

## 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	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	26
		$T_C = 100^\circ C$	17
$I_{DM}$	Pulsed Drain Current <sup>A</sup>	100	A
$I_D$	Continuous Drain Current	$T_A = 25^\circ C$	12.8
		$T_A = 70^\circ C$	10.2
$P_D$	Power Dissipation <sup>B</sup>	$T_A = 25^\circ C$	4.2
		$T_A = 70^\circ C$	2.7
$I_{AS}$	Avalanche Current <sup>A</sup>	10	A
$E_{AS}$	Single Pulse Avalanche energy $L=0.5mH$ <sup>AF</sup>	25	mJ
$P_D$	Power Dissipation <sup>C</sup>	$T_C = 25^\circ C$	16.7
		$T_C = 100^\circ C$	6.7
$T_J$	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>B</sup>		30	$^\circ C/W$
	Thermal Resistance Junction to Ambient <sup>BD</sup>		60	
$R_{\theta JC}$	Thermal Resistance Junction to Case	Steady-State	7.5	

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

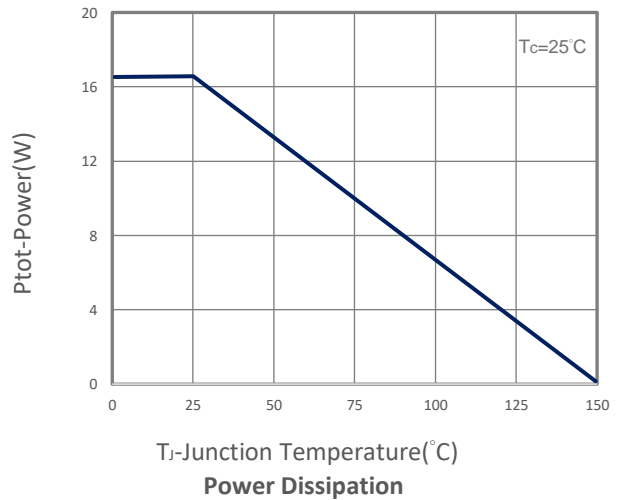
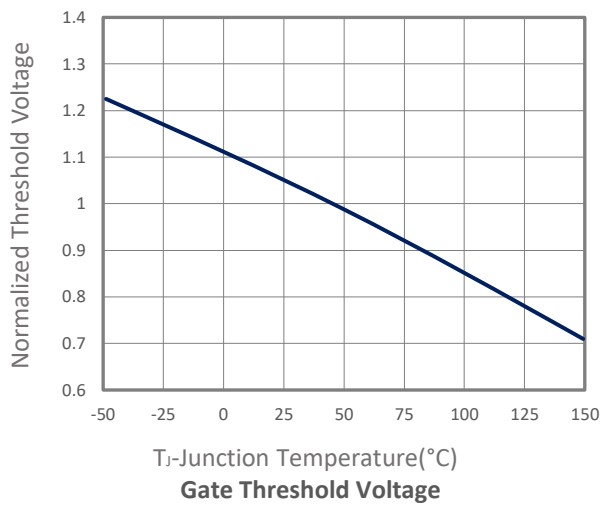
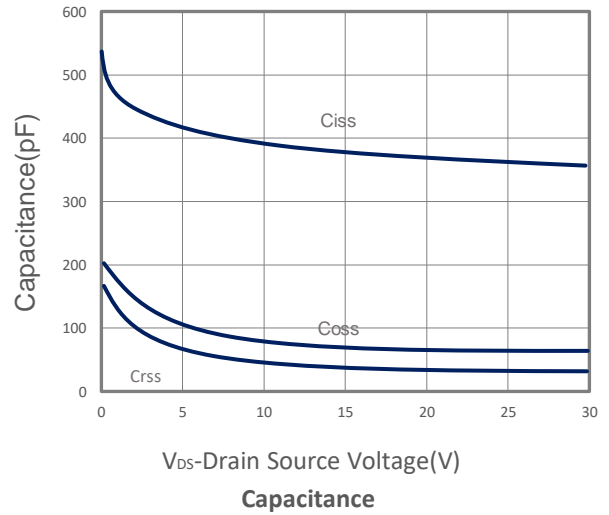
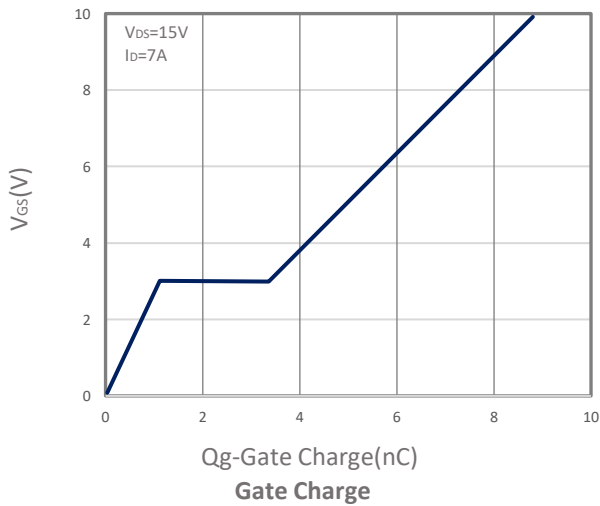
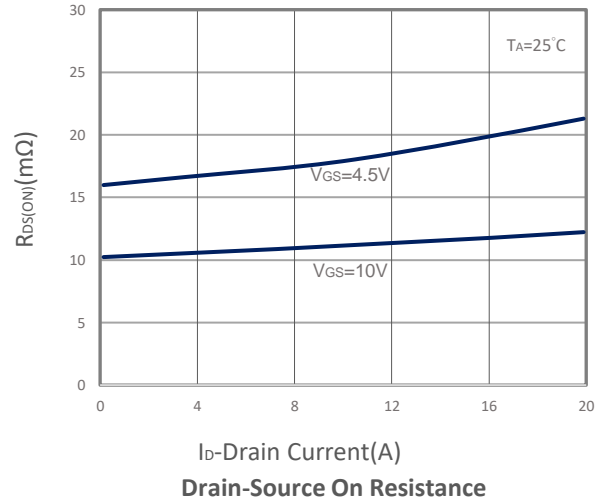
