

Dual P-Channel MOSFET

DESCRIPTION

SMC4931 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.

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

FEATURES

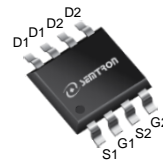
$V_{DS} = -30V$, $I_D = -7A$

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

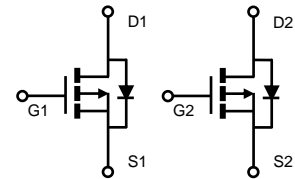
- ◆ 100% EAS Guarantee
- ◆ High power and current handling capability

APPLICATIONS

- ◆ High Frequency Point-of-Load Synchronous
- ◆ DC-DC Power System
- ◆ Load Switch



SOP-8



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	$T_A = 25^\circ C$	-7
		$T_A = 70^\circ C$	-5.6
I_{DM}	Pulsed Drain Current ^A	-28	A
I_{AS}	Avalanche Current ^A	-25	A
EAS	Single Pulse Avalanche energy $L=0.1mH$ ^{AE}	31	mJ
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	2
		$T_A = 70^\circ C$	1.3
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 ^B	$t \leq 10s$	62	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BC}	Steady-State	100	

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

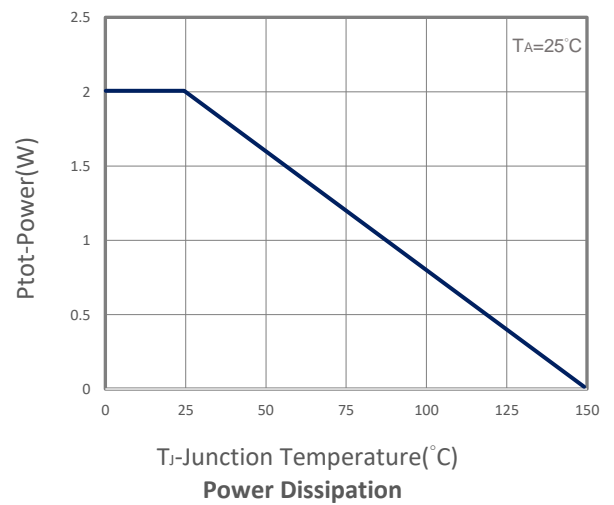
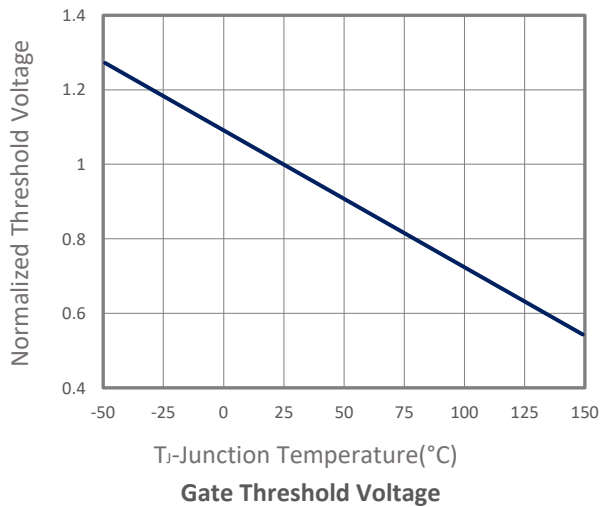
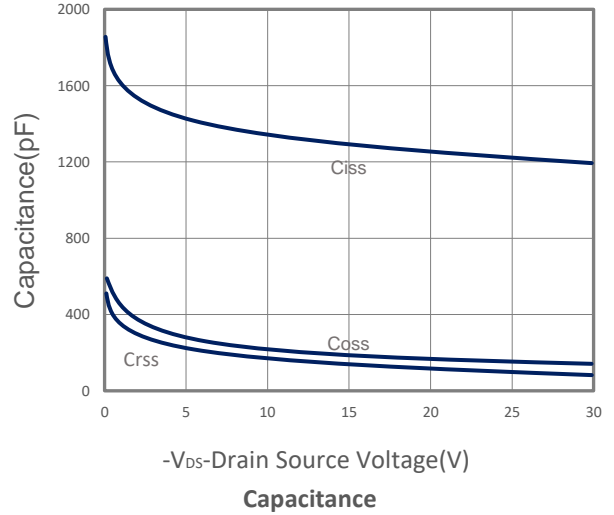
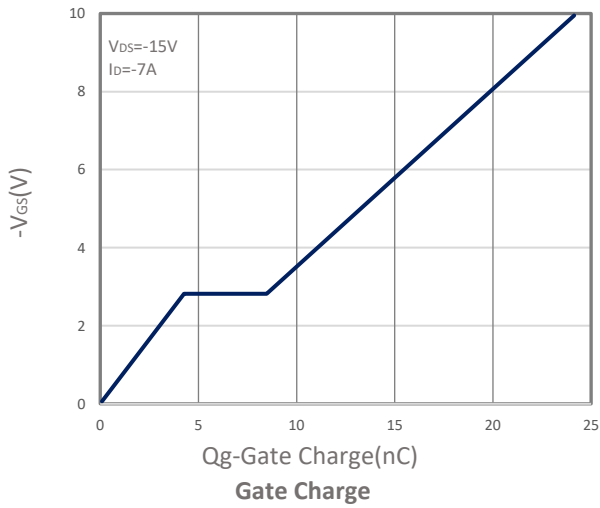
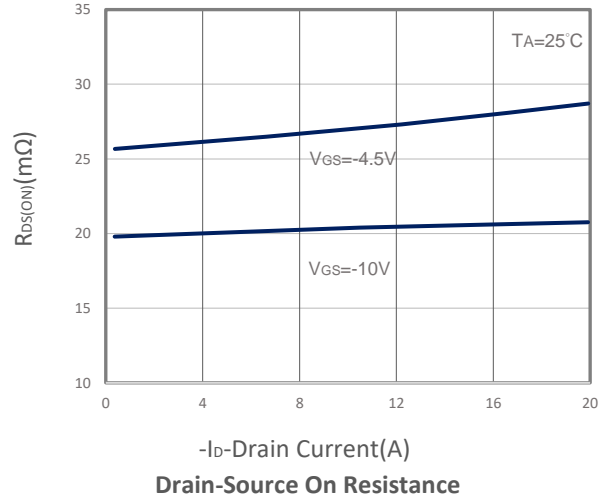
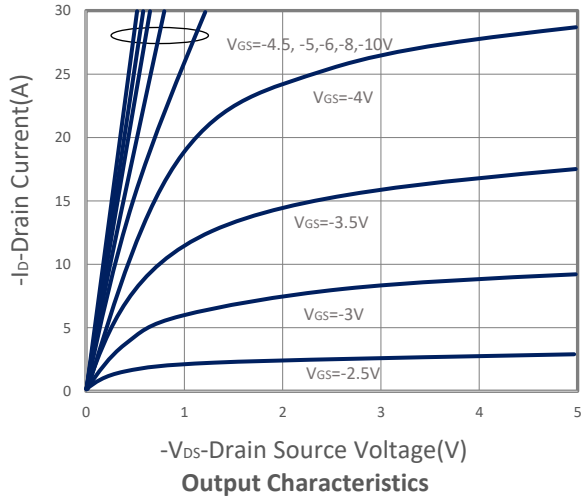
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250 μ A	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250 μ A	-1	-1.6	-2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 20V			\pm 100	nA
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 =-7A		20	25	m Ω
		V _{GS} =-4.5V, I _D =-5.6A		26	32	
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-7A		15.3		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =-1A, V _{GS} =0V		-0.7	-1	V
I _S	Continuous Source Current				-7	A
t _{rr}	Reverse Recovery Time	I _S =-7A, dI/dt=100A/ μ s		9		ns
Q _{rr}	Reverse Recovery Charge			3		nC
Dynamic and Switching Parameters						
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 =3.3 Ω , 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.

