

Single P-Channel MOSFET

DESCRIPTION

SMC4237NA is the P-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 4237 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

$V_{DS} = -20V$, $I_D = -34A$

- $R_{DS(ON)} = 12m\Omega(Typ.)@V_{GS} = -10V$
- $R_{DS(ON)} = 14m\Omega(Typ.)@V_{GS} = -4.5V$
- $R_{DS(ON)} = 18m\Omega(Typ.)@V_{GS} = -2.5V$
- $R_{DS(ON)} = 23m\Omega(Typ.)@V_{GS} = -1.8V$

APPLICATIONS

- ◆ Portable Equipment
- ◆ Power Management
- ◆ Battery Powered Systems



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

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ($V_{GS} = -4.5V$)	$T_C = 25^\circ C$	-34
		$T_C = 100^\circ C$	-21.5
I_{DM}	Pulsed Drain Current ^A	-136	A
I_D	Continuous Drain Current ($V_{GS} = -4.5V$)	$T_A = 25^\circ C$	-12.8
		$T_A = 70^\circ C$	-10.2
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	4.2
		$T_A = 70^\circ C$	2.7
I_{AS}	Avalanche Current ^A	-25	A
E_{AS}	Single Pulse Avalanche energy $L = 0.1mH$ ^{AF}	31	mJ
P_D	Power Dissipation ^C	$T_C = 25^\circ C$	29
		$T_C = 100^\circ C$	11.6
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	$t \leq 10s$	30	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	60	
$R_{\theta JC}$	Thermal Resistance Junction to Case		4.3	

