SemTron Microtech Corporation

SMC3327SN

Single P-Channel MOSFET

■DESCRIPTION

SMC3327 is the P-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 needed in small outline surface mount package.

■FEATURES

V_{DS} = -30V, I_D = -4A

$R_{DS(ON)}$=45mΩ(Typ.)@V_{GS}=-10V
$R_{DS(ON)}$=52mΩ(Typ.)@V_{GS}=-4.5V
$R_{DS(ON)}$=68mΩ(Typ.)@V_{GS}=-2.5V

◆Fast switch
◆2.5V Low gate drive applications

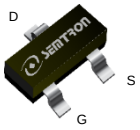
■PART NUMBER INFORMATION

SMC	3327	SN	-	TR	G
a	b	c		d	e

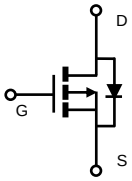
a : Company name.
b : Product Serial number.
c : Package code SN: SOT-23
d : Handling code TR: Tape&Reel
e : Green produce code G: *RoHS Compliant*

■APPLICATIONS

◆Portable Equipment
◆Power Management



SOT-23



■ABSOLUTE MAXIMUM RATINGS (T_A = 25°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°C	-4	A
		T_A=70°C	-3.1	A
I_{DM}	Pulsed Drain Current [A]		-16	A
P_D	Power Dissipation [C]	T_A=25°C	1.3	W
		T_A=70°C	0.8	W
T_J	Operation Junction Temperature		-55/150	°C
T_{STG}	Storage Temperature Range		-55/150	°C

■THERMAL RESISTANCE

Symbol	Parameter		Typ	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to Ambient [B]	t≦10s		95	°C/W
	Thermal Resistance Junction to Ambient [BD]	Steady-State		130	

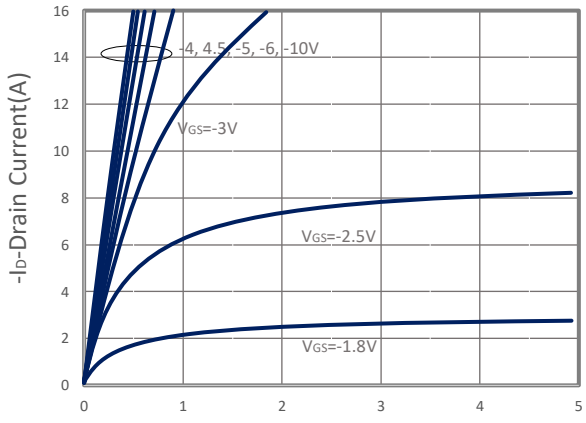
■ELECTRICAL CHARACTERISTICS(T_A = 25°C Unless otherwise noted)

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	-0.5	-0.7	-1	V
I_{GSS}	Gate Leakage Current	V_{DS} =0V, V_{GS}=±12V			±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=-4A V_{GS}=-4.5V, I_D=-3A V_{GS}=-2.5V, I_D=-2.2A		45 52 68	54 62 85	mΩ
G_{fs}	Forward Transconductance	V_{DS} =-10V, I_D=-7A		5.7		S
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V		-0.7	-1	V
I_S	Continuous Source Current				-4	A
Dynamic and Switching Parameters						
Q_g	Total Gate Charge	V_{DS}=-15V, V_{GS}=-10V, I_D=-4A		16.8	23.5	nC
Q_g	Total Gate Charge(4.5V)			8.2	11.5	
Q_{gs}	Gate-Source Charge			2	2.8	
Q_{gd}	Gate-Drain Charge			1.5	2.1	
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz		805		pF
C_{oss}	Output Capacitance			87		
C_{rss}	Reverse Transfer Capacitance			48		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V, V_{GEN}=-10V R_G=6Ω, I_D=-1A		5.6	11	nS
t_r				8.2	16	
$t_{d(off)}$	Turn-Off Time			36.5	69	
t_f				9.6	18	

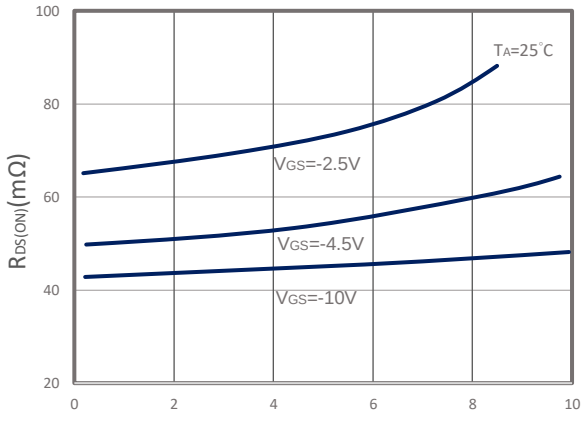
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

A. Pulsed width limited by maximum junction temperature, $T_{J(MAX)}$=150°C.
B. Measure the value in a still air environment at T_A=25°C, using an installation mounted on a 1 in2 FR-4 board, maximum junction temperature $T_{J(MAX)}$=150°C.
C. $T_{J(MAX)}$=150°C,using junction-to-case thermal resistance ($R_{θJC}$) is more useful in additional heat sinking is used.

