

Single N-Channel MOSFET

DESCRIPTION

SMC4732 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. These devices are well suited for high efficiency fast switching applications.

PART NUMBER INFORMATION

SMC 4732 PA - TR G
 a b c d e

a : Company name.
 b : Product Serial number.
 c : Package code PA:DFN5X6A-8
 d : Handling code TR:Tape&Reel
 e : Green produce code G:RoHS Compliant

FEATURES

$V_{DS} = 30V$, $I_D = 50A$

$R_{DS(ON)} = 2.9m\Omega(Typ.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 4.3m\Omega(Typ.) @ V_{GS} = 4.5V$

- ◆ Low Gate Charge
- ◆ 100% UIS and Rg tested
- ◆ High power and current handling capability

APPLICATIONS

- ◆ POL Applications
- ◆ DC/DC Converters



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current *	$T_C = 25^\circ C$	50
		$T_C = 100^\circ C$	50
I_{DM}	Pulsed Drain Current ^A	150	A
I_D	Continuous Drain Current	$T_A = 25^\circ C$	29
		$T_A = 70^\circ C$	23.2
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	5
		$T_A = 70^\circ C$	2
I_{AS}	Avalanche Current ^A	35	A
E_{AS}	Single Pulse Avalanche energy $L = 0.1mH$ ^{AF}	61	mJ
P_D	Power Dissipation ^C	$T_C = 25^\circ C$	41.7
		$T_C = 100^\circ C$	16.7
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 ^B	$t \leq 10s$	25	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BD}	Steady-State	50	
$R_{\theta JC}$	Thermal Resistance Junction to Case		3	

