

DESCRIPTION

SMC2868ESN 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 SN - TR G
 a b c d e f

- a : Company name
- b : Product Serial number
- c : ESD Protection
- d : Package code SN: SOT-23
- e : Handling code TR: Tape&Reel
- f : Green produce code G: RoHS Compliant

FEATURES

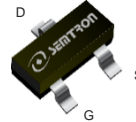
$V_{DS}=20V, I_D=1A$

- $R_{DS(ON)}=190m\Omega(Typ.)@V_{GS}=4.5V$
- $R_{DS(ON)}=235m\Omega(Typ.)@V_{GS}=2.5V$
- $R_{DS(ON)}=305m\Omega(Typ.)@V_{GS}=1.8V$
- $R_{DS(ON)}=420m\Omega(Typ.)@V_{GS}=1.5V$
- $R_{DS(ON)}=650m\Omega(Typ.)@V_{GS}=1.2V$

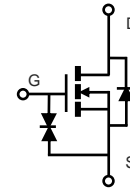
- ◆ High-speed switching, Low On-resistance
- ◆ 1.2V Low gate drive
- ◆ ESD protected

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Switching application



SOT-23



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	$T_A=25^{\circ}C$	1	A
		$T_A=70^{\circ}C$	0.8	A
I_{DM}	Pulsed Drain Current ^B	2.5	A	
P_D	Power Dissipation ^B	$T_A=25^{\circ}C$	0.42	W
		$T_A=70^{\circ}C$	0.27	W
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 ^A	$t \leq 10s$	150	$^{\circ}C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	300	$^{\circ}C/W$

