

Single N-Channel MOSFET

DESCRIPTION

SMC3332 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 3332 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

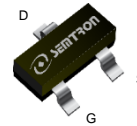
$V_{DS} = 30V, I_D = 5.5A$

$R_{DS(ON)}=22m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)}=26m\Omega(Typ.)@V_{GS}=4.5V$
 $R_{DS(ON)}=40m\Omega(Typ.)@V_{GS}=2.5V$

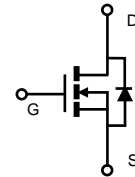
- ◆ Fast switch
- ◆ 2.5V Low gate drive applications
- ◆ 100% EAS Guaranteed

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	± 12	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 ^C	12	A
EAS	Single Pulse Avalanche energy $L=0.1mH$ ^{AE}	7.2	mJ
P_D	Power Dissipation ^C	$T_A=25^\circ C$	1.3
		$T_A=70^\circ C$	0.8
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 ^{BD}	Steady-State	130	

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

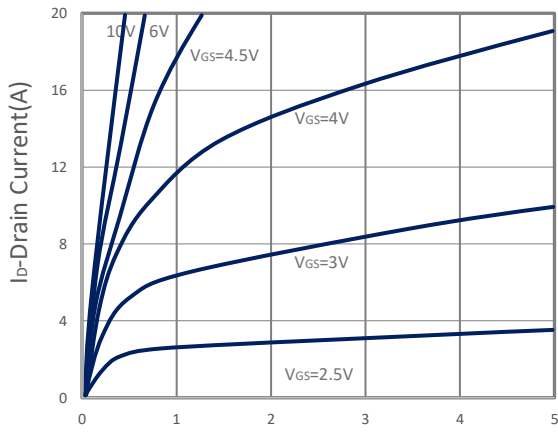
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	30			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 μ A	0.5	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} = \pm 12V			\pm 100	nA
I _{DSS}	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	V _{GS} =10V, I _D =5.5A		22	26	m Ω
		V _{GS} =4.5V, I _D =3.6A		26	32	
		V _{GS} =2.5V, I _D =2.5A		40	43	
G _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3A		7		S
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.75	1	V
I _S	Continuous Source Current				2.8	A
Dynamic and Switching Parameters						
Q _g (10V)	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _D =5A		10.7	14.9	nC
Q _g (4.5V)	Total Gate Charge			5.2	7	
Q _{gs}	Gate-Source Charge			1.4	2	
Q _{gd}	Gate-Drain Charge			1.8	2.5	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz		432		pF
C _{oss}	Output Capacitance			80		
C _{rss}	Reverse Transfer Capacitance			60		
t _{d(on)}	Turn-On Time	V _{DD} =15, V _{GEN} =10V, R _G =6 Ω , I _D =1A		3.8	7	nS
t _r				12	23	
t _{d(off)}	Turn-Off Time			24	46	
t _f				8	15	

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

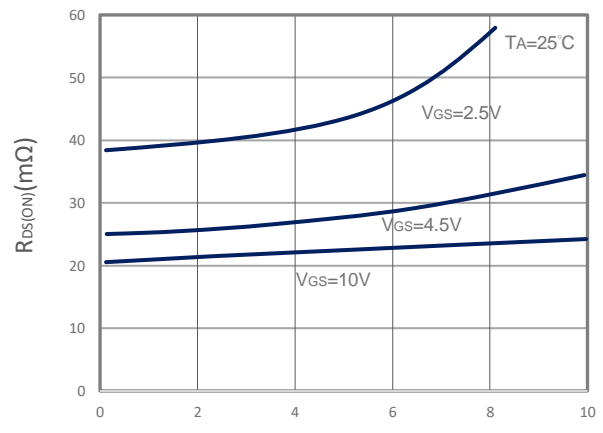
- Pulsed width limited by maximum junction temperature T_{J(MAX)}=150 $^\circ$ C, initial temperature T_J=25 $^\circ$ C.
- Measure the value in a still air environment at T_A=25 $^\circ$ C using an installation mounted on a 1 in2 FR-4 board.
- Current Rating based t \leq 10 sec thermal resistance rating.
- The R θ J_A is the sum of the thermal resistance.
- The EAS data shows Maximum, tested and pulse width limited by maximum.

