SemTron Microtech Corporation

SMC4953AM

Dual P-Channel MOSFET

■DESCRIPTION

SMC4953A is the Dual P-Channel enhancement mode power field effect transistors are using trench DMOS technology.This advanced technology has been especially tailored to minimize on-state resistance.This device is ideal for load switch applications.

■FEATURES

V_{DS} = -30V, I_D = -5A

$R_{DS(ON)}$ =46mΩ(Typ.)@V_{GS} = -10V
$R_{DS(ON)}$ =65mΩ(Typ.)@V_{GS} = -4.5V

◆Fast switch
◆High power and current handling capability

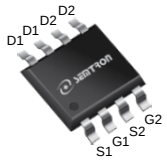
■PART NUMBER INFORMATION

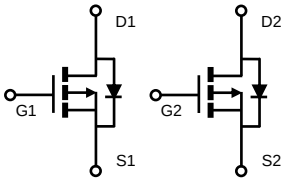
SMC 4953A M - TR G
a b c d e

a : Company name.
b : Product Serial number.
c : Package code M:SOP-8
d : Handling code TR:Tape&Reel
e : Green produce code G:*RoHS Compliant*

■APPLICATIONS

◆DC-DC Power System
◆Load Switch





SOP-8

■ABSOLUTE MAXIMUM RATINGS (T_A = 25°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	T_A=25°C	-5	A
		T_A=70°C	-4	A
I_{DM}	Pulsed Drain Current [A]		-20	A
P_D	Power Dissipation [B]	T_A=25°C	2	W
		T_A=70°C	1.3	W
T_J	Operation Junction Temperature		-55/150	°C
T_{STG}	Storage Temperature Range		-55/150	°C

■THERMAL RESISTANCE

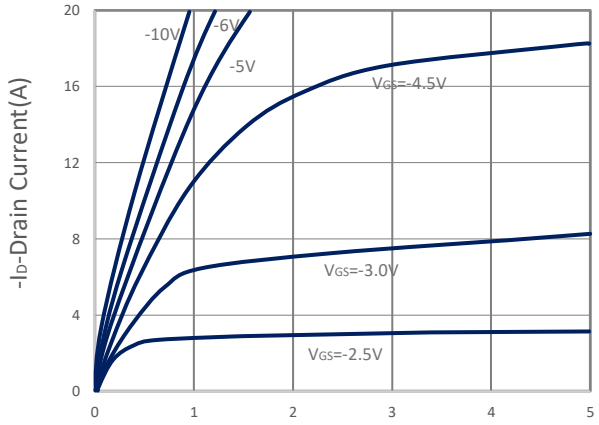
Symbol	Parameter		Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient [C]	t≦10s		62	°C/W
	Thermal Resistance Junction to Ambient [C]	Steady-State		110	
$R_{\theta JC}$	Thermal Resistance Junction to Case [C]			45	

