

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

## DESCRIPTION

The SMS3400A provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The SOT-23 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

## FEATURES

- Lower Gate Charge
- Simple Drive Requirement
- Fast Switching Characteristic

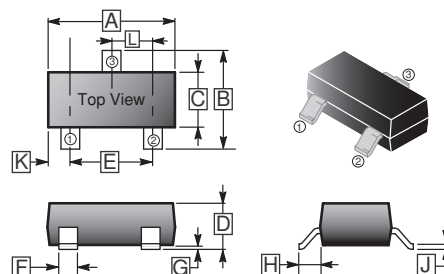
## MARKING

R0A

## PACKAGE INFORMATION

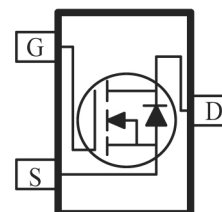
Package	MPQ	Leader Size
SOT-23	3K	7 inch

## 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			

## Top View



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>1</sup>	$I_D$	5.8	A
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	30	A
Maximum Power Dissipation <sup>1</sup>	$P_D$	$T_A=25^\circ\text{C}$	1.4
		$T_A=70^\circ\text{C}$	0.9
Thermal Resistance Junction-Ambient	$R_{\theta JA}^1$	$t \leq 10\text{s}, 89$	$^\circ\text{C} / \text{W}$
	$R_{\theta JA}^2$	313	
Operating Junction & Storage Temperature	$T_J, T_{STG}$	150, -55~150	$^\circ\text{C}$

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

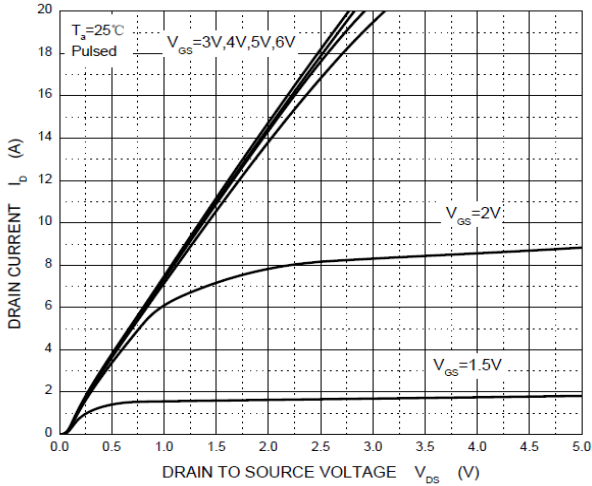
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate-Threshold Voltage	$V_{GS(th)}$	0.7	-	1.4	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 12\text{V}, V_{DS}=0$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=24\text{V}, V_{GS}=0$
Forward Transfer conductance	$g_{fs}$	8	-	-	S	$V_{DS}=5\text{V}, I_D=5\text{A}$
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	-	-	1	V	$I_S=1\text{A}, V_{GS}=0$
Static Drain-Source On-Resistance <sup>4</sup>	$R_{DS(ON)}$	-	-	32	m $\Omega$	$V_{GS}=10\text{V}, I_D=5.8\text{A}$
		-	-	38		$V_{GS}=4.5\text{V}, I_D=5\text{A}$
		-	-	45		$V_{GS}=2.5\text{V}, I_D=4\text{A}$
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	-	9.5	-	nC	$I_D=5.8\text{A}$ $V_{DS}=15\text{V}$ $V_{GS}=4.5\text{V}$
Gate-Source Charge	$Q_{gs}$	-	1.5	-		
Gate-Drain Change	$Q_{gd}$	-	3	-		
Input Capacitance	$C_{iss}$	-	1155	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	108	-		
Reverse Transfer Capacitance	$C_{rss}$	-	84	-		
Turn-on Delay Time	$T_{d(on)}$	-	5	-	nS	$V_{DS}=15\text{V}$ $V_{GS}=10\text{V}$ $R_{GEN}=3\Omega$ $R_L=2.7\Omega$
Rise Time	$T_r$	-	7	-		
Turn-off Delay Time	$T_{d(off)}$	-	40	-		
Fall Time	$T_f$	-	6	-		
Gate Resistance	$R_g$	-	-	3.6	$\Omega$	$V_{GS}=V_{DS}=0, f=1.0\text{MHz}$

