

Single P-Channel MOSFET

DESCRIPTION

The SMC3241PA uses trench MOSFET technology. Provides extremely low $R_{DS(ON)}$, Low resistance package and excellent fast switching performance. This device is ideal for efficient and fast switching applications.

PART NUMBER INFORMATION

SMC 3241 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

$V_{DS}=-30V$, $I_D=-32A$

$R_{DS(ON)}=16m\Omega(Typ.)@V_{GS}=-10V$

$R_{DS(ON)}=24m\Omega(Typ.)@V_{GS}=-4.5V$

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

APPLICATIONS

- ◆ Power Management
- ◆ 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	± 25	V
I_D	Continuous Drain Current	$T_C=25^\circ C$	-32
		$T_C=100^\circ C$	-20
I_{DM}	Pulsed Drain Current ^B	-128	A
I_D	Continuous Drain Current	$T_A=25^\circ C$	-12.5
		$T_A=70^\circ C$	-10
P_D	Power Dissipation ^A	$T_A=25^\circ C$	5
		$T_A=70^\circ C$	3.2
I_{AS}	Avalanche Current ^A	-25	A
EAS	Single Pulse Avalanche energy $L=0.1mH$ ^B	31.3	mJ
P_D	Power Dissipation ^C	$T_C=25^\circ C$	31.3
		$T_C=100^\circ C$	12.5
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		25	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{AC}	$t \leq 10s$	60	
$R_{\theta JC}$	Thermal Resistance Junction to Case	Steady-State	4	

