SemTron Microtech Corporation

SMC4272S6

Common-Drain Dual N-Channel MOSFET

DESCRIPTION

SMC4272 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.

FEATURES

V_{DS} = 20V, I_D = 6.5A

$R_{DS(ON)}$ =18mΩ(Typ.)@V_{GS} = 4.5V
$R_{DS(ON)}$ =19mΩ(Typ.)@V_{GS} = 4.0V
$R_{DS(ON)}$ =20mΩ(Typ.)@V_{GS} = 3.2V
$R_{DS(ON)}$ =22mΩ(Typ.)@V_{GS} = 2.5V

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

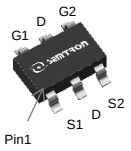
PART NUMBER INFORMATION

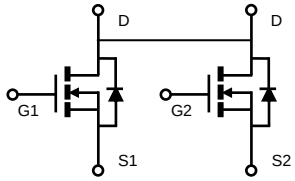
SMC 4272 S6 - TR G
a b c d e

a : Company name.
b : Product Serial number.
c : Package code S6:SOT-23-6L
d : Handling code TR:Tape&Reel
e : Green produce code G:*RoHS Compliant*

APPLICATIONS

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





SOT-23-6L

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 [A]	T_A=25°C	6.5	A
		T_A=70°C	5.2	A
I_{DM}	Pulsed Drain Current [B]		26	A
P_D	Power Dissipation [A]	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 [C]	t≦10s	75	90	°C/W
	Thermal Resistance Junction to Ambient [C]	Steady-State	115	130	
$R_{\theta JC}$	Thermal Resistance Junction to Case [C]		65	80	

■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 [D]	V_{GS} =4.5V,I_D=6.5A V_{GS} =4.0V,I_D=5.0A V_{GS} =3.2V,I_D=4.0A V_{GS} =2.5V,I_D=3.0A		18 19 20 22	22 23 24 26	mΩ
G_{fs}	Forward Transconductance	V_{DS} =5V,I_D=5.2A		13		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	I_S=1A,V_{GS}=0V		0.7	1	V
I_S	Continuous Source Current				6	A
t_{rr}	Body Diode Revese Recovery Time	V_{DD}=10V, T_J=25°C I_S=6.5A, dI/dt=100A/μs		21		ns
Q_{rr}	Body Diode Revese Recovery Charge			10		nC
Dynamic Parameters						
Q_g	Total Gate Charge	V_{DS} =10V,V_{GS} =4.5V I_D =6.5A		6.2	8.2	nC
Q_{gs}	Gate-Source Charge			2.2	3.0	
Q_{gd}	Gate-Drain Charge			1.75	2.3	
C_{iss}	Input Capacitance	V_{DS} =10V,V_{GS} =0V f =1MHz		572	709	pF
C_{oss}	Output Capacitance			72	90	
C_{rss}	Reverse Transfer Capacitance			38	45	
$t_{d(on)}$	Turn-On Time [E]	V_{DD}=10V, V_{GEN}=4.5V, R_G=3Ω, I_D=1A		6.7		nS
t_r				6		
$t_{d(off)}$	Turn-Off Time [E]			12.2		
t_f				5		

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

A. The value of $R_{\theta JA}$ is measured with the device in a still air environment with maximum junction temperature $T_{J(MAX)}$= 150°C (initial temperature T_A=25°C).

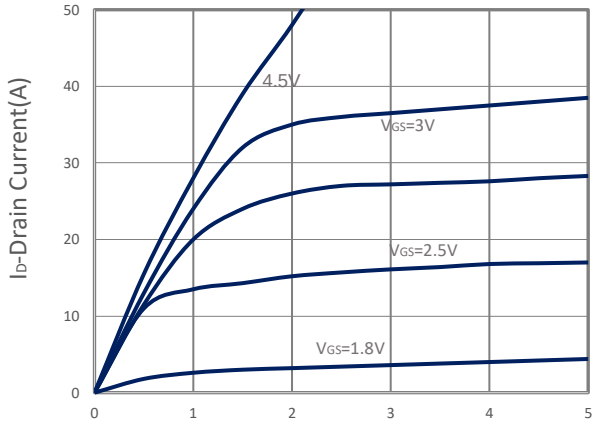
B. The $T_{J(MAX)}$=150°C, using junction-to-ambient thermal resistance.

