

DESCRIPTION

SMC2868ESC 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 2868 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

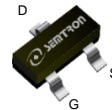
$V_{DS}=20V, I_D=0.83A$

- $R_{DS(ON)}=200m\Omega(Typ.)@V_{GS}=4.5V$
- $R_{DS(ON)}=245m\Omega(Typ.)@V_{GS}=2.5V$
- $R_{DS(ON)}=310m\Omega(Typ.)@V_{GS}=1.8V$
- $R_{DS(ON)}=380m\Omega(Typ.)@V_{GS}=1.5V$
- $R_{DS(ON)}=680m\Omega(Typ.)@V_{GS}=1.2V$

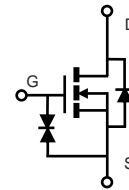
- ◆ High-speed switching, Low On-resistance
- ◆ 1.2V Low gate drive
- ◆ ESD protected

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Switching application



SOT-523



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 ^A	$T_A=25^{\circ}C$	0.83
		$T_A=70^{\circ}C$	0.67
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)

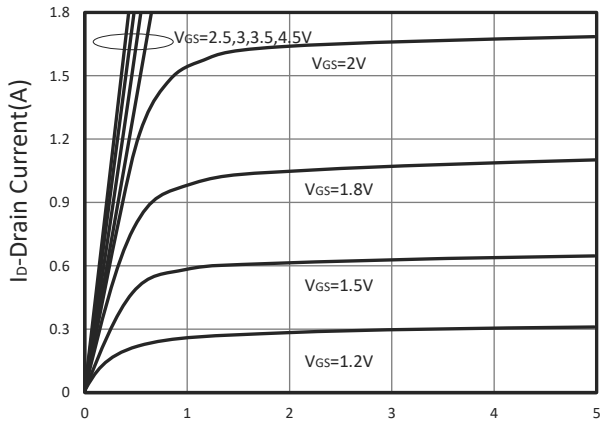
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.3	0.6	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±8V			±10	μA
I _{DSS}	Zero Gate 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 =0.83A		200	270	Ω
		V _{GS} =2.5V, I _D =0.5A		245	380	
		V _{GS} =1.8V, I _D =0.3A		310	500	
		V _{GS} =1.5V, I _D =0.2A		380	600	
		V _{GS} =1.2V, I _D =0.1A		680	1000	
G _{fs}	Forward Transconductance	V _{DS} =5V, I _D =0.5A		1.7		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				0.42	A
t _{rr}	Reverse Recovery Time	I _S =0.5A, di/dt=100A/μs		8.8		ns
Q _{rr}	Reverse Recovery Charge			0.8		nC
Dynamic and Switching Parameters^E						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V I _D =0.5A		0.97		nC
Q _{gs}	Gate-Source Charge			0.28		
Q _{gd}	Gate-Drain Charge			0.12		
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		42		pF
C _{oss}	Output Capacitance			9		
C _{rss}	Reverse Transfer Capacitance			6		
t _{d(on)}	Turn-On Time	V _{DD} =10V, V _{GS} =4.5V R _G =6Ω, I _D =0.5A		6	11	nS
t _r				3.8	7	
t _{d(off)}	Turn-Off Time			14	23	
t _f				15	29	

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

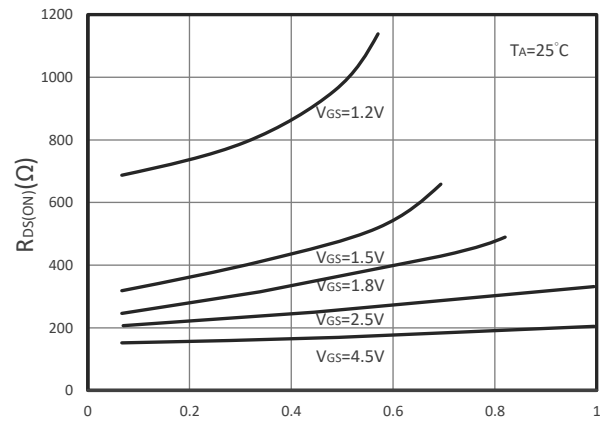
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. Guaranteed by design, not subject to production testing.

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date. We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this datasheet.

