

DESCRIPTION

SMC2208E is the 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 2208 E CD - TR G
 a b c d e f

- a : Company name.
- b : Product Serial number.
- c : ESD
- d : Package code CD: SOT-363/SC70-6
- e : Handling code TR: Tape&Reel
- f : Green produce code G: *RoHS Compliant*

FEATURES

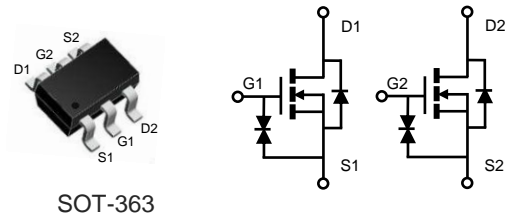
$V_{DS} = 20V$, $I_D = 0.82A$

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

- ◆ ESD protected
- ◆ Fast switching
- ◆ 1.2V Low gate drive applications

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Low current DC/DC Applications



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	$T_A=25^\circ C$	0.82	A
		$T_A=70^\circ C$	0.65	A
I_{DM}	Pulsed Drain Current ^A	3.3	A	
P_D	Power Dissipation ^C	$T_A=25^\circ C$	0.3	W
		$T_A=70^\circ C$	0.19	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 ^B	$t \leq 10s$	420	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	460	

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

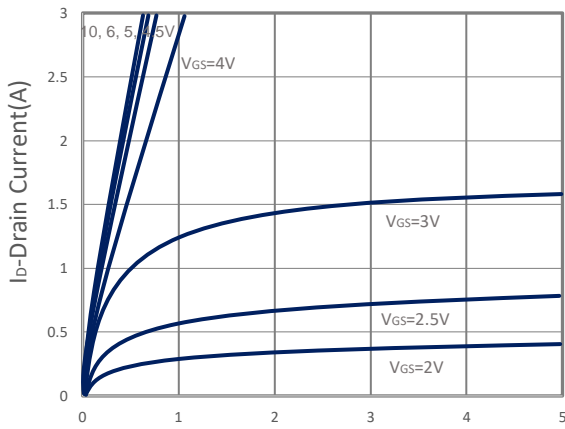
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.3	0.6	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±8V			±20	μA
I _{DSS}	Zero Gate 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	V _{GS} =4.5V, I _D =0.82A		195	270	mΩ
		V _{GS} =2.5V, I _D =0.6A		230	320	
		V _{GS} =1.8V, I _D =0.3A		300	400	
		V _{GS} =1.5V, I _D =0.2A		355	500	
		V _{GS} =1.2V, I _D =0.1A		580	800	
G _{fs}	Forward Transconductance	V _{DS} =5V, I _D =0.82A		3.8		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =0.5A, V _{GS} =0V			1	V
I _S	Diode Continuous Forward Current				0.6	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =0.5A		1.4	2	nC
Q _{gs}	Gate-Source Charge			0.17	0.24	
Q _{gd}	Gate-Drain Charge			0.3	0.42	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		50		pF
C _{oss}	Output Capacitance			18		
C _{rss}	Reverse Transfer Capacitance			10		
t _{d(on)}	Turn-On Time	V _{DD} =10V, V _{GEN} =4.5V, R _G =10Ω, I _D =0.5A		4.6	9	nS
t _r				3.2	6	
t _{d(off)}	Turn-Off Time			12.5	24	
t _f				5	10	

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

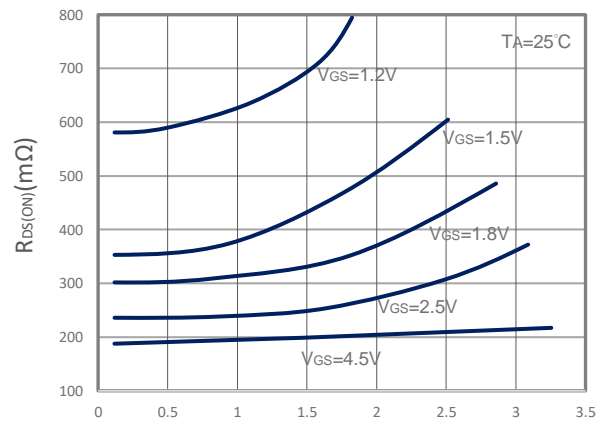
- A. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- B. The value is measured with the device mounted on 1in2 FR-4 board in a still air environment T_A =25°C with.
- C. The T_{J(MAX)}=150°C, using junction-to-ambient thermal resistance.
- D. T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.

