

Single N-Channel MOSFET

DESCRIPTION

SMC4880 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, and withstand high energy pulse in the avalanche and commutation mode.

PART NUMBER INFORMATION

SMC 4880 NA - TR G
 a b c d e

a : Company name.
 b : Product Serial number.
 c : Package code NA:DFN3.3X3.3A-8
 d : Handling code TR:Tape&Reel
 e : Green produce code G:RoHS Compliant

FEATURES

$V_{DS} = 30V$, $I_D = 26A$

$R_{DS(ON)} = 12m\Omega (Typ.) @ V_{GS} = 10V$

$R_{DS(ON)} = 18m\Omega (Typ.) @ V_{GS} = 4.5V$

APPLICATIONS

- ◆ Power Management
- ◆ Load switch
- ◆ Battery Powered Systems



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 _C =25°C	26	A
		T _C =100°C	17	A
I _{DM}	Pulsed Drain Current ^A		100	A
I _D	Continuous Drain Current	T _A =25°C	12.8	A
		T _A =70°C	10.2	A
P _D	Power Dissipation ^B	T _A =25°C	4.2	W
		T _A =70°C	2.7	W
I _{AS}	Avalanche Current ^A		10	A
E _{AS}	Single Pulse Avalanche energy L=0.5mH ^{AF}		25	mJ
P _D	Power Dissipation ^C	T _C =25°C	16.7	W
		T _C =100°C	6.7	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	$t \leq 10s$	30	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	60	
$R_{\theta JC}$	Thermal Resistance Junction to Case		7.5	

