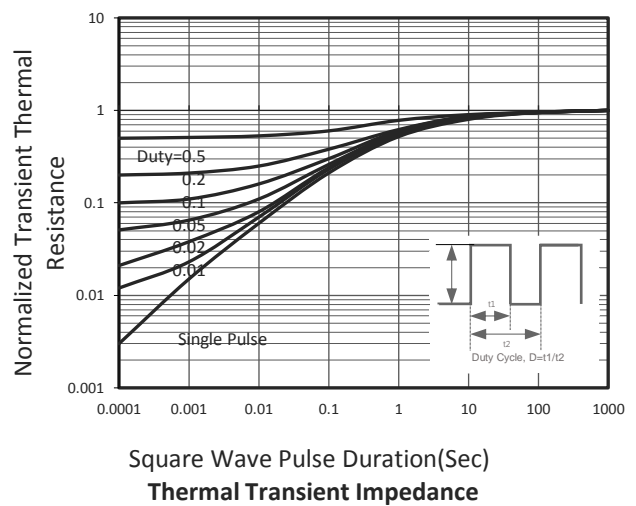
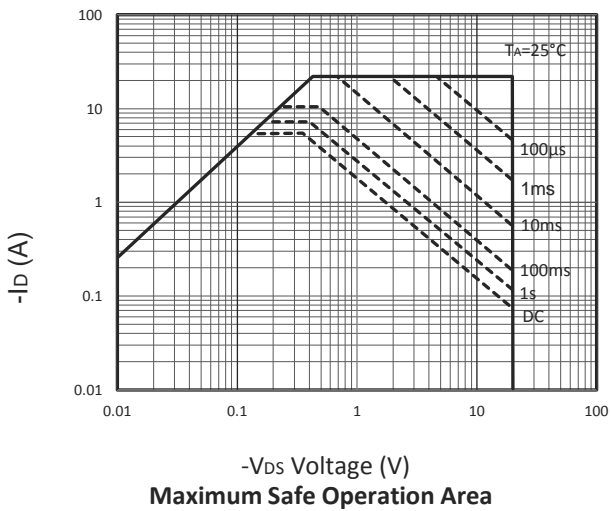
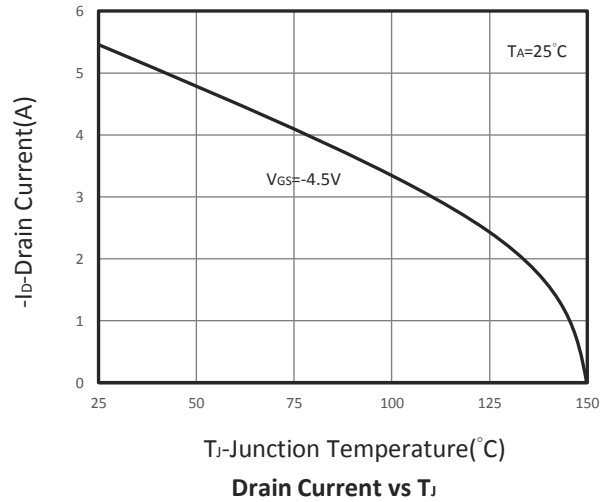
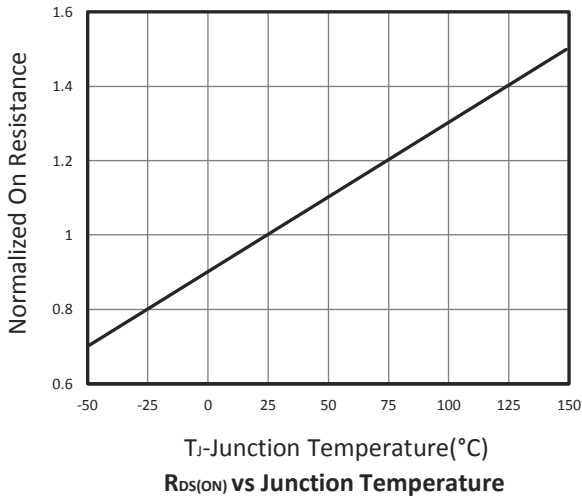
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C (initial temperature T_J=25°C).
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. Guaranteed by design, not subject to production testing.

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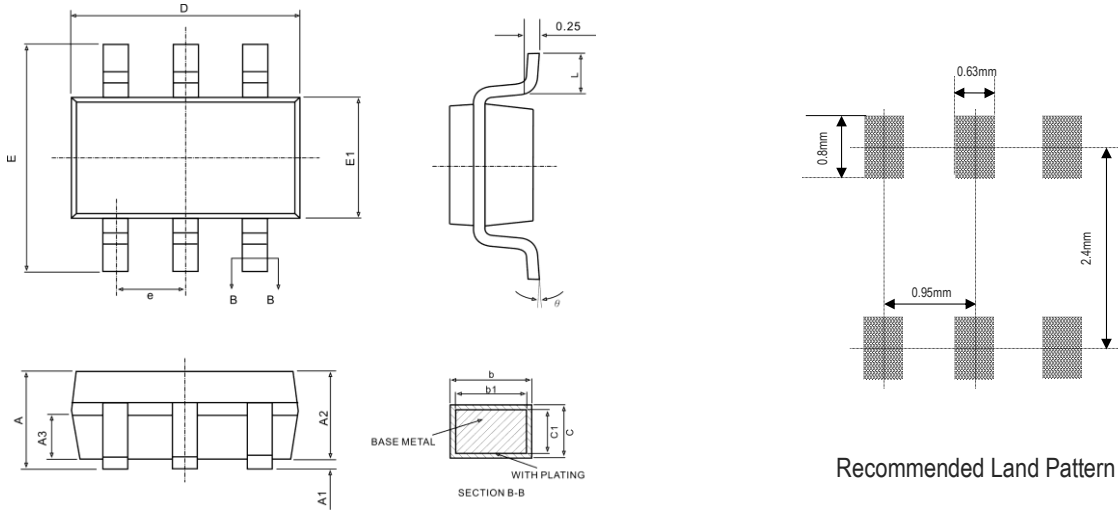
TYPICAL CHARACTERISTICS



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°