SemTron Microtech Corporation

SMC4628M

Single N-Channel MOSFET

■DESCRIPTION

SMC4628M 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.These devices are well suited for high efficiency fast switching applications.

■FEATURES

V_{DS}=60V, I_D=7A

$R_{DS(ON)}$=30mΩ(Typ.)@V_{GS}=10V
$R_{DS(ON)}$=37mΩ(Typ.)@V_{GS}=4.5V

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

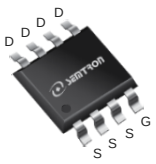
■PART NUMBER INFORMATION

SMC 4628 M - TR G
a b c d e

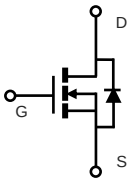
a : Company name.
b : Product Serial number.
c : Package code M:SOP-8
d : Handling code TR:Tape&Reel
e : Green produce code G:*RoHS Compliant*

■APPLICATIONS

◆LED Application
◆Power Management
◆Motor Dirve



SOP-8



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

Symbol	Parameter		Rating	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25°C	7	A
		T_A=70°C	5.6	A
I_{DM}	Pulsed Drain Current [B]		28	A
I_{AS}	Avalanche Current [B]		18	A
E_{AS}	Single Pulse Avalanche energy L=0.1mH [B]		16	mJ
P_D	Power Dissipation [A]	T_A=25°C	3.1	W
		T_A=70°C	2	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 [A]	t≦10s		40	°C/W
	Thermal Resistance Junction to Ambient [AC]	Steady-State		70	

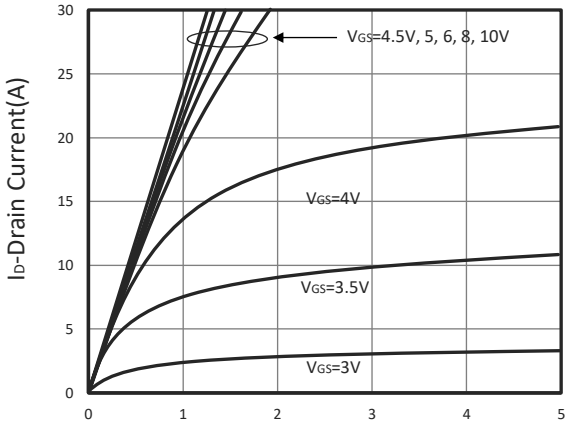
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.2	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
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=75°C			10	
$R_{DS(ON)}$	Drain-source On-Resistance [D]	V_{GS}=10V, I_D=7A V_{GS}=4.5V, I_D=5.8A		31 37	35 45	mΩ
G_{fs}	Forward Transconductance	V_{DS}=10V, I_D=7A		6.5		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	I_S=1A, V_{GS}=0V			1.0	V
I_S	Diode Continuous Forward Current				3.5	A
t_{rr}	Reverse Recovery Time	I_S=7A, dI/dt=100A/μs		23		ns
Q_{rr}	Reverse Recovery Charge			30		nC
Dynamic and Switching Parameters [E]						
Q_g	Total Gate Charge	V_{DS} =30V, V_{GS}=10V, I_D=7A		12.3	16.6	nC
Q_g	Total Gate Charge (4.5V)			6	8.1	
Q_{gs}	Gate-Source Charge			2.9	3.9	
Q_{gd}	Gate-Drain Charge			3	4.1	
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz		635		pF
C_{oss}	Output Capacitance			78		
C_{rss}	Reverse Transfer Capacitance			40		
R_g	Gate Resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz		1.7		Ω
$t_{d(on)}$	Turn-On Time	V_{DD}=30V, V_{GEN}=10V R_G=6Ω, I_D=1A		8.2	16	nS
t_r				9	17	
$t_{d(off)}$	Turn-Off Time			27	51	
t_f				20	38	

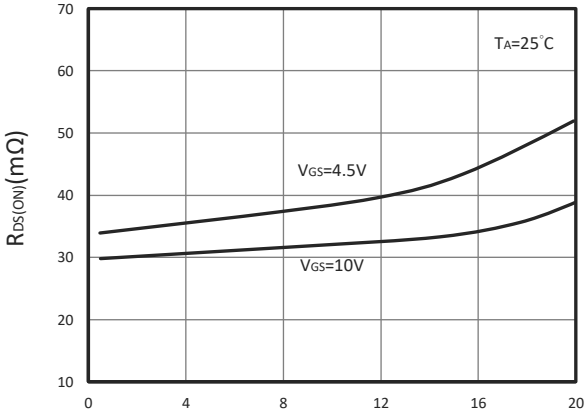
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Surface mounted on FR4 board using 1 in^2 pad size.
B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.
C. Using ≤ 10s junction-to-ambient thermal resistance is base on $T_{J(MAX)}$=150°C.
D. Pulse test width ≤300μs and duty cycle ≤ 2%.
E. Guaranteed by design, not subject to production testing.