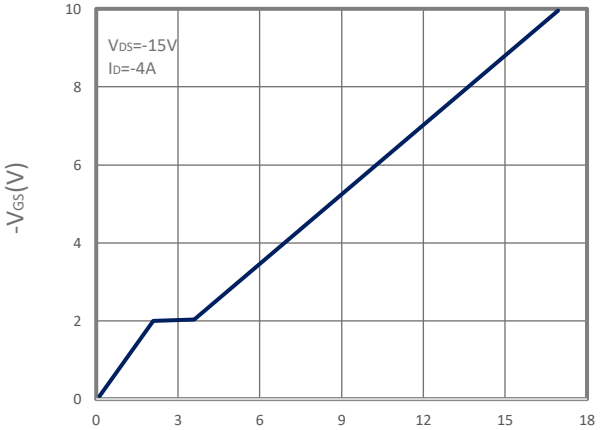
TYPICAL CHARACTERISTICS



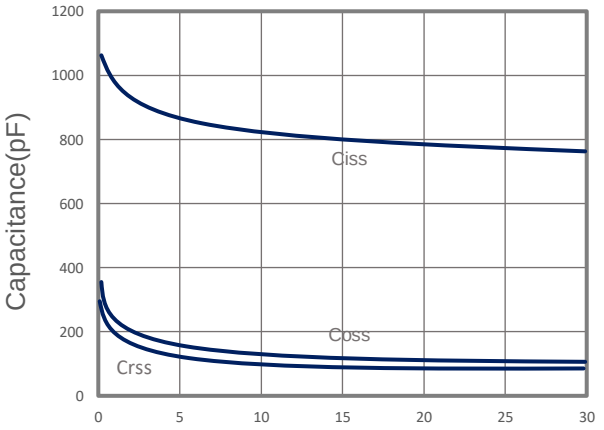
Output Characteristics



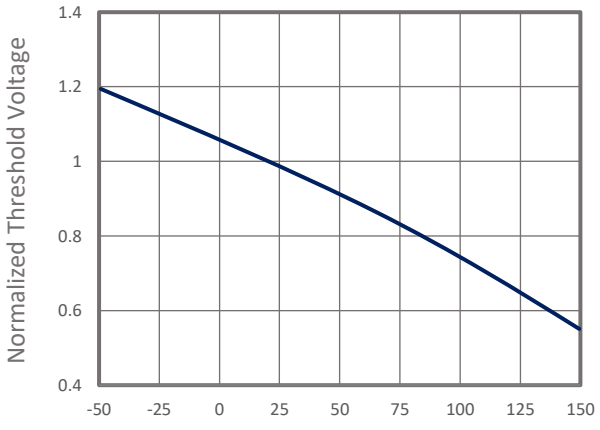
Drain-Source On Resistance



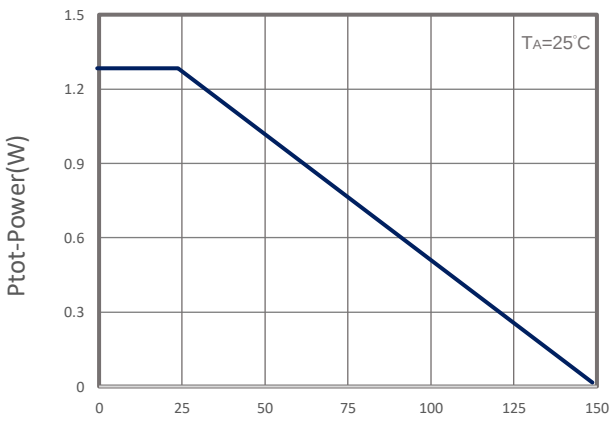
Gate Charge



Capacitance

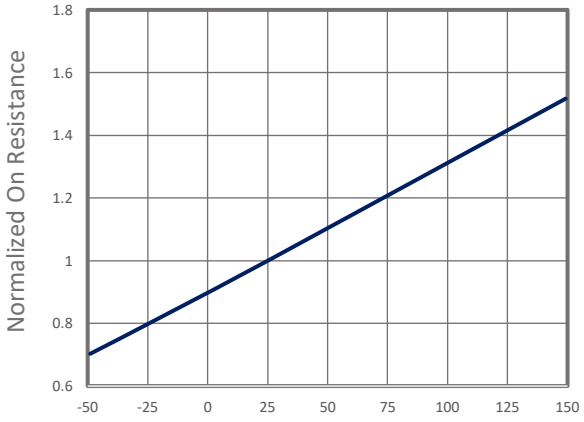


Gate Threshold Voltage



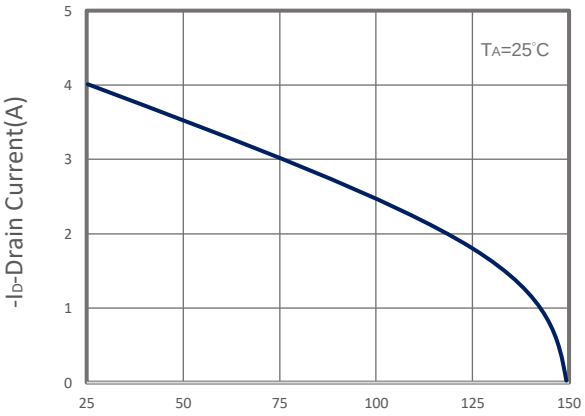
Power Dissipation

TYPICAL CHARACTERISTICS



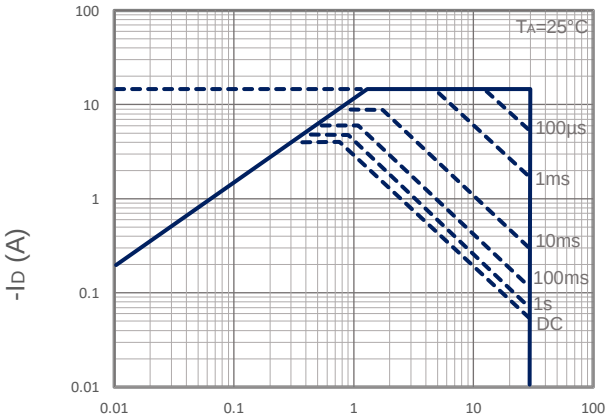
TJ-Junction Temperature(°C)