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

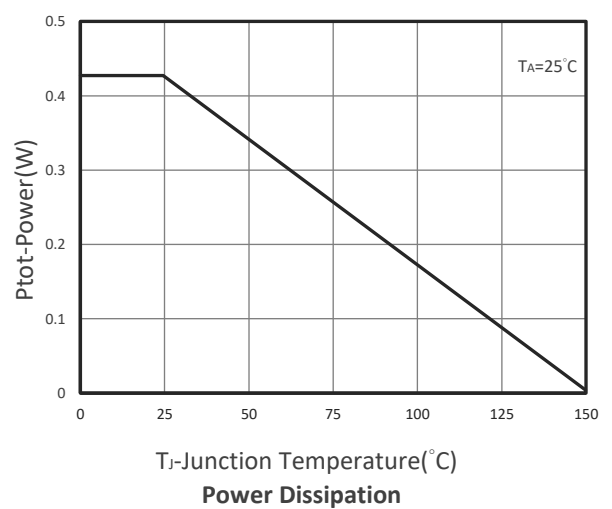
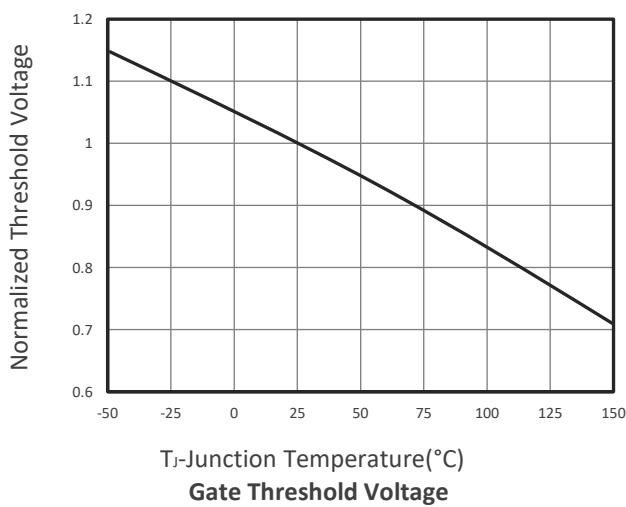
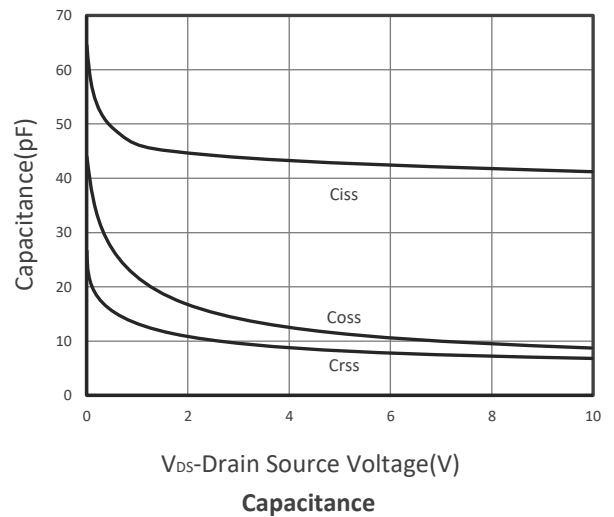
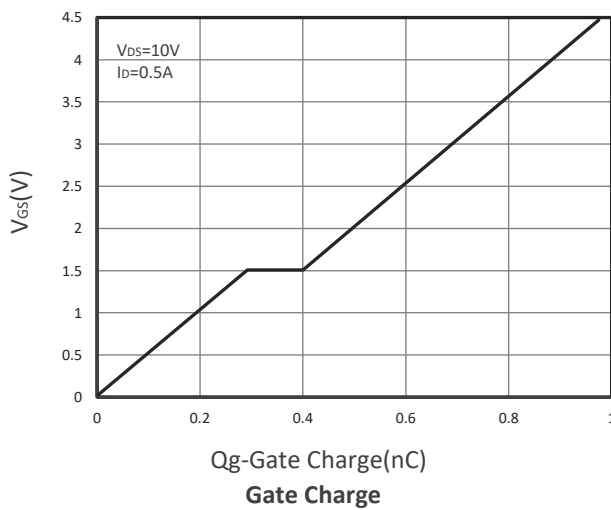
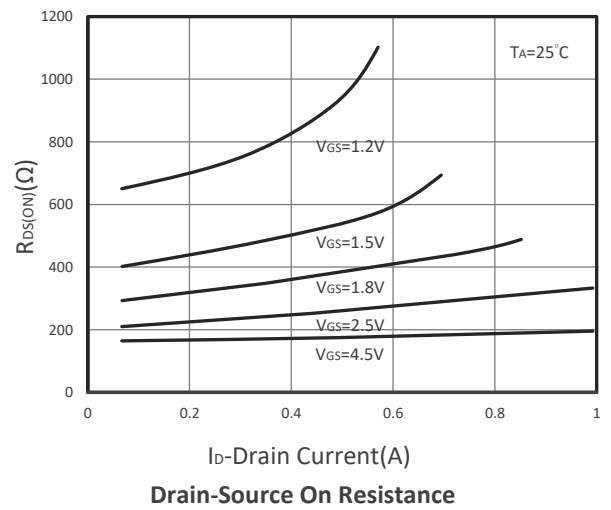
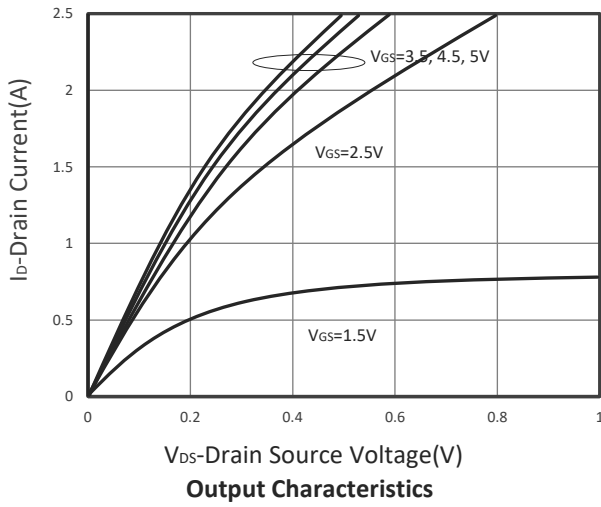
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μ A	0.3	0.6	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 8V			\pm 10	μ A
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V, T _J =25 $^{\circ}$ C			1	μ A
		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 =1A		190	250	Ω
		V _{GS} =2.5V, I _D =0.5A		235	320	
		V _{GS} =1.8V, I _D =0.3A		305	420	
		V _{GS} =1.5V, I _D =0.2A		420	600	
		V _{GS} =1.2V, I _D =0.1A		650	950	
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				1	A
t _{rr}	Reverse Recovery Time	I _S =0.5A, dI/dt=100A/ μ s		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 =6 Ω , 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.

