

DESCRIPTION

SMC2868ESA 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 SA - TR G
 a b c d e f

- a : Company name
- b : Product Serial number
- c : ESD Protection
- d : Package code SA: SOT-723
- e : Handling code TR: Tape&Reel
- f : Green produce code G: RoHS Compliant

FEATURES

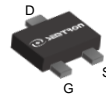
$V_{DS}=20V, I_D=0.6A$

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

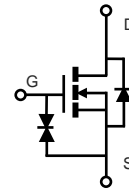
- ◆ High-speed switching, Low On-resistance
- ◆ 1.2V Low gate drive
- ◆ ESD protected

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Switching application



SOT-723



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	$T_A=25^\circ C$	0.6	A
		$T_A=70^\circ C$	0.47	A
I_{DM}	Pulsed Drain Current ^B	1.8	A	
P_D	Power Dissipation ^A	$T_A=25^\circ C$	0.15	W
		$T_A=70^\circ C$	0.1	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	$t \leq 10s$	-	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	833	$^\circ C/W$

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

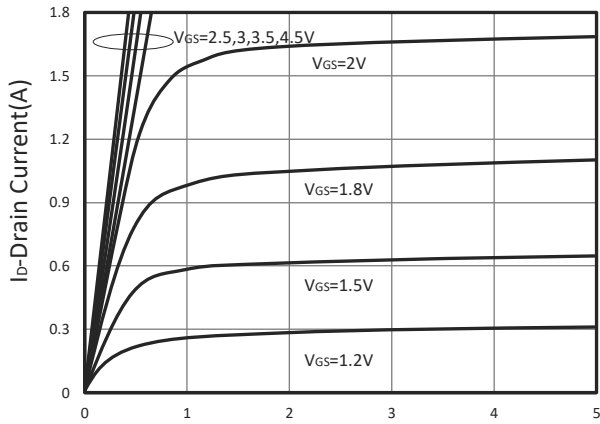
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.3	0.6	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±8V			±10	μA
I _{DSS}	Zero Gate 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 ⁸	V _{GS} =4.5V, I _D =0.6A		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				0.3	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.

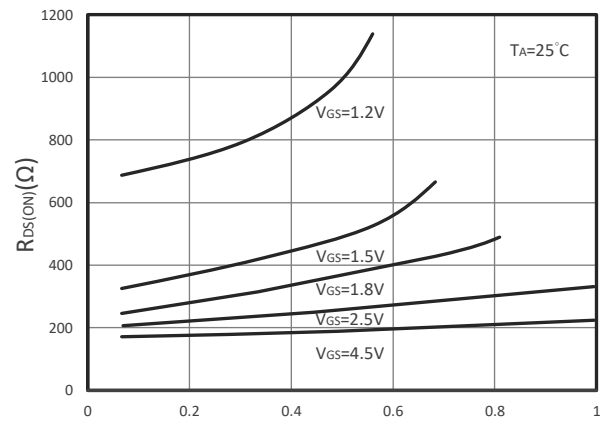
- A. Surface mounted on FR4 board using the minimum recommended pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. Guaranteed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

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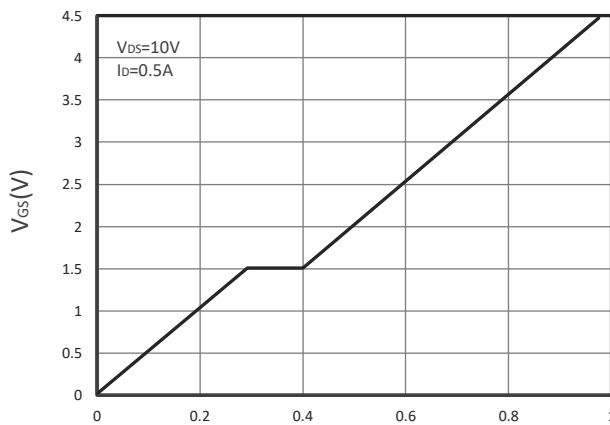
TYPICAL CHARACTERISTICS



