

Single N-Channel MOSFET

DESCRIPTION

SMC4812 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.

PART NUMBER INFORMATION

SMC 4812 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

$V_{DS} = 30V, I_D = 10.7A$

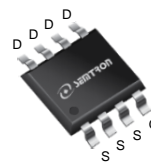
$R_{DS(ON)} = 14m\Omega (Typ.) @ V_{GS} = 10V$

$R_{DS(ON)} = 21m\Omega (Typ.) @ V_{GS} = 4.5V$

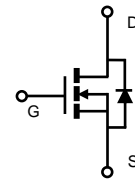
- ◆ Fast switch
- ◆ Improved dv/dt capability
- ◆ High power and current handling capability

APPLICATIONS

- ◆ LED Lighting
- ◆ Power Management
- ◆ DC-DC Power System
- ◆ 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	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	10.7
		$T_A = 70^\circ C$	8.6
I_{DM}	Pulsed Drain Current ^A	42.8	A
I_{AS}	Avalanche Current ^A	20	A
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^{AD}	20	mJ
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	3.1
		$T_A = 70^\circ C$	2
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	65	

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

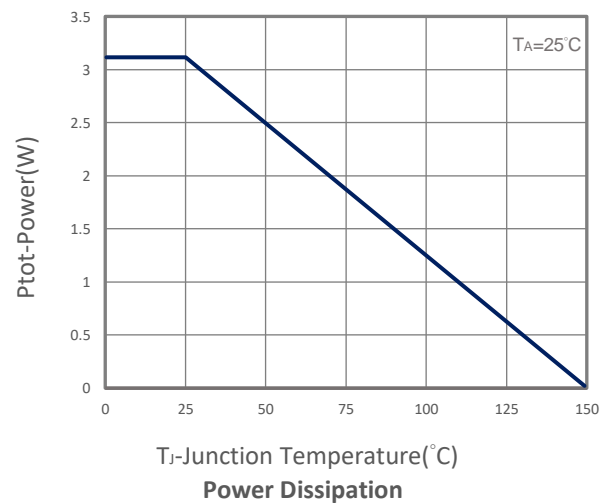
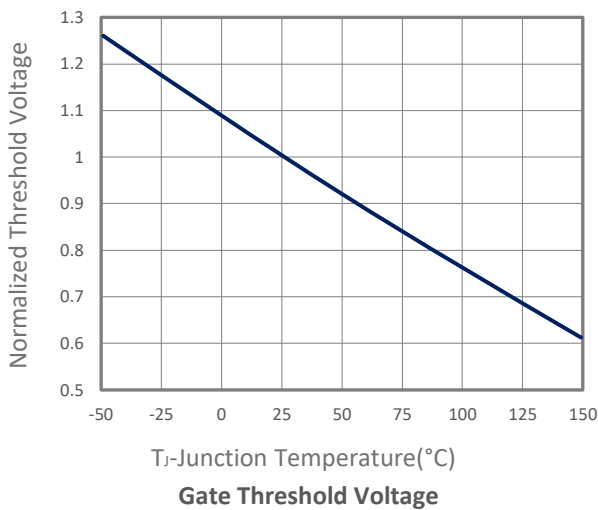