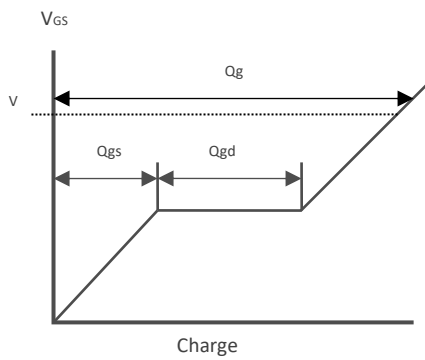
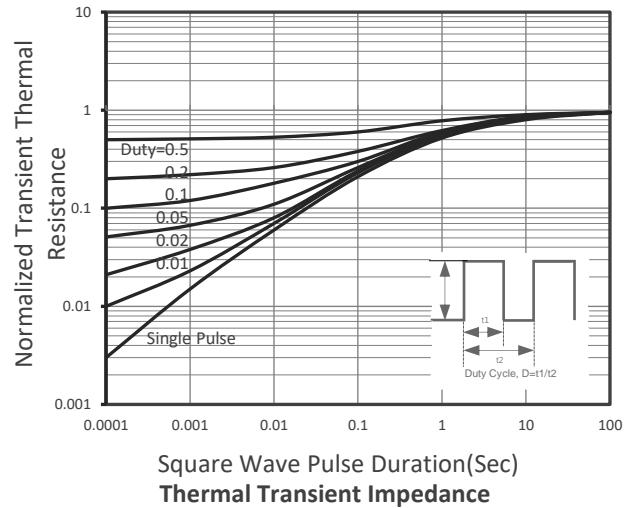
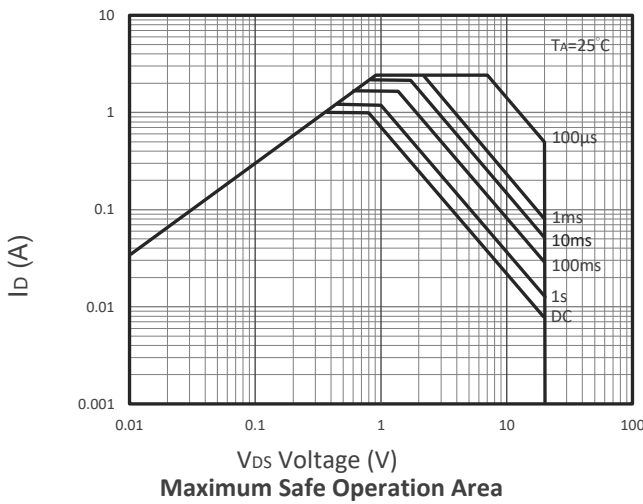
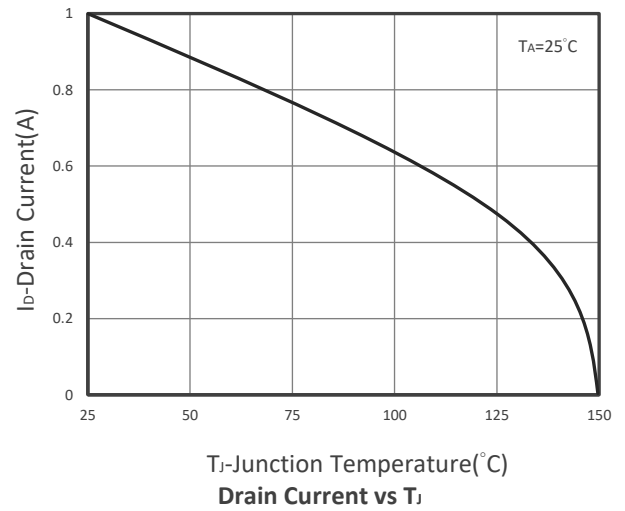
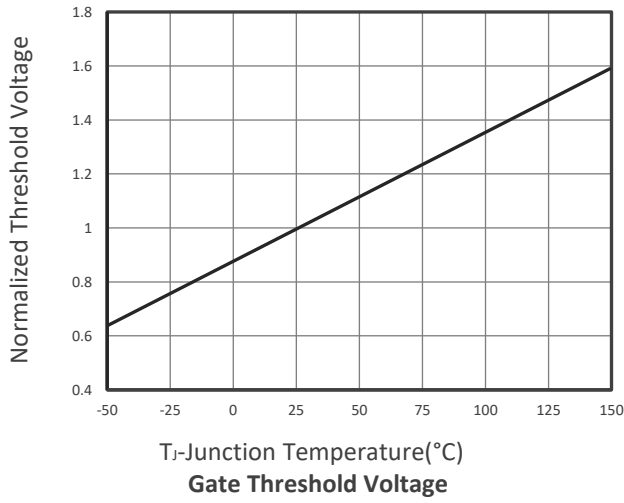
- A. Surface mounted on FR4 board using 1 in² pad size
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^{\circ}$ C.
- C. Using \leq 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150 $^{\circ}$ C.
- D. Pulse test width \leq 300 μ s and duty cycle \leq 2%.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

