

30V P-Channel Enhancement Mode MOSFET

DESCRIPTION

The SMC4735 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density and trench DMOS technology.

It has been optimized for low gate charge, low RDS(ON) and fast switching speed.

These devices are well suited for high efficiency fast switching applications.

SMC4735PD-TRG ROHS Compliant This is Halogen Free

FEATURE

- ◆ -30V / -43A
- ◆ $R_{DS(ON)} = 10.5m\Omega(typ.)@V_{GS} = -10V$
- ◆ $R_{DS(ON)} = 14m\Omega(typ.)@V_{GS} = -4.5V$
- ◆ Fast switch
- ◆ Low gate charge
- ◆ Improved dv/dt capability
- ◆ High power and current handling capability
- ◆ 100% EAS Guaranteed

APPLICATIONS

- ◆ High Frequency DC/DC converters
- ◆ Power Management in Notebook Computer
- ◆ Portable Equipment and Battery Powered.

PIN CONFIGURATION



PART NUMBER INFORMATION

<p>SMC 4735 PD - TR G</p> <p>a b c d e</p>	<p>a : Company name.</p> <p>b : Product Serial number.</p> <p>c : Package code</p> <p>d : Handling code</p> <p>e : Green produce code</p>
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ORDERING INFORMATION

Part Number	Package Code	Handling Code	Shipping
SMC4735PD-TRG	PD : DFN5X6A-8	TR : Tape&Reel	2.5K/Reel

※ Year Code : 0 ~ 9, 2010 : 0
 ※ Week Code : A(1~2) ~ Z(53~54)
 ※ DFN-56 : Only available in tape and reel packaging.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise noted)

Symbol	Parameter	Typical	Unit
V _{DSS}	Drain-Source Voltage	-30	V
V _{GSS}	Gate-Source Voltage	±25	V
I _D	Continuous Drain Current ^A	T _C =25°C	-43
		T _C =100°C	-26
I _{DM}	Pulsed Drain Current ^A	T _C =25°C	-60
E _{AS}	Single Pulse Avalanche energy L=0.1mH ^B	-98	mJ
I _{AS}	Avalanche Current ^B	-30	A
P _D	Power Dissipation ^F	T _C =25°C	31
		T _C =100°C	13
P _D	Power Dissipation ^A Surface-mounted	T _C =25°C	4.0
		T _C =100°C	2.7
T _J	Operation Junction Temperature	-55/150	°C
T _{STG}	Storage Temperature Range	-55/150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient ^C Steady-State	57	°C/W
R _{θJC}	Thermal Resistance Junction to Lead ^C Steady-State	3.7	°C/W

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

A. Surface-mounted on FR-4 board using 1 sq-in pad, 1 oz Cu.

B. The EAS data shows Max. rating. The test condition is V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-30A, R_G=25Ω, Starting T_J=25°C.

C. UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

F. The power dissipation P_D is based on T_J(MAX)=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper.

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

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
V(BR)DSS	Drain-Source Breakdown Voltage ^D	$V_{GS}=0V, I_D=-250\mu A$	-30			V
$V_{GS(th)}$	Gate Threshold Voltage ^D	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.5	-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 ^D	$V_{GS}=-10V, I_D=-16A$ $V_{GS}=-4.5V, I_D=-10A$		10.5 14	13 18	$m\Omega$
Source-Drain Diode						
V_{SD}	Diode Forward Voltage ^B	$I_S=-1A, V_{GS}=0V$		-0.7	-1.0	V
I_S	Continuous Source Current				-15	A
Dynamic Parameters						
$Q_g(4.5V)$	Total Gate Charge			28		nC
Q_{gs}	Gate-Source Charge	$V_{DS}=-15V, V_{GS}=-4.5V$ $I_D=-10A$		4.2		
Q_{gd}	Gate-Drain Charge			10.2		
C_{iss}	Input Capacitance			1480		μF
C_{oss}	Output Capacitance	$V_{DS}=-25V, V_{GS}=0V$ $f=1\text{MHz}$		295		
C_{rss}	Reverse Transfer Capacitance			215		
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ $F=1\text{MHz}$		2.6		Ω
$t_{d(on)}$	Turn-On Time ^E	$V_{DD}=-15V, V_{GEN}=-10V,$ $R_G=3.3\Omega,$		12		nS
t_r				26		
$t_{d(off)}$	Turn-Off Time ^E			52		
t_f				20		

