

Single N-Channel MOSFET

DESCRIPTION

SMC4730PA is the N-Channel enhancement mode power field effect transistors, provide superior fast switching performance and withstand high energy pulse in the avalanche and commutation mode.

PART NUMBER INFORMATION

SMC 4730 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

$V_{DS}=30V, I_D=100A$

$R_{DS(ON)}=1.8m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)}=2.3m\Omega(Typ.)@V_{GS}=4.5V$

- ◆ 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_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current [*]	$T_C=25^{\circ}C$	100
		$T_C=100^{\circ}C$	89
I_{DM}	Pulsed Drain Current ^B	280	A
I_D	Continuous Drain Current	$T_A=25^{\circ}C$	27
		$T_A=70^{\circ}C$	21
P_D	Power Dissipation ^A	$T_A=25^{\circ}C$	2.5
		$T_A=70^{\circ}C$	1.6
I_{AS}	Single Pulse Avalanche Current ^B	60	A
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^{BE}	180	mJ
P_D	Power Dissipation ^C	$T_C=25^{\circ}C$	69
		$T_C=100^{\circ}C$	28
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		20	$^{\circ}C/W$
	Thermal Resistance Junction to Ambient ^{AC}		55	
$R_{\theta JC}$	Thermal Resistance Junction to Case		1.8	

