

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

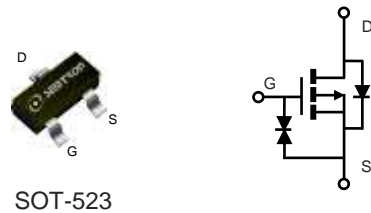
$V_{DS}=-20V$, $I_D=-0.54A$

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

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

APPLICATIONS

- ◆ Load switch application for portable



ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}C$ 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	$T_A=25^{\circ}C$	-0.54
		$T_A=70^{\circ}C$	-0.43
I_{DM}	Pulsed Drain Current ^B	-1.8	A
P_D	Power Dissipation ^A	$T_A=25^{\circ}C$	0.3
		$T_A=70^{\circ}C$	0.19
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 ^{AC}		415	$^{\circ}C/W$
	Steady-State			

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

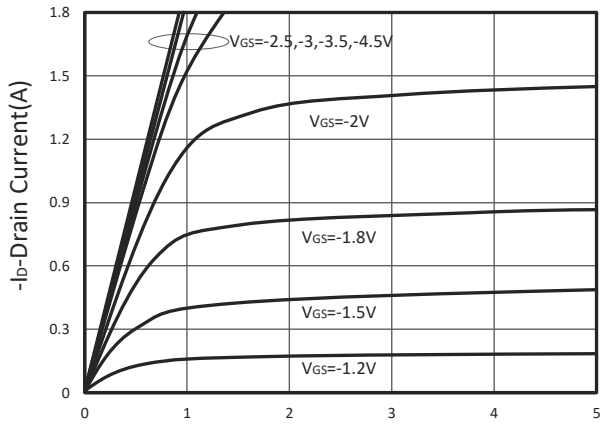
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.7	-1	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 8V$			± 10	μA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ C$			1	μA
		$V_{DS}=-12V, V_{GS}=0V, T_J=85^\circ C$			-10	
$R_{DS(on)}$	Drain-source On-Resistance ^D	$V_{GS}=-4.5V, I_D=-0.54A$		560	680	m Ω
		$V_{GS}=-2.5V, I_D=-0.3A$		740	900	
		$V_{GS}=-1.8V, I_D=-0.2A$		1000	1300	
		$V_{GS}=-1.5V, I_D=-0.1A$		1400	1800	
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				-0.32	A
t_{rr}	Reverse Recovery Time	$I_S=-0.5A, di/dt=100A/\mu s$		9		ns
Q_{rr}	Reverse Recovery Charge			0.7		nC
Dynamic and Switching Parameters ^F						
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	$V_{DD}=-10V, V_{GS}=-4.5V$ $R_G=3\Omega, I_D=-0.5A$		4.6	9	nS
t_r				6.2	12	
$t_{d(off)}$	Turn-Off Time	$V_{DD}=-10V, V_{GS}=-4.5V$ $R_G=3\Omega, I_D=-0.5A$		16	30	
t_f				25	48	

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

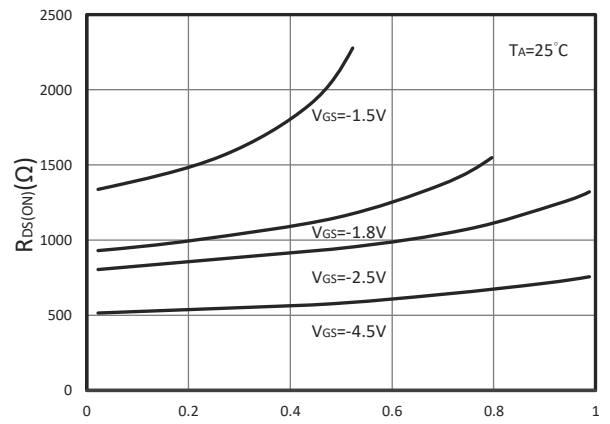
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ C$ (initial temperature $T_J=25^\circ C$).
- C. Using $\leq 10s$ junction-to-ambient thermal resistance is base on $T_{J(MAX)}=150^\circ C$.
- D. Pulse test width $\leq 300\mu s$ and duty cycle $\leq 2\%$.
- E. The EAS data shows maximum, The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=45A$
- F. Guaranteed by design, not subject to production testing.

