

DESCRIPTION

SMC2355DSQ is the Dual 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 2355D 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

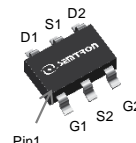
$V_{DS}=-20V$, $I_D=-3.5A$

- $R_{DS(ON)}=60m\Omega(Typ.)@V_{GS}=-4.5V$
- $R_{DS(ON)}=80m\Omega(Typ.)@V_{GS}=-2.5V$
- $R_{DS(ON)}=110m\Omega(Typ.)@V_{GS}=-1.8V$

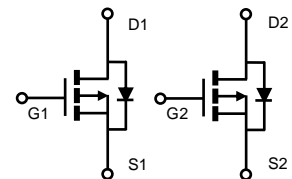
- ◆Fast switch
- ◆1.8V Low gate drive applications
- ◆High power and current handling capability

APPLICATIONS

- ◆Hend-Held Instruments
- ◆Load Switch



SOT-23-6L



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ^A ($V_{GS}=-4.5V$)	$T_A=25^{\circ}C$	-3.5
		$T_A=70^{\circ}C$	-2.8
I_{DM}	Pulsed Drain Current ^B	-13.8	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	$T_A=25^{\circ}C$	1.4
		$T_A=70^{\circ}C$	0.9
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	$t \leq 10s$	90	$^{\circ}C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	130	

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

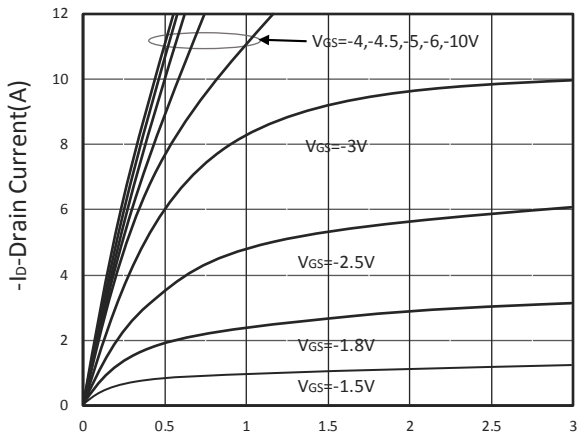
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _b =-250μA	-0.4	-0.7	-1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	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} =-4.5V, I _D =-3.5A		60	70	mΩ
		V _{GS} =-2.5V, I _D =-2.5A		80	100	
		V _{GS} =-1.8V, I _D =-1.5A		110	145	
G _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-3A		2.5		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Forward Current				-3.2	A
t _{rr}	Reverse Recovery Time	I _S =-3A, dI/dt=100A/μs		13.2		ns
Q _{rr}	Reverse Recovery Charge	T _J =25°C		7.4		nC
Dynamic and Switching Parameters^E						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-3A		7.2	10.1	nC
Q _{gs}	Gate-Source Charge			0.8	1.1	
Q _{gd}	Gate-Drain Charge			2	2.8	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz		360		pF
C _{oss}	Output Capacitance			70		
C _{rss}	Reverse Transfer Capacitance			55		
t _{d(on)}	Turn-On Time	V _{DD} =-10V, V _{GEN} =-4.5V, R _G =3Ω, I _D =-3A		4.8	9	nS
t _r				12.8	24	
t _{d(off)}	Turn-Off Time			20	38	
t _f				6	11	

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

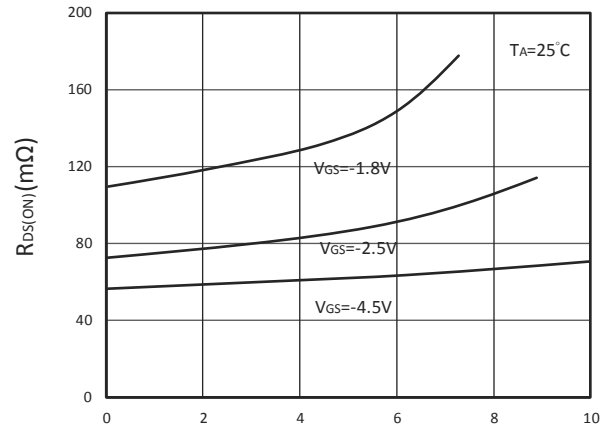
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C (initial temperature T_J=25°C).
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
-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

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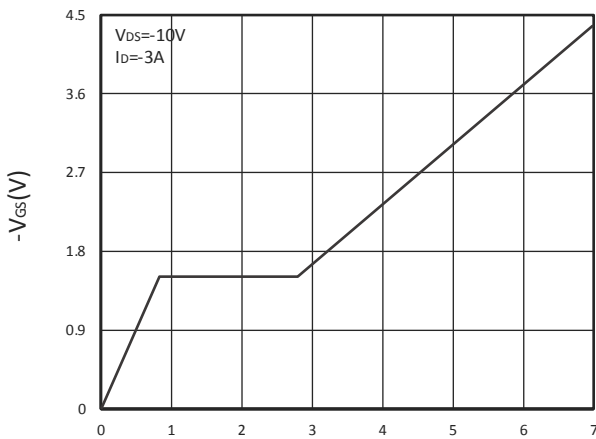
TYPICAL CHARACTERISTICS



