

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

DESCRIPTION

The SMS2001-C is the highest performance trench P-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 SMS2001-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge

MARKING

2001

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

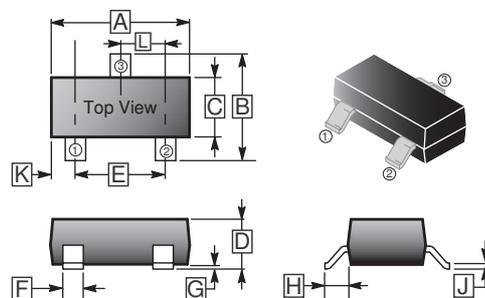
ORDER INFORMATION

Part Number	Type
SMS2001-C	Lead (Pb)-free and Halogen-free

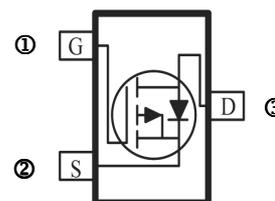
ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current, @ $V_{GS} = -4.5V$ ¹	I_D	$T_A = 25^\circ C$	-2
		$T_A = 70^\circ C$	-1.6
Pulsed Drain Current ³	I_{DM}	-8	A
Power Dissipation	P_D	1	W
Operating Junction & Storage Temperature	T_J, T_{STG}	-55~150	$^\circ C$
Thermal Resistance Ratings			
Thermal Resistance Junction-ambient ¹	$R_{\theta JA}$	$t \leq 5sec, 125$	$^\circ C/W$
		Steady State, 250	
Thermal Resistance Junction-ambient ²		415	

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			



ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	BV_{DSS}	-20	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$	
Gate-Threshold Voltage	$V_{GS(th)}$	-0.45	-	-1	V	$V_{DS}=V_{GS}, I_D = -250\mu\text{A}$	
Forward Transconductance	g_{fs}	-	3.4	-	S	$V_{DS} = -5V, I_D = -2A$	
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 8V$	
Drain-Source Leakage Current	I_{DSS}	$T_J=25^\circ\text{C}$	-	-	-1	μA	$V_{DS} = -16V, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	-10		
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	-	150	200	m Ω	$V_{GS} = -4.5V, I_D = -2A$	
		-	200	280		$V_{GS} = -2.5V, I_D = -1.5A$	
Total Gate Charge ³	Q_g	-	4.6	-	nC	$I_D = -2A$ $V_{DS} = -20V$ $V_{GS} = -4.5V$	
Gate-Source Charge	Q_{gs}	-	0.27	-			
Gate-Drain ("Miller") Charge	Q_{gd}	-	2.34	-			
Turn-on Delay Time ³	$T_{d(on)}$	-	11.6	-	nS	$V_{DS} = -12V$ $V_{GS} = -4.5V$ $I_D = -1A$ $R_G = 3.3\Omega$	
Rise Time	T_r	-	6.2	-			
Turn-off Delay Time	$T_{d(off)}$	-	31.8	-			
Fall Time	T_f	-	2.8	-			
Input Capacitance	C_{iss}	-	194	-	pF	$V_{GS}=0$ $V_{DS} = -15V$ $f=1\text{MHz}$	
Output Capacitance	C_{oss}	-	35.5	-			
Reverse Transfer Capacitance	C_{rss}	-	28.2	-			
Source-Drain Diode							
Forward on Voltage ⁴	V_{SD}	-	-0.85	-1.2	V	$I_S = -1A, V_{GS}=0$	
Continuous Source Current ¹	I_S	-	-	-2	A		
Pulsed Source Current ³	I_{SM}	-	-	-8			

Notes:

1. Surface Mounted on 1"x1" FR4 Board with 2OZ copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by maximum junction temperature, Pulse Width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

