SemTron Microtech Corporation

SMC4931M

Dual P-Channel MOSFET

■DESCRIPTION

The SMC4931M uses trench MOSFET technology Provides extremely low $R_{DS(ON)}$, Low resistance package and excellent fast switching performance. This device is ideal for efficient and fast switching applications.

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■FEATURES

V_{DS}=-30V, I_D=-7A

$R_{DS(ON)}$=20mΩ(Typ.)@V_{GS}=-10V
$R_{DS(ON)}$=26mΩ(Typ.)@V_{GS}=-4.5V

◆100% EAS Guarantee
◆High power and current handling capability

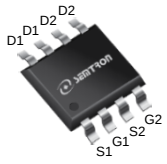
■PART NUMBER INFORMATION

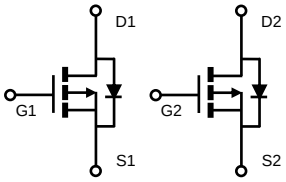
SMC 4931 M - TR G
a b c d e

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

◆High Frequency Point-of-Load Synchronous
◆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		±25	V
I_D	Continuous Drain Current	T_A=25°C	-7	A
		T_A=70°C	-5.6	A
I_{DM}	Pulsed Drain Current [B]		-28	A
I_{AS}	Avalanche Current [B]		-20	A
E_{AS}	Single Pulse Avalanche energy L=0.1mH [B]		20	mJ
P_D	Power Dissipation [A]	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 [A]	t≦10s		62	°C/W
	Thermal Resistance Junction to Ambient [AC]	Steady-State		90	

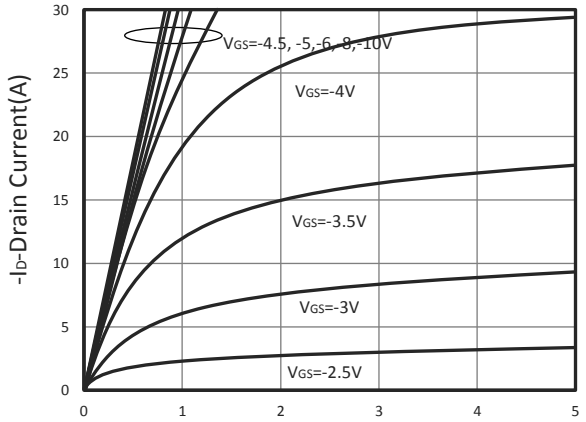
ELECTRICAL CHARACTERISTICS (T_A=25°C Unless otherwise noted)

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=-7A V_{GS}=-4.5V, I_D=-5.6A		20 26	25 32	mΩ
G_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-7A		12.5		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	I_S=-1A,V_{GS}=0V			-1	V
I_S	Diode Continuous Forward Current				-7	A
t_{rr}	Reverse Recovery Time	I_S=-7A, dI/dt=100A/μs		11		ns
Q_{rr}	Reverse Recovery Charge			5.8		nC
Dynamic and Switching Parameters [E]						
Q_g	Total Gate Charge	V_{DS}=-15V,V_{GS}=-10V, I_D=-7A		23.6	33	nC
Q_g	Total Gate Charge (4.5V)			11.5	16.1	
Q_{gs}	Gate-Source Charge			4.2	5.9	
Q_{gd}	Gate-Drain Charge			4.4	6.2	
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz		1280		pF
C_{oss}	Output Capacitance			175		
C_{rss}	Reverse Transfer Capacitance			125		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V, V_{GEN}=-10V, R_G=3.3Ω, I_D=-1A		6.1	12	nS
t_r				14	27	
$t_{d(off)}$	Turn-Off Time			34	65	
t_f				13.2	25	

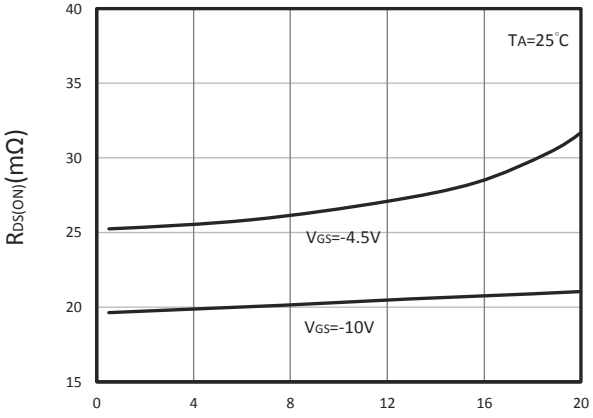
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Surface mounted on FR4 board using 1 in^2 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.