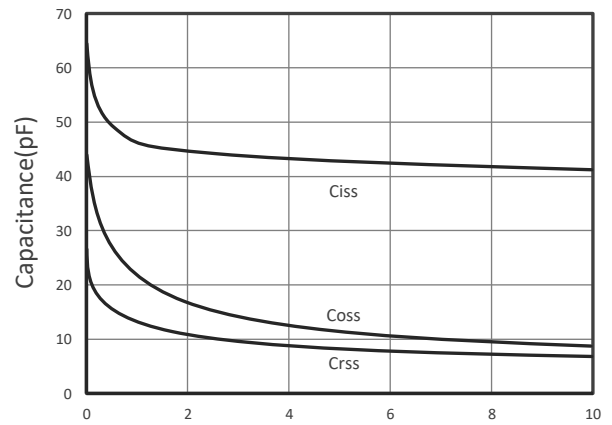
Output Characteristics



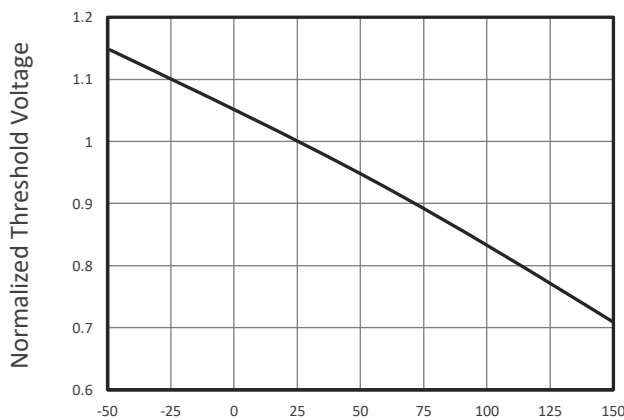
Drain-Source On Resistance



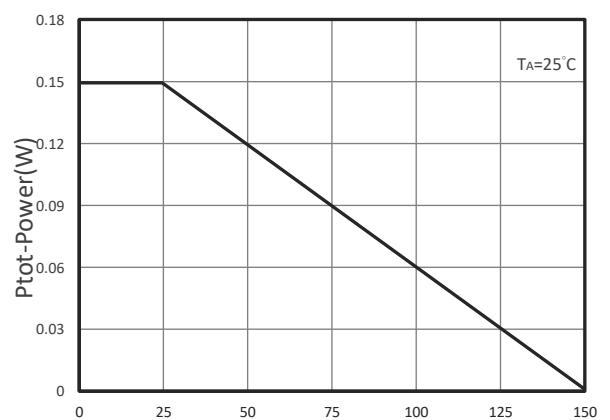
Gate Charge



Capacitance

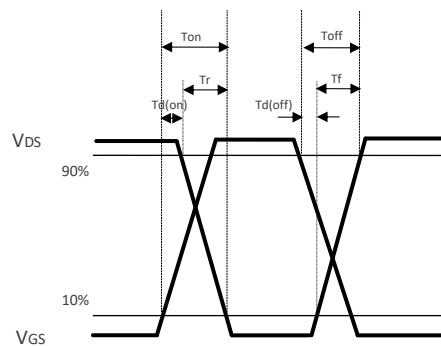
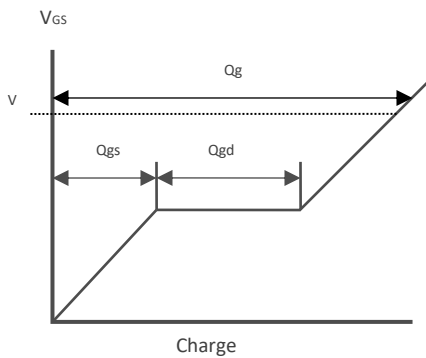
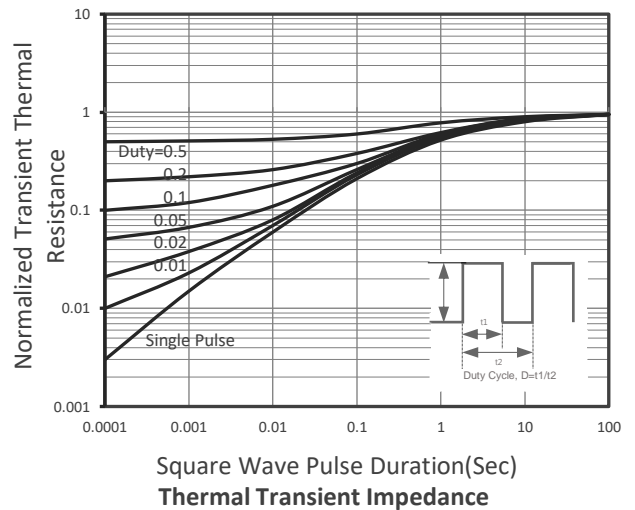
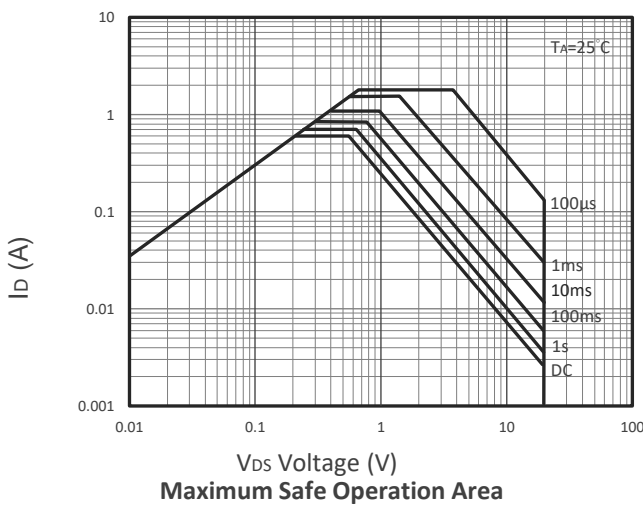
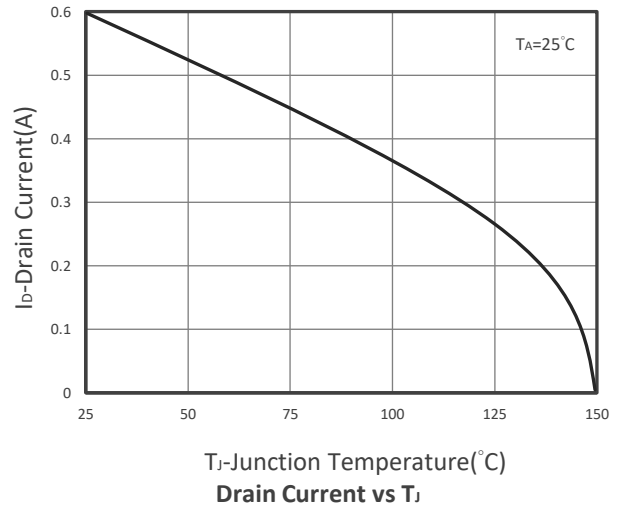
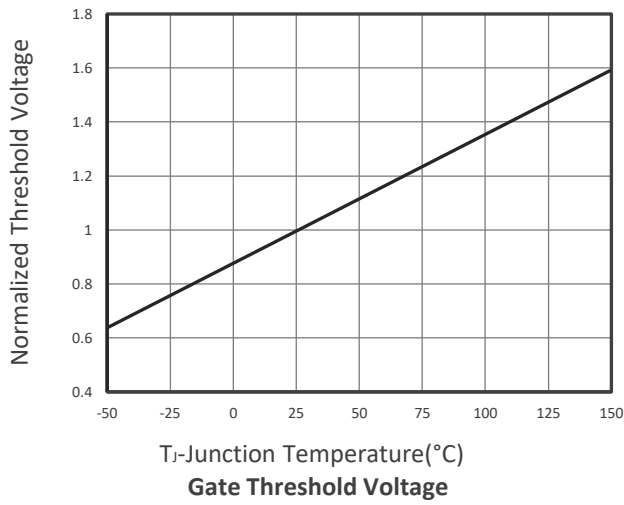


Gate Threshold Voltage



Power Dissipation

