Single P-Channel MOSFET

■ DESCRIPTION

SMC3323SN is the P-Channel 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

<u>SMC</u> <u>3323</u> <u>SN</u> - <u>TR</u> <u>G</u>
  a   b   c   d   e

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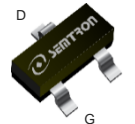e : Green produce code G: *RoHS Compliant*

■ FEATURES

V_{DS}=-30V, I_D=-4.3A

$R_{DS(ON)}$=42mΩ(Typ.)@V_{GS}=-10V
$R_{DS(ON)}$=48mΩ(Typ.)@V_{GS}=-4.5V
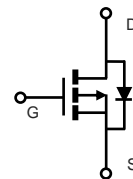$R_{DS(ON)}$=62mΩ(Typ.)@V_{GS}=-2.5V

◆ Fast switch
◆ 2.5V Low gate drive applications

■ APPLICATIONS

◆ Portable Equipment
◆ Power Management
◆ Load Switch

SOT-23

■ ABSOLUTE MAXIMUM RATINGS *(T_A=25°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 [A]	T_A=25°C	-4.3	A
		T_A=70°C	-3.4	A
I_{DM}	Pulsed Drain Current [B]		-17.2	A
P_D	Power Dissipation [A]	T_A=25°C	1.3	W
		T_A=70°C	0.8	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 [A]	t≤10s		95	°C/W
	Thermal Resistance Junction to Ambient [AC]	Steady-State		130	

■*ELECTRICAL CHARACTERISTICS*$(T_A=25°C$ *Unless otherwise noted*)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=-250\mu A$	-0.5	-0.7	-1	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V$, $V_{GS}=\pm12V$			±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]	$V_{GS}=-10V$, $I_D=-4.3A$ $V_{GS}=-4.5V$, $I_D=-3.2A$ $V_{GS}=-2.5V$, $I_D=-2.2A$		44 50 65	48 58 78	mΩ
G_{fs}	Forward Transconductance	$V_{DS}=-10V$, $I_D=-4.3A$		6		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	$I_S=-1A$, $V_{GS}=0V$			-1	V
I_S	Diode Continuous Forward Current				-4.3	A
Dynamic and Switching Parameters [E]						
Q_g	Total Gate Charge	$V_{DS}=-15V$, $V_{GS}=-10V$ $I_D=-4.3A$		25	35	nC
Q_g	Total Gate Charge(4.5V)			12.2	17.1	
Q_{gs}	Gate-Source Charge			2	2.8	
Q_{gd}	Gate-Drain Charge			3	4.2	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, f=1MHz		915		pF
C_{oss}	Output Capacitance			71		
C_{rss}	Reverse Transfer Capacitance			60		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-15V$, $V_{GEN}=-10V$ $R_G=3.3\Omega$, $I_D=-1A$		6.2	12	nS
t_r				27	51	
$t_{d(off)}$	Turn-Off Time			23	44	
t_f				15	29	