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

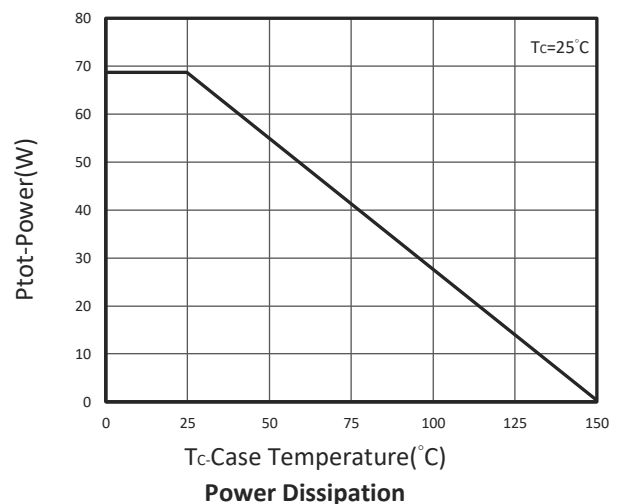
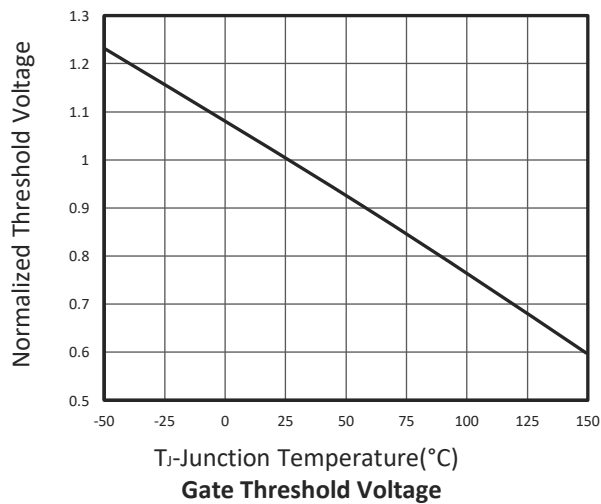
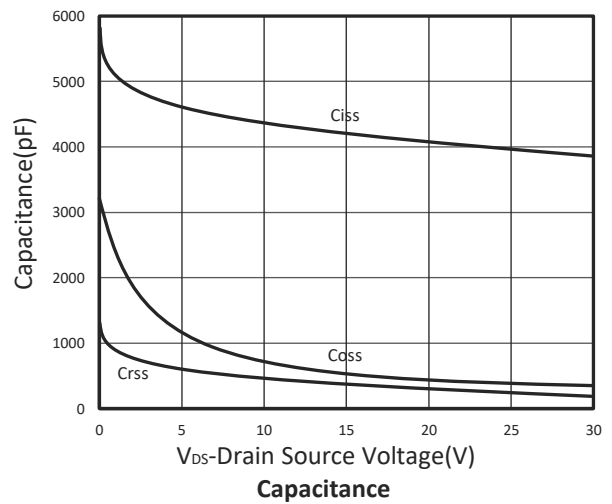
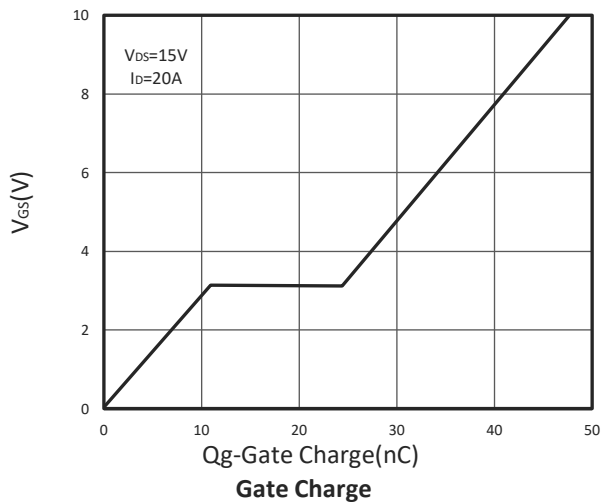
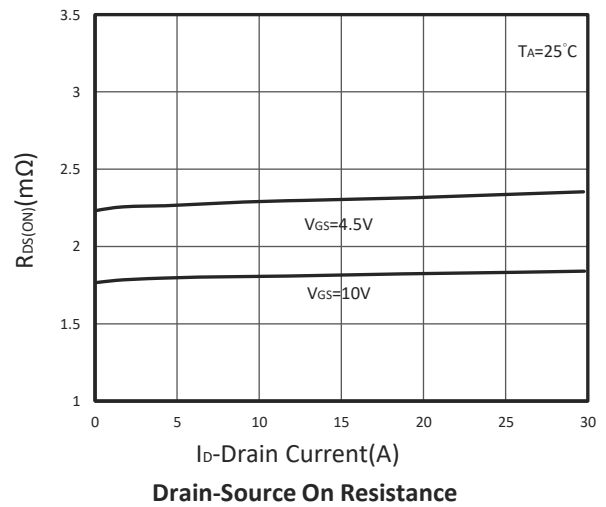
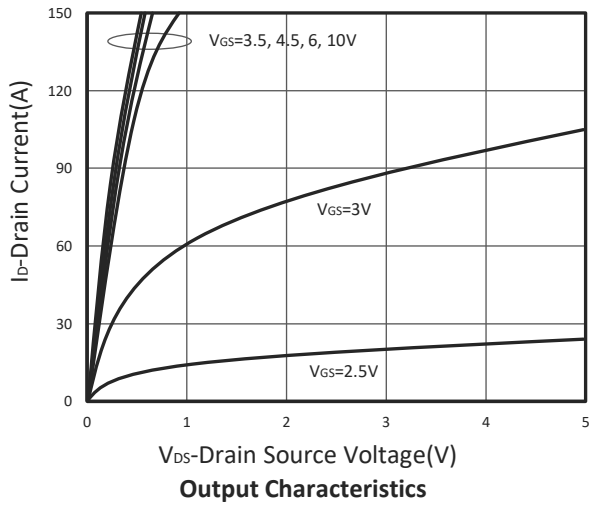
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	2.5	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=24V, V_{GS}=0V, T_J=75^\circ\text{C}$			10	
$R_{DS(ON)}$	Drain-source On-Resistance ^D	$V_{GS}=10V, I_D=25A$ $V_{GS}=4.5V, I_D=20A$		1.8 2.3	2.2 3	$m\Omega$
G_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=20A$		85		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage ^D	$I_S=1A, V_{GS}=0V$			1	V
I_S	Diode Continuous Forward Current				100	A
T_{rr}	Reverse Recovery Time	$I_S=20A, di/dt=100A/\mu s$		25		ns
Q_{rr}	Reverse Recovery Charge			52		nC
Dynamic and Switching Parameters^F						
Q_g	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V, I_D=20A$		47.1	63.6	nC
Q_g	Total Gate Charge (4.5V)			22	30.8	
Q_{gs}	Gate-Source Charge			11	15.4	
Q_{gd}	Gate-Drain Charge			12	17	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$		4250		pF
C_{oss}	Output Capacitance			680		
C_{rss}	Reverse Transfer Capacitance			330		
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.6		Ω
$t_{d(on)}$	Turn-On Time	$V_{DD}=15V, V_{GS}=10V, R_G=3.3\Omega$ $I_D=20A$		15		ns
t_r				9		
$t_{d(off)}$	Turn-Off Time			42		
t_f				13		

