

Single P-Channel MOSFET

DESCRIPTION

SMC4733PA 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. These devices are well suited for high efficiency load switching applications.

PART NUMBER INFORMATION

SMC 4733 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

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

$R_{DS(ON)}=6.8m\Omega(Typ.)@V_{GS}=-10V$

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

- ◆ 100% EAS Guaranteed
- ◆ High power and current handling capability

APPLICATIONS

- ◆ Load Switch
- ◆ Power Applications
- ◆ Portable 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	± 25	V
I_D	Continuous Drain Current	$T_C=25^{\circ}C$	-60
		$T_C=100^{\circ}C$	-38
I_{DM}	Pulsed Drain Current ^B	-240	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	-21.4
		$T_A=70^{\circ}C$	-17.1
P_D	Power Dissipation ^A	$T_A=25^{\circ}C$	6.3
		$T_A=70^{\circ}C$	4
I_{AS}	Single Pulse Avalanche Current ^B	-40	A
EAS	Single Pulse Avalanche energy $L=0.1mH$ ^B	80	mJ
P_D	Power Dissipation ^C	$T_C=25^{\circ}C$	46
		$T_C=100^{\circ}C$	18.5
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 ^A	$t \leq 10s$	20	$^{\circ}C/W$
	Thermal Resistance Junction to Ambient ^{AC}	Steady-State	50	
$R_{\theta JC}$	Thermal Resistance Junction to Case		2.5	

