

Single N-Channel MOSFET

DESCRIPTION

SMC4618 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 4618 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

$V_{DS} = 60V, I_D = 30A$

$R_{DS(ON)} = 15m\Omega(Typ.)@V_{GS} = 10V$
 $R_{DS(ON)} = 18m\Omega(Typ.)@V_{GS} = 4.5V$

- ◆ 100% UIS and Rg tested

APPLICATIONS

- ◆ Power Management
- ◆ Motor Drive
- ◆ LED Application



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ Unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	30
		$T_C = 100^\circ C$	19
I_{DM}	Pulsed Drain Current ^A	120	A
I_D	Continuous Drain Current	$T_A = 25^\circ C$	10.2
		$T_A = 70^\circ C$	8.2
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	3.6
		$T_A = 70^\circ C$	2.3
I_{AS}	Avalanche Current ^A	30	A
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^{AF}	45	mJ
P_D	Power Dissipation ^C	$T_C = 25^\circ C$	31
		$T_C = 100^\circ C$	12.4
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	$t \leq 10s$	35	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	65	
$R_{\theta JC}$	Thermal Resistance Junction to Case		4	

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

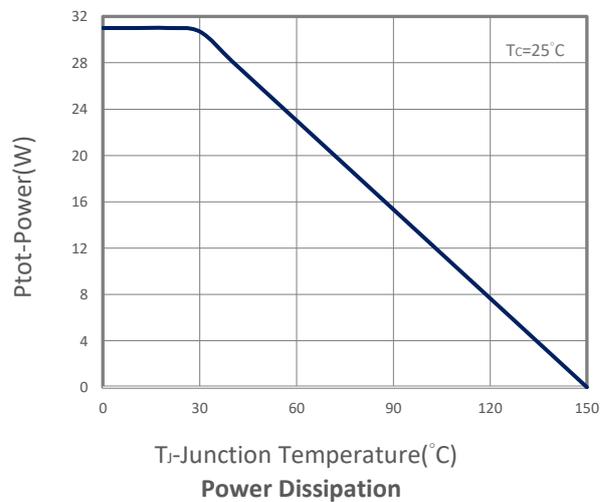
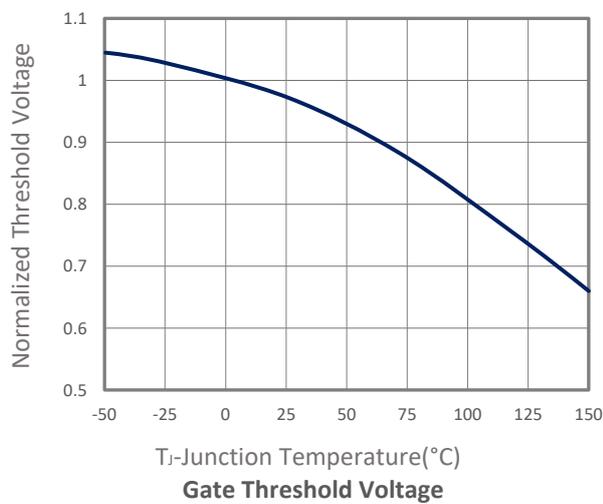
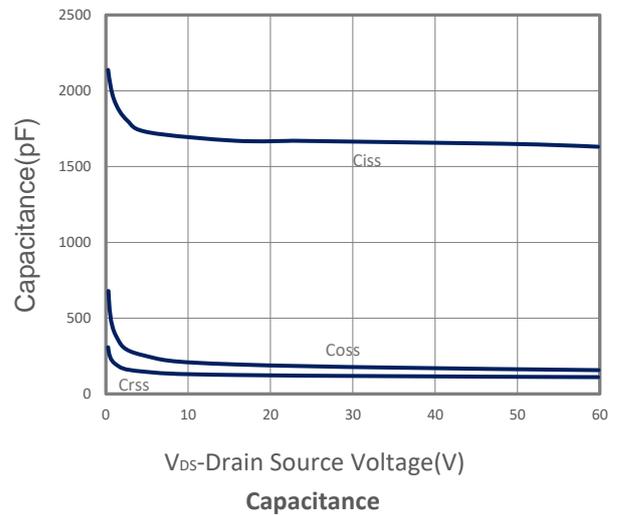
