SemTron Microtech Corporation

SMC3241H

Single P-Channel MOSFET

■DESCRIPTION

The SMC3241 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.

■FEATURES

V_{DS} = -30V, I_D = -38A

$R_{DS(ON)}$=16mΩ(Typ.)@V_{GS}=-10V
$R_{DS(ON)}$=24.5mΩ(Typ.)@V_{GS}=-4.5V

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

■PART NUMBER INFORMATION

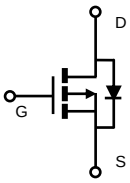
SMC 3241 H - TR G
a b c d e

a : Company name.
b : Product Serial number.
c : Package code H:TO-252
d : Handling code TR:Tape&Reel
e : Green produce code G:*RoHS Compliant*

■APPLICATIONS

◆Power Management
◆DC/DC Converters

TO-252



■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	-38	A
		T_C=100°C	-24	A
I_{DM}	Pulsed Drain Current [A]		-152	A
I_D	Continuous Drain Current	T_A=25°C	-12.7	A
		T_A=70°C	-10.2	A
P_D	Power Dissipation [B]	T_A=25°C	5	W
		T_A=70°C	3.2	W
I_{AS}	Avalanche Current [A]		-25	A
E_{AS}	Single Pulse Avalanche energy L=0.1mH [AF]		31	mJ
P_D	Power Dissipation [C]	T_C=25°C	44.6	W
		T_C=100°C	17.9	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		25	°C/W
	Thermal Resistance Junction to Ambient [BD]	Steady-State		50	
$R_{\theta JC}$	Thermal Resistance Junction to Case			2.8	

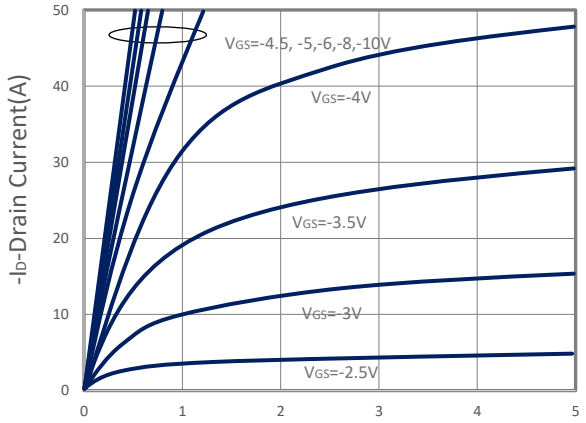
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

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	-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=-12.7A V_{GS}=-4.5V, I_D=-8A		16 24.5	20 29	mΩ
G_{fs}	Forward Transconductance	V_{DS}=-10V, I_D=-10A		22		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage [E]	I_S=-1A, V_{GS}=0V		-0.7	-1	V
I_S	Continuous Source Current				-38	A
t_{rr}	Reverse Recovery Time	I_S=-10A, dI/dt=100A/μs		12		ns
Q_{rr}	Reverse Recovery Charge			5		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 [E]	V_{DD}=-15V, V_{GEN}=-10V, R_G=6Ω, I_D=-1A		6.1	12	nS
t_r				14	27	
$t_{d(off)}$	Turn-Off Time [E]			34	65	
t_f				13.2	25	

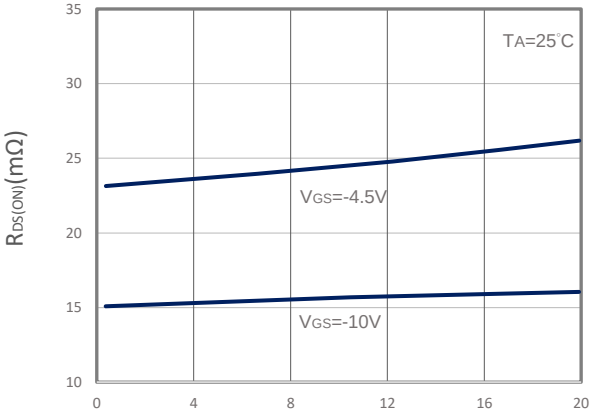
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.
B. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature $T_{J(MAX)}$=150°C (initial temperature T_A=25°C).
C. $T_{J(MAX)}$=150°C,using junction-to-ambient thermal resistance, t ≦10sec.
D. $T_{J(MAX)}$=150°C,using junction-to-case thermal resistance ($R_{\theta JC}$) is more useful in additional heat sinking is used.
E. The data tested by pulsed , pulse width ≦ 300μS , duty cycle ≦ 2%.
F. The E_{AS} data shows Max, tested and pulse width limited by $T_{J(MAX)}$=150°C (initial temperature T_J=25°C).

