SemTron Microtech Corporation

SMC2208ESD

Single N-Channel MOSFET

■DESCRIPTION

SMC2208E is the 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 needed in small outline surface mount package.

■PART NUMBER INFORMATION

SMC	2208	E	SD	-	TR	G
a	b	c	d		e	f

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

■FEATURES

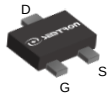
V_{DS} = 20V, I_D = 0.8A

$R_{DS(ON)}$ =200mΩ(Typ.)@V_{GS} = 4.5V
$R_{DS(ON)}$ =300mΩ(Typ.)@V_{GS} = 2.5V
$R_{DS(ON)}$ =500mΩ(Typ.)@V_{GS} = 1.8V
$R_{DS(ON)}$ =800mΩ(Typ.)@V_{GS} = 1.5V

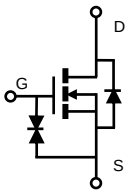
◆Fast switch
◆Low gate drive applications
◆Low Input Capacitance

■APPLICATIONS

◆Hend-Held Instruments
◆Load Switch
◆Battery Protection



SOT-723



■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	0.8	A
		T_A=70°C	0.7	A
I_{DM}	Pulsed Drain Current [A]		3.2	A
P_D	Power Dissipation [B]	T_A=25°C	0.3	W
		T_A=70°C	0.2	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 [C]	t≦10s		-	°C/W
	Thermal Resistance Junction to Ambient [C]	Steady-State		280	

■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	0.5	0.85	V
I_{GSS}	Gate Leakage Current	V_{DS} =0V,V_{GS}=±8V			±20	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =20V,V_{GS} =0V T_J =25°C			1	μA
		V_{DS} =16V,V_{GS} =0V T_J =75°C			10	
$R_{DS(ON)}$	Drain-source On-Resistance [D]	V_{GS} =4.5V,I_D=0.5A V_{GS} =2.5V,I_D=0.4A V_{GS} =1.8V,I_D=0.2A V_{GS} =1.5V,I_D=0.1A		200 300 500 800	300 450 700 1200	mΩ
Source-Drain Diode						
V_{SD}	Diode Forward Voltage[B]	I_S=1A,V_{GS}=0V			1.0	V
I_S	Continuous Source Current				0.8	A
Dynamic and Switching Parameters						
Q_g	Total Gate Charge	V_{DS} =10V,V_{GS} =4.5V I_D =0.8A		1	1.3	nC
Q_{gs}	Gate-Source Charge			0.26	0.33	
Q_{gd}	Gate-Drain Charge			0.2	0.27	
C_{iss}	Input Capacitance	V_{DS} =10V,V_{GS} =0V f =1MHz		39	46	pF
C_{oss}	Output Capacitance			14	18	
C_{rss}	Reverse Transfer Capacitance			6	7.8	
$t_{d(on)}$	Turn-On Time [E]	V_{DD}=10V, V_{GEN}=4.5V, R_G=10Ω, I_D=0.5A		5		nS
t_r				3.5		
$t_{d(off)}$	Turn-Off Time [E]			14		
t_f				6		

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

A. The value of $R_{\theta JA}$ is measured with the device in a still air environment with maximum junction temperature $T_{J(MAX)}$= 150°C (initial temperature T_A=25°C)..

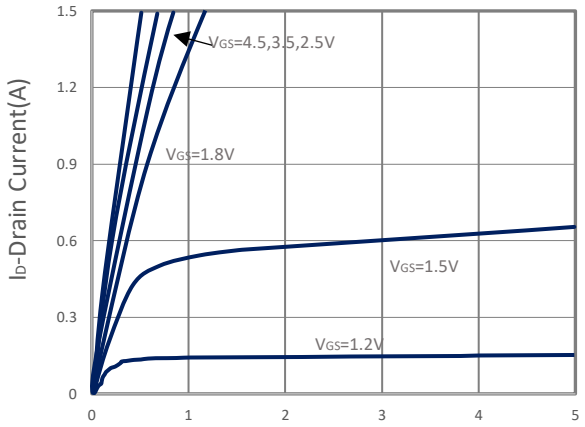
B. The $T_{J(MAX)}$=150°C, using junction-to-ambient thermal resistance.

C. Surface−mounted on FR-4 board using 1 sq−in pad, 2 oz Cu, in a still air environment with T_A=25°C.

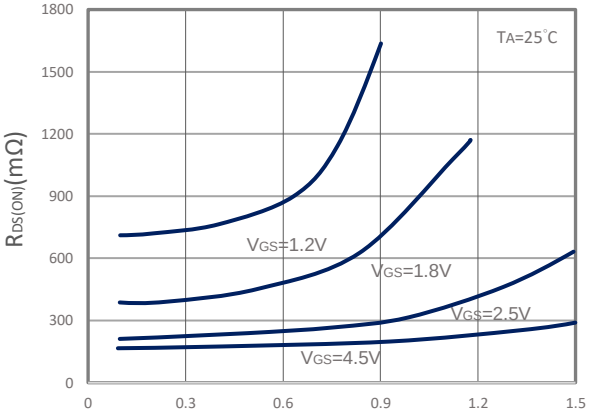
D. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