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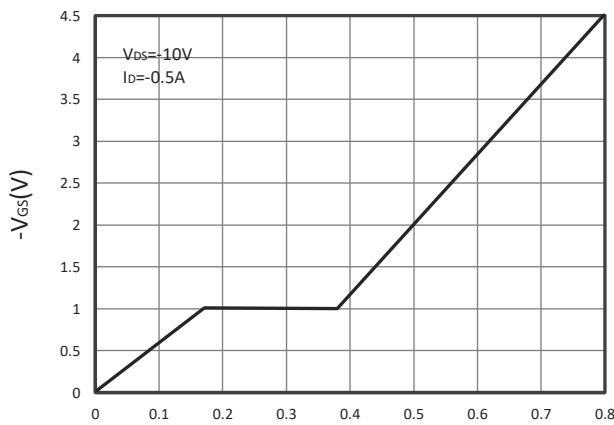
TYPICAL CHARACTERISTICS



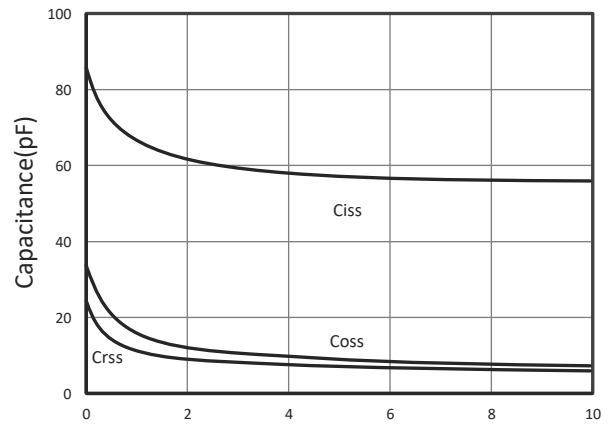
$-V_{DS}$ -Drain Source Voltage(V)
Output Characteristics



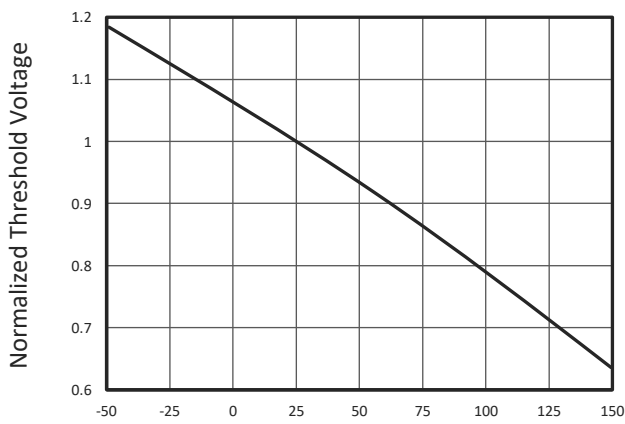
$-I_D$ -Drain Current(A)
Drain-Source On Resistance



