

Single N-Channel MOSFET

DESCRIPTION

SMC3322 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 are needed in small outline surface mount package.

PART NUMBER INFORMATION

SMC 3322 SN - TR G
 a b c d e

a : Company name.
 b : Product Serial number.
 c : Package code SN: SOT-23
 d : Handling code TR: Tape&Reel
 e : Green produce code G: *RoHS Compliant*

FEATURES

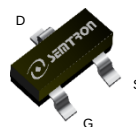
$V_{DS} = 30V$, $I_D = 5.4A$

$R_{DS(ON)} = 23m\Omega(Typ.)@V_{GS} = 10V$
 $R_{DS(ON)} = 25m\Omega(Typ.)@V_{GS} = 4.5V$
 $R_{DS(ON)} = 30m\Omega(Typ.)@V_{GS} = 2.5V$

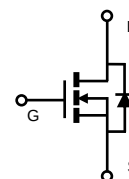
- ◆ Fast switch
- ◆ Improved dv/dt capability
- ◆ High power and current handling capability

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load Switch



SOT-23



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	± 12	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	5.4
		$T_A = 70^\circ C$	4.3
I_{DM}	Pulsed Drain Current ^A	21.6	A
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	1.3
		$T_A = 70^\circ C$	0.8
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 ^C	$t \leq 10s$	95	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^C	Steady-State	130	

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	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V T _J =25°C			1	μA
		V _{DS} =24V, V _{GS} =0V T _J =75°C			10	
R _{DS(ON)}	Drain-source On-Resistance ^D	V _{GS} =10V, I _D =5.4A V _{GS} =4.5V, I _D =4.3A V _{GS} =2.5V, I _D =3.2A		23 25 30	27 30 38	mΩ
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3A		7		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^B	I _S =1A, V _{GS} =0V		0.7	1	V
I _S	Continuous Source Current				1.8	A
Dynamic and Switching Parameters						
Q _g (10V)	Total Gate Charge	V _{DS} =15V, V _{GS} =10V I _D =5A		17	23	nC
Q _g (4.5V)	Total Gate Charge			8.7	11.7	
Q _{gs}	Gate-Source Charge			1.2	1.6	
Q _{gd}	Gate-Drain Charge			2	2.7	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V f =1MHz		670	938	pF
C _{oss}	Output Capacitance			54	76	
C _{rss}	Reverse Transfer Capacitance			45	63	
t _{d(on)}	Turn-On Time ^E	V _{DD} =15V, V _{GEN} =10V, R _G =3Ω, I _D =1A		4.2		nS
t _r				14		
t _{d(off)}	Turn-Off Time ^E			22		
t _f				6.5		

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 $T_{J(MAX)} = 150^\circ\text{C}$ (initial temperature $T_A = 25^\circ\text{C}$).

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

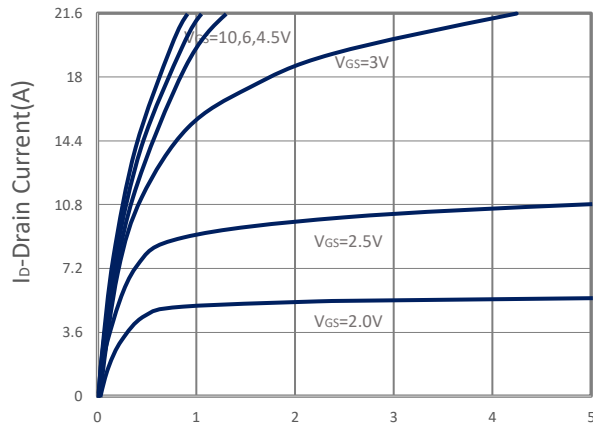
C. Surface-mounted on FR-4 board using 1 sq-in pad, 2 oz Cu, in a still air environment with $T_A = 25^\circ\text{C}$.

D. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

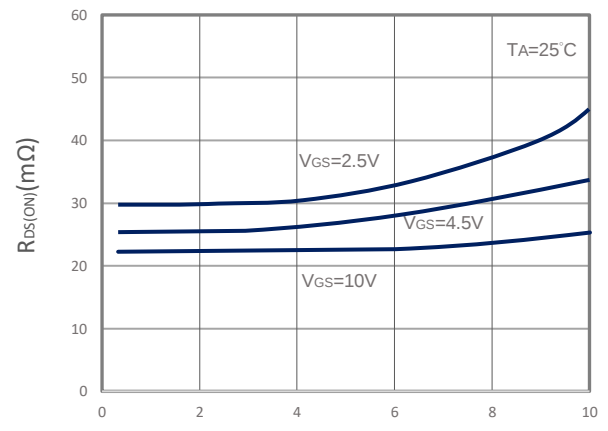
E. Pulsed width limited by maximum junction temperature.

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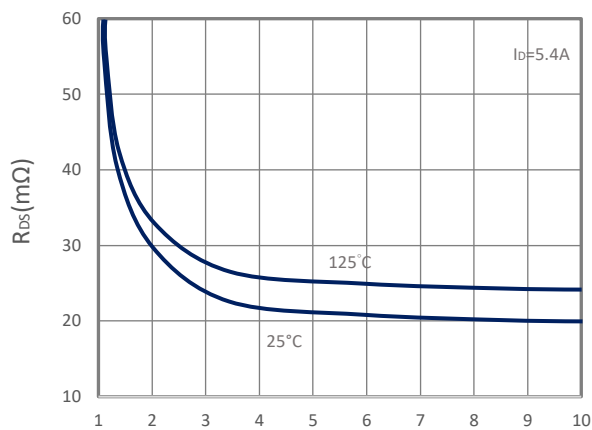
TYPICAL CHARACTERISTICS