CHARACTERISTIC CURVES

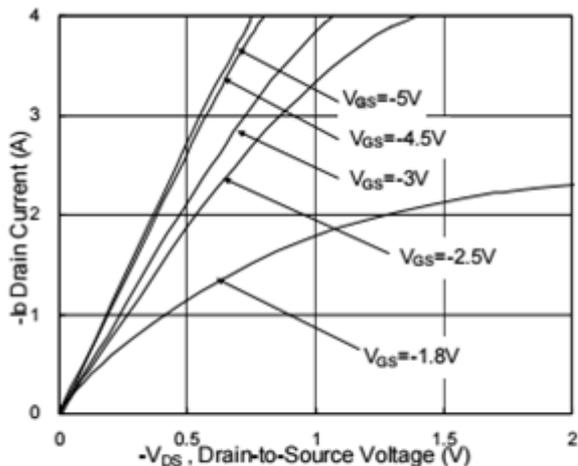


Fig.1 Typical Output Characteristics

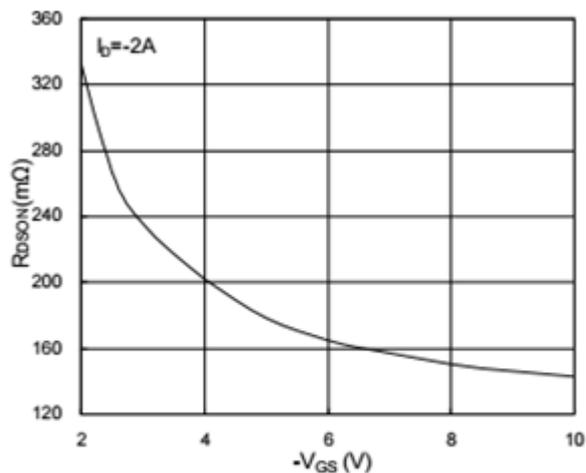


Fig.2 On-Resistance vs. Gate-Source

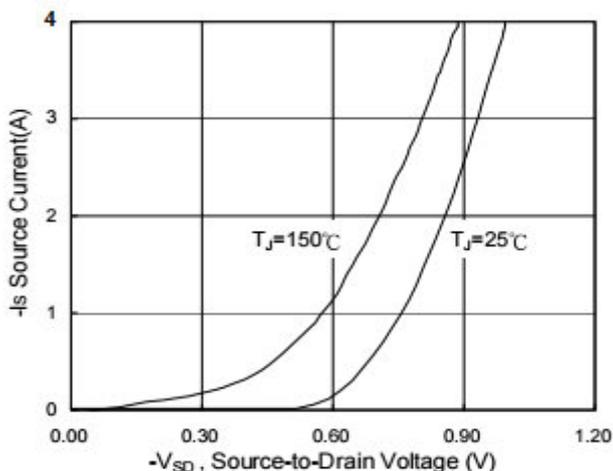


Fig.3 Forward Characteristics Of Reverse

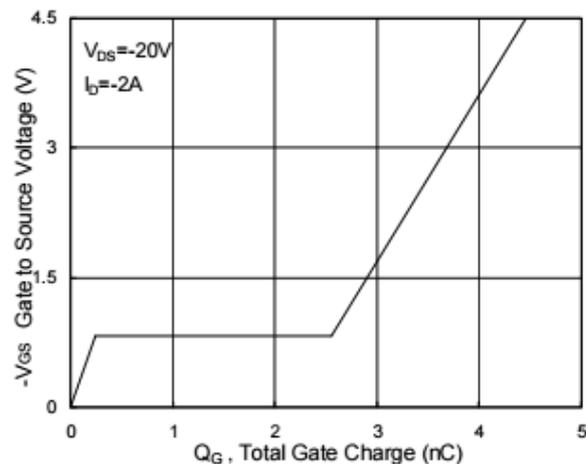


