

Single N-Channel MOSFET

DESCRIPTION

SMC3400SN 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 3400 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

$V_{DS}=30V$, $I_D=5.8A$

$R_{DS(ON)}=20m\Omega(Typ.)@V_{GS}=10V$

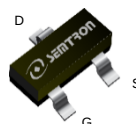
$R_{DS(ON)}=23m\Omega(Typ.)@V_{GS}=4.5V$

$R_{DS(ON)}=27m\Omega(Typ.)@V_{GS}=2.5V$

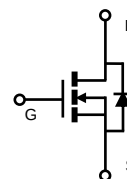
- ◆ Fast switch
- ◆ Low gate drive applications
- ◆ High power and current handling capability

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load Switch
- ◆ PWM Applications



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 ^A	$T_A=25^{\circ}C$	5.8
		$T_A=70^{\circ}C$	4.7
I_{DM}	Pulsed Drain Current ^B	23	A
I_{AS}	Avalanche Current ^B	15	A
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^B	11	mJ
P_D	Power Dissipation ^A	$T_A=25^{\circ}C$	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 ^A	$t \leq 10s$	95	$^{\circ}C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	130	

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

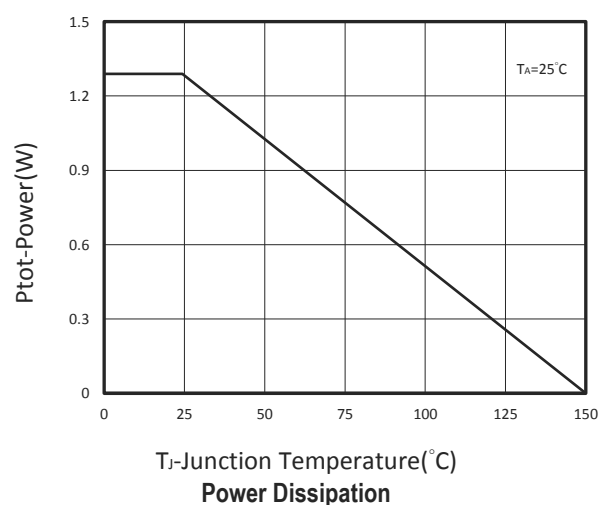
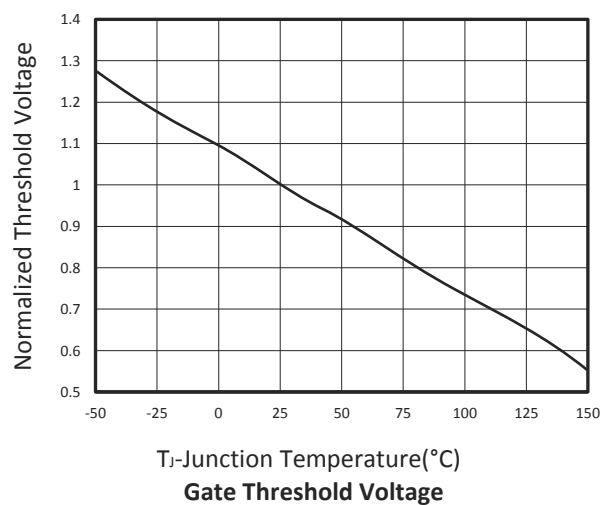
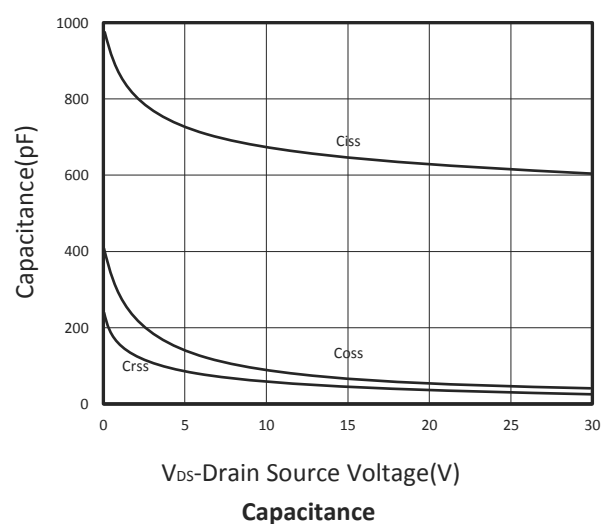
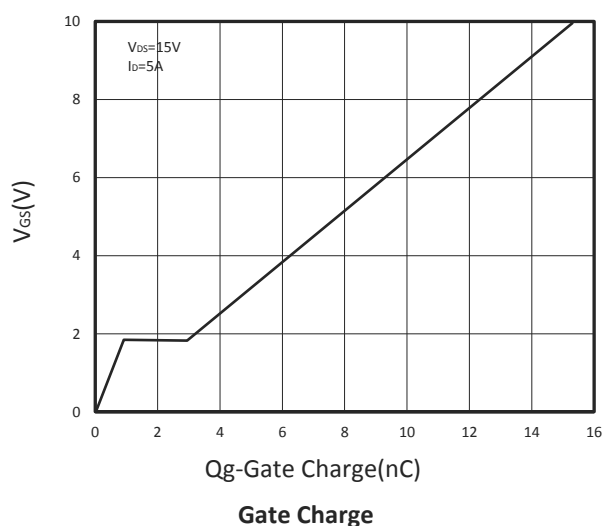
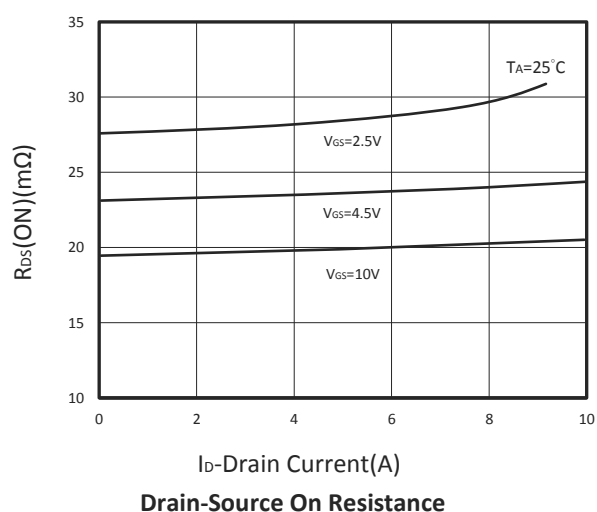
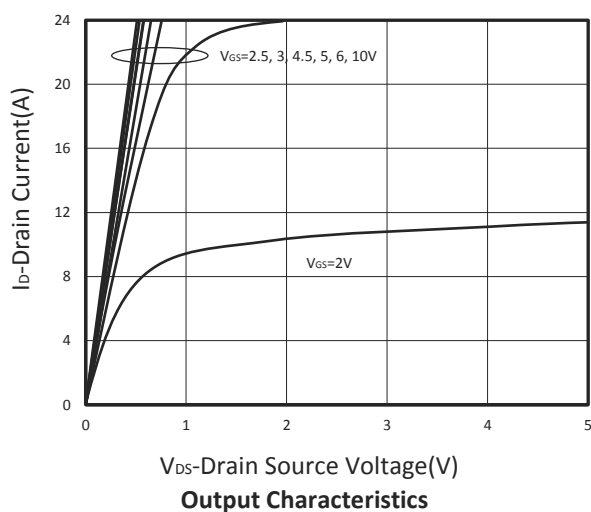
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	Zero Gate 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 [Ⓟ]	V _{GS} =10V, I _D =5.8A		20	24	mΩ
		V _{GS} =4.5V, I _D =5A		23	26	
		V _{GS} =2.5V, I _D =3.2A		27	32	
G _{fs}	Forward Transconductance	V _{DS} =5V, I _D =5A		11		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage [Ⓟ]	I _S =1A, V _{GS} =0V			1.0	V
I _S	Diode Continuous Forward Current				3	A
Dynamic and Switching Parameters [Ⓔ]						
Q _g	Total Gate Charge	V _{DS} =15V,V _{GS} =10V, I _D =5A		15.4	21.5	nC
Q _g	Total Gate Charge (4.5V)			7.5	10.5	
Q _{gs}	Gate-Source Charge			1.3	1.8	
Q _{gd}	Gate-Drain Charge			1.8	2.5	
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 =3.3Ω, I _D =1A		4.7	9	nS
t _r				12.5	24	
t _{d(off)}	Turn-Off Time			28.5	54	
t _f				4.2	8	

