

Single N-Channel MOSFET

DESCRIPTION

SMC3216 is the N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced trench technology devices are well suited for high efficiency fast switching applications, low in-line power loss are needed in small outline surface mount package.

PART NUMBER INFORMATION

SMC 3216 K - TR G
 a b c d e

- a : Company name.
- b : Product Serial number.
- c : Package code K: SOT-89
- d : Handling code TR: Tape&Reel
- e : Green produce code G: *RoHS Compliant*

FEATURES

$V_{DS} = 30V, I_D = 7.5A$

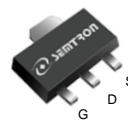
$R_{DS(ON)} = 17m\Omega (Typ.) @ V_{GS} = 10V$

$R_{DS(ON)} = 22m\Omega (Typ.) @ V_{GS} = 4.5V$

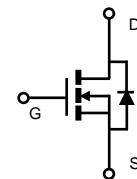
- ◆ Fast switch
- ◆ 100% EAS Guaranteed
- ◆ High power and current handling capability

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load Switch
- ◆ Battery Powered System



SOT-89



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	± 20	V
I_D	Continuous Drain Current	$T_A = 25^\circ C$	7.5
		$T_A = 70^\circ C$	6
I_{DM}	Pulsed Drain Current ^A	30	A
I_{AS}	Avalanche Current ^A	8	I_{AS}
EAS	Single Pulse Avalanche energy $L=0.3mH$ ^{AE}	9.6	EAS
P_D	Power Dissipation ^B	$T_A = 25^\circ C$	1.9
		$T_A = 70^\circ C$	1.2
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 ^B	$t \leq 10s$	40	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BC}	Steady-State	90	

