

DESCRIPTION

The SMC2862ESG dual N Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology devices are well suited for high efficiency fast switching applications, low in-line power loss are needed in small outline surface mount package.

PART NUMBER INFORMATION

SMC 2862 E SG - TR G
 a b c d e f

- a : Company name
- b : Product Serial number
- c : ESD Protection
- d : Package code SG: SOT-563
- e : Handling code TR: Tape&Reel
- f : Green produce code G: RoHS Compliant

FEATURES

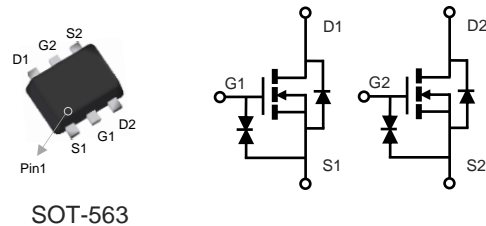
$V_{DS} = 20V, I_D = 0.98A$

- $R_{DS(ON)} = 195m\Omega(Typ.) @ V_{GS} = 4.5V$
- $R_{DS(ON)} = 230m\Omega(Typ.) @ V_{GS} = 2.5V$
- $R_{DS(ON)} = 300m\Omega(Typ.) @ V_{GS} = 1.8V$
- $R_{DS(ON)} = 355m\Omega(Typ.) @ V_{GS} = 1.5V$
- $R_{DS(ON)} = 580m\Omega(Typ.) @ V_{GS} = 1.2V$

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

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load/Power Switches



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ Unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 8	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	0.98
		$T_A = 70^\circ C$	0.79
I_{DM}	Pulsed Drain Current ^A	3.9	A
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	0.38
		$T_A = 70^\circ C$	0.24
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}		330	$^\circ C/W$
	Steady-State			

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

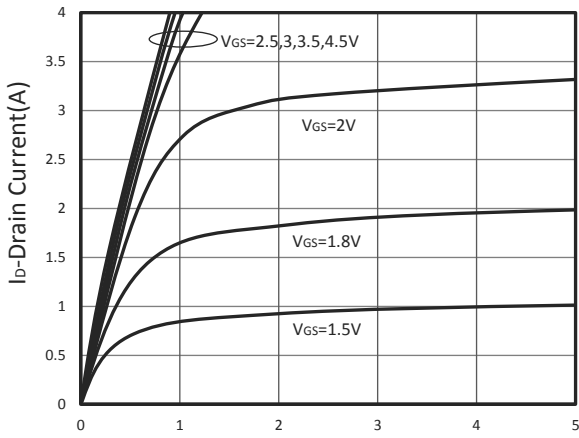
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.3	0.6	1	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 8V$			± 10	μA
I_{DSS}	Zero Gate 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	$V_{GS}=4.5V, I_D=0.6A$		195	250	m Ω
		$V_{GS}=2.5V, I_D=0.4A$		230	300	
		$V_{GS}=1.8V, I_D=0.3A$		295	400	
		$V_{GS}=1.5V, I_D=0.1A$		365	500	
G_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=0.6A$		1.8		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage ^D	$I_S=0.2A, V_{GS}=0V$			1	V
I_S	Diode Continuous Forward Current				0.49	A
t_{rr}	Reverse Recovery Time	$I_S=0.5A, di/dt=100A/\mu s$		8.8		ns
Q_{rr}	Reverse Recovery Charge			1.3		nC
Dynamic and Switching Parameters ^E						
Q_g	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=0.6A$		1.05		nC
Q_{gs}	Gate-Source Charge			0.26		
Q_{gd}	Gate-Drain Charge			0.2		
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		40		pF
C_{oss}	Output Capacitance			14		
C_{rss}	Reverse Transfer Capacitance			6		
$t_{d(on)}$	Turn-On Time	$V_{DD}=10V, V_{GS}=4.5V$		5.3		nS
t_r				3.7		
$t_{d(off)}$	Turn-Off Time	$R_G=6\Omega, I_D=0.5A$		18		
t_f				8		