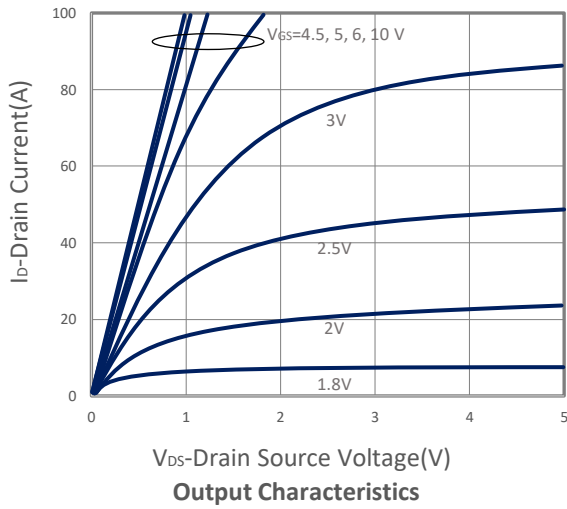
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	$\mu A$
		$V_{DS}=24V, V_{GS}=0V, T_J=75^\circ\text{C}$			10	
$R_{DS(ON)}$	Drain-source On-Resistance <sup>E</sup>	$V_{GS}=10V, I_D=12.8A$		12	15	m $\Omega$
		$V_{GS}=4.5V, I_D=8A$		18	24	
$G_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=10A$		7.5		S
<b>Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage <sup>E</sup>	$I_S=1A, V_{GS}=0V$		0.7	1	V
$I_S$	Continuous Source Current				26	A
<b>Dynamic and Switching Parameters</b>						
$Q_g$	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	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$		380		pF
$C_{oss}$	Output Capacitance			60		
$C_{rss}$	Reverse Transfer Capacitance			35		
$R_g$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		3.1		$\Omega$
$t_{d(on)}$	Turn-On Time <sup>E</sup>	$V_{DD}=15V, V_{GS}=10V, R_G=6\Omega, I_D=1A$		3.2	6	nS
$t_r$				7.5	14	
$t_{d(off)}$	Turn-Off Time <sup>E</sup>			16	30	
$t_f$				4.2	8	