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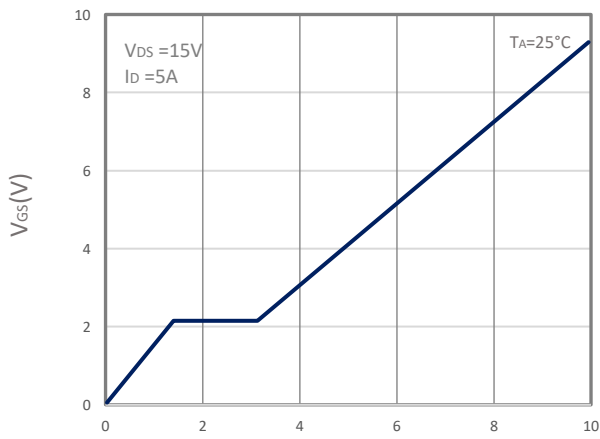
TYPICAL CHARACTERISTICS



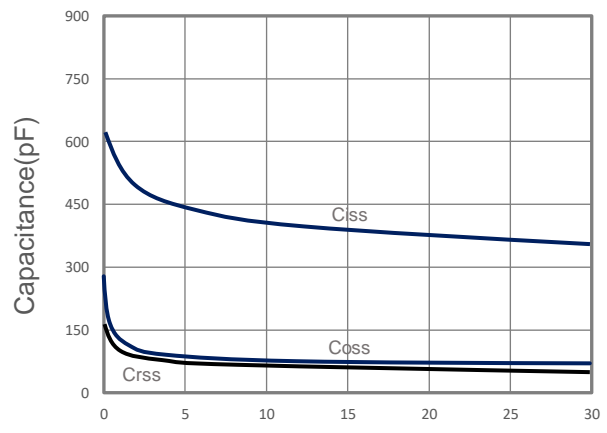
Output Characteristics



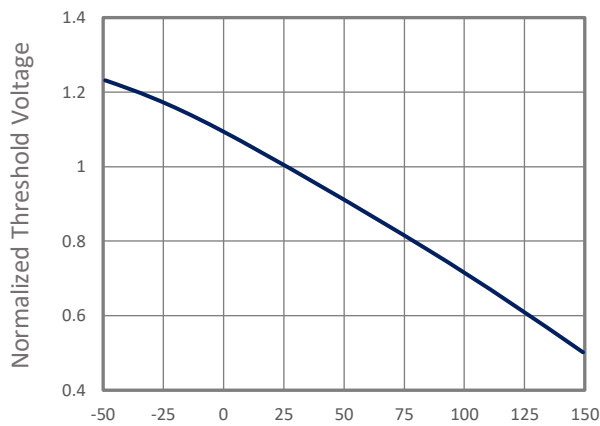
Drain-Source On Resistance



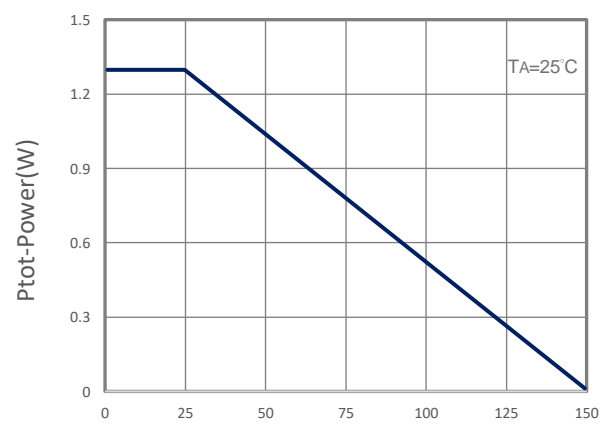
Gate Charge



Capacitance

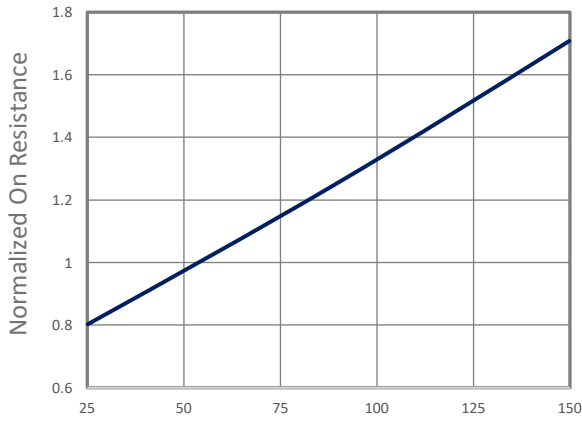


Gate Threshold Voltage

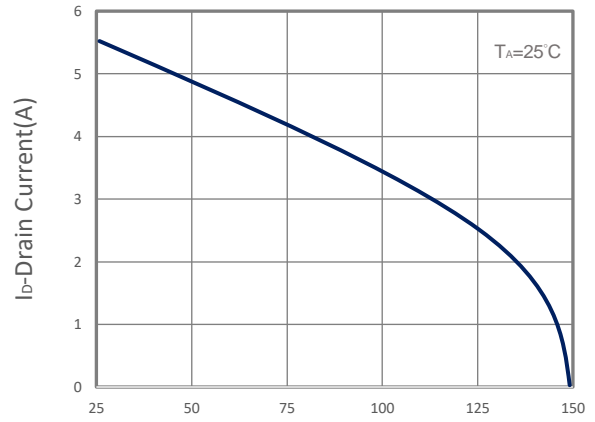


Power Dissipation