C. Surface−mounted on FR-4 board using 1 sq−in pad, 2 oz Cu, in a still air environment with T_A=25°C.

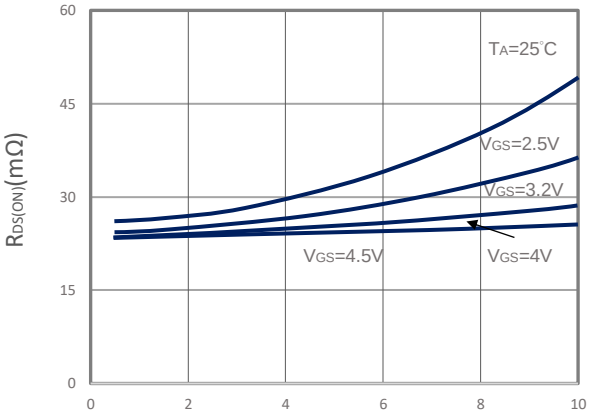
D. The data tested by pulsed , pulse width ≦ 300uS , duty cycle ≦ 2%

E. Pulsed width limited by maximum junction temperature.

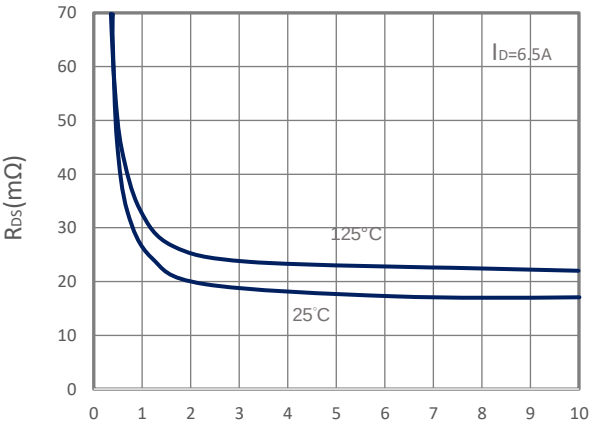
TYPICAL CHARACTERISTICS



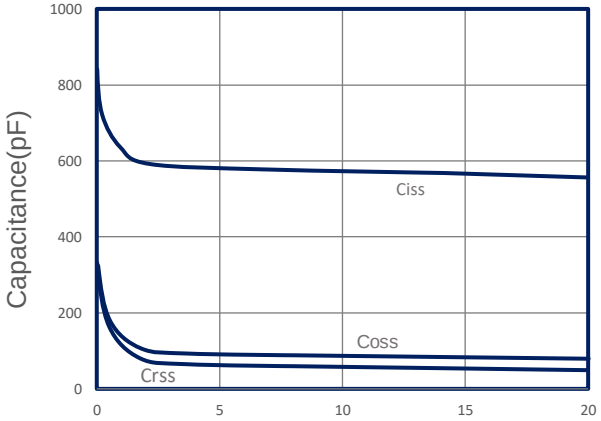
Output Characteristics



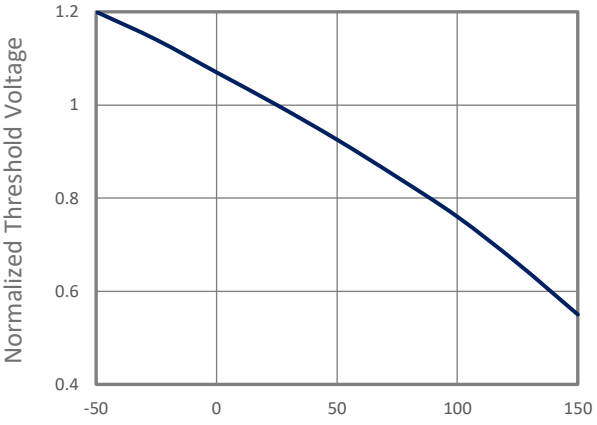
Drain-Source On Resistance



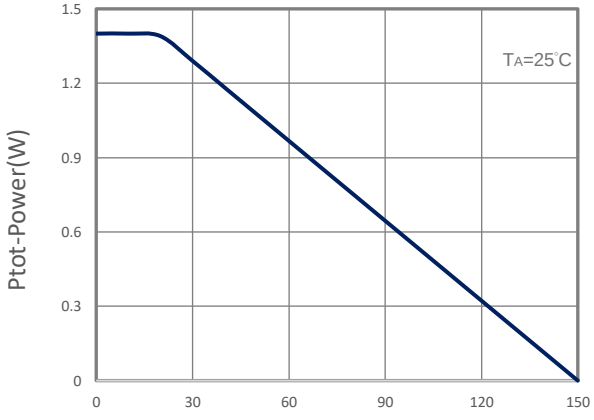