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

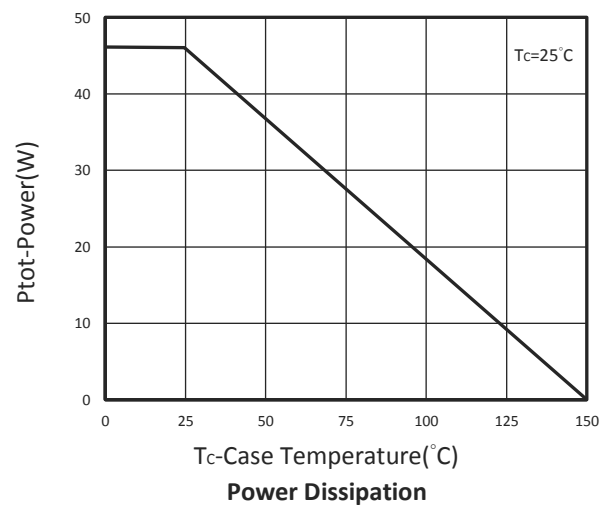
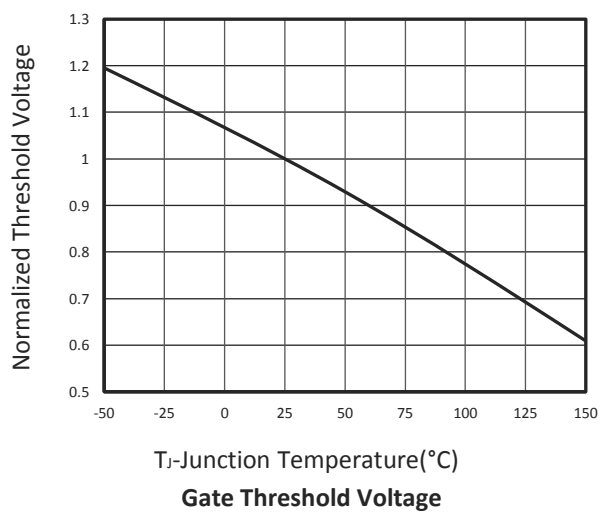
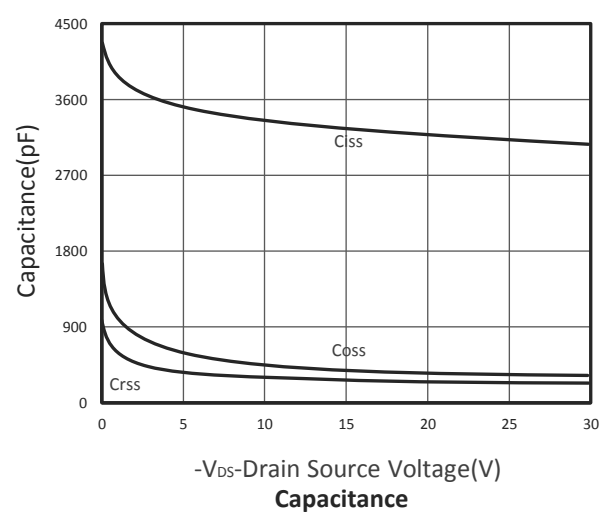
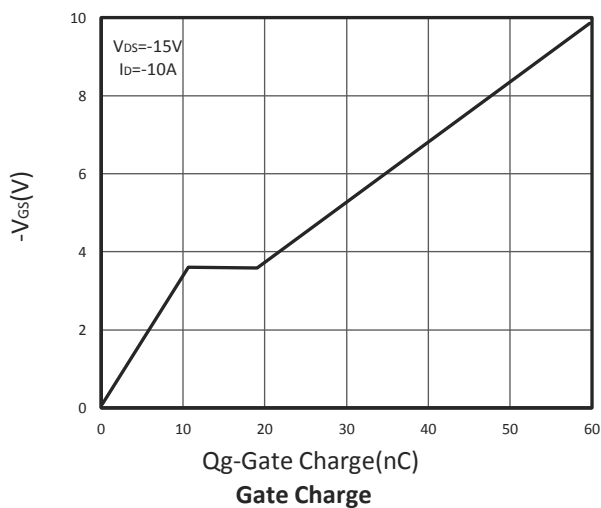
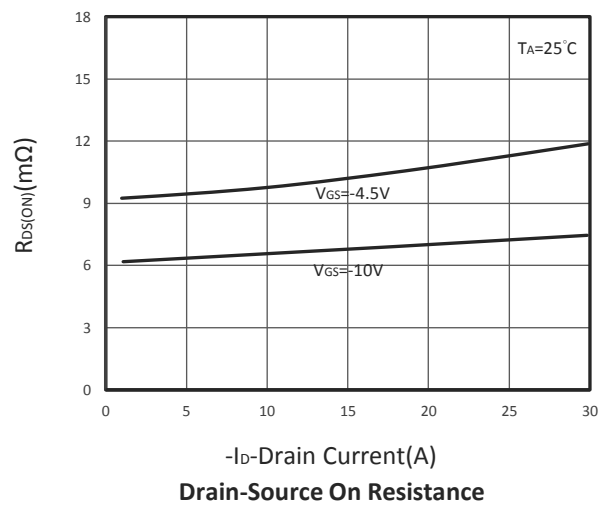
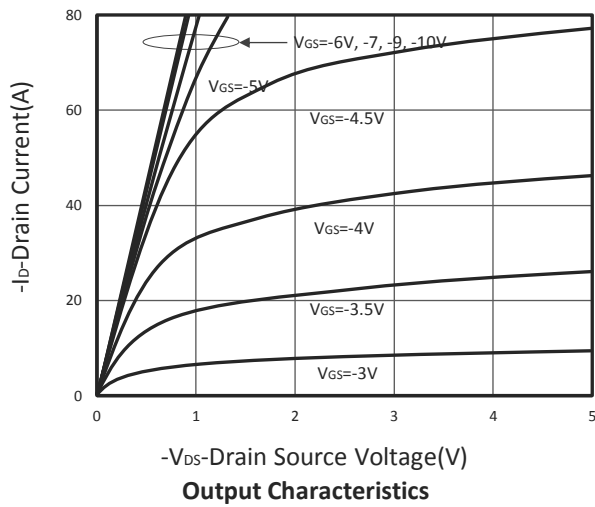
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.6	-2.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 25V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$			-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=75^{\circ}\text{C}$			-10	
$R_{DS(ON)}$	Drain-source On-Resistance [Ⓓ]	$V_{GS}=-10V, I_D=-20A$ $V_{GS}=-4.5V, I_D=-12A$		6.8 10	8.5 13	$m\Omega$
G_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-10A$		14.8		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [Ⓓ]	$I_S=-1A, V_{GS}=0V$			-1	V
I_S	Diode Continuous Forward Current				-60	A
t_{rr}	Reverse Recovery Time	$I_S=-10A, dI/dt=100A/\mu s$		21		ns
Q_{rr}	Reverse Recovery Charge			15.5		nC
Dynamic and Switching Parameters[Ⓔ]						
Q_g	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V$ $I_D=-10A$		61	85	nC
Q_g	Total Gate Charge (4.5V)			30	42	
Q_{gs}	Gate-Source Charge			10.6	14.3	
Q_{gd}	Gate-Drain Charge			9	12.6	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$		3230		pF
C_{oss}	Output Capacitance			369		
C_{rss}	Reverse Transfer Capacitance			265		
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$		8.3		Ω
$t_{d(on)}$	Turn-On Time	$V_{DD}=-15V, V_{GEN}=-10V$ $R_G=3\Omega, I_D=-1A$		24	46	nS
t_r				11.6	22	
$t_{d(off)}$	Turn-Off Time			78.8	150	
t_f				33.8	63	

