SMC3401E

-20V P-Channel Enhancement Mode MOSFET

DESCRIPTION

The SMC3401E is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density. advanced trench technology to provide excellent $R_{DS(ON)}$.

This device is suitable for use as a load switch or in PWM and gate charge for most of the synchronous buck converter applications.

SMC3401ES-TRG ROHS Compliant This is Halogen Free

FEATURE

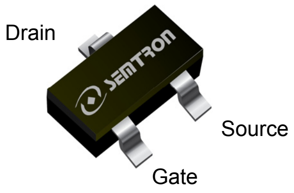
- ***-20V/-4.3A, $R_{DS(ON)}$ =36mΩ(typ)@V_{GS} =-10V***
- ***-20V/-3.5A, $R_{DS(ON)}$ =43mΩ(typ)@V_{GS} =-4.5V***
- ***-20V/-2.5A, $R_{DS(ON)}$ =55mΩ(typ)@V_{GS} =-2.5V***

- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

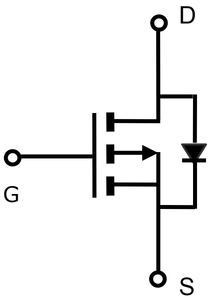
FEATURE

- DC/DC Converter
- Load Switch
- Mobile Battery Powered System

PIN CONFIGURATION



SOT-23L
Top View



PART NUMBER INFORMATION

SMC	**3401E**	**S**	**-**	**TR**	**G**
a	b	c		d	e

a : Company name.
b : Product Serial number.
c : Package code
d : Handling code
e : Green produce code

ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
SMC3401ES-TRG	S : SOT-23L	TR : Tape&Reel	3K/Reel

※ Year Code : 0 ~ 9, 2010 : 0
※ Week Code : A(1~2) ~ Z(53~54)
※ SOT-23L : Only available in tape and reel packaging.

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current (T_C=25°C)[A]	V_{GS}=-12V	-4.3	A
	Continuous Drain Current (T_C=70°C)[A]		-3.6	A
I_{DM}	Pulsed Drain Current[B]		-20	A
P_D	Power Dissipation	T_A=25°C T_A=70°C	1.52 1.08	W
T_J	Operation Junction Temperature		-55 to150	°C
T_{STG}	Storage Temperature Range		-55 to150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

THERMAL DATA

Symbol	Parameter		Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient[A]	Steady-State	-	120	°C/W
$R_{\theta JL}$	Thermal Resistance Junction to Lead[A]	Steady-State	-	80	°C/W

■*ELECTRICAL CHARACTERISTICS*(T_J = 25℃ *Unless otherwise noted*)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.65	-1.0	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±12V			±100	nA
I_{DSS}	Zero Gate Voltage, Drain-Source Leakage Current	V_{DS}=-20V,V_{GS}=0V T_J=25°C			-1	μA
		V_{DS}=-16V,V_{GS}=0V T_J=55°C			-5	
$R_{DS(ON)}$	Drain-source On-Resistance[B]	V_{GS}=-10V,I_D=-4.3A V_{GS}=-4.5V,I_D=-3.5A V_{GS}=-2.5V,I_D=-2.5A		36 43 55	40 48 65	mΩ
Source-Drain Doide						
V_{SD}	Diode Forward Voltage	I_S=-1.0A,V_{GS}=0V		-0.7	-1.0	V
I_S	Continuous Source Current[AD]				-1	A
Dynamic Parameters						
Q_g (-4.5V)	Total Gate Charge	V_{DS}=-15V V_{GS}=-10V I_D=-4.3A		9.8		nC
Q_{gs}	Gate-Source Charge			2.1		
Q_{gd}	Gate-Drain Charge			2.8		
C_{iss}	Input Capacitance	V_{DS}=-15V V_{GS}=0V f=1MHz		968		pF
C_{oss}	Output Capacitance			132		
C_{rss}	Reverse Transfer Capacitance			76		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V I_D=-4.3A V_{GEN}=-10V R_G=6Ω		6.6		nS
t_r				3		
$t_{d(off)}$	Turn-Off Time			33		
t_f				13		

