

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

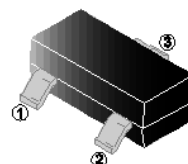
## FEATURES

- High Power and Current Handling Capability
- Fast Switching

**SOT-23**

## APPLICATION

- PWM Applications
- Load Switch
- Power Management



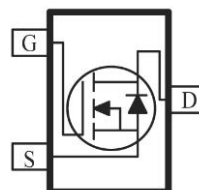
## MARKING

2310

6003

## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch



## ORDER INFORMATION

Part Number	Type
SMS03N06-C	Lead (Pb)-free and Halogen-free

## ABSOLUTE MAXIMUM RATINGS ( $T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	3	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	9.2	A
Power Dissipation <sup>3</sup>	$P_D$	1	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^{\circ}\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	125	$^{\circ}\text{C}/\text{W}$
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	80	

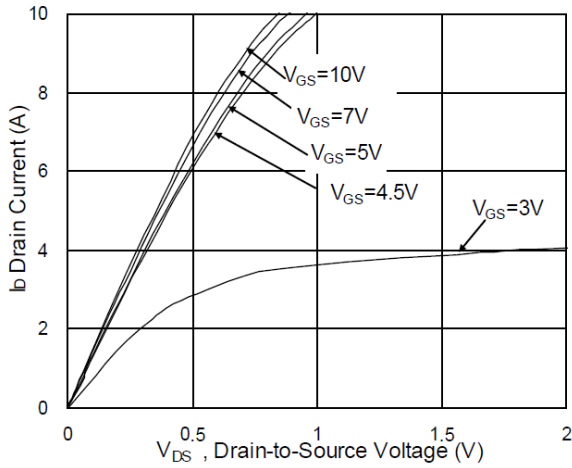
**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	60	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	1.2	-	2.5	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
Drain-Source Leakage Current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	100	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =2A
		-	-	110		V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A
Total Gate Charge	Q <sub>g</sub>	-	5	-	nC	V <sub>DS</sub> =48V V <sub>GS</sub> =4.5V I <sub>D</sub> =2A
Gate-Source Charge	Q <sub>gs</sub>	-	1.68	-		
Gate-Drain Charge	Q <sub>gd</sub>	-	1.9	-		
Turn-on Delay Time	T <sub>d(on)</sub>	-	1.6	-	nS	V <sub>DD</sub> =30V V <sub>GS</sub> =10V I <sub>D</sub> =2A R <sub>G</sub> =3.3Ω
Rise Time	T <sub>r</sub>	-	7.2	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	25	-		
Fall Time	T <sub>f</sub>	-	14.4	-		
Input Capacitance	C <sub>iss</sub>	-	511	-	pF	V <sub>DS</sub> =15V V <sub>GS</sub> =0V f=1MHz
Output Capacitance	C <sub>oss</sub>	-	38	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	25	-		
<b>Source-Drain Diode</b>						
Continuous Source Current <sup>1 4</sup>	I <sub>S</sub>	-	-	2.3	A	V <sub>D</sub> =V <sub>G</sub> =0V, Force Current
Pulsed Source Current <sup>2 4</sup>	I <sub>SM</sub>	-	-	9.2		
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.2	V	I <sub>S</sub> =1A, V <sub>GS</sub> =0V
Reverse Recovery Time	t <sub>rr</sub>	-	9.7	-	nS	I <sub>F</sub> =2A
Reverse Recovery Charge	Q <sub>rr</sub>	-	5.8	-	nC	di/dt=100A/μs

