

Single N-Channel MOSFET

DESCRIPTION

SMC3232 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 **3232** **SN** - **TR** **G**
 a b c d e

- a : Company name.
- b : Product Serial number.
- c : Package code SN: SOT-23
- d : Handling code TR: Tape&Reel
- e : Green produce code G: *RoHS Compliant*

FEATURES

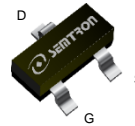
$V_{DS} = 30V, I_D = 5.5A$

$R_{DS(ON)}=22m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)}=32m\Omega(Typ.)@V_{GS}=4.5V$

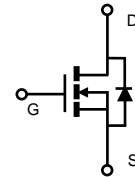
- ◆ Fast switch

APPLICATIONS

- ◆ Hand-Held Instruments
- ◆ Load Switch
- ◆ LED Applications



SOT-23



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	$T_A=25^\circ C$	5.5
		$T_A=70^\circ C$	4.4
I_{DM}	Pulsed Drain Current ^A	22	A
I_{AS}	Avalanche Current ^A	8	A
E_{AS}	Single Pulse Avalanche energy $L=0.1mH$ ^{AD}	3.2	mJ
P_D	Power Dissipation ^B	$T_A=25^\circ C$	1.3
		$T_A=70^\circ C$	0.84
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	$t \leq 10s$	95	$^\circ C/W$
	Thermal Resistance Junction to Ambient ^{BC}	Steady-State	130	

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

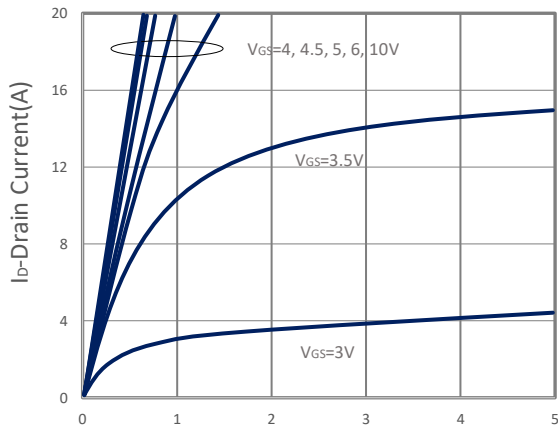
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Zero Gate 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	V _{GS} =10V, I _D =5.5A		22	26	mΩ
		V _{GS} =4.5V, I _D =3.6A		32	42	
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3A		6.8		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V			1	V
I _S	Continuous Source Current				2.8	A
Dynamic and Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =5A		7.6	10.6	nC
Q _g	Total Gate Charge(4.5V)			3.7	5.2	
Q _{gs}	Gate-Source Charge			1.5	2.1	
Q _{gd}	Gate-Drain Charge			1.6	2.2	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		300		pF
C _{oss}	Output Capacitance			55		
C _{rss}	Reverse Transfer Capacitance			42		
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.1		Ω
t _{d(on)}	Turn-On Time	V _{DD} =15, V _{GEN} =10V, R _G =6Ω, I _D =1A		2.65	5	nS
t _r				8.5	16	
t _{d(off)}	Turn-Off Time			18.2	35	
t _f				5	10	

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

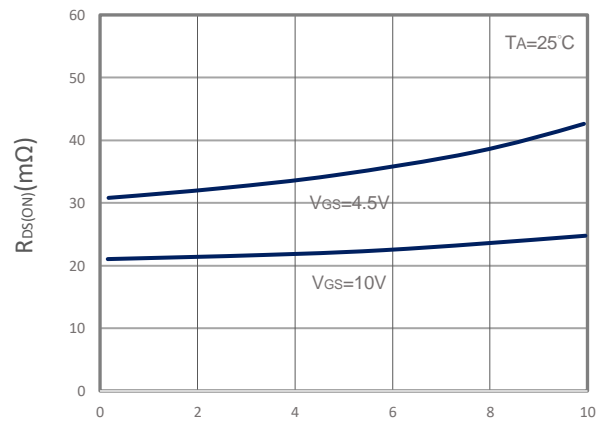
- Pulsed width limited by maximum junction temperature, T_{J(MAX)}=150°C.
- The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board in a still air environment with maximum junction temperature T_{J(MAX)}=150°C (initial temperature T_A=25°C).
- T_{J(MAX)}=150°C, using junction-to-case thermal resistance (R_{θJC}) is more useful in additional heat sinking is used.
- The EAS data shows Max, tested and pulse width limited by T_{J(MAX)}=150°C (initial temperature T_J=25°C).