Note:

A. The value of R $_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

B. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

C. The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH.

D. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

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

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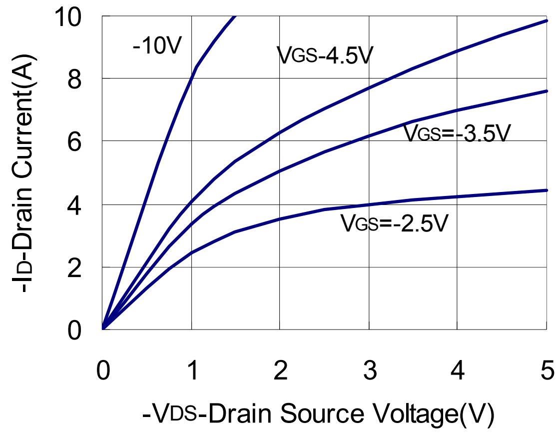
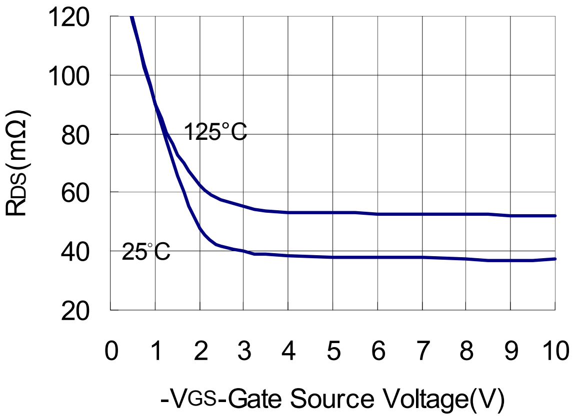
■*TYPICAL CHARACTERISTICS (25℃ Unless Note)*

