

## 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.

### PART NUMBER INFORMATION

**SMC 3241 M - TR G**  
 a      b      c      d      e

- a : Company name.
- b : Product Serial number.
- c : Package code            M:SOP-8
- d : Handling code            TR:Tape&Reel
- e : Green produce code    G:RoHS Compliant

### FEATURES

**$V_{DS} = -30V$ ,  $I_D = -9.8A$**

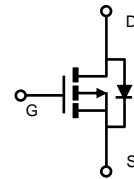
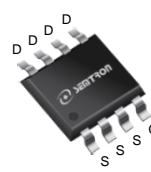
$R_{DS(ON)}=17m\Omega(Typ.)@V_{GS}=-10V$

$R_{DS(ON)}=25m\Omega(Typ.)@V_{GS}=-4.5V$

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

### APPLICATIONS

- ◆ Power Management
- ◆ DC/DC Converters



SOP-8

### 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	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_A=25^\circ C$	-9.8
		$T_A=70^\circ C$	-7.8
$I_{DM}$	Pulsed Drain Current <sup>A</sup>	-39	A
$I_{AS}$	Avalanche Current <sup>A</sup>	-25	A
EAS	Single Pulse Avalanche energy $L=0.1mH$ <sup>AE</sup>	31	mJ
$P_D$	Power Dissipation <sup>B</sup>	$T_A=25^\circ C$	3.1
		$T_A=70^\circ C$	2
$T_J$	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 <sup>B</sup>	$t \leq 10s$	40	$^\circ C/W$
	Thermal Resistance Junction to Ambient <sup>BC</sup>	Steady-State	70	

