

Single N-Channel MOSFET

DESCRIPTION

SMC4734PA 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. 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

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

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

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

APPLICATIONS

- ◆ Wireless Charging
- ◆ DC/DC Converters
- ◆ Load Switch



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 [*]	$T_C=25^\circ C$	50
		$T_C=100^\circ C$	39.1
I_{DM}	Pulsed Drain Current ^B	124	A
I_D	Continuous Drain Current	$T_A=25^\circ C$	25.5
		$T_A=70^\circ C$	20.4
P_D	Power Dissipation ^A	$T_A=25^\circ C$	6.3
		$T_A=70^\circ C$	4
I_{AS}	Avalanche Current ^B	35	A
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^B	61	mJ
P_D	Power Dissipation ^C	$T_C=25^\circ C$	36.8
		$T_C=100^\circ C$	14.7
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 ^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		3.4	

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

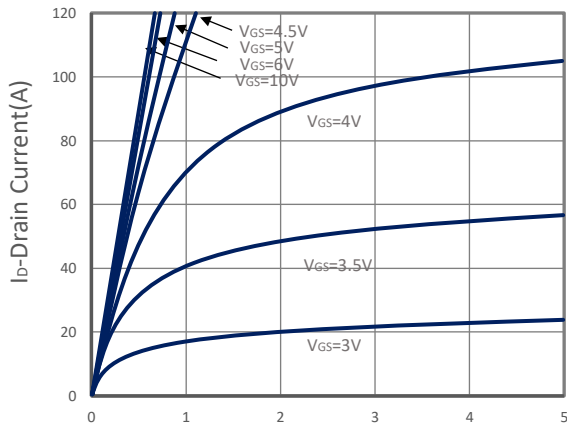
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.6	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero 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 [Ⓟ]	V _{GS} =10V, I _D =20A V _{GS} =4.5V, I _D =15A		4.5 5.6	6 7	mΩ
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =10A		8.8		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage [Ⓟ]	I _S =1A, V _{GS} =0V			1.0	V
I _S	Diode Continuous Forward Current [*]				50	A
t _{rr}	Reverse Recovery Time	I _S =10A, dI/dt=100A/μs		12		ns
Q _{rr}	Reverse Recovery Charge			3.5		nC
Dynamic and Switching Parameters[Ⓔ]						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =10A		24.6	33.4	nC
Q _g	Total Gate Charge (4.5V)			12	15	
Q _{gs}	Gate-Source Charge			2.8	3.5	
Q _{gd}	Gate-Drain Charge			6	8.1	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		1280		pF
C _{oss}	Output Capacitance			196		
C _{rss}	Reverse Transfer Capacitance			162		
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		2.2		Ω
t _{d(on)}	Turn-On Time	V _{DD} =15V, V _{GEN} =10V R _G =3.3Ω, I _D =1A		6.4	12	ns
t _r				14	27	
t _{d(off)}	Turn-Off Time			32.4	62	
t _f				9.2	17	

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

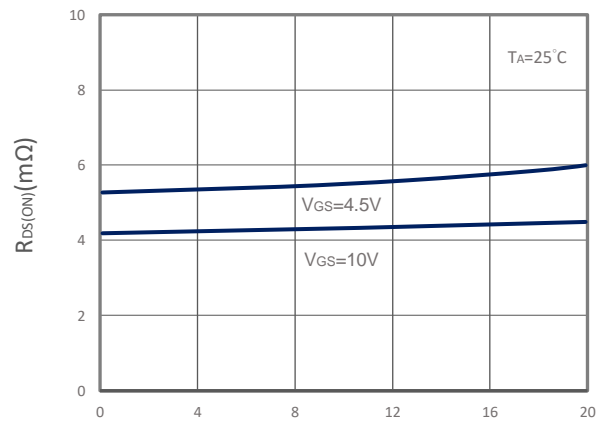
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. Guaranteed by design, not subject to production testing.
- * . The maximum rating current is limited by wire bonding.

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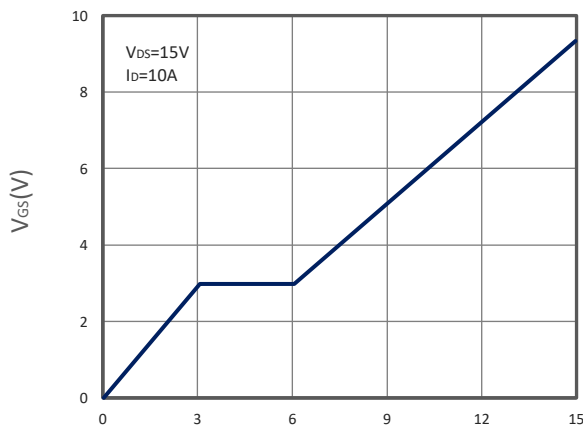
TYPICAL CHARACTERISTICS



