Elektronische Bauelemente

SMS4002-C

5A, 40V, $R_{DS(ON)}$ 35mΩ
N-Ch Enhancement Mode Power MOSFET

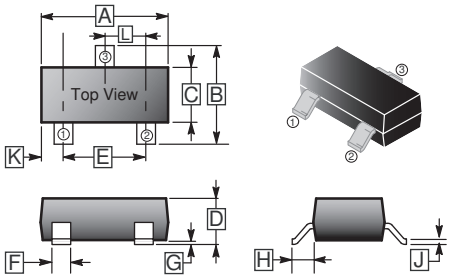
RoHS Compliant Product
A Suffix of "-C" specifies halogen & lead-free

FEATURES

The SMS4002-C 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 small power switching and load switch applications.

The SMS4002-C meet the RoHS and Green Product requirement with full function reliability approved.

SOT-23



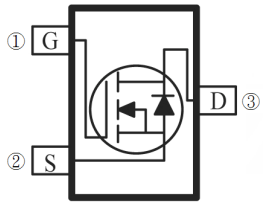
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0	0.18
B	2.10	2.95	H	0.55 REF.	
C	1.20	1.7	J	0.08	0.20
D	0.89	1.3	K	0.6 REF.	
E	1.70	2.3	L	0.95 BSC.	
F	0.30	0.50			

APPLICATION

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge
- Green Device Available

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch



ORDER INFORMATION

Part Number	Type
SMS4002-C	Lead (Pb)-free and Halogen-free

MAXIMUM RATINGS

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current @V_{GS}=10V [1]	T_A=25℃	I_D	5	A
	T_A=70℃		4.1	
Pulsed Drain Current [2]		I_{DM}	16	A
Power Dissipation [3]	T_A=25℃	P_D	1.25	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Thermal Resistance Ratings				
Thermal Resistance from Junction-Ambient [1]		$R_{\theta JA}$	100	℃/W
Thermal Resistance from Junction-Case [1]		$R_{\theta JC}$	60	

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	40	-	-	V	V_{GS}=0, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transconductance		g_{fs}	-	12	-	S	V_{DS}=5V, I_D=4A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V, V_{DS}=0
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	1	μA	V_{DS}=32V, V_{GS}=0
	T_J=55℃		-	-	5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	28	35	mΩ	V_{GS}=10V, I_D=4A
			-	33	45		V_{GS}=4.5V, I_D=3A
Gate Resistance		R_g	-	2.6	-	Ω	V_{DS}=V_{GS}=0, f=1MHz
Total Gate Charge		Q_g	-	5.5	-	nC	I_D=3A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	1.25	-		
Gate-Drain Charge		Q_{gd}	-	2.5	-		
Turn-on Delay Time		$T_{d(on)}$	-	8.9	-	nS	V_{DD}=15V I_D=1A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	2.2	-		
Turn-off Delay Time		$T_{d(off)}$	-	41	-		
Fall Time		T_f	-	2.7	-		
Input Capacitance		C_{iss}	-	593	-	pF	V_{GS}=0 V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	76	-		
Reverse Transfer Capacitance		C_{rss}	-	56	-		
Source-Drain Diode							
Forward on Voltage [2]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0
Continuous Source Current [1]		I_S	-	-	5	A	V_G=V_D=0V, Force Current
Pulsed Source Current [2]		I_{SM}	-	-	16		

Notes:
1. The data tested by surface mounted on 1inch^2 FR4 Board with 2OZ copper.
2. The data tested by pulsed, Pulse Width≦300μs, Duty Cycle≦2%.
3. The power dissipation is limited by 150℃ junction temperature.