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

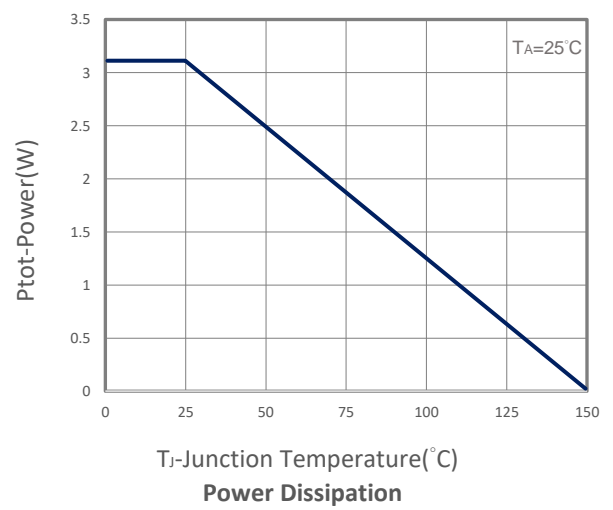
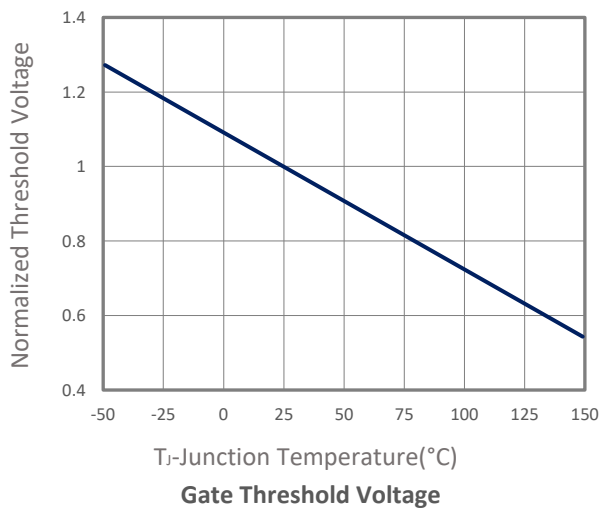
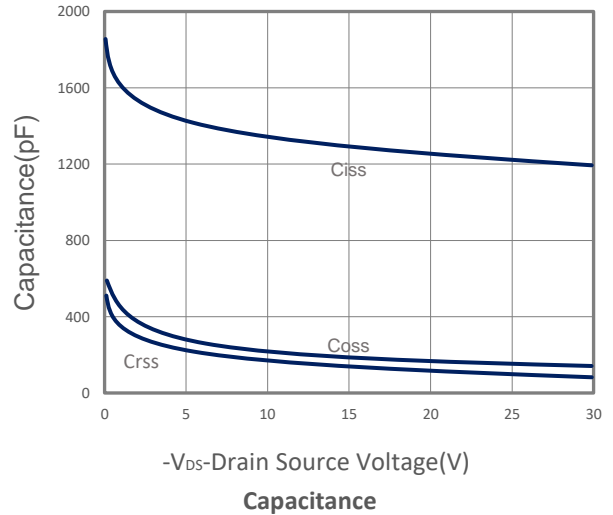
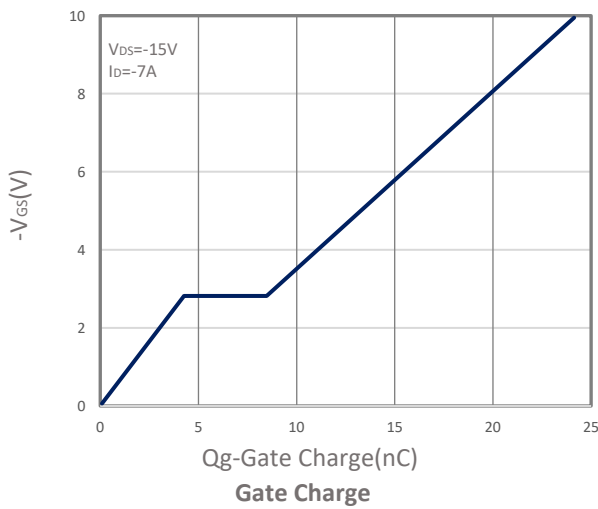
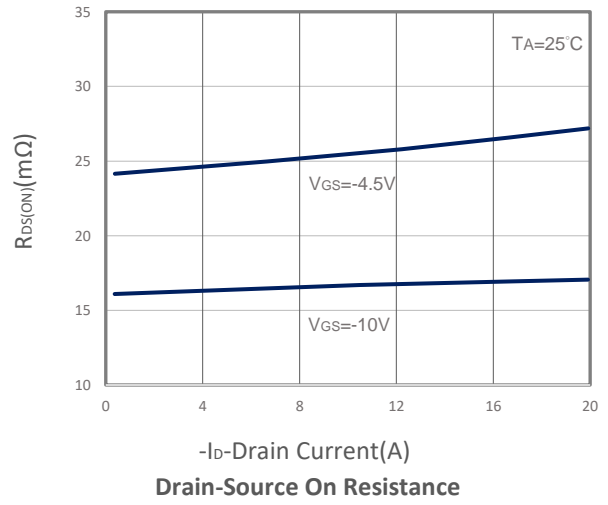
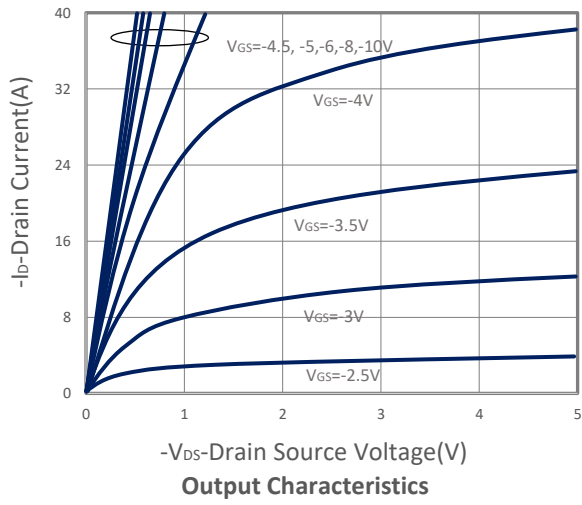
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250 $\mu$ A	-30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250 $\mu$ A	-1	-1.6	-2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = $\pm$ 25V			$\pm$ 100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25 $^\circ$ C			-1	$\mu$ A
		V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V, T <sub>J</sub> =75 $^\circ$ C			-10	
R <sub>DS(ON)</sub>	Drain-source On-Resistance <sup>D</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-9.8A V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-7A		17 25	21 30	m $\Omega$
G <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-7A		15.3		S
<b>Diode Characteristics</b>						
V <sub>SD</sub>	Diode Forward Voltage <sup>D</sup>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V		-0.7	-1	V
I <sub>S</sub>	Continuous Source Current				-9.8	A
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =-7A, dI/dt=100A/ $\mu$ s		9		ns
Q <sub>rr</sub>	Reverse Recovery Charge			3		nC
<b>Dynamic and Switching Parameters</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A		23.6	33	nC
Q <sub>g</sub>	Total Gate Charge (4.5V)			11.5	16.1	
Q <sub>gs</sub>	Gate-Source Charge			4.2	5.9	
Q <sub>gd</sub>	Gate-Drain Charge			4.4	6.2	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz		1280		pF
C <sub>oss</sub>	Output Capacitance			175		
C <sub>rss</sub>	Reverse Transfer Capacitance			125		
t <sub>d(on)</sub>	Turn-On Time <sup>D</sup>	V <sub>DD</sub> =-15V, V <sub>GEN</sub> =-10V, R <sub>G</sub> =3.3 $\Omega$ , I <sub>D</sub> =-1A		6.1	12	nS
t <sub>r</sub>				14	27	
t <sub>d(off)</sub>	Turn-Off Time <sup>D</sup>			34	65	
t <sub>f</sub>				13.2	25	