E. Pulsed width limited by maximum junction temperature.

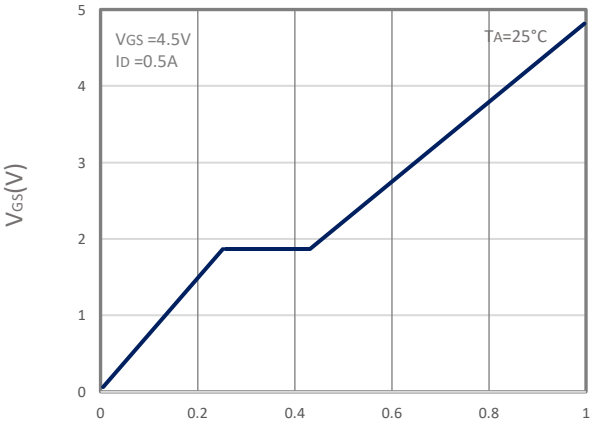
TYPICAL CHARACTERISTICS



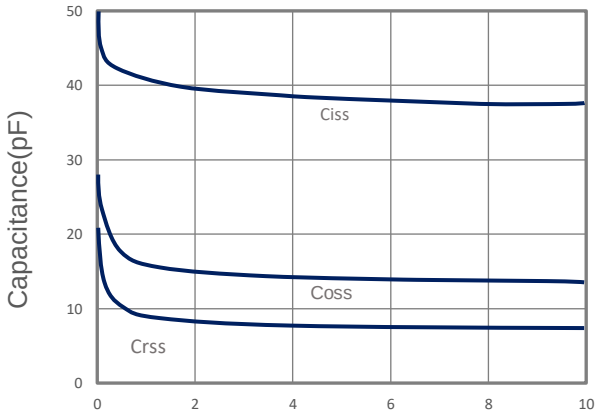
Output Characteristics



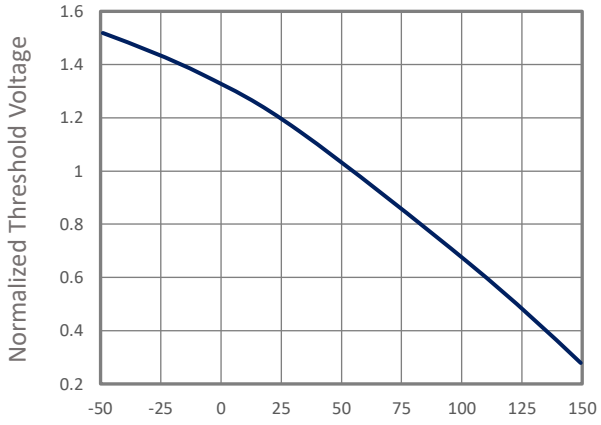
Drain-Source On Resistance



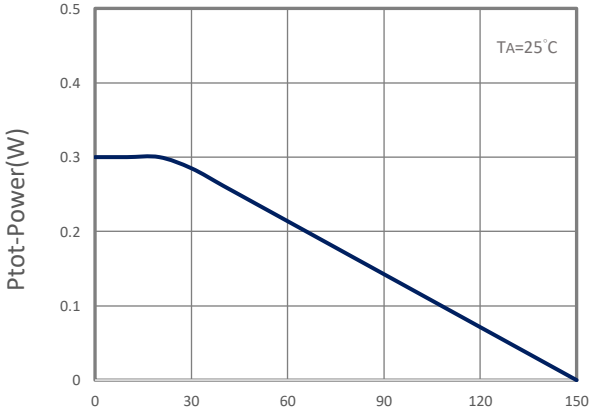
Gate Charge



Capacitance

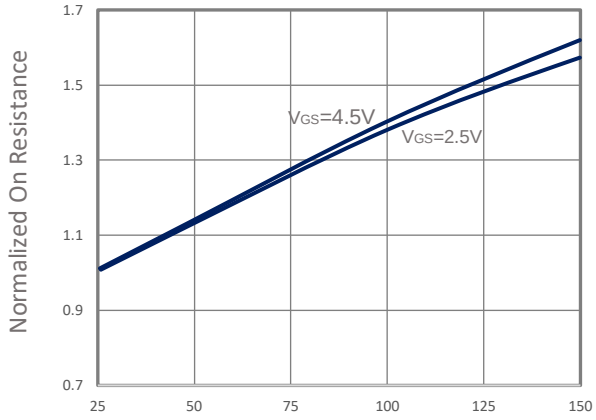


Gate Threshold Voltage

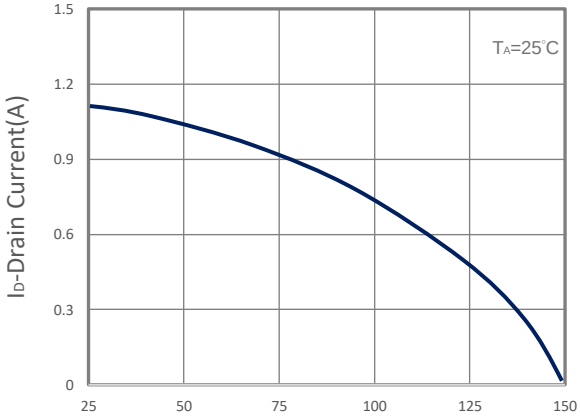


Power Dissipation

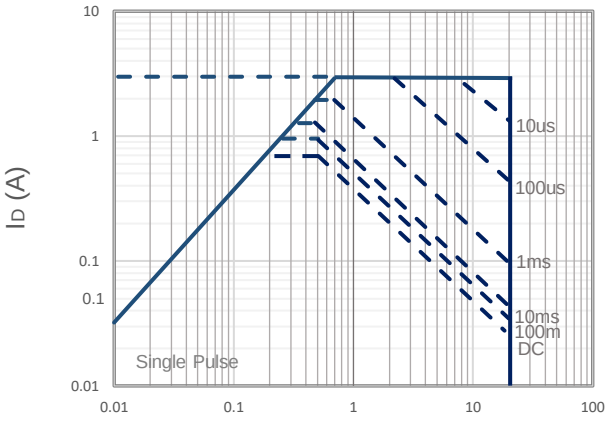
TYPICAL CHARACTERISTICS

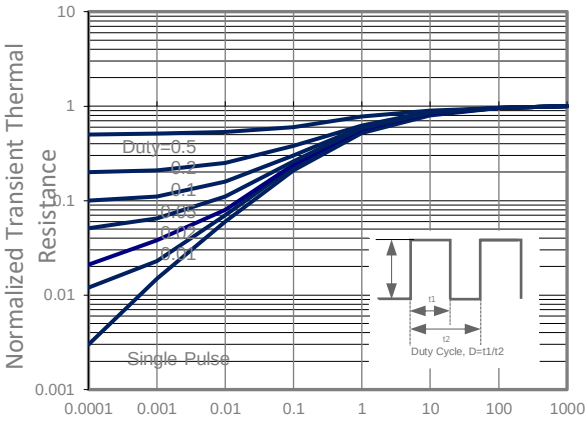