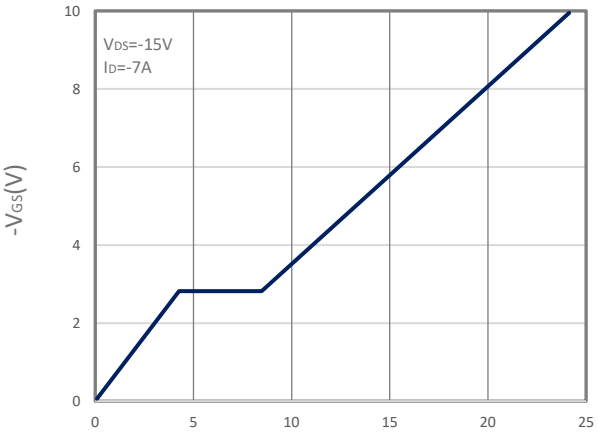
■TYPICAL CHARACTERISTICS



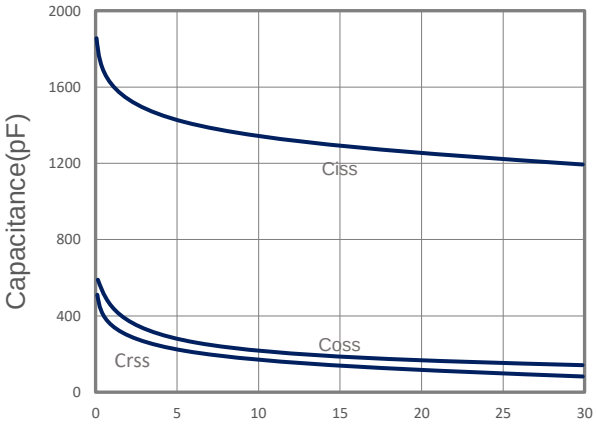
Output Characteristics



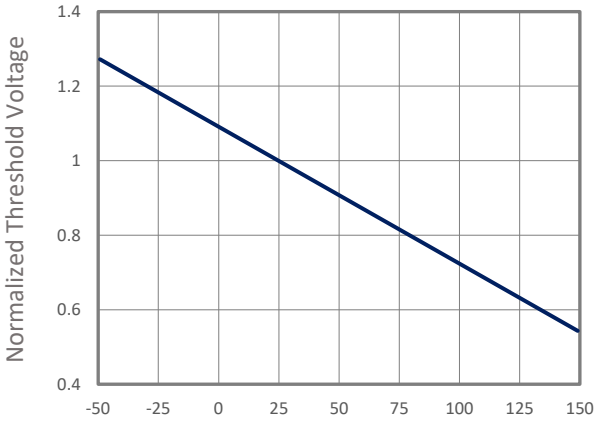
Drain-Source On Resistance



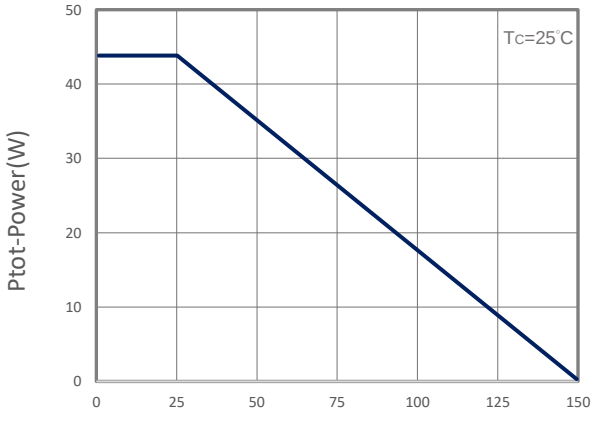
Gate Charge



Capacitance

