SemTron Microtech Corporation

SMC7002

60V N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SMC7002 is the N-Channel enhancement mode power field effect transistor is using trench DMOS technology.
This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.
These devices are well suited for high efficiency fast switching applications. This device is suitable for use as a load switch or other general applications.

SMC7002S-TRG ROHS Compliant This is Halogen Free

FEATURE

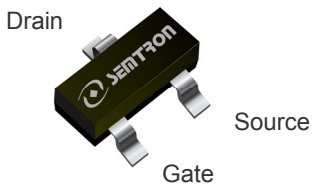
- ***60V/0.5A, $R_{DS(ON)}$ =1.2Ω(typ.)@V_{GS} =10V***
- ***60V/0.2A, $R_{DS(ON)}$ =1.8Ω(typ.)@V_{GS} =4.5V***
- Fast switching
- 100%EAS Guaranteed
- Improved dv/dt capability
- ESD Protection Diode Embedded

APPLICATIONS

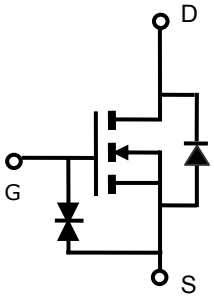
- LED Lighting
- Moto Drive
- Load Switch

Green Product

PIN CONFIGURATION



SOT-23
Top View



PART NUMBER INFORMATION

SMC 7002 S - TR G a b c d e	**a : Company name.** **b : Product Serial number.** **c : Package code.** **d : Handling code** **e : Green product code**

■ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
SMC7002S-TRG	S : SOT-23	TR : Tape&Reel	3K/Reel

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

■ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current (T_C=25°C) [A]	V_{GS}=4.5V	0.3	A
	Continuous Drain Current (T_C=100°C) [A]		0.2	A
I_{DM}	Pulsed Drain Current[B]		1.0	A
P_D	Power Dissipation	T_A=25°C T_A=70°C	0.35 0.25	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	-	357	°C/W

■ELECTRICAL CHARACTERISTICS(T_A = 25°C 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	60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1	1.6	2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±10	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V T_J=25°C			1	μA
		V_{DS}=48V,V_{GS}=0V T_J=125°C			100	
$R_{DS(ON)}$	Drain-source On-Resistance[B]	V_{GS}=10V,I_D=0.5A V_{GS}=4.5V,I_D=0.2A		1.2 1.8	1.6 3.0	Ω
G_{fs}	Forward Transconductance	V_{DS}=10V,I_D=0.1A		250		mS
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] VG=VD=0V , Force Current				0.3	A
Dynamic Parameters						
Q_g	Total Gate Charge	V_{DS}=30V V_{GS}=10V I_D≡0.20A		1.1	2.0	nC
Q_{gs}	Gate-Source Charge			0.1	0.2	
Q_{gd}	Gate-Drain Charge			0.23	0.5	
C_{iss}	Input Capacitance	V_{DS}=10V V_{GS}=0V f=1MHz		30.6	45	pF
C_{oss}	Output Capacitance			5.5	10	
C_{rss}	Reverse Transfer Capacitance			4.0	8.0	
$t_{d(on)}$	Turn-On Time	V_{DD}=30V I_D=0.2A V_{GEN}=10V R_G=6Ω		3.0	6.0	nS
t_r				5.0	10	
$t_{d(off)}$	Turn-Off Time			14	27	
t_f				9.0	17	

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}=48V,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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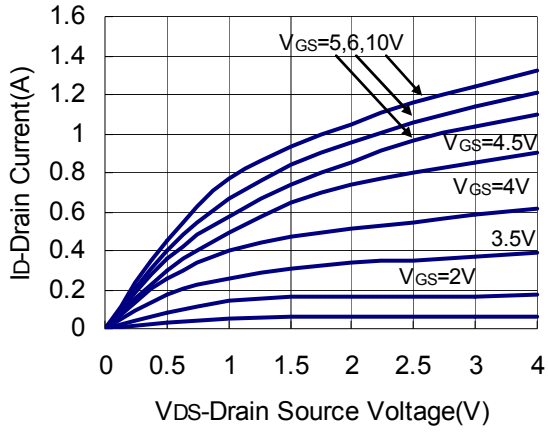
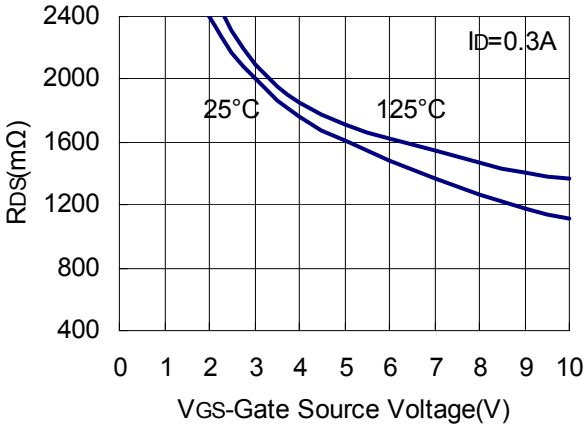
TYPICAL CHARACTERISTICS