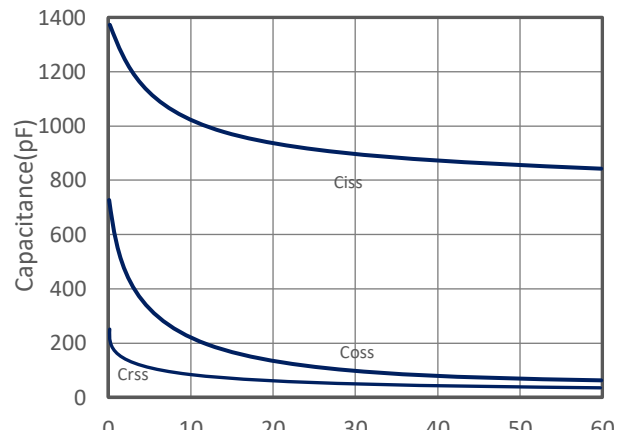
VDS-Drain Source Voltage (V)
Output Characteristics



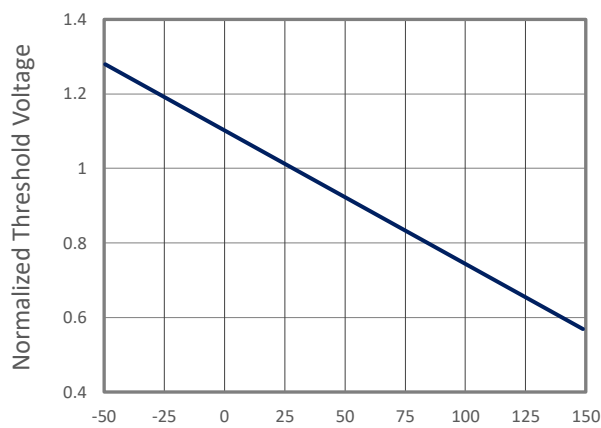
Id-Drain Current (A)
Drain-Source On Resistance



