SemTron Microtech Corporation

SMC2869ESC

Single P-Channel MOSFET

■DESCRIPTION

SMC2869ESC used trench technology are well suited for high efficiency fast switching applications, this MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, this devices are well suited for applications in the small surface mount package.

■PART NUMBER INFORMATION

SMC	2869	E	SC	-	TR	G
a	b	c	d		e	f

a : Company name
b : Product Serial number
c : ESD Protection
d : Package code SC: SOT-523
e : Handling code TR: Tape&Reel
f : Green produce code G: *RoHS Compliant*

■FEATURES

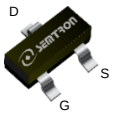
V_{DS}=-20V, I_D=-0.54A

$R_{DS(ON)}$=560mΩ(Typ.)@V_{GS}=-4.5V
$R_{DS(ON)}$=740mΩ(Typ.)@V_{GS}=-2.5V
$R_{DS(ON)}$=1000mΩ(Typ.)@V_{GS}=-1.8V
$R_{DS(ON)}$=1400mΩ(Typ.)@V_{GS}=-1.5V

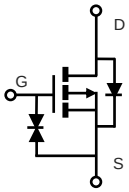
◆High-speed switching, Low On-resistance
◆1.5V Low gate drive
◆ESD protected

■APPLICATIONS

◆Load switch application for portable



SOT-523



■ABSOLUTE MAXIMUM RATINGS (T_A=25°C Unless otherwise noted)

Symbol	Parameter		Rating	Units
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		±8	V
I_D	Continuous Drain Current [A]	T_A=25°C	-0.54	A
		T_A=70°C	-0.43	A
I_{DM}	Pulsed Drain Current [B]		-1.8	A
P_D	Power Dissipation [A]	T_A=25°C	0.3	W
		T_A=70°C	0.19	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 [AC]	Steady-State		415	°C/W

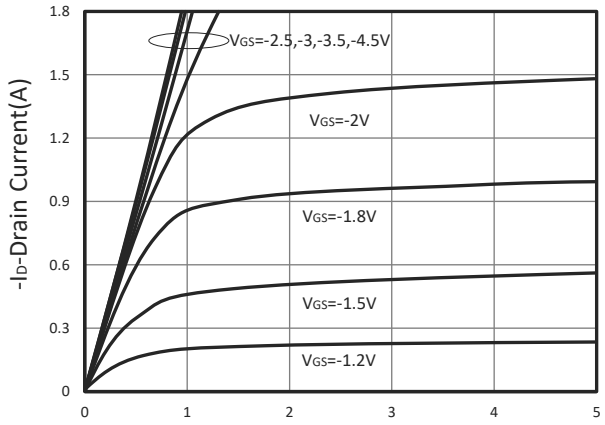
ELECTRICAL CHARACTERISTICS (T_A=25°C Unless otherwise noted)

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}=±8V			±10	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-20V, V_{GS}=0V, T_J=25°C			-1	μA
		V_{DS}=-12V, V_{GS}=0V, T_J=85°C			-10	
$R_{DS(ON)}$	Drain-source On-Resistance [D]	V_{GS}=-4.5V, I_D=-0.54A V_{GS}=-2.5V, I_D=-0.3A V_{GS}=-1.8V, I_D=-0.2A V_{GS}=-1.5V, I_D=-0.1A		560 740 1000 1400	680 900 1300 1800	Ω
G_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-0.5A		1		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	I_S=-0.2A, V_{GS}=0V			-1	V
I_S	Diode Continuous Forward Current [A]				-0.32	A
t_{rr}	Reverse Recovery Time	I_S=-0.5A, dI/dt=100A/μs		9		ns
Q_{rr}	Reverse Recovery Charge			0.7		nC
Dynamic and Switching Parameters [E]						
Q_g	Total Gate Charge	V_{DS}=-10V, V_{GS}=-4.5V I_D=-0.5A		0.8		nC
Q_{gs}	Gate-Source Charge			0.17		
Q_{gd}	Gate-Drain Charge			0.19		
C_{iss}	Input Capacitance	V_{DS}=-10V, V_{GS}=0V, f=1MHz		55		pF
C_{oss}	Output Capacitance			5.6		
C_{rss}	Reverse Transfer Capacitance			4.6		
$t_{d(on)}$	Turn-On Time	V_{DD}=-10V, V_{GS}=-4.5V R_G=3Ω, I_D=-0.5A		4.6	9	nS
t_r				6.2	12	
$t_{d(off)}$	Turn-Off Time			16	30	
t_f				25	48	