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

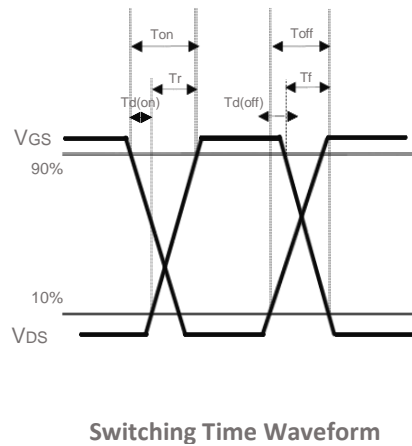
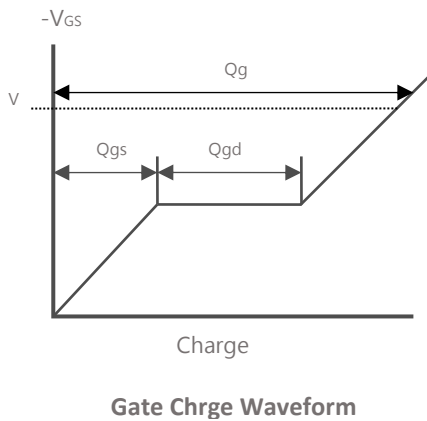
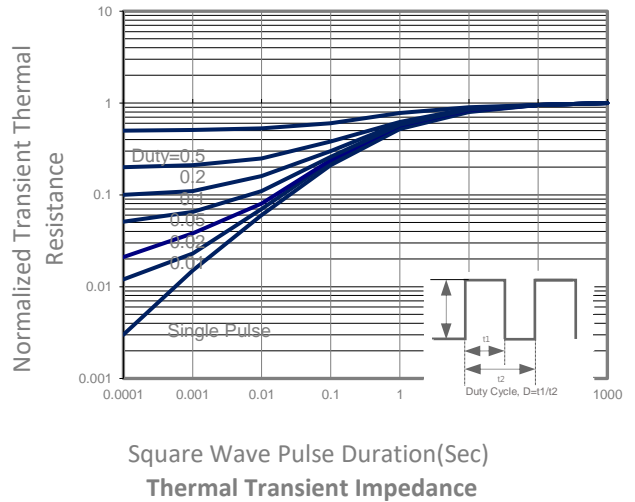
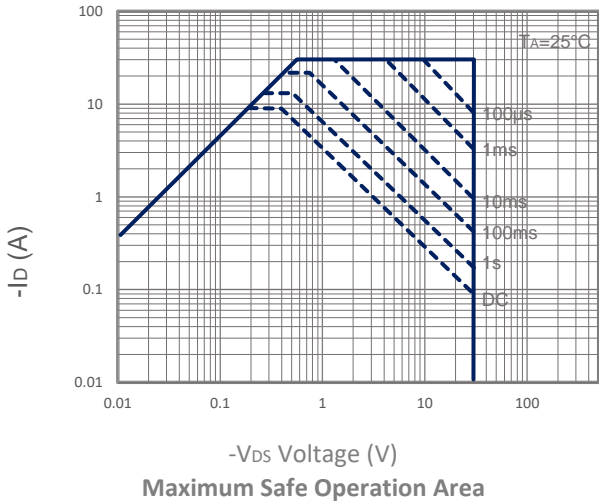
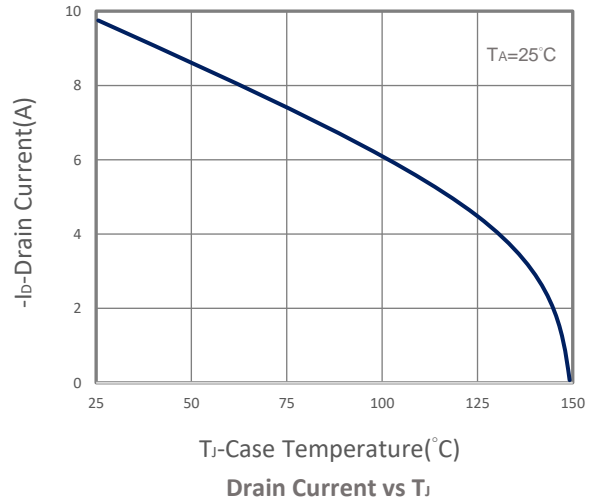
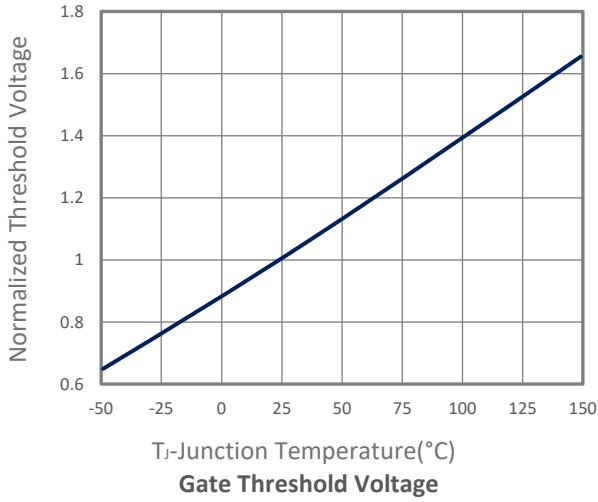
- A. Pulsed width limited by maximum junction temperature, T<sub>J(MAX)</sub>=150 $^\circ$ C.
- B. The value of R <sub>$\theta$ JA</sub> is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T<sub>J(MAX)</sub>=150 $^\circ$ C (initial temperature T<sub>A</sub>=25 $^\circ$ C).
- C. T<sub>J(MAX)</sub>=150 $^\circ$ C, using junction-to-case thermal resistance (R <sub>$\theta$ JC</sub>) is more useful in additional heat sinking is used.
- D. The data tested by pulsed, pulse width  $\leq$  300 $\mu$ s, duty cycle  $\leq$  2%.
- E. The EAs data shows Max, tested and pulse width limited by T<sub>J(MAX)</sub>=150 $^\circ$ C (initial temperature T<sub>J</sub>=25 $^\circ$ C).