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

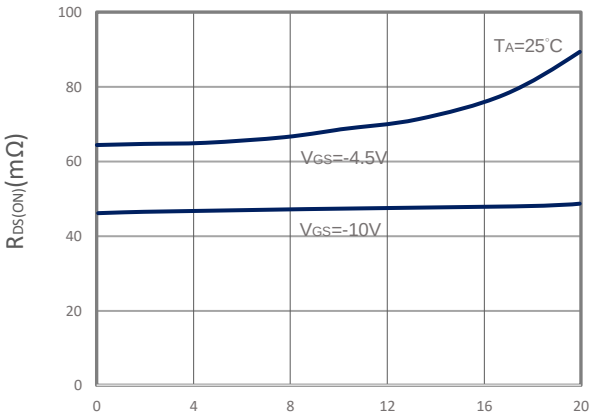
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} =0V,I_D =-250μA	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D =-250μA	-1	-1.6	-2.5	V
I_{GSS}	Gate Leakage Current	V_{DS} =0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =-30V,V_{GS} =0V T_J =25°C			-1	μA
		V_{DS} =-24V,V_{GS} =0V T_J =75°C			-10	
$R_{DS(ON)}$	Drain-source On-Resistance [D]	V_{GS} =-10V,I_D=-5A V_{GS} =-4.5V,I_D=-3.6A		46 65	52 75	mΩ
G_{fs}	Forward Transconductance	V_{DS} =-10V,I_D=-5A		8.7		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage[B]	I_S=-1A,V_{GS}=0V		-0.7	-1	V
I_S	Continuous Source Current				-2.5	A
Dynamic and Switching Parameters						
Q_g	Total Gate Charge (10V)	V_{DS} =-15V,V_{GS} =-10V I_D =-5A		10.8	15.1	nC
Q_g	Total Gate Charge (4.5V)			5.4	7.6	
Q_{gs}	Gate-Source Charge			2.1	2.9	
Q_{gd}	Gate-Drain Charge			1.8	1.4	
C_{iss}	Input Capacitance	V_{DS} =-15V,V_{GS} =0V f =1MHz		512	717	pF
C_{oss}	Output Capacitance			52	73	
C_{rss}	Reverse Transfer Capacitance			43	60	
$t_{d(on)}$	Turn-On Time [E]	V_{DD}=-15V, V_{GEN}=-10V, R_G=3.3Ω, I_D=-1A		7.5		nS
t_r				10		
$t_{d(off)}$	Turn-Off Time [E]			22		
t_f				6		

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
A.Pulse width limited by maximum junction temperature $T_{J(MAX)}$=150°C (initial temperature T_J=25°C).
B.The $T_{J(MAX)}$=150°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°C.
D. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%
E. Pulsed width limited by maximum junction temperature.
F. The E_{AS} data shows Max.