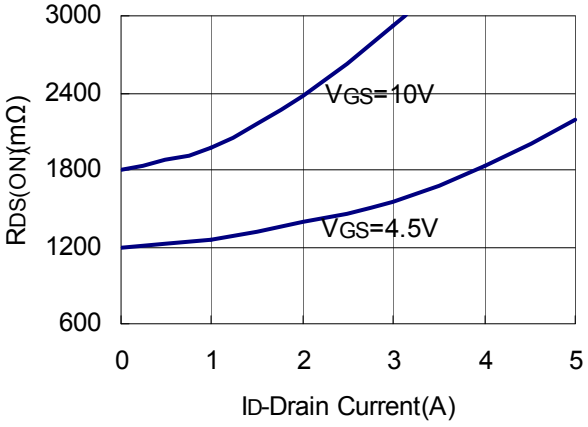
Output Characteristics



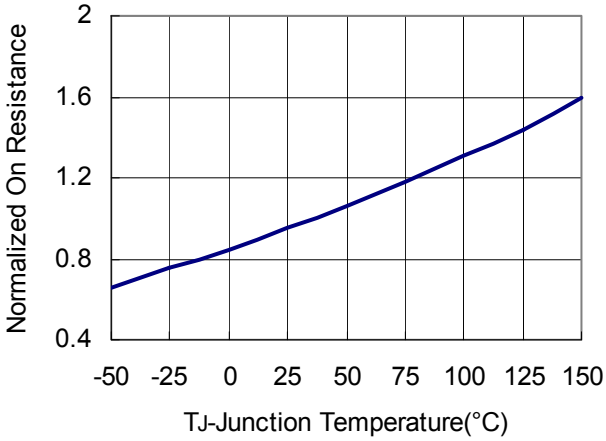
Drain-Source On Resistance



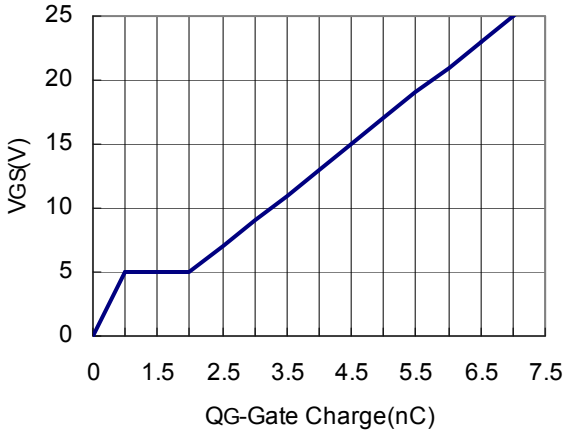
Drain Source On Resistance



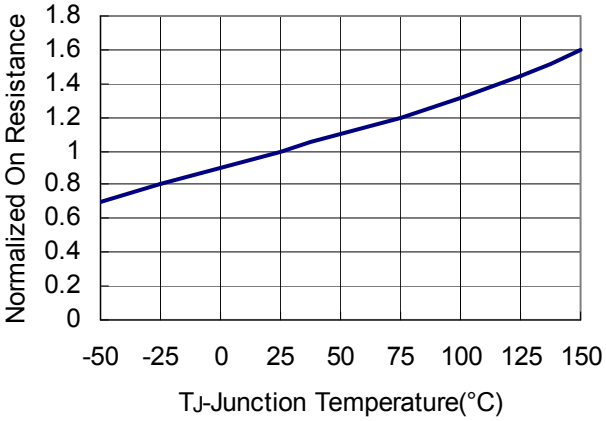
Drain Source On Resistance



Gate Charge

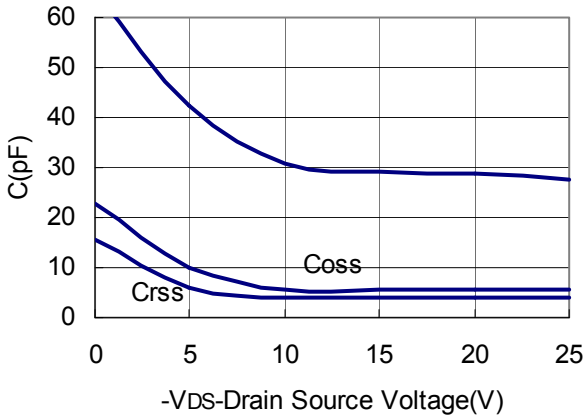


Drain Source On Resistance

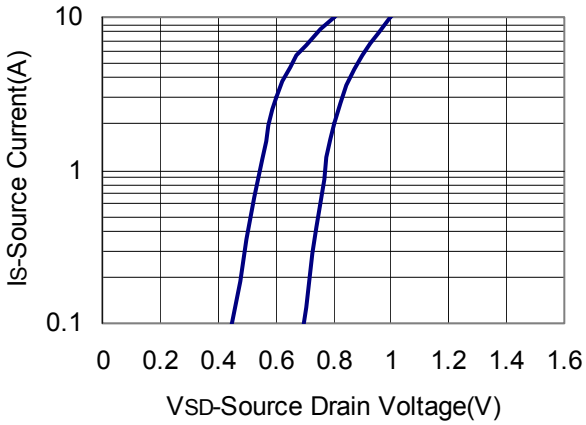