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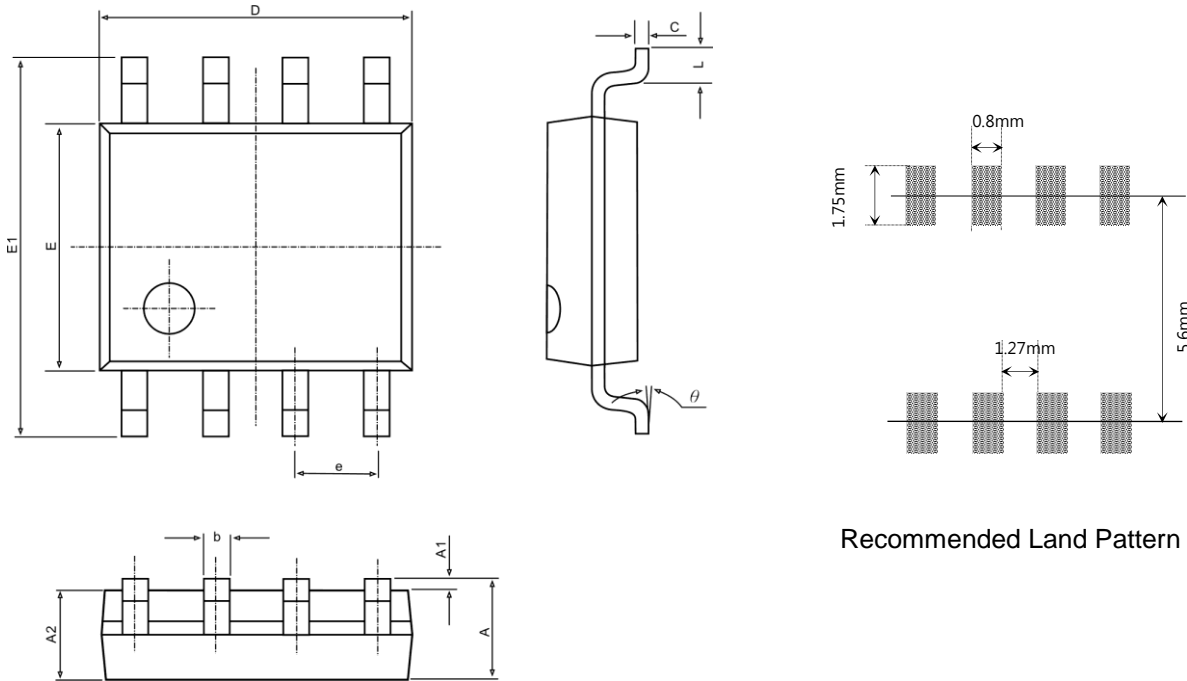
## TYPICAL CHARACTERISTICS



## TYPICAL CHARACTERISTICS



## ■ SOP-8 PACKAGE DIMENSIONS



Recommended Land Pattern

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.040.	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.130	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270BSC.		0.050BSC.	
L	0.400	1.270	0.016	0.005
Θ	0°	8°	0°	8°