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

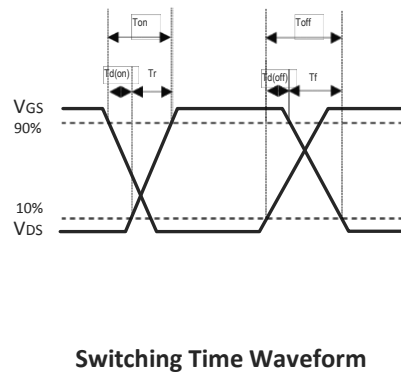
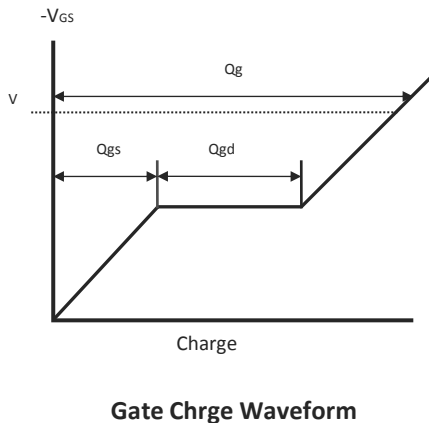
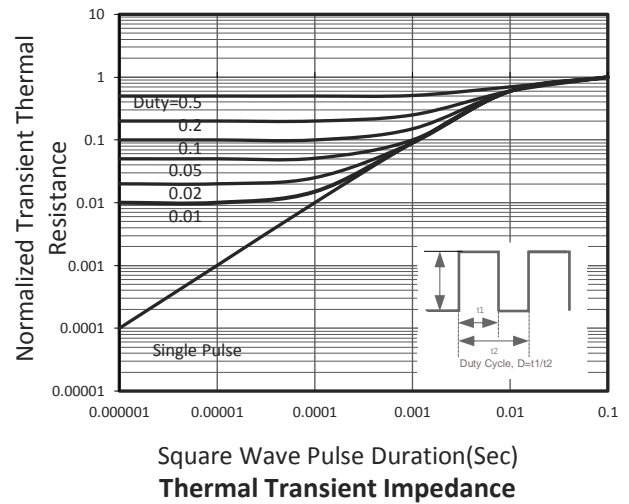
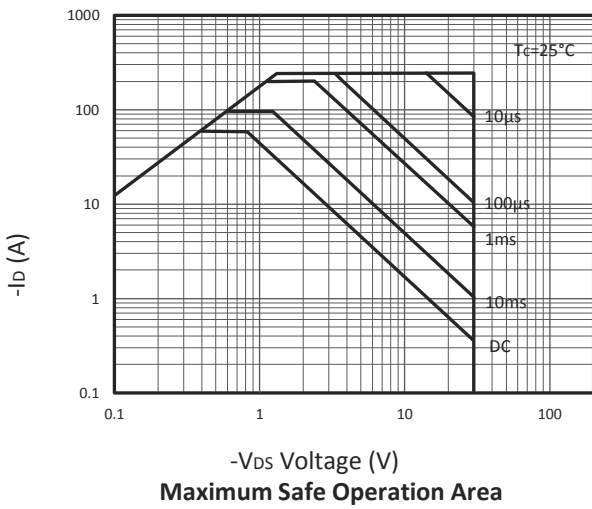
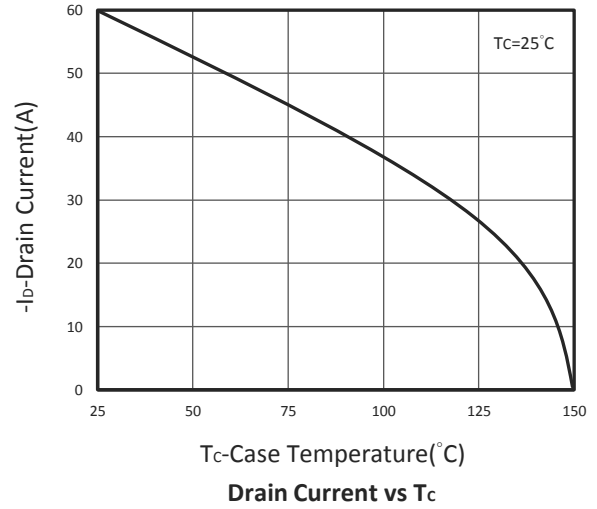
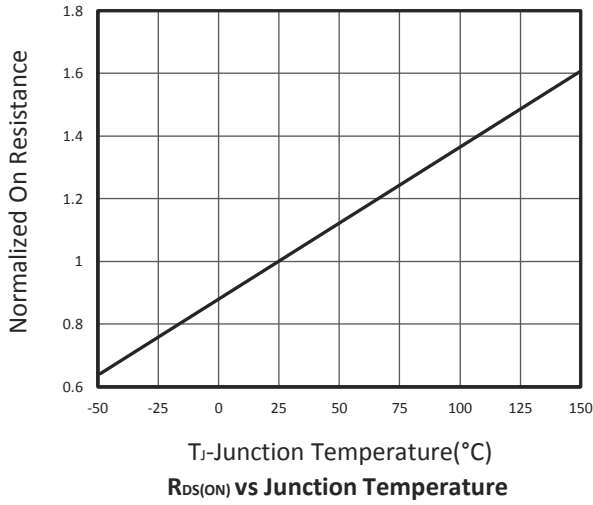
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^{\circ}\text{C}$ (initial temperature $T_J=25^{\circ}\text{C}$).
- C. Using $\leq 10\text{s}$ junction-to-ambient thermal resistance is base on $T_{J(MAX)}=150^{\circ}\text{C}$.
- D. Pulse test width $\leq 300\mu\text{s}$ and duty cycle $\leq 2\%$.
- E. Guaranteed by design, not subject to production testing.