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

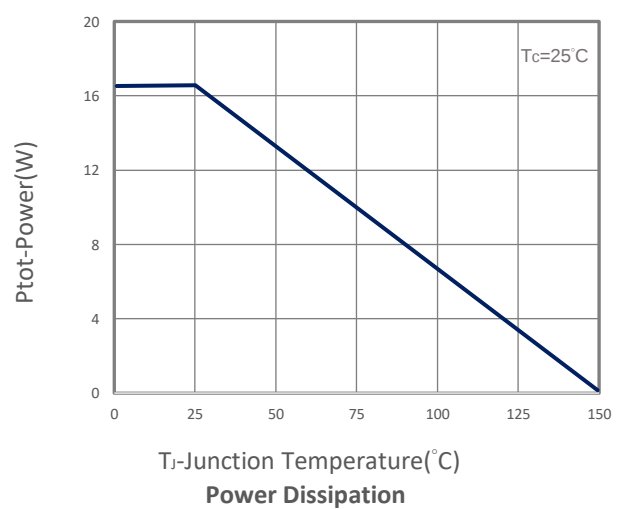
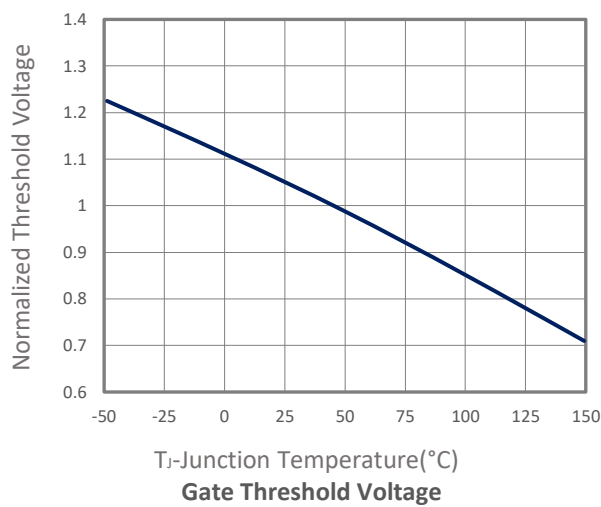
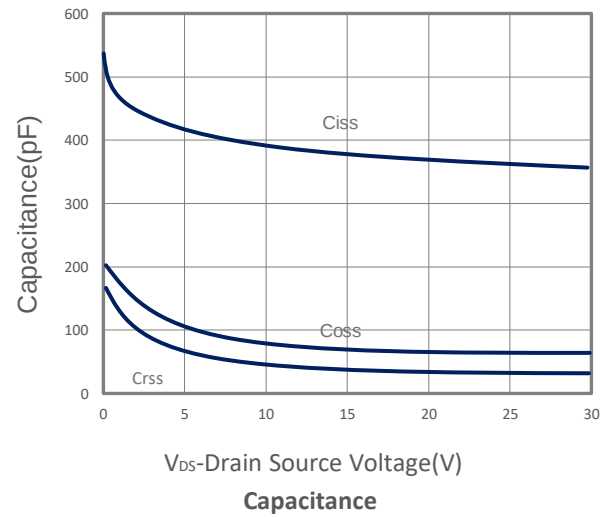
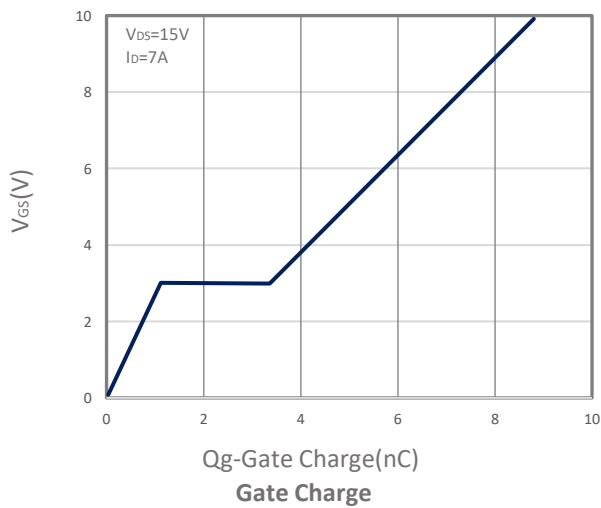
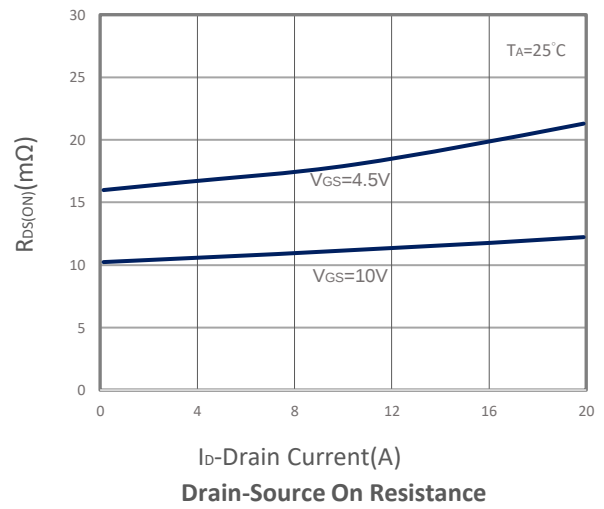
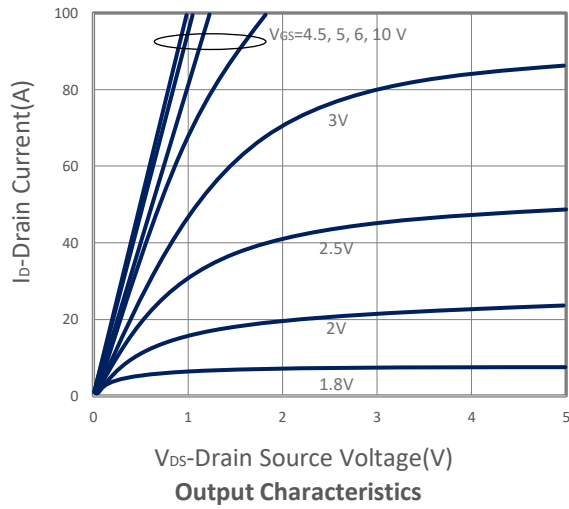
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate 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 ^E	V _{GS} =10V, I _D =12.8A V _{GS} =4.5V, I _D =8A		12 18	15 24	mΩ
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =10A		7.5		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^E	I _S =1A, V _{GS} =0V		0.7	1	V
I _S	Continuous Source Current				26	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =7A		8.6	12.1	nC
Q _g	Total Gate Charge (4.5V)			4.2	5.9	
Q _{gs}	Gate-Source Charge			1.1	1.5	
Q _{gd}	Gate-Drain Charge			2.1	2.9	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		380		pF
C _{oss}	Output Capacitance			60		
C _{rss}	Reverse Transfer Capacitance			35		
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		3.1		Ω
t _{d(on)}	Turn-On Time ^E	V _{DD} =15V, V _{GS} =10V, R _G =6Ω, I _D =1A		3.2	6	nS
t _r				7.5	14	
t _{d(off)}	Turn-Off Time ^E			16	30	
t _f				4.2	8	

