

Single P-Channel MOSFET

DESCRIPTION

SMC5225 is the P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior, fast switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

PART NUMBER INFORMATION

SMC 5225 H - TR G
 a b c d e

- a : Company name.
- b : Product Serial number.
- c : Package code H:TO-252
- d : Handling code TR:Tape&Reel
- e : Green produce code G:RoHS Compliant

FEATURES

$V_{DS} = -30V$, $I_D = -22A$

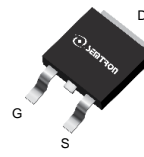
$R_{DS(ON)} = 38m\Omega (Typ.) @ V_{GS} = -10V$

$R_{DS(ON)} = 50m\Omega (Typ.) @ V_{GS} = -4.5V$

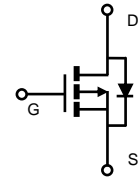
- ◆ High power and current handling capability

APPLICATIONS

- ◆ LED Application
- ◆ Power Management



TO-252



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	-22
		$T_C = 100^\circ C$	-14
I_{DM}	Pulsed Drain Current ^A	-80	A
I_D	Continuous Drain Current	$T_A = 25^\circ C$	-9.2
		$T_A = 70^\circ C$	-7.3
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	2.5
		$T_A = 70^\circ C$	1.6
I_{AS}	Avalanche Current ^A	-15	A
E_{AS}	Single Pulse Avalanche energy $L=0.3mH$ ^{AF}	33.5	mJ
P_D	Power Dissipation ^C	$T_C = 25^\circ C$	35
		$T_C = 100^\circ C$	14
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	$t \leq 10s$	20	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	50	
$R_{\theta JC}$	Thermal Resistance Junction to Case		3.5	