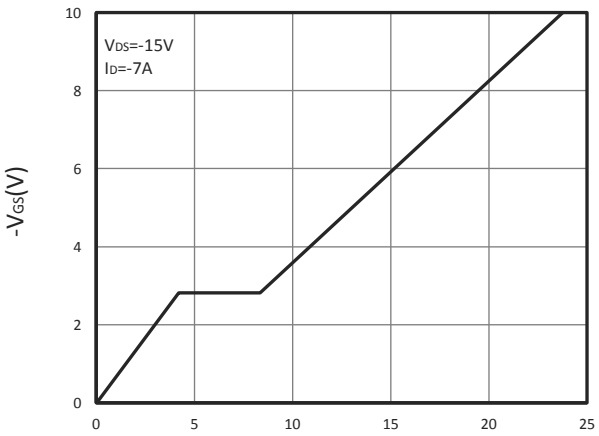
TYPICAL CHARACTERISTICS



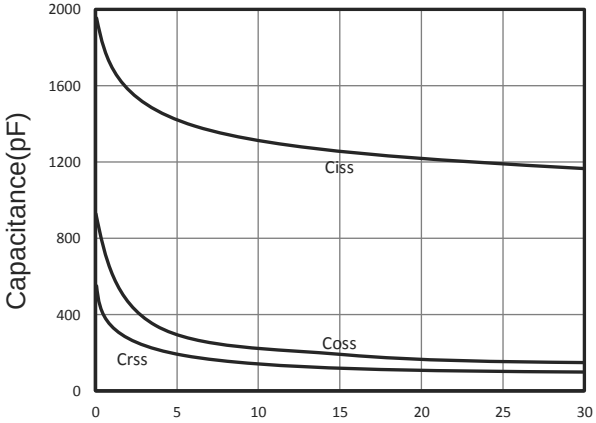
Output Characteristics



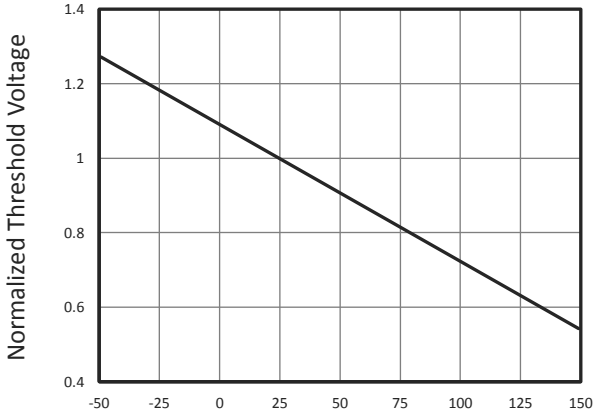
Drain-Source On Resistance



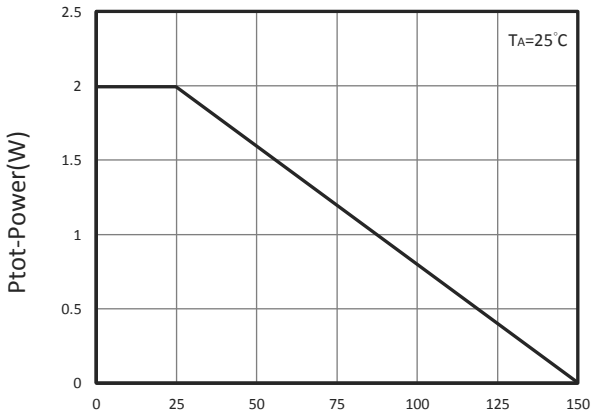
Gate Charge



Capacitance

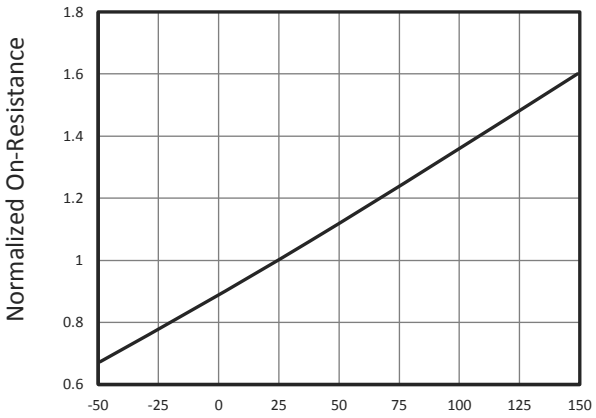


Gate Threshold Voltage



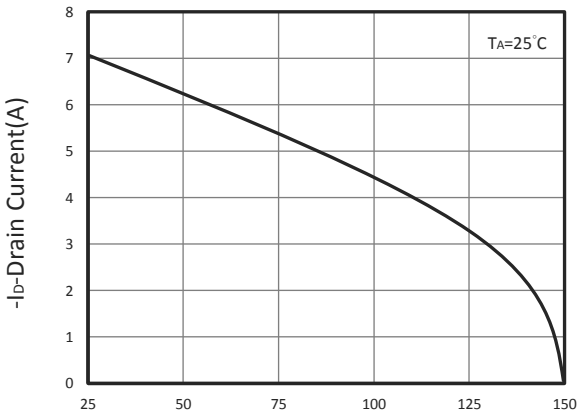
Power Dissipation

TYPICAL CHARACTERISTICS



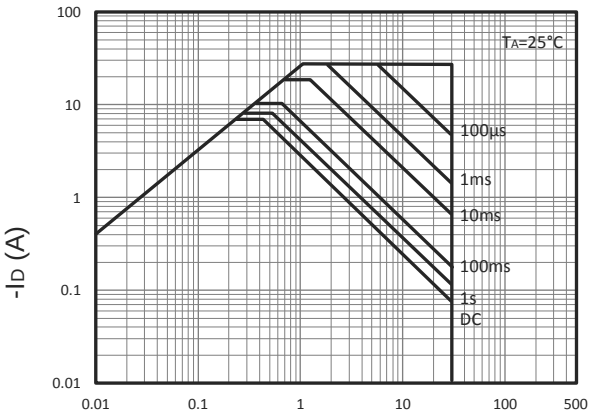
T_J-Junction Temperature(°C)

Drain-Source On Resistance



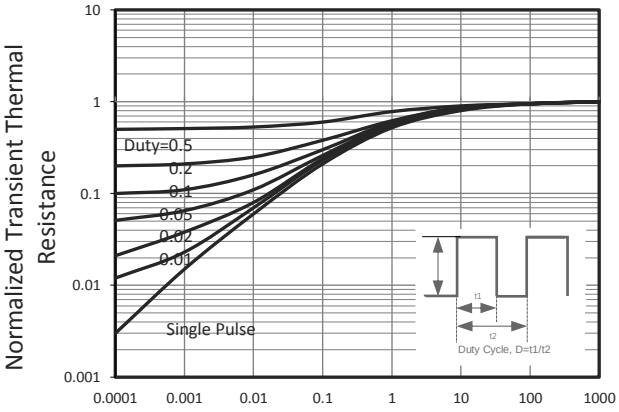
T_J-Junction Temperature(°C)

Drain Current vs T_J



