SemTron Microtech Corporation

SMC2868ESD

Single N-Channel MOSFET

■DESCRIPTION

SMC2868ESD 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 SD - TR G
a b c d e f

a : Company name
b : Product Serial number
c : ESD Protection
d : Package code SD: SOT-323
e : Handling code TR: Tape&Reel
f : Green produce code G: *RoHS Compliant*

■FEATURES

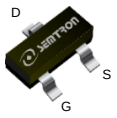
V_{DS}=20V, I_D=0.9A

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

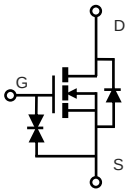
◆High-speed switching, Low On-resistance
◆1.2V Low gate drive
◆ESD protected

■APPLICATIONS

◆Hend-Held Instruments
◆Switching application



SOT-323



■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	T_A=25°C	0.9	A
		T_A=70°C	0.73	A
I_{DM}	Pulsed Drain Current[B]		1.8	A
P_D	Power Dissipation[8]	T_A=25°C	0.36	W
		T_A=70°C	0.23	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 [A]	t≦10s		-	°C/W
	Thermal Resistance Junction to Ambient [AC]	Steady-State		350	°C/W

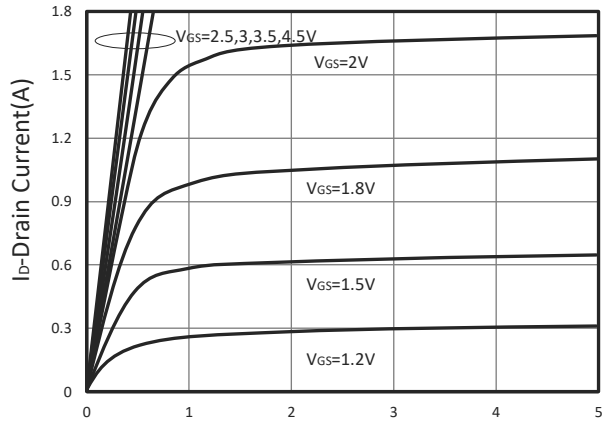
■ELECTRICAL CHARACTERISTICS(T_A=25°C Unless otherwise noted)

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	0.3	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=0.9A		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				0.46	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	

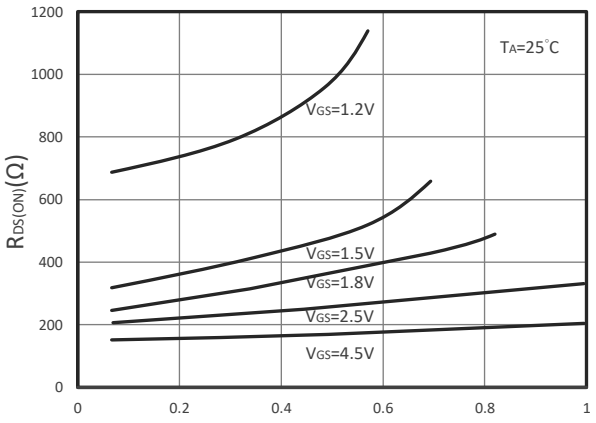
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

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.