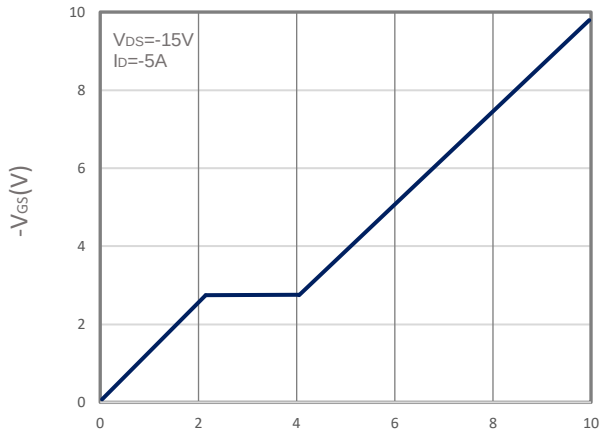
■ TYPICAL CHARACTERISTICS



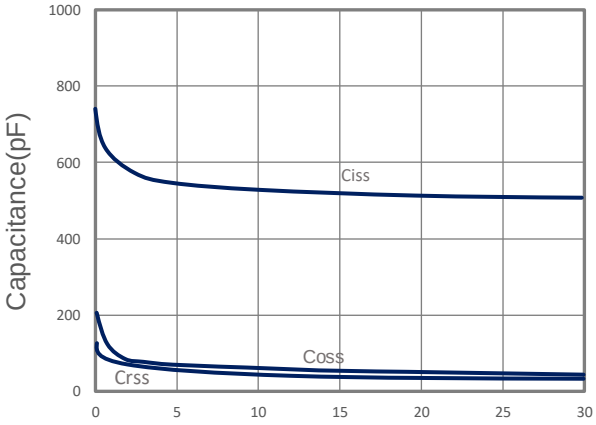
Output Characteristics



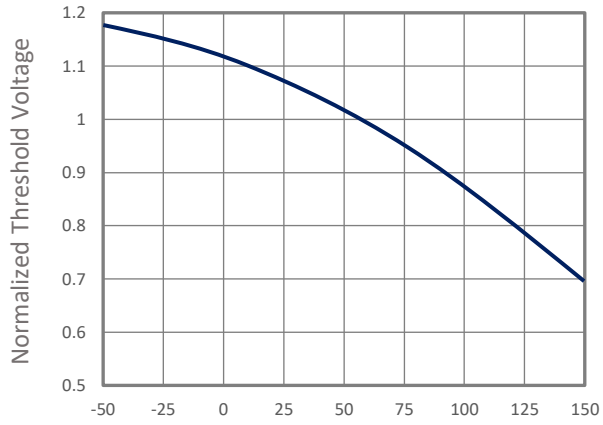
Drain-Source On Resistance



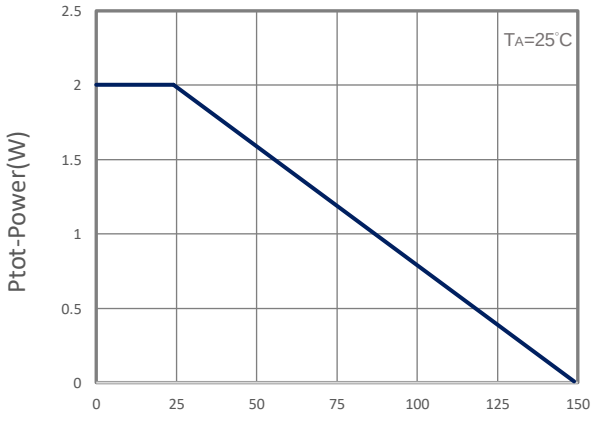
Gate Charge



Capacitance

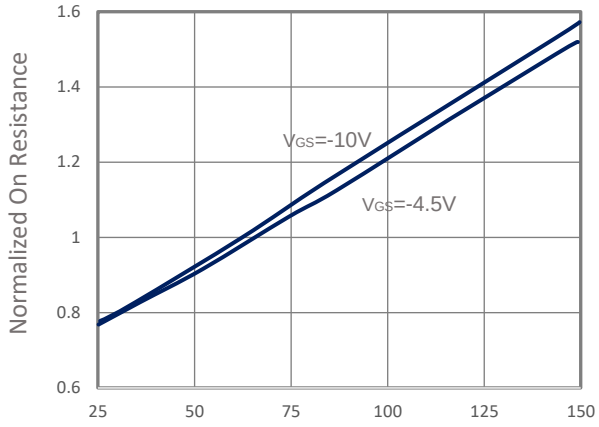


Gate Threshold Voltage

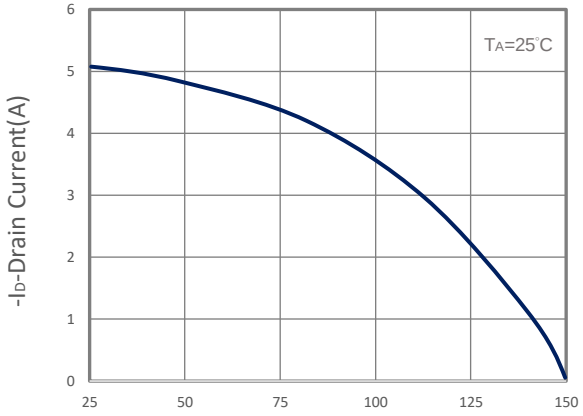


Power Dissipation

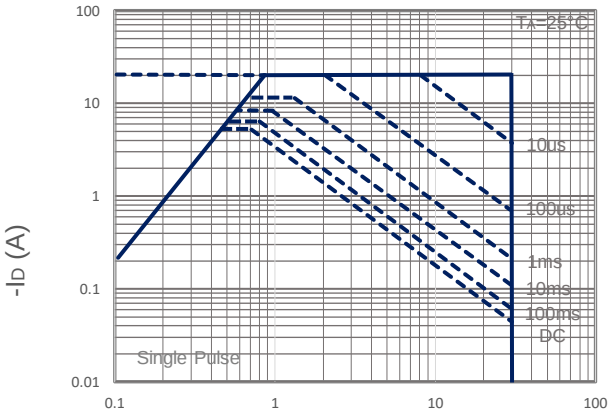
TYPICAL CHARACTERISTICS

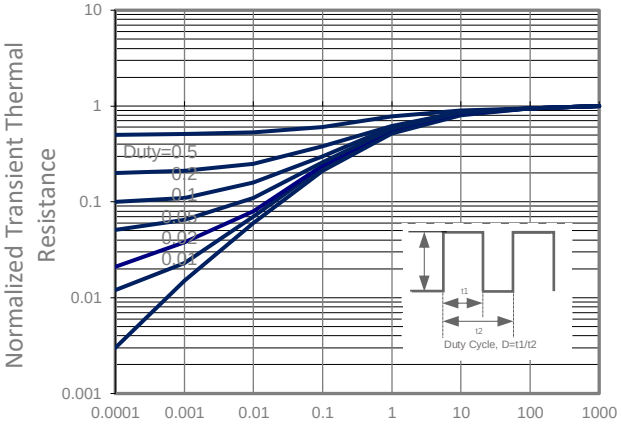


RDS(ON) vs Junction Temperature

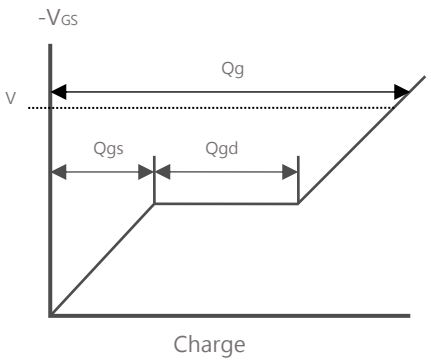