Notes:

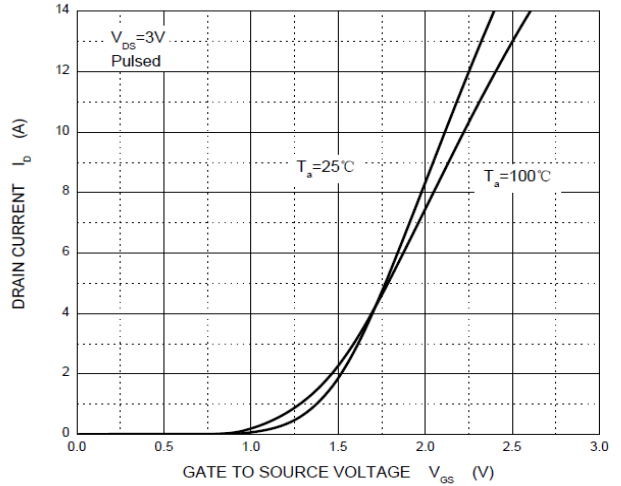
1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR4 board with 2OZ copper.
2. Surface mounted on min. copper pad.
3. Pulse width limited by maximum junction temperature.
4. . Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

**CHARACTERISTIC CURVES**

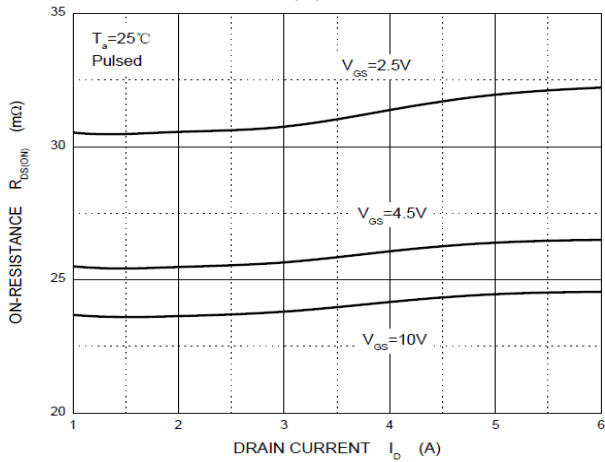
