

Single N-Channel MOSFET

DESCRIPTION

SMC4426 is the N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior ,fast switching performance, and withstand high energy pulse in the avalanche and commutation mode.

PART NUMBER INFORMATION

SMC 4426 M - TR G
 a b c d e

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

FEATURES

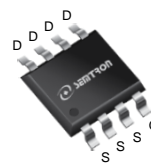
$V_{DS} = 30V, I_D = 13.2A$

$R_{DS(ON)} = 9.5m\Omega(Typ.)@V_{GS} = 10V$
 $R_{DS(ON)} = 13m\Omega(Typ.)@V_{GS} = 4.5V$

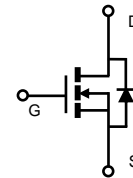
- ◆Fast switch
- ◆Improved dv/dt capability
- ◆High power and current handling capability

APPLICATIONS

- ◆Power Management
- ◆DC/DC Converters
- ◆Battery Powered Systems



SOP-8



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ Unless otherwise noted)

Symbol	Parameter	Rating	Units	
V_{DSS}	Drain-Source Voltage	30	V	
V_{GSS}	Gate-Source Voltage	± 20	V	
I_D	Continuous Drain Current	$T_A = 25^\circ C$	13.2	A
		$T_A = 70^\circ C$	10.5	A
I_{DM}	Pulsed Drain Current ^A	52	A	
I_{AS}	Avalanche Current ^A	16	A	
E_{AS}	Single Pulse Avalanche energy $L=0.3mH$ ^{AE}	38	mJ	
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	3.1	W
		$T_A = 70^\circ C$	2	W
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 ^B	$t \leq 10s$	40	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BC}	Steady-State	75	