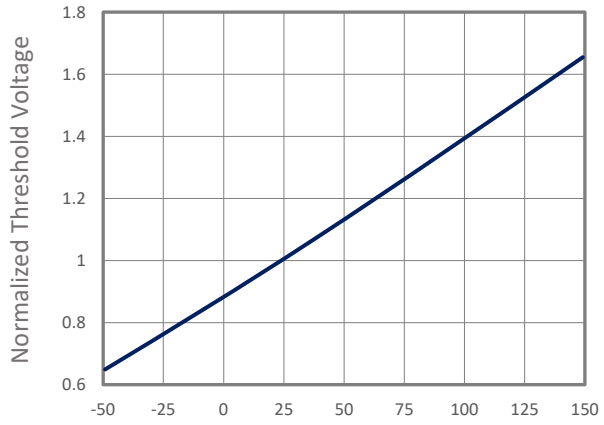


Gate Threshold Voltage



Power Dissipation

TYPICAL CHARACTERISTICS



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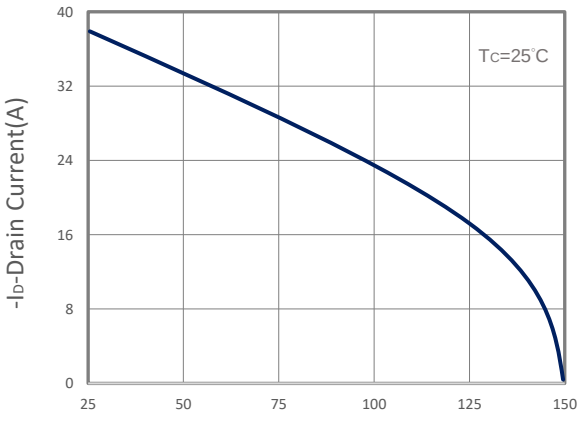
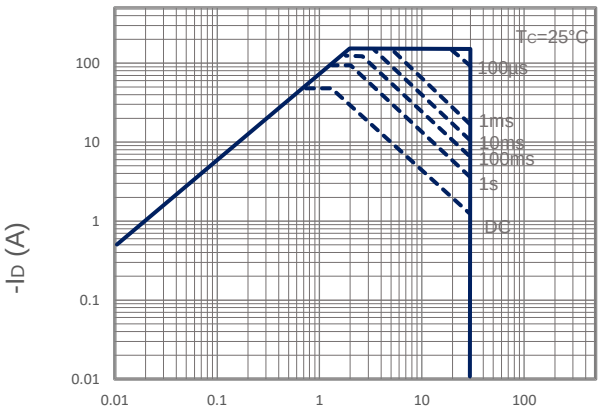
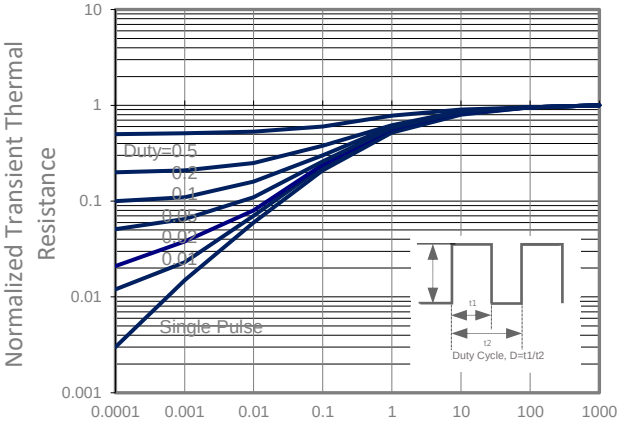