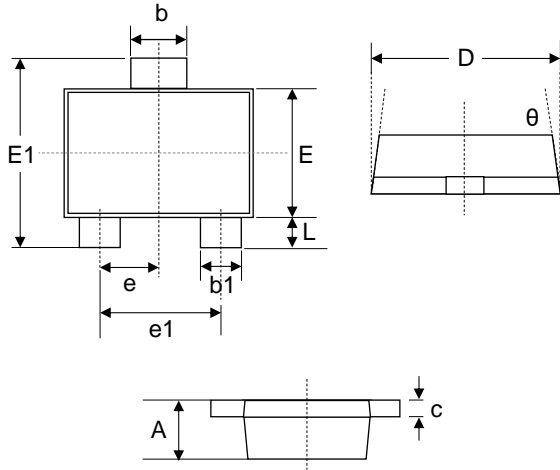
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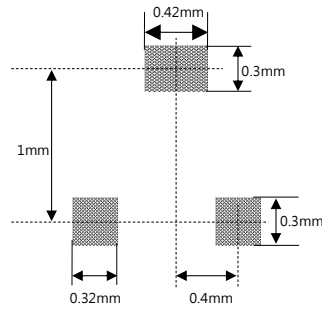
Gate Charge Waveform

Switching Time Waveform

■ SOT-723 PACKAGE DIMENSIONS



Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
b	0.270	0.370	0.011	0.015
b1	0.170	0.270	0.007	0.011
c	0.001	0.015	0.003	0.006
D	1.150	1.250	0.045	0.049
E	0.750	0.850	0.030	0.033
E1	1.150	1.250	0.045	0.049
e	0.400 BSC.		0.016 BSC.	
e1	0.800 BSC.		0.032 BSC.	
L	0.200 BSC.		0.008 BSC.	
θ	7°		7°	