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

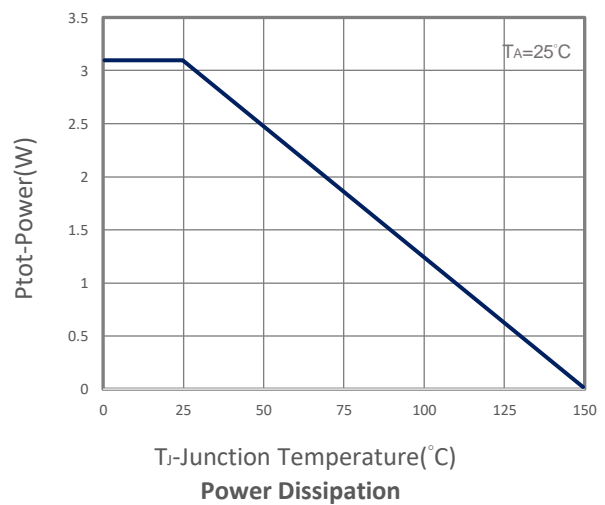
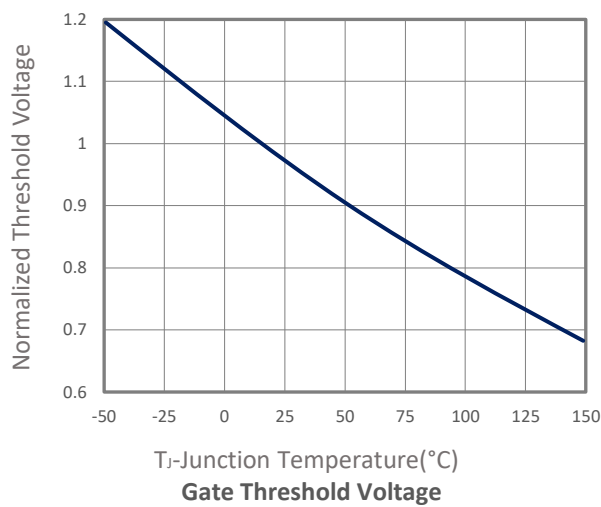
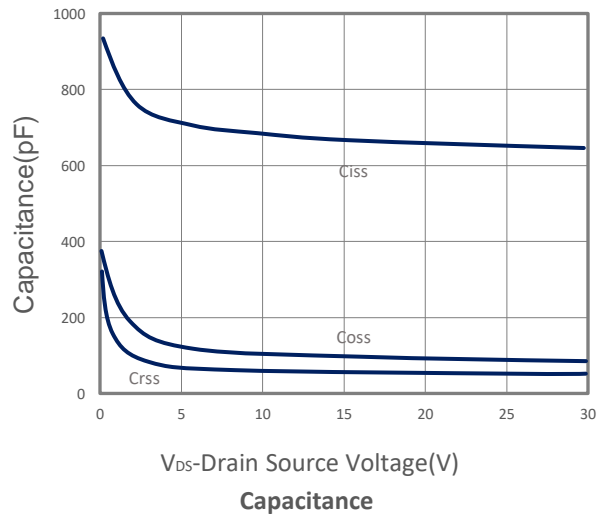
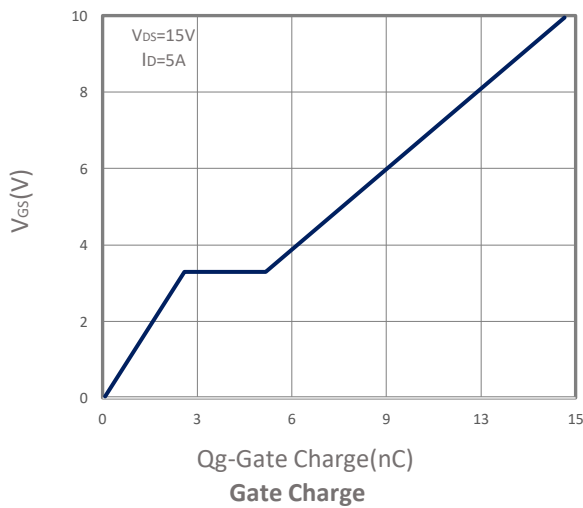
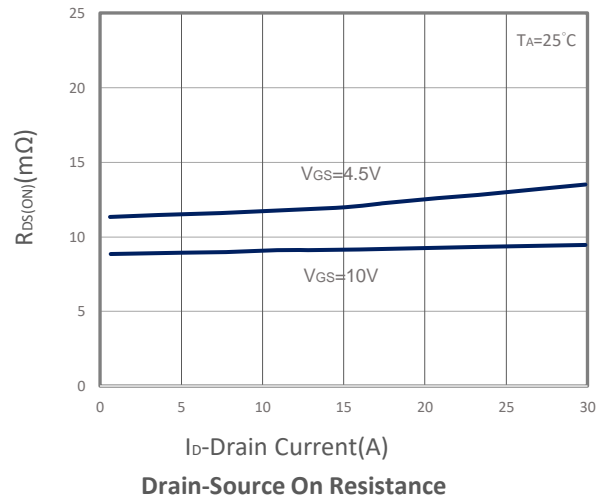
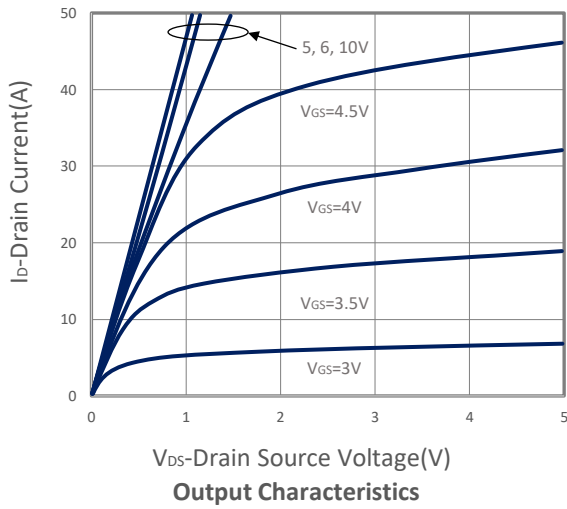
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=75^\circ\text{C}$			10	
$R_{DS(ON)}$	Drain-source On-Resistance ^D	$V_{GS}=10V, I_D=13.2A$ $V_{GS}=4.5V, I_D=10A$		9.5 13	12 17	m Ω
G_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=-10A$		45		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage ^D	$I_S=1A, V_{GS}=0V$		0.7	1	V
I_S	Continuous Source Current				6.6	A
t_{rr}	Reverse Recovery Time	$I_S=10A, di/dt=100A/\mu s$		16.8		ns
Q_{rr}	Reverse Recovery Charge			9.5		nC
Dynamic and Switching Parameters						
Q_g	Total Gate Charge (10V)	$V_{DS}=15V, V_{GS}=10V, I_D=5A$		14.8	20.7	nC
Q_g	Total Gate Charge (4.5V)			7.2	10.1	
Q_{GS}	Gate-Source Charge			2.6	3.6	
Q_{GD}	Gate-Drain Charge			2.8	3.9	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$		650		pF
C_{oss}	Output Capacitance			89		
C_{rss}	Reverse Transfer Capacitance			63		
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		2.7		Ω
$t_{d(on)}$	Turn-On Time ^D	$V_{DD}=15V, V_{GS}=10V,$ $R_G=6\Omega, I_D=1A$		8	15	nS
t_r				10	19	
$t_{d(off)}$	Turn-Off Time ^D			22	42	
t_f				6.6	13	