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

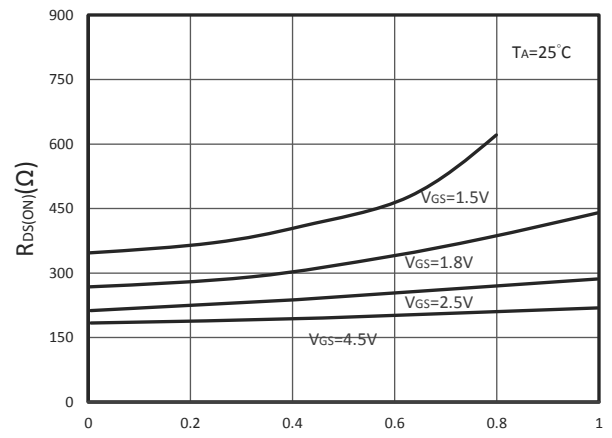
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ C$ (initial temperature $T_J=25^\circ C$).
- C. Using $\leq 10s$ junction-to-ambient thermal resistance is base on $T_{J(MAX)}=150^\circ C$.
- D. Pulse test width $\leq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

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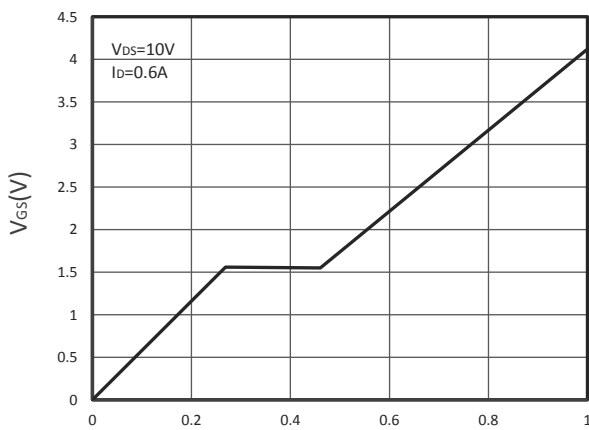
TYPICAL CHARACTERISTICS