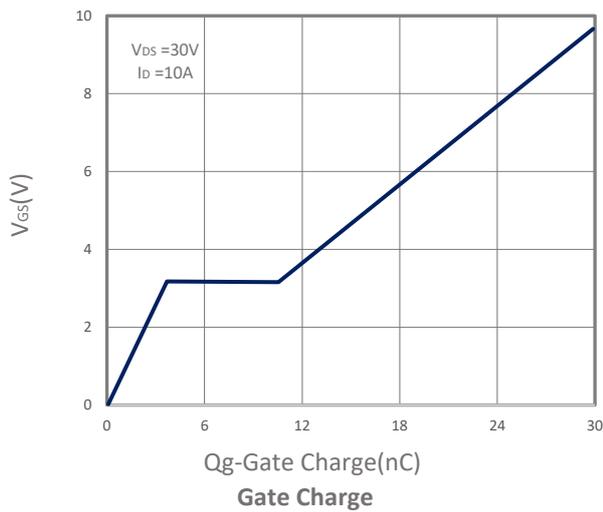
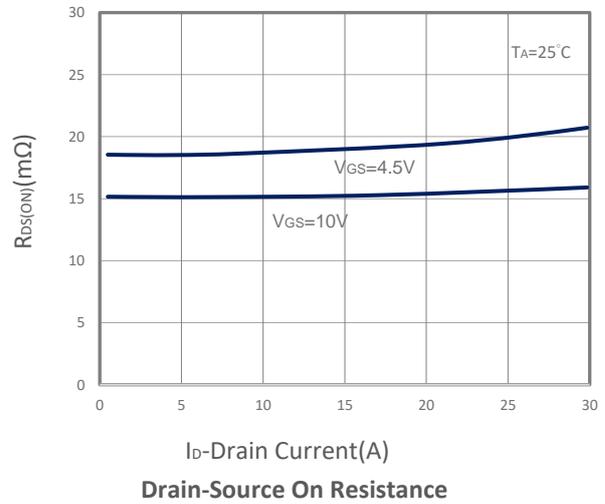
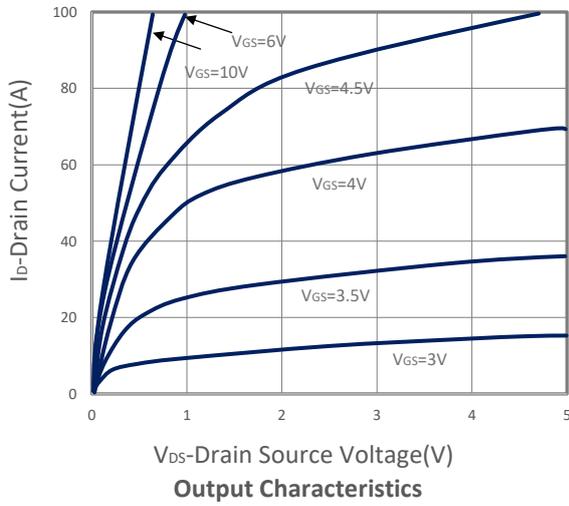
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.7	2.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=48V, V_{GS}=0V, T_J=75^\circ\text{C}$			10	
$R_{DS(ON)}$	Drain-source On-Resistance ^E	$V_{GS}=10V, I_D=10A$ $V_{GS}=4.5V, I_D=8A$		15 18	18 23	m Ω
G_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=10A$		12		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage ^E	$I_S=1A, V_{GS}=0V$		0.7	1	V
I_S	Continuous Source Current				30	A
t_{rr}	Reverse Recovery Time	$I_S=10A, di/dt=100A/\mu s$		16		ns
Q_{rr}	Reverse Recovery Charge			28		nC
Dynamic and Switching Parameters						
Q_g	Total Gate Charge (10V)	$V_{DS}=30V, V_{GS}=10V, I_D=10A$		30.8	41.5	nC
Q_g	Total Gate Charge (4.5V)			15	20.3	
Q_{gs}	Gate-Source Charge			3.8	5.1	
Q_{gd}	Gate-Drain Charge			7	9.5	
C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$		1710		pF
C_{oss}	Output Capacitance			138		
C_{rss}	Reverse Transfer Capacitance			98		
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		2.1		Ω
$t_{d(on)}$	Turn-On Time ^E	$V_{DD}=30V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$		7.8	15	nS
t_r				18	34	
$t_{d(off)}$	Turn-Off Time ^E			28	53	
T_f				9.2	17	