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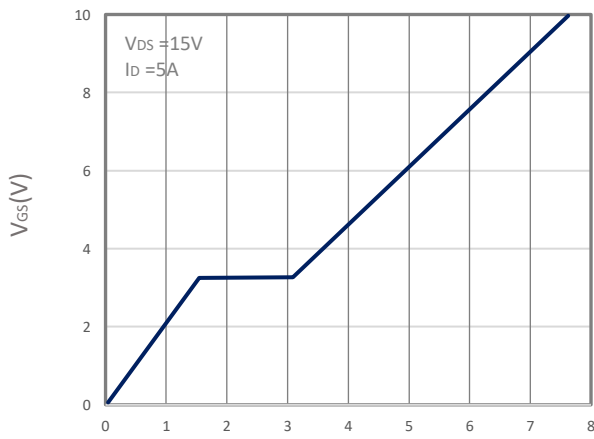
TYPICAL CHARACTERISTICS



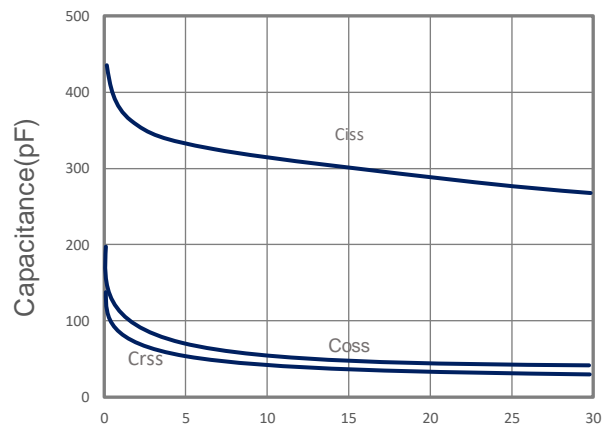
Output Characteristics



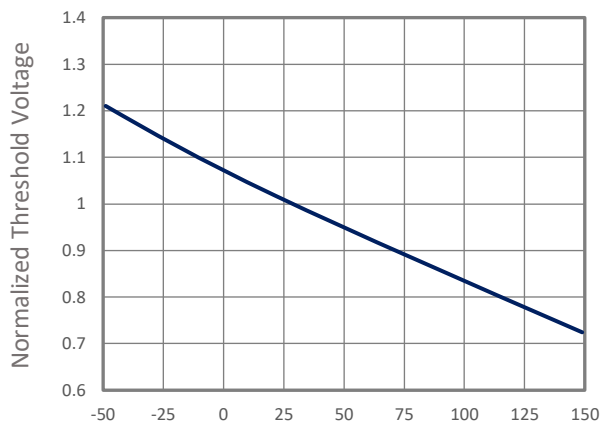
Drain-Source On Resistance



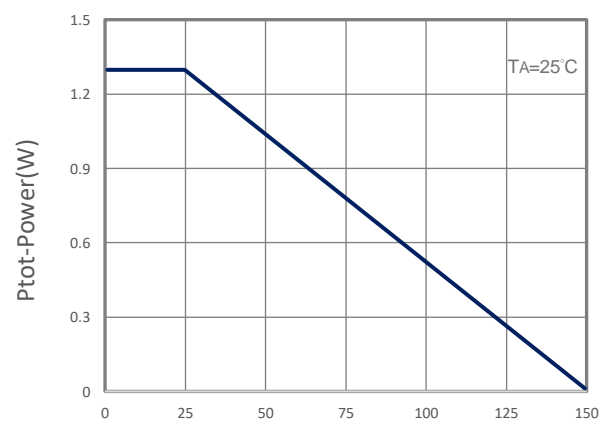