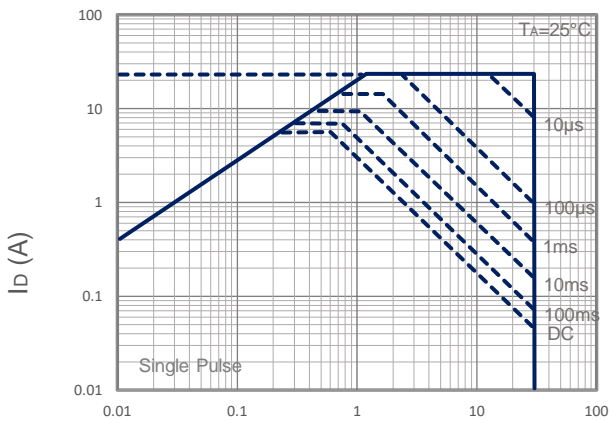
TYPICAL CHARACTERISTICS



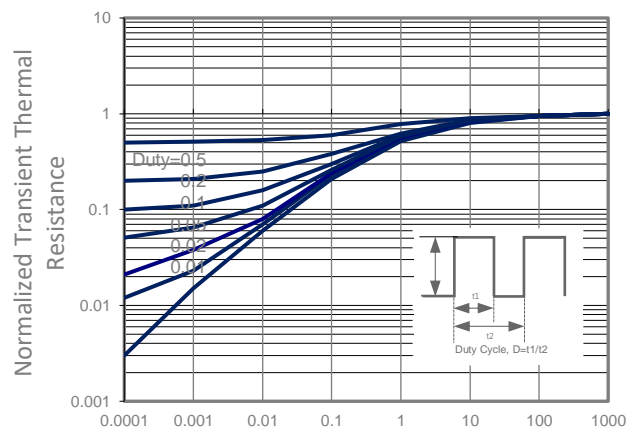
$R_{DS(ON)}$ vs Junction Temperature



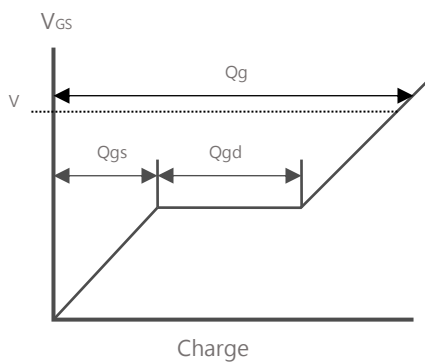
Drain Current vs T_j



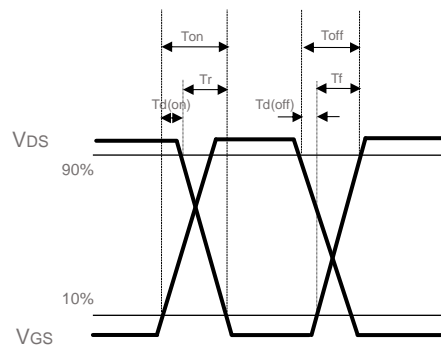
Maximum Safe Operation Area



Thermal Transient Impedance

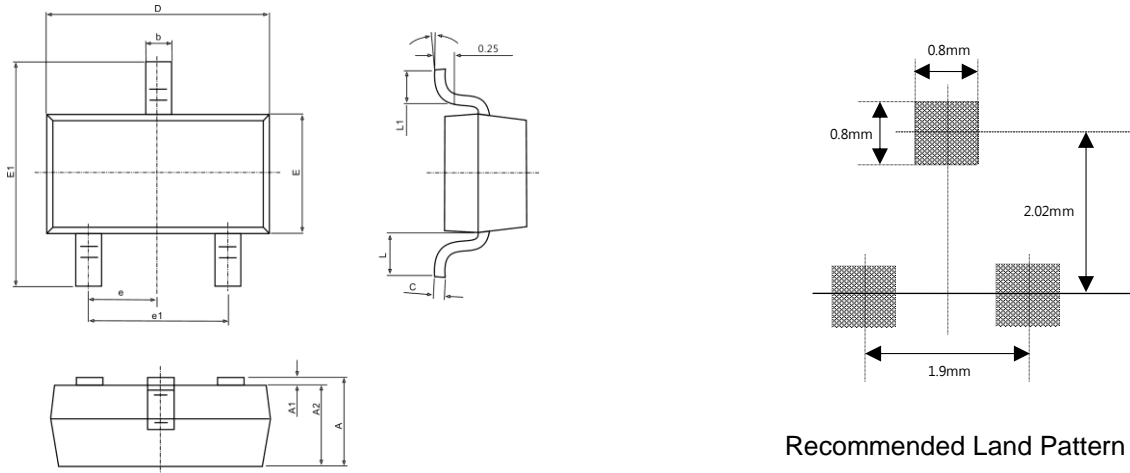


Gate Charge Waveform



Switching Time Waveform

SOT-23 PACKAGE DIMENSIONS



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°