SMS501DE

0.03A , 600V , $R_{DS(ON)}$ 700Ω
N-Ch Enhancement Mode Power MOSFET

secos
Elektronische Bauelemente

RoHS Compliant Product
A suffix of “-C” specifies halogen free

DESCRIPTION

The SMS501DE is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications .

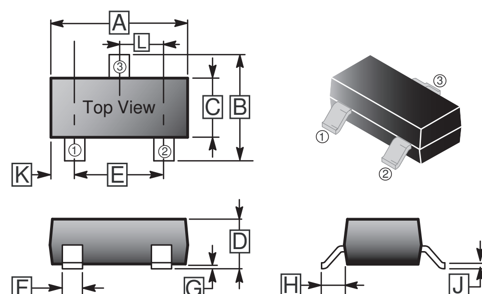
FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

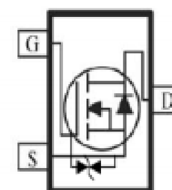
MARKING

501DE

SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.09	0.18
B	2.10	2.65	H	0.35	0.65
C	1.20	1.40	J	0.08	0.20
D	0.89	1.15	K	0.6 REF.	
E	1.78	2.04	L	0.95 BSC.	
F	0.30	0.50			



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	0.03	A
	T_C=100℃		0.024	A
Pulsed Drain Current		I_{DM}	0.12	A
Total Power Dissipation	T_C=25℃	P_D	0.5	W
	Derate above 25℃		0.004	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Thermal Resistance Rating				
Maximum Thermal Resistance Junction-Ambient		$R_{θJA}$	250	℃ / W
Maximum Thermal Resistance Junction-Case		$R_{θJC}$	50	℃ / W

ELECTRICAL CHARACTERISTICS (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	600	-	-	V	V_{GS}=5V, I_D= 250μA
Drain-Source Leakage Current	$I_{D(OFF)}$	-	-	0.1	μA	V_{GS}=5V, V_{DS}=600V
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Gate-Threshold Voltage	$V_{GS(th)}$	-2.7	-	-1	V	V_{DS}=3V, I_D=8μA
Drain-Source Leakage Current	I_{DSS}	12	-	-	mA	V_{DS}=25V, V_{GS}=0
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	310	700	Ω	V_{GS}=0V, I_D=3mA
		-	330	700		V_{GS}=10V, I_D=16mA
Total Gate Charge [1,2]	Q_g	-	1.8	-	nC	I_D=0.01A V_{DS}=4000V V_{GS}=5V
Gate-Source Charge [1,2]	Q_{gs}	-	0.75	-		
Gate-Drain Change [1,2]	Q_{gd}	-	0.56	-		
Turn-on Delay Time [1,2]	$T_{d(on)}$	-	18	-	nS	V_{DD}=300V I_D=0.01A V_{GS}=-5V V_{GS}=7V R_G=6Ω
Rise Time [1,2]	T_r	-	90	-		
Turn-off Delay Time [1,2]	$T_{d(off)}$	-	93	-		
Fall Time [1,2]	T_f	-	210	-		
Input Capacitance	C_{iss}	-	99	-	pF	V_{GS} =5V V_{DS}=25V f =1.0MHz
Output Capacitance	C_{oss}	-	9.1	-		
Reverse Transfer Capacitance	C_{rss}	-	5	-		
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	-	-	1.2	V	I_S=16mA, V_{GS}=5v
Continuous Source Current	I_S	-	-	0.03	A	Integral Reverse P-N Junction Diode in the MOSFET
Pulsed Source Current	I_{SM}	-	-	0.12	A	
Reverse Recovery Time	T_{rr}	-	-	367	ns	I_F=0.01A,V_R=300V, dI_F/dt=100A/μS
Reverse Recovery Charge	Q_{rr}	-	-	963	μC	

Notes:
1. Pulse Test: Pulse width ≦300μS, Duty cycle≦2%
2. Essentially independent of operating temperature.

