Elektronische Bauelemente

SMS2304B-C

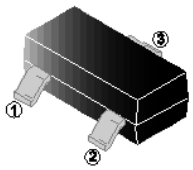
4A, 30V, $R_{DS(ON)}$ 36mΩ
N-Ch Enhancement Mode Power MOSFET

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

FEATURES

- Trench Power MV MOSFET Technology
- High Power and current handing capability
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating

SOT-23



APPLICATION

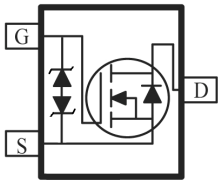
- PWM Application
- Load Switch

MARKING

2304B.

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch



ORDER INFORMATION

Part Number	Type
SMS2304B-C	Lead (Pb)-free and Halogen-free

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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	T_A=25℃	I_D	4	A
	T_A=100℃		2.5	
Pulsed Drain Current [1]		I_{DM}	20	A
Total Power Dissipation [2]	T_A=25℃	P_D	1	W
	T_A=100℃		0.4	
Thermal Resistance from Junction-Ambient [3]		$R_{\theta JA}$	125	℃/W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	℃

Notes:

1. Repetitive rating; pulse width limited by max. Junction temperature.
2. P_D is based on max. Junction temperature, using junction-case thermal resistance.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in the still air environment with T_A=25℃. The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	30	-	-	V	V_{GS}=0, I_D=250μA
Gate Threshold Voltage		$V_{GS(th)}$	1	1.6	2.2	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Body Leakage Current		I_{GSS}	-	-	±100	μA	V_{GS}= ±20V, V_{DS}=0
Zero Gate Voltage Drain Current	T_J=25℃	I_{DSS}	-	-	1	μA	V_{DS}=30V, V_{GS}=0
	T_J=150℃		-	-	100		
Drain-Source On-Resistance		$R_{DS(ON)}$	-	28	36	mΩ	V_{GS}=10V, I_D=4A
			-	46	60		V_{GS}=4.5V, I_D=3A
Gate resistance		R_G	-	5	-	Ω	f=1MHz, Open drain
Total Gate Charge		Q_g	-	6.5	-	nC	V_{GS}=10V, V_{DS}=15V, I_D=4A
Gate-Source Charge		Q_{gs}	-	1	-		
Gate-Drain Charge		Q_{gd}	-	2	-		
Turn-on Delay Time		$t_{(on)}$	-	3	-	nS	V_{GS}=10V, V_{DD}=15V, I_D=4A R_G=2.2Ω
Rise Time		t_r	-	15	-		
Turn-off Delay Time		$t_{(off)}$	-	12	-		
Fall Time		t_f	-	3	-		
Input Capacitance		C_{iss}	-	280	-	pF	V_{DS}=15V V_{GS}=0 f=1MHz
Output Capacitance		C_{oss}	-	45	-		
Reverse Transfer Capacitance		C_{rss}	-	35	-		
Source-Drain Diode							
Diode Forward Voltage		V_{SD}	-	0.9	1.2	V	V_{GS}=0, I_S=4A
Maximum Body-Diode Continuous Current		I_S	-	-	4	A	
Reverse Recovery Time		T_{rr}	-	6.5	-	nS	I_F=4A di/dt=300A/μs
Recovered Charge		Q_r	-	5	-	nC	

TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

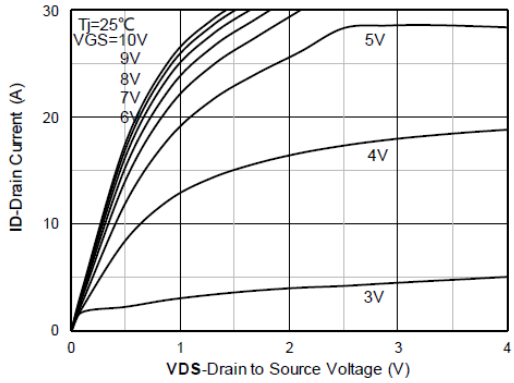


Figure 2. Transfer Characteristics

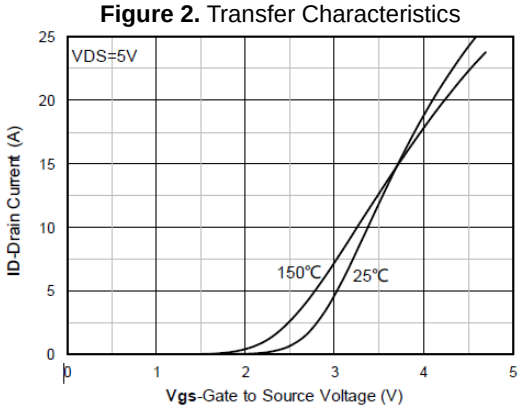


Figure 3. Capacitance Characteristics

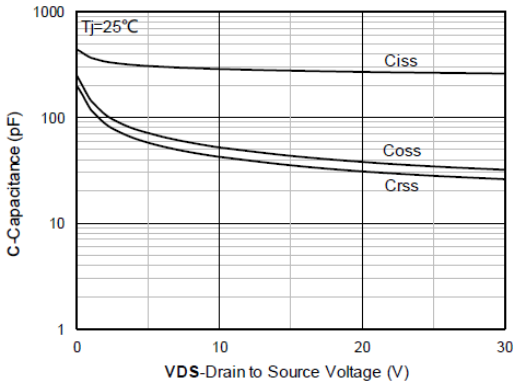


Figure 4. Gate Charge

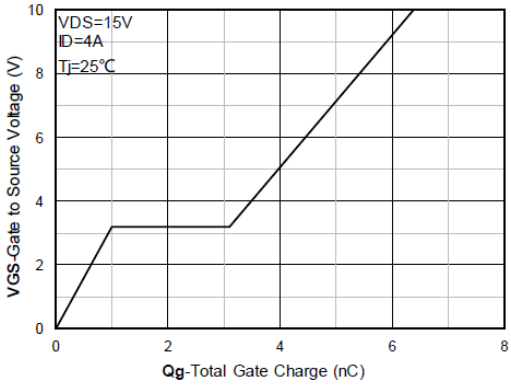


Figure 5. On-Resistance vs Gate to Source Voltage

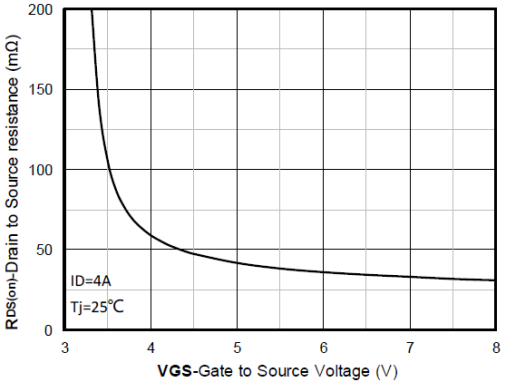


Figure 6. Normalized On-Resistance

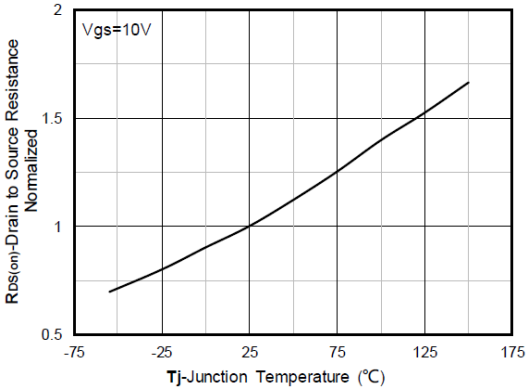


Figure 7. $R_{DS(on)}$ VS Drain Current

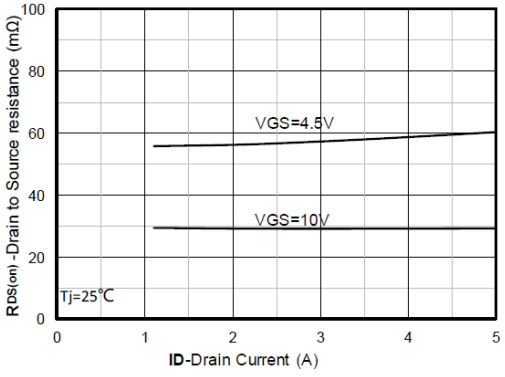
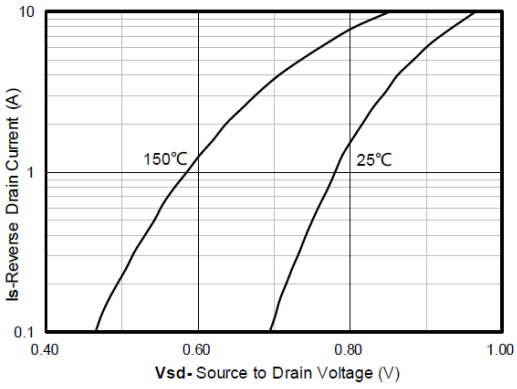


