

## Dual N-Channel MOSFET

### DESCRIPTION

SMC4842M 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.

### 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

### FEATURES

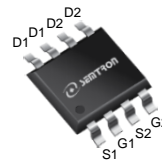
**$V_{DS}=30V, I_D=8A$**

$R_{DS(ON)}=16m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)}=20m\Omega(Typ.)@V_{GS}=4.5V$

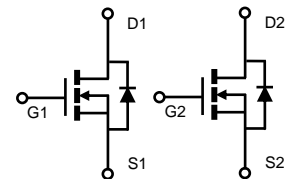
- ◆ High power and current handling capability

### APPLICATIONS

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



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	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_A=25^\circ C$	8
		$T_A=70^\circ C$	6.5
$I_{DM}$	Pulsed Drain Current <sup>B</sup>	32	A
$I_{AS}$	Avalanche Current <sup>B</sup>	15	A
$E_{AS}$	Single Pulse Avalanche energy $L=0.3mH$ <sup>BE</sup>	33	mJ
$P_D$	Power Dissipation <sup>A</sup>	$T_A=25^\circ C$	2
		$T_A=70^\circ C$	1.3
$T_J$	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 <sup>A</sup>		62	$^\circ C/W$
	Thermal Resistance Junction to Ambient <sup>AC</sup>	Steady-State	90	

