

Single P-Channel MOSFET

DESCRIPTION

SMC3401SN 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

SMC 3401 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

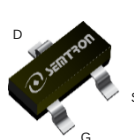
$V_{DS} = -30V$, $I_D = -4.3A$

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

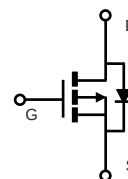
- ◆ Fast switch
- ◆ 2.5V Low gate drive applications

APPLICATIONS

- ◆ Portable Equipment
- ◆ Power Management
- ◆ Load Switch



SOT-23



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ 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	$T_A = 25^\circ C$	-4.3	A
		$T_A = 70^\circ C$	-3.4	A
I_{DM}	Pulsed Drain Current ^B		-17.2	A
P_D	Power Dissipation ^A	$T_A = 25^\circ C$	1.3	W
		$T_A = 70^\circ C$	0.8	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 ^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)

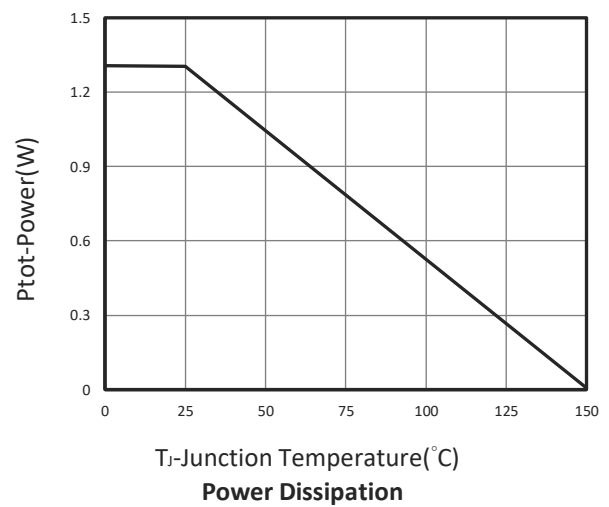
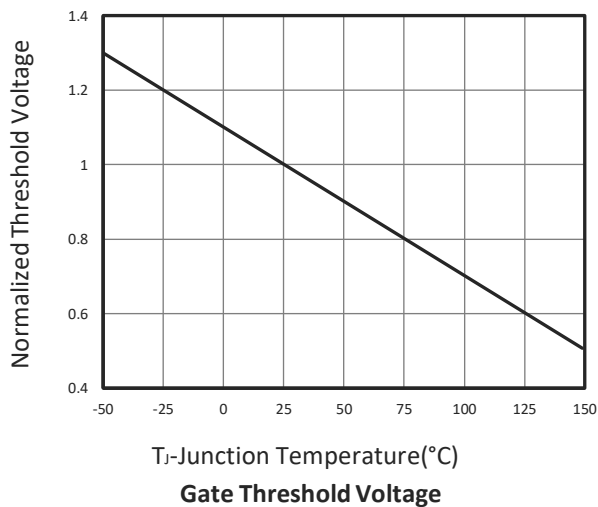
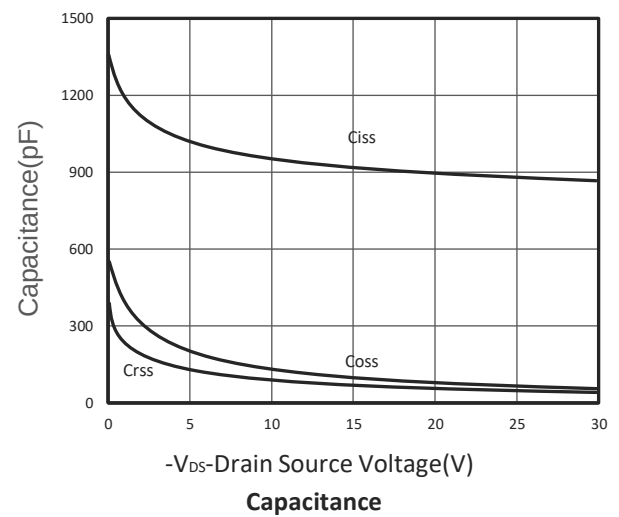
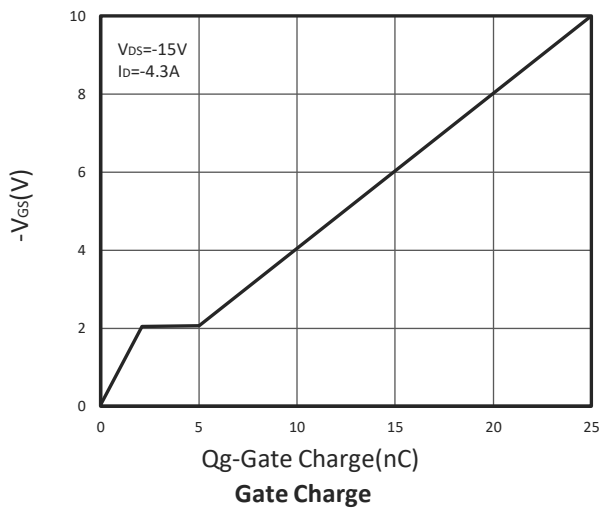
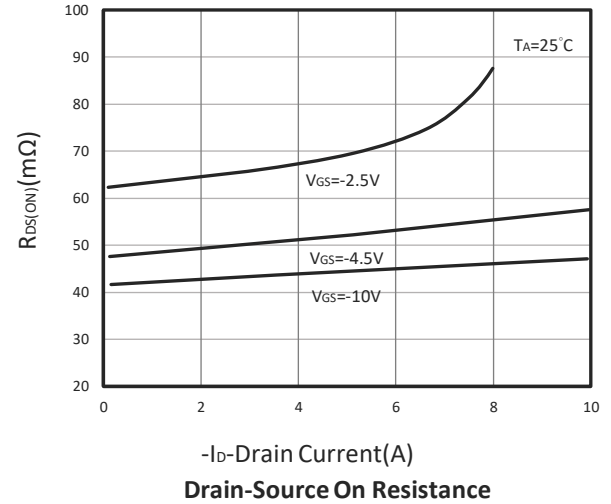
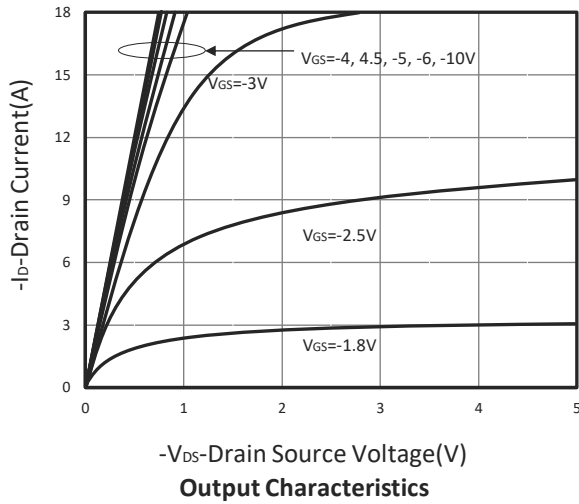
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.5	-0.7	-1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	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 =-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 [Ⓓ]	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Forward Current				-4.3	A
Dynamic and Switching Parameters [Ⓔ]						
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 =3.3Ω, 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.

