SemTron Microtech Corporation

SMC4842M

Dual N-Channel MOSFET

■DESCRIPTION

SMC4842 is the Dual 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.This device is ideal for load switch applications.

■FEATURES

V_{DS} = 30V, I_D = 8A

$R_{DS(ON)}$=16mΩ(Typ.)@V_{GS}= 10V
$R_{DS(ON)}$=23mΩ(Typ.)@V_{GS}= 4.5V

◆High power and current handling capability

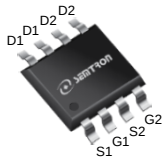
■PART NUMBER INFORMATION

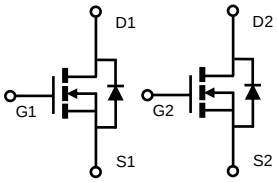
SMC 4842 M - TR G
a b c d e

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

◆DC-DC Power System
◆Portable Equipment
◆Load Switch





SOP-8

■ABSOLUTE MAXIMUM RATINGS (T_A = 25°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°C	8	A
		T_A=70°C	6.5	A
I_{DM}	Pulsed Drain Current [A]		32	A
I_{AS}	Avalanche Current [A]		15	A
E_{AS}	Single Pulse Avalanche energy L=0.3mH [AE]		33	mJ
P_D	Power Dissipation [B]	T_A=25°C	2	W
		T_A=70°C	1.3	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		62	°C/W
	Thermal Resistance Junction to Ambient [BC]	Steady-State		100	
$R_{\theta JC}$	Thermal Resistance Junction to Case			48	

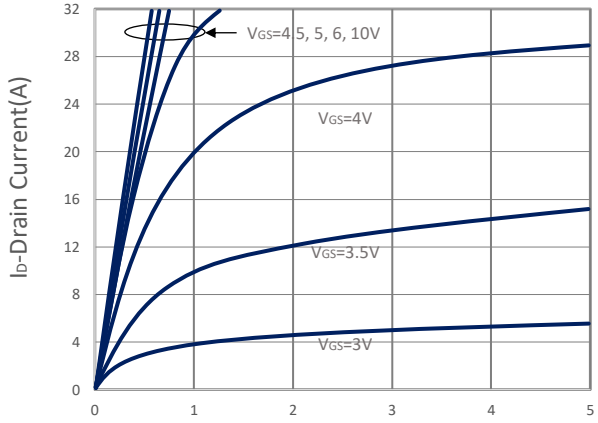
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1	1.5	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}=30V, V_{GS}=0V, T_J=25°C			1	μA
		V_{DS}=24V, V_{GS}=0V, T_J=75°C			10	
$R_{DS(ON)}$	Drain-source On-Resistance [D]	V_{GS}=10V, I_D=8A V_{GS}=4.5V, I_D=6A		16 23	20 30	mΩ
G_{fs}	Forward Transconductance	V_{DS}=15V, I_D=6A		6		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [D]	I_S=1A, V_{GS}=0V		0.7	1	V
I_S	Continuous Source Current				8	A
t_{rr}	Reverse Recovery Time	I_S=6A, dI/dt=100A/μs T_J=25°C		20		ns
Q_{rr}	Reverse Recovery Charge			1.2		nC
Dynamic and Switching Parameters						
Q_g	Total Gate Charge	V_{DS}=15V,V_{GS}=10V, I_D=6A		12.7	11.8	nC
Q_g	Total Gate Charge(4.5V)			6.2	5.9	
Q_{gs}	Gate-Source Charge			2.4	2.2	
Q_{gd}	Gate-Drain Charge			2	2.8	
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz		550	588	pF
C_{oss}	Output Capacitance			78	87	
C_{rss}	Reverse Transfer Capacitance			62	70	
R_g	Gate Resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz		2.4		Ω
$t_{d(on)}$	Turn-On Time	V_{DD}=15V, V_{GEN}=10V, R_G=6Ω, I_D=1A		2.5	10	nS
t_r				7.6	14	
$t_{d(off)}$	Turn-Off Time			19.8	30	
t_f				4.2	8	

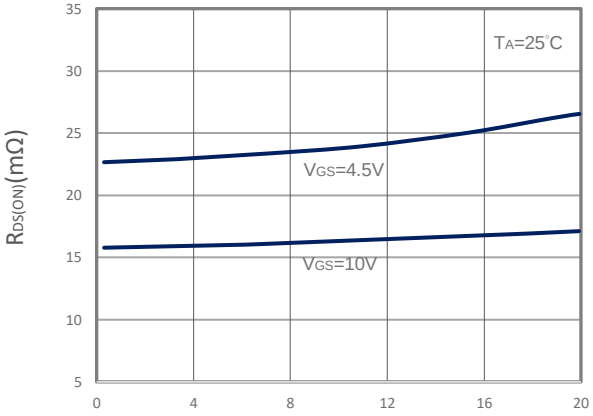
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

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 T_A=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.
D. The data tested by pulsed , pulse width ≦ 300μS , duty cycle ≦ 2%.
E. The E_{AS} data shows Max, tested and pulse width limited by $T_{J(MAX)}$=150°C (initial temperature T_J=25°C).

