

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

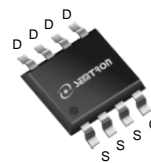
$V_{DS} = 30V, I_D = 9.8A$

$R_{DS(ON)} = 14m\Omega (Typ.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 22m\Omega (Typ.) @ V_{GS} = 4.5V$

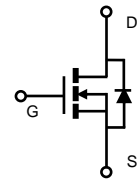
- ◆ Fast switch
- ◆ Improved dv/dt capability
- ◆ High power and current handling capability

APPLICATIONS

- ◆ LED Lighting
- ◆ Power Management
- ◆ Portable Equipment



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	$T_A = 25^\circ C$	9.8
		$T_A = 70^\circ C$	7.9
I_{DM}	Pulsed Drain Current ^A	39	A
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	2.8
		$T_A = 70^\circ C$	1.8
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	$t \leq 10s$	45	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BC}	Steady-State	70	
$R_{\theta JC}$	Thermal Resistance Junction to Case		27	

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

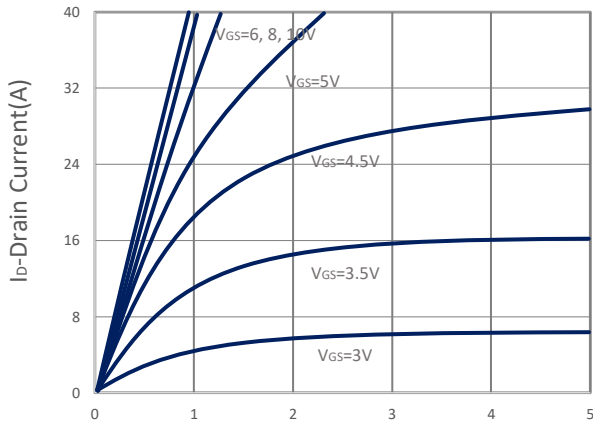
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero 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 =9.8A		14	18	mΩ
		V _{GS} =4.5V, I _D =6A		22	28	
G _{fs}	Forward Transconductance	V _{DS} =15V, I _D =6A		12		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =1A, V _{GS} =0V		0.7	1.0	V
I _S	Continuous Source Current				4.5	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge (10V)	V _{DS} =15V, V _{GS} =10V, I _D =6.5A		8.4	11.3	nC
Q _g	Total Gate Charge (4.5V)			4.2	5.7	
Q _{gs}	Gate-Source Charge			1.6	2.2	
Q _{gd}	Gate-Drain Charge			2	2.7	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V f=1MHz		420	588	pF
C _{oss}	Output Capacitance			62	87	
C _{rss}	Reverse Transfer Capacitance			50	70	
t _{d(on)}	Turn-On Time	V _{DD} =15V, V _{GEN} =10V, R _G =6Ω, I _D =1A		5.3	10	nS
t _r				7.6	14	
t _{d(off)}	Turn-Off Time			15.8	30	
t _f				4.2	8	

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

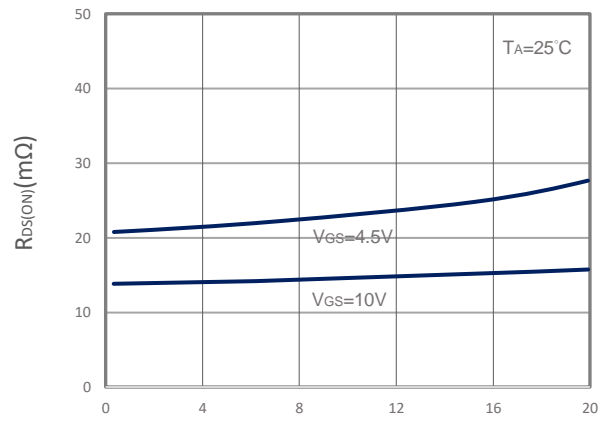
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- Measure the value in a still air environment at T_A=25°C, using an installation mounted on a 1 in2 FR-4 board, maximum junction temperature T_{J(MAX)}=150°C.
- T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.
- The pulse test width is ≤300μs and the duty cycle ≤ 2%.