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

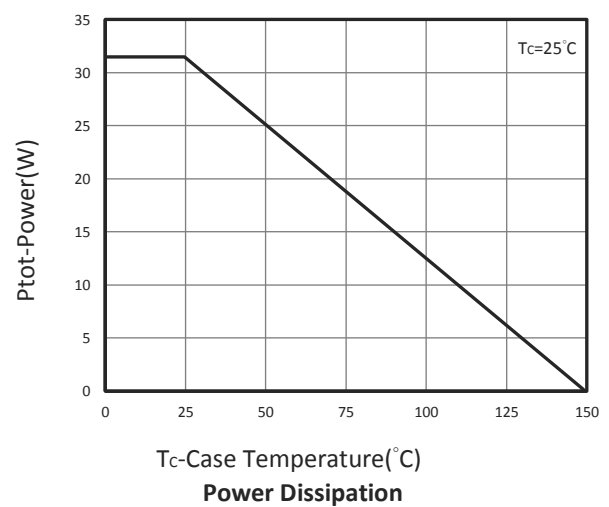
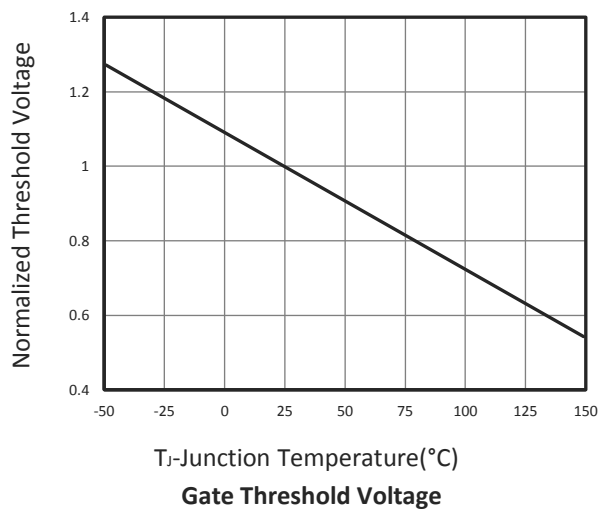
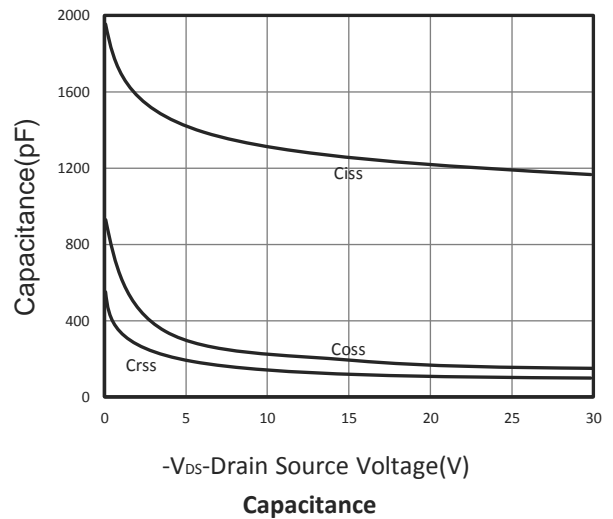
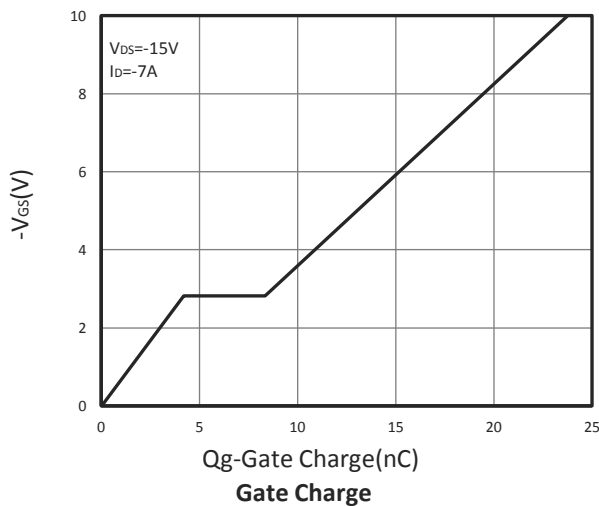
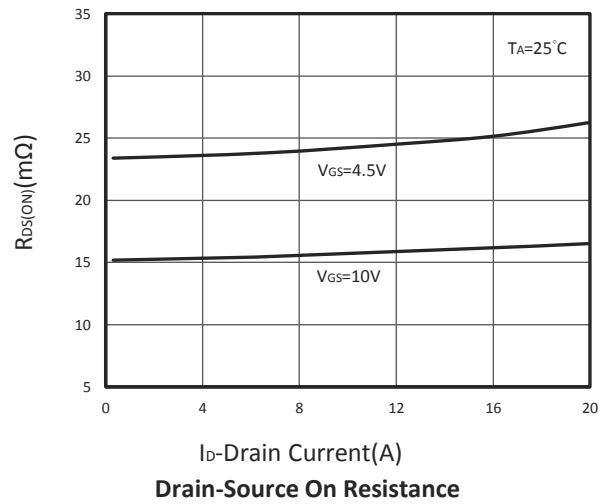
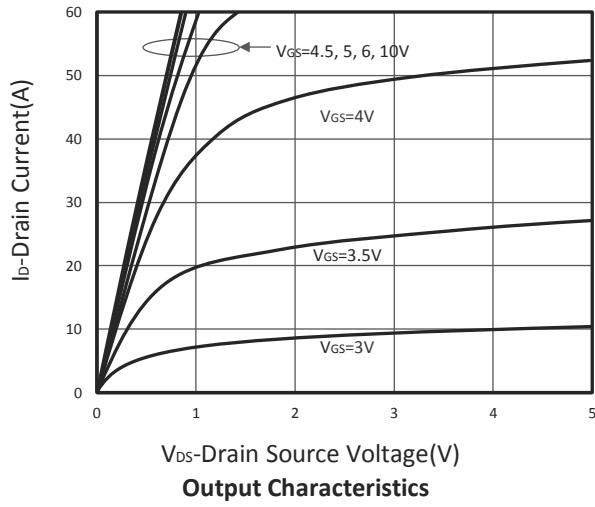
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	-30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.6	-2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	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 [Ⓟ]	V _{GS} =-10V, I _D =-12.5A V _{GS} =-4.5V, I _D =-8A		16 24	20 29	mΩ
G _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-7A		12.5		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage [Ⓟ]	I _S =-1A, V _{GS} =0V			-1	V
I _S	Diode Continuous Forward Current				-32	A
t _{rr}	Reverse Recovery Time	I _S =-7A, dI/dt=100A/μs		11		ns
Q _{rr}	Reverse Recovery Charge			5.8		nC
Dynamic and Switching Parameters[Ⓔ]						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _D =-7A		23.6	33	nC
Q _g	Total Gate Charge (4.5V)			11.5	16.1	
Q _{gs}	Gate-Source Charge			4.2	5.9	
Q _{gd}	Gate-Drain Charge			4.4	6.2	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		1280		pF
C _{oss}	Output Capacitance			175		
C _{rss}	Reverse Transfer Capacitance			125		
t _{d(on)}	Turn-On Time	V _{DD} =-15V, V _{GEN} =-10V R _G =3.3Ω, I _D =-1A		6.1	12	ns
t _r				14	27	
t _{d(off)}	Turn-Off Time			34	65	
t _f				13.2	25	