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

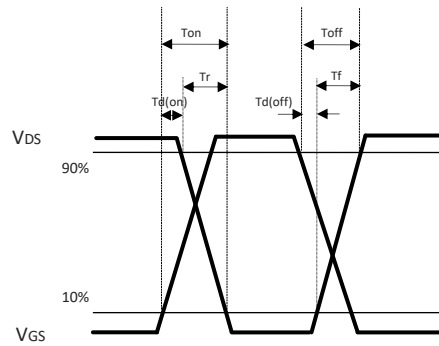
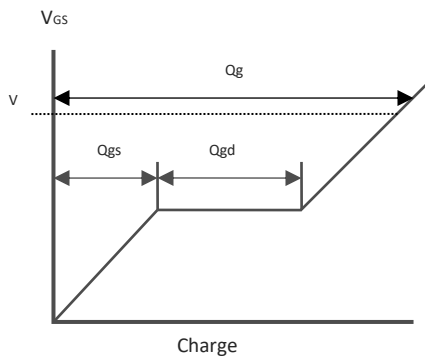
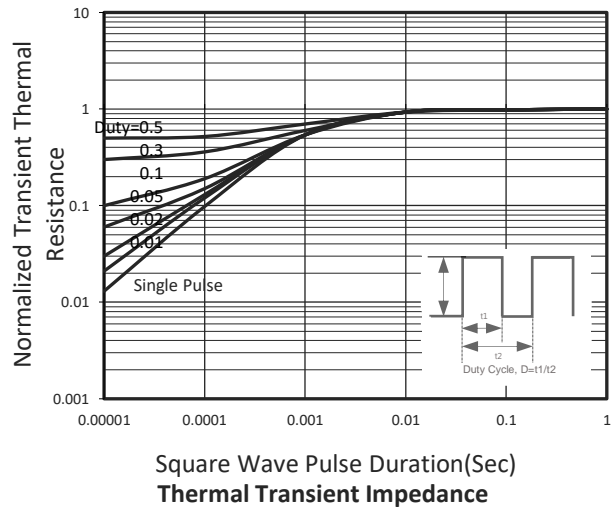
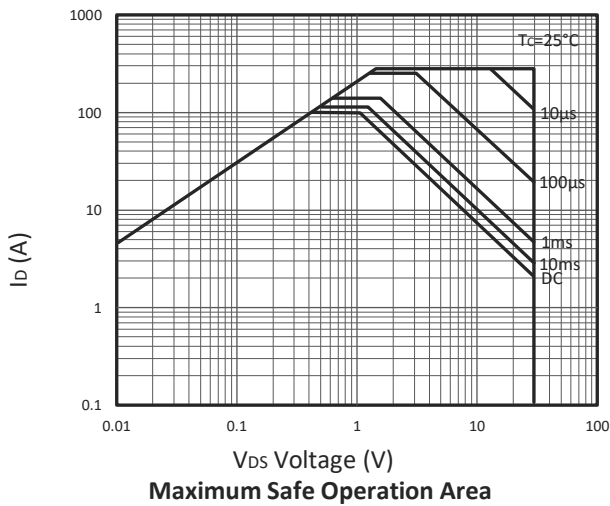
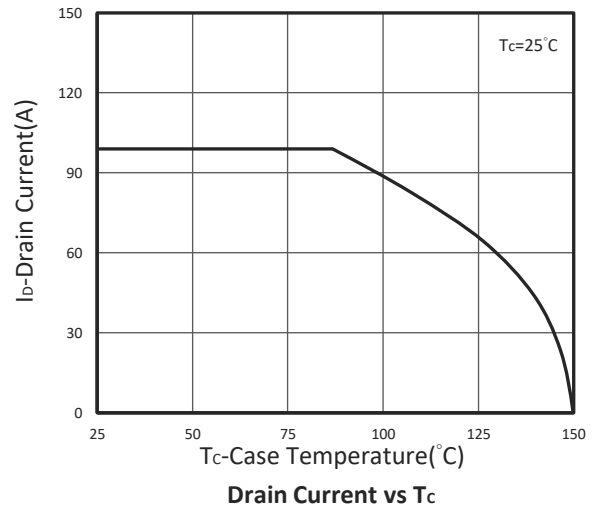
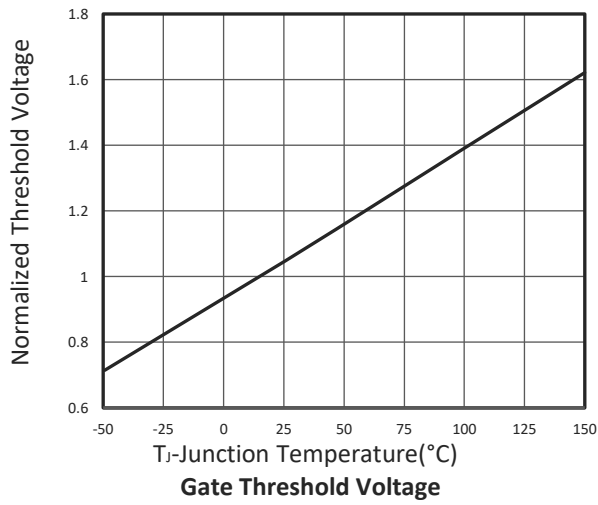
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}=150^\circ\text{C}$ (initial temperature $T_J=25^\circ\text{C}$).
- C. Using $\leq 10s$ junction-to-ambient thermal resistance is base on $T_{J(MAX)}=150^\circ\text{C}$.
- D. Pulse test width $\leq 300\mu s$ and duty cycle $\leq 2\%$.
- E. The EAS data shows maximum, The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=60A$.
- F. Guaranteed by design, not subject to production testing.
- *. The maximum rating current limited by package.