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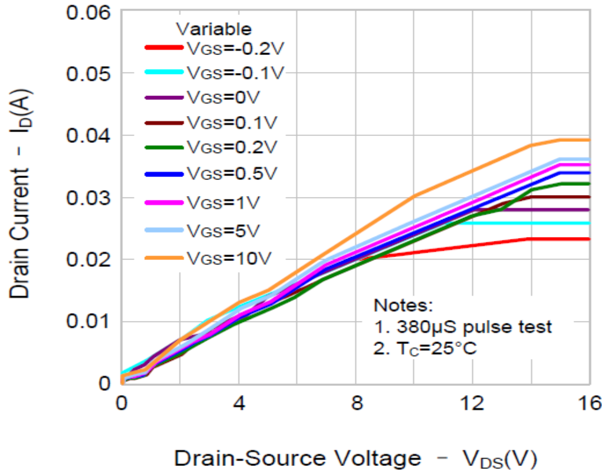
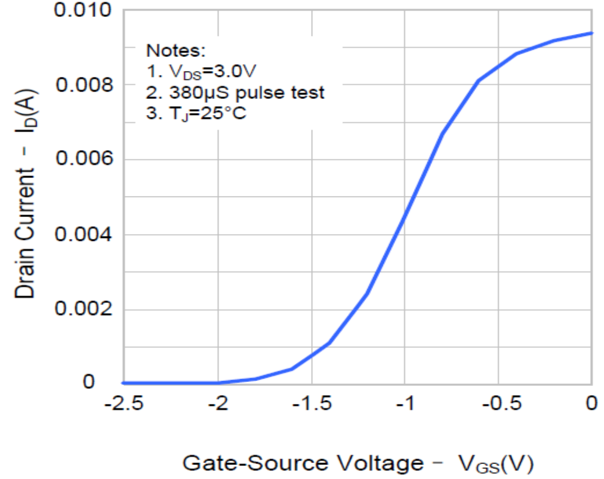
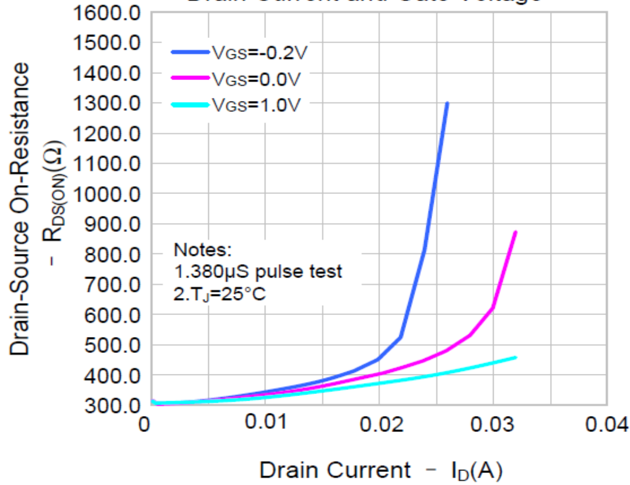
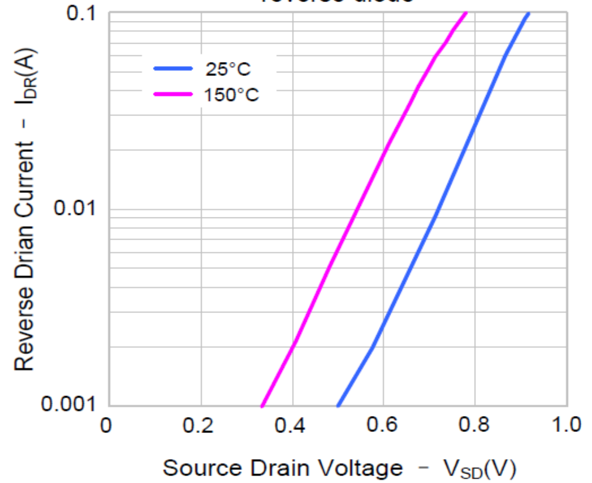
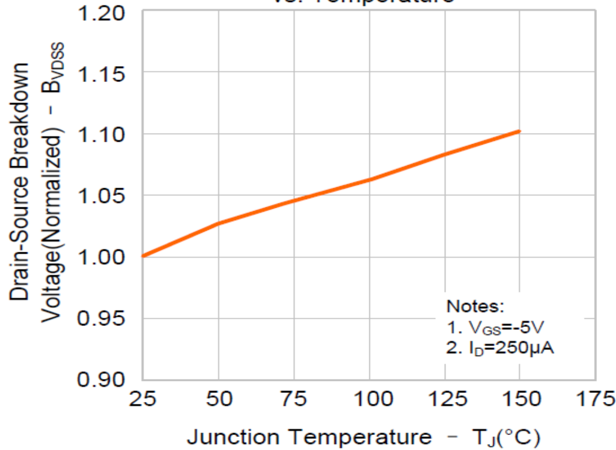
CHARACTERISTIC CURVES

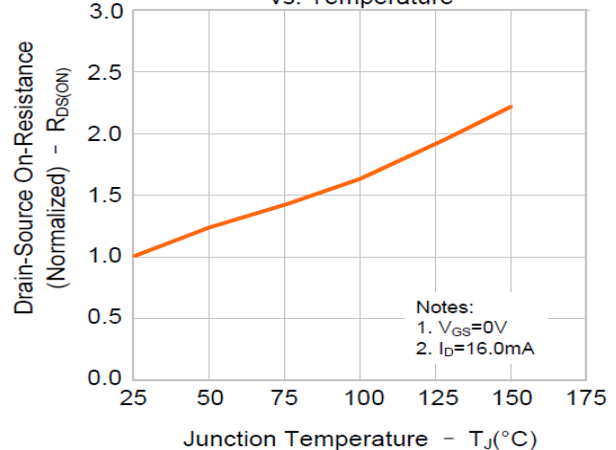












CHARACTERISTIC CURVES