

## Single N-Channel MOSFET

### DESCRIPTION

SMC3240H is the N-Channel enhancement mode power field effect transistors, provide superior fast switching performance and withstand high energy pulse in the avalanche and commutation mode.

### PART NUMBER INFORMATION

**SMC 3240 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

### FEATURES

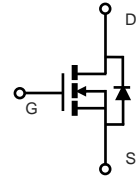
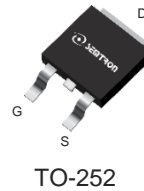
**$V_{DS}=30V, I_D=53A$**

$R_{DS(ON)}=7m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)}=9m\Omega(Typ.)@V_{GS}=4.5V$

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

### APPLICATIONS

- ◆ DC/DC Converter
- ◆ Power Management



### 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 <sup>*</sup>	$T_C=25^\circ C$	53
		$T_C=100^\circ C$	33.4
$I_{DM}$	Pulsed Drain Current <sup>B</sup>	160	A
$I_D$	Continuous Drain Current	$T_A=25^\circ C$	21
		$T_A=70^\circ C$	17
$P_D$	Power Dissipation <sup>A</sup>	$T_A=25^\circ C$	6.3
		$T_A=70^\circ C$	4
$I_{AS}$	Single Pulse Avalanche Current <sup>B</sup>	30	A
$E_{AS}$	Single Pulse Avalanche energy $L=0.1mH$ <sup>BE</sup>	45	mJ
$P_D$	Power Dissipation <sup>C</sup>	$T_C=25^\circ C$	39
		$T_C=100^\circ C$	15.6
$T_J$	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>A</sup>		20	$^\circ C/W$
	Thermal Resistance Junction to Ambient <sup>AC</sup>		50	
$R_{\theta JC}$	Thermal Resistance Junction to Case	Steady-State	3.2	

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C Unless otherwise noted)

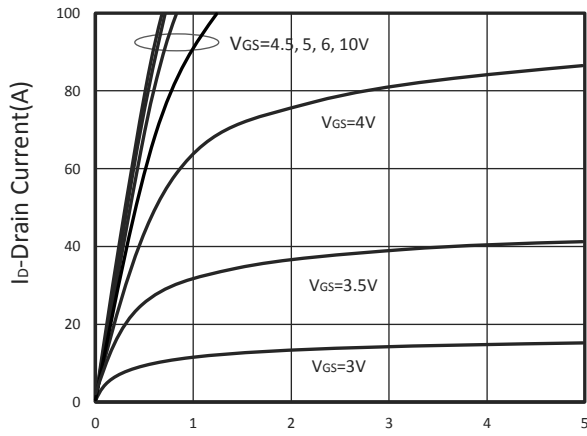
Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2	1.5	2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±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°C			1	μA
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V, T <sub>J</sub> =75°C			10	
R <sub>DS(ON)</sub>	Drain-source On-Resistance <sup>D</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		7	8.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A		9	12	
G <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =10A		14		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			1	V
I <sub>S</sub>	Diode Continuous Forward Current				53	A
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =10A, di/dt=100A/μs		9		ns
Q <sub>rr</sub>	Reverse Recovery Charge			3.2		nC
<b>Dynamic and Switching Parameters <sup>F</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =10A		16.9		nC
Q <sub>g</sub>	Total Gate Charge (4.5V)			7.9		
Q <sub>gs</sub>	Gate-Source Charge			3.7		
Q <sub>gd</sub>	Gate-Drain Charge			3.2		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		955		pF
C <sub>oss</sub>	Output Capacitance			138		
C <sub>rss</sub>	Reverse Transfer Capacitance			110		
R <sub>g</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		2.5		Ω
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω I <sub>D</sub> =1A		5	8.7	nS
t <sub>r</sub>				9.6	18	
t <sub>d(off)</sub>	Turn-Off Time			28	53	
t <sub>f</sub>				8	15	