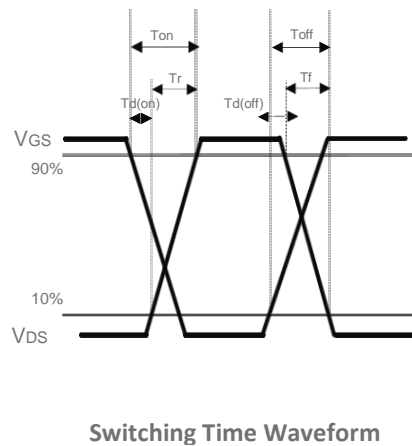
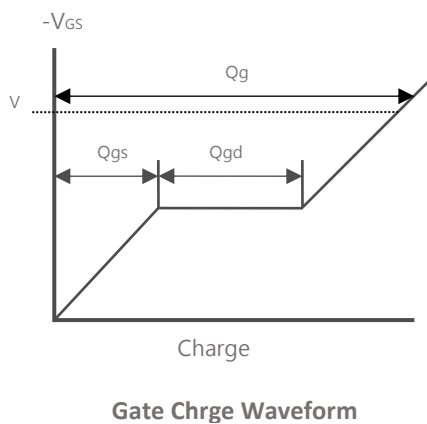
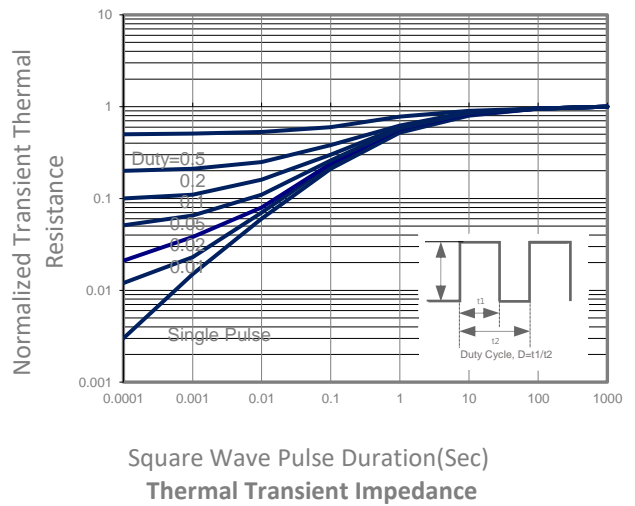
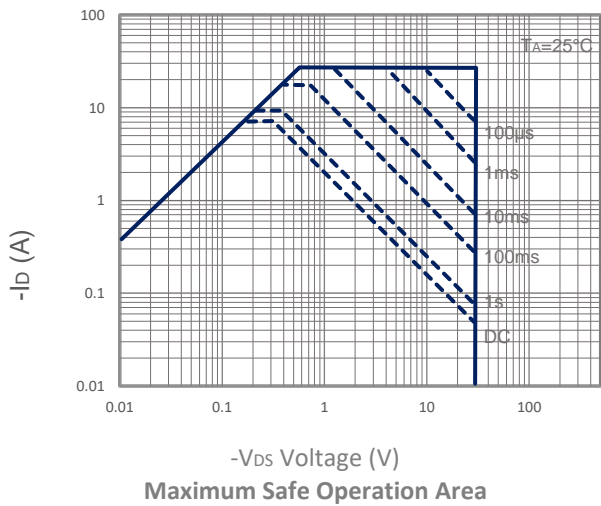
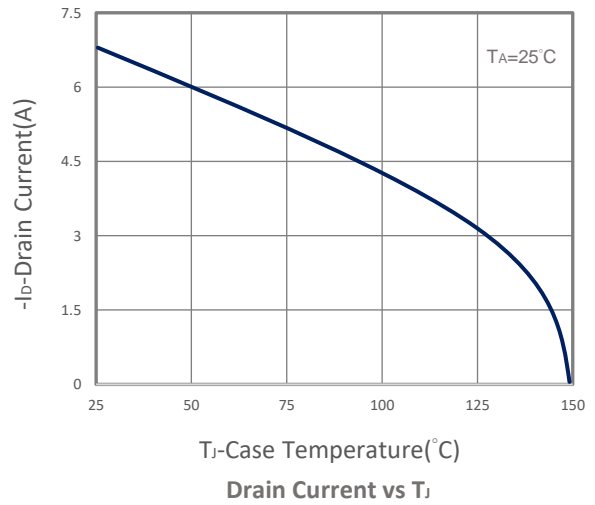
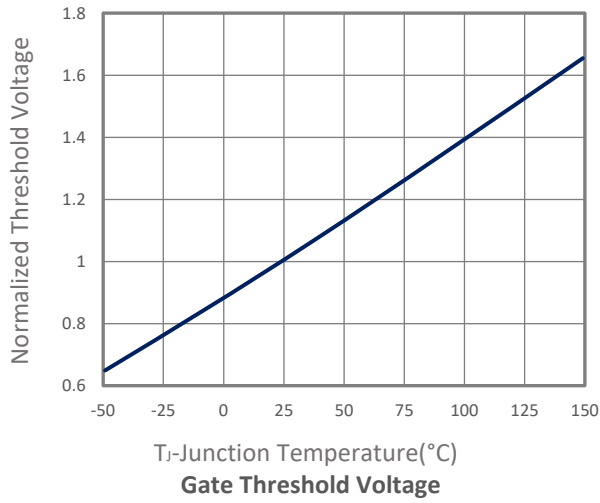
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^\circ$ C.
- The value of R _{θ JA} is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150 $^\circ$ C (initial temperature T_A=25 $^\circ$ C).
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-case thermal resistance (R _{θ JC}) is more useful in additional heat sinking is used.
- The data tested by pulsed, pulse width \leq 300 μ s, duty cycle \leq 2%.
- The EAS data shows Max, tested and pulse width limited by T_{J(MAX)}=150 $^\circ$ C (initial temperature T_J=25 $^\circ$ C).