TYPICAL CHARACTERISTICS

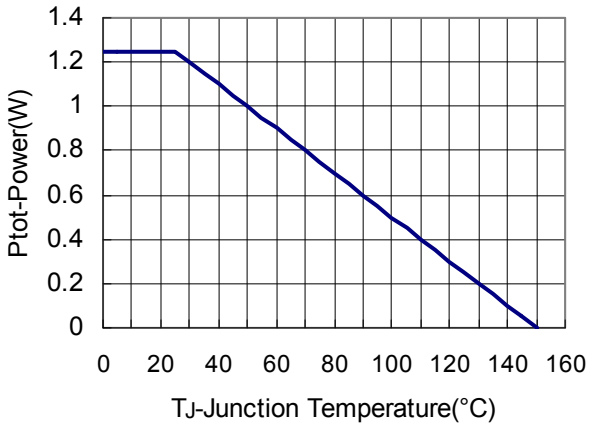
Capacitance



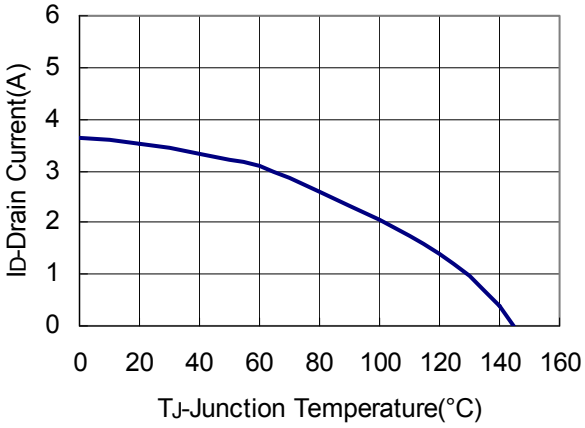
Source Drain Diode Forward



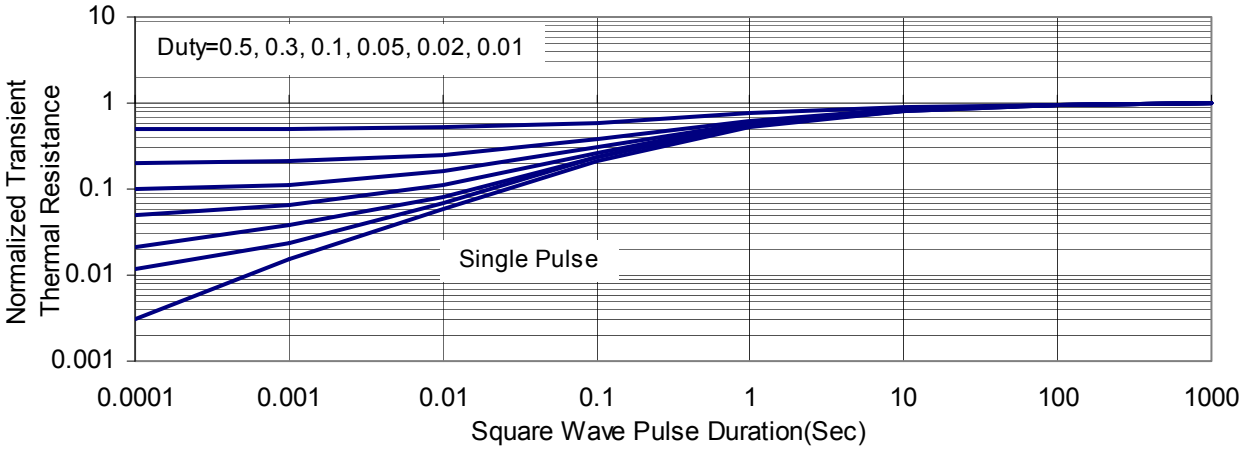
Power Dissipation



Drain Current



Thermal Transient Impedance



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
L1	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°