Gate-Source vs On Resistance



Capacitance

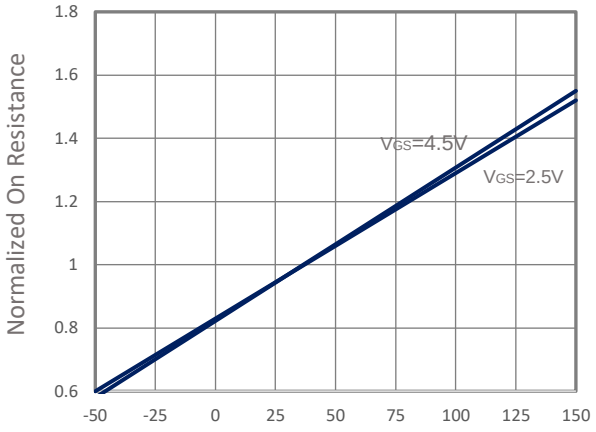


Gate Threshold Voltage

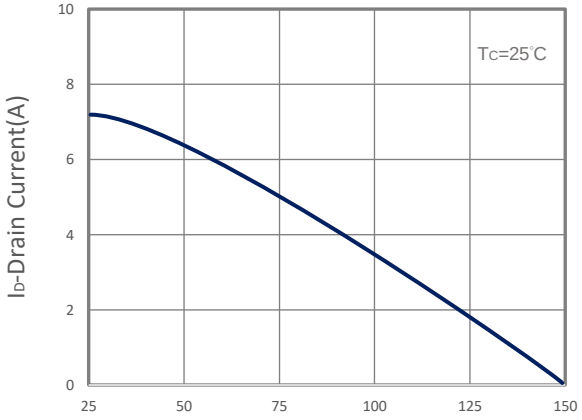


Power Dissipation

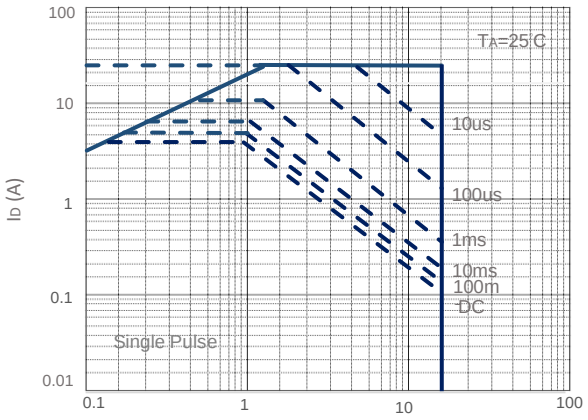
TYPICAL CHARACTERISTICS

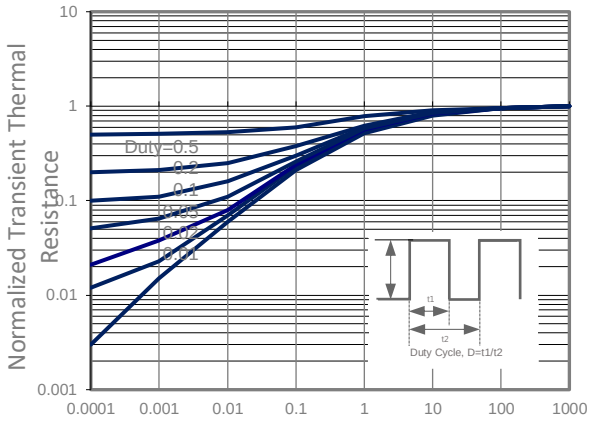


RDS(ON) vs Junction Temperature

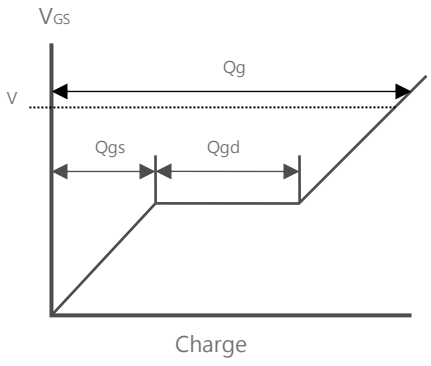


Drain Current vs TJ

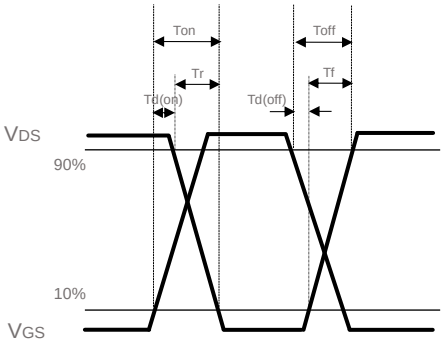




Thermal Transient Impedance

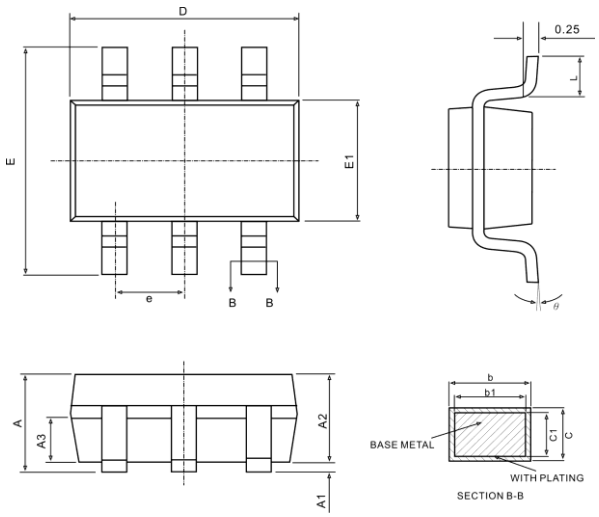


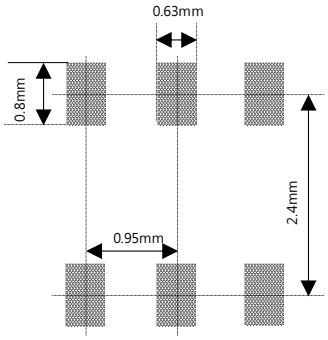
Gate Chrge Waveform



Switching Time Waveform

SOT-23-6L PACKAGE DIMENSIONS





Recommended Land Pattern

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	-	1.300	-	0.051
A1	0.040	0.100	0.002	0.004
A2	1.000	1.200	0.039	0.047
A3	0.550	0.750	0.022	0.030
b	0.340	0.430	0.013	0.017
b1	0.330	0.380	0.013	0.015
c	0.150	0.210	0.006	0.008
c1	0.140	0.160	0.006	0.006
D	2.720	3.120	0.107	0.123
E	2.600	3.000	0.102	0.118
E1	1.400	1.800	0.055	0.071
e	0.950 BSC		0.066 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°