SemTron Microtech Corporation

SMC4734PA

Single N-Channel MOSFET

DESCRIPTION

SMC4734 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 4734 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

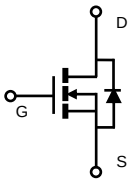
$R_{DS(ON)}$=4.5mΩ(Typ.)@V_{GS}=10V
$R_{DS(ON)}$=5.6mΩ(Typ.)@V_{GS}=4.5V

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

APPLICATIONS

- Wireless Charging
- DC/DC Converters

DFN5X6A-8



ABSOLUTE MAXIMUM RATINGS (T_A = 25°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°C	60	A
		T_C=100C	38	A
I_{DM}	Pulsed Drain Current [A]		200	A
I_D	Continuous Drain Current	T_A=25°C	21	A
		T_A=70°C	17	A
P_D	Power Dissipation [B]	T_A=25°C	4.2	W
		T_A=70°C	2.7	W
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°C	33	W
		T_C=100°C	13.2	W
T_J	Operation Junction Temperature		-55/150	°C
T_{STG}	Storage Temperature Range		-55/150	°C

THERMAL RESISTANCE

Symbol	Parameter		Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient [B]	t≦10s		30	°C/W
	Thermal Resistance Junction to Ambient [BD]	Steady-State		50	
$R_{\theta JC}$	Thermal Resistance Junction to Case			3.8	

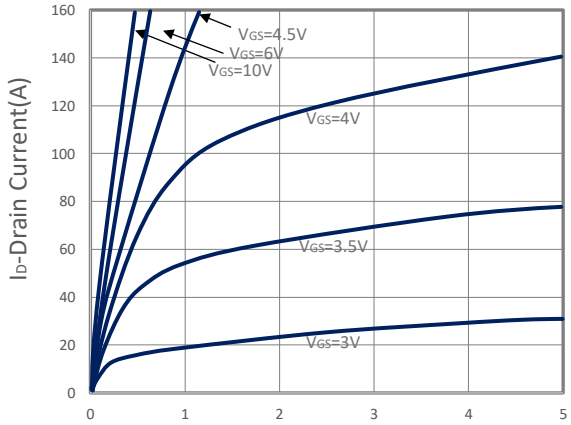
ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise noted)

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=21A V_{GS}=4.5V, I_D=15A		4.5 5.6	6 7	mΩ
G_{fs}	Forward Transconductance	V_{DS}=10V,I_D =10A		60		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [E]	I_S=1A, V_{GS}=0V		0.7	1.0	V
I_S	Continuous Source Current				30	A
t_{rr}	Reverse Recovery Time	I_S=10A, dI/dt=100A/μs		22		ns
Q_{rr}	Reverse Recovery Charge			14		nC
Dynamic and Switching Parameters						
Q_g	Total Gate Charge (10V)	V_{DS}=15V, V_{GS}=10V, I_D=10A		24.7	33.4	nC
Q_g	Total Gate Charge (4.5V)			12	16.8	
Q_{gs}	Gate-Source Charge			2.5	3.5	
Q_{gd}	Gate-Drain Charge			7.4	10.4	
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz		1210		pF
C_{oss}	Output Capacitance			220		
C_{rss}	Reverse Transfer Capacitance			198		
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				16.2	31	
$t_{d(off)}$	Turn-Off Time [E]			30	57	
t_f				10.2	19	

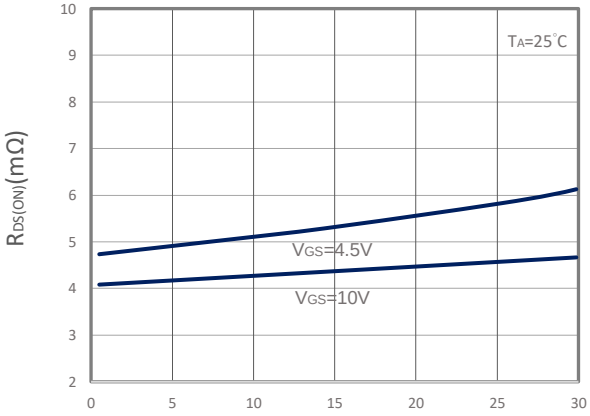
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