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

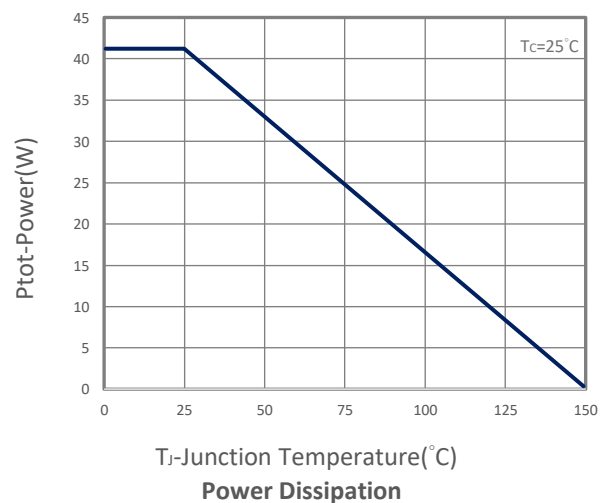
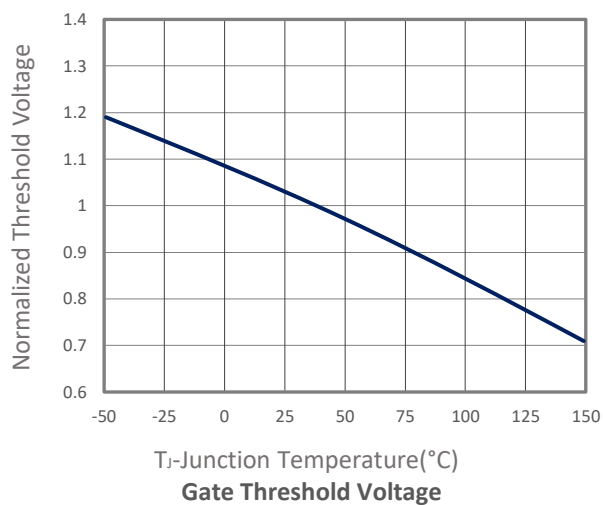
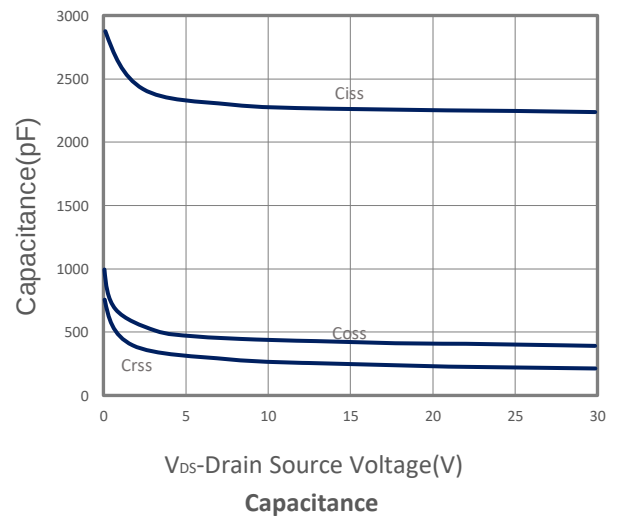
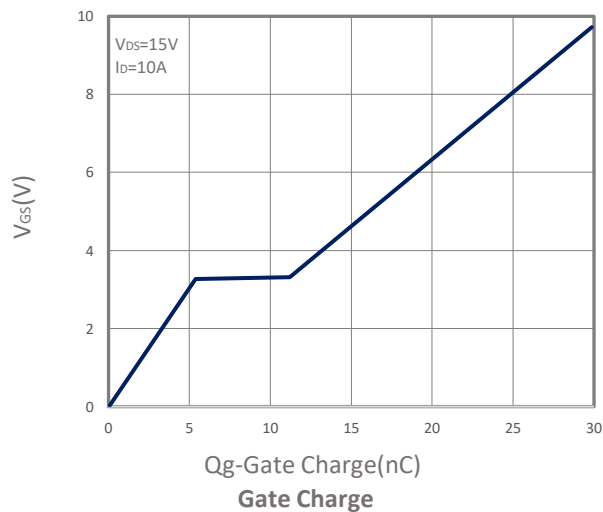
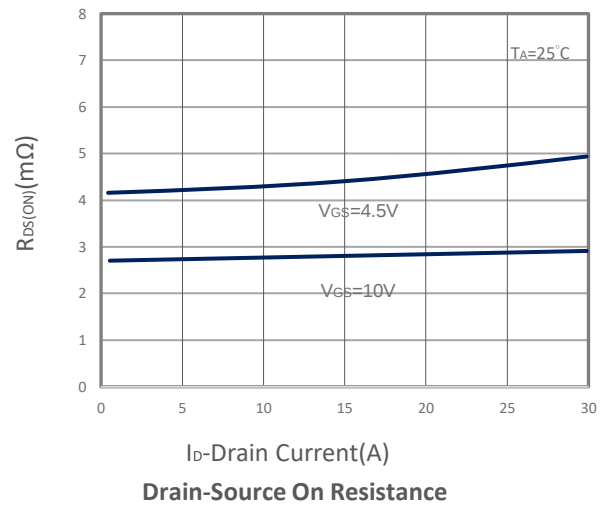
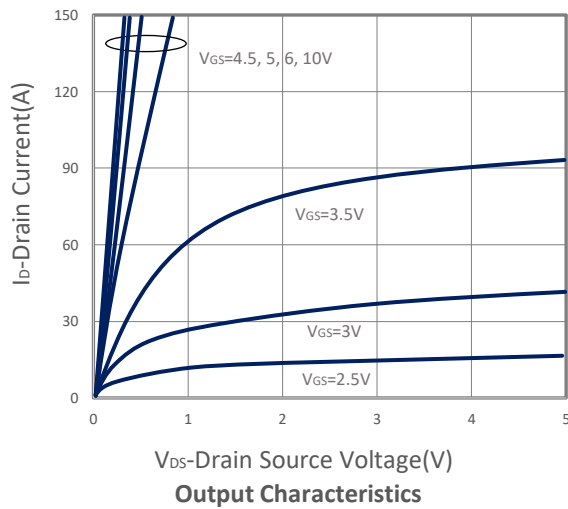
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.6	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero 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 =20A V _{GS} =4.5V, I _D =15A		2.9 4.3	3.8 5.5	mΩ
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =10A		25		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^E	I _S =1A, V _{GS} =0V		0.7	1	V
I _S	Continuous Source Current *				50	A
T _{rr}	Reverse Recovery Time	I _S =20A, dI/dt=100A/μs		14		ns
Q _{rr}	Reverse Recovery Charge			922		nC
Dynamic and Switching Parameters						
Q _g	Total Gate Charge (10V)	V _{DS} =15V, V _{GS} =10V, I _D =20A		51.5	72.1	nC
Q _g	Total Gate Charge (4.5V)			25	35	
Q _{gs}	Gate-Source Charge			6.2	8.7	
Q _{gd}	Gate-Drain Charge			11	15.4	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		2250		pF
C _{oss}	Output Capacitance			290		
C _{rss}	Reverse Transfer Capacitance			185		
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		2		Ω
t _{d(on)}	Turn-On Time ^E	V _{DD} =15V, V _{GEN} =10V R _G =3Ω, I _D =1A		8.5	16	ns
t _r				12	23	
t _{d(off)}	Turn-Off Time ^E			48	91	
t _f				13.2	25	