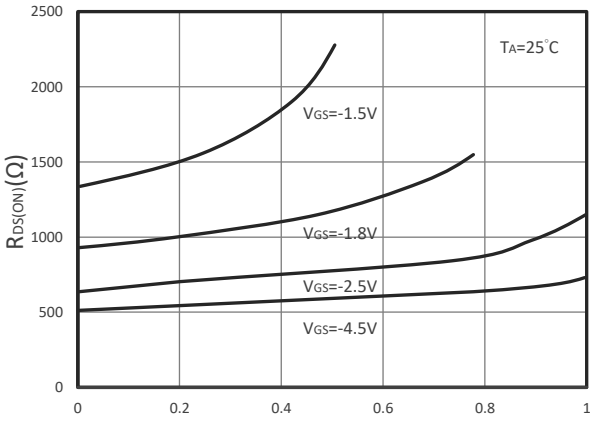
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Surface mounted on FR4 board using 1 in^2 pad size.
B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°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.

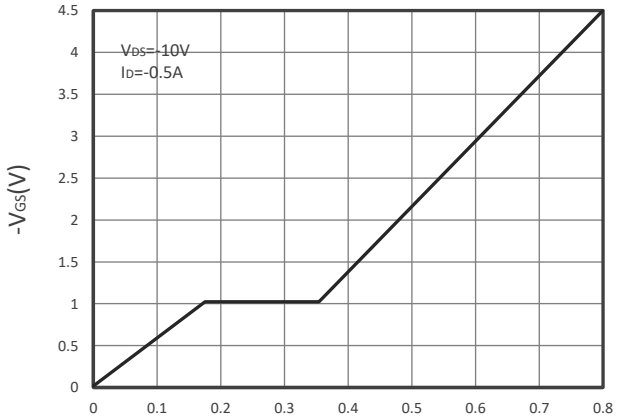
TYPICAL CHARACTERISTICS



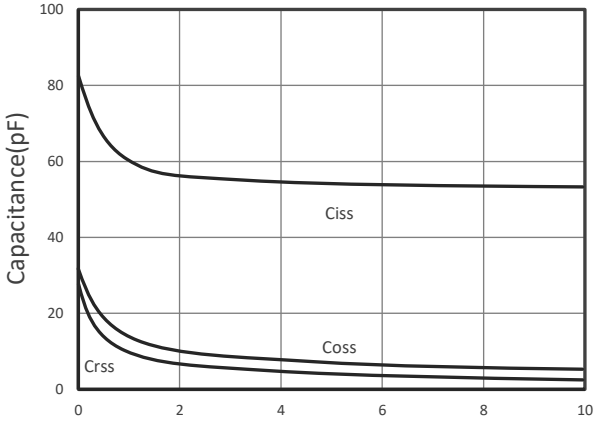