Fig.4 Gate-Charge Characteristics

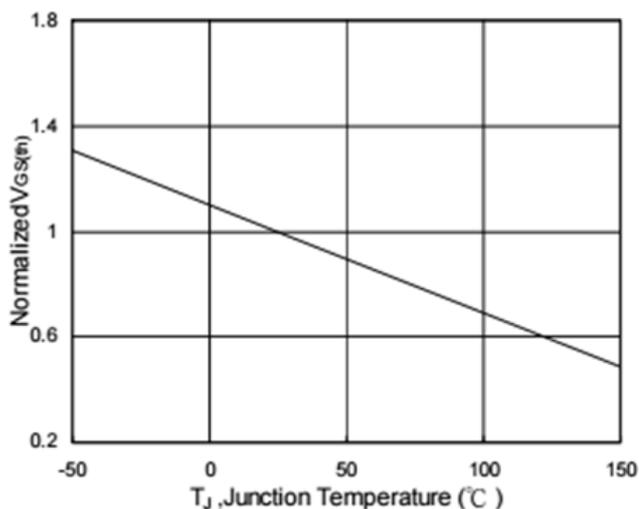


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

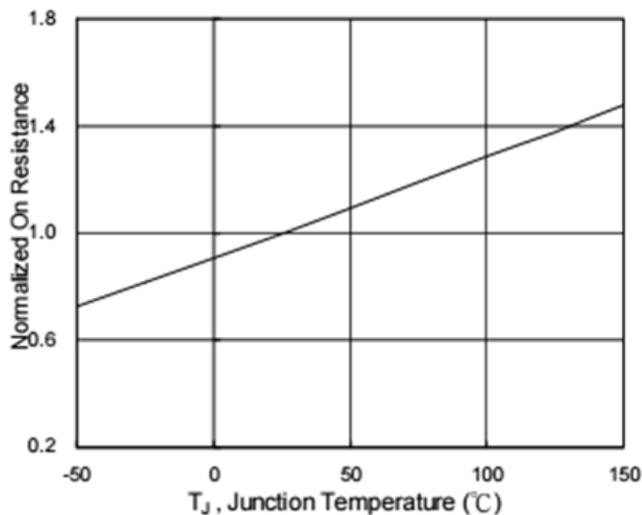


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

CHARACTERISTIC CURVES

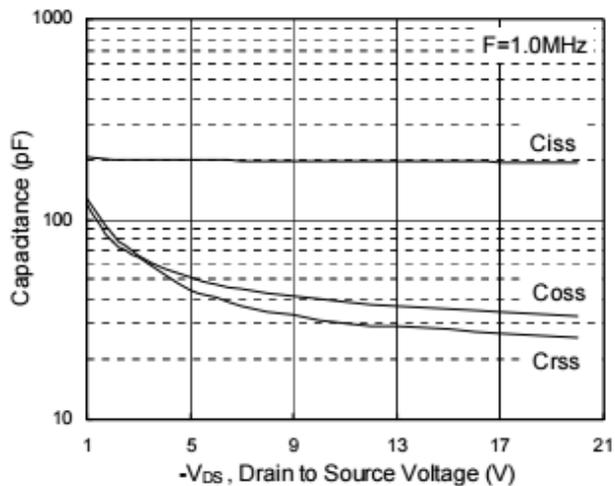


Fig.7 Capacitance