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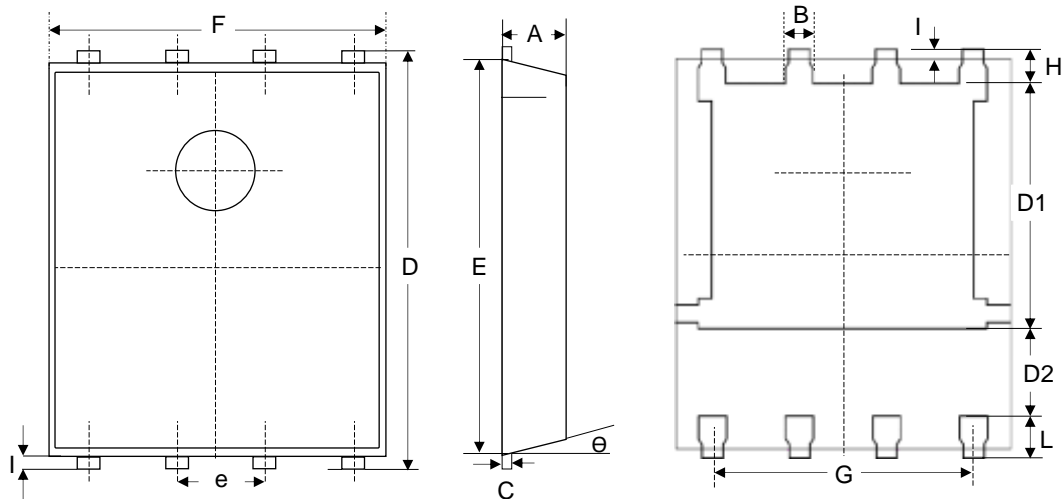
TYPICAL CHARACTERISTICS



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°