SemTron Microtech Corporation

SMC3401

-30V P-Channel Enhancement Mode MOSFET

P-Channel Enhancement Mode MOSFET

DESCRIPTION

The SMC3401 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.

SMC3401S-TRG ROHS Compliant This is Halogen Free

FEATURE

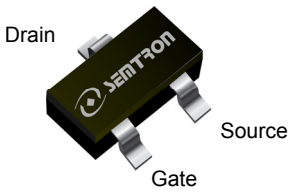
- ***-30V/-4.3A, $R_{DS(ON)}$ =44mΩ(typ)@V_{GS} =-10V***
- ***-30V/-3.5A, $R_{DS(ON)}$ =50mΩ(typ)@V_{GS} =-4.5V***
- ***-30V/-2.5A, $R_{DS(ON)}$ =65mΩ(typ)@V_{GS} =-2.5V***
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

FEATURE

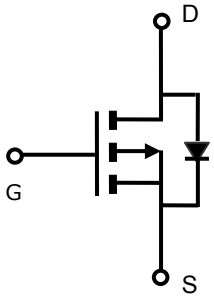
- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- DC/DC Converter
- Load Switch
- Battery Powered System

Green Product

PIN CONFIGURATION



SOT-23L
Top View



PART NUMBER INFORMATION

SMC 3401 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
SMC3401S-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		-30	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current (T_C=25°C) [A]	V_{GS}=-10V	-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	1.4 0.9	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	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-0.6		-1.2	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}=-24V,V_{GS}=0V T_J=25°C			-1	μA
		V_{DS}=-24V,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		44 50 65	52 58 78	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		14		nC
Q_{gs}	Gate-Source Charge			1.25		
Q_{gd}	Gate-Drain Charge			2.1		
C_{iss}	Input Capacitance	V_{DS}=-15V V_{GS}=0V f=1MHz		580		pF
C_{oss}	Output Capacitance			76		
C_{rss}	Reverse Transfer Capacitance			55		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V I_D=-4.3A V_{GEN}=-10V R_G=6Ω		7		nS
t_r				12.5		
$t_{d(off)}$	Turn-Off Time			26		
t_f				12		

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.

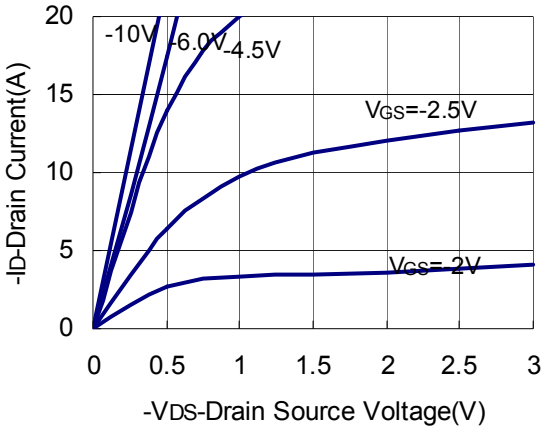
B. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

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

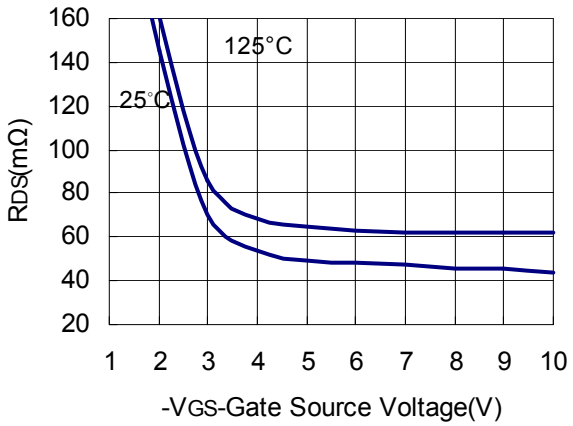
D. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

TYPICAL CHARACTERISTICS (25℃ Unless Note)