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

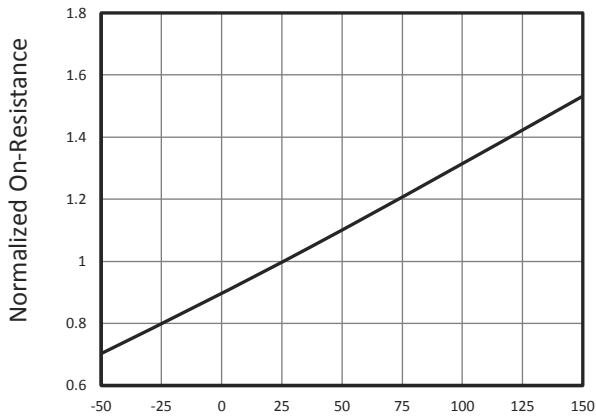
- A. Surface mounted on FR4 board using 1 in² pad size.
- B. Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C (initial temperature T_J=25°C).
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T_{J(MAX)}=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
-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

The products and product specifications contained herein are subject to change without notice to improve performance characteristics. Consult us, or our representatives before use, to confirm that the information in this datasheet is up to date. We assume no responsibility for any infringement of patents, patent rights, or other rights arising from the use of any information and circuitry in this datasheet.

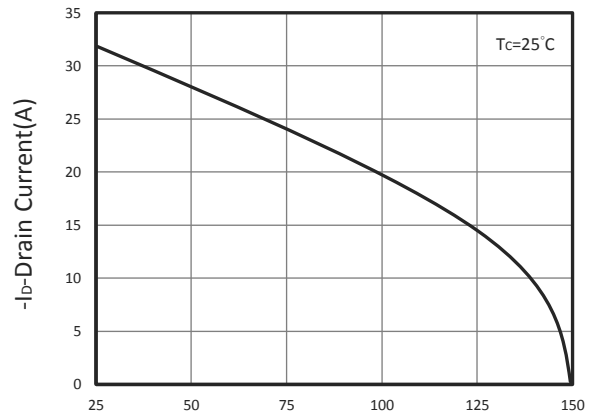
TYPICAL CHARACTERISTICS



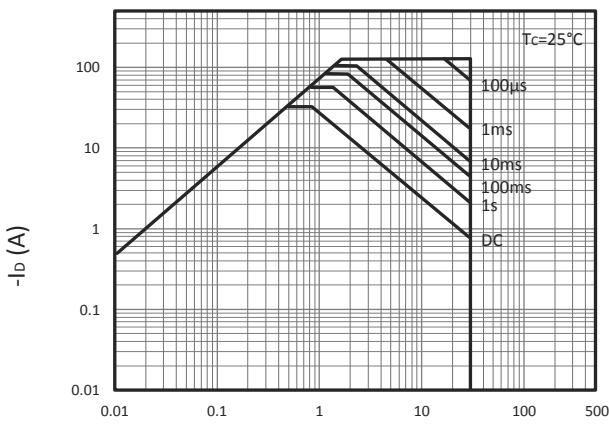
TYPICAL CHARACTERISTICS



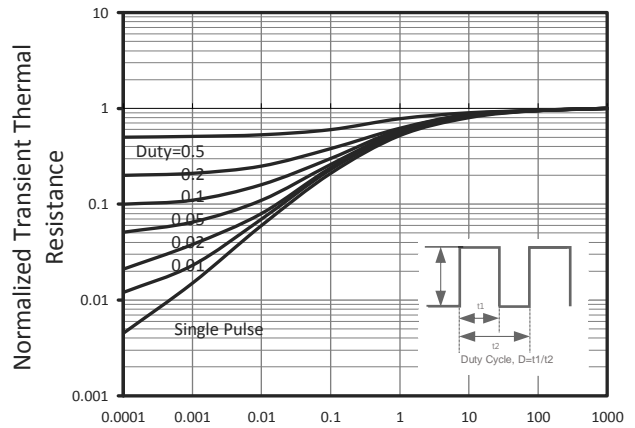
T_J-Junction Temperature(°C)
Drain-Source On Resistance



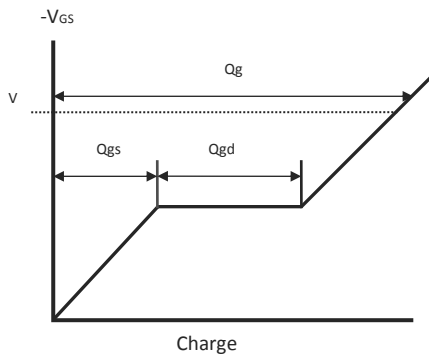
T_C-Case Temperature(°C)
Drain Current vs T_C



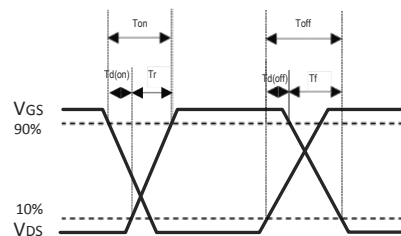
-V_{DS} Voltage (V)
Maximum Safe Operation Area



Square Wave Pulse Duration(Sec)
Thermal Transient Impedance

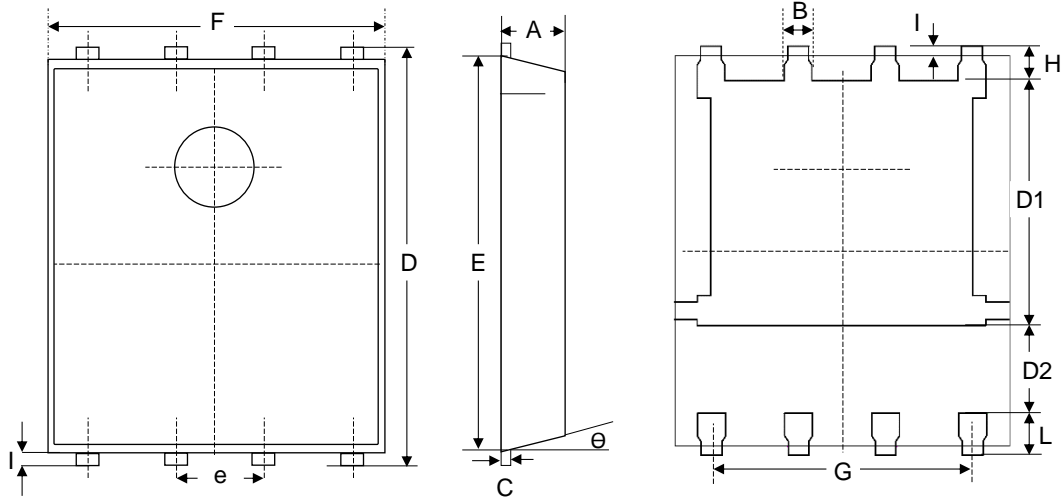


Gate Charge Waveform



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

