SemTron Microtech Corporation

SMC4270W

Common-Drain Dual N-Channel MOSFET

DESCRIPTION

SMC4270 is the Dual N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology to provide excellent $R_{DS(ON)}$. These 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 4270 W - TR G
a b c d e

a : Company name.
b : Product Serial number.
c : Package code W:TSSOP-8
d : Handling code TR:Tape&Reel
e : Green produce code G:*RoHS Compliant*

FEATURES

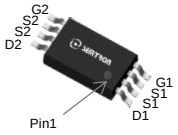
V_{DS} = 20V, I_D = 7A

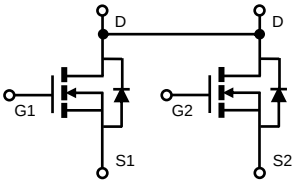
$R_{DS(ON)}$=16.5mΩ(Typ.)@V_{GS}=4.5V
$R_{DS(ON)}$=17mΩ(Typ.) @V_{GS}=4.0V
$R_{DS(ON)}$=18mΩ(Typ.) @V_{GS}=3.2V
$R_{DS(ON)}$=20mΩ(Typ.) @V_{GS}=2.5V
$R_{DS(ON)}$=23mΩ(Typ.) @V_{GS}=1.8V

- Fast switch
- High power and current handling capability
- Exceptional on-resistance

APPLICATIONS

- Power Management in Notebook Computer
- Portable Equipment and Battery Powered.





TSSOP-8

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

Symbol	Parameter		Rating	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current (V_{GS}=4.5V)	T_A=25°C	7	A
		T_A=70°C	5.6	A
I_{DM}	Pulsed Drain Current [A]		28	A
P_D	Power Dissipation [B]	T_A=25°C	1.4	W
		T_A=70°C	0.9	W
T_J	Operation Junction Temperature		-55/150	°C
T_{STG}	Storage Temperature Range		-55/150	°C

THERMAL RESISTANCE

Symbol	Parameter		Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient [B]	t≦10s		80	°C/W
	Thermal Resistance Junction to Ambient [BC]	Steady-State		120	
$R_{\theta JC}$	Thermal Resistance Junction to Case			70	

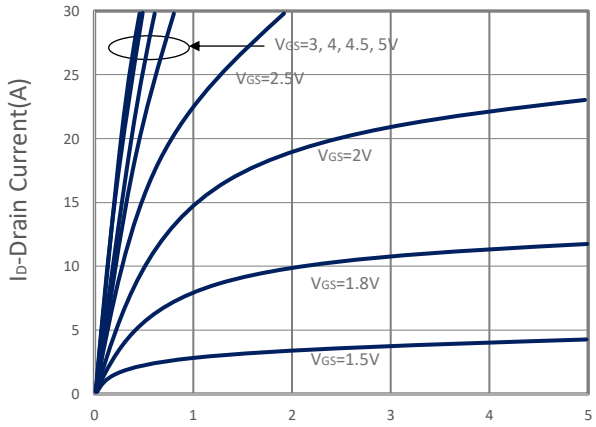
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.4	0.6	1.0	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=20V, V_{GS}=0V, T_J=25°C			1	μA
		V_{DS}=16V, V_{GS}=0V, T_J=75°C			10	
$R_{DS(ON)}$	Drain-source On-Resistance	V_{GS}=4.5V, I_D=7A V_{GS}=4.0V, I_D=6.0A V_{GS}=3.2V, I_D=4.0A V_{GS}=2.5V, I_D=3.0A V_{GS}=1.8V, I_D=2.0A		16.5 17 18 20 23	19 20 21 24 28	mΩ
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V		0.7	1	V
I_S	Continuous Source Current				3.5	A
Dynamic Parameters						
Q_g	Total Gate Charge	V_{DS} =10V,V_{GS} =4.5V, I_D=6A		8.5	11.9	nC
Q_{gs}	Gate-Source Charge			1.4	2	
Q_{gd}	Gate-Drain Charge			2.2	3.1	
C_{iss}	Input Capacitance	V_{DS} =10V,V_{GS} =0V, f=1MHz		550		pF
C_{oss}	Output Capacitance			65		
C_{rss}	Reverse Transfer Capacitance			41		
$t_{d(on)}$	Turn-On Time	V_{DD}=10V, V_{GEN}=4.5V R_G=3Ω, I_D=1A		4.8	9.1	nS
t_r				13.5	25.7	
$t_{d(off)}$	Turn-Off Time			28	53.2	
t_f				8.8	16.7	