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

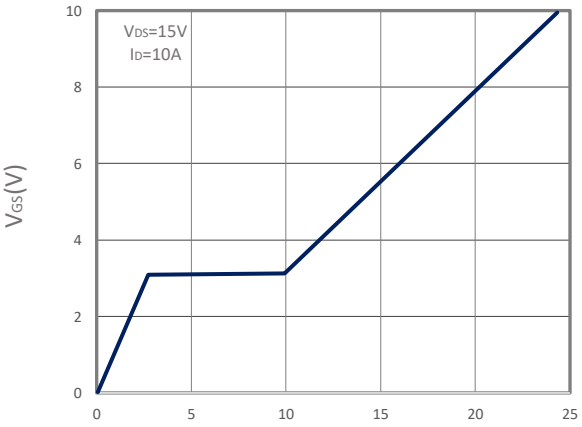
TYPICAL CHARACTERISTICS



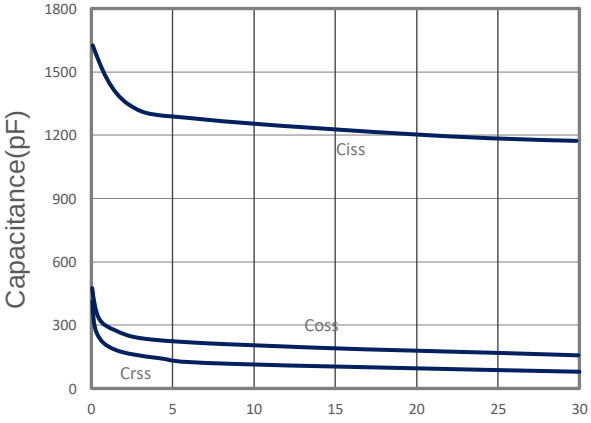
Output Characteristics



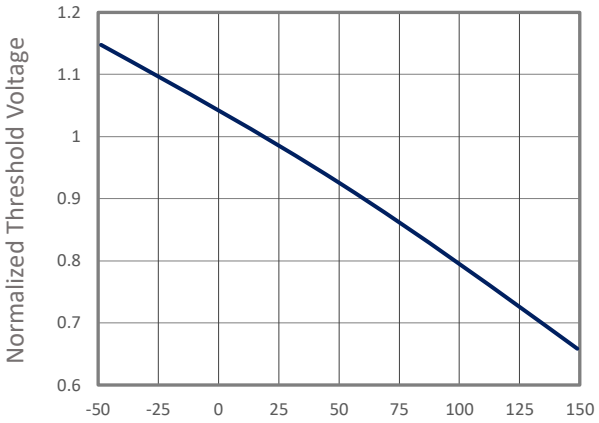
Drain-Source On Resistance



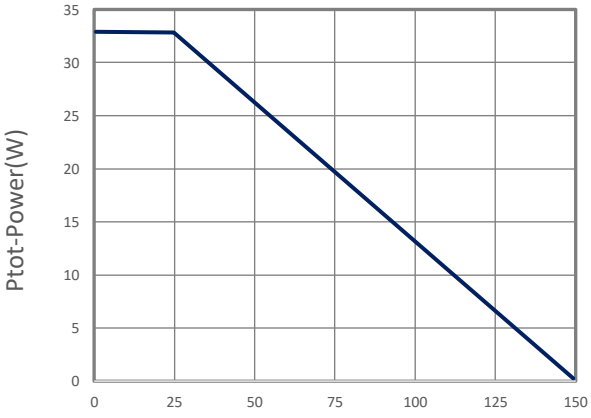
Gate Charge



Capacitance

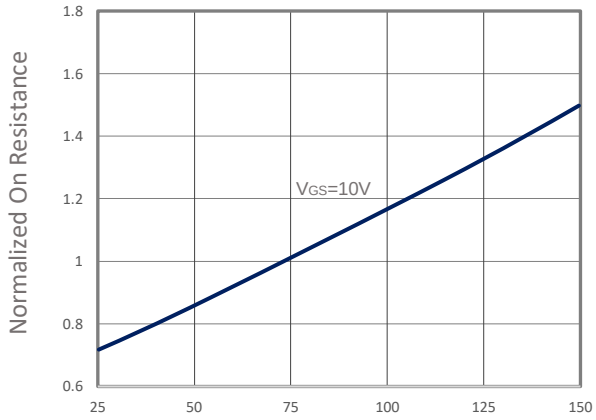


Gate Threshold Voltage

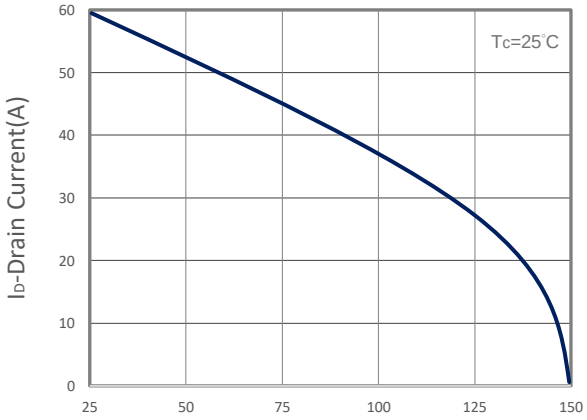


Power Dissipation