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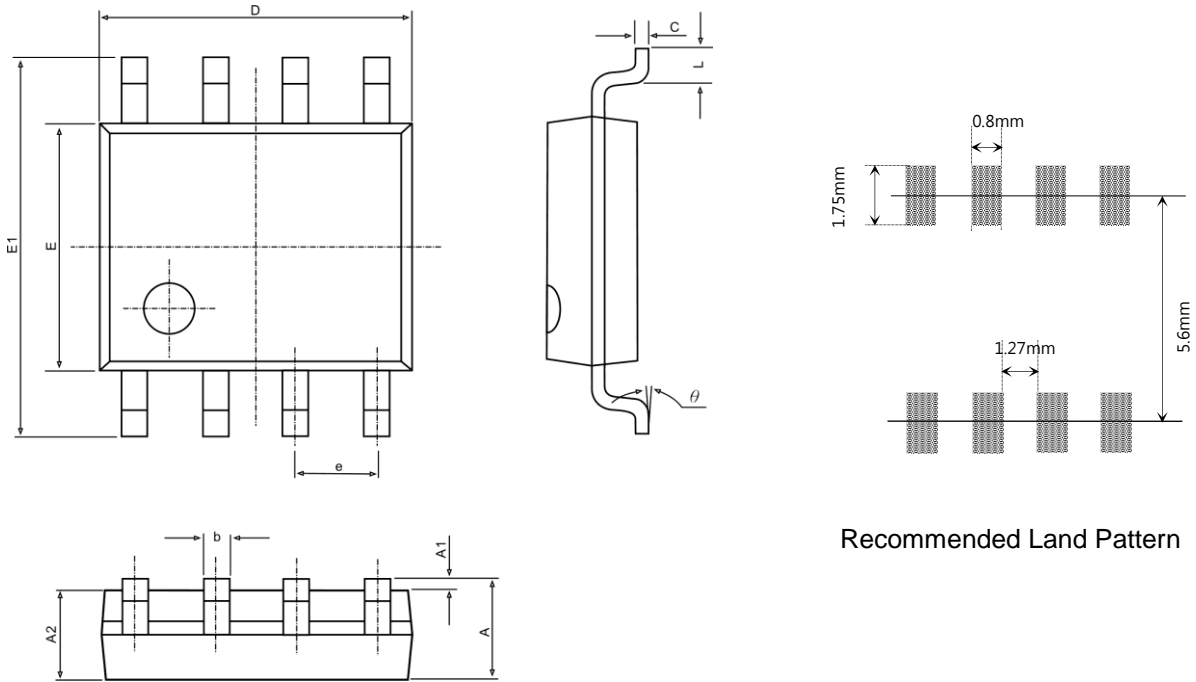
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



■ 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°