RDS(ON) vs Junction Temperature



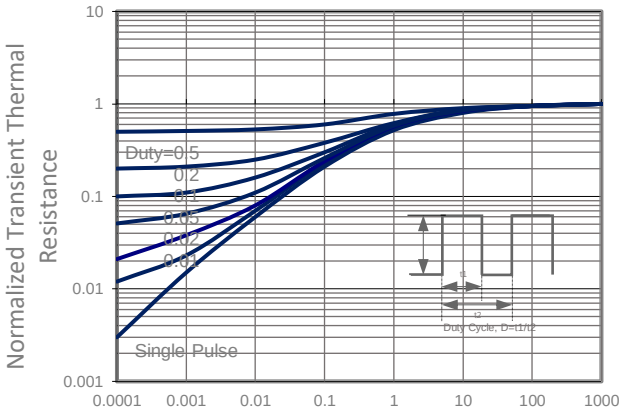
TJ-Case Temperature(°C)

Drain Current vs TJ



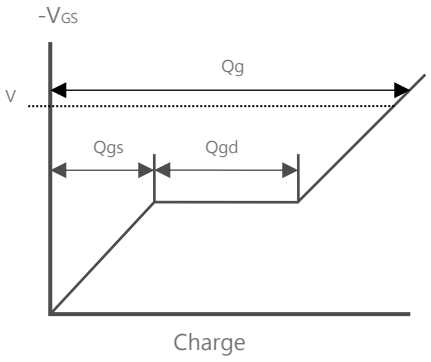
-VDS Voltage (V)

Maximum Safe Operation Area

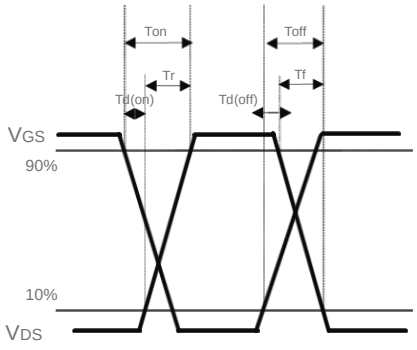


Square Wave Pulse Duration(Sec)

Thermal Transient Impedance

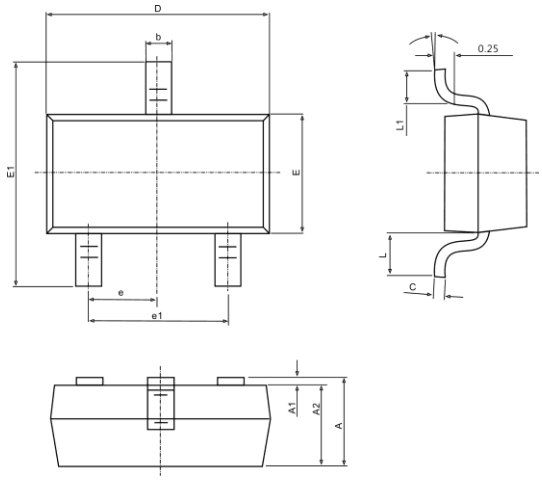


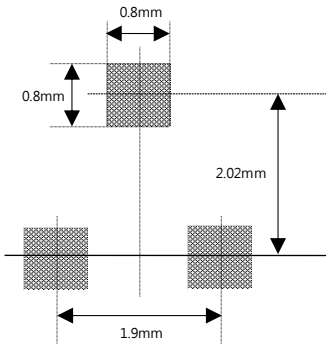
Gate Chrge Waveform



Switching Time Waveform

■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°