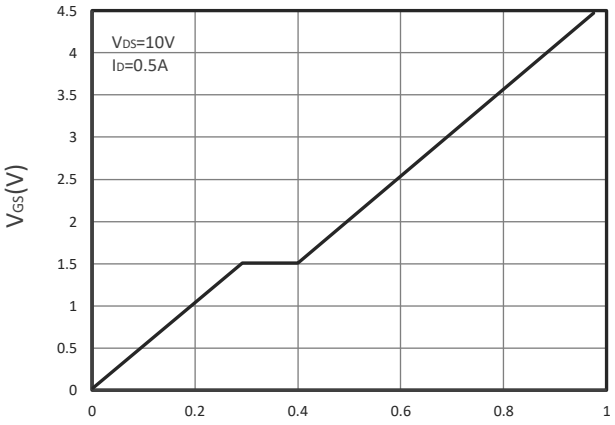
TYPICAL CHARACTERISTICS



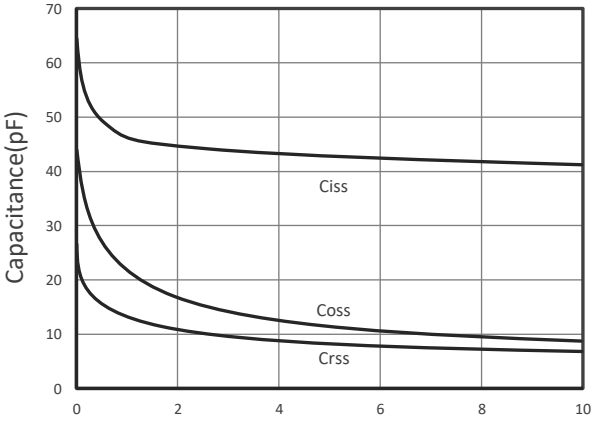
Output Characteristics



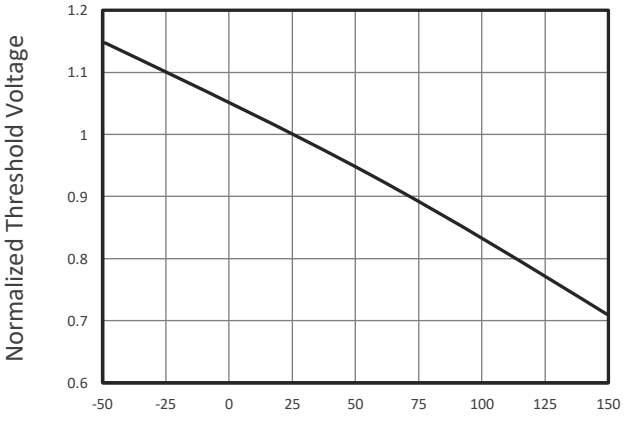
Drain-Source On Resistance



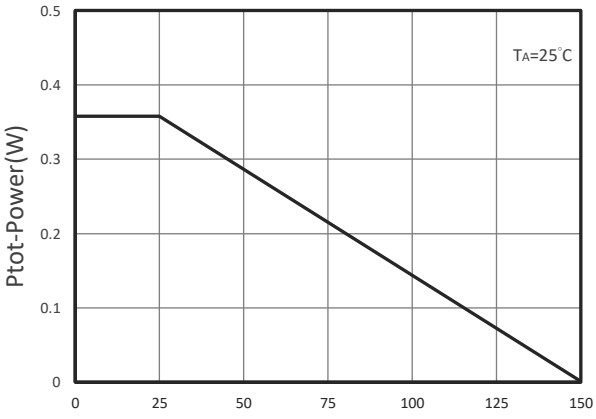
Gate Charge



Capacitance

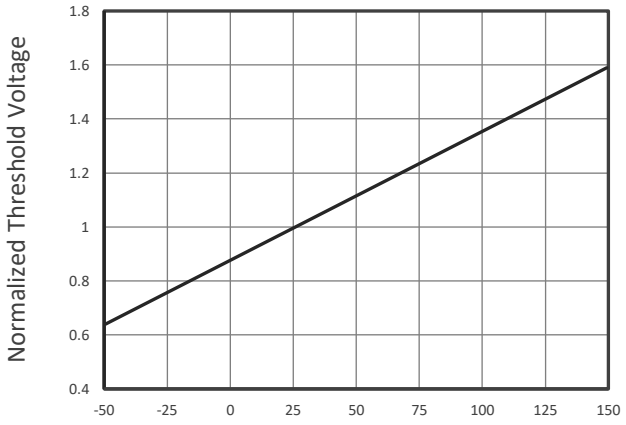


Gate Threshold Voltage

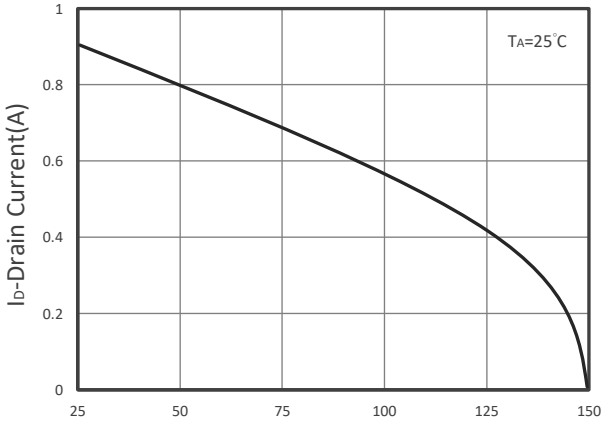


Power Dissipation

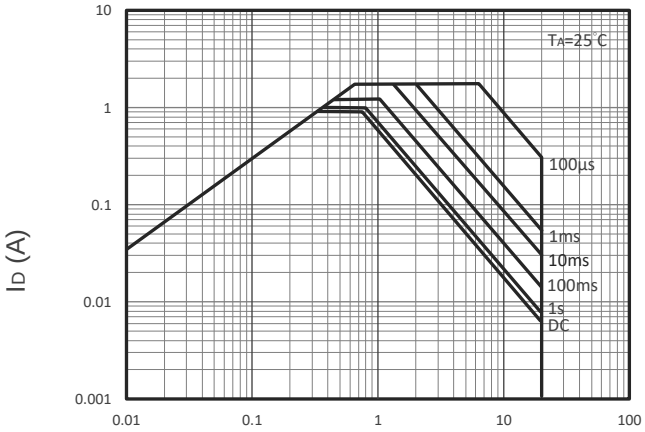
TYPICAL CHARACTERISTICS



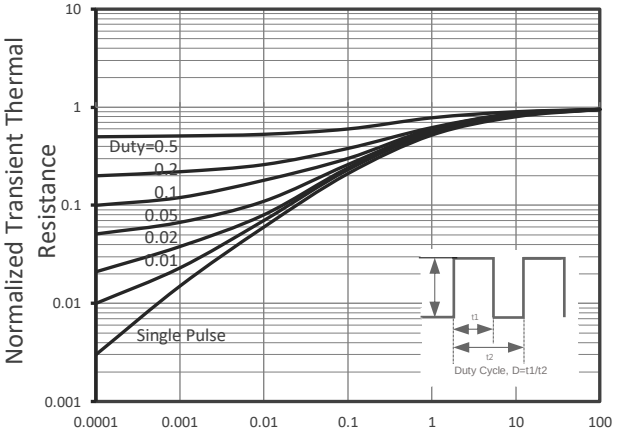
Gate Threshold Voltage



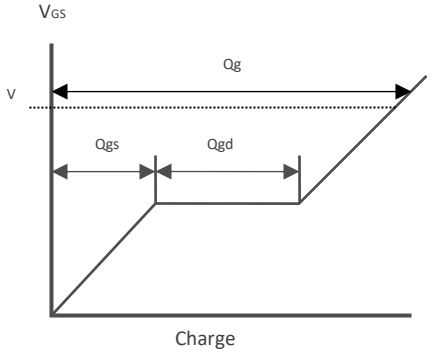