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

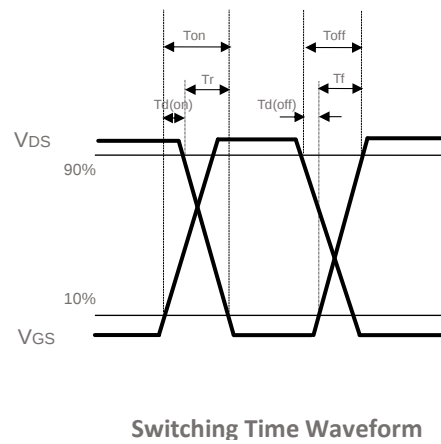
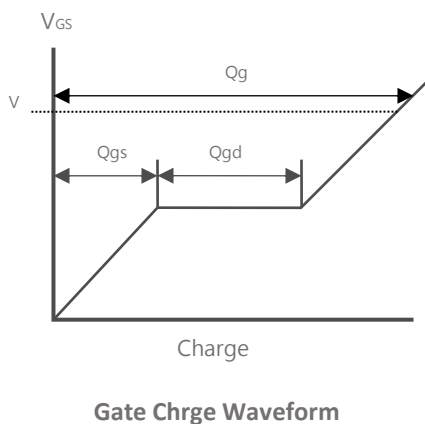
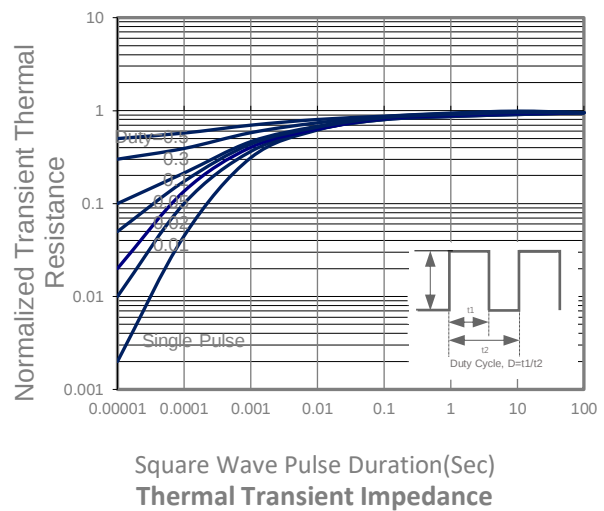
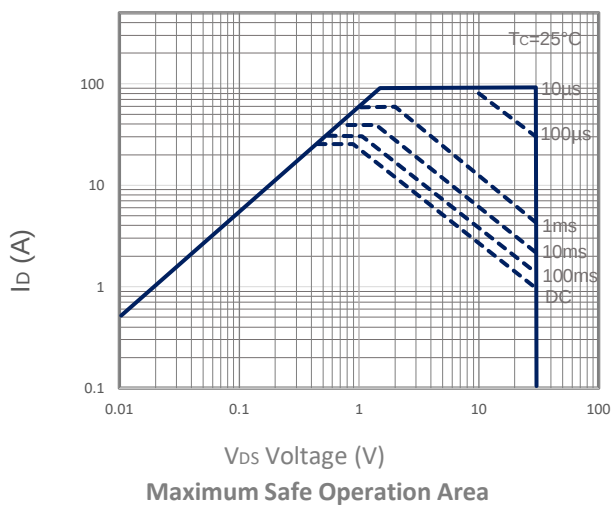
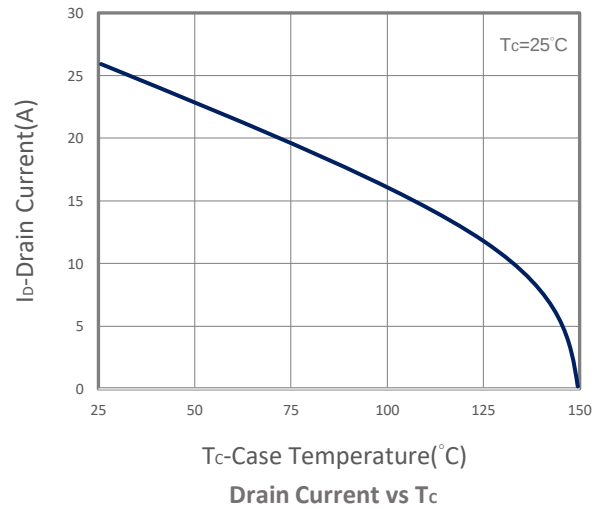
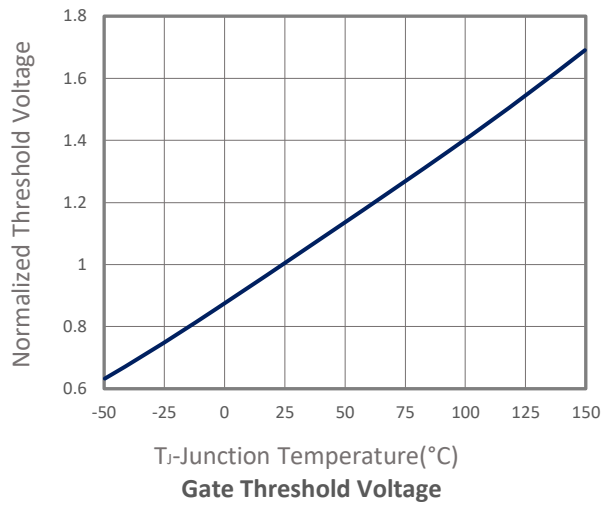
- Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ\text{C}$.
- The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_A=25^\circ\text{C}$).
- $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-ambient thermal resistance, $t \leq 10\text{sec}$.
- $T_{J(MAX)}=150^\circ\text{C}$, using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.
- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- The EAS data shows Max, tested and pulse width limited by $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_J=25^\circ\text{C}$).