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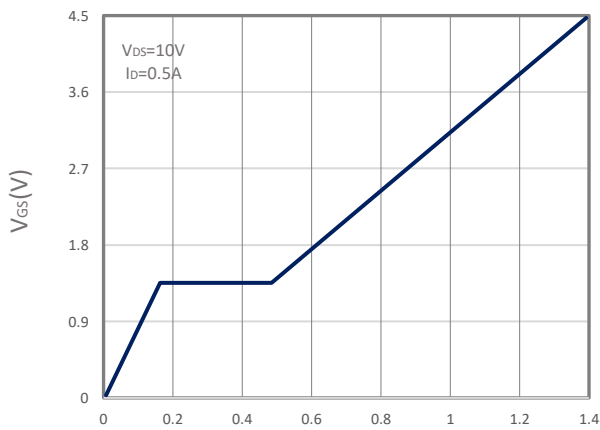
TYPICAL CHARACTERISTICS



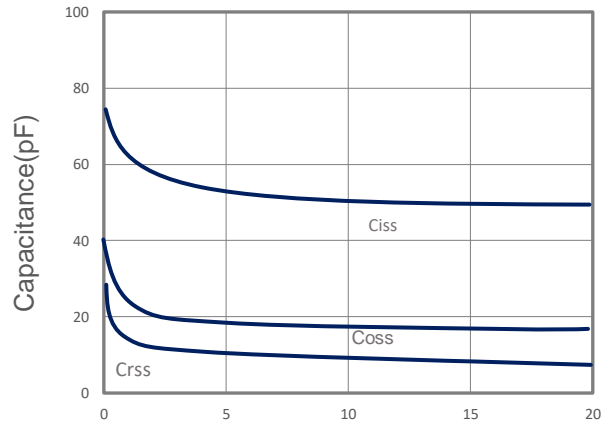
V_{DS}-Drain Source Voltage (V)
Output Characteristics



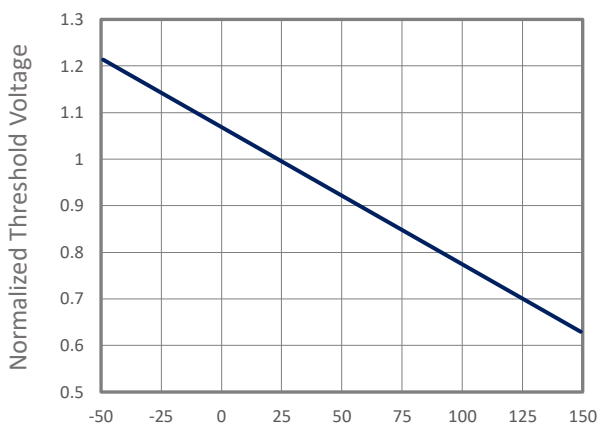
R_{DS(on)} (mΩ)
Id-Drain Current (A)
Drain-Source On Resistance