Gate Charge



Capacitance

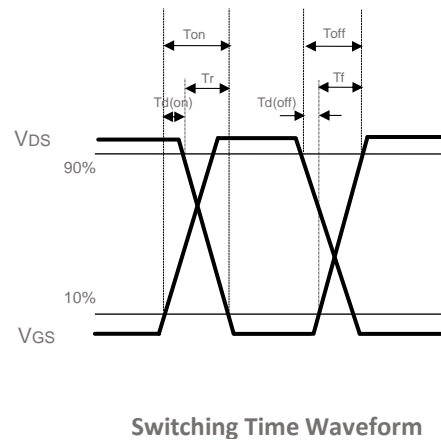
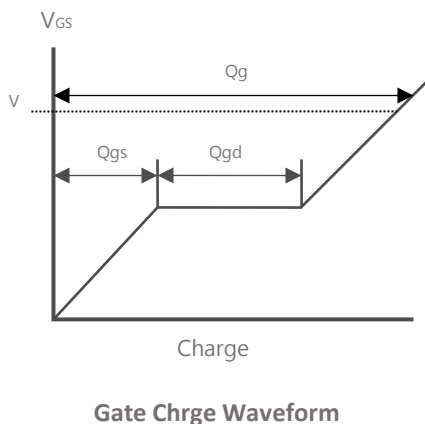
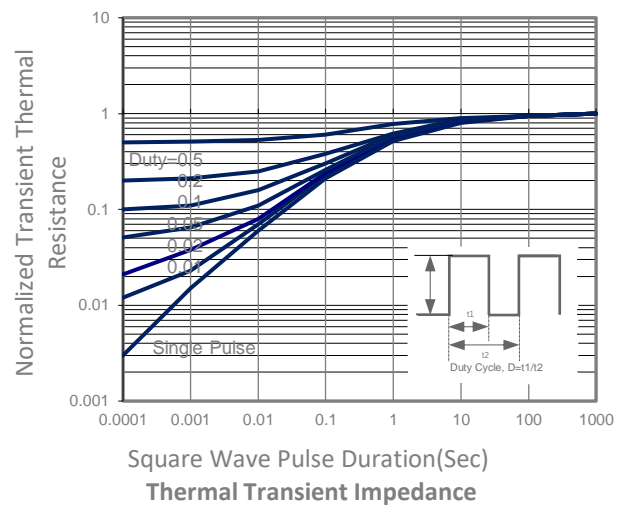
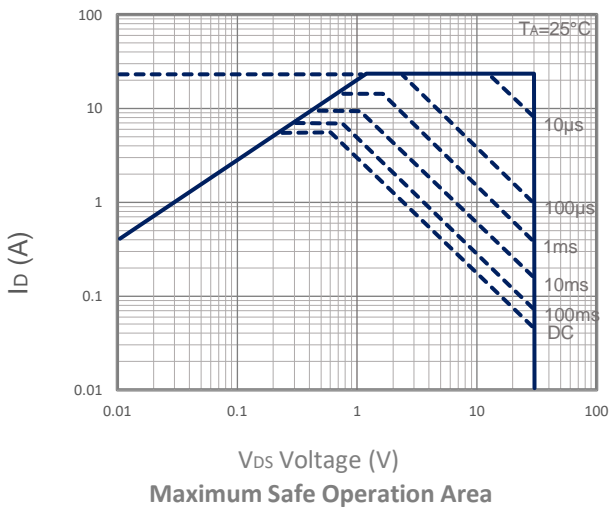
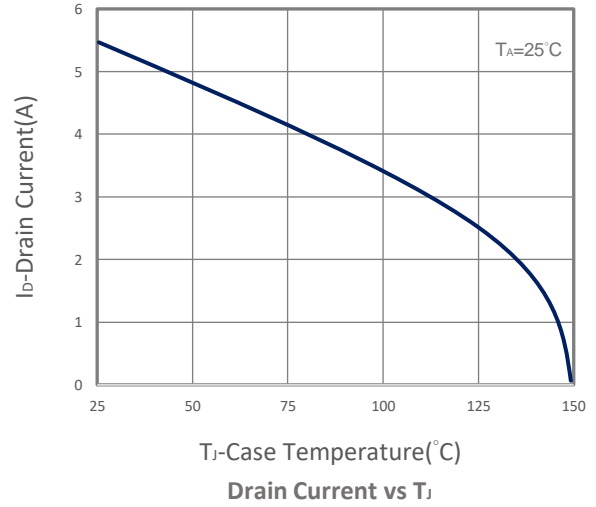
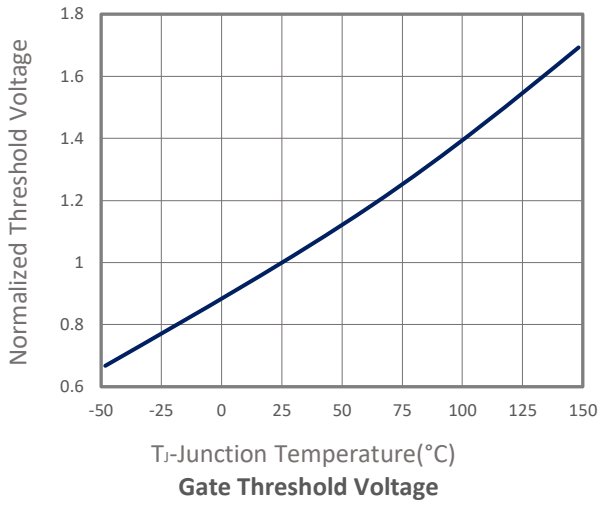