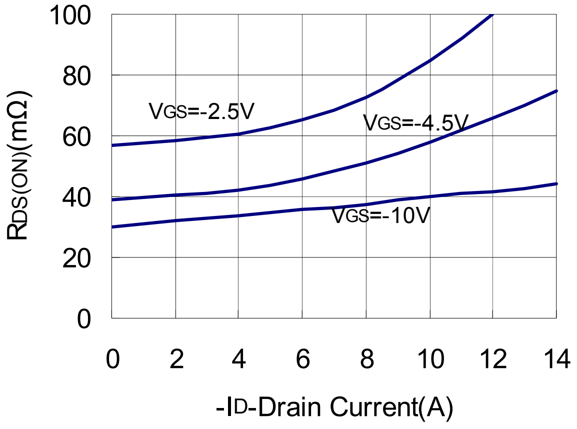
Output Characteristics



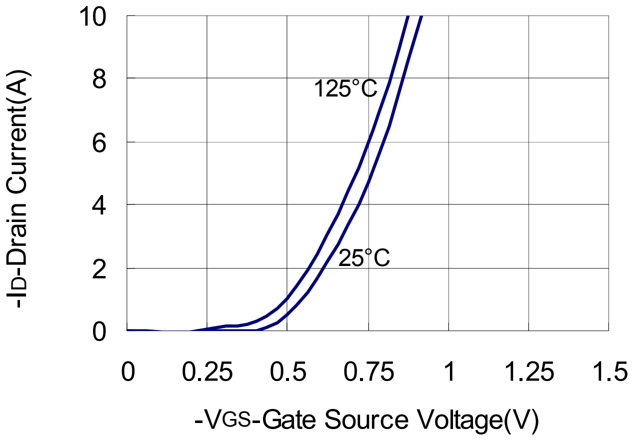
Drain-Source On Resistance



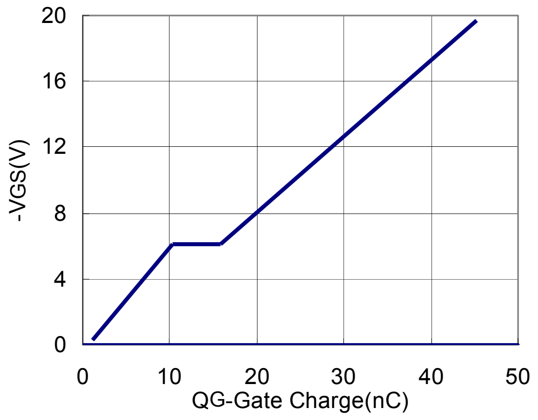
Drain Source On Resistance



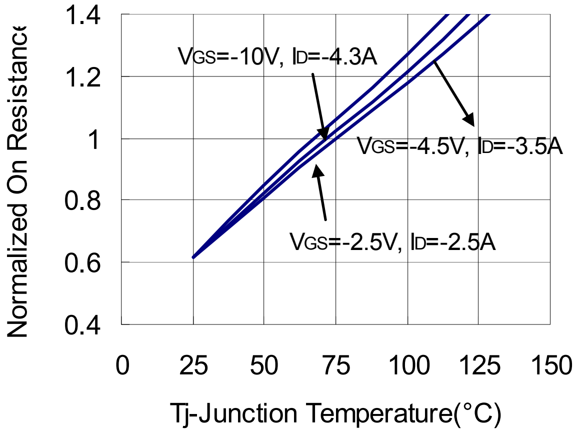
Transfer Characteristics



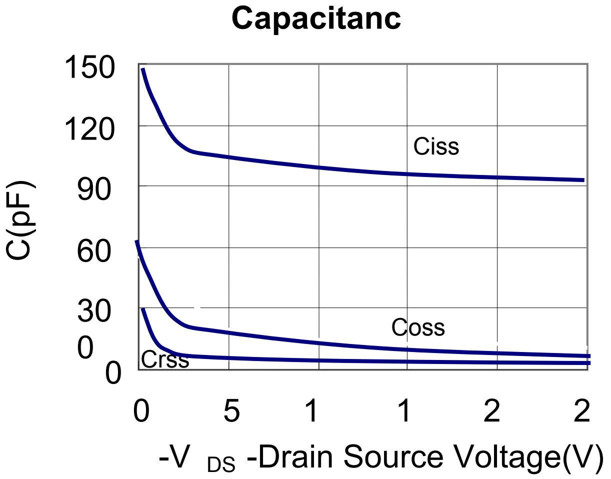
Gate Charge

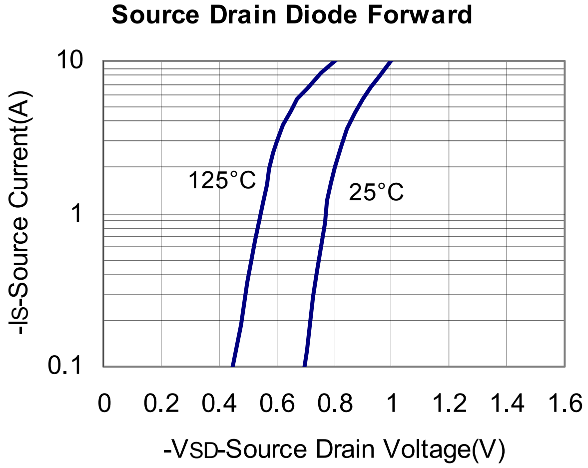