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

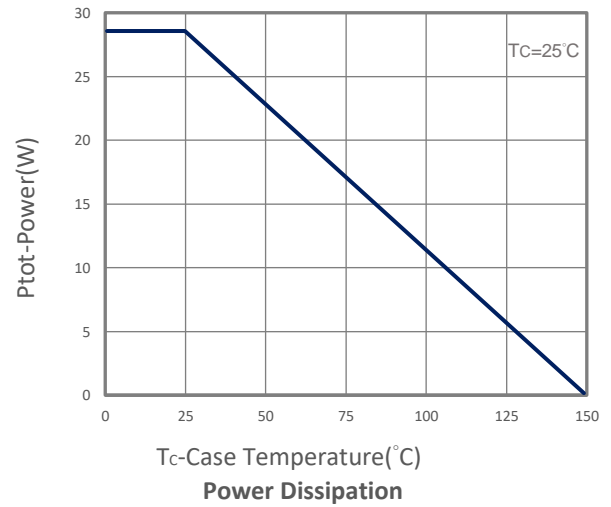
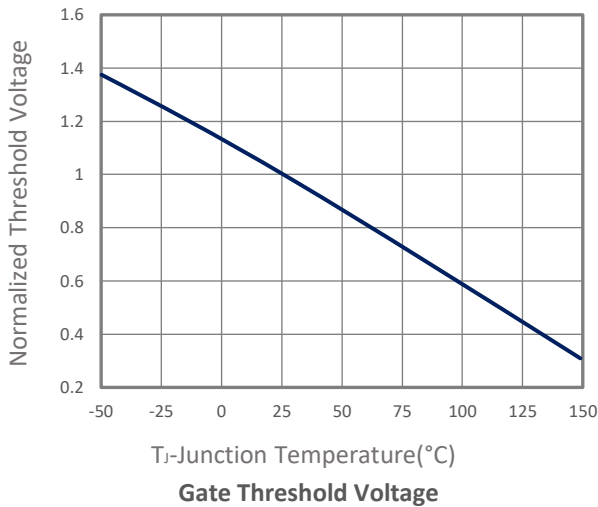
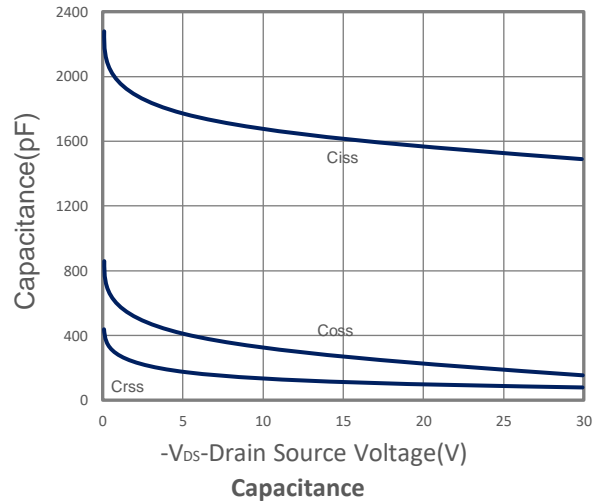
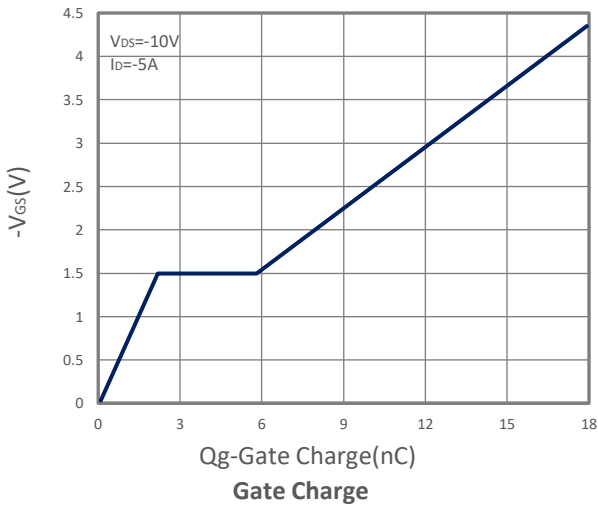
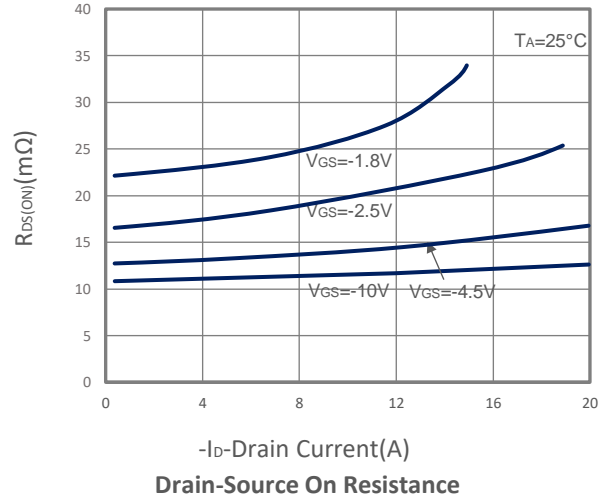
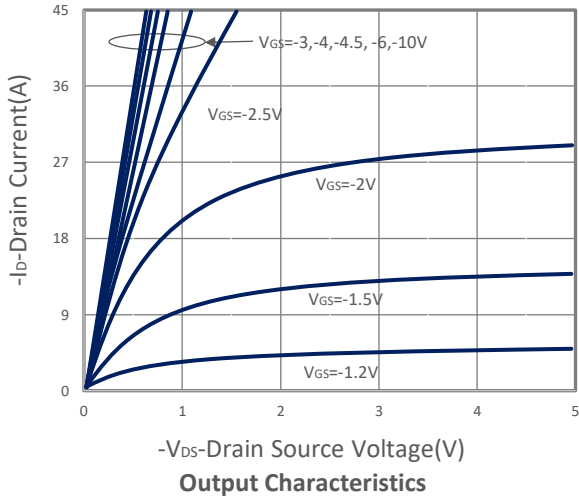
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250 μ A	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250 μ A	-0.4	-0.6	-1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 12V			\pm 100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V, T _J =25 $^\circ$ C			-1	μ A
		V _{DS} =-16V, V _{GS} =0V, T _J =75 $^\circ$ C			-10	
R _{DS(ON)}	Drain-source On-Resistance ^E	V _{GS} =-10V, I _D =-12.8A		12	15	m Ω
		V _{GS} =-4.5V, I _D =-8A		14	17	
		V _{GS} =-2.5V, I _D =-5A		18	22	
		V _{GS} =-1.8V, I _D =-3A		23	28	
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-10A		33		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^E	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Current				-15	A
t _{rr}	Reverse Recovery Time	I _S =-10A, dI/dt=100A/ μ s		16.8		ns
Q _{rr}	Reverse Recovery Charge			8		nC
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-5A		39	54	nC
Q _g	Total Gate Charge (4.5V)			19	26.6	
Q _{gs}	Gate-Source Charge			2.1	2.9	
Q _{gd}	Gate-Drain Charge			3.8	5.3	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz		1680		pF
C _{oss}	Output Capacitance			228		
C _{rss}	Reverse Transfer Capacitance			115		
t _{d(on)}	Turn-On Time ^E	V _{DD} =-10V, V _{GEN} =-4.5V R _G =10 Ω , I _D =-1A		10	19	nS
t _r				38	72	
t _{d(off)}	Turn-Off Time ^E			75	143	
t _f				25	48	