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

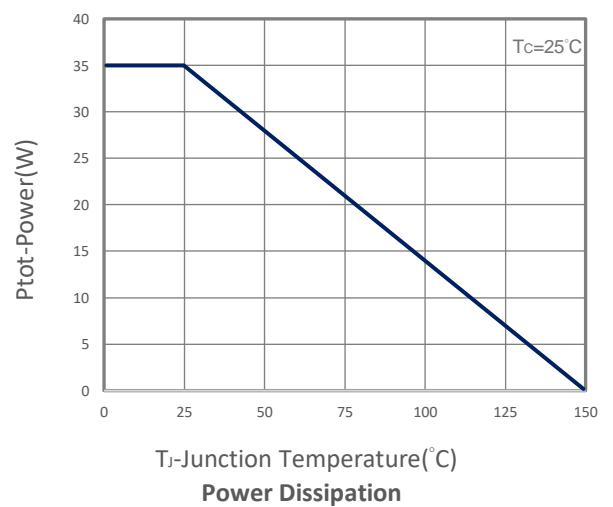
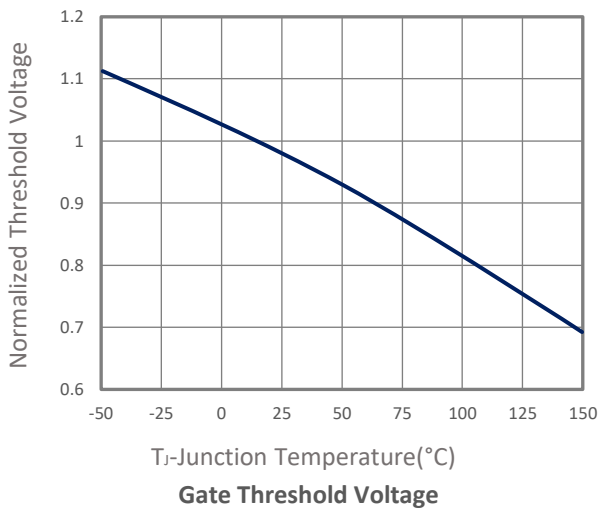
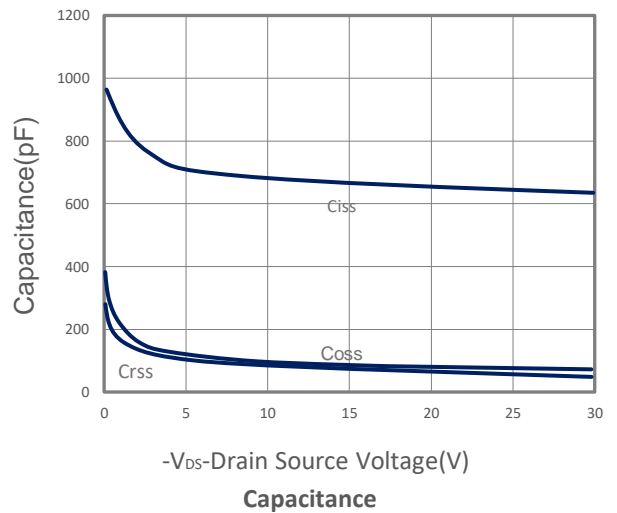
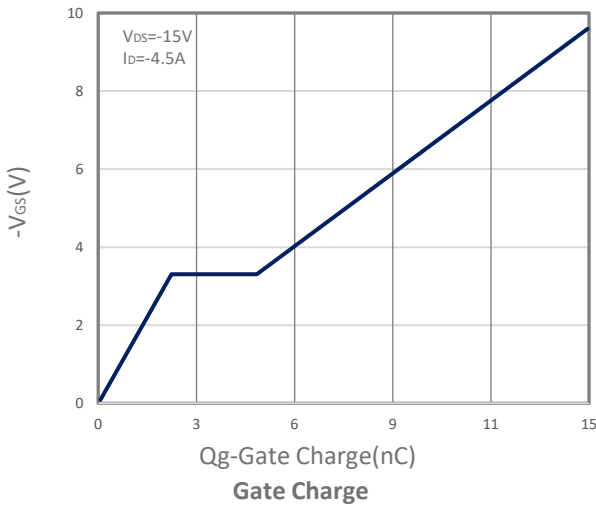
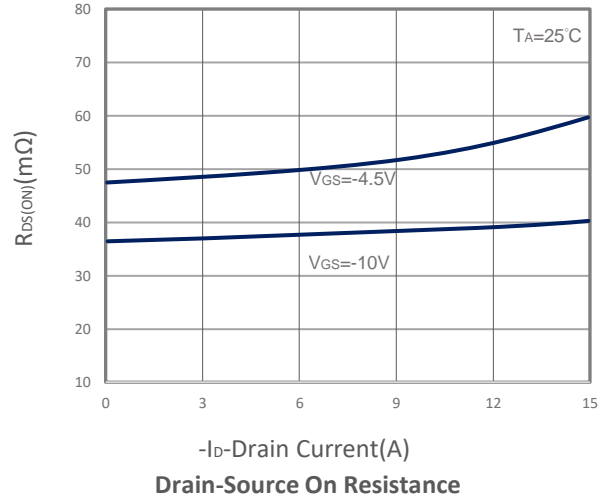
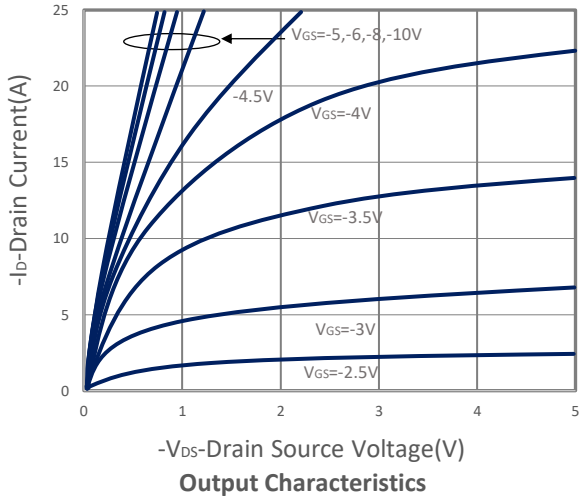
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250 μ A	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250 μ A	-1	-1.5	-2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 20V			\pm 100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V, T _J =25 $^\circ$ C			-1	μ A
		V _{DS} =-24V, V _{GS} =0V, T _J =75 $^\circ$ C			-10	
R _{DS(ON)}	Drain-source On-Resistance ^E	V _{GS} =-10V, I _D =-9.2A V _{GS} =-4.5V, I _D =-7A		38 50	45 60	m Ω
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-6.6A		22		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^E	I _S =-1A, V _{GS} =0V		-0.7	-1	V
I _S	Continuous Source Current				-4.6	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge (10V)	V _{DS} =-15V, V _{GS} =-10V, I _D =-4.5A		15.8	22.1	nC
Q _g	Total Gate Charge (4.5V)			7.7	10.8	
Q _{gs}	Gate-Source Charge			2.3	3.2	
Q _{gd}	Gate-Drain Charge			2.6	3.6	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		645		pF
C _{oss}	Output Capacitance			63		
C _{rss}	Reverse Transfer Capacitance			52		
t _{d(on)}	Turn-On Time	V _{DD} =-15V, V _{GEN} =-10V, R _G =3.3 Ω , I _D =-1A		6	11	nS
t _r				12	23	
t _{d(off)}	Turn-Off Time			25.5	48	
t _f				7	13	