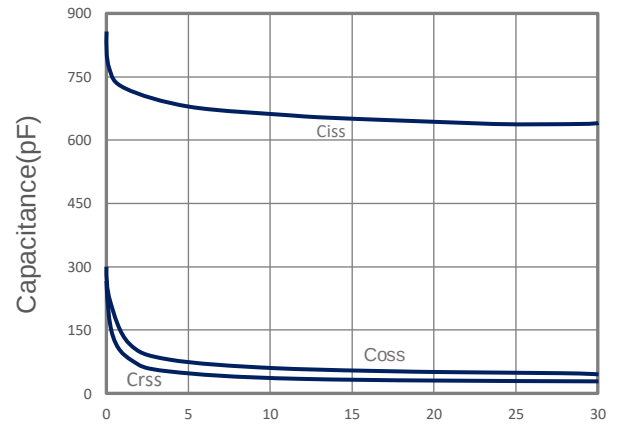
Output Characteristics



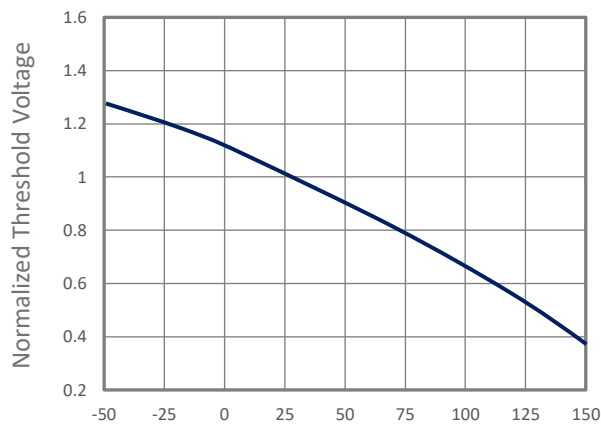
Drain-Source On Resistance



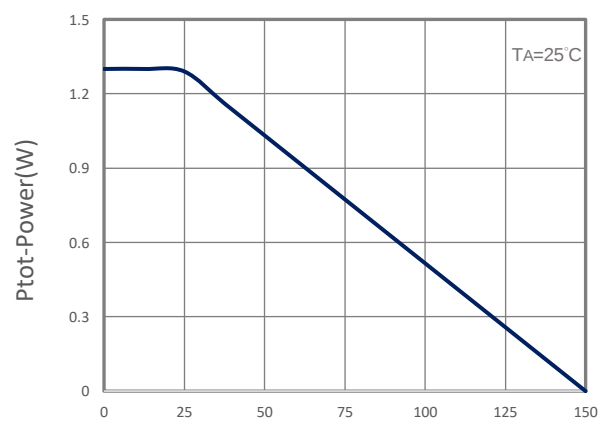
Gate-Source vs On Resistance



Capacitance

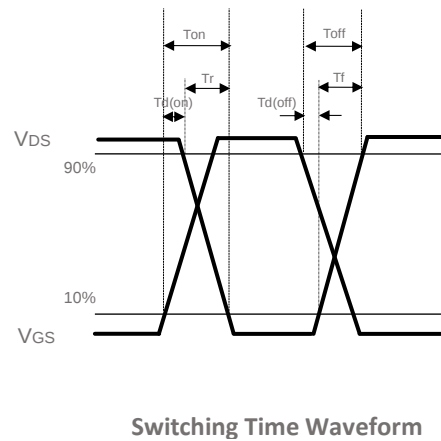
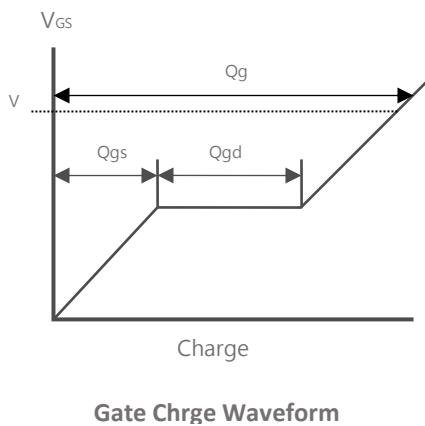
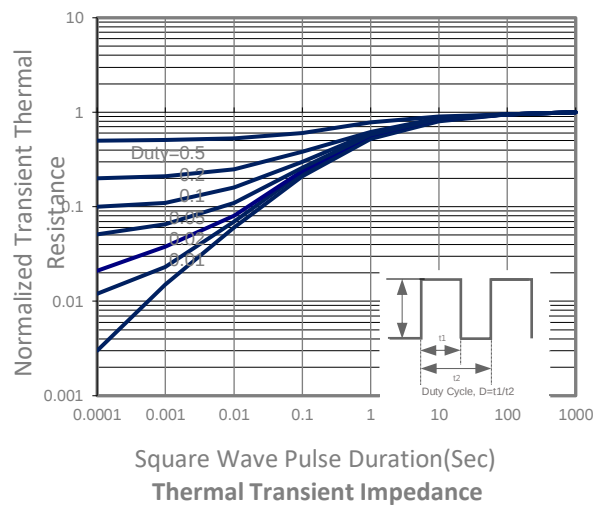
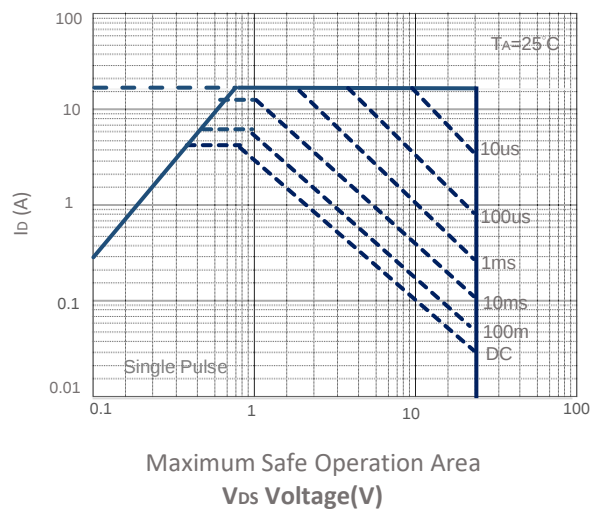
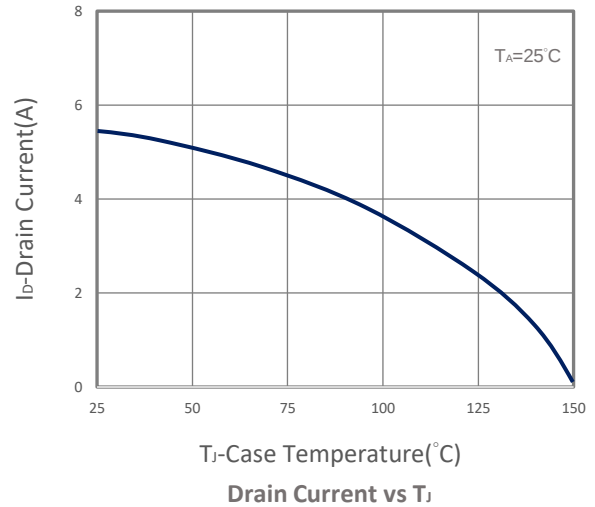
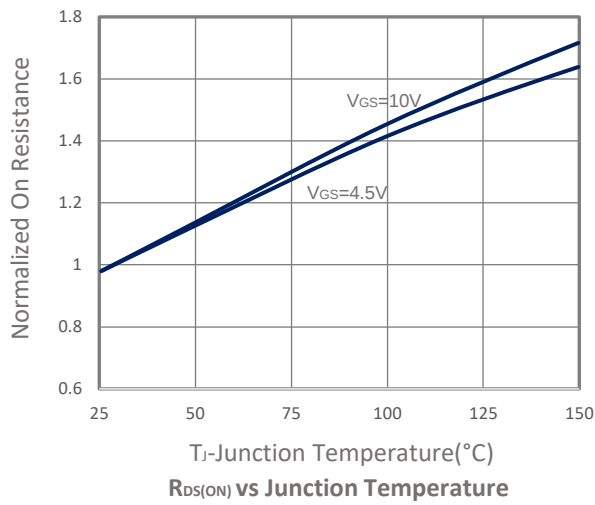