Note:

D. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

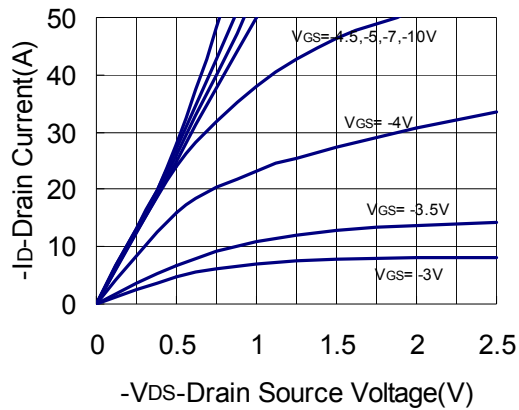
E. Pulsed width limited by maximum junction temperature.

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

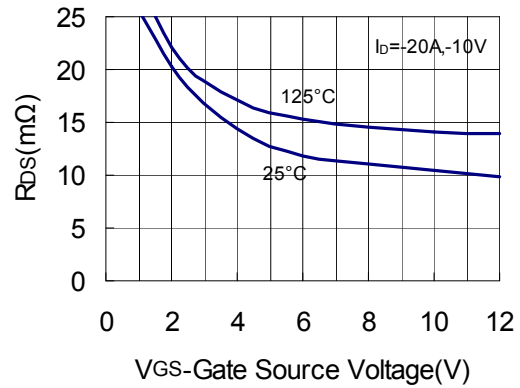
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TYPICAL CHARACTERISTICS