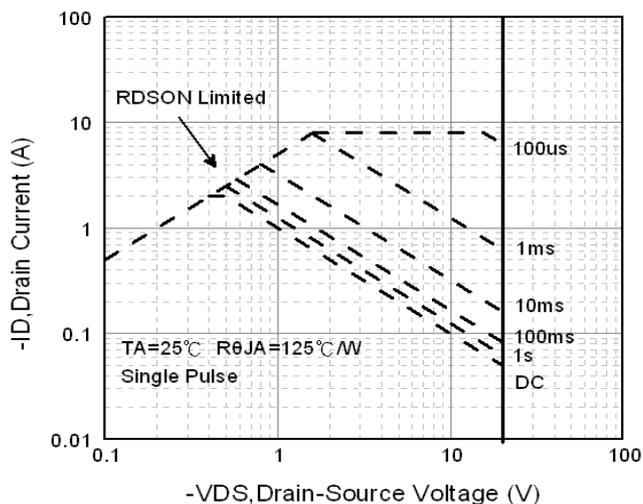


Fig.8 Safe Operating Area

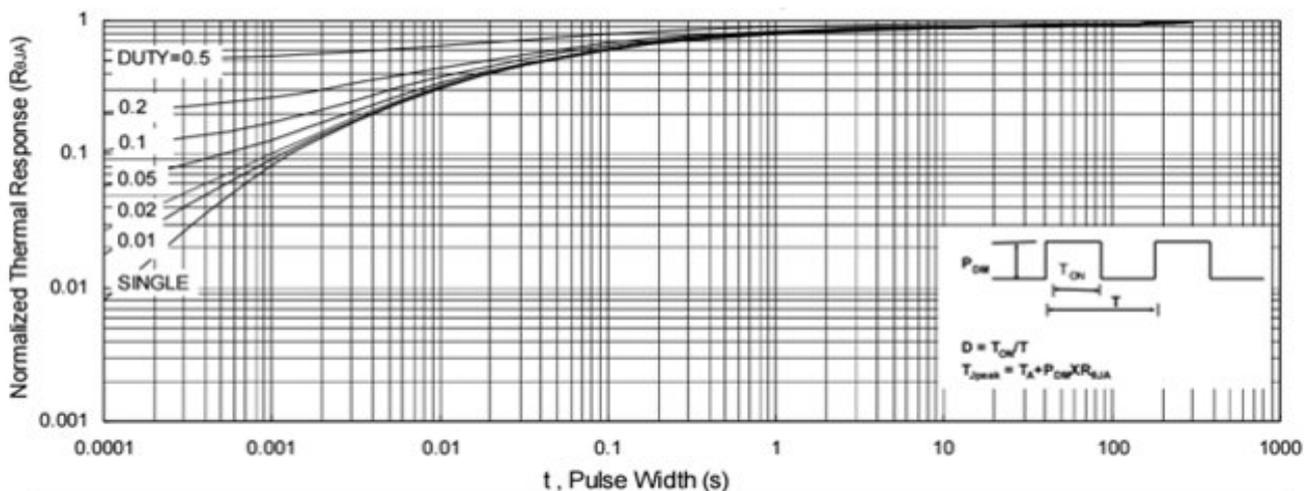


Fig.9 Normalized Maximum Transient Thermal Impedance

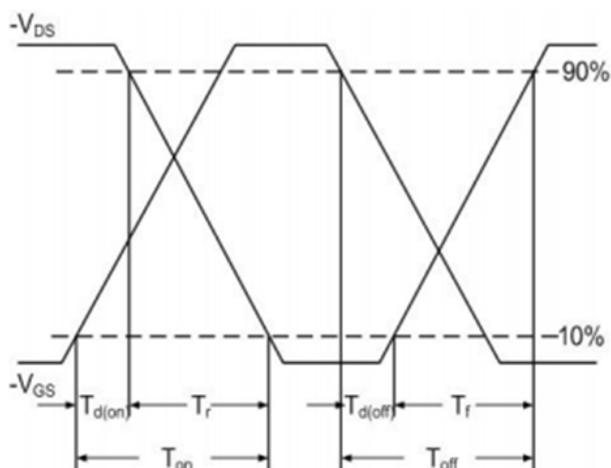


Fig.10 Switching Time Waveform

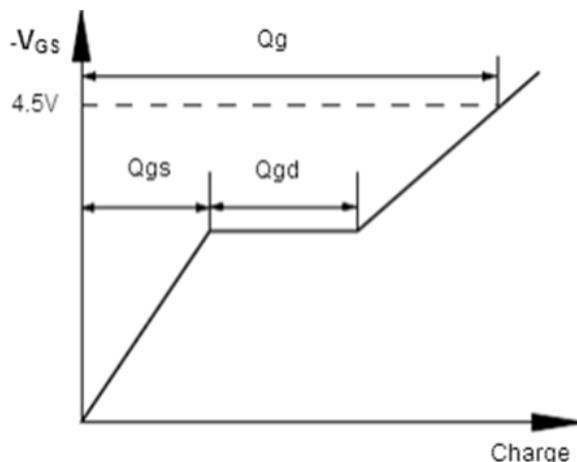


Fig.11 Gate Charge Waveform