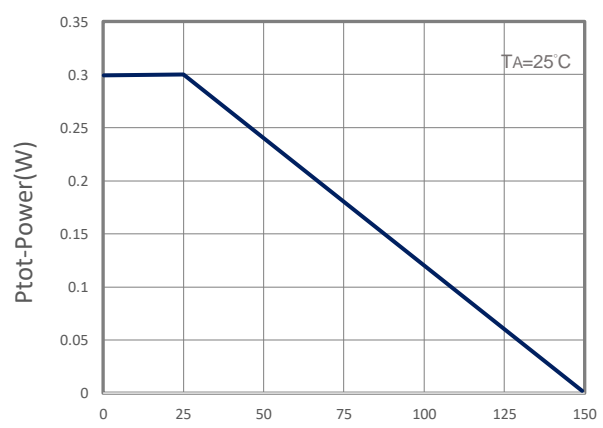
V_{GS} (V)
Q_g-Gate Charge (nC)
Gate Charge



Capacitance (pF)
V_{DS}-Drain Source Voltage (V)
Capacitance

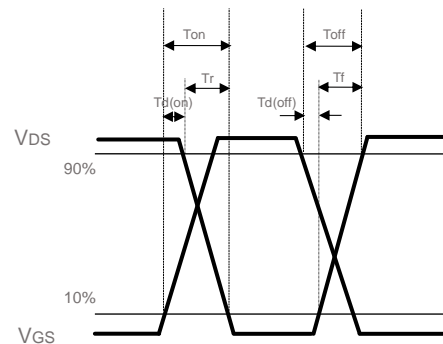
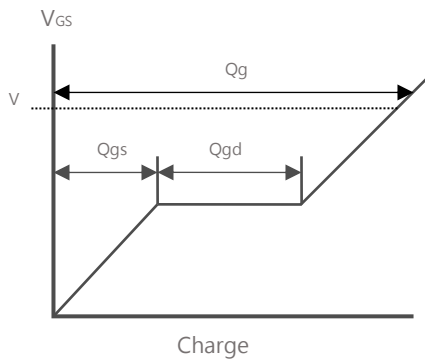
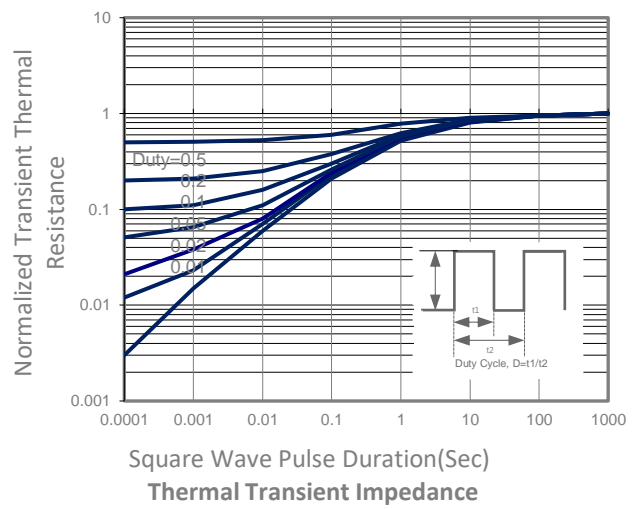
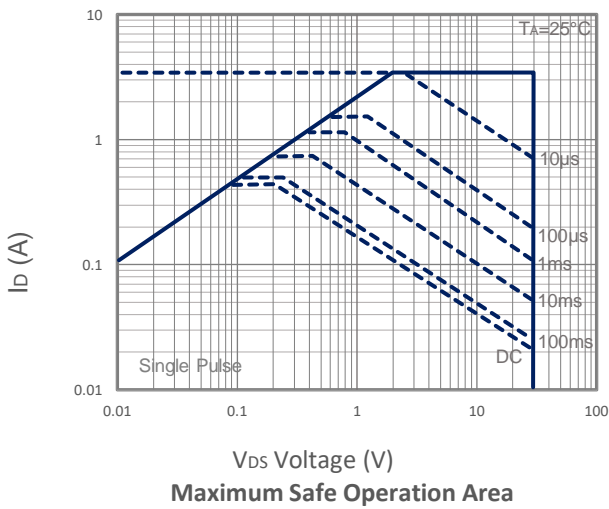
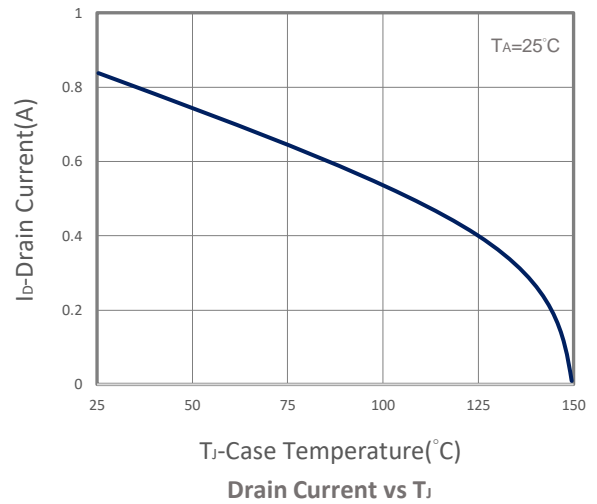
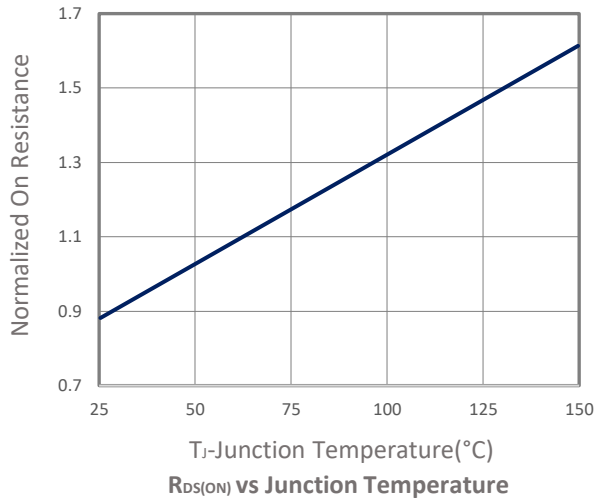