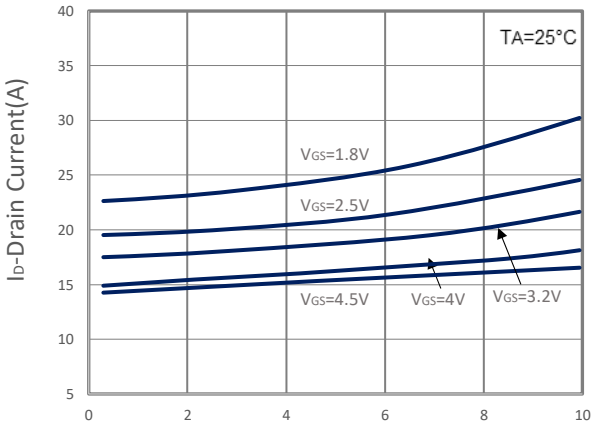
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.
B. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature $T_{J(MAX)}$=150°C (initial temperature TA=25°C).
C. $T_{J(MAX)}$=150°C,using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.

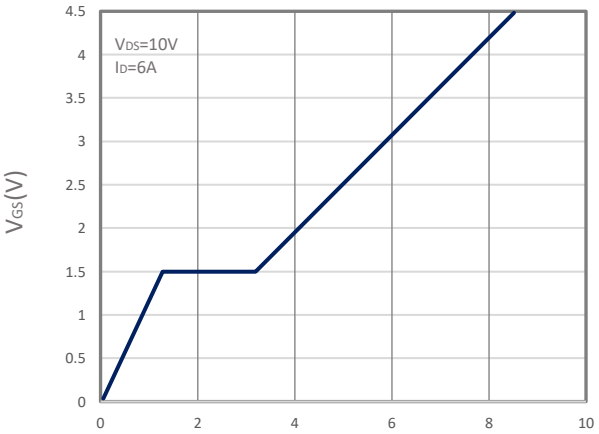
TYPICAL CHARACTERISTICS



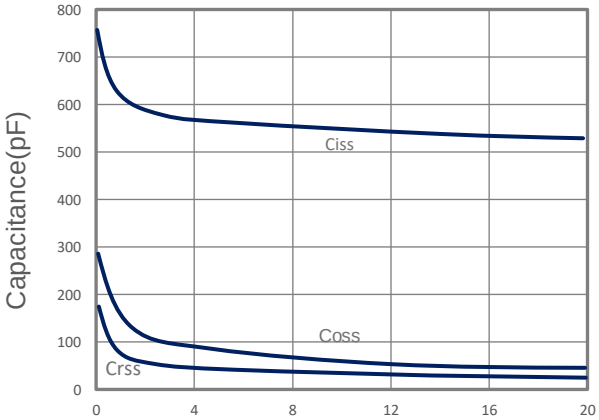
Output Characteristics