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

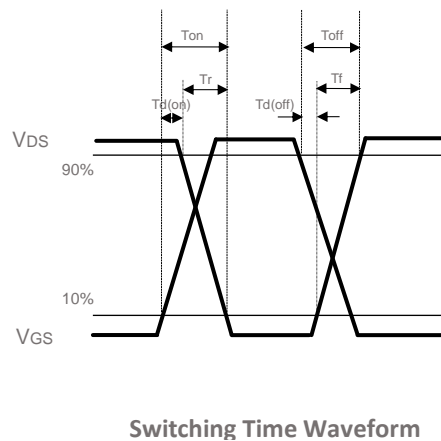
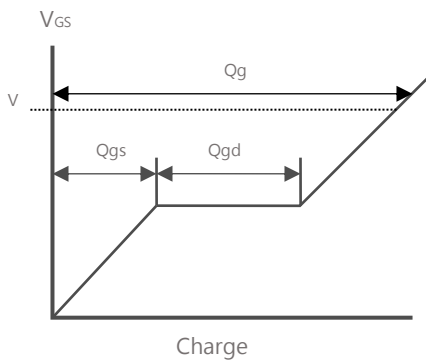
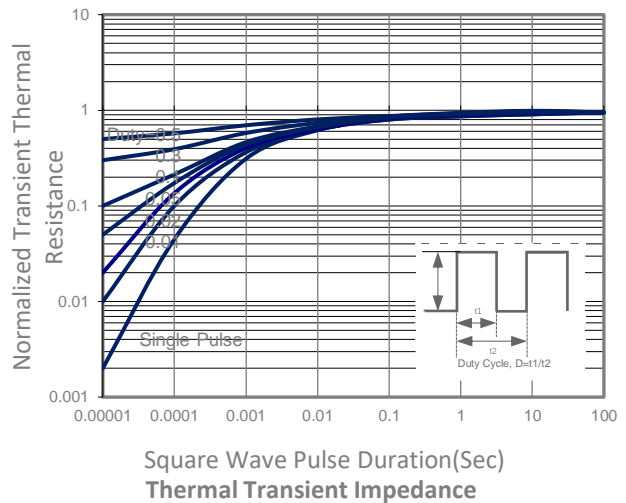
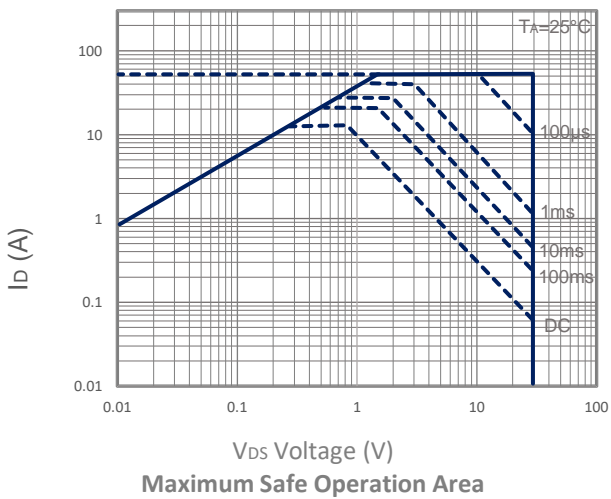
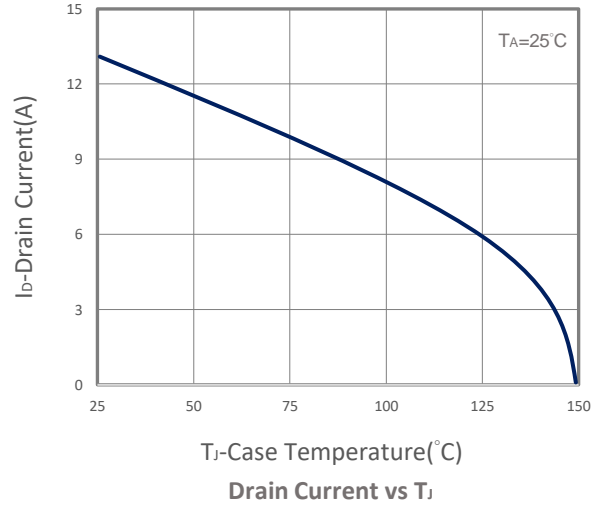
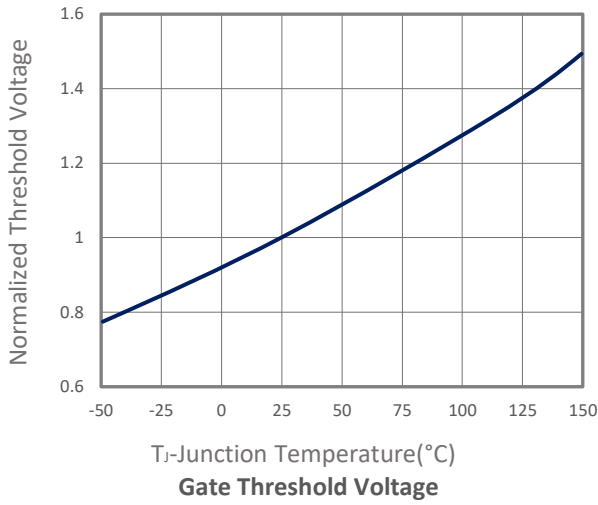
- Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ\text{C}$.
- The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_A=25^\circ\text{C}$).
- $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- The EAS data shows Max, tested and pulse width limited by $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_J=25^\circ\text{C}$).