CHARACTERISTIC CURVES

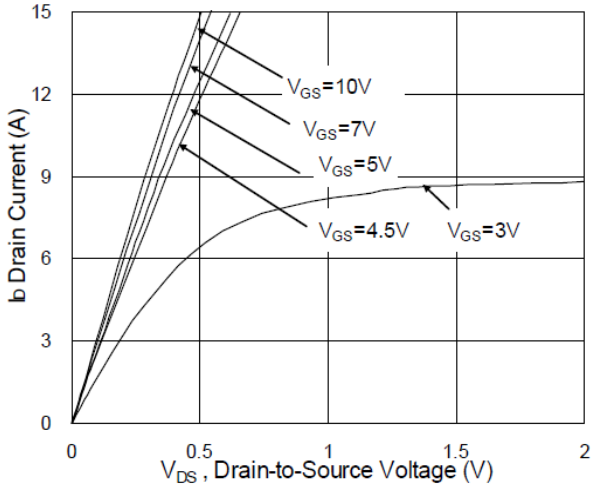


Fig.1 Typical Output Characteristics

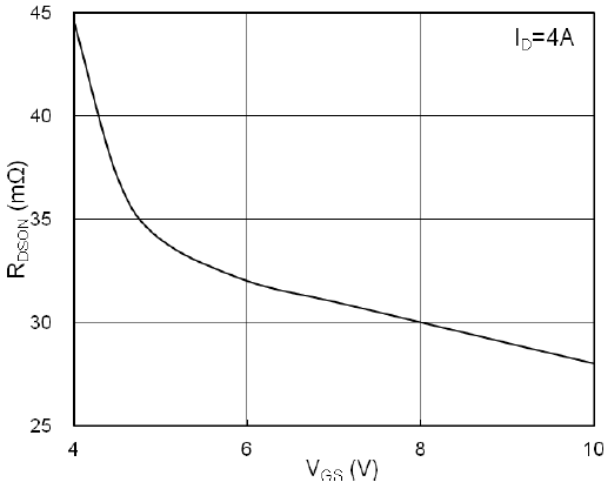


Fig.2 On-Resistance vs. Gate-Source

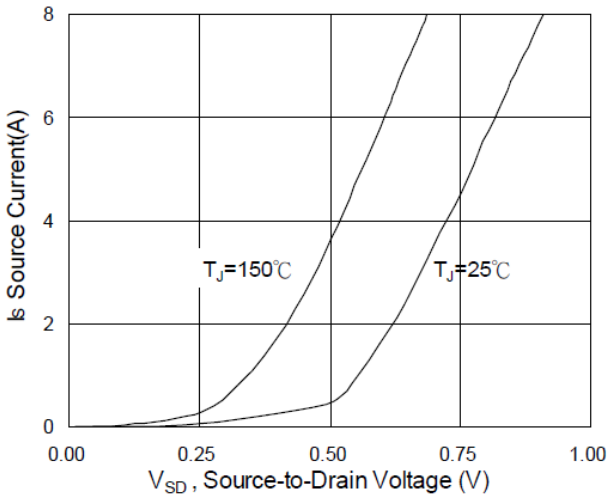


Fig.3 Forward Characteristics Of Reverse

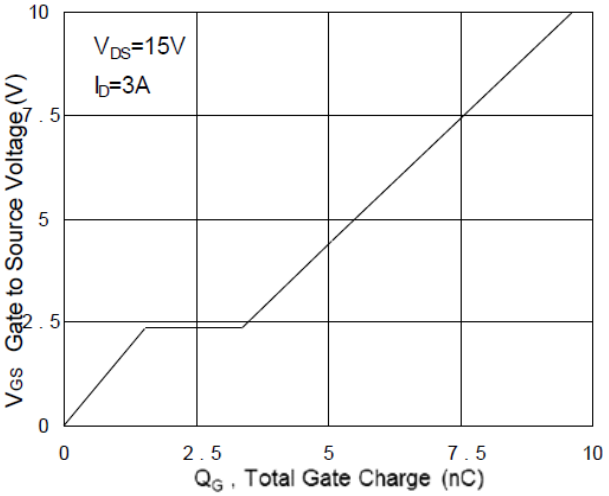