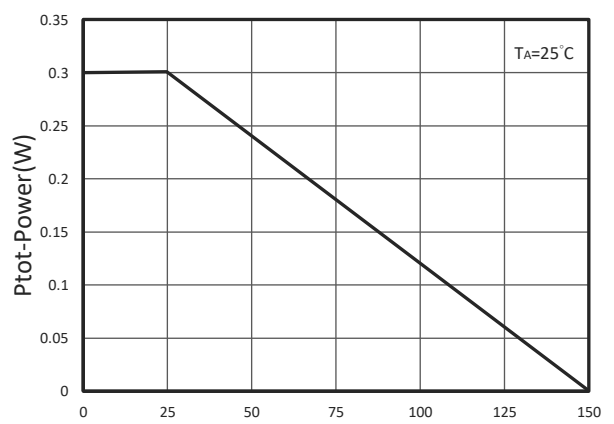
Q_g -Gate Charge(nC)
Gate Charge



$-V_{DS}$ -Drain Source Voltage(V)
Capacitance

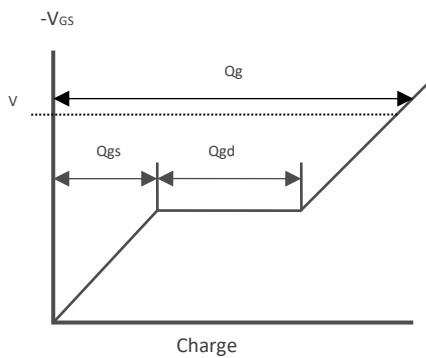
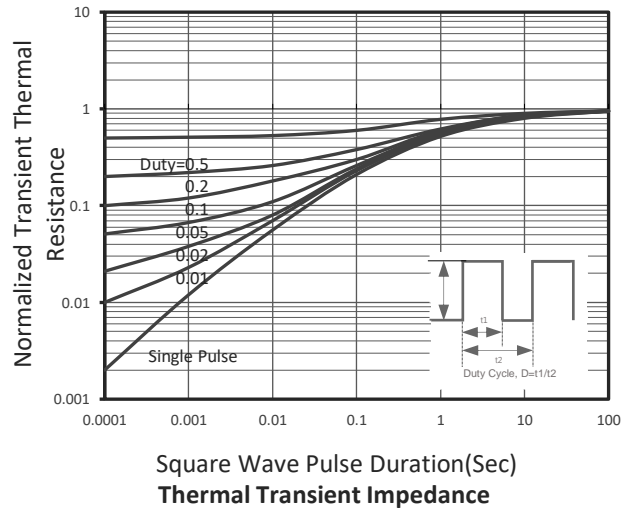
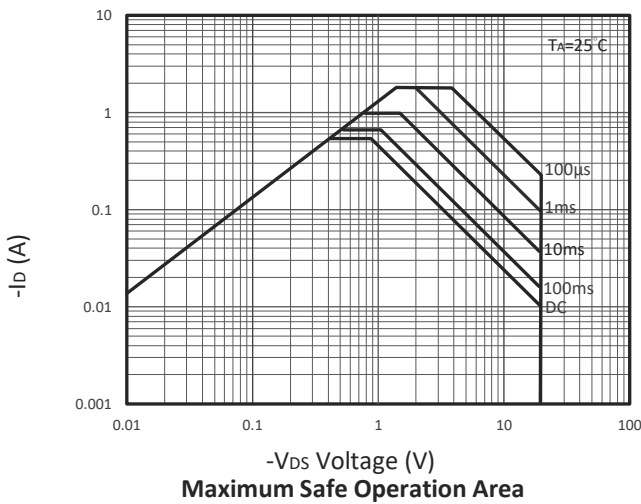
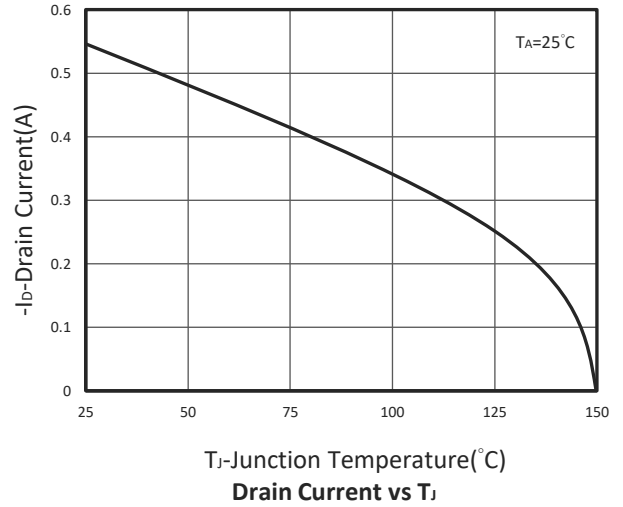
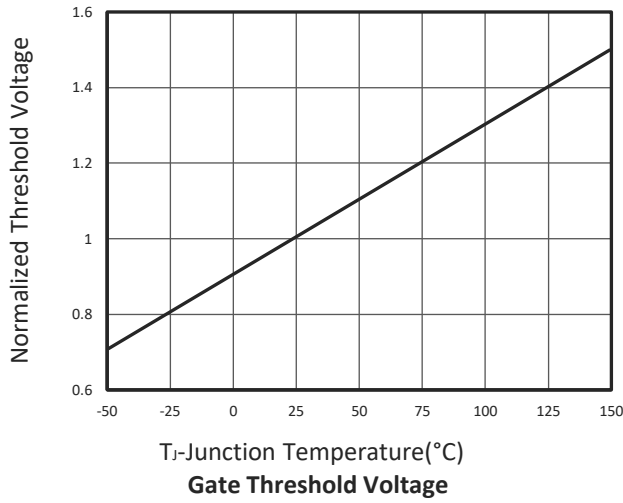