Normalized Threshold Voltage
T_J-Junction Temperature (°C)
Gate Threshold Voltage

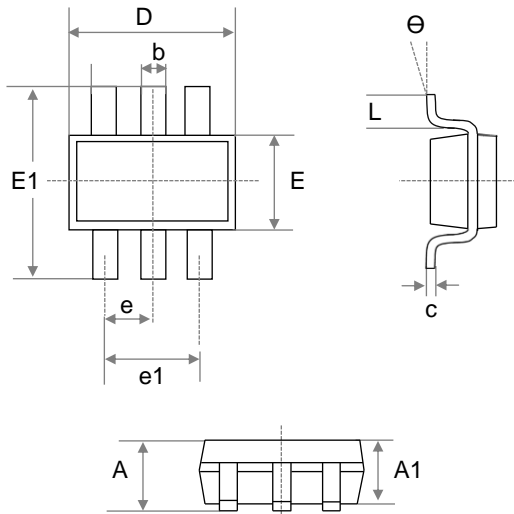


P_{tot}-Power (W)
T_A-Junction Temperature (°C)
Power Dissipation

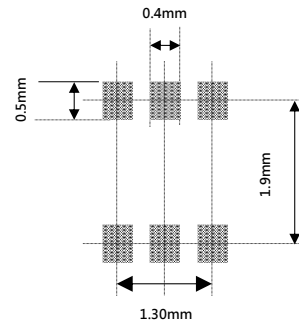
TYPICAL CHARACTERISTICS



■ SOT-363 PACKAGE DIMENSIONS



Recommended Land Pattern



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
A1	0.800	1.000	0.031	0.039
b	0.100	0.330	0.004	0.013
c	0.100	0.250	0.004	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.053	0.045
E1	1.800	2.400	0.071	0.094
e	0.650 BSC.		0.026 BSC.	
e1	1.300 BSC.		0.052 BSC.	
L	0.100	0.350	0.004	0.014
Θ	0°	8°	0°	8°