Drain Current vs TJ

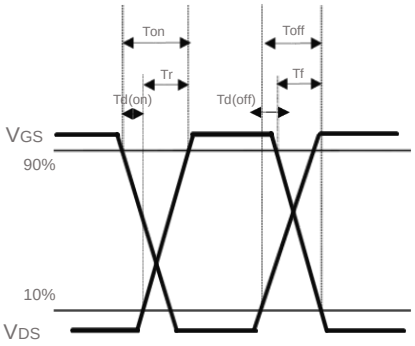




Thermal Transient Impedance

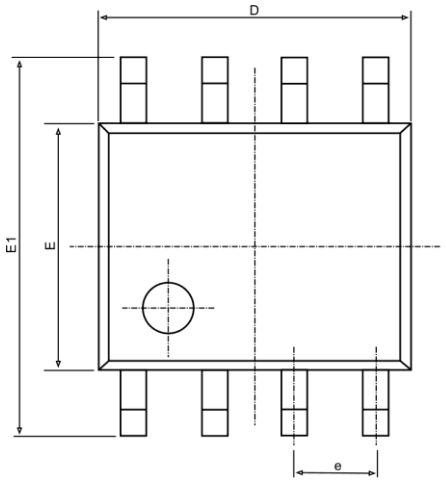


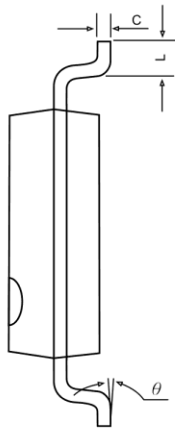
Gate Chrge Waveform

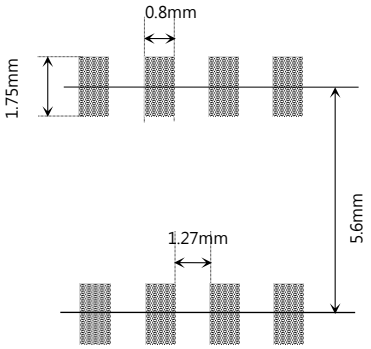


Switching Time Waveform

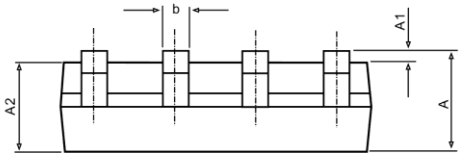
■SOP-8 PACKAGE DIMENSIONS







Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.040.	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.130	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270BSC.		0.050BSC.	
L	0.400	1.270	0.016	0.005
Θ	0°	8°	0°	8°