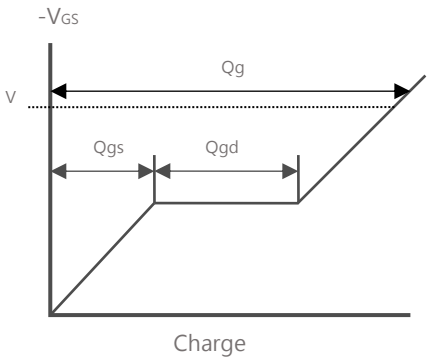
Drain Current vs TJ



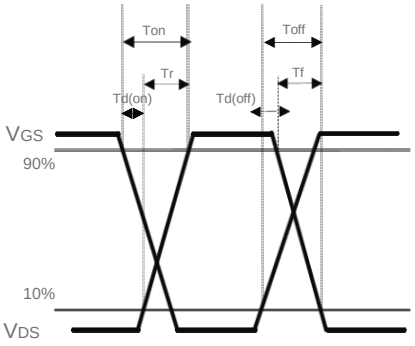
Maximum Safe Operation Area



Thermal Transient Impedance

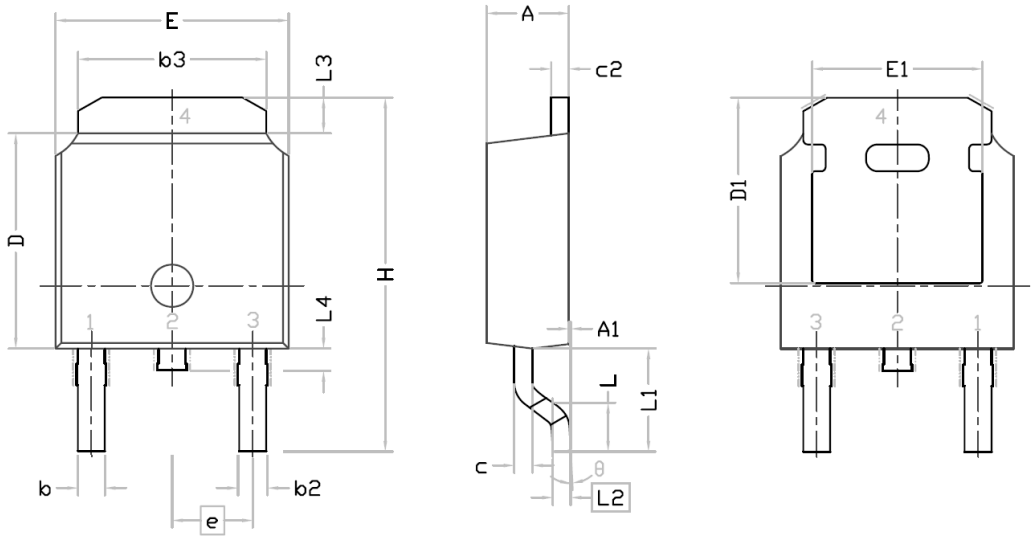


Gate Chrge Waveform



Switching Time Waveform

■TO-252 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.640	0.880	0.025	0.035
b2	0.770	1.140	0.030	0.045
b3	5.210	5.460	0.205	0.215
c	0.460	0.600	0.018	0.024
c2	0.460	0.580	0.018	0.023
D	6.000	6.223	0.236	0.245
D1	5.210	-	0.205	-
E	6.400	6.731	0.252	0.265
E1	4.400	-	0.173	-
e	2.286 BSC.		0.090 BSC.	
H	9.400	10.40	0.370	0.409
L	1.400	1.770	0.055	0.070
L1	2.743 REF.		0.108 REF.	
L2	0.508 BSC.		0.020 BSC.	
L3	0.890	1.270	0.035	0.050
L4	0.640	1.010	0.025	0.040
θ	0°	10°	0°	10°

Recommended Land Pattern