Fig.4 Gate-Charge Characteristics

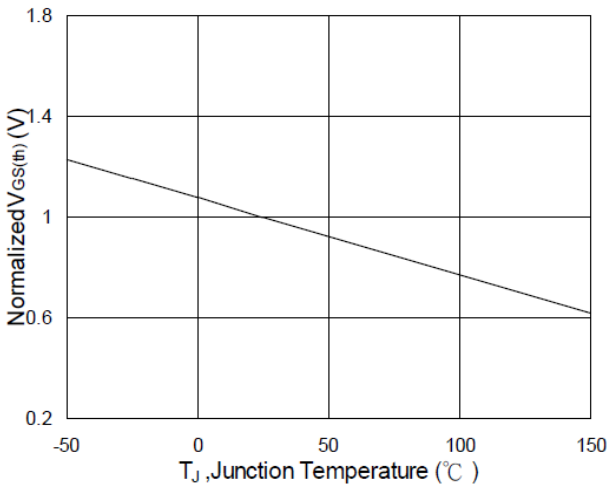


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

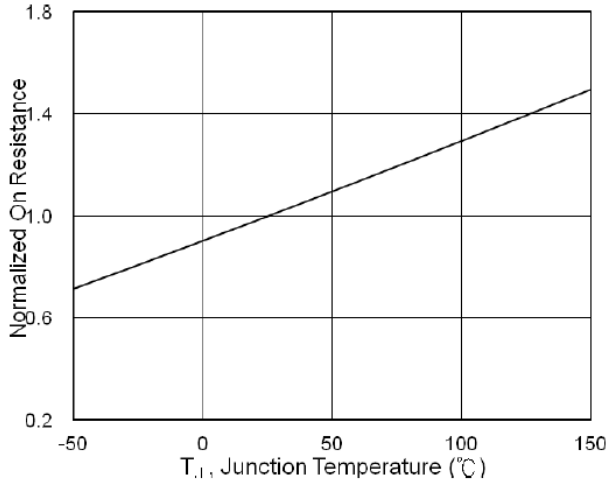


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

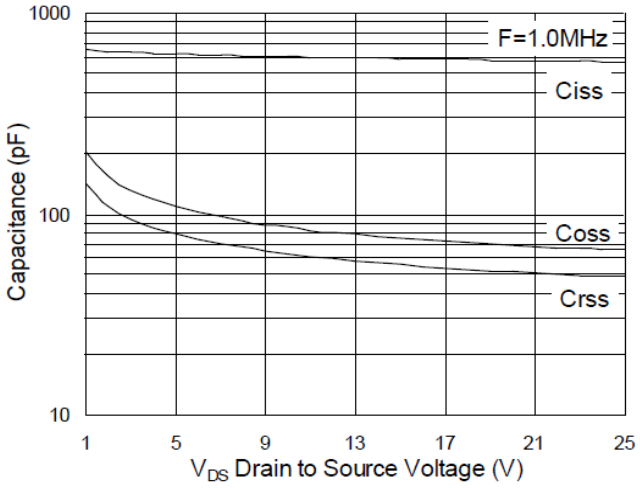


Fig.7 Capacitance