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.

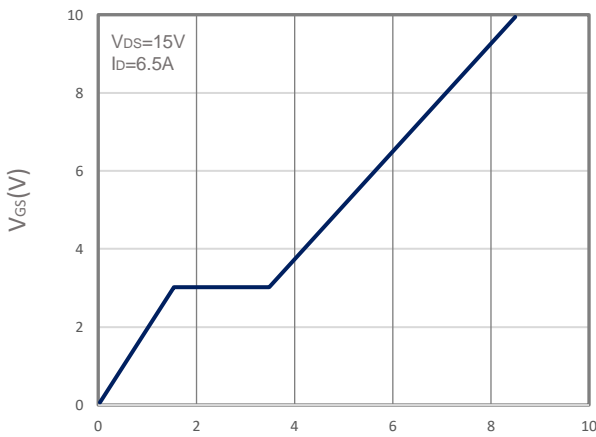
TYPICAL CHARACTERISTICS



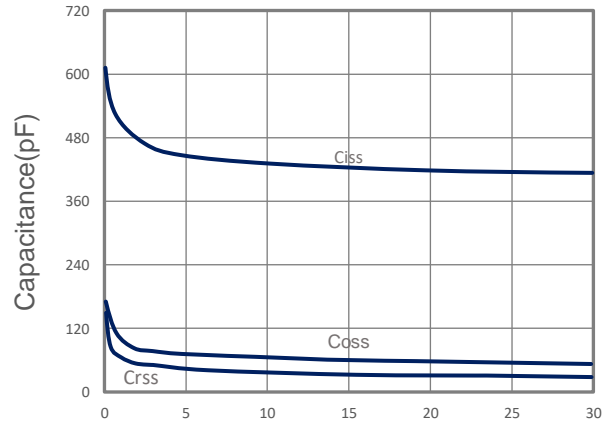
V_{DS}-Drain Source Voltage(V)
Output Characteristics



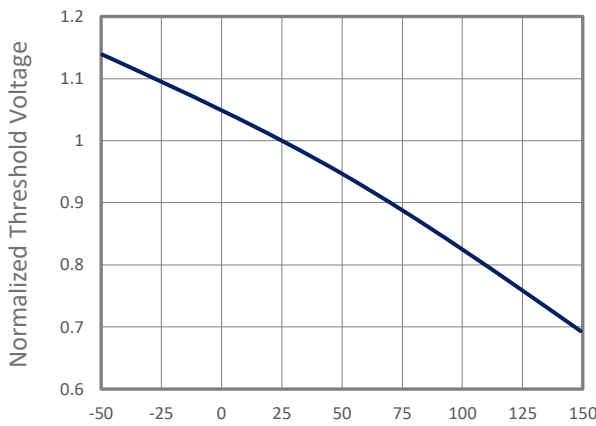
Id-Drain Current(A)
Drain-Source On Resistance