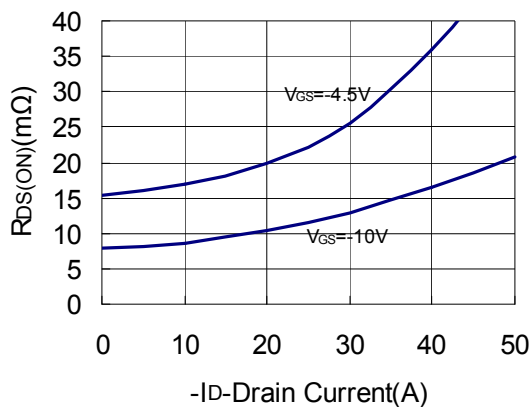
Output Characteristics



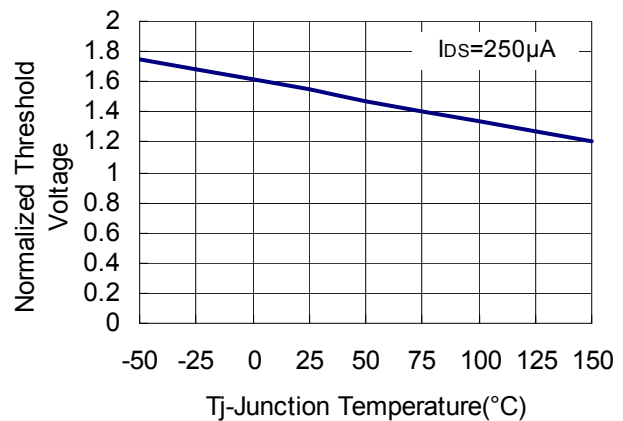
On Resistance VS Gate Source Voltage



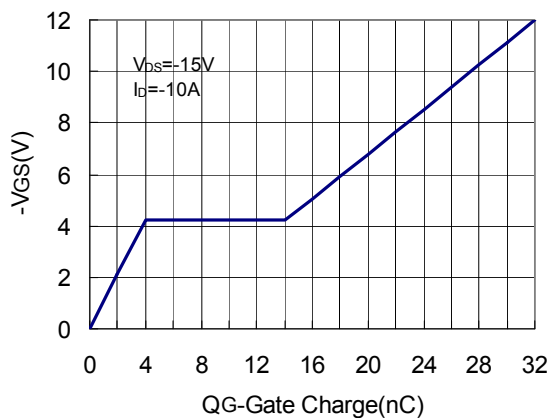
Drain Source On Resistance



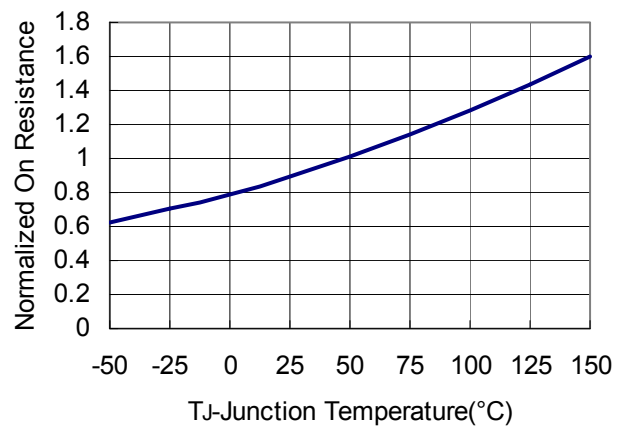
Gate Threshold Voltage



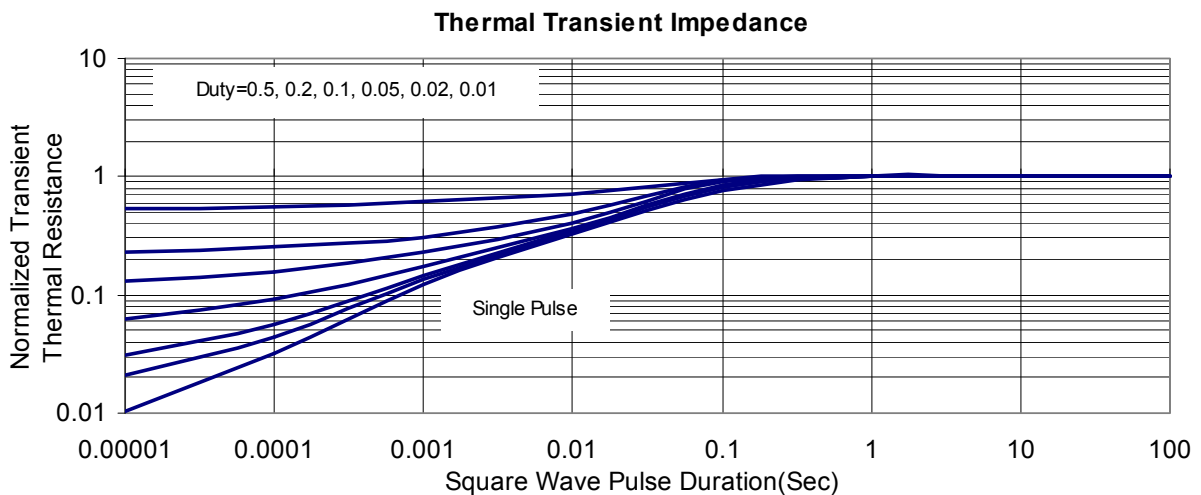
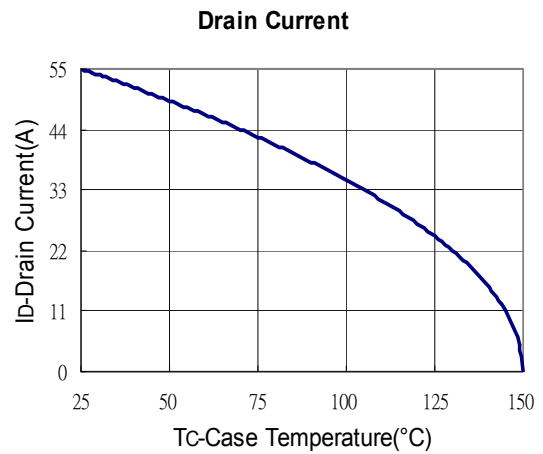
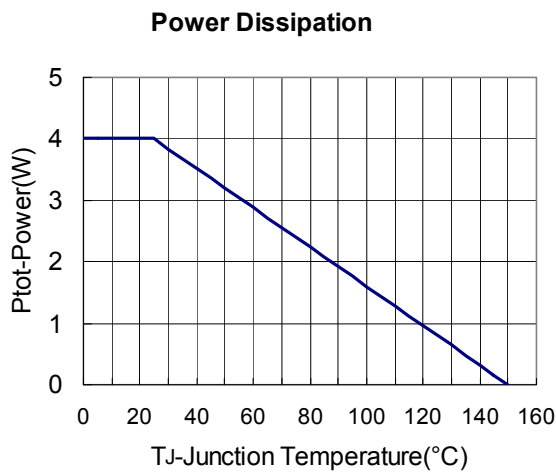
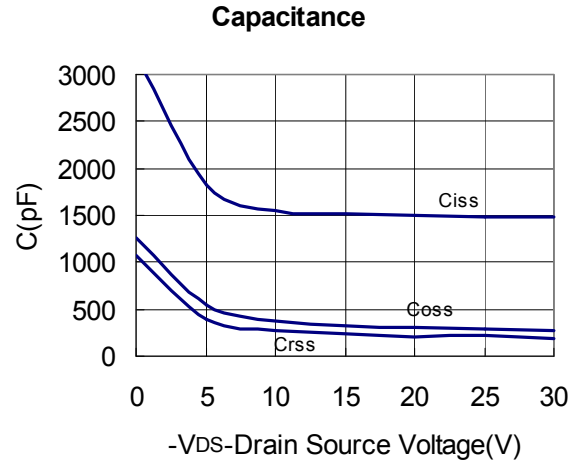