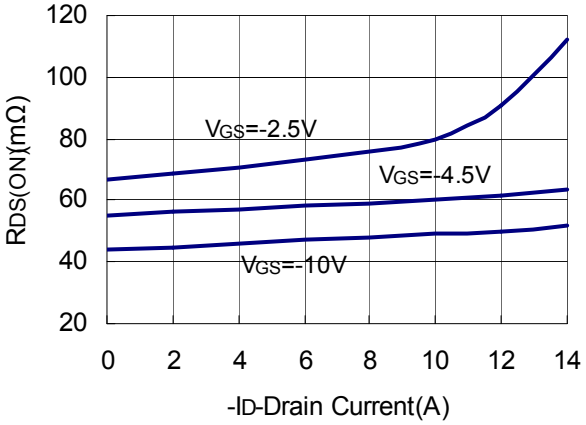
Output Characteristics



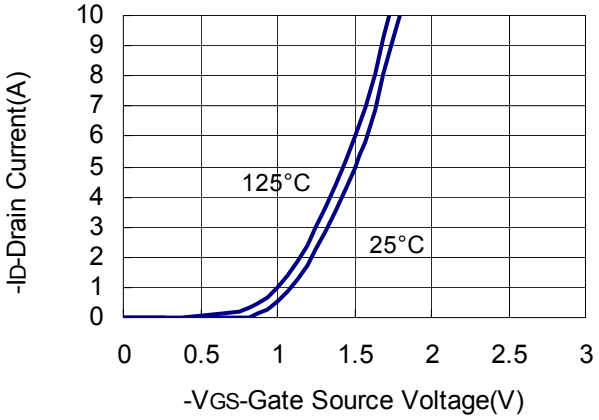
Drain-Source On Resistance



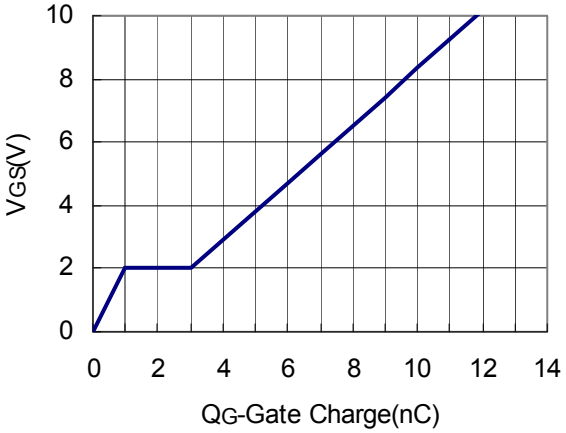
Drain Source On Resistance



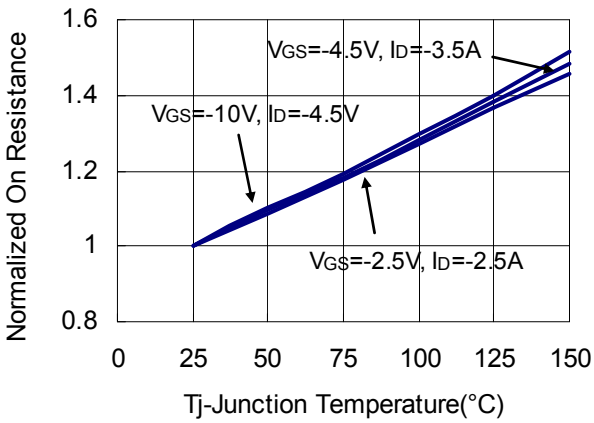
Transfer Characteristics



Gate Charge

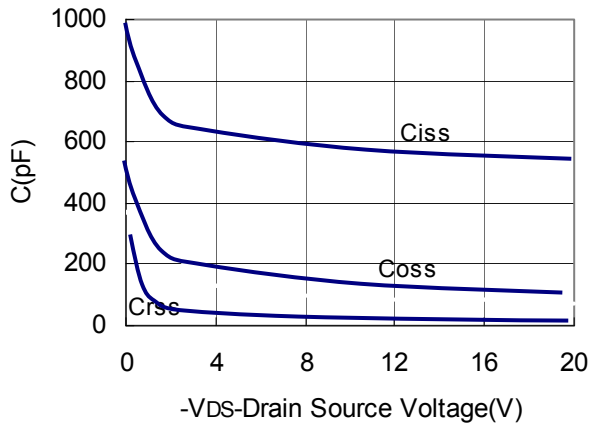


Drain Source Resistance

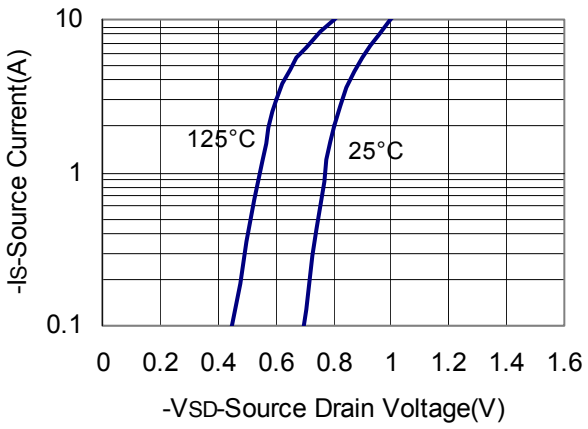


TYPICAL CHARACTERISTICS (25℃ Unless Note)