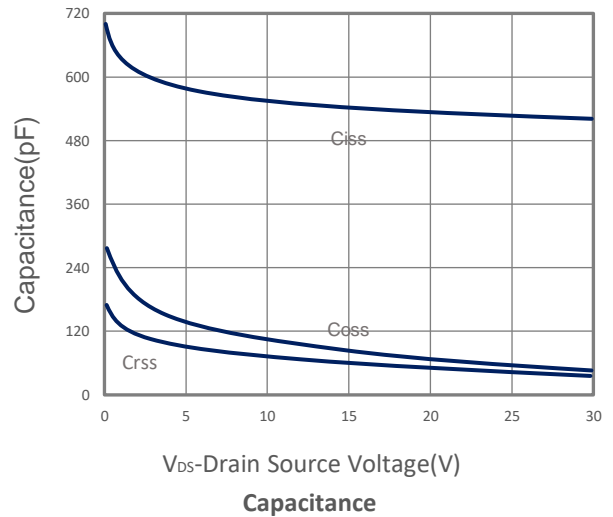
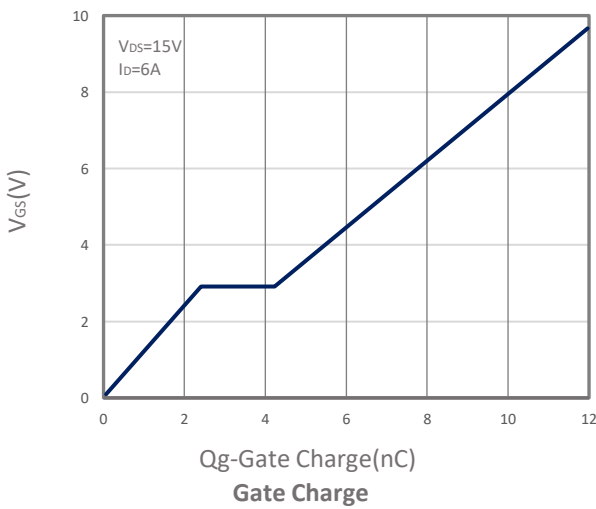
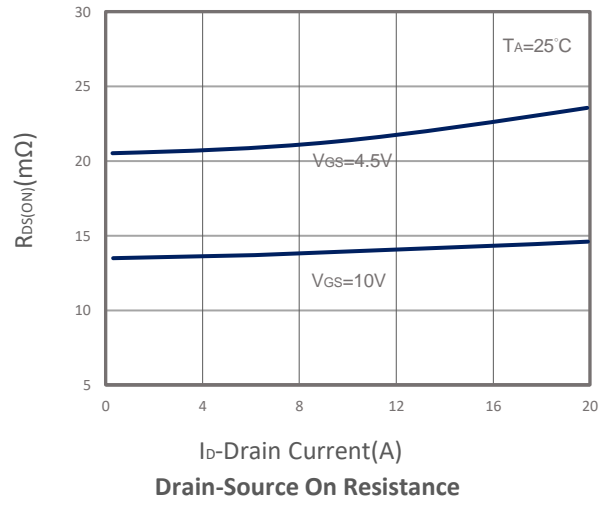
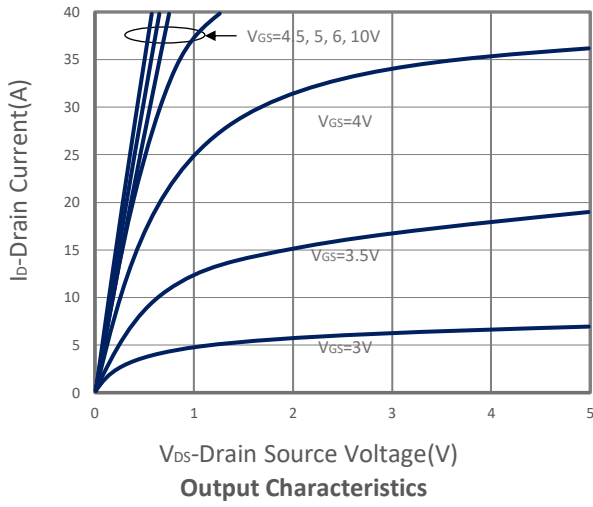
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate 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	V _{GS} =10V, I _D =10.7A V _{GS} =4.5V, I _D =8A		14 21	17 27	mΩ
G _{fs}	Forward Transconductance	V _{DS} =15V, I _D =6A		6		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V			1	V
I _S	Diode Continuous Current				10.7	A
t _{rr}	Reverse Recovery Time	I _S =6A, di/dt=100A/μs		12.5		ns
Q _{rr}	Reverse Recovery Charge	T _J =25°C		3.2		nC
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =6A		12.7	17.8	nC
Q _g	Total Gate Charge(4.5V)			6.2	8.7	
Q _{gs}	Gate-Source Charge			2.4	3.4	
Q _{gd}	Gate-Drain Charge			2	2.8	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		550		pF
C _{oss}	Output Capacitance			78		
C _{rss}	Reverse Transfer Capacitance			62		
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 =3.3Ω, I _D =1A		2.5	5	nS
t _r				7.6	14	
t _{d(off)}	Turn-Off Time			19.8	38	
t _f				4.2	8	