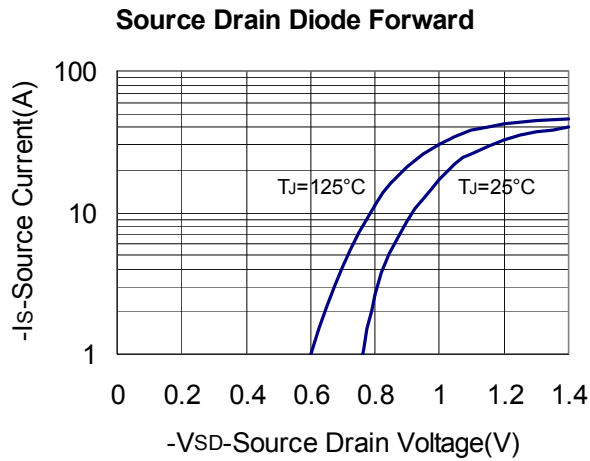
Gate Charge



Normalized RDS(On) V.S. TJ



TYPICAL CHARACTERISTICS



PDFN5X6-8 PACKAGE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
D2	4.824	4.976	0.190	0.196
E1	3.375	3.575	0.133	0.141
E2	5.674	5.826	0.223	0.229
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
k	1.190	1.390	0.047	0.055
L	0.559	0.325	0.011	0.013
L1	0.424	0.725	0.027	0.029
H	0.574	0.325	0.011	0.013
θ	10°	12°	10°	12°