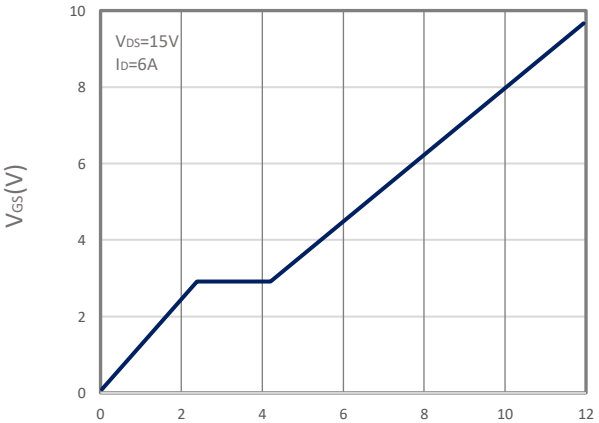
TYPICAL CHARACTERISTICS



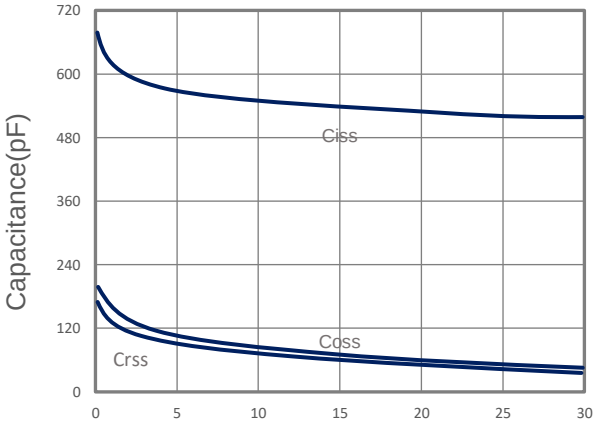
Output Characteristics



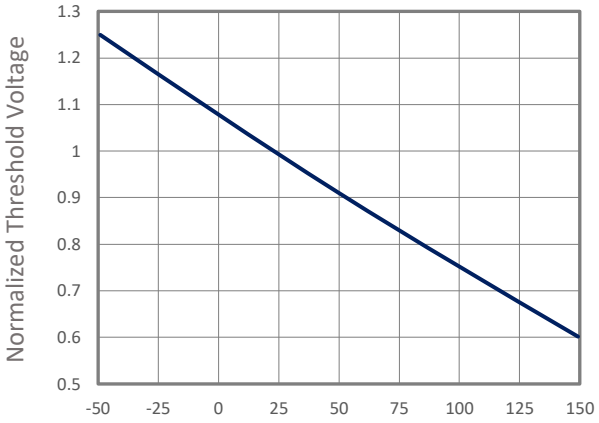
Drain-Source On Resistance



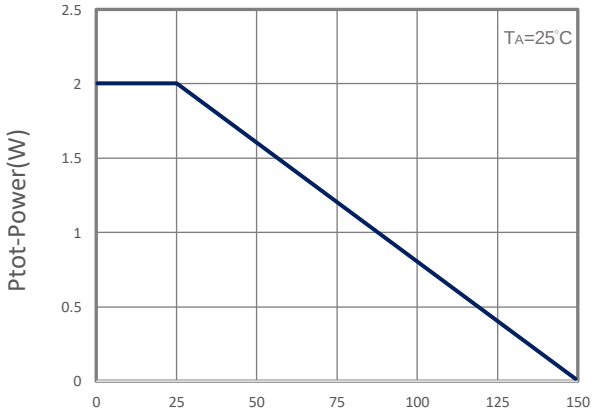
Gate Charge



Capacitance

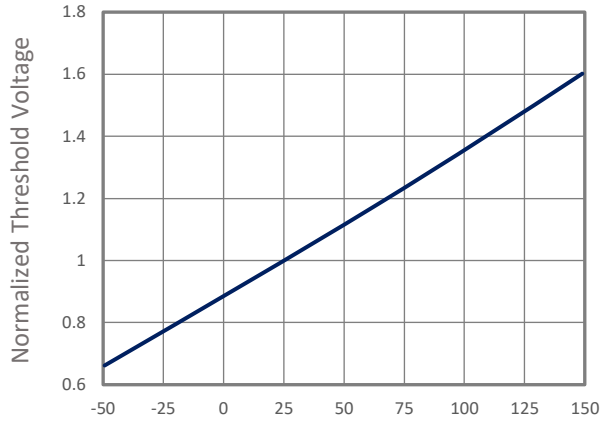


Gate Threshold Voltage

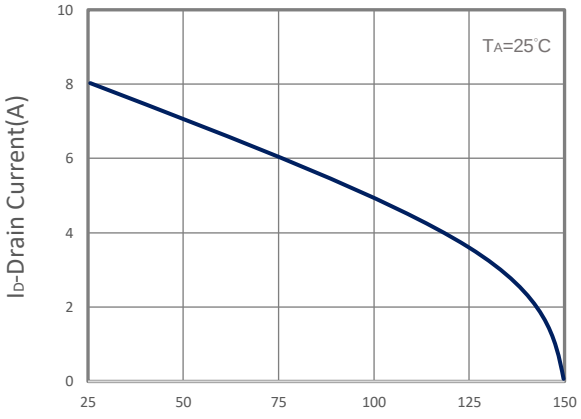


Power Dissipation

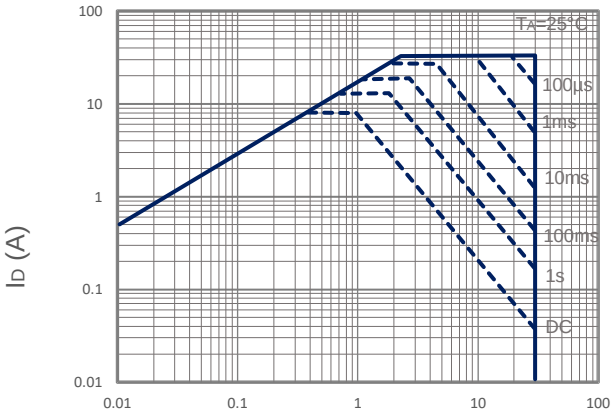
TYPICAL CHARACTERISTICS



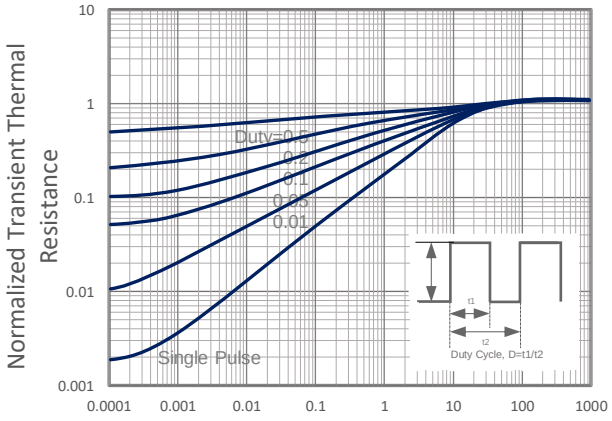