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

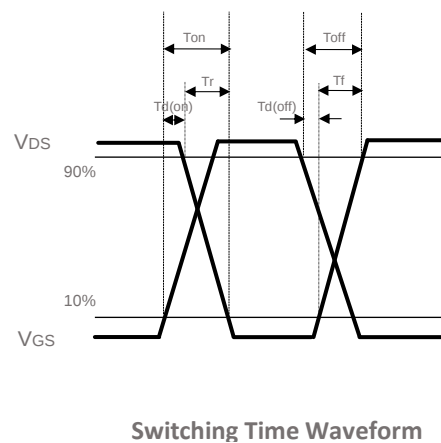
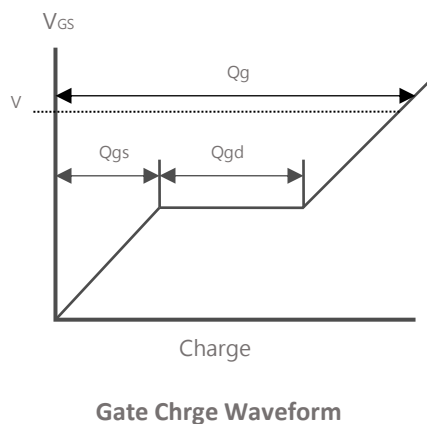
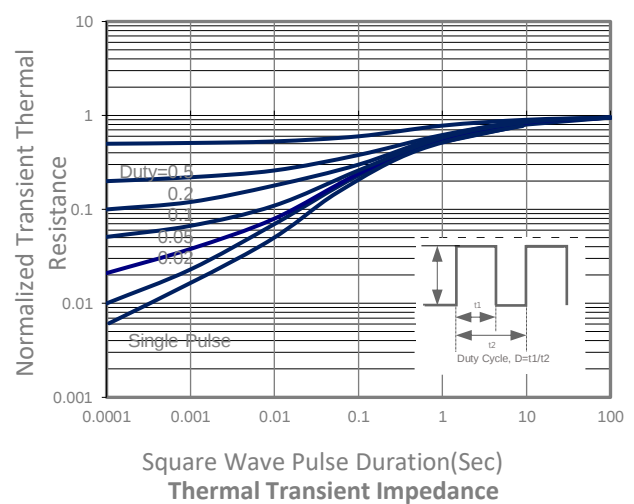
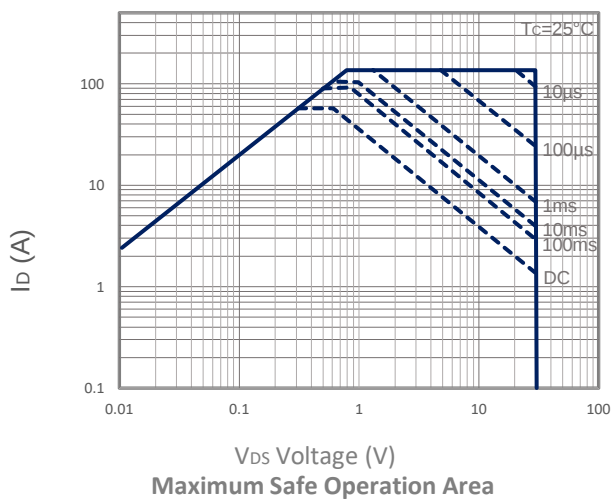
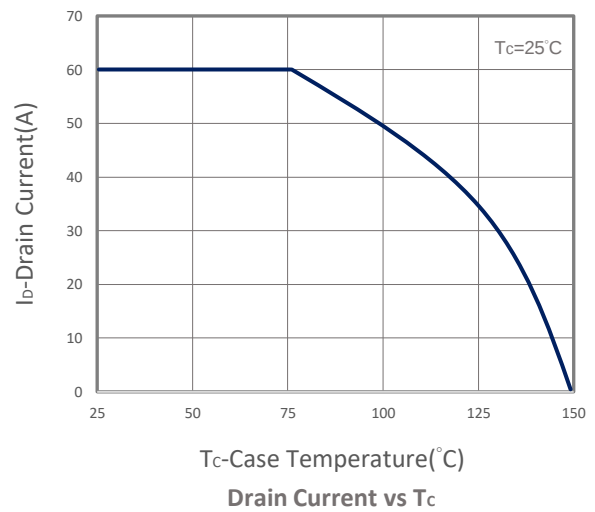
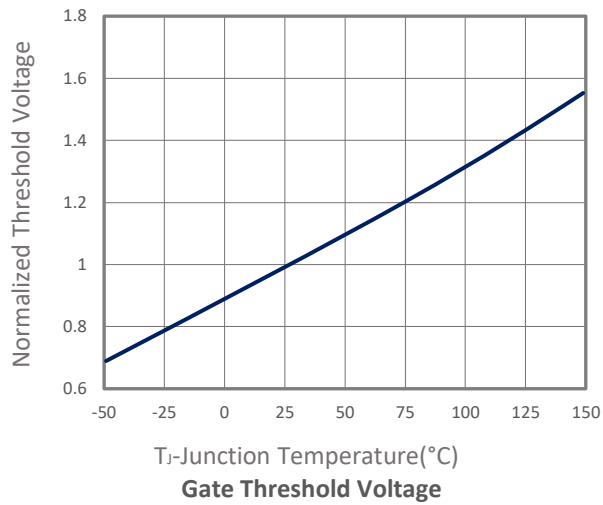
- A. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ\text{C}$.
- B. Measure the value in a still air environment at $T_A=25^\circ\text{C}$, using an installation mounted on a 1 in2 FR-4 board, maximum junction temperature $T_{J(MAX)}=150^\circ\text{C}$.
- C. Using junction-to-case thermal resistance, dissipation limit in the case of additional heat.
- 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 pulse test width is $\leq 300\mu s$ and the duty cycle $\leq 2\%$.
- F. The EAS data shows Maximum, tested and pulse width limited by maximum.
- *. The maximum rating current 60A limited by bond wire.