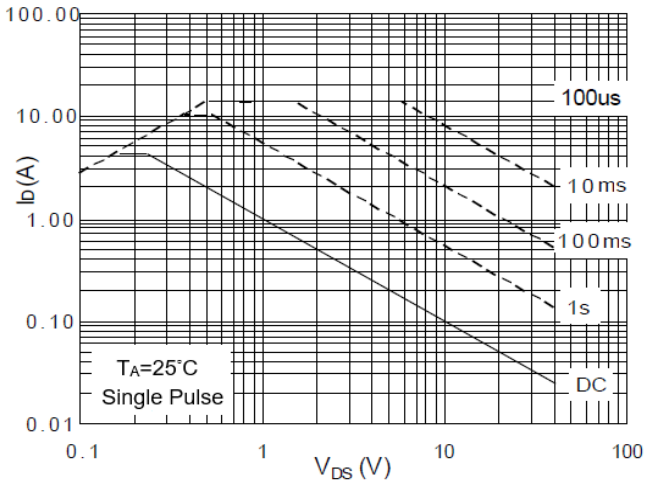


Fig.8 Safe Operating Area

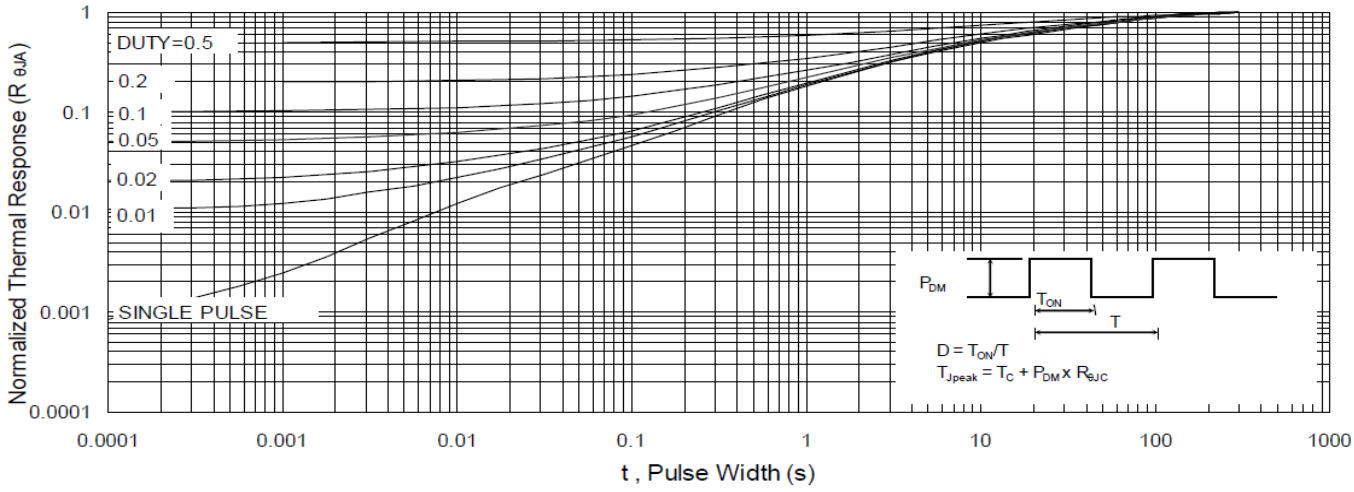


Fig.9 Normalized Maximum Transient Thermal Impedance

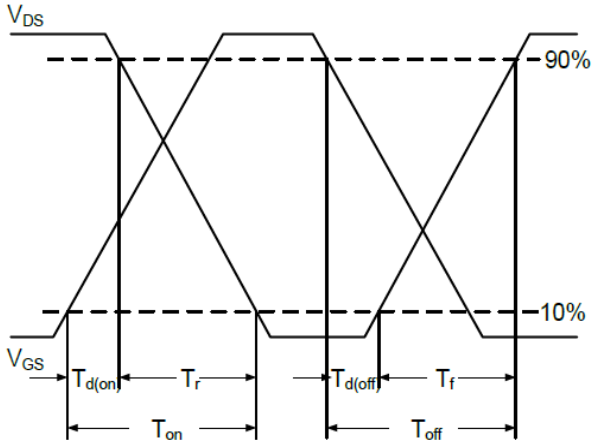


Fig.10 Switching Time Waveform

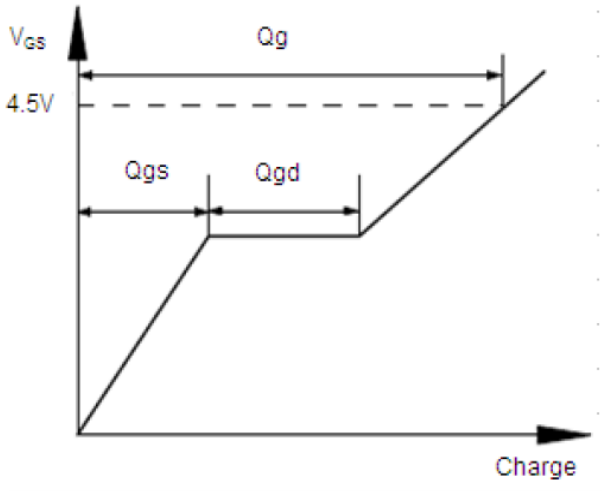


Fig.11 Gate Charge Waveform