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

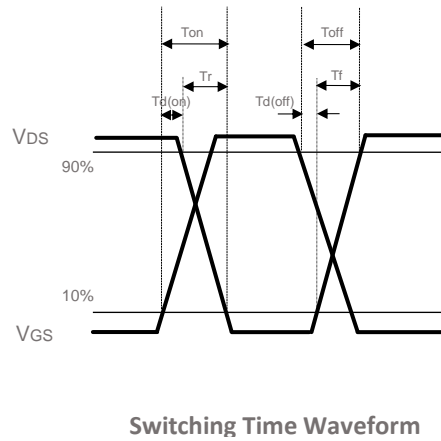
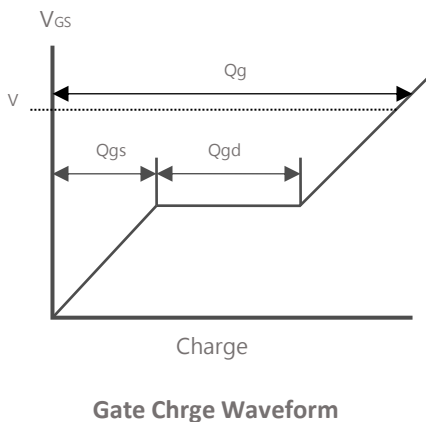
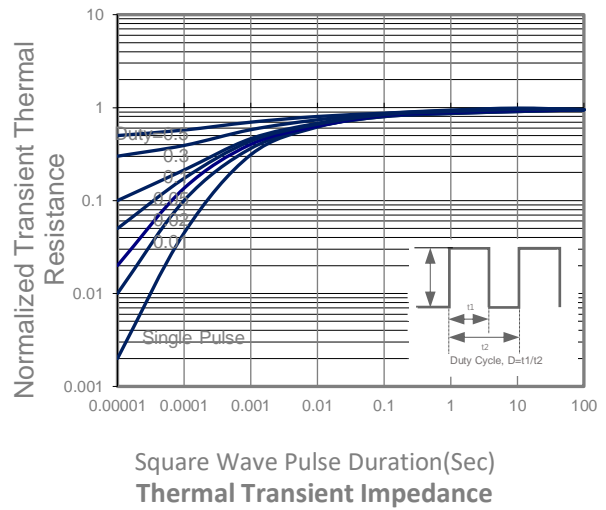
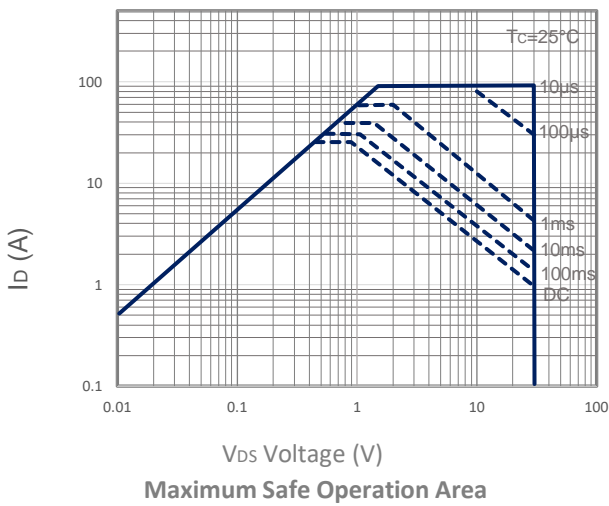
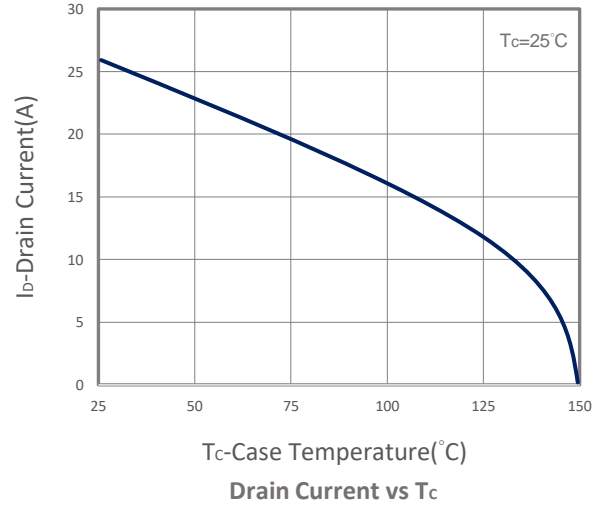
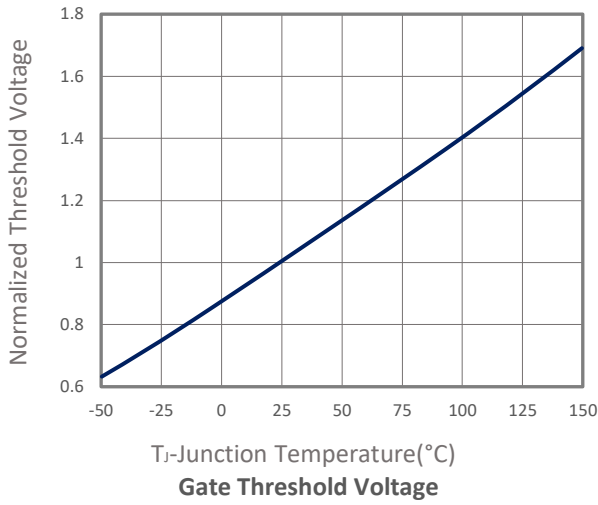
- Pulsed width limited by maximum junction temperature,  $T_{J(MAX)}=150^\circ\text{C}$ .