Gate Threshold Voltage

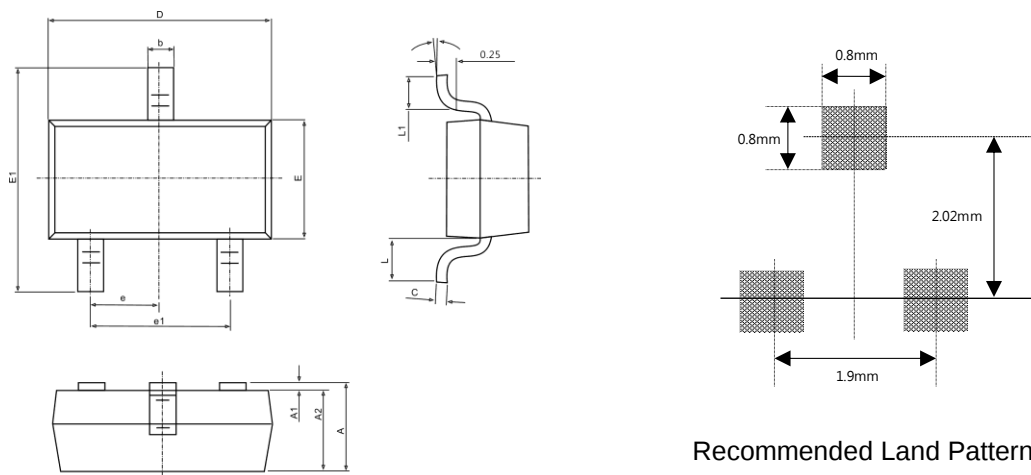


Power Dissipation

TYPICAL CHARACTERISTICS



SOT-23 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	-	1.050	-	0.041
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.043
b	0.390	0.450	0.015	0.018
c	0.050	0.150	0.002	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.300	2.500	0.091	0.098
e	0.950 TYP.		0.037 TYP.	
e1	1.900 REF.		0.075 REF.	
L	0.550 REF.		0.022 REF.	
L1	0.200	-	0.008	-
θ	0°	10°	0°	10°