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

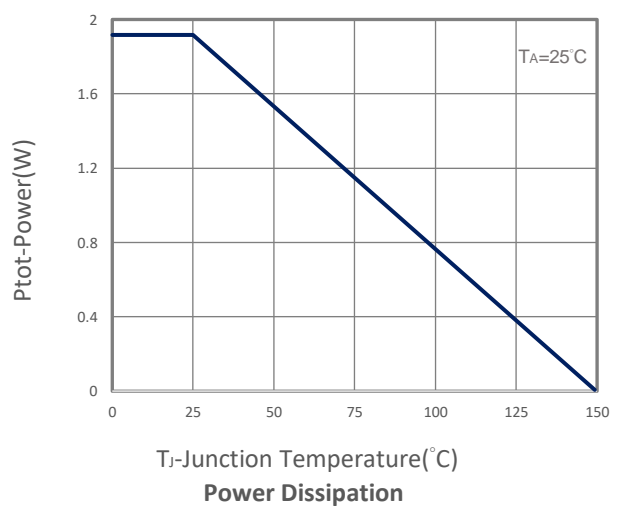
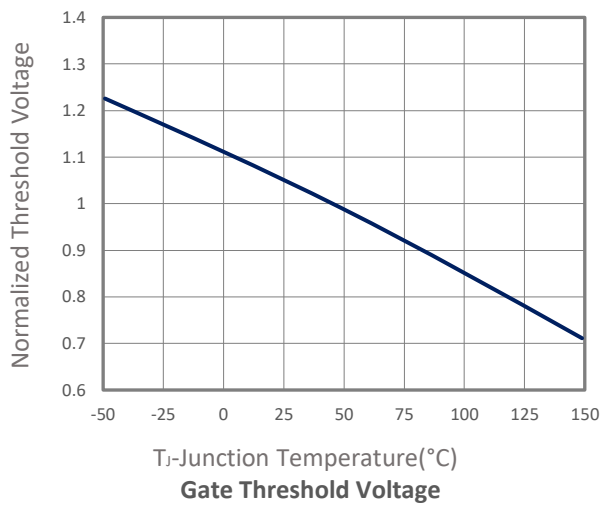
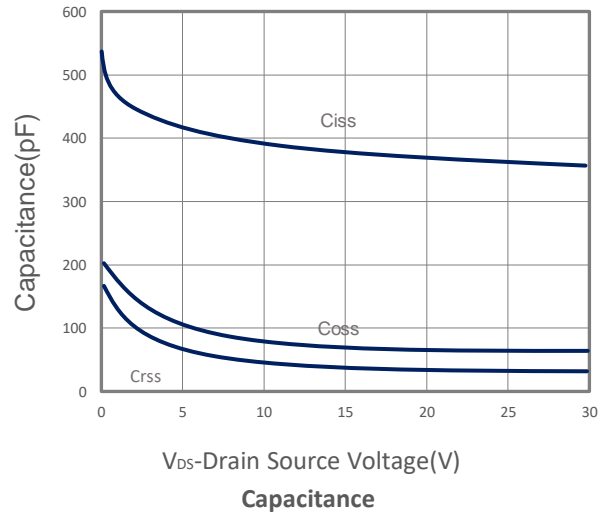
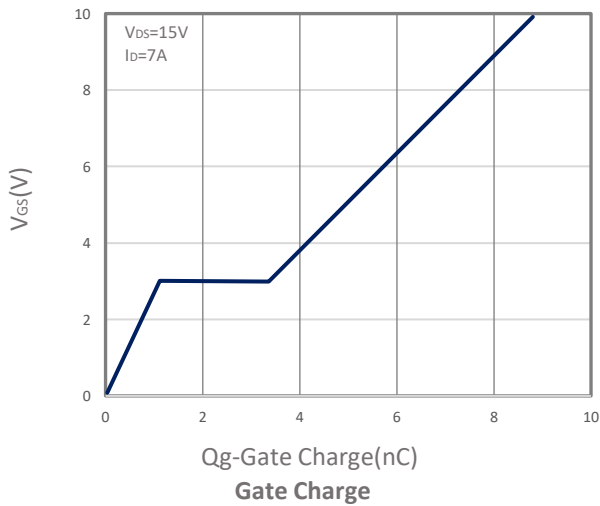
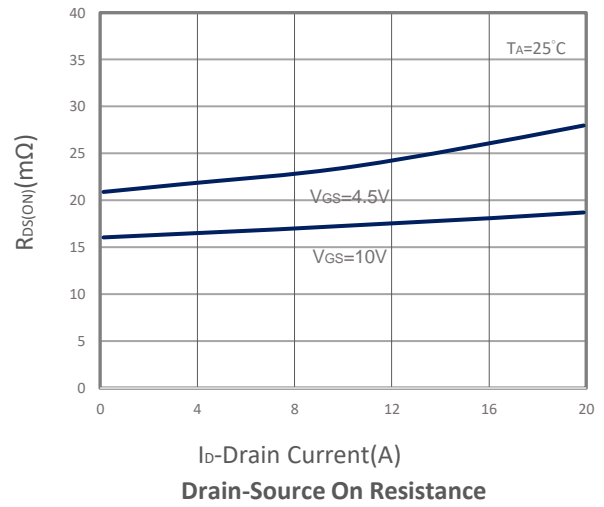
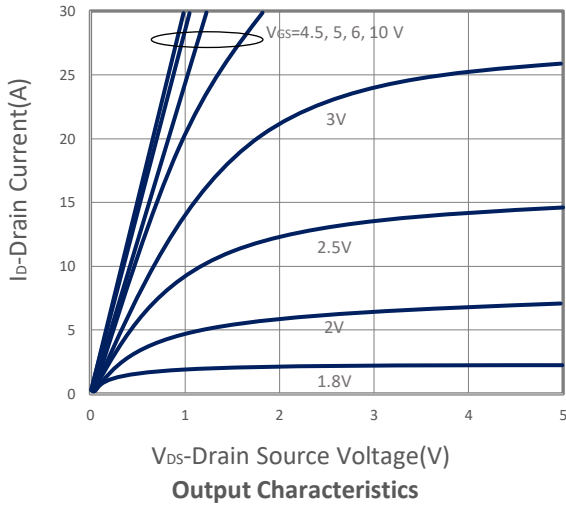
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μ A	1	1.6	2.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 20V			\pm 100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V, T _J =25 $^\circ$ C			1	μ A
		V _{DS} =24V, V _{GS} =0V, T _J =75 $^\circ$ C			10	
R _{DS(ON)}	Drain-source On-Resistance ^D	V _{GS} =4.5V, I _D =7.5A		17	22	m Ω
		V _{GS} =2.5V, I _D =4A		22	28	
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =7A		6.5		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage ^D	I _S =1A, V _{GS} =0V		0.7	1.0	V
I _S	Continuous Source Current				7.5	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =7A		8.6	12.1	nC
Q _g	Total Gate Charge (4.5V)			4.2	5.9	
Q _{gs}	Gate-Source Charge			1.1	1.5	
Q _{gd}	Gate-Drain Charge			2.1	2.9	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		380		pF
C _{oss}	Output Capacitance			60		
C _{rss}	Reverse Transfer Capacitance			35		
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		3.1		Ω
t _{d(on)}	Turn-On Time ^D	V _{DD} =15V, V _{GS} =10V, R _G =6 Ω , I _D =1A		3.2	6	nS
t _r				7.5	14	
t _{d(off)}	Turn-Off Time ^D			16	30	
t _f				4.2	8	