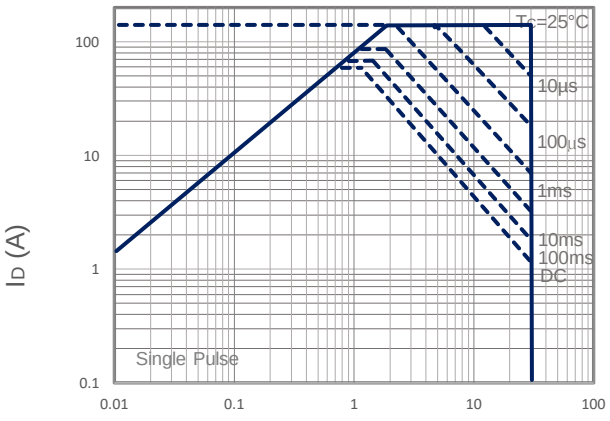
TYPICAL CHARACTERISTICS



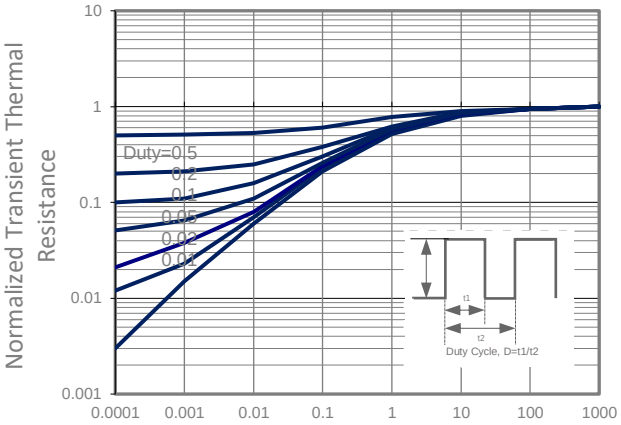
RDS(ON) vs Junction Temperature



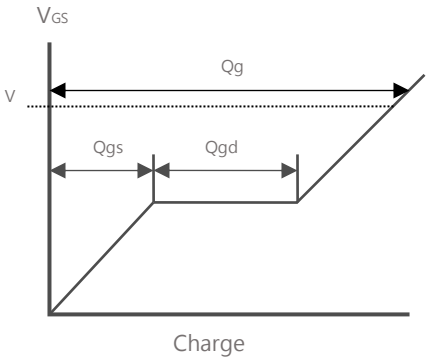
Drain Current vs TC



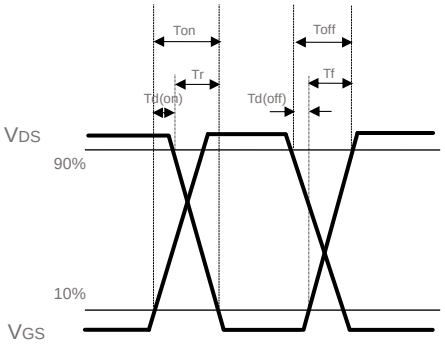
Maximum Safe Operation Area



Thermal Transient Impedance

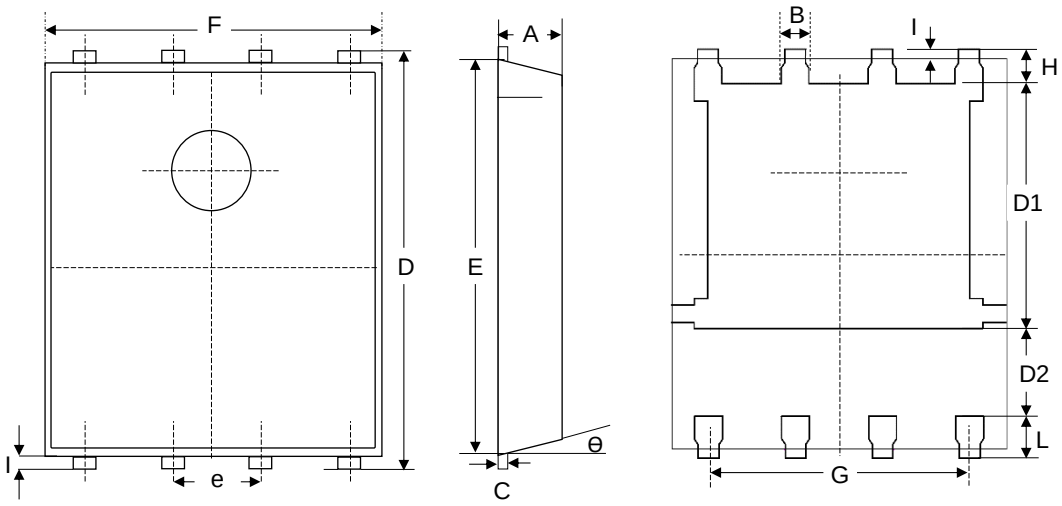


Gate Chrge Waveform



Switching Time Waveform

■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°