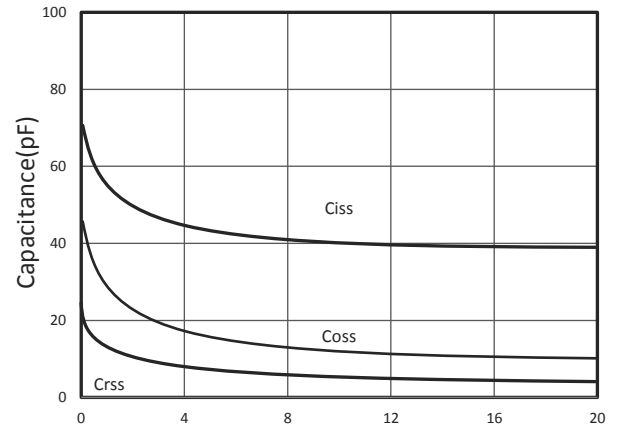
Output Characteristics



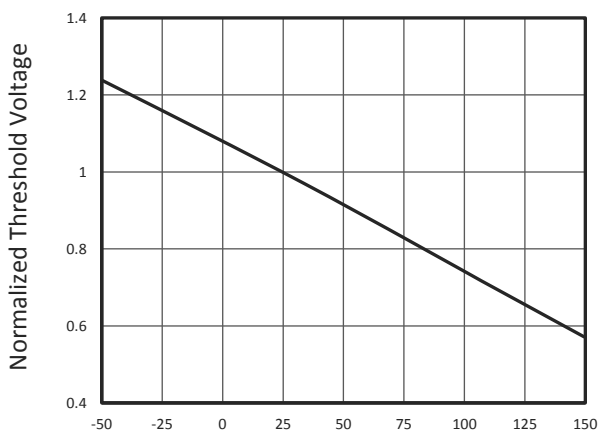
Drain-Source On Resistance



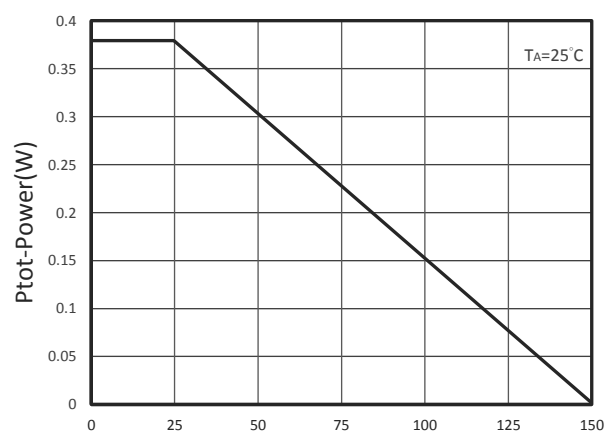
Gate Charge



Capacitance

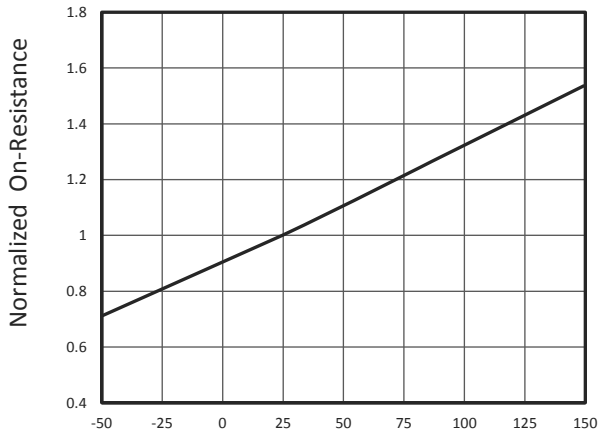


Gate Threshold Voltage

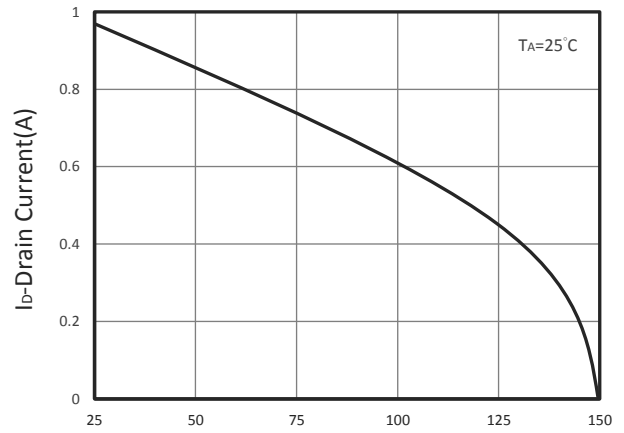


Power Dissipation

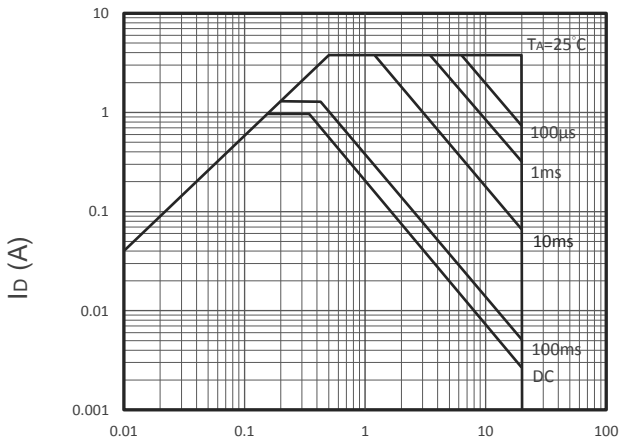
TYPICAL CHARACTERISTICS



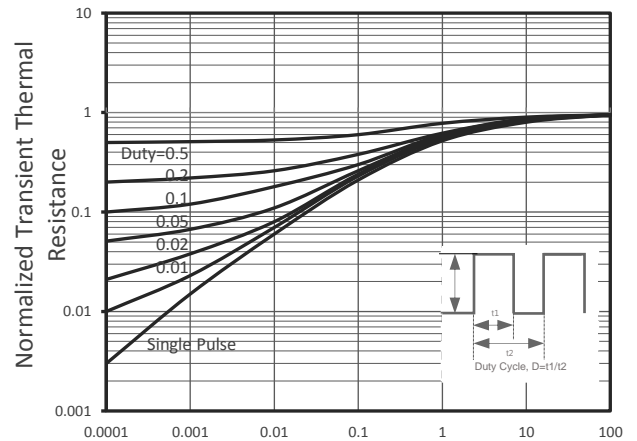
T_J-Junction Temperature(°C)
Drain-Source On Resistance



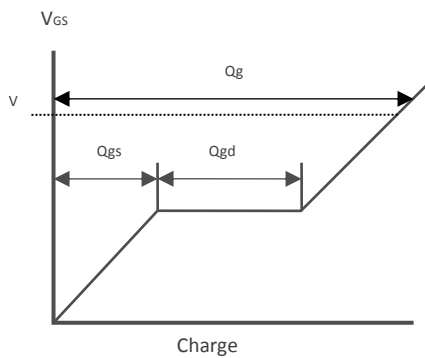
T_J-Junction Temperature(°C)