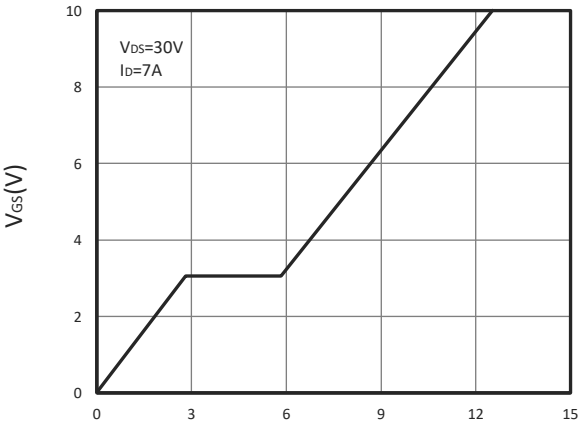
TYPICAL CHARACTERISTICS



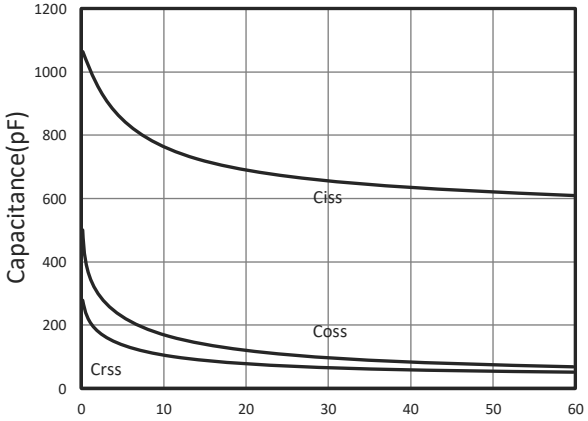
Output Characteristics



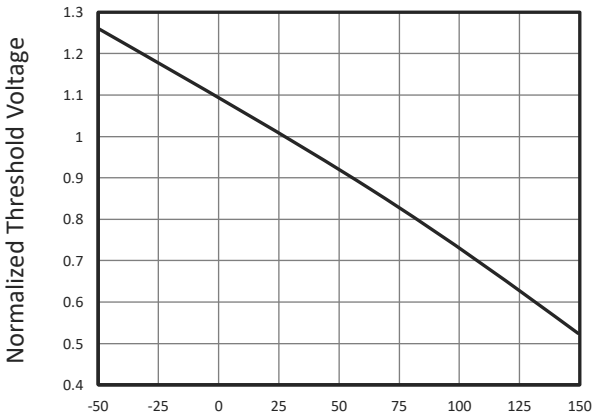
Drain-Source On Resistance



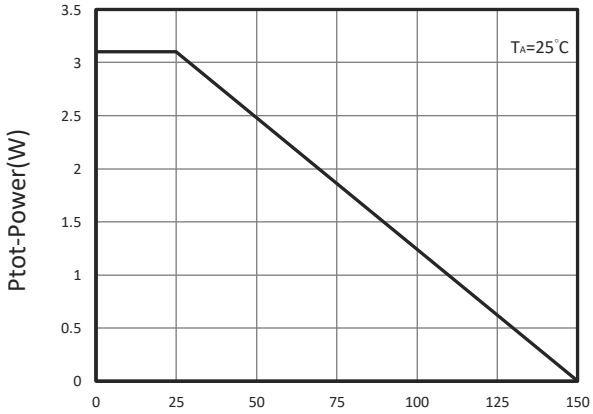
Gate Charge



Capacitance

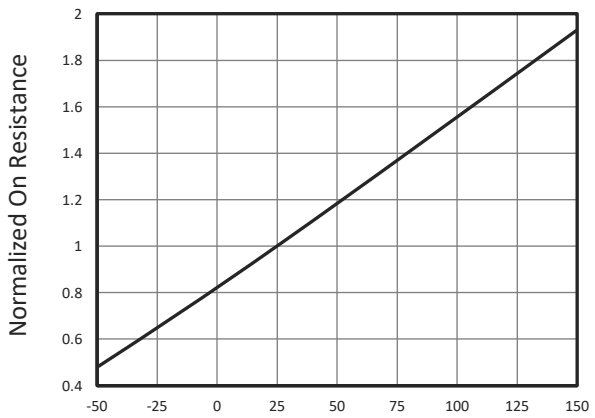


Gate Threshold Voltage

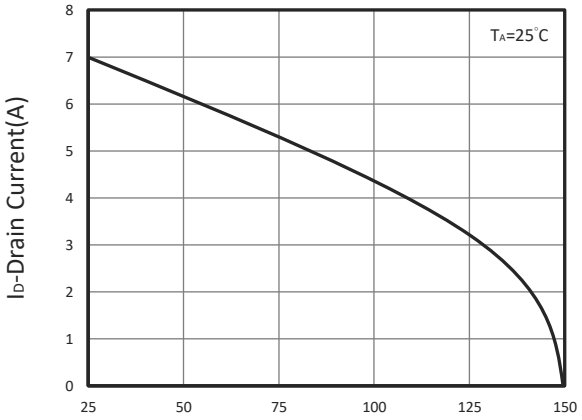


Power Dissipation

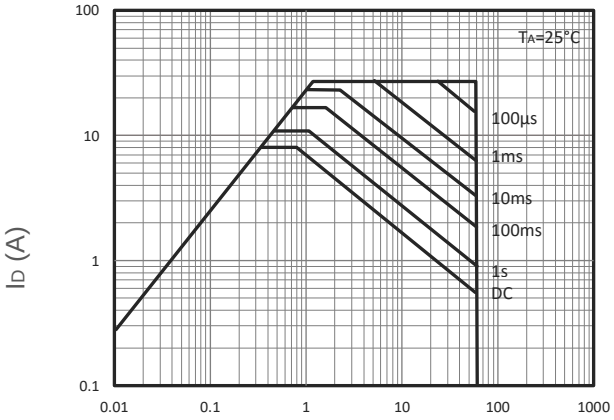