Output Characteristics



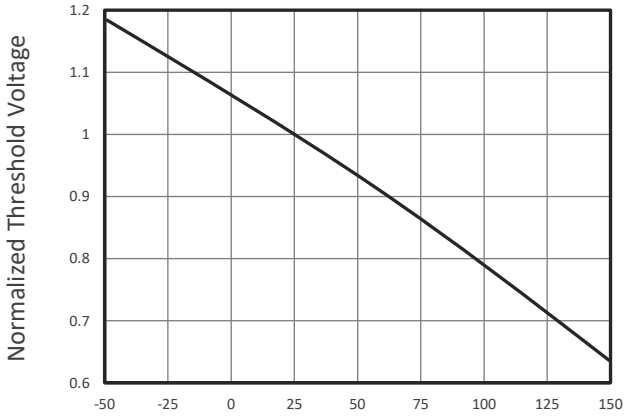
Drain-Source On Resistance



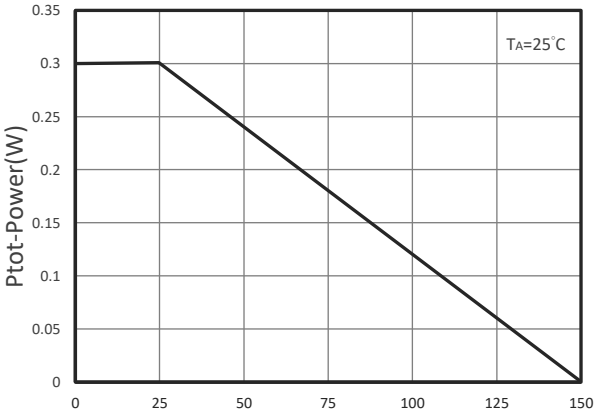
Gate Charge



Capacitance

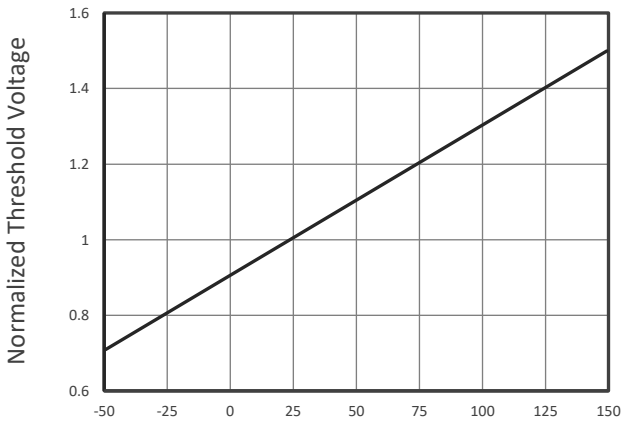


Gate Threshold Voltage



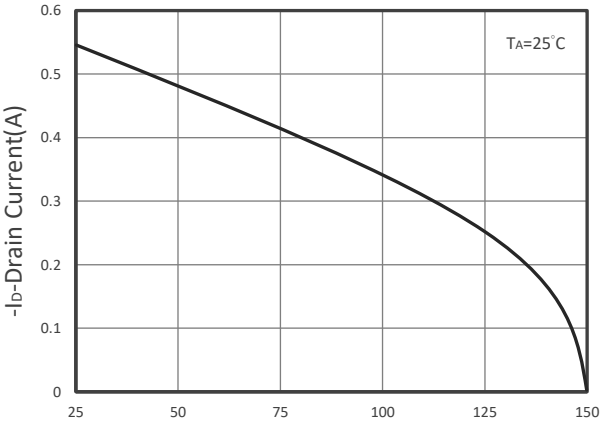
Power Dissipation

TYPICAL CHARACTERISTICS



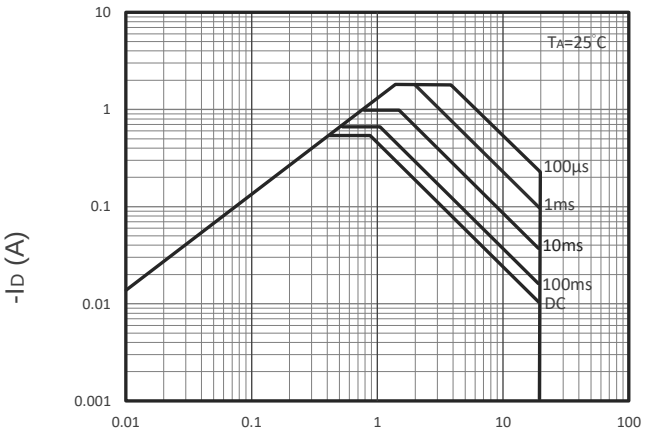
TJ-Junction Temperature(°C)