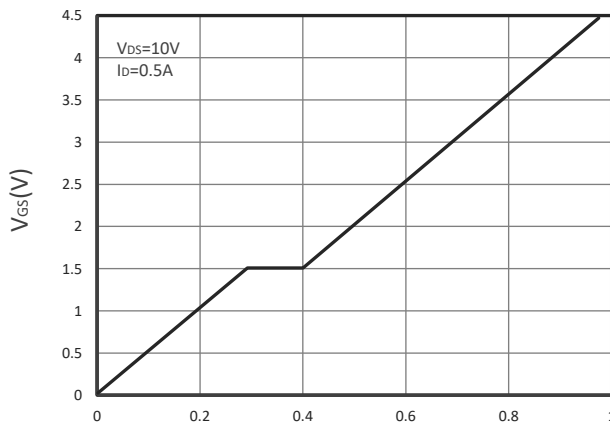
TYPICAL CHARACTERISTICS



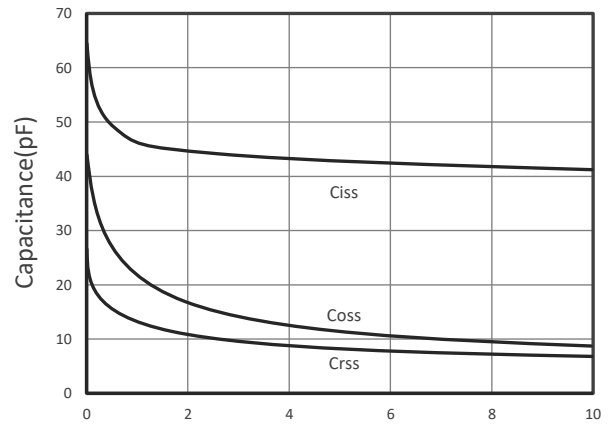
Output Characteristics



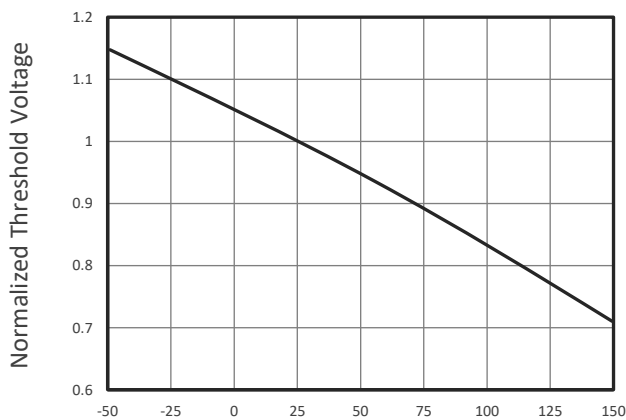
Drain-Source On Resistance



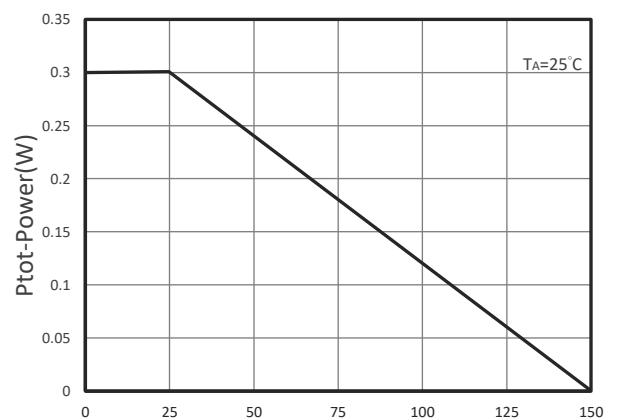
Gate Charge



Capacitance

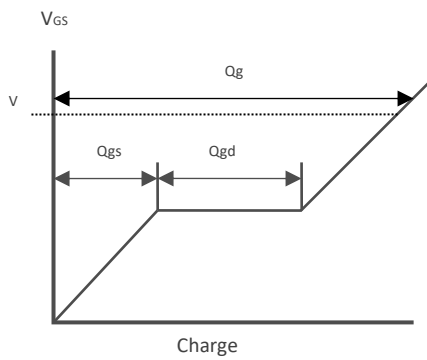
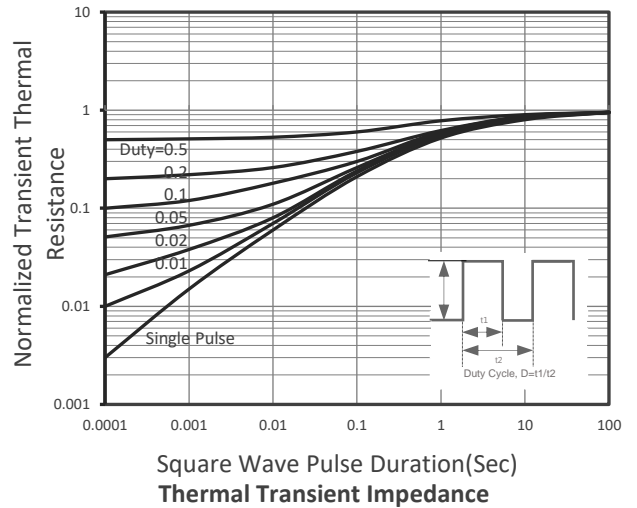
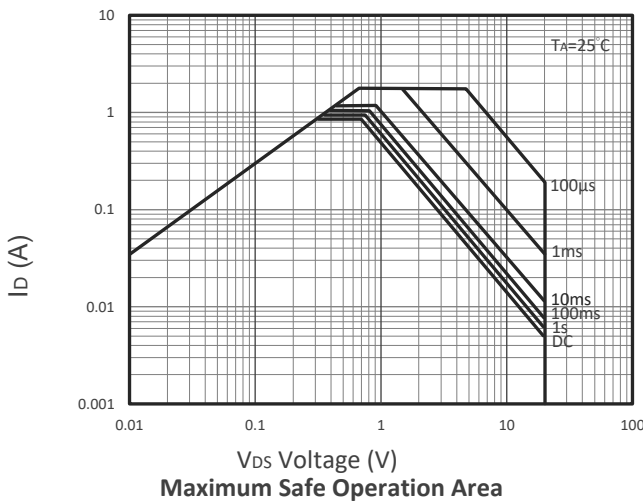
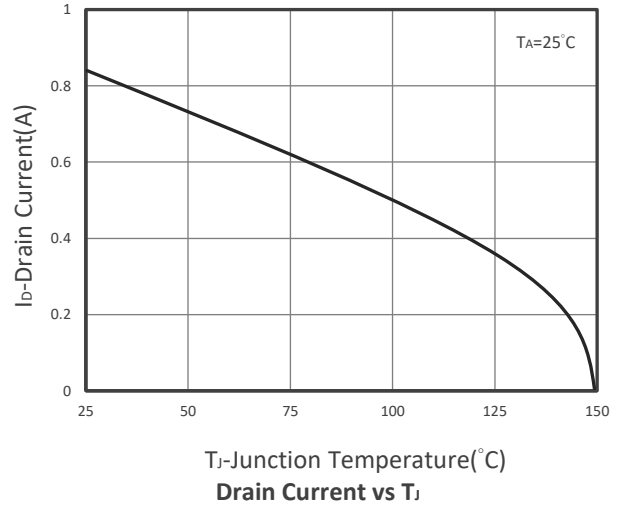