TYPICAL CHARACTERISTICS



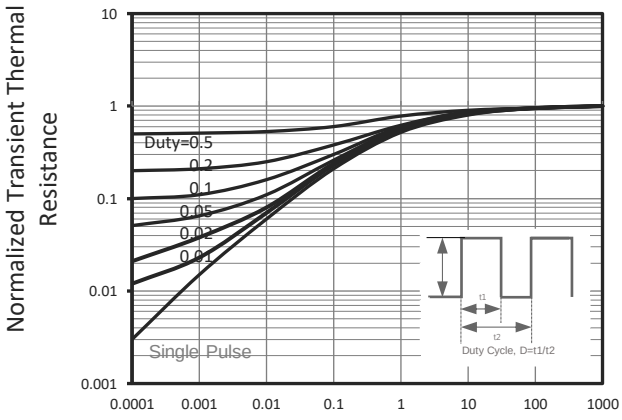
RDS(ON) vs Junction Temperature



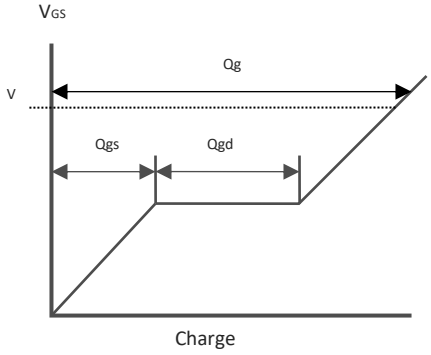
Drain Current vs TC



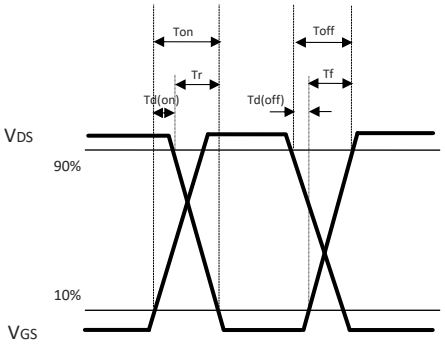
Maximum Safe Operation Area



Thermal Transient Impedance

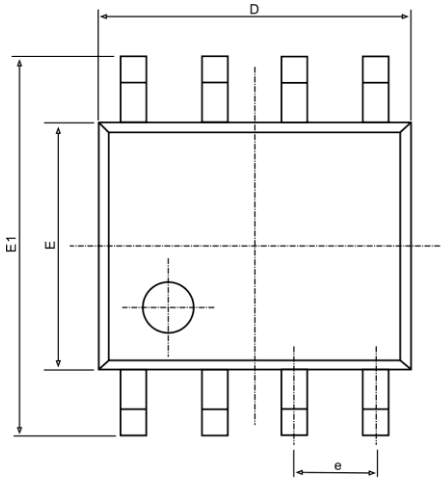


Gate Chrge Waveform

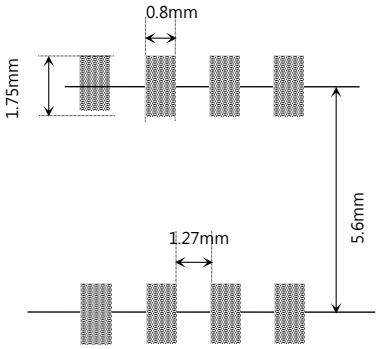


Switching Time Waveform

■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°