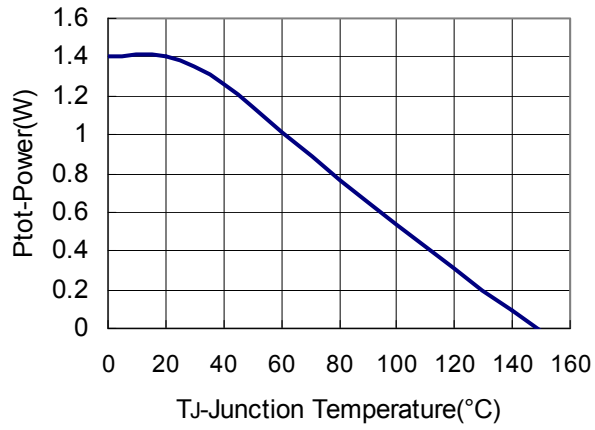
Capacitance



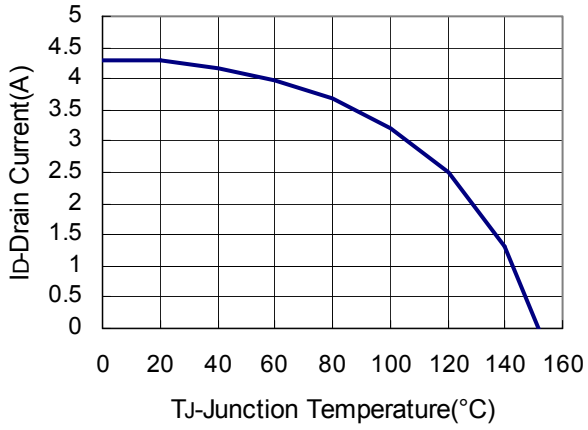
Source Drain Diode Forward



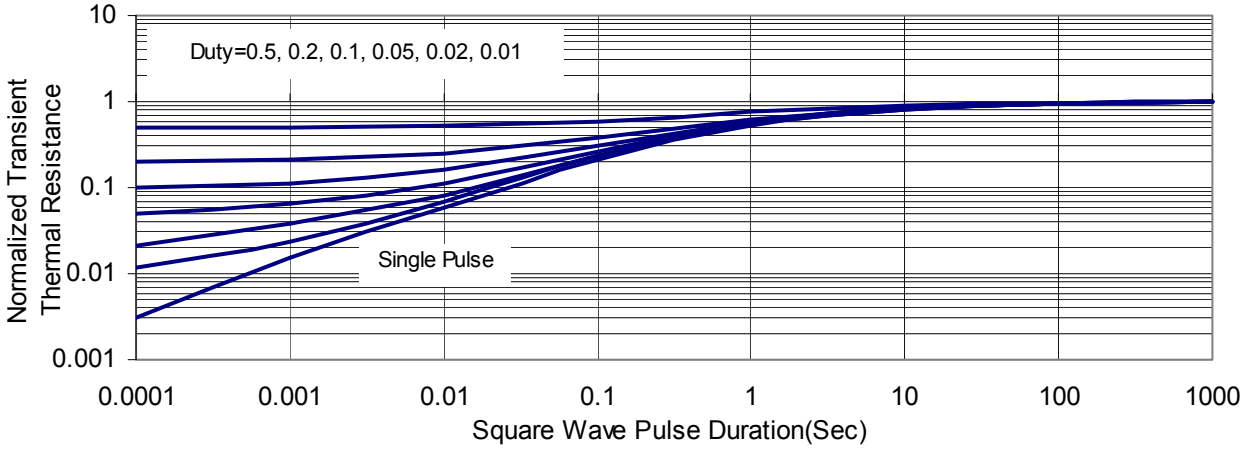
Power Dissipation



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