Gate Threshold Voltage

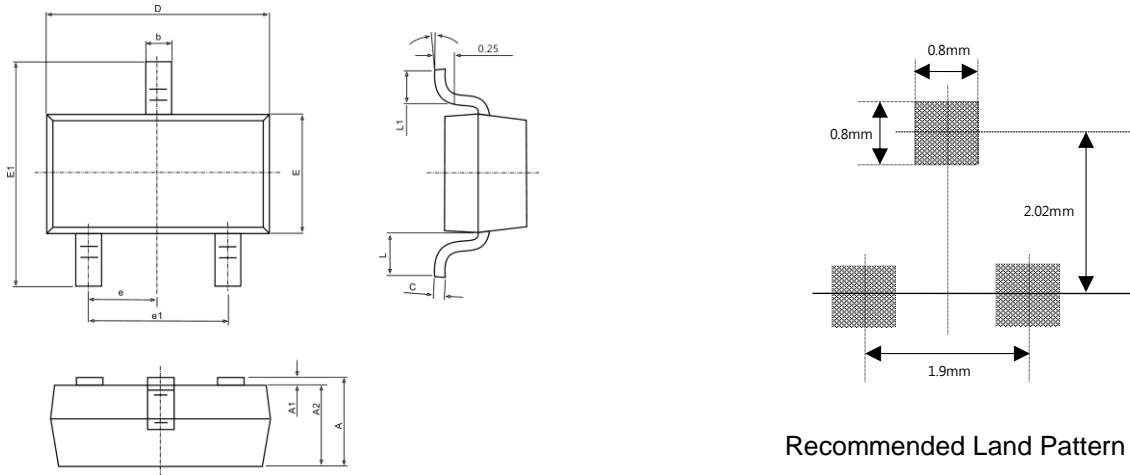


Power Dissipation

TYPICAL CHARACTERISTICS



■ SOT-23 PACKAGE DIMENSIONS



Recommended Land Pattern

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°