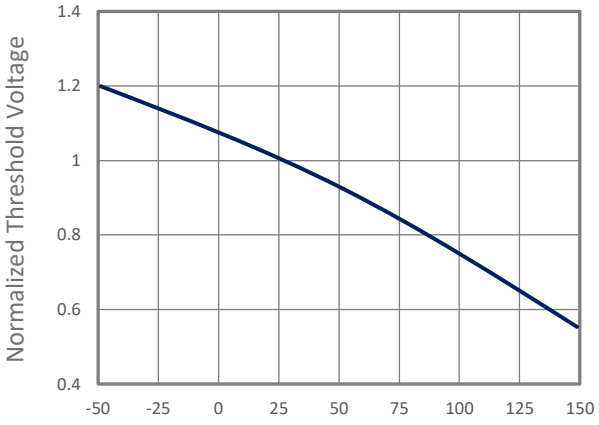
Output Characteristics



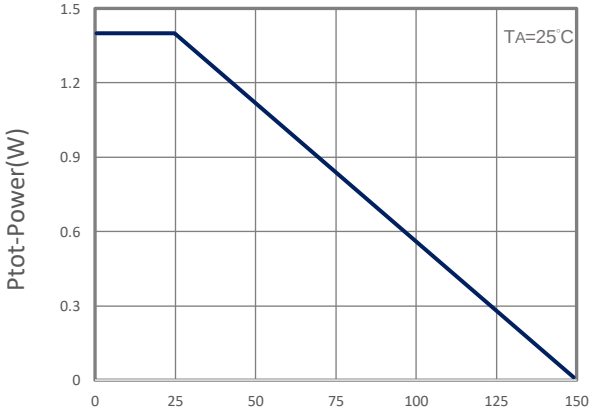
Gate Charge



Capacitance

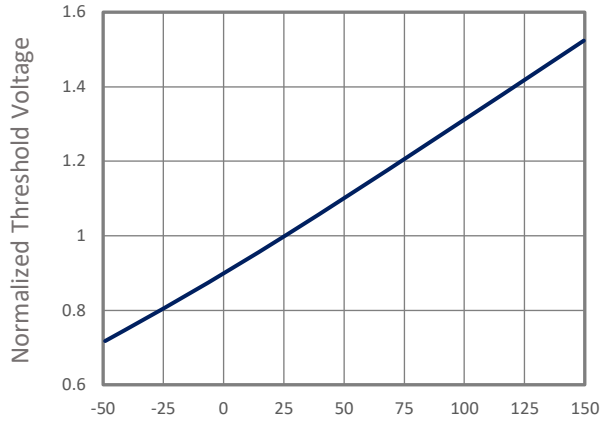


Gate Threshold Voltage



Power Dissipation

TYPICAL CHARACTERISTICS



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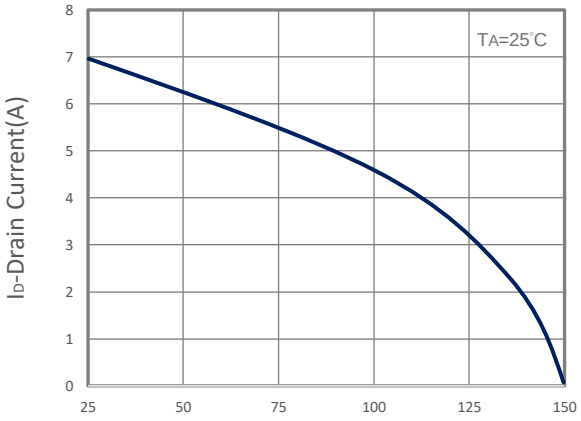
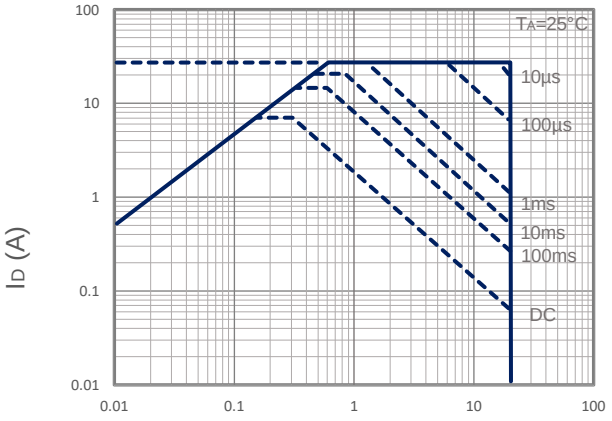
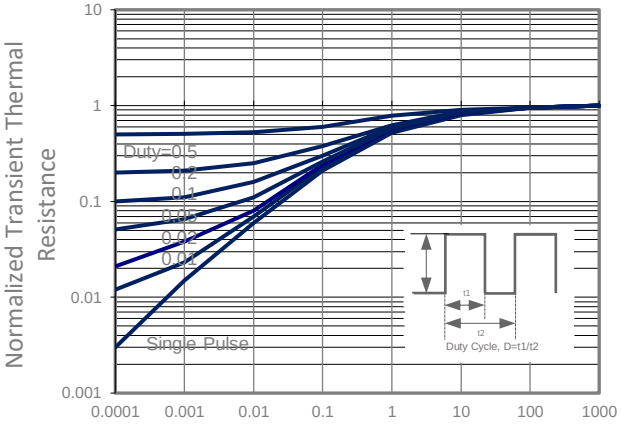