Figure 8. Forward Characteristics of Reverse Diode



TYPICAL CHARACTERISTICS

Figure 9. Normalized Breakdown Voltage

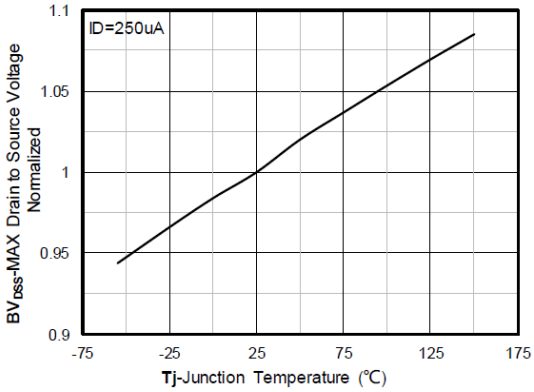


Figure 10. Normalized Threshold Voltage

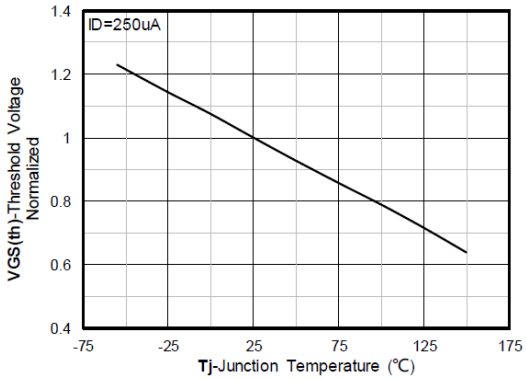


Figure 11. Current Dissipation

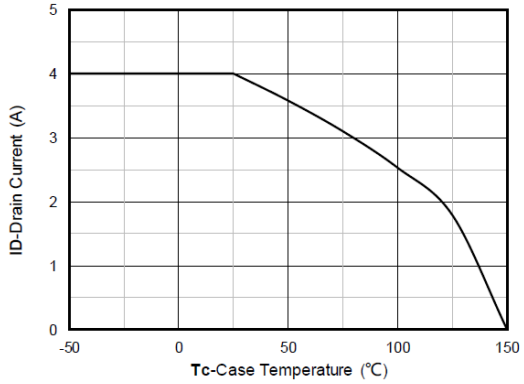


Figure 12. Power Dissipation

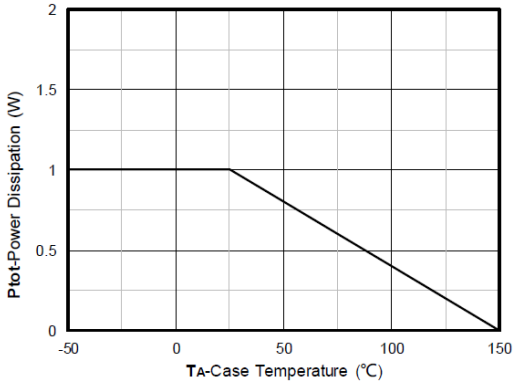


Figure 13. Maximum Transient Thermal Impedance

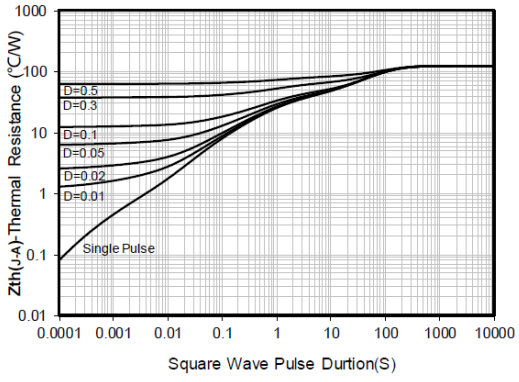
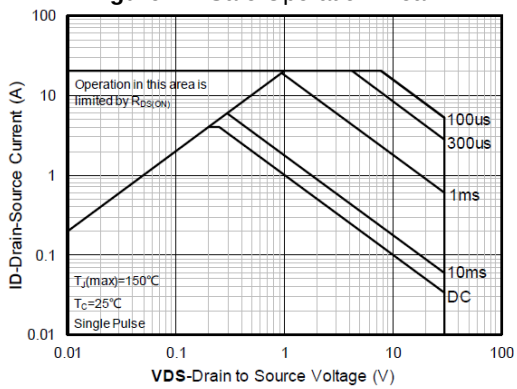
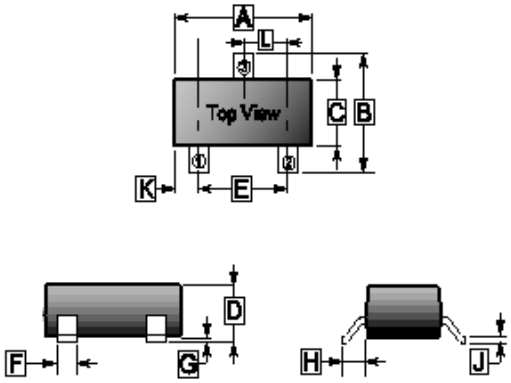


Figure 14. Safe Operation Area



PACKAGE OUTLINE DIMENSIONS

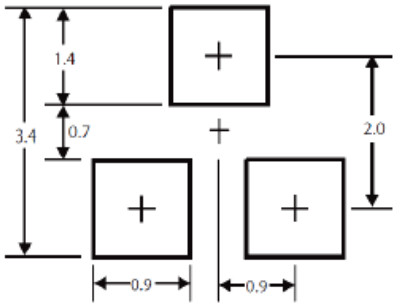
SOT-23



REF.	Millimeter	
	Min.	Max.
A	2.65	3.10
B	2.10	3.00
C	1.10	1.80
D	0.89	1.40
E	1.70	2.30
F	0.28	0.55
G	-	0.18
H	0.55 REF.	
J	0.05	0.26
K	0.60 REF.	
L	0.95 TYP.	

MOUNTING PAD LAYOUT

SOT-23



*Dimensions in millimeters