

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.

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

FEATURES

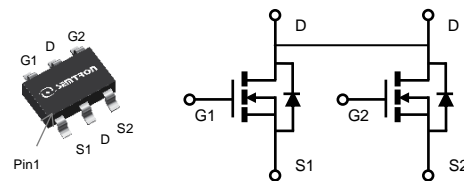
$V_{DS} = 20V, I_D = 6.5A$

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

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

APPLICATIONS

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



SOT-23-6L

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ 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	$T_A = 25^\circ C$	6.5
		$T_A = 70^\circ C$	5.2
I_{DM}	Pulsed Drain Current ^B	26	A
P_D	Power Dissipation ^A	$T_A = 25^\circ C$	1.4
		$T_A = 70^\circ C$	0.9
T_J	Operation Junction Temperature	-55/150	$^\circ C$
T_{STG}	Storage Temperature Range	-55/150	$^\circ C$

THERMAL RESISTANCE

Symbol	Parameter	Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ^C	75	90	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^C			
$R_{\theta JC}$	Thermal Resistance Junction to Case ^C	65	80	

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μ A	0.4	0.6	1.0	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 12V			\pm 100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} 20V, V _{GS} =0V T _J =25 $^\circ$ C			1	μ A
		V _{DS} =16V, V _{GS} =0V T _J =75 $^\circ$ C			10	
R _{DS(ON)}	Drain-source On-Resistance ^D	V _{GS} =4.5V, I _D =6.5A		18	22	m Ω
		V _{GS} =4.0V, I _D =5.0A		19	23	
		V _{GS} =3.2V, I _D =4.0A		20	24	
		V _{GS} =2.5V, I _D =3.0A		22	26	
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 Reverse Recovery Time	V _{DD} =10V, T _J =25 $^\circ$ C		21		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _S =6.5A, dI/dt=100A/ μ s		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 =3 Ω , 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_{thJA} is measured with the device in a still air environment with maximum junction temperature T_{J(MAX)}=150 $^\circ$ C (initial temperature T_A=25 $^\circ$ C).