T_J -Junction Temperature($^\circ\text{C}$)
Gate Threshold Voltage

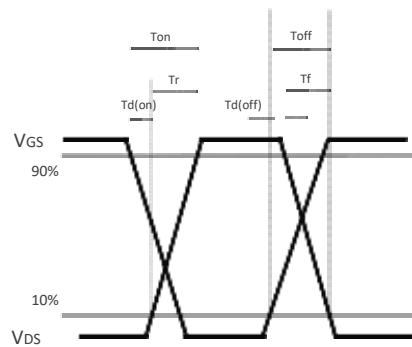


T_J -Junction Temperature($^\circ\text{C}$)
Power Dissipation

TYPICAL CHARACTERISTICS

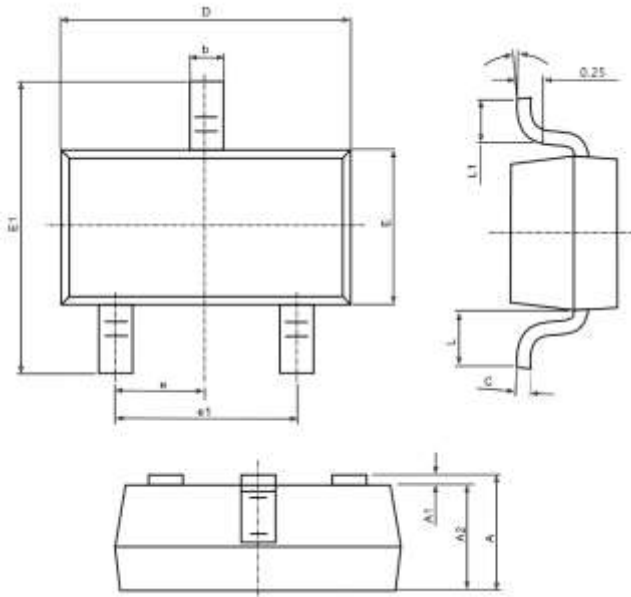


Gate Charge Waveform

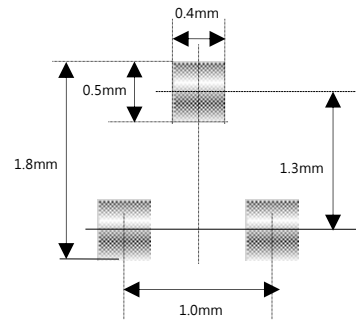


Switching Time Waveform

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	0.000	0.100	0.000	0.004
A2	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	1.750	0.059	0.069
E	0.700	0.900	0.028	0.035
E1	1.400	1.750	0.055	0.069
e	0.500 TYP.		0.020 TYP..	
e1	0.900	1.100	0.035	0.043
L	0.300	0.460	0.012	0.018
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°