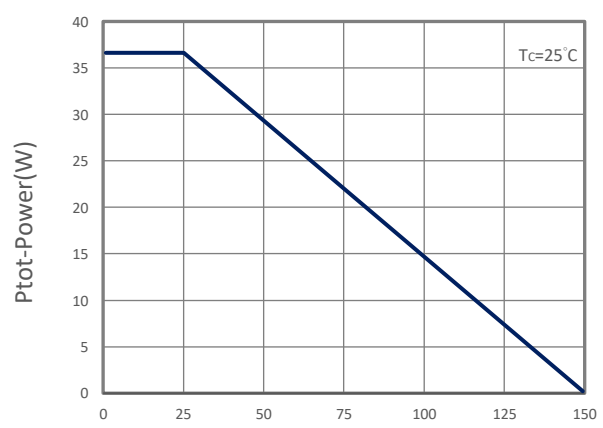
Qg-Gate Charge (nC)
Gate Charge



VDS-Drain Source Voltage (V)
Capacitance

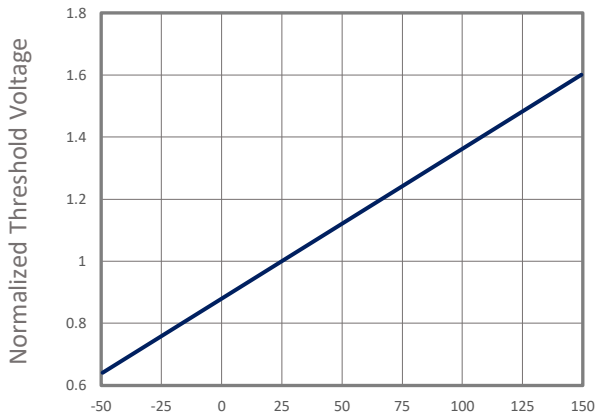


TJ-Junction Temperature (°C)
Gate Threshold Voltage

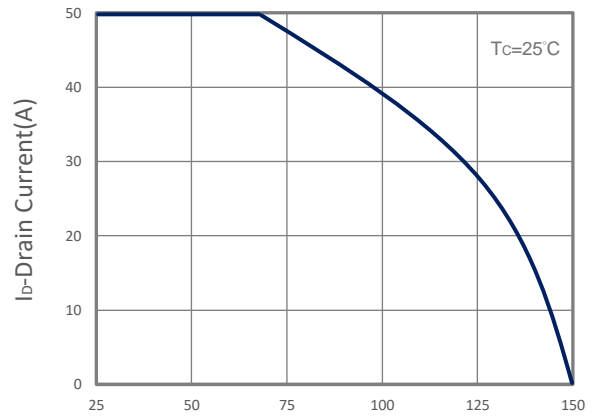


TC-Case Temperature (°C)
Power Dissipation

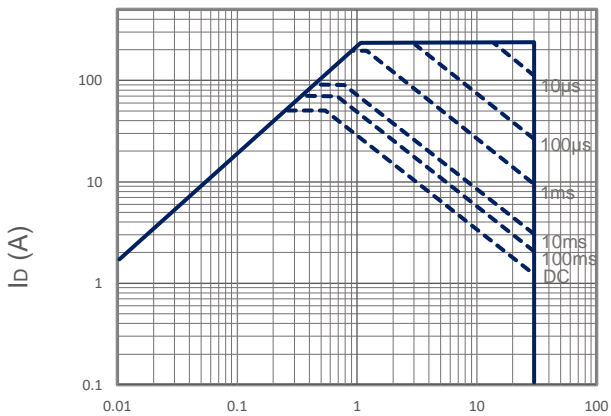
TYPICAL CHARACTERISTICS



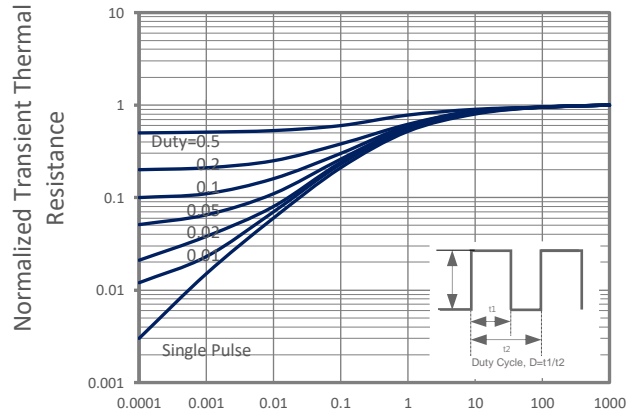
T_J-Junction Temperature(°C)
Gate Threshold Voltage



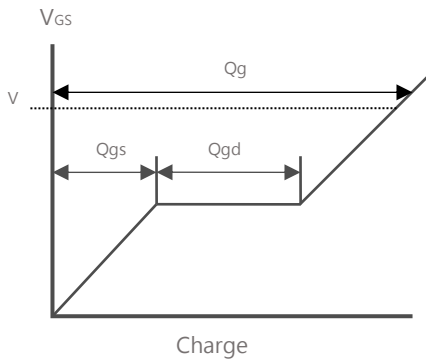
T_J-Case Temperature(°C)
Drain Current vs T_J



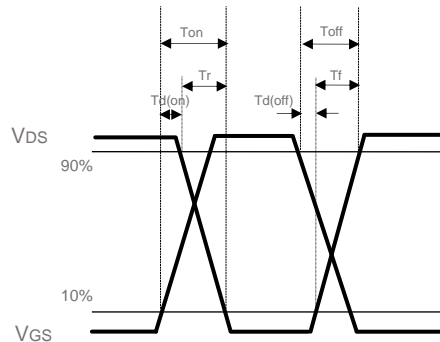
Maximum Safe Operation Area
V_{DS} Voltage (V)



Square Wave Pulse Duration(Sec)
Thermal Transient Impedance

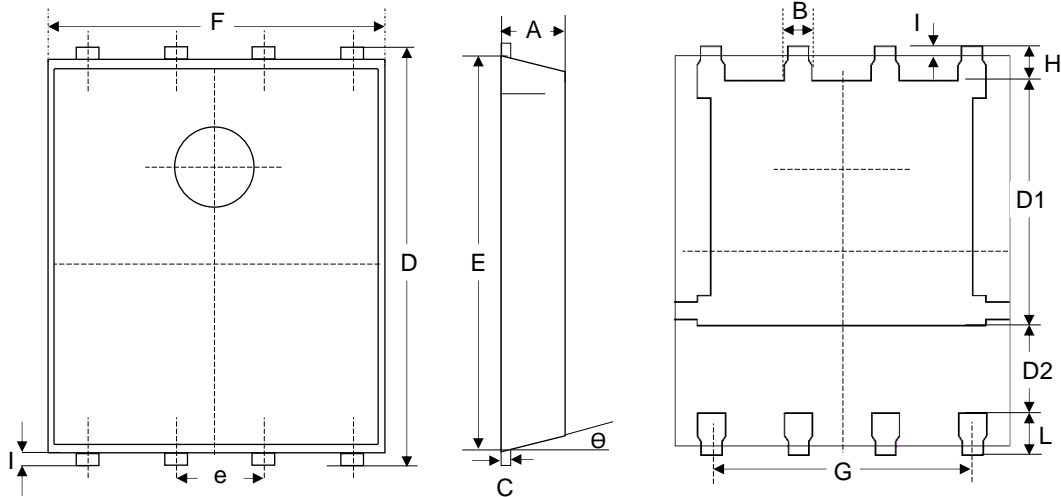


Gate Charge Waveform



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°

Recommended Land Pattern