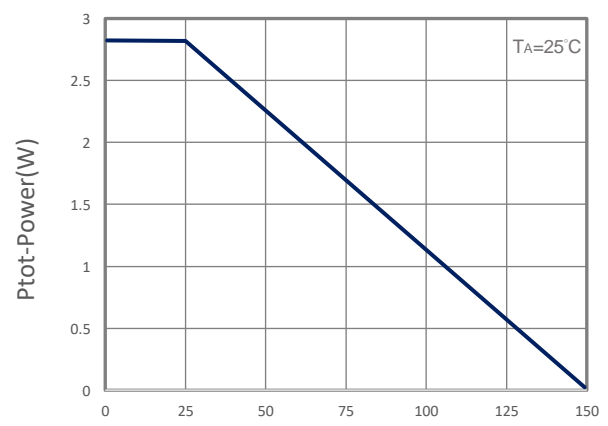
Qg-Gate Charge(nC)
Gate Charge



V_{DS}-Drain Source Voltage(V)
Capacitance

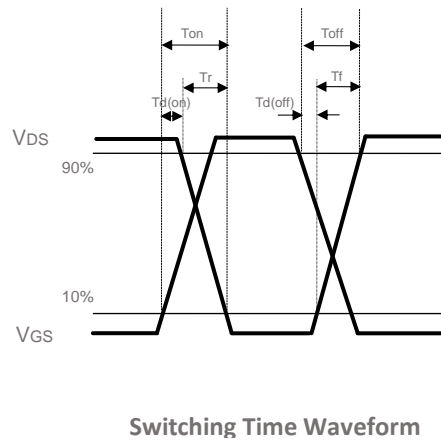
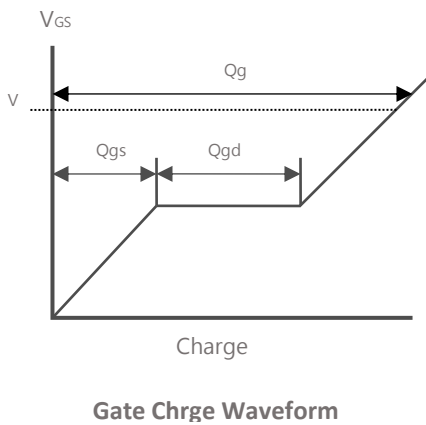
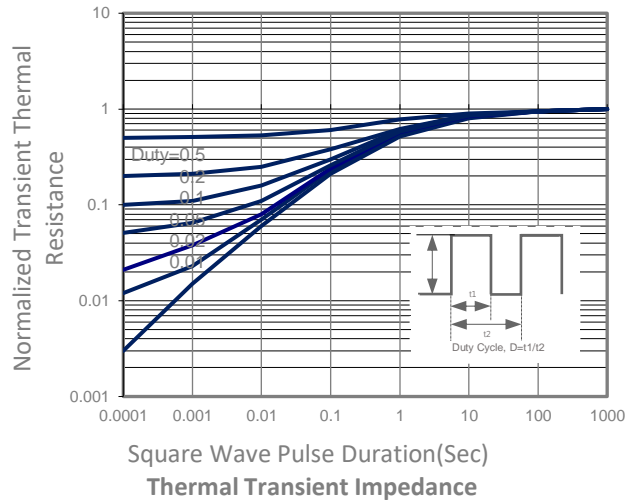
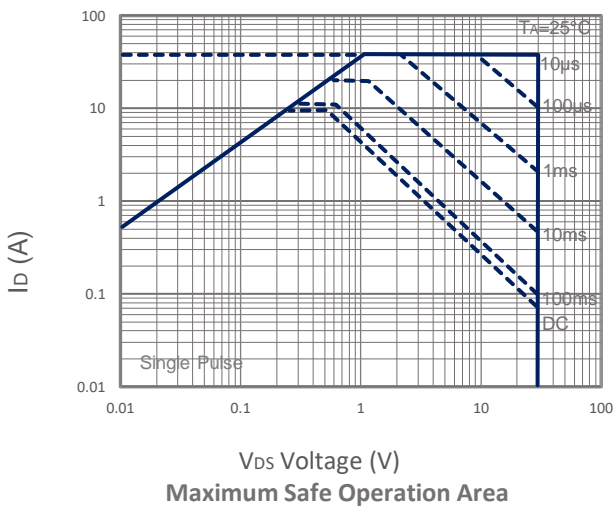
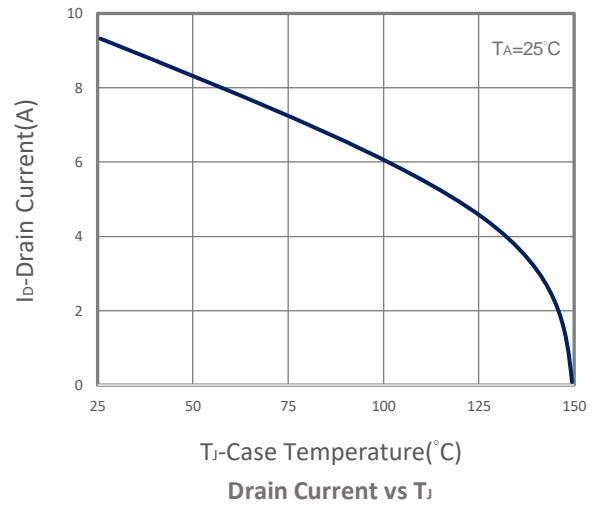
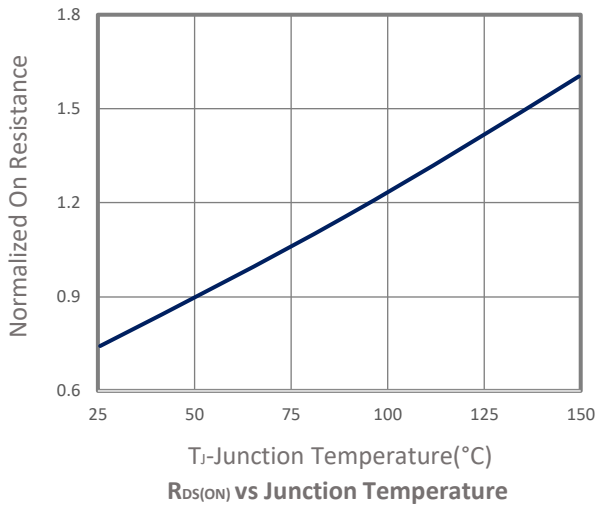