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature  $T_{J(MAX)}=150^\circ\text{C}$  (initial temperature  $T_A=25^\circ\text{C}$ ).
- $T_{J(MAX)}=150^\circ\text{C}$ , 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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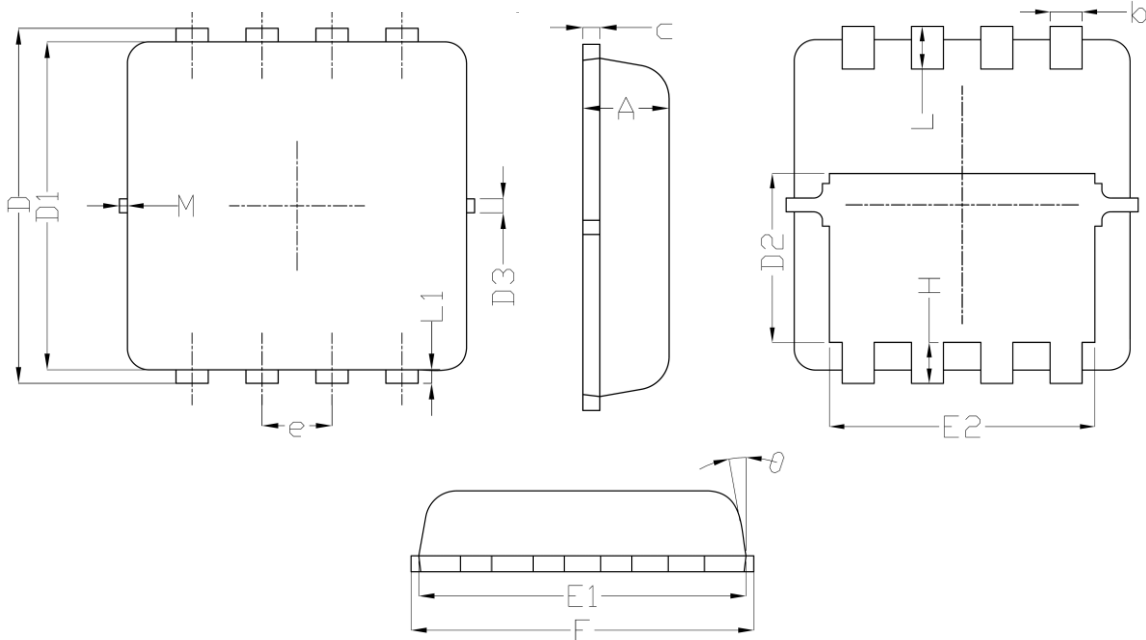
## TYPICAL CHARACTERISTICS



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## 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°

Recommended Land Pattern