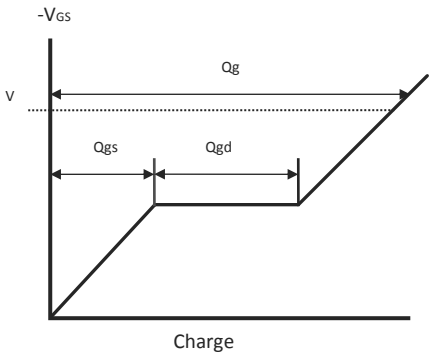
$-V_{DS}$ Voltage (V)

Maximum Safe Operation Area

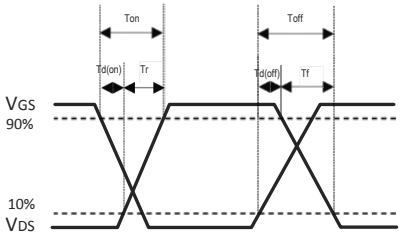


Square Wave Pulse Duration(Sec)

Thermal Transient Impedance

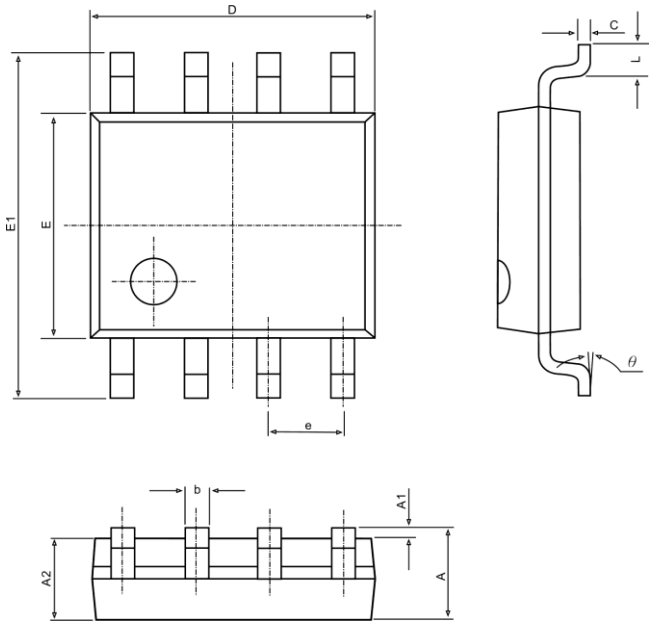


Gate Chrge Waveform

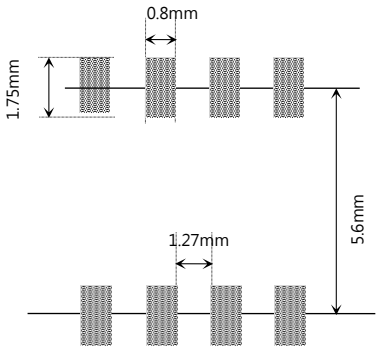


Switching Time Waveform

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	0.004	0.010
A2	1.300	1.500	0.051	0.059
b	0.390	0.490	0.015	0.019
c	0.200	0.250	0.008	0.010
D	4.800	5.100	0.189	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 BSC		0.050 BSC	
L	0.500	0.800	0.020	0.031
Θ	0°	8°	0°	8°