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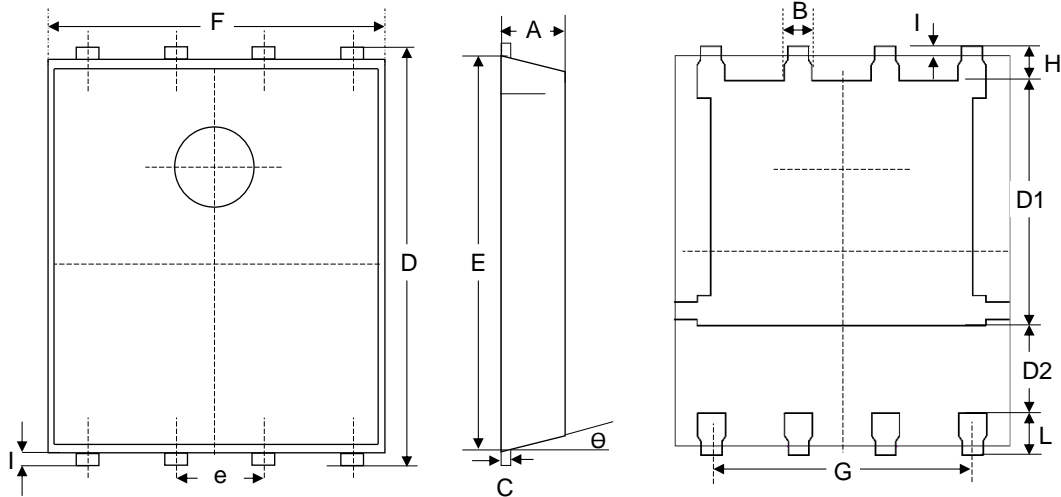
TYPICAL CHARACTERISTICS



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°

Recommended Land Pattern