Drain Current vs T_J



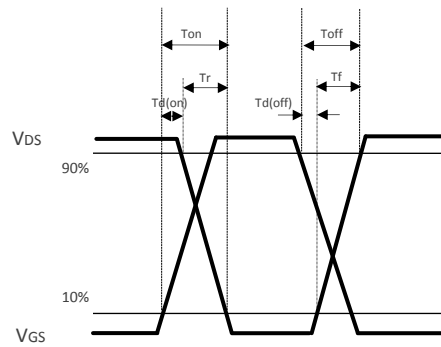
V_{DS} Voltage (V)
Maximum Safe Operation Area



Square Wave Pulse Duration(Sec)
Thermal Transient Impedance



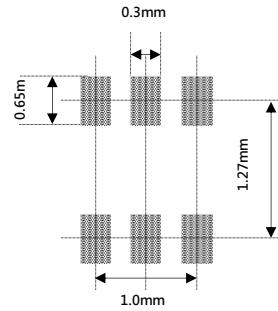
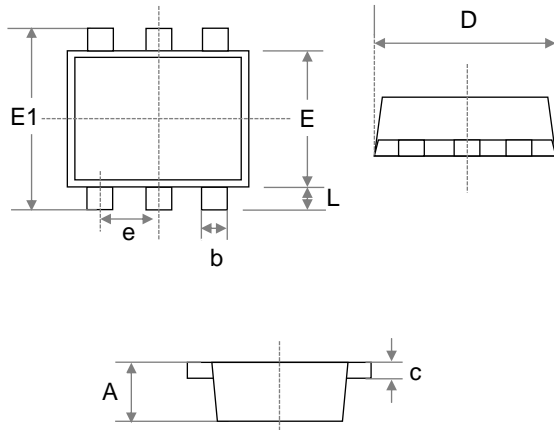
Gate Chrgc Waveform



Switching Time Waveform

■ SOT-563 PACKAGE DIMENSIONS

Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.500	0.600	0.020	0.024
b	0.150	0.300	0.006	0.012
c	0.100	0.180	0.004	0.007
D	1.500	1.700	0.059	0.067
E	1.100	1.250	0.043	0.049
E1	1.550	1.700	0.061	0.067
e	0.500 BSC.		0.020 BSC.	
L	0.100	0.300	0.004	0.012