Gate Threshold Voltage



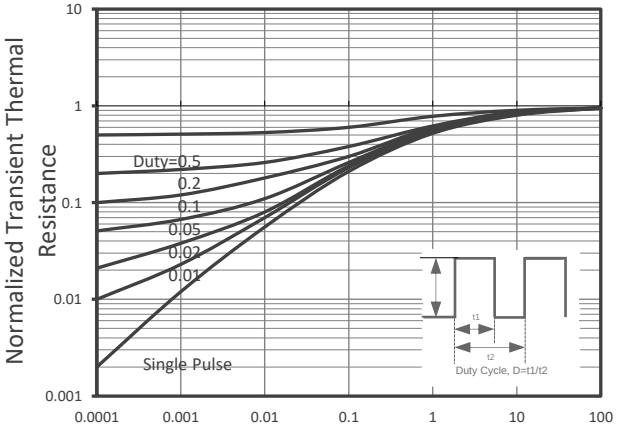
TJ-Junction Temperature(°C)

Drain Current vs TJ



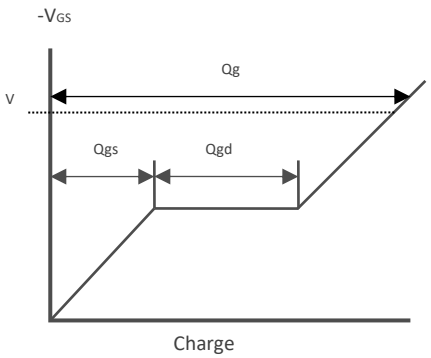
-VDS Voltage (V)

Maximum Safe Operation Area

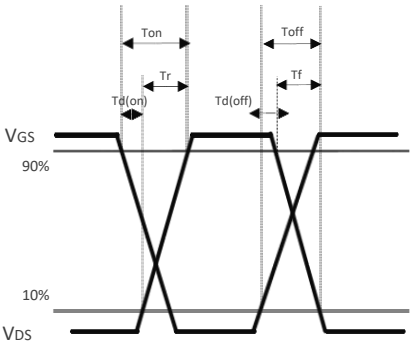


Square Wave Pulse Duration(Sec)

Thermal Transient Impedance

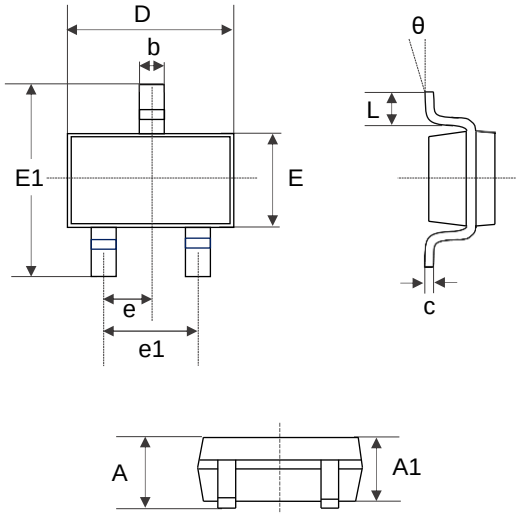


Gate Chrge Waveform

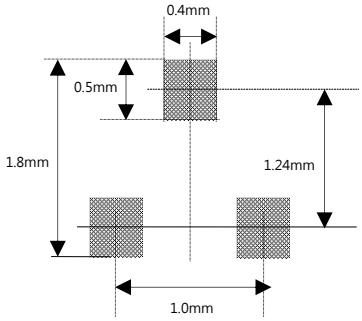


Switching Time Waveform

SOT-523 PACKAGE DIMENSIONS



Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP..	
e1	0.900	1.100	0.035	0.043
L	0.100	0.30	0.004	0.012
Θ	0°	8°	0°	8°