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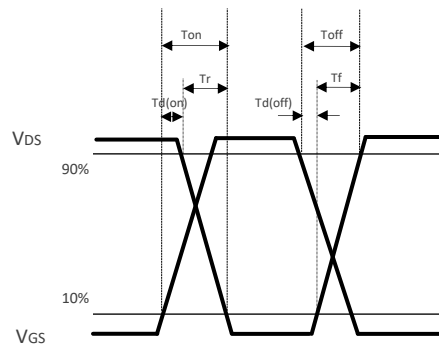
TYPICAL CHARACTERISTICS



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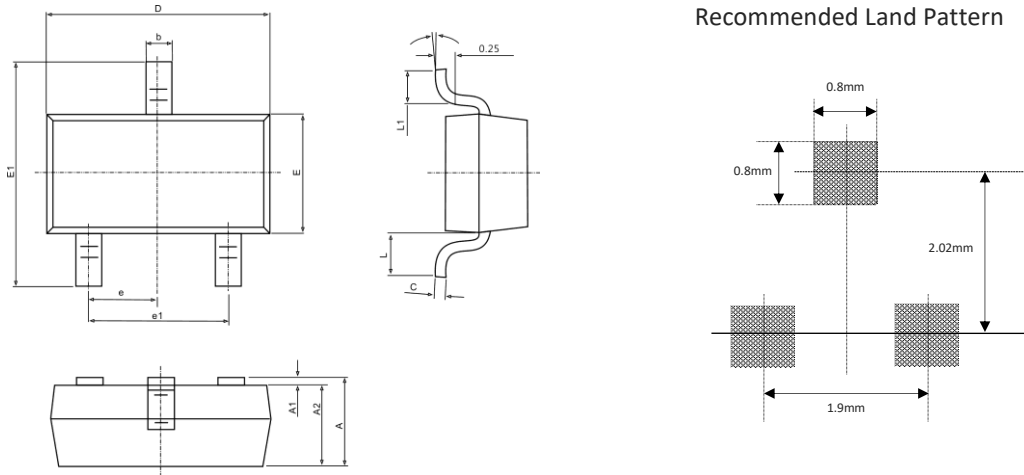


Gate Charge Waveform



Switching Time Waveform

■ SOT-23 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.940	1.120	0.037	0.044
A1	0.040	0.120	0.002	0.005
A2	0.900	1.000	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.004	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.500	0.600	0.020	0.024
L	0.550 BSC		0.022 BSC.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°