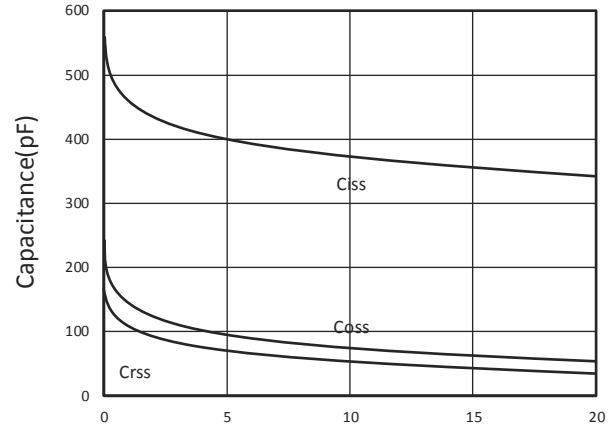
Output Characteristics



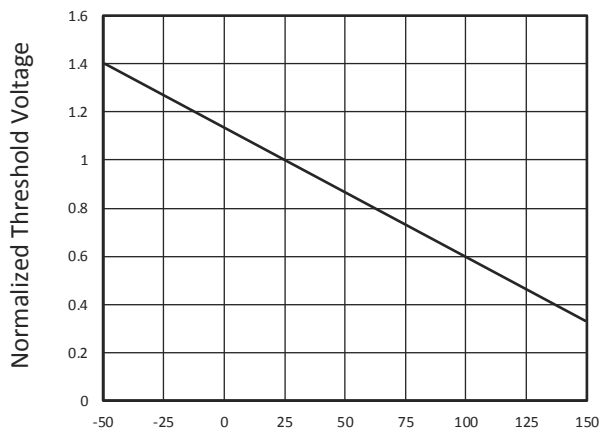
Drain-Source On Resistance



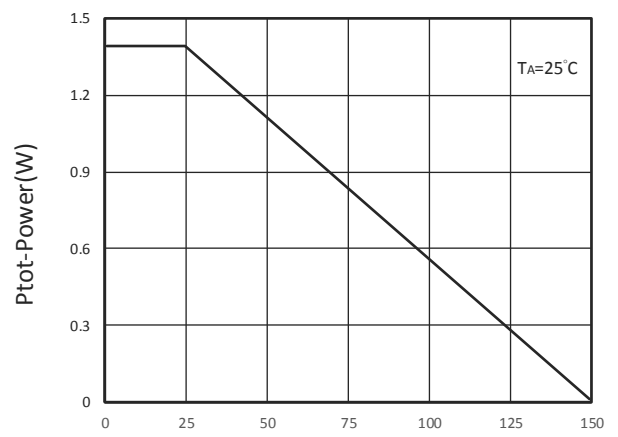
Gate Charge



Capacitance

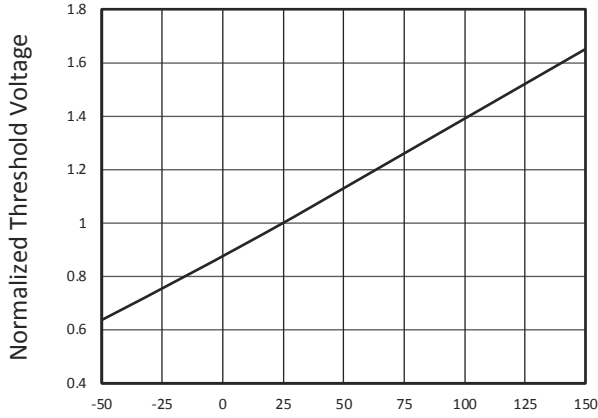


Gate Threshold Voltage

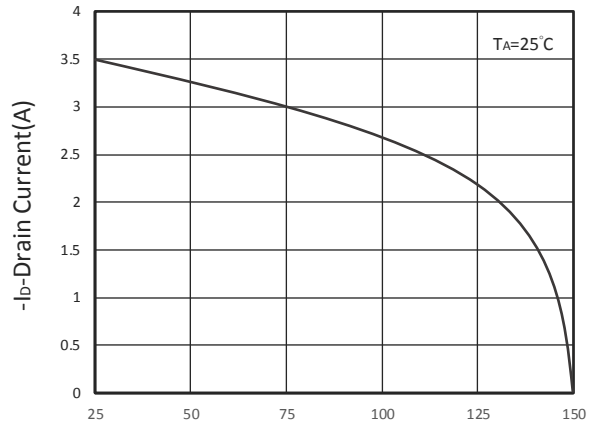


Power Dissipation

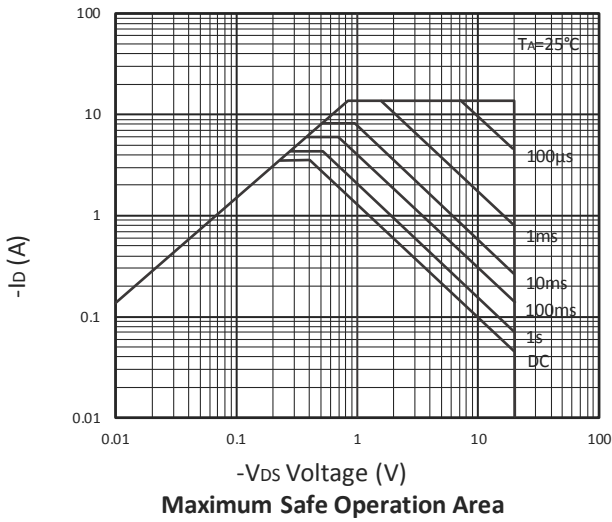
TYPICAL CHARACTERISTICS



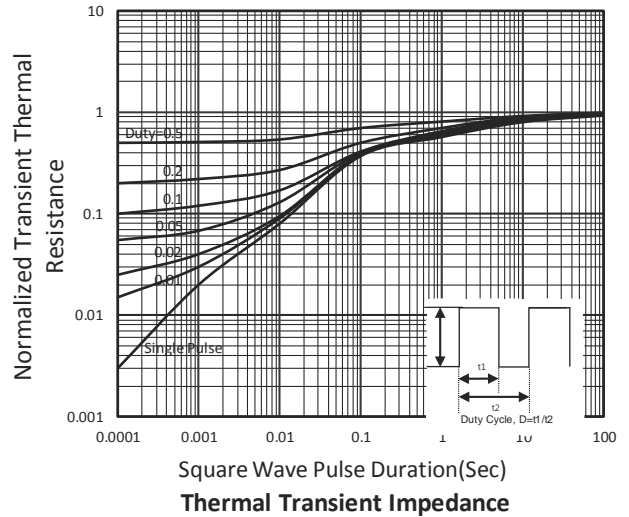