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

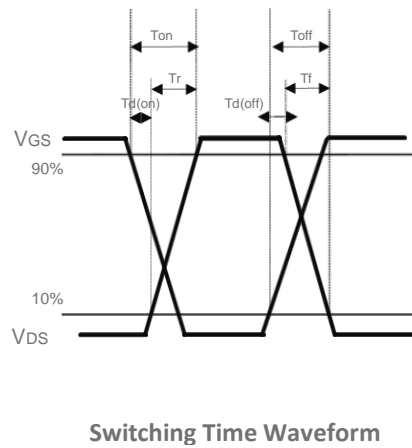
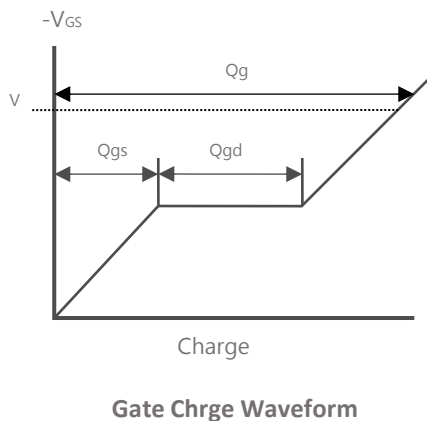
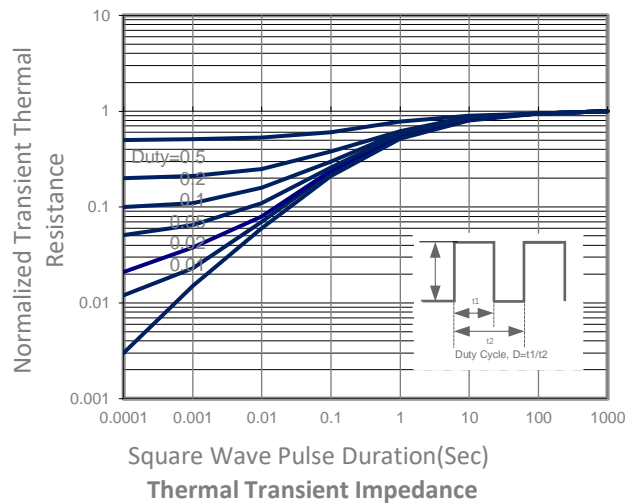
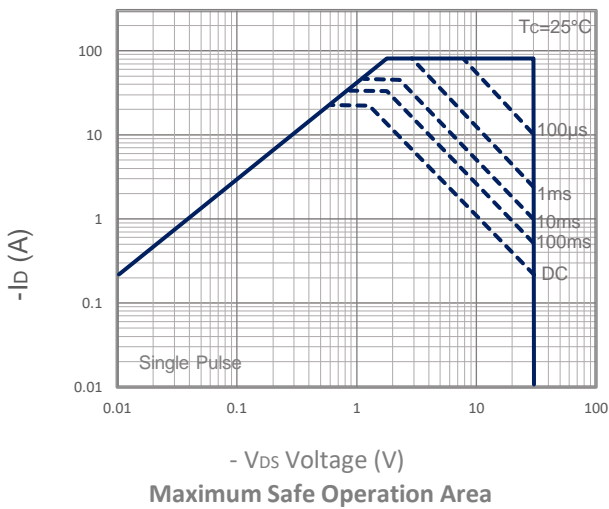
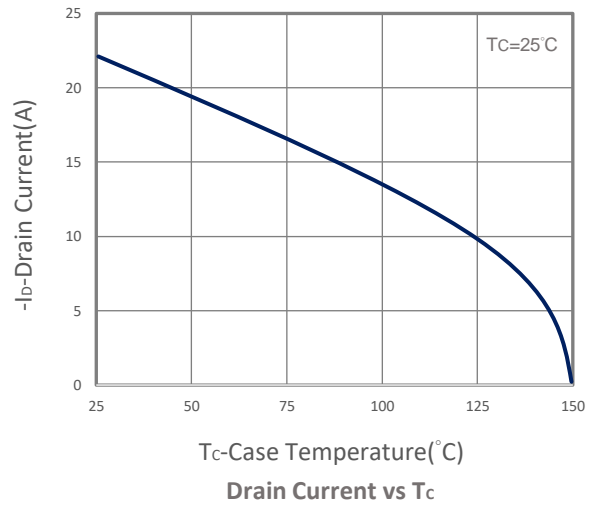
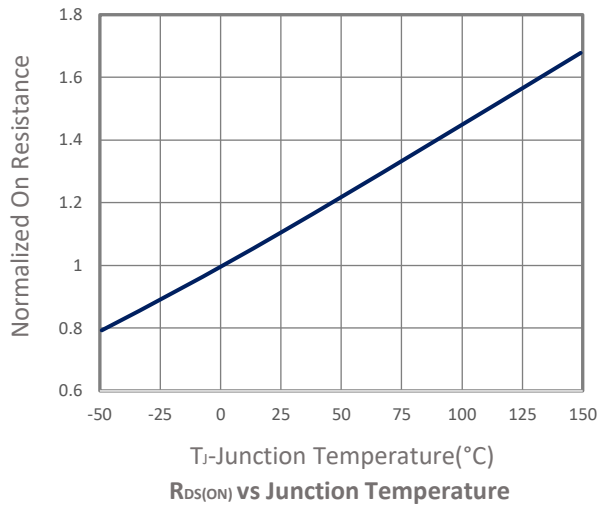
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^\circ$ C.
- The value of R _{θ JA} is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150 $^\circ$ C (initial temperature T_A=25 $^\circ$ C).
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-ambient thermal resistance, t \leq 10sec.
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-case thermal resistance (R _{θ JC}) is more useful in additional heat sinking is used.
- The data tested by pulsed, pulse width \leq 300 μ s, duty cycle \leq 2%.
- The EAS data shows Max, tested and pulse width limited by T_{J(MAX)}=150 $^\circ$ C (initial temperature T_J=25 $^\circ$ C).