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

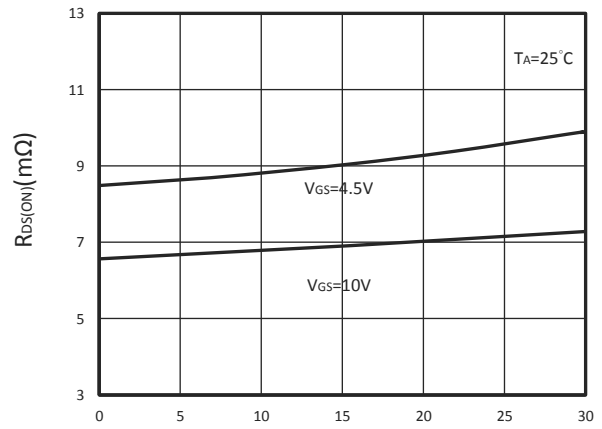
- A. Surface mounted on FR4 board using 1 in<sup>2</sup> pad size.
- B. Pulsed width limited by maximum junction temperature, T<sub>J(MAX)</sub>=150°C (initial temperature T<sub>J</sub>=25°C).
- C. Using ≤ 10s junction-to-ambient thermal resistance is base on T<sub>J(MAX)</sub>=150°C.
- D. Pulse test width ≤300μs and duty cycle ≤ 2%.
- E. The EAS data shows maximum, The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=30A
- F. Guaranteed by design, not subject to production testing.
- \*. The maximum rating current limited by package.

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.