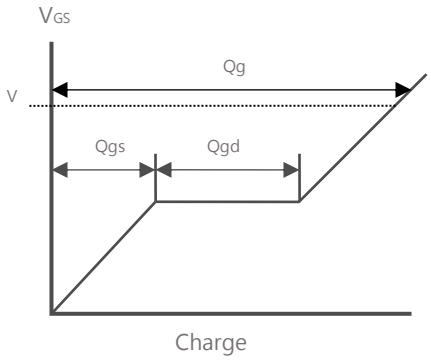
Drain Current vs TJ



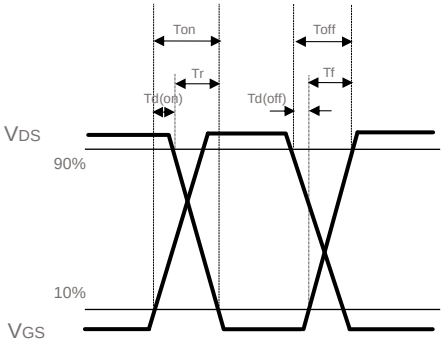
Maximum Safe Operation Area



Thermal Transient Impedance

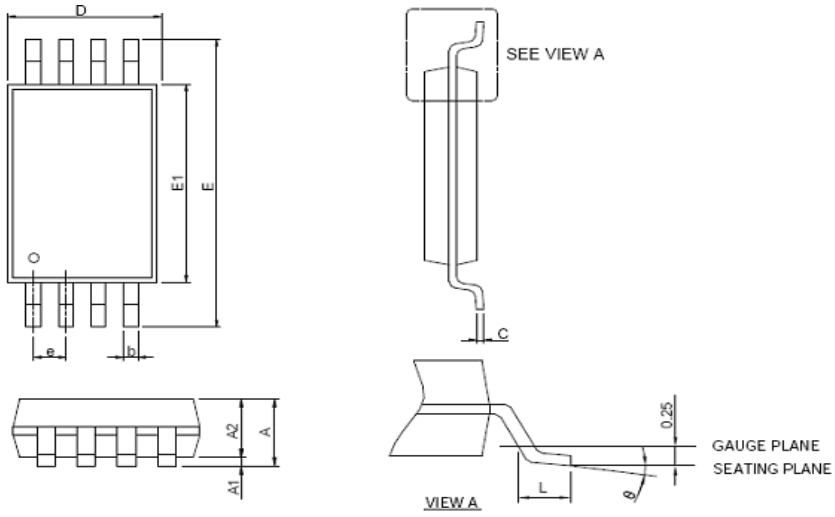


Gate Chrge Waveform



Switching Time Waveform

■TSSOP-8 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A		1.200		0.047
A1	0.050	0.150	0.002	0.006
A2	0.800	1.050	0.031	0.041
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
D	2.900	3.100	0.114	0.122
E	6.200	6.600	0.244	0.260
E1	4.300	4.500	0.169	0.177
e	0.650 REF		0.026 REF	
L	0.450	0.750	0.018	0.030
θ	0°	8°	0°	8°