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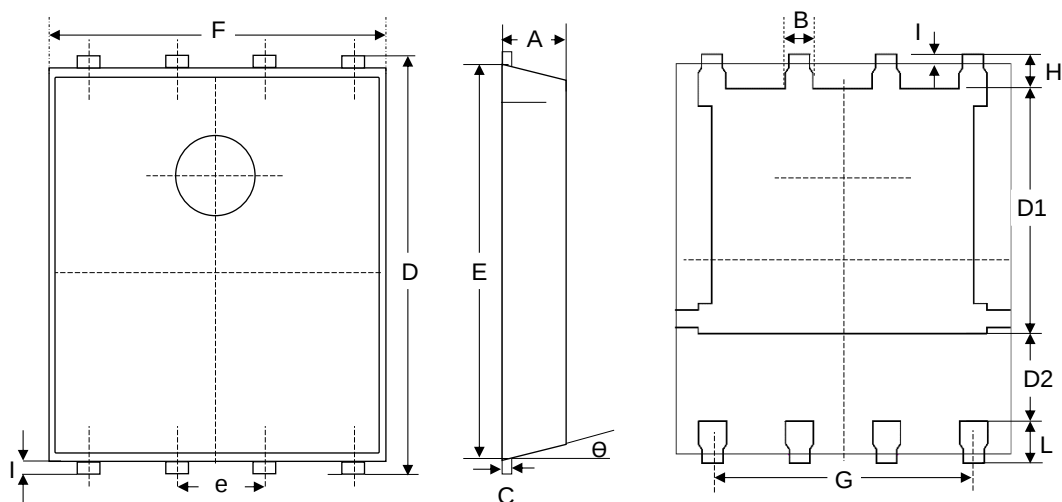
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



DFN5X6A PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
B	0.330	0.510	0.013	0.020
C	0.200	0.300	0.008	0.012
D	5.900	6.100	0.232	0.240
D1	3.380	3.780	0.133	0.149
D2	1.100		0.043	
E	5.700	5.800	0.224	0.228
e	1.270BSC.		1.270BSC.	
F	4.800	5.000	0.189	0.197
G	0.361	0.396	0.014	0.016
H	0.410	0.610	0.016	0.024
I	0.060	0.200	0.002	0.008
L	0.510	0.710	0.020	0.028
θ	0°	12°	0°	12°