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

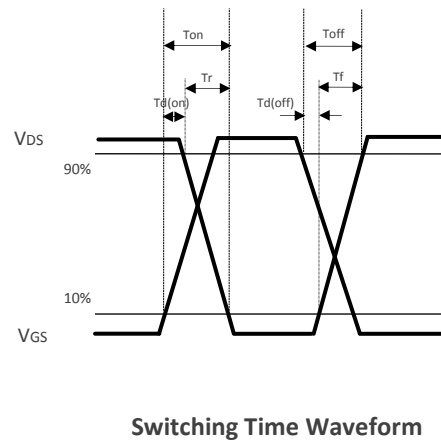
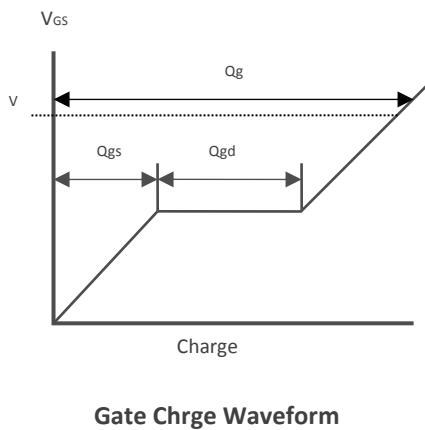
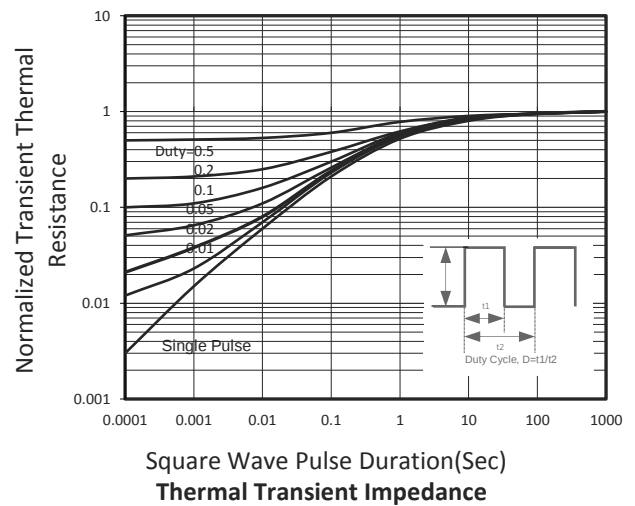
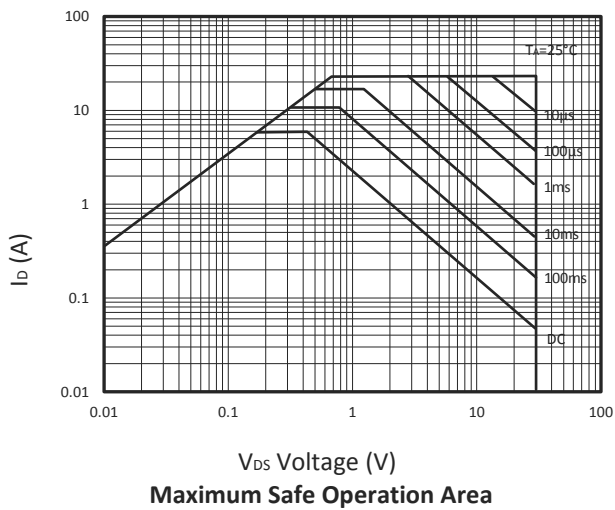
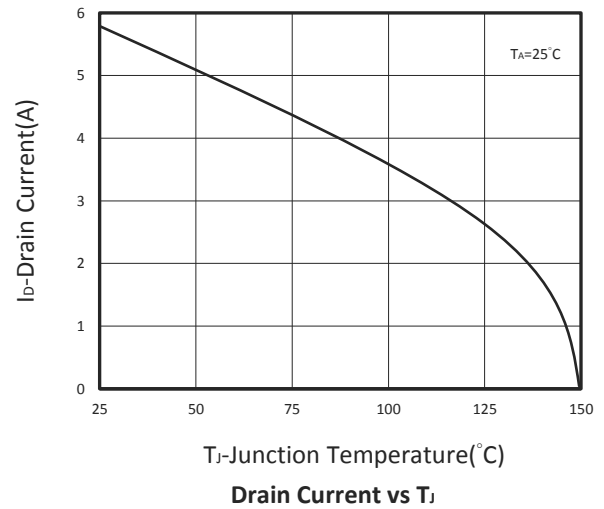
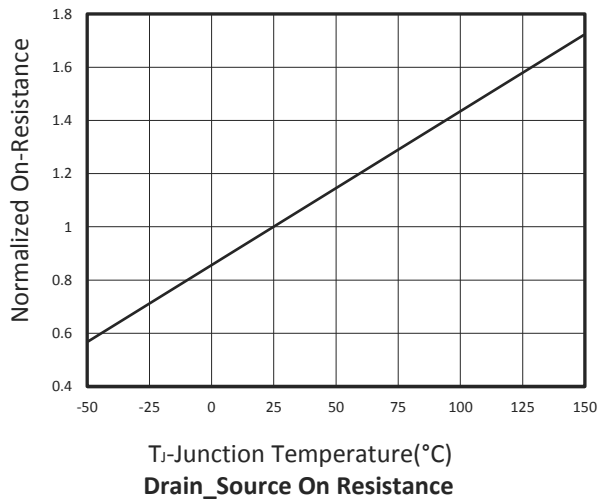
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C (initial temperature T_J=25°C).
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. Guaranteed by design, not subject to production testing.