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.

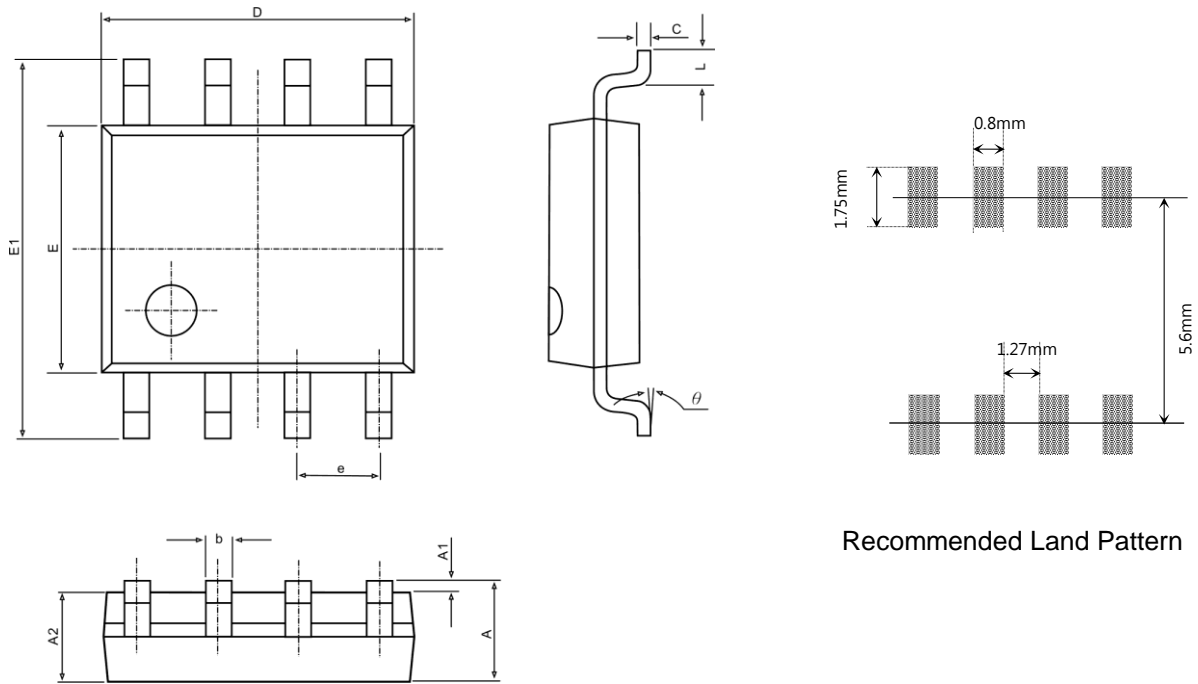
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



■ SOP-8 PACKAGE DIMENSIONS



Recommended Land Pattern

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.040	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.130	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270BSC.		0.050BSC.	
L	0.400	1.270	0.016	0.005
θ	0°	8°	0°	8°