T_J-Junction Temperature(°C)
Gate Threshold Voltage

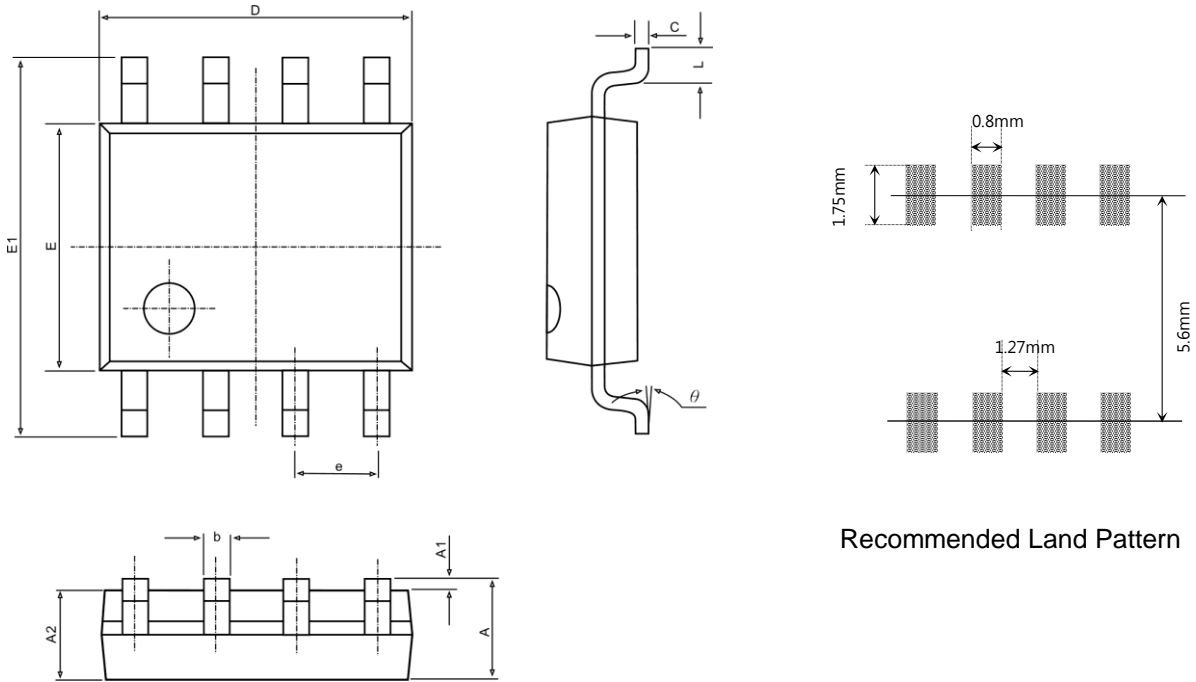


T_J-Junction Temperature(°C)
Power Dissipation

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°