Drain Current vs TJ



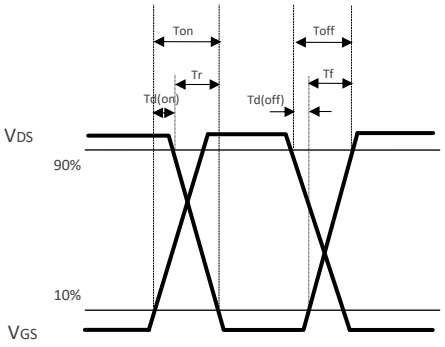
Maximum Safe Operation Area



Thermal Transient Impedance

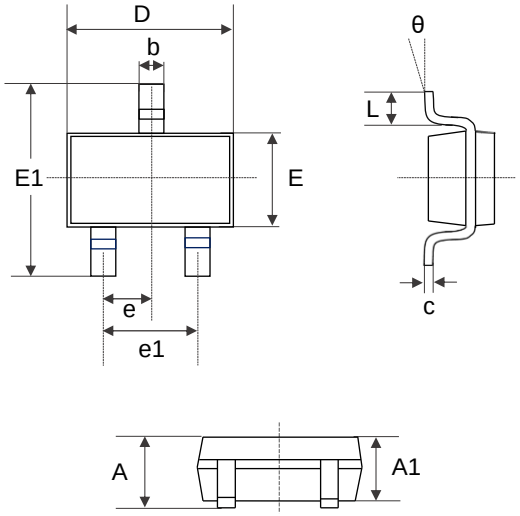


Gate Chrge Waveform

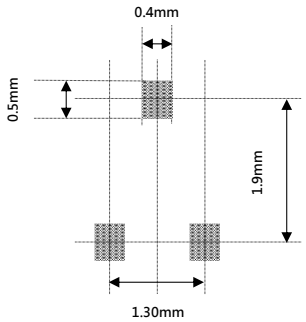


Switching Time Waveform

SOT-323 PACKAGE DIMENSIONS



Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.800	1.000	0.031	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.250	0.003	0.010
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.1500	2.450	0.085	0.096
e	0.650 BSC.		0.026 BSC.	
e1	1.200	1.400	0.047.	0.055
L	0.15	0.45	0.06	0.018
θ	0°	8°	0°	8°