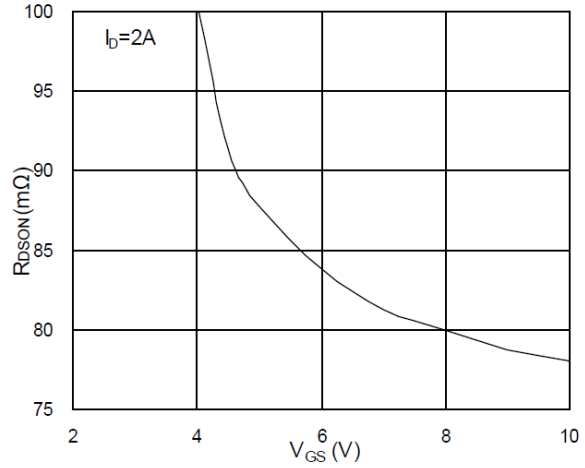
Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≤ 300μs, duty cycle ≤ 2%.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

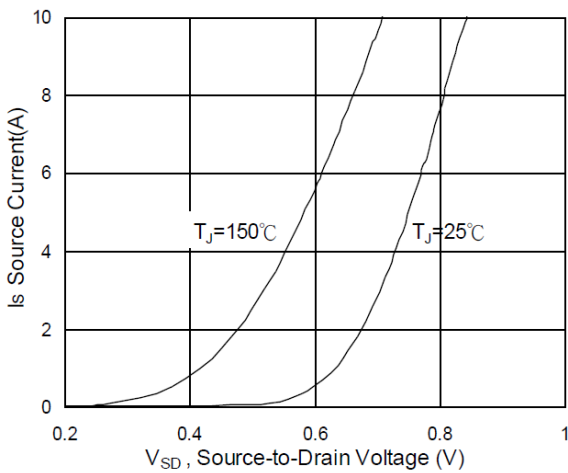
**TYPICAL CHARACTERISTICS**



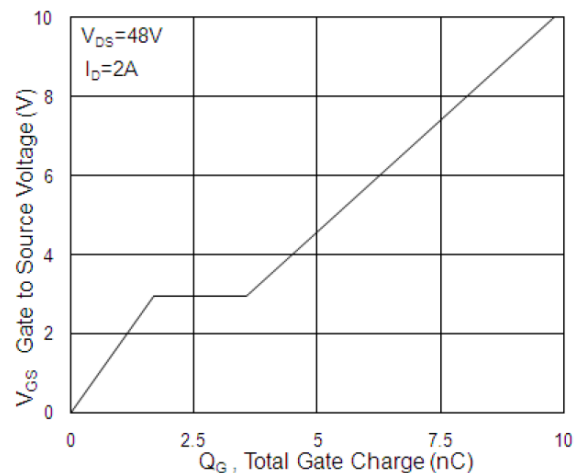
**Fig.1 Typical Output Characteristics**



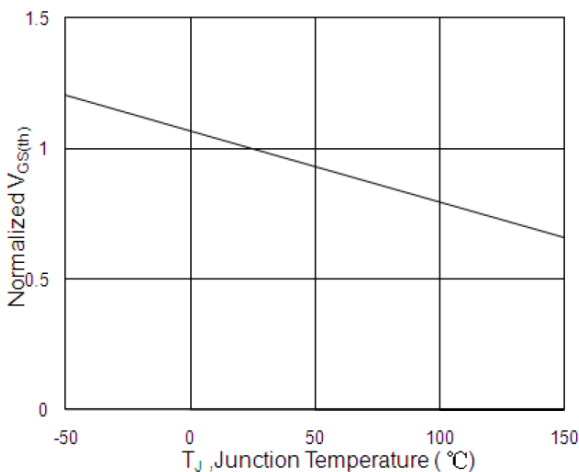
**Fig.2 On-Resistance v.s Gate-Source**



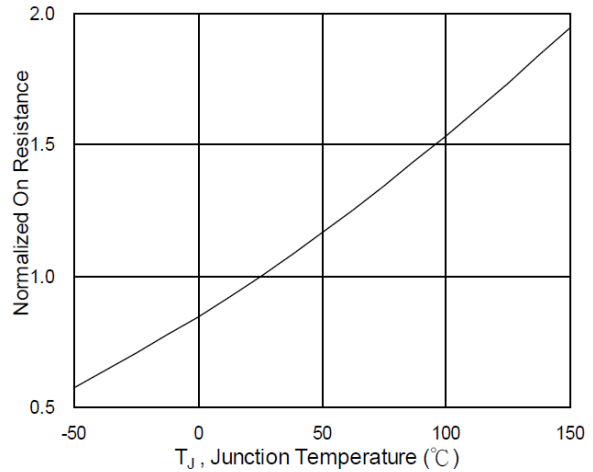
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate-Charge Characteristics**