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

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

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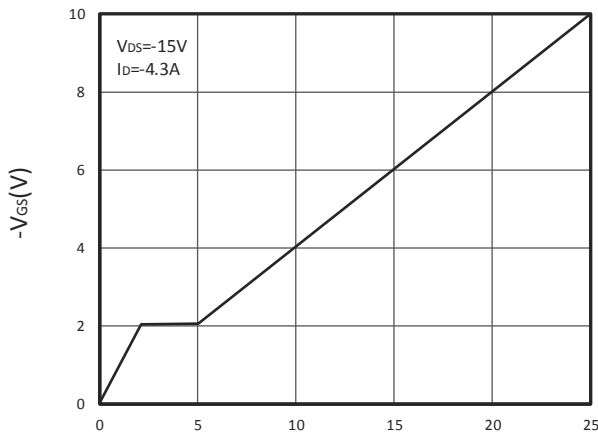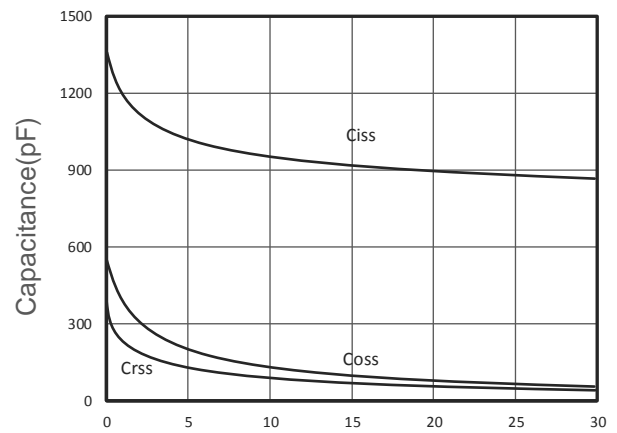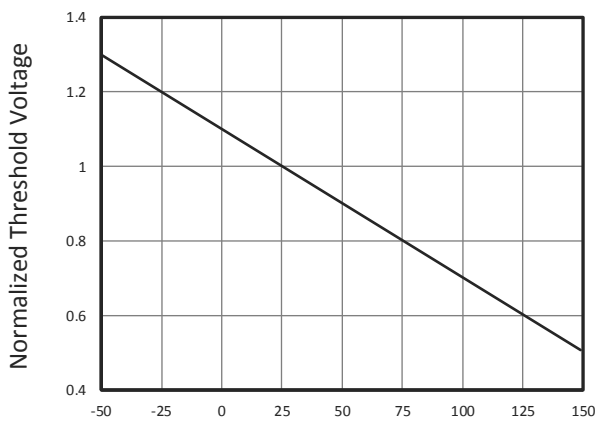
■ *TYPICAL CHARACTERISTICS*
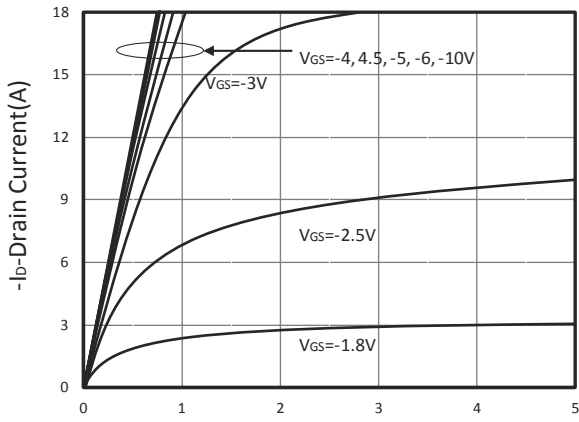
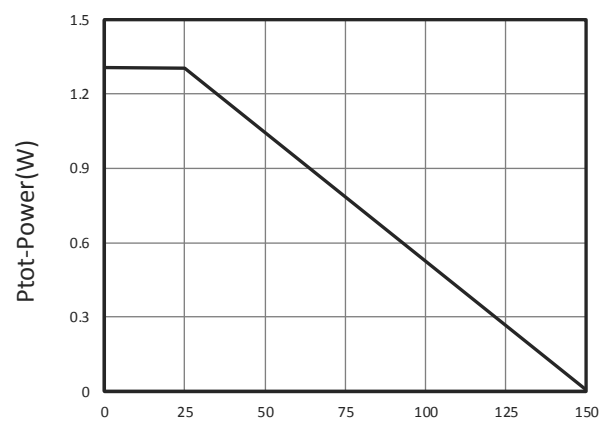**Output Characteristics**
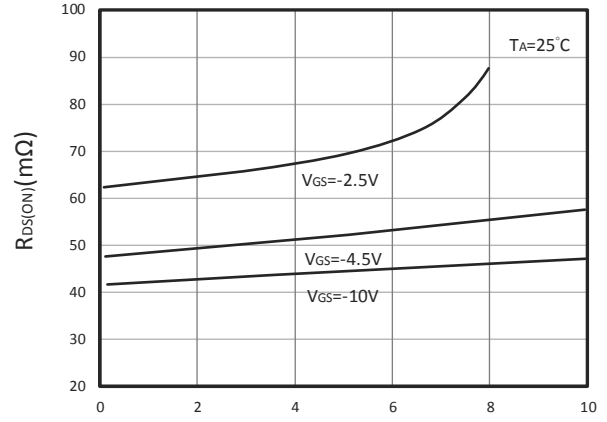
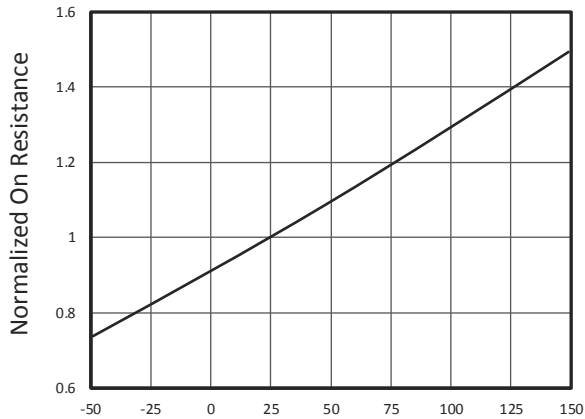**Drain-Source On Resistance**