T_J-Junction Temperature(°C)
Gate Threshold Voltage



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

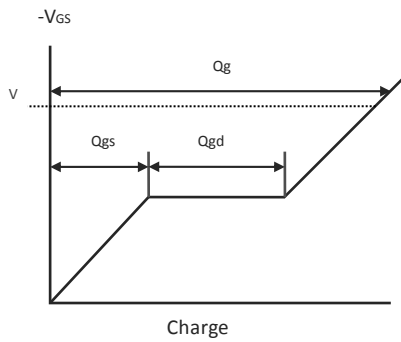


Maximum Safe Operation Area

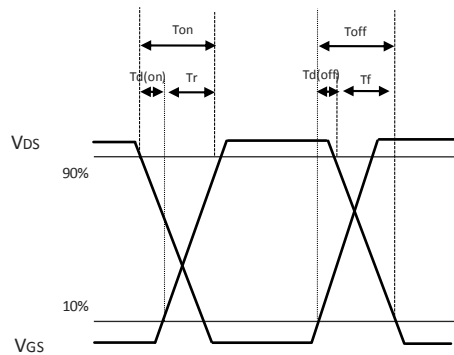


Square Wave Pulse Duration(Sec)

Thermal Transient Impedance

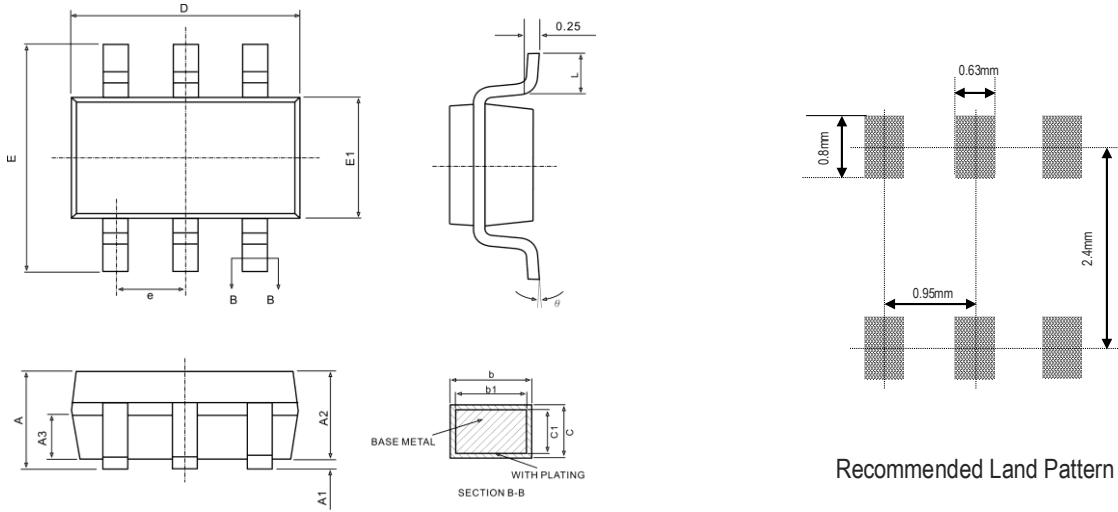


Gate Charge Waveform



Switching Time Waveform

■ 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°