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

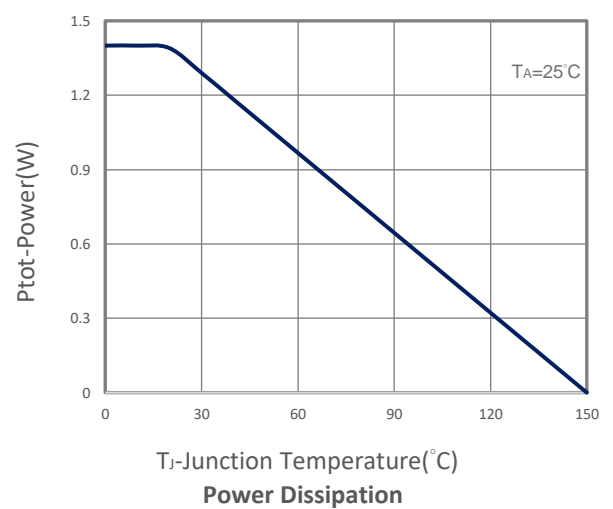
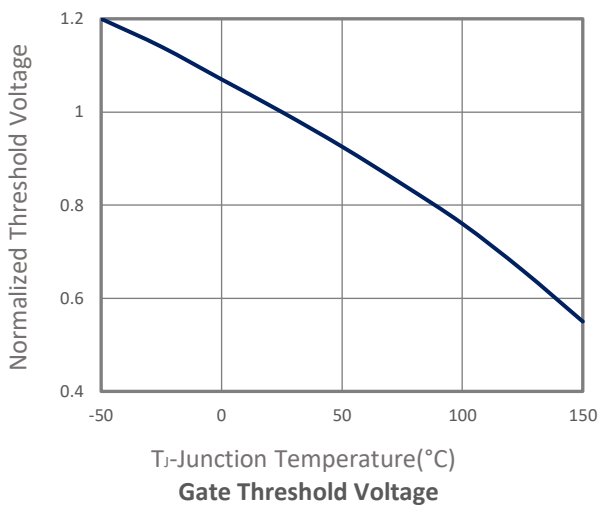
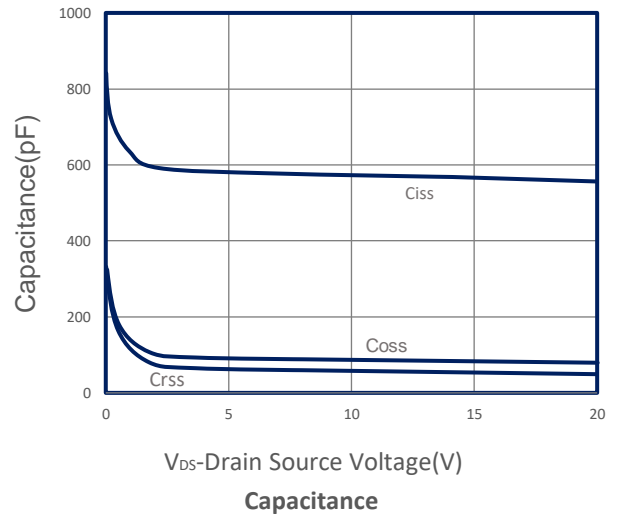
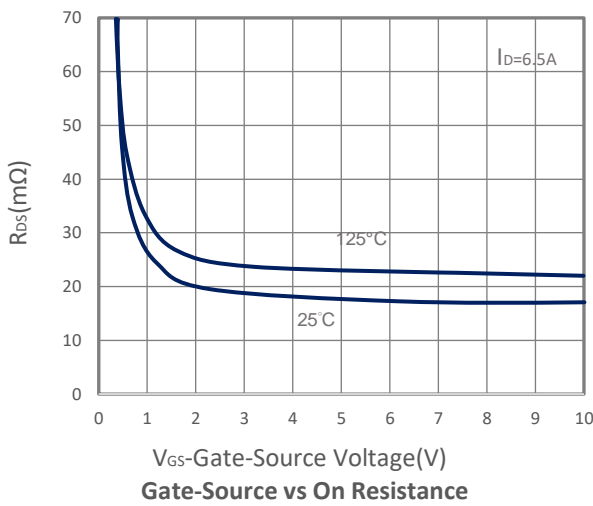
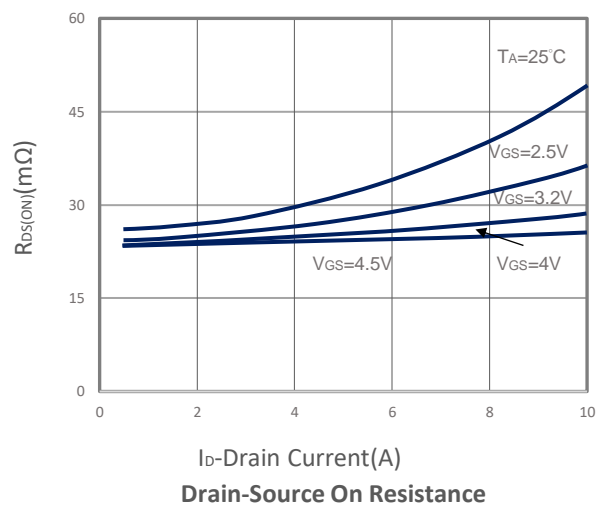
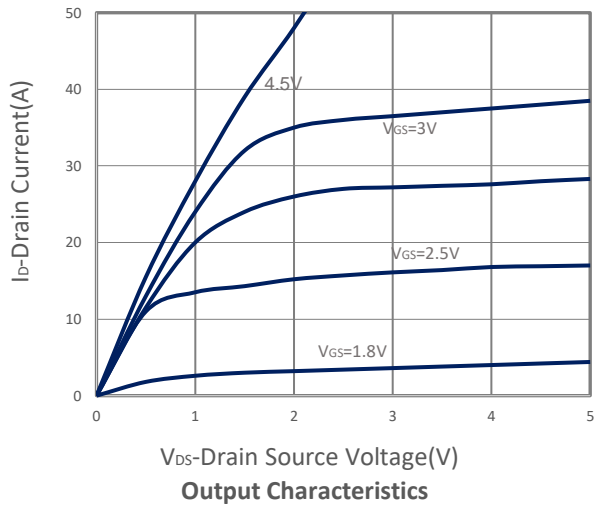
C. Surface-mounted on FR-4 board using 1 sq-in pad, 2 oz Cu, in a still air environment with T_A=25 $^\circ$ C.