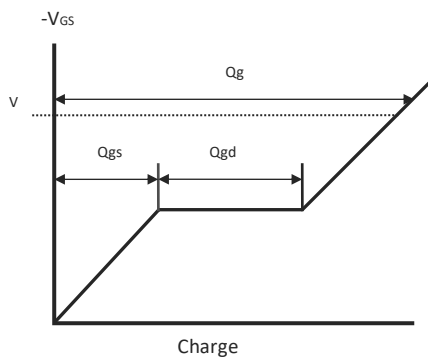
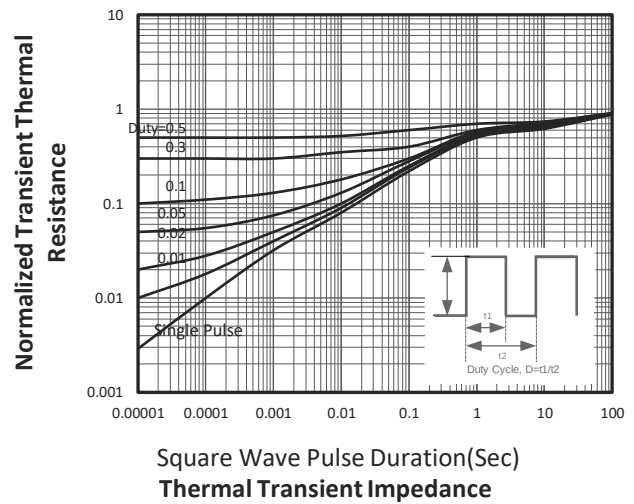
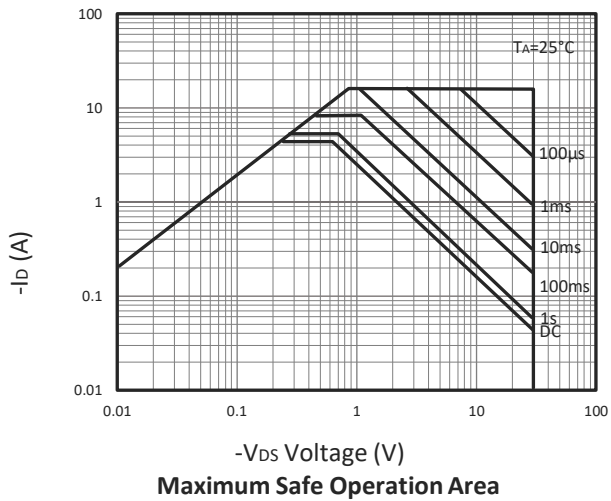
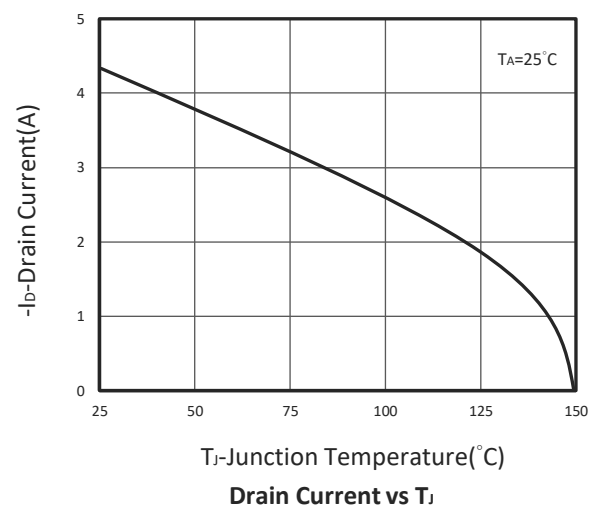
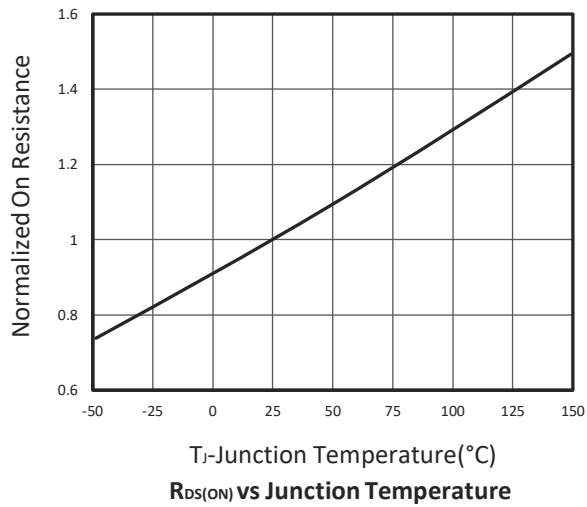
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_J=25^\circ\text{C}$).
- C. Using $\leq 10\text{s}$ junction-to-ambient thermal resistance is base on $T_{J(MAX)}=150^\circ\text{C}$.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