Gate Threshold Voltage



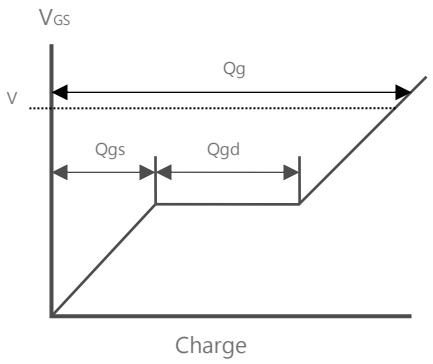
Drain Current vs TJ



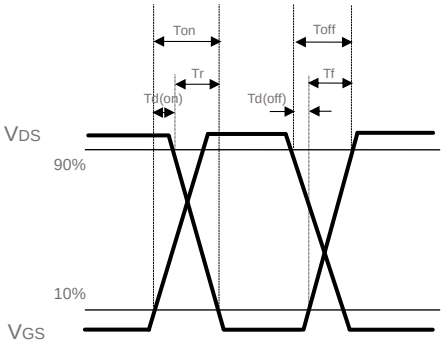
Maximum Safe Operation Area



VDS Voltage (V)

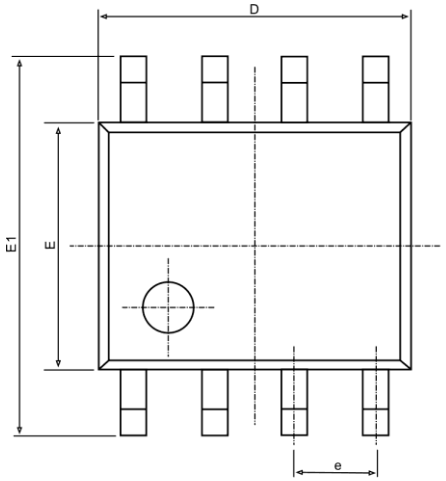


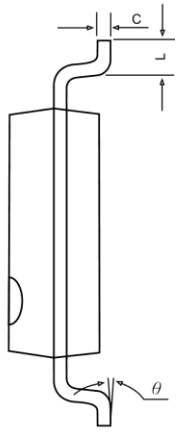
Gate Chrge Waveform

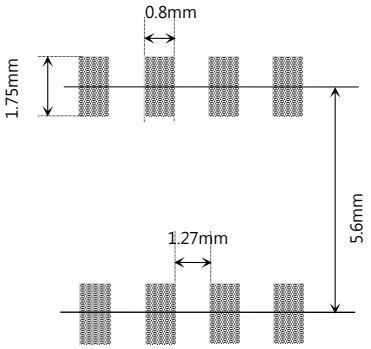


Switching Time Waveform

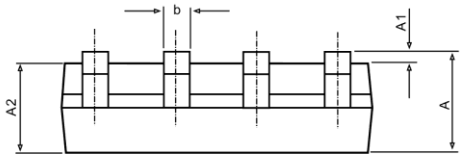
■SOP-8 PACKAGE DIMENSIONS







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°