D. The data tested by pulsed, pulse width \leq 300 μ s, duty cycle \leq 2%

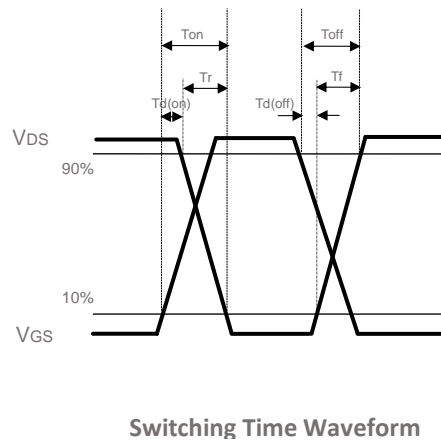
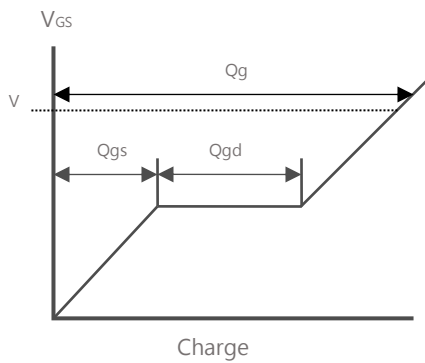
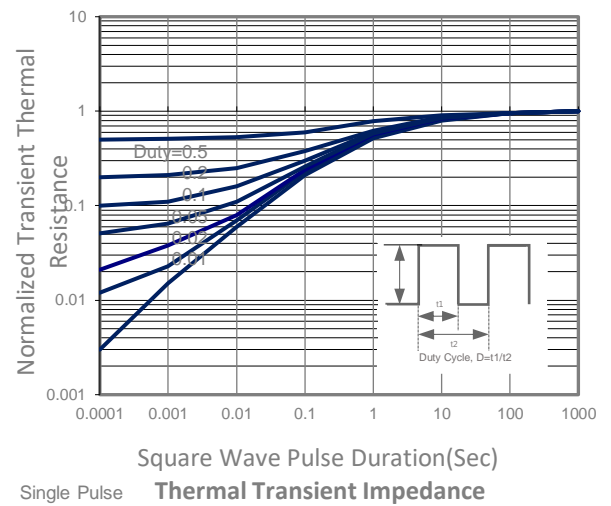
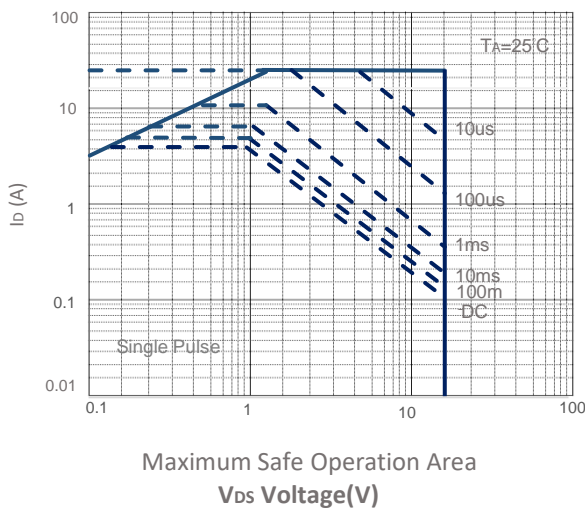
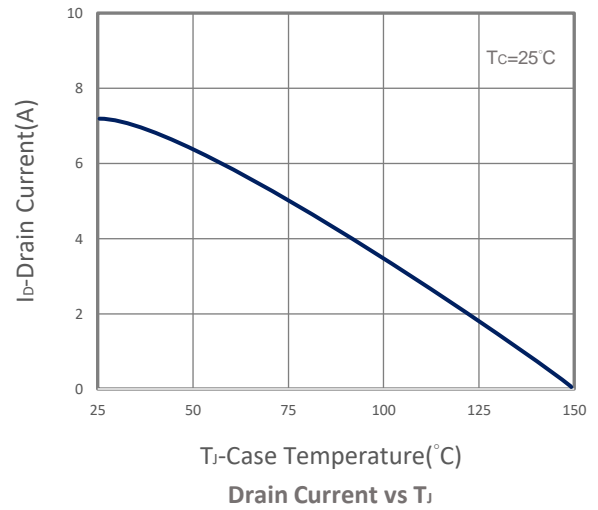
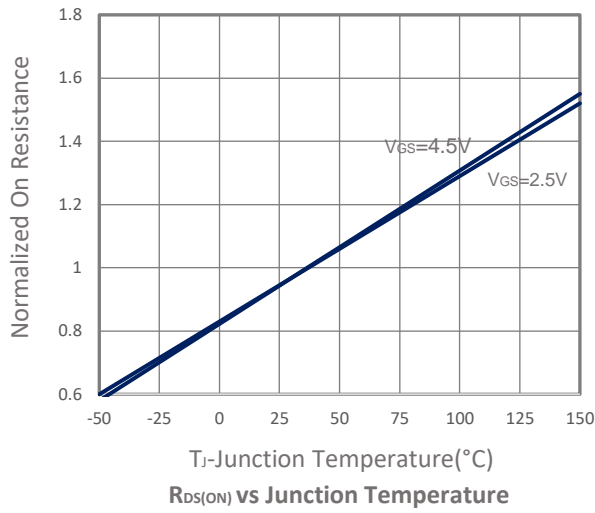
E. Pulsed width limited by maximum junction temperature.