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

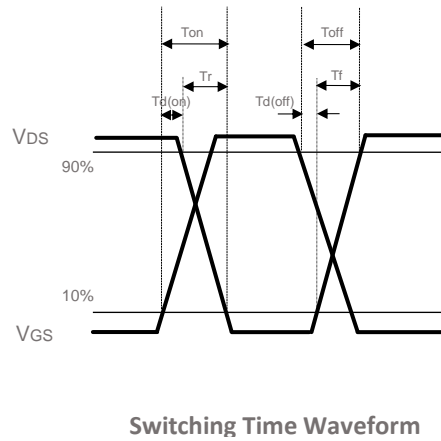
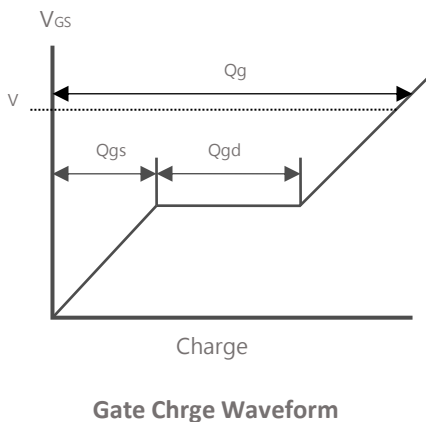
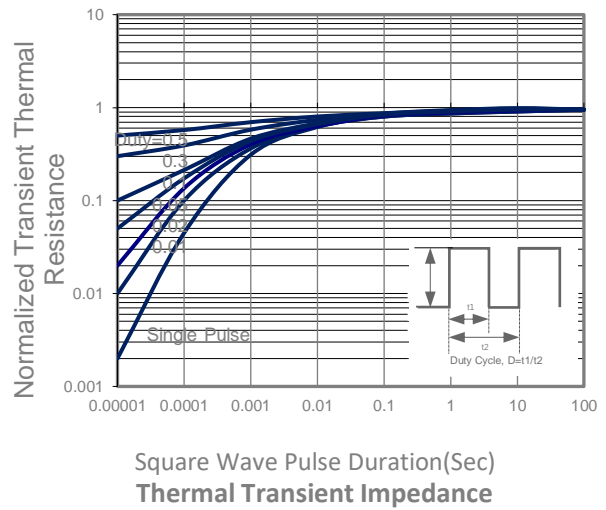
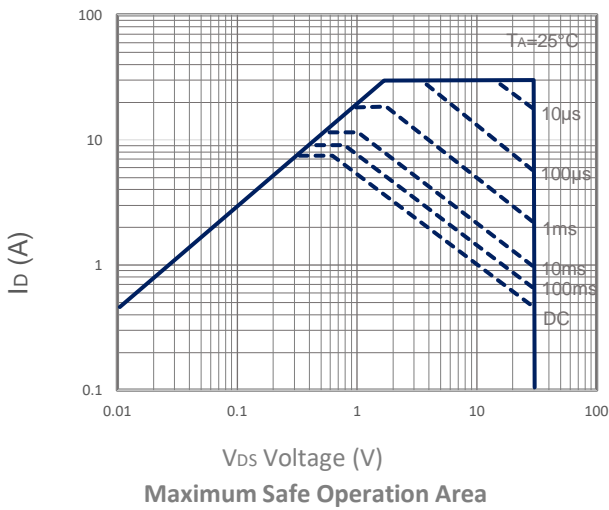
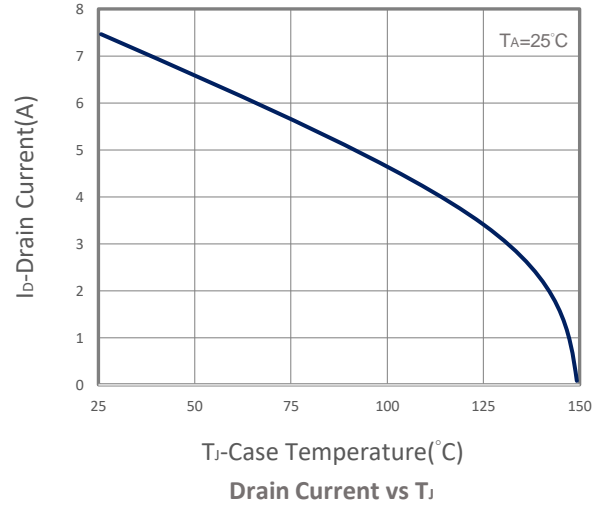
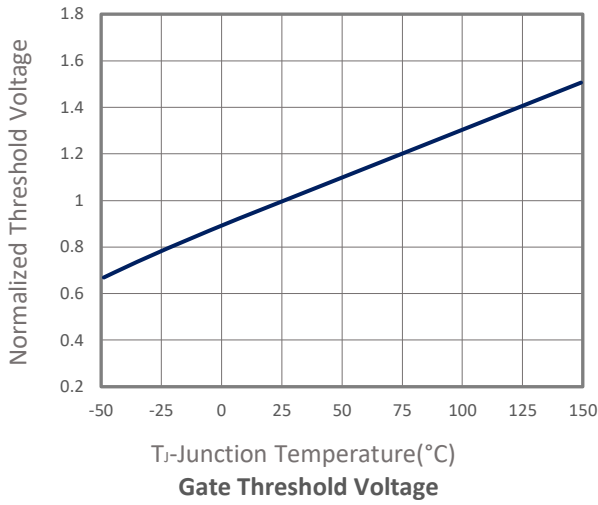
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150 $^\circ$ C.
- The value of R θ JA is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150 $^\circ$ C (initial temperature T_A=25 $^\circ$ C).
- T_{J(MAX)}=150 $^\circ$ C, using junction-to-case thermal resistance (R θ JC) is more useful in additional heat sinking is used.
- The data tested by pulsed, pulse width \leq 300 μ S, duty cycle \leq 2%.
- The EAS data shows Max, tested and pulse width limited by T_{J(MAX)}=150 $^\circ$ C (initial temperature T_J=25 $^\circ$ C).