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

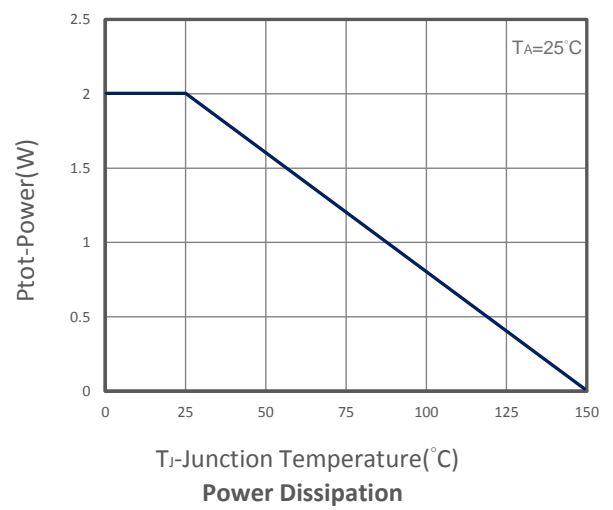
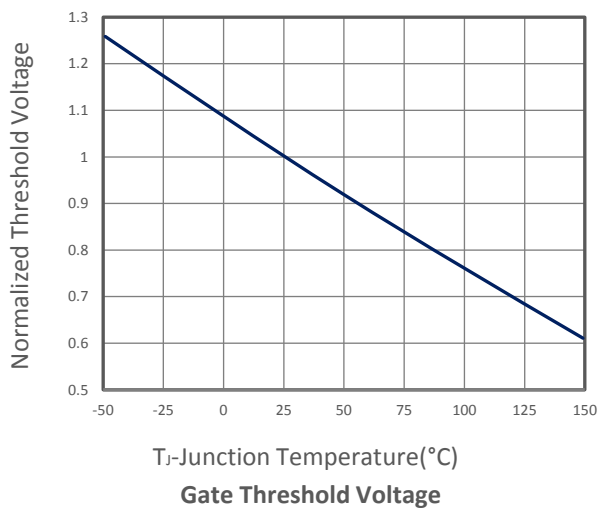
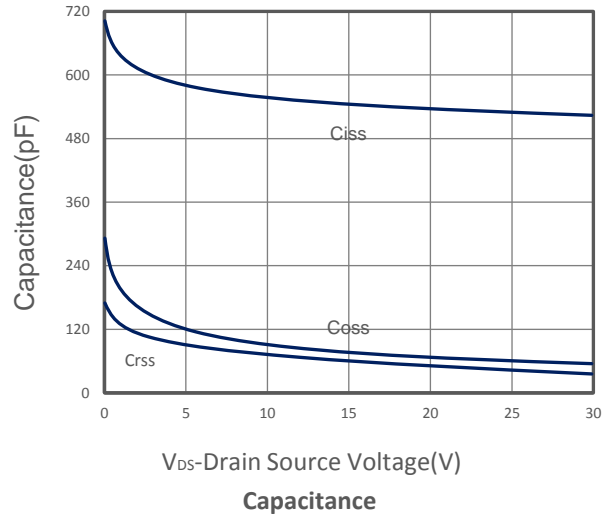
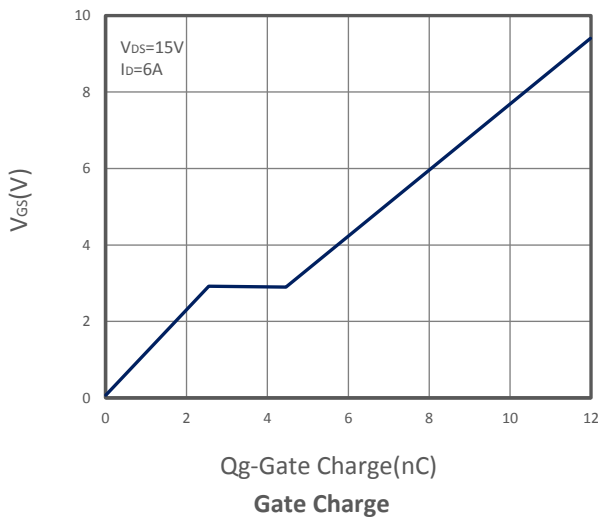
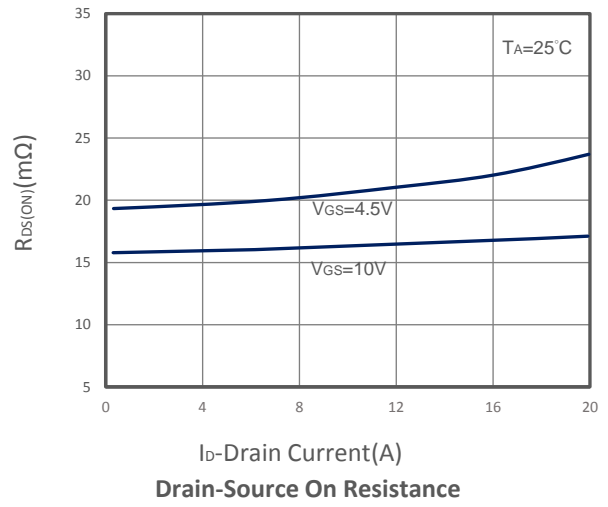
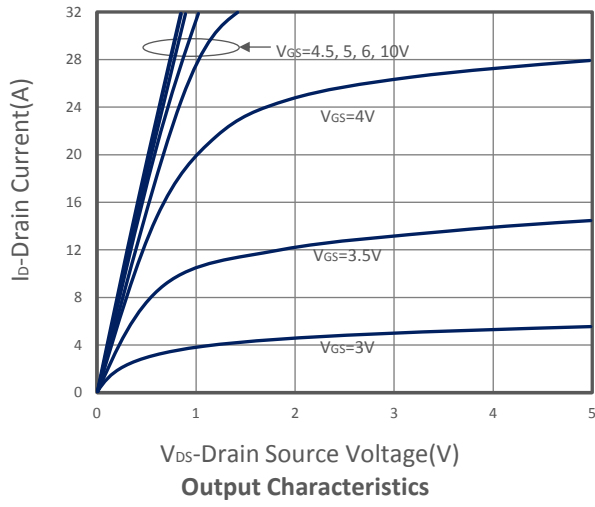
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250 $\mu$ A	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 $\mu$ A	1	1.5	2	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = $\pm$ 20V			$\pm$ 100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25 $^\circ$ C			1	$\mu$ A
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =75 $^\circ$ C			10	
R <sub>DS(ON)</sub>	Drain-source On-Resistance <sup>D</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A		16	20	m $\Omega$
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A		20	26	
G <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =6A		6		S
<b>Diode Characteristics</b>						
V <sub>SD</sub>	Diode Forward Voltage <sup>D</sup>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V
I <sub>S</sub>	Diode Continuous Forward Current				8	A
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =6A, dI/dt=100A/ $\mu$ s		12.5		ns
Q <sub>rr</sub>	Reverse Recovery Charge	T <sub>J</sub> =25 $^\circ$ C		3.2		nC
<b>Dynamic and Switching Parameters <sup>F</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =6A		12.7	17.8	nC
Q <sub>g</sub>	Total Gate Charge (4.5V)			6.2	8.7	
Q <sub>gs</sub>	Gate-Source Charge			2.4	3.4	
Q <sub>gd</sub>	Gate-Drain Charge			2	2.8	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		550		pF
C <sub>oss</sub>	Output Capacitance			78		
C <sub>rss</sub>	Reverse Transfer Capacitance			62		
R <sub>g</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		2.4		$\Omega$
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V, V <sub>GEN</sub> =10V R <sub>G</sub> =3.3 $\Omega$ , I <sub>D</sub> =1A		2.5	5	nS
t <sub>r</sub>				7.6	14	
t <sub>d(off)</sub>	Turn-Off Time			19.8	38	
t <sub>f</sub>				4.2	8	