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

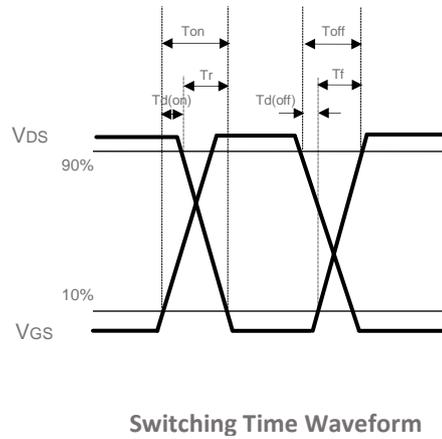
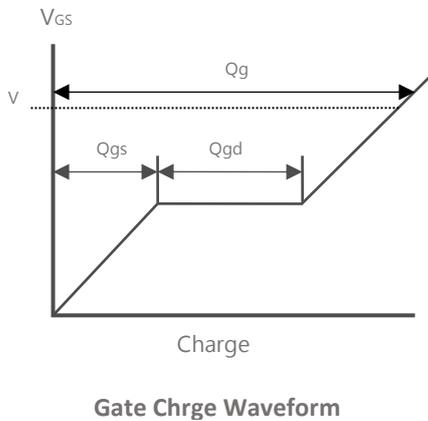
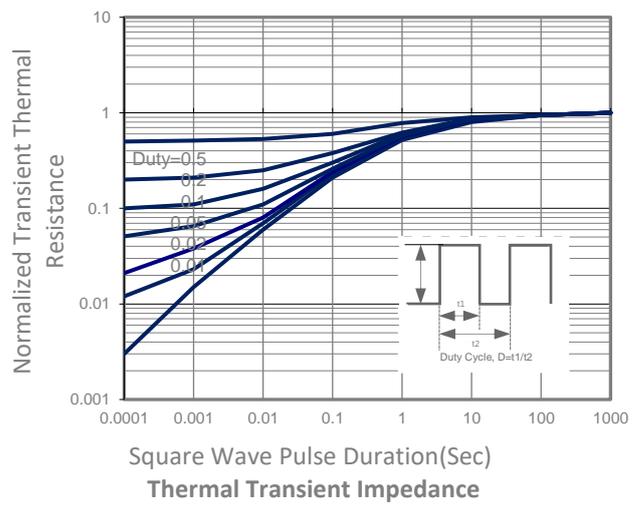
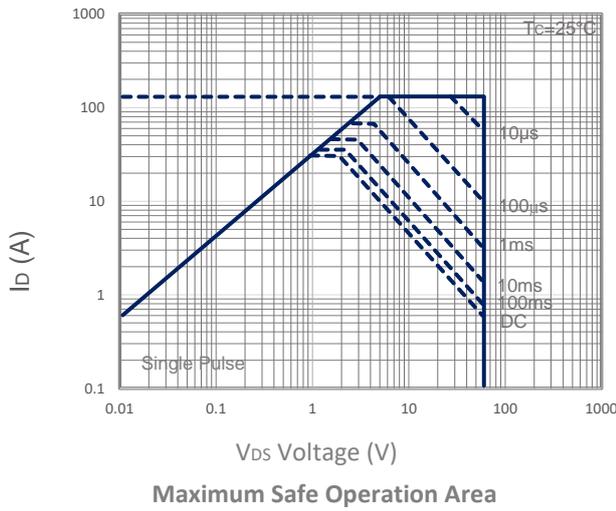
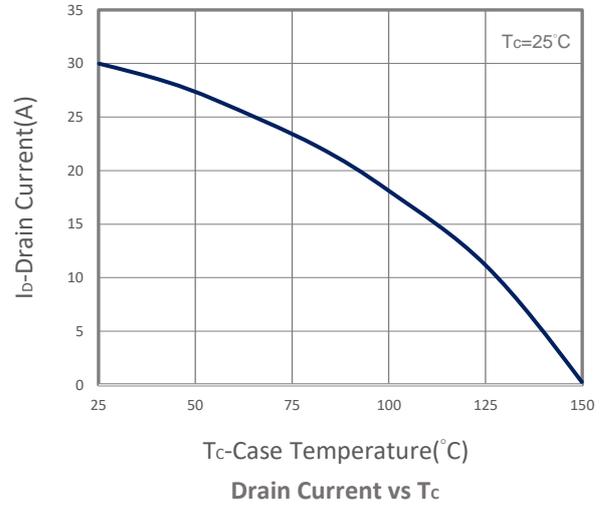
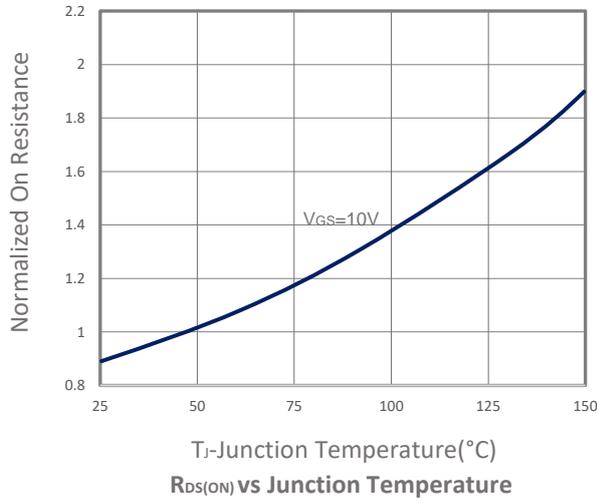