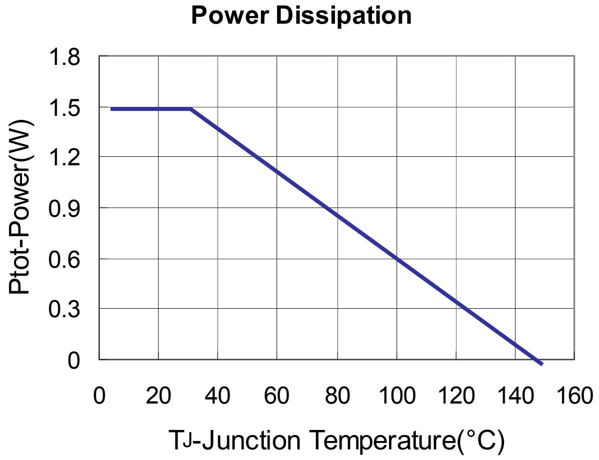
Drain Source Resistance

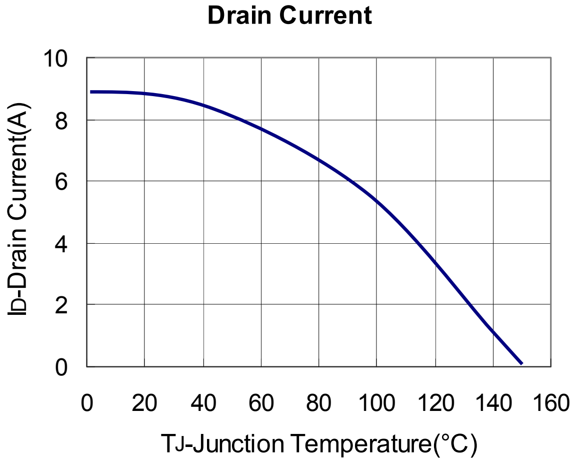


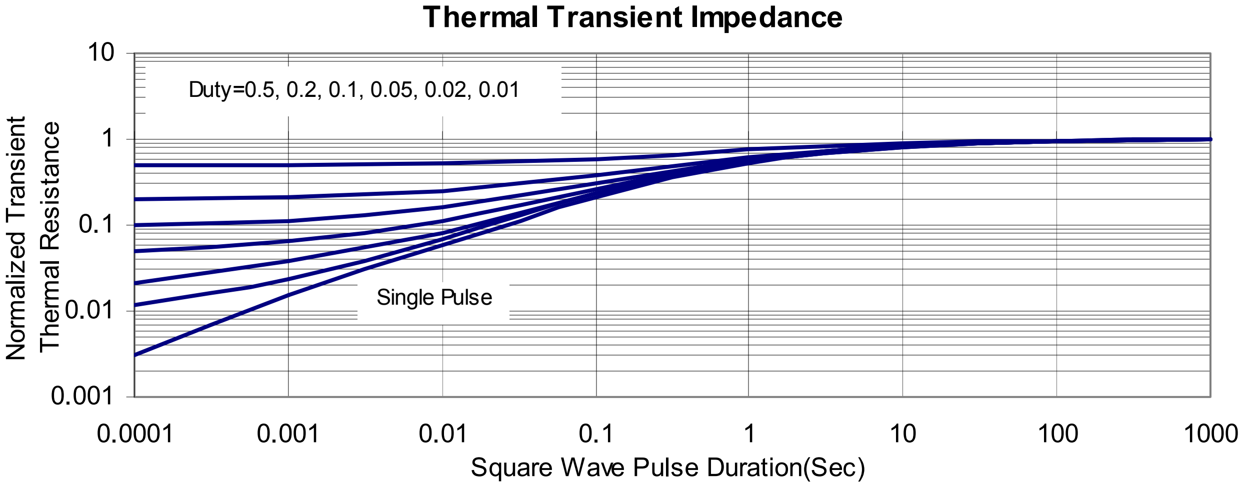
■TYPICAL CHARACTERISTICS *(25℃ Unless Note)*


Capacitanc


Source Drain Diode Forward


Power Dissipation


Drain Current


Thermal Transient Impedance

■SOT-23L PACKAGE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23L PACKAGE OUTLINE DIMENSIONS