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

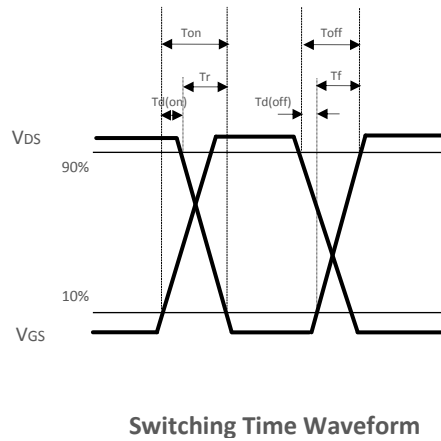
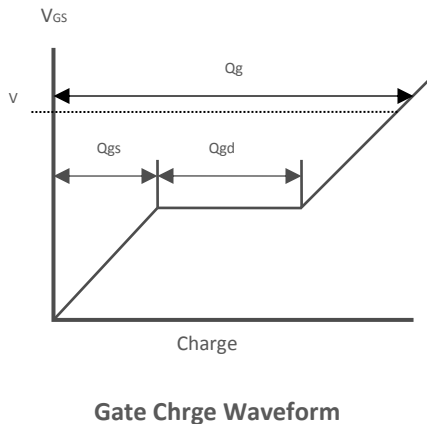
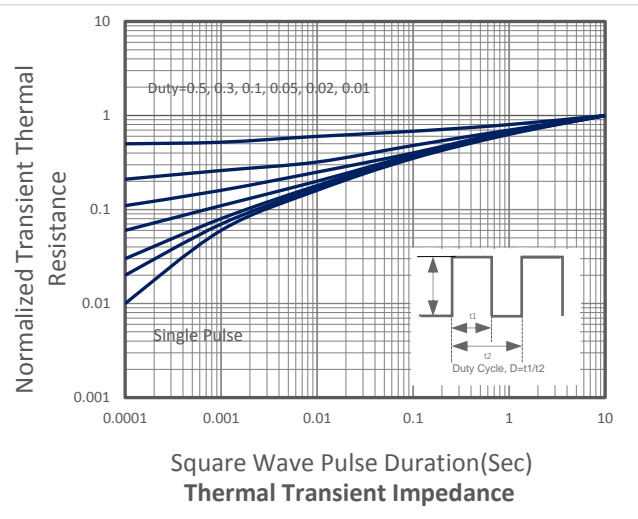
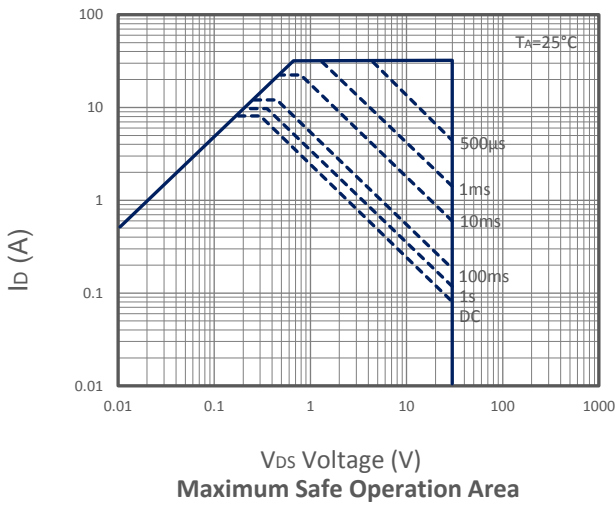
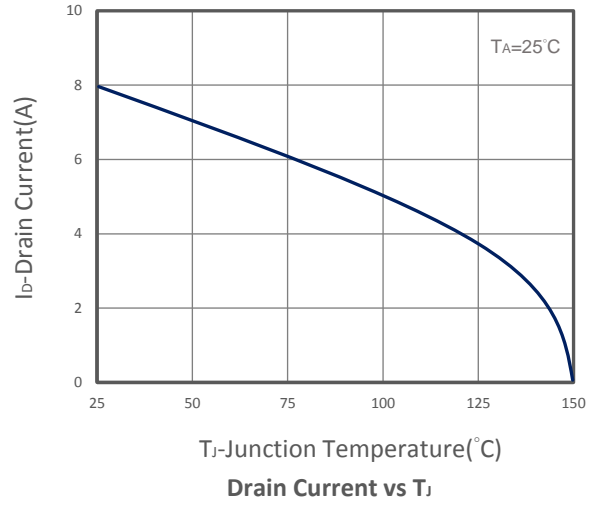
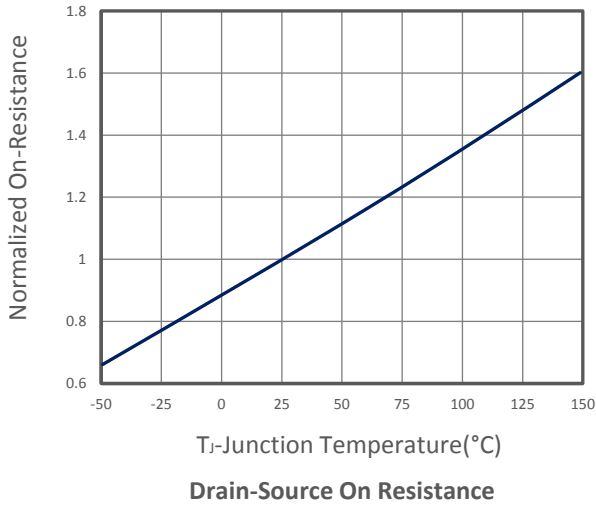
- A. Surface mounted on FR4 board using 1 in<sup>2</sup> pad size.
- B. Pulsed width limited by maximum junction temperature, T<sub>J(MAX)</sub>=150 $^\circ$ C (initial temperature T<sub>J</sub>=25 $^\circ$ C).
- C. Using  $\leq$  10s junction-to-ambient thermal resistance is base on T<sub>J(MAX)</sub>=150 $^\circ$ C.
- D. Pulse test width  $\leq$ 300 $\mu$ s and duty cycle  $\leq$  2%.
- E. The EAS data shows maximum, The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.3mH, I<sub>AS</sub>=15A
- F. Guaranteed by design, not subject to production testing.