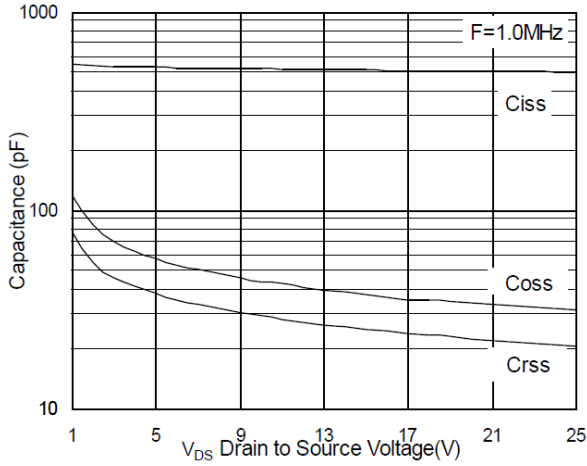


**Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$**

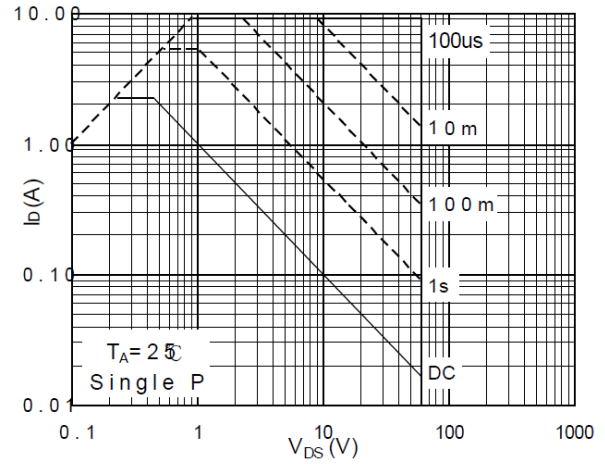


**Fig.6 Normalized  $R_{DS(on)}$  v.s  $T_J$**

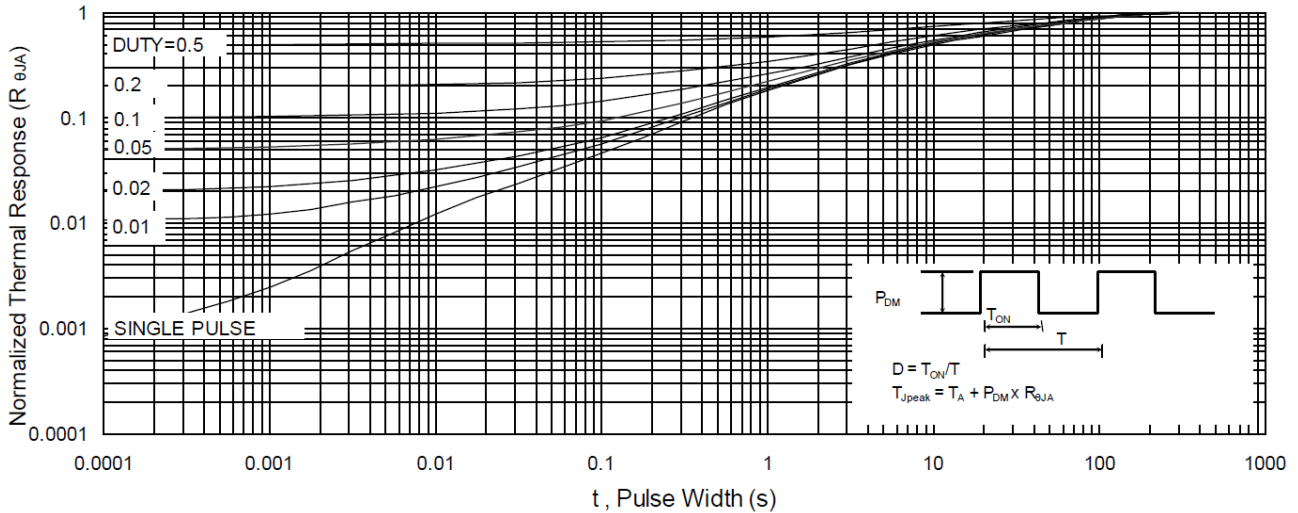
**TYPICAL CHARACTERISTICS**



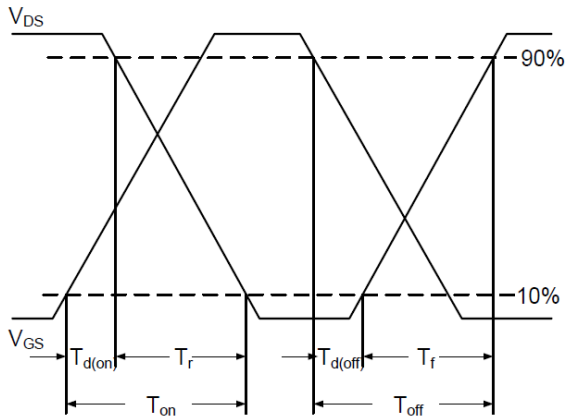