- A. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ\text{C}$.
- B. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_A=25^\circ\text{C}$).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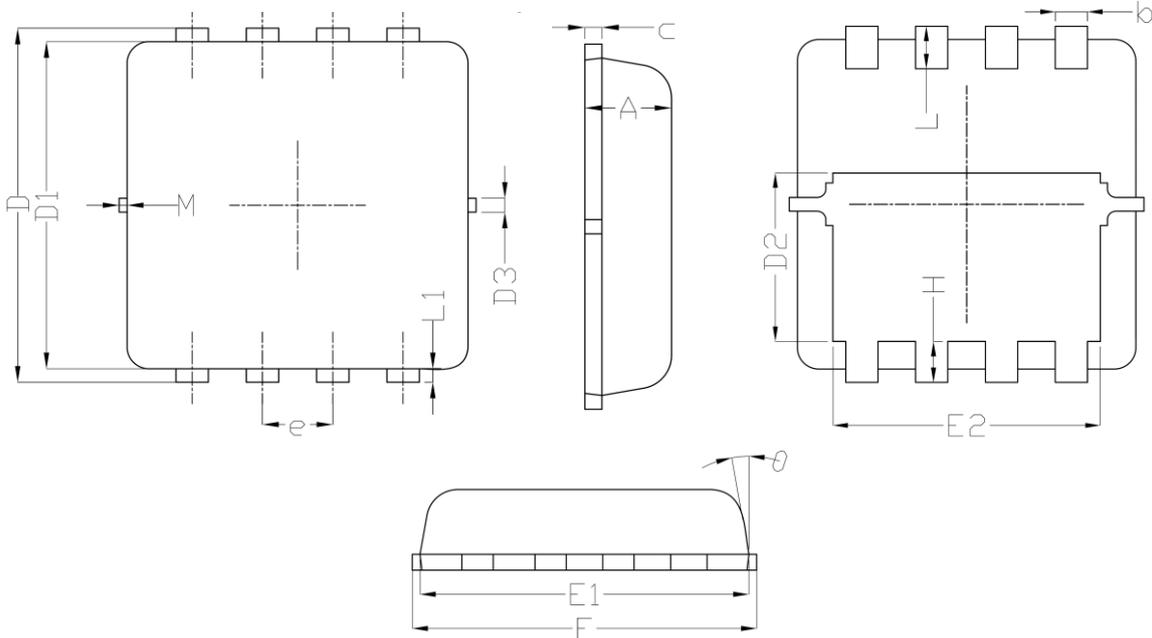
TYPICAL CHARACTERISTICS



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°

Recommended Land Pattern