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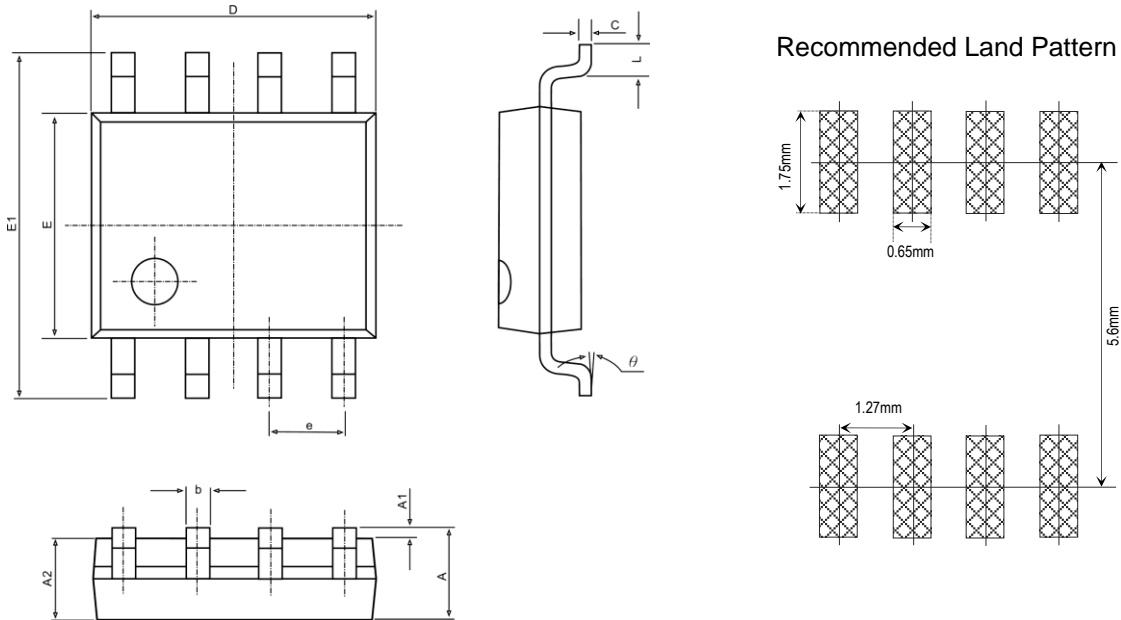
## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS



## ■ SOP-8 PACKAGE DIMENSIONS



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	0.004	0.010
A2	1.300	1.500	0.051	0.059
b	0.390	0.490	0.015	0.019
c	0.200	0.250	0.008	0.010
D	4.800	5.100	0.189	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 BSC		0.050 BSC	
L	0.500	0.800	0.020	0.031
θ	0°	8°	0°	8°