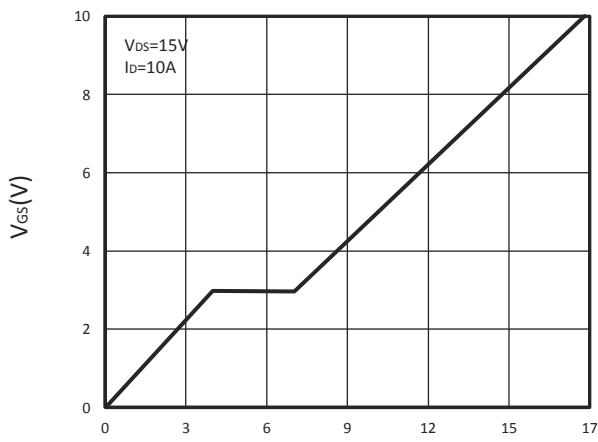
## TYPICAL CHARACTERISTICS



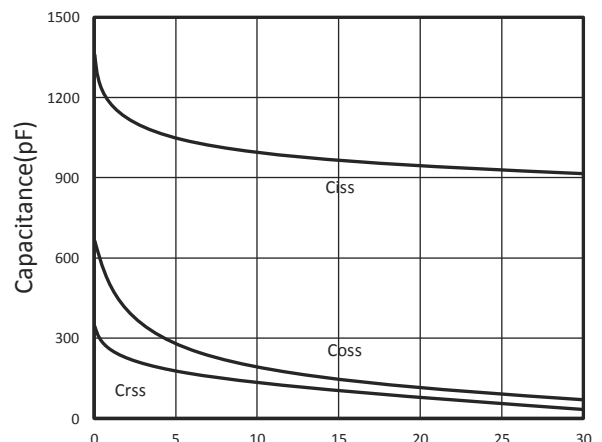
**Output Characteristics**



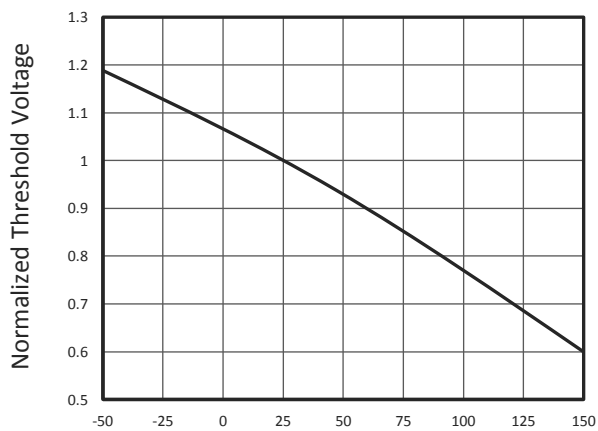
**Drain-Source On Resistance**



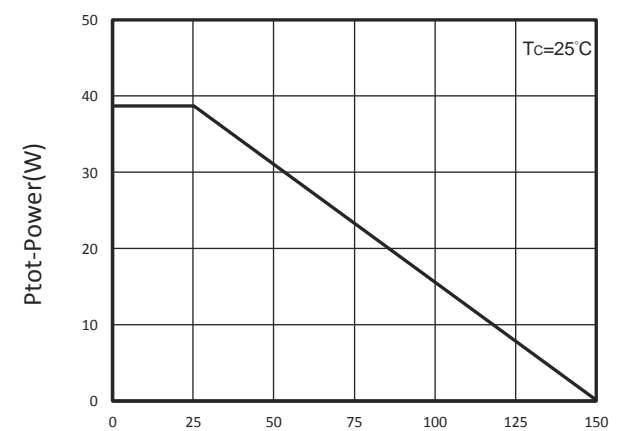
**Gate Charge**



**Capacitance**

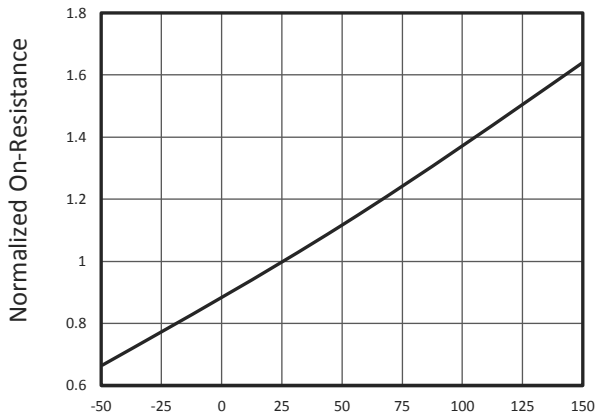


**Gate Threshold Voltage**

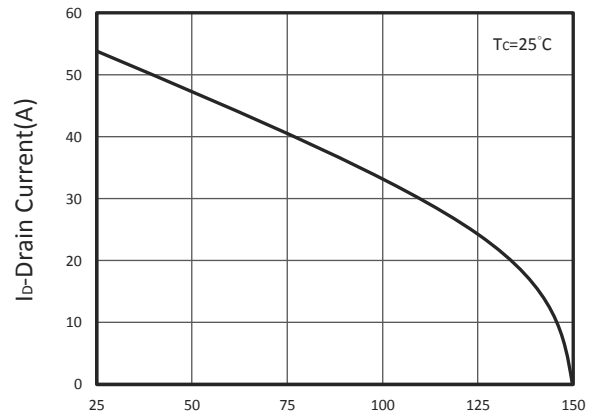


**Power Dissipation**

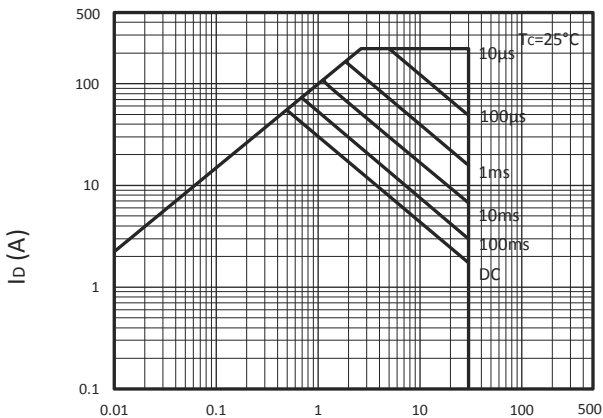