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

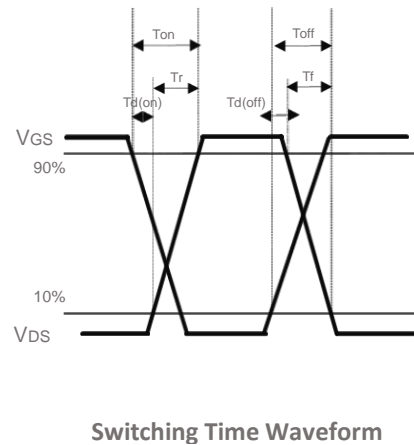
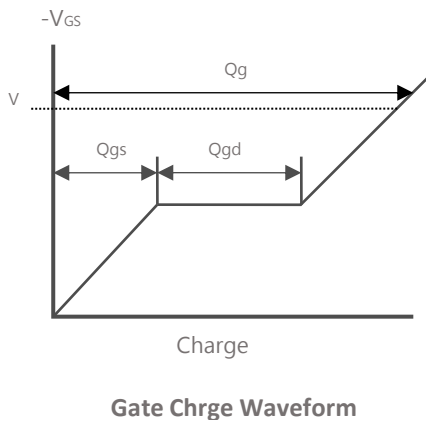
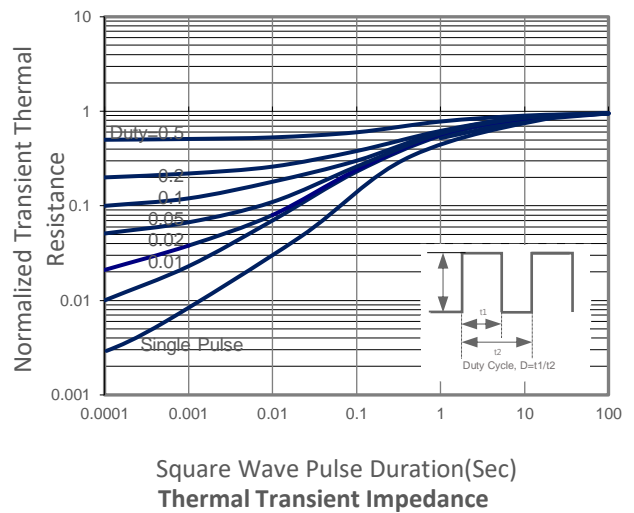
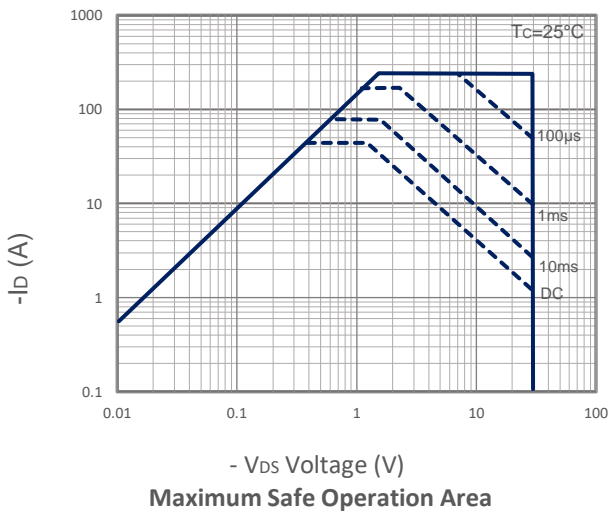
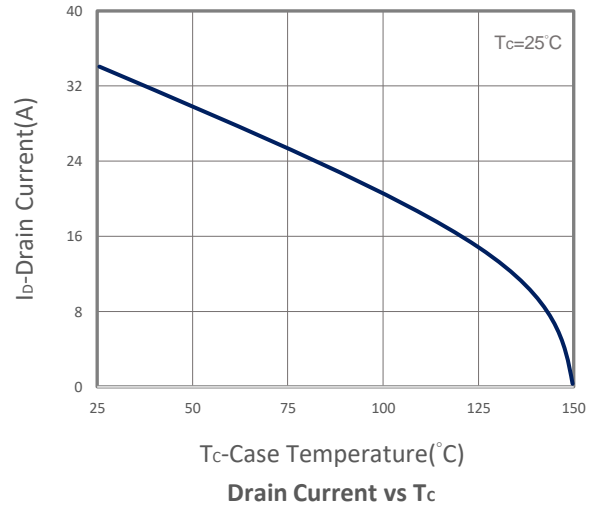
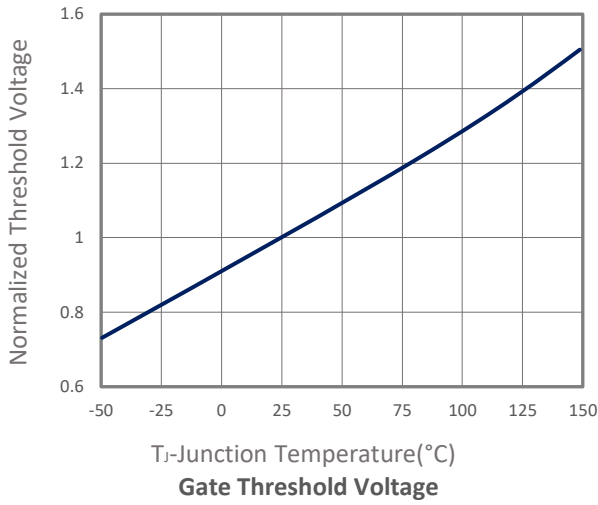
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^\circ$ C.
- Measure the value in a still air environment at T_A=25 $^\circ$ C, using an installation mounted on a 1 in2 FR-4 board, maximum junction temperature T_{J(MAX)}=150 $^\circ$ C.
- Using junction-to-case thermal resistance, dissipation limit in the case of additional heat.
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.
- The pulse test width is \leq 300 μ s and the duty cycle \leq 2%.
- The EAS data shows Maximum, tested and pulse width limited by maximum.