RDS(ON) vs Junction Temperature

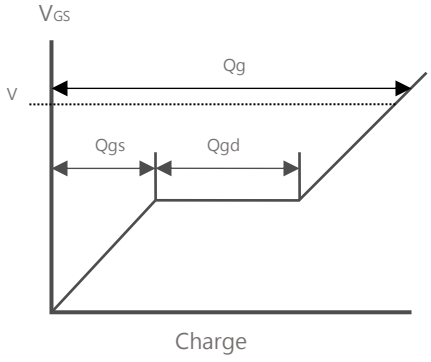


Drain Current vs TJ

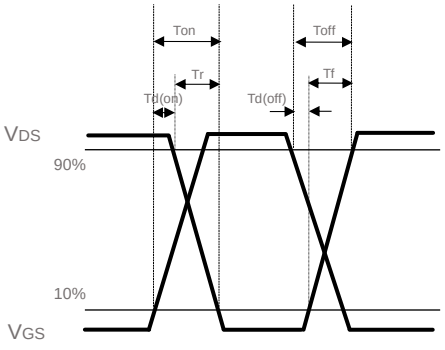




Thermal Transient Impedance

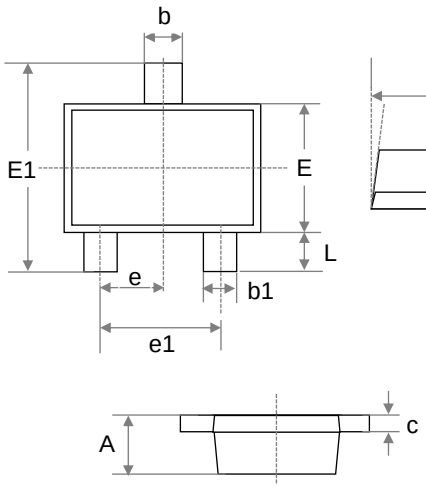


Gate Chrge Waveform

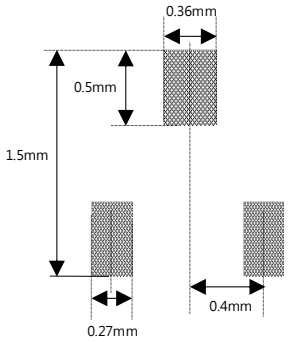


Switching Time Waveform

■POD-050C_SOT-723 PACKAGE DIMENSIONS



Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.370	0.390	0.015	0.015
b	0.220	0.270	0.009	0.011
b1	0.170	0.220	0.007	0.009
c	0.009	0.011	0.003	0.004
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	0.150	0.250	0.006	0.010
Θ	7°	11°	7°	11°