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

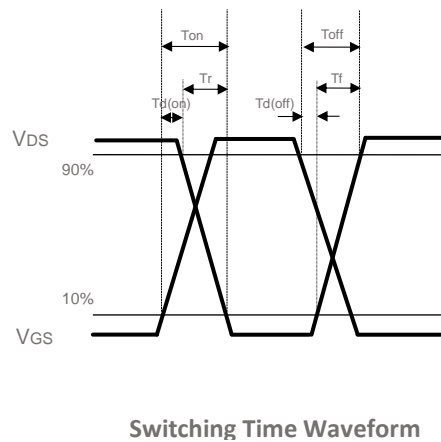
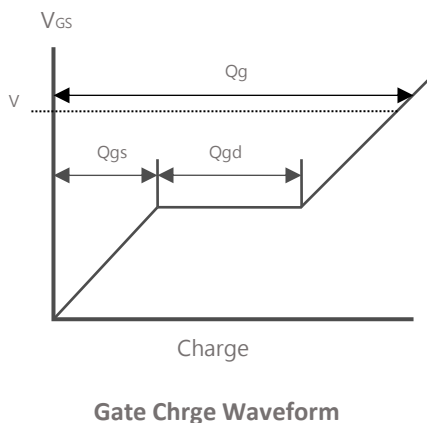
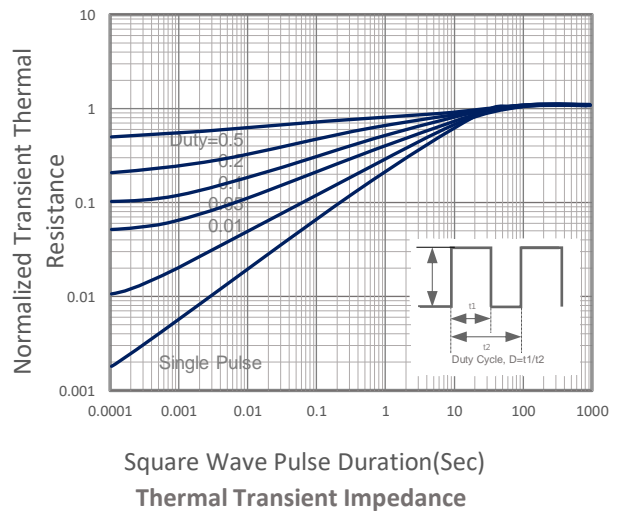
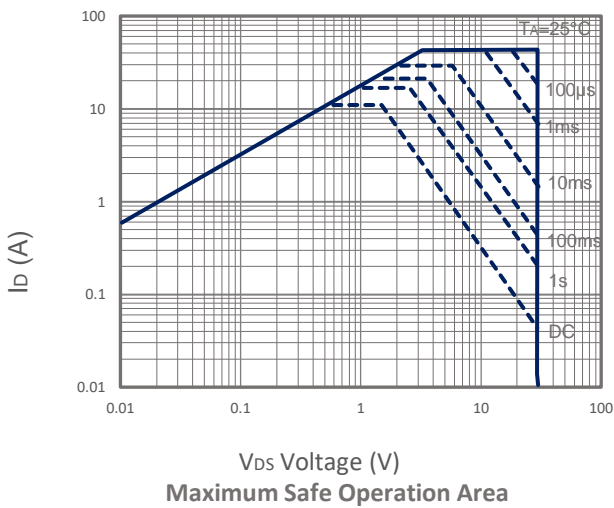
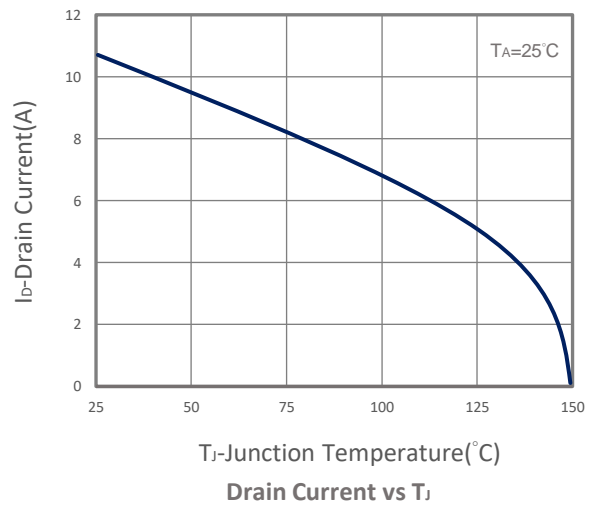
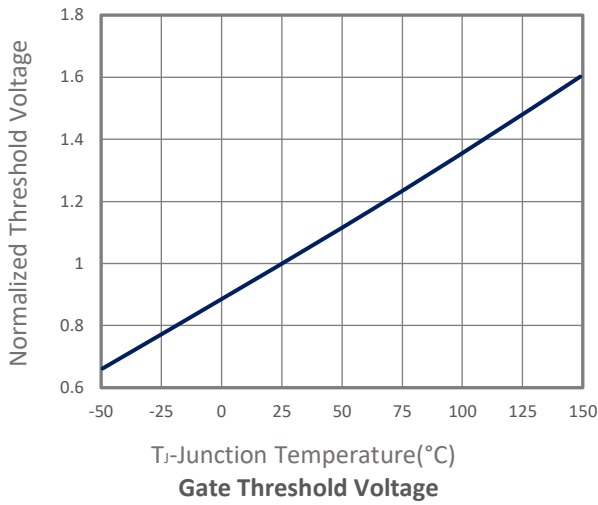
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150°C (initial temperature T_A=25°C).
- T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.
- The EAS data shows Max, tested and pulse width limited by T_{J(MAX)}=150°C (initial temperature T_J=25°C).