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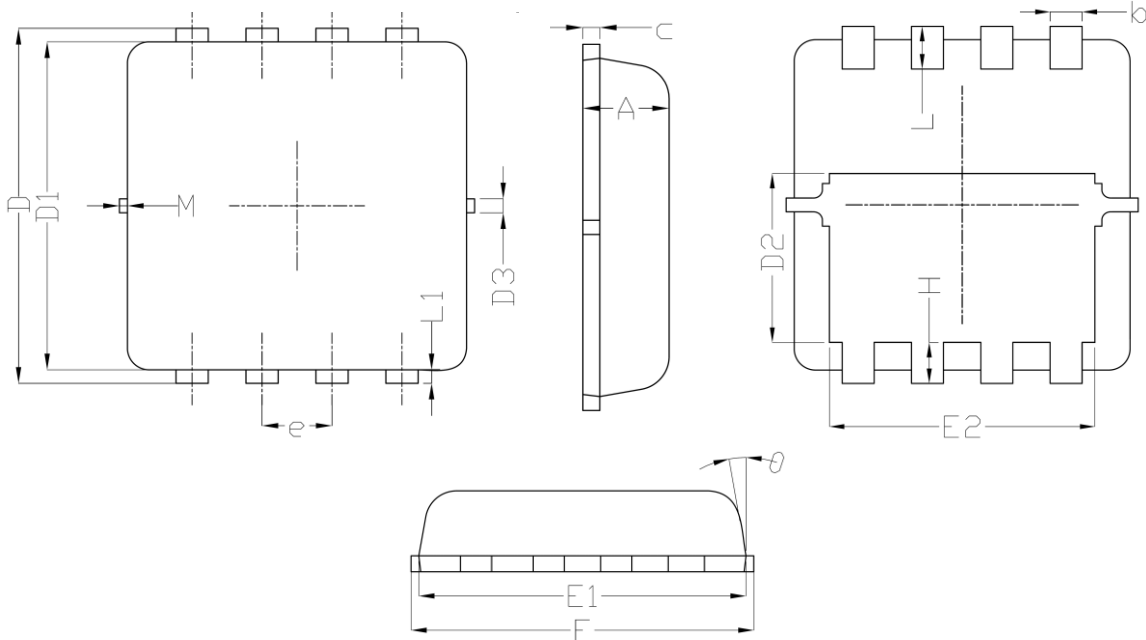
TYPICAL CHARACTERISTICS



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