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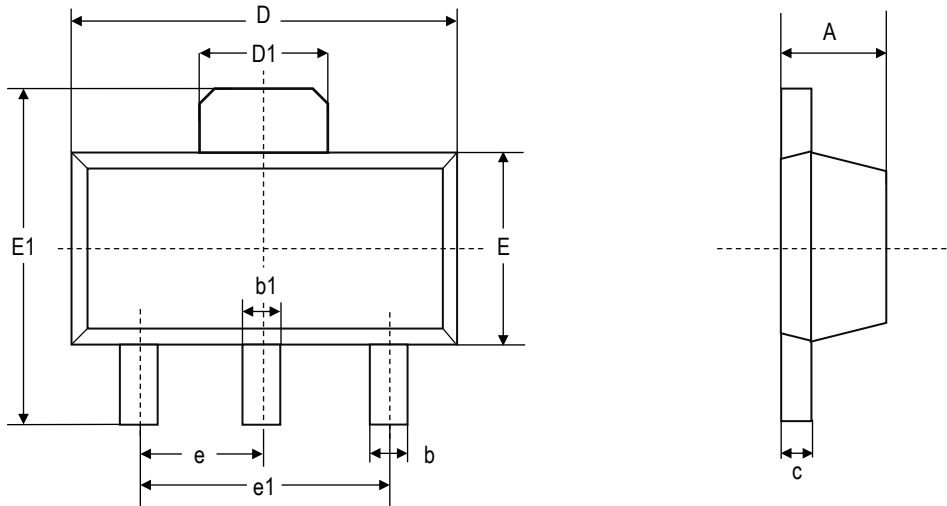
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



■ SOT-89 PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.440	1.540	0.567	0.606
b	0.350	0.450	0.138	0.177
b1	0.450	0.550	0.177	0.217
c	0.350	0.450	0.138	0.177
D	4.450	4.550	1.752	0.791
D1	1.650	1.750	0.650	0.689
E	2.450	2.550	0.965	1.004
E1	3.950	4.250	1.555	1.673
e	1.450	1.550	0.571	0.610
e1	2.900	3.100	1.142	1.220
L	0.900	1.200	0.354	0.472
θ	2°	10°	2°	10°