## TYPICAL CHARACTERISTICS



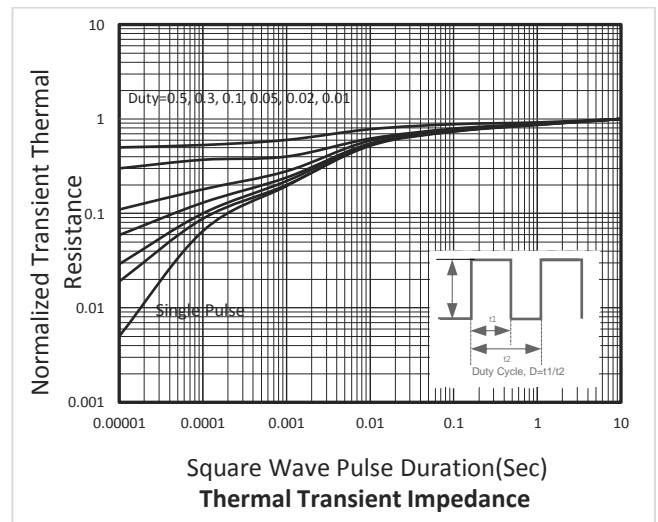
T<sub>J</sub>-Junction Temperature(°C)  
Drain-Source On Resistance



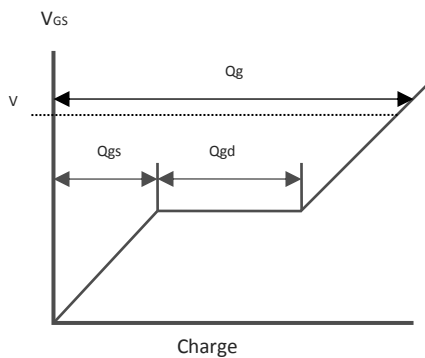
T<sub>C</sub>-Case Temperature(°C)  
Drain Current vs T<sub>C</sub>



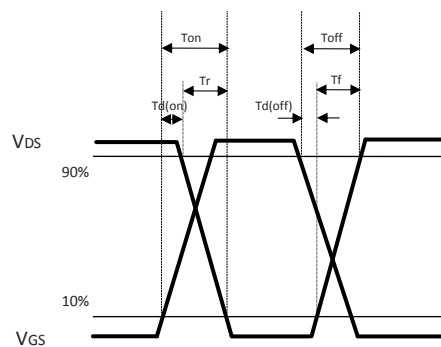
V<sub>DS</sub> Voltage (V)  
Maximum Safe Operation Area



Square Wave Pulse Duration(Sec)  
Thermal Transient Impedance

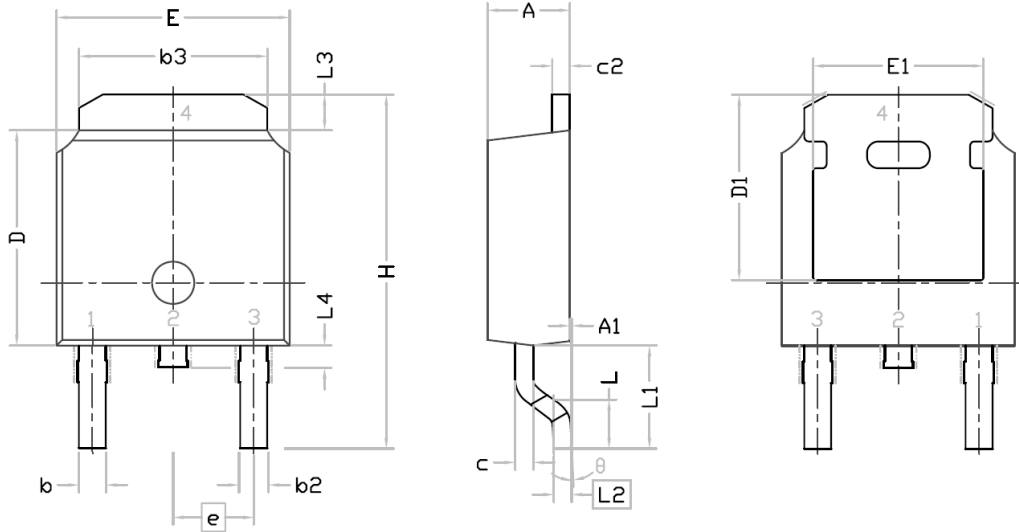


Gate Charge Waveform



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