Gate Charge

Capacitance

Gate Threshold Voltage
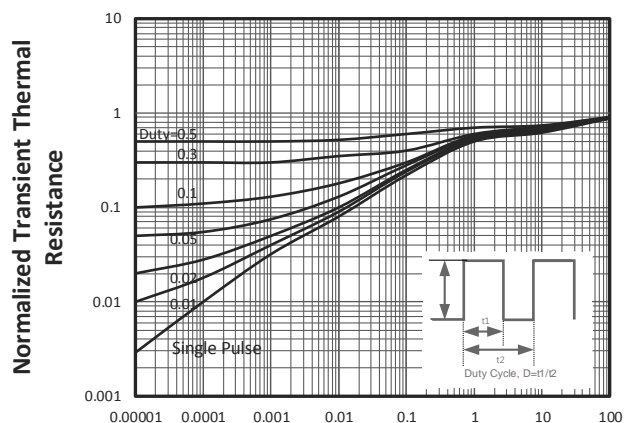

Power Dissipation

■ *TYPICAL CHARACTERISTICS*

Drain-Source On Resistance
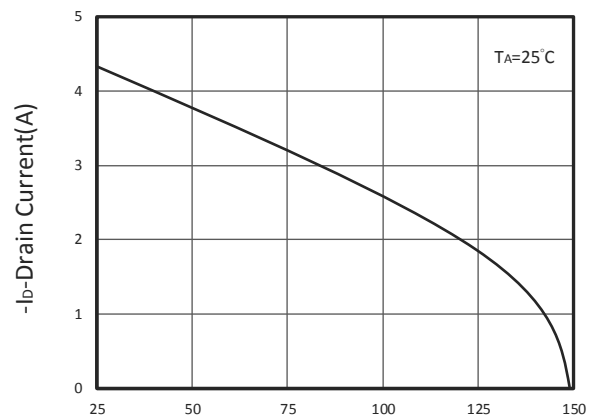
Drain Current vs T$_J$
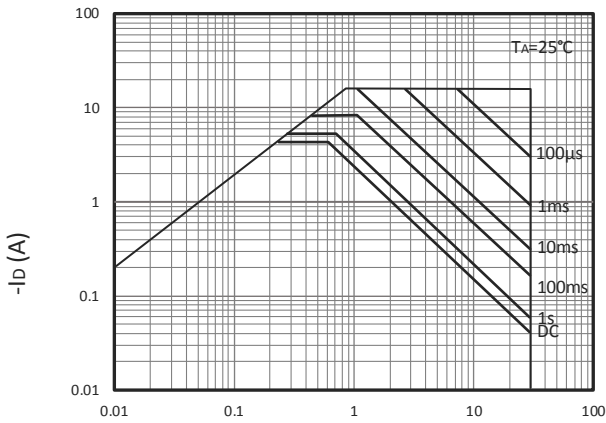
Maximum Safe Operation Area

Thermal Transient Impedance
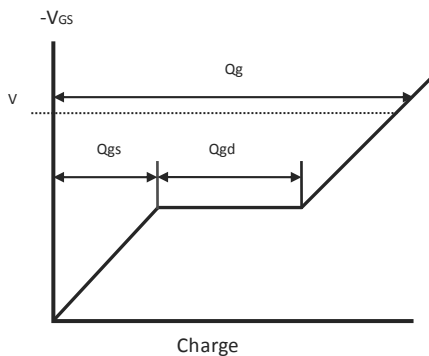
Gate Chrge Waveform
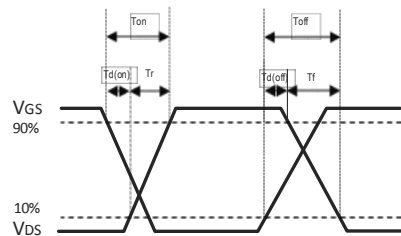
Switching Time Waveform

SemTron Microtech Corporation

■ *SOT-23 PACKAGE DIMENSIONS*

Recommended Land Pattern
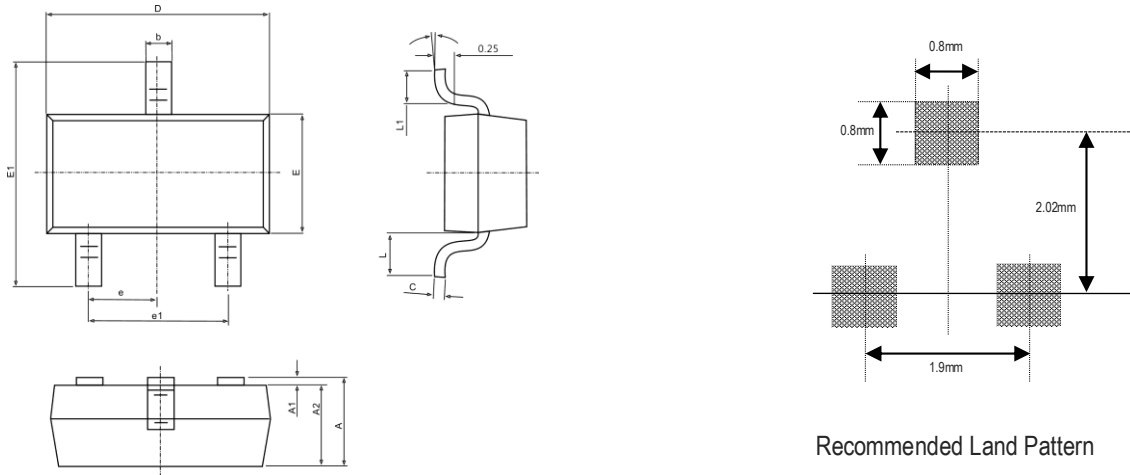
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°