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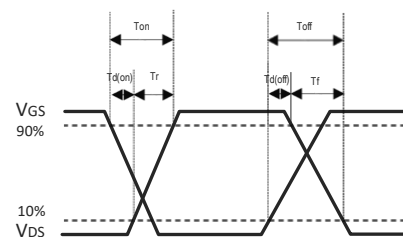
TYPICAL CHARACTERISTICS



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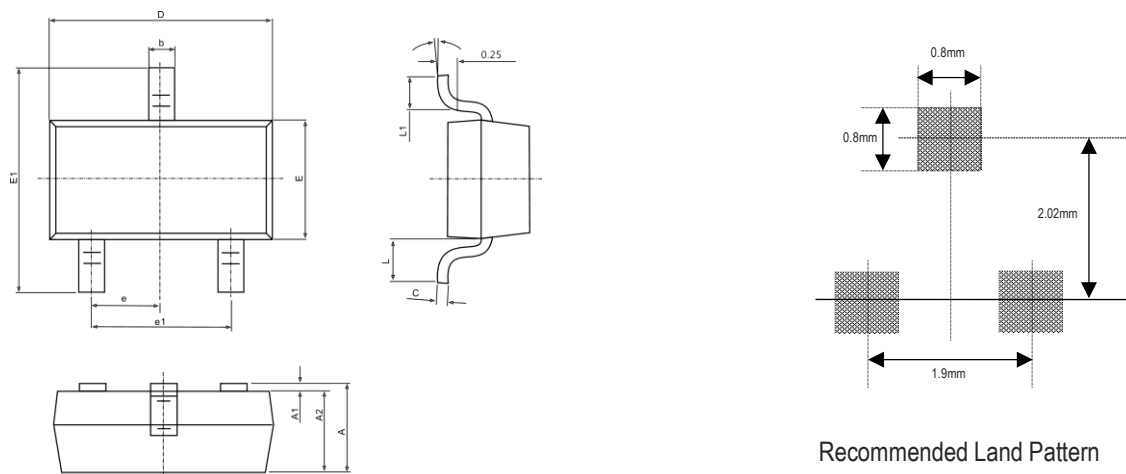


Gate Chrg Waveform



Switching Time Waveform

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°