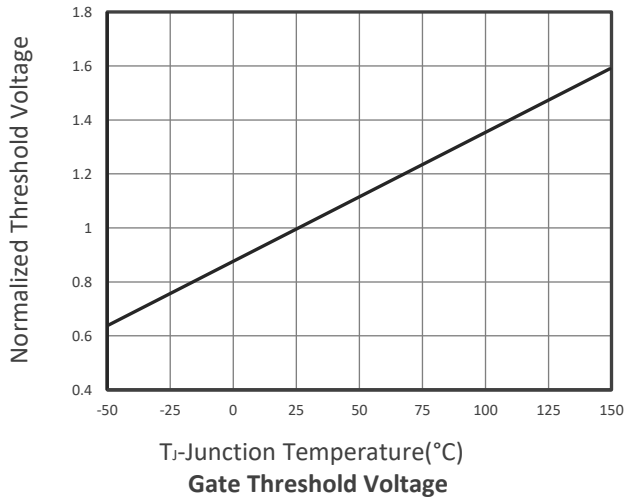


Gate Threshold Voltage

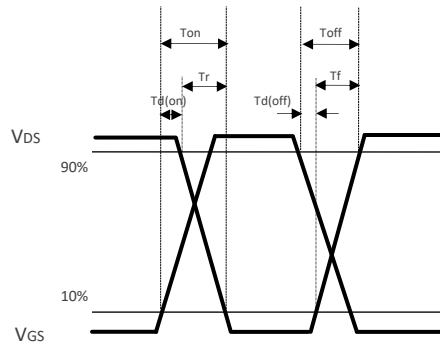


Power Dissipation

TYPICAL CHARACTERISTICS

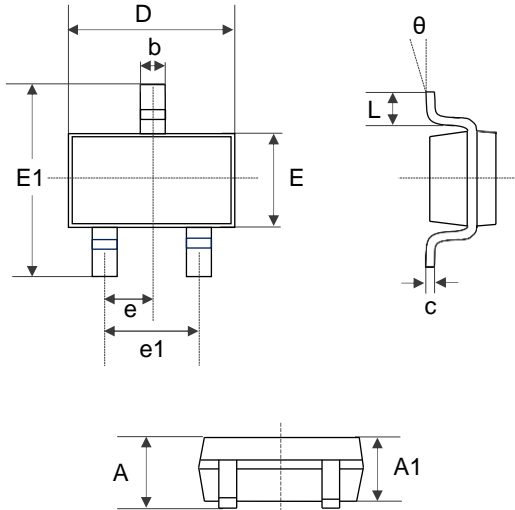


Gate Charge Waveform

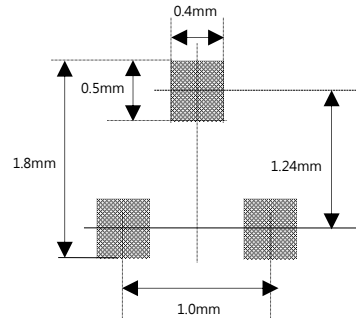


Switching Time Waveform

■ 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	0.700	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°