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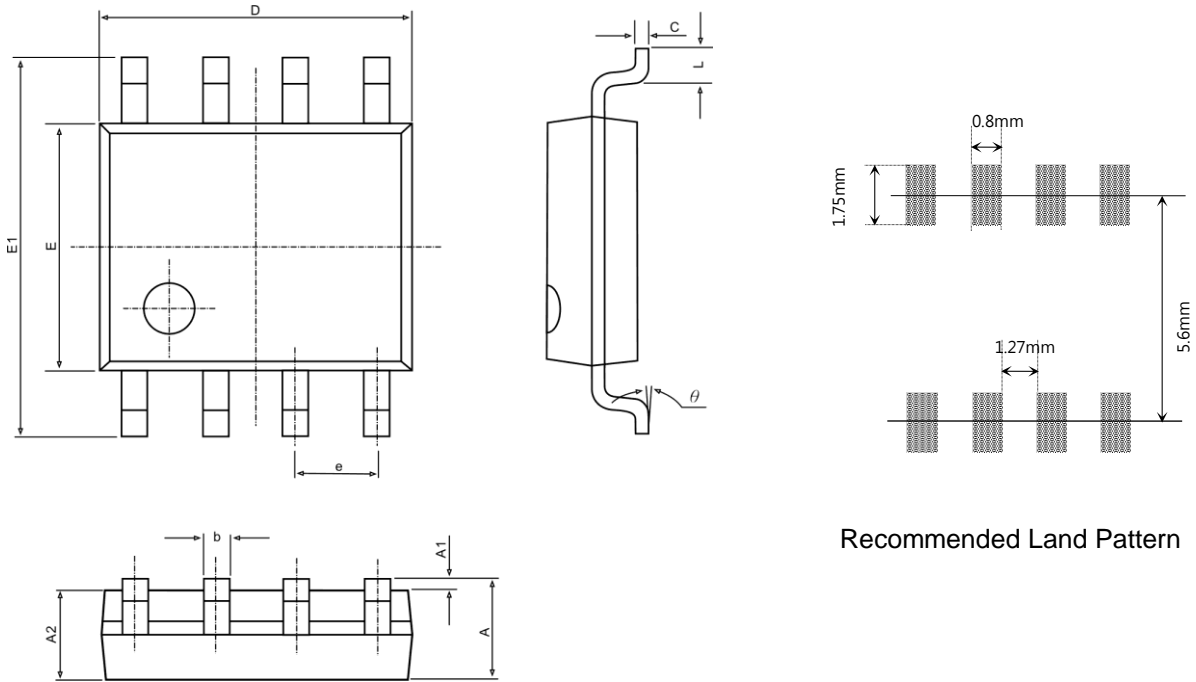
TYPICAL CHARACTERISTICS



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°