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date. We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this datasheet.

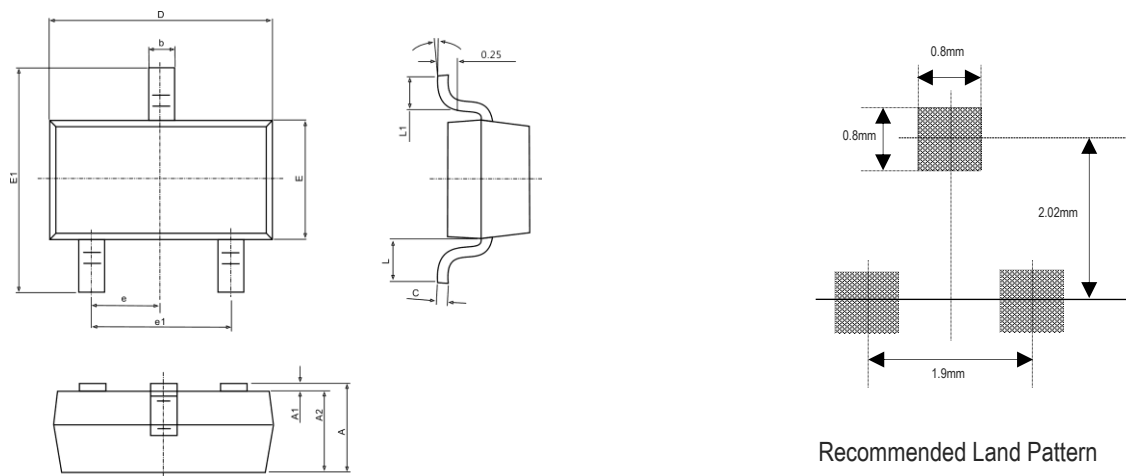
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



■ SOT-23 PACKAGE DIMENSIONS



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°