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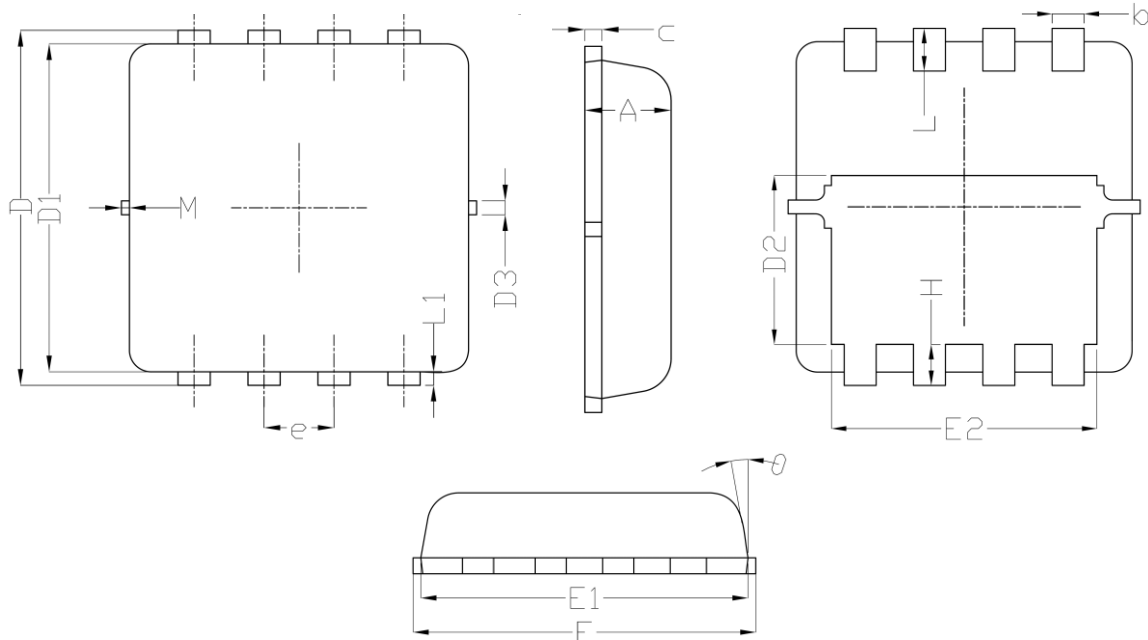
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



DFN3.3X3.3A-8 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.300	3.400	0.130	0.134
D1	3.250	3.450	0.128	0.136
D2	1.780	1.980	0.070	0.078
D3	-	0.130	-	0.005
E	3.200	3.400	0.126	0.134
E1	3.000	3.200	0.118	0.126
E2	2.390	2.590	0.094	0.102
e	0.65BSC.		0.026BSC.	
H	0.300	0.500	0.012	0.020
L	0.300	0.500	0.012	0.020
L1	-	0.130	-	0.005
M	-	0.150	-	0.006
Θ	0°	12°	0°	15°