**Fig.7 Capacitance**



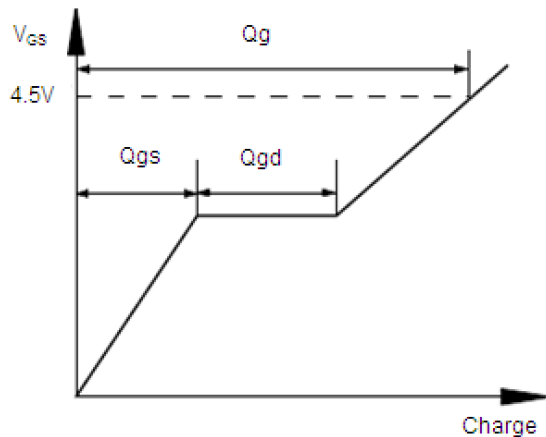
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



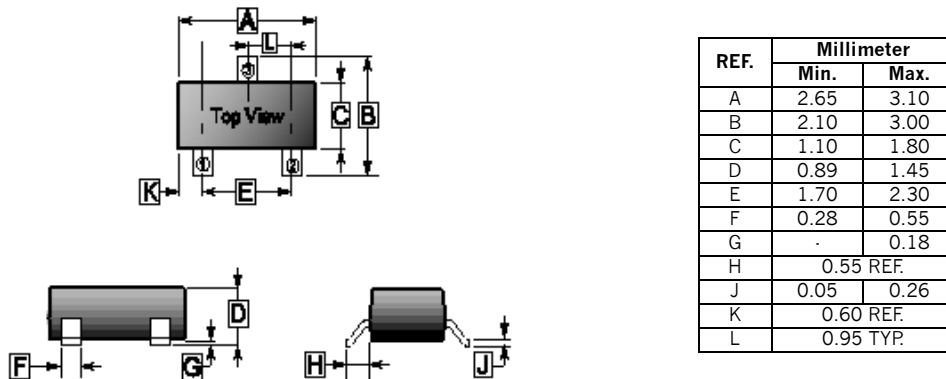
**Fig.10 Switching Time Waveform**



**Fig.11 Gate Charge Waveform**

**PACKAGE OUTLINE DIMENSIONS**

**SOT-23**



**MOUNTING PAD LAYOUT**

**SOT-23**