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. We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this datasheet.

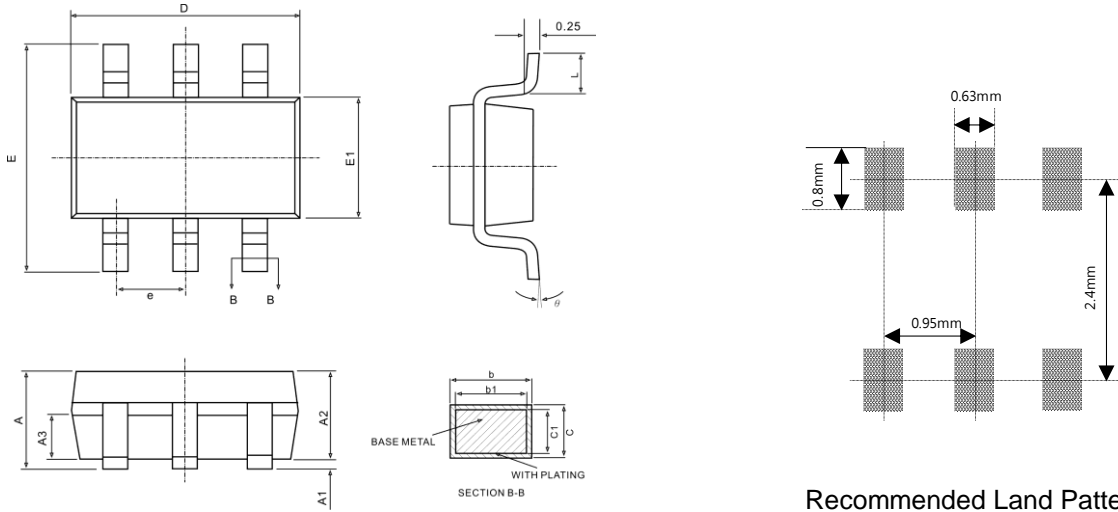
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



■ 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°