**Output Characteristics**



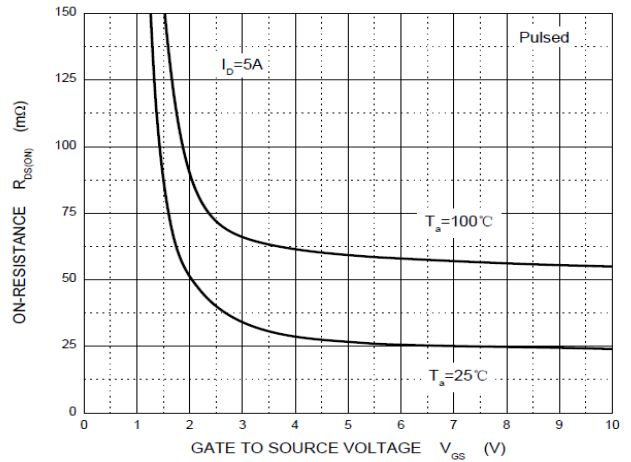
**Transfer Characteristics**



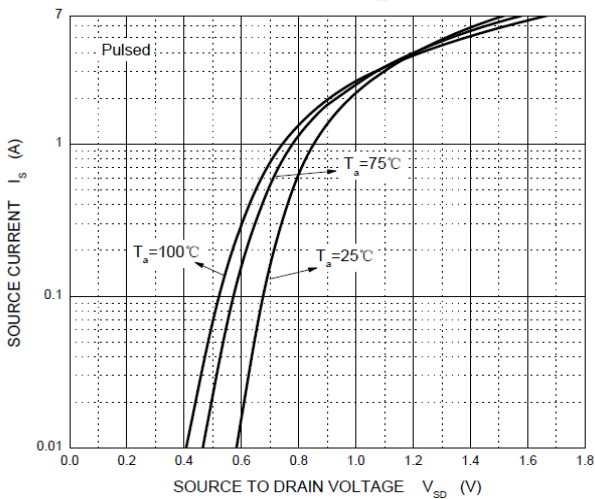
**$R_{DS(ON)}$  —  $I_D$**



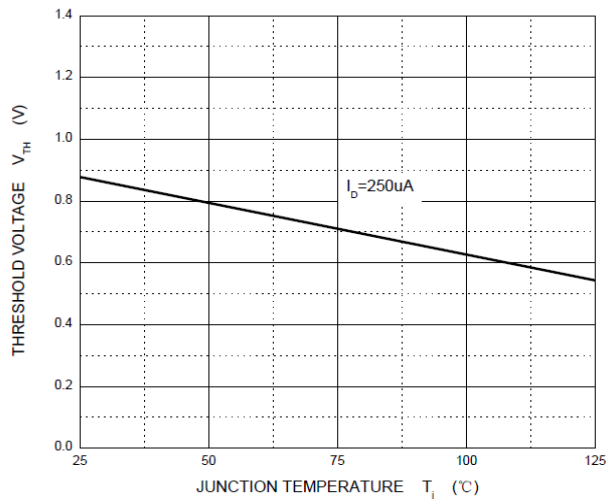
**$R_{DS(ON)}$  —  $V_{GS}$**



**$I_S$  —  $V_{SD}$**

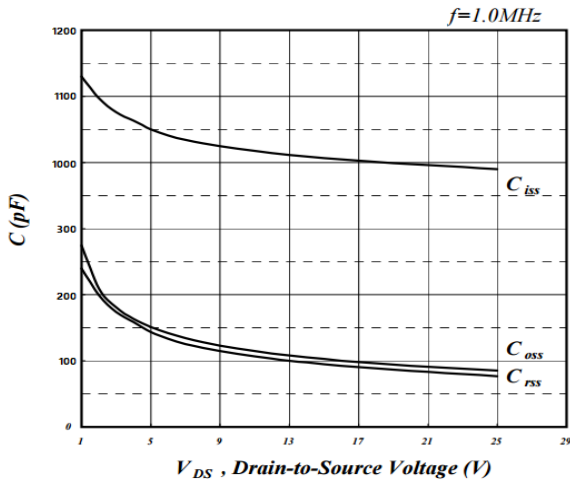


**Threshold Voltage**

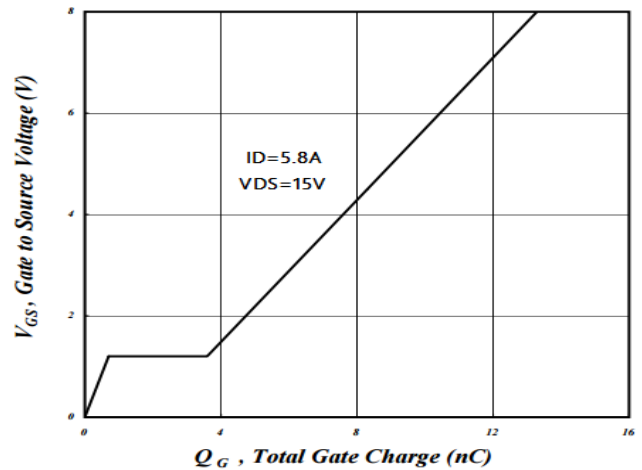


**CHARACTERISTIC CURVES**