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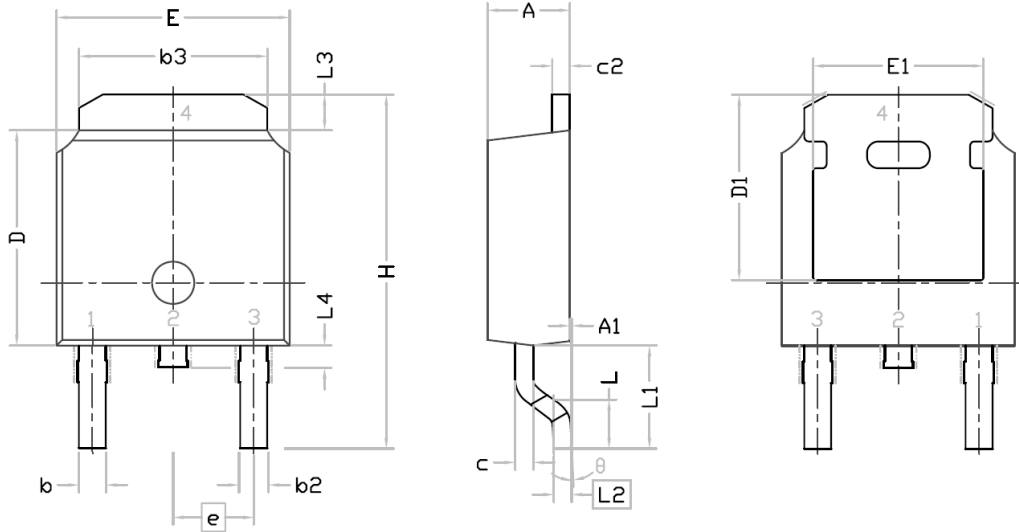
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



TO-252 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.640	0.880	0.025	0.035
b2	0.770	1.140	0.030	0.045
b3	5.210	5.460	0.205	0.215
c	0.460	0.600	0.018	0.024
c2	0.460	0.580	0.018	0.023
D	6.000	6.223	0.236	0.245
D1	5.210	-	0.205	-
E	6.400	6.731	0.252	0.265
E1	4.400	-	0.173	-
e	2.286 BSC.		0.090 BSC.	
H	9.400	10.40	0.370	0.409
L	1.400	1.770	0.055	0.070
L1	2.743 REF.		0.108 REF.	
L2	0.508 BSC.		0.020 BSC.	
L3	0.890	1.270	0.035	0.050
L4	0.640	1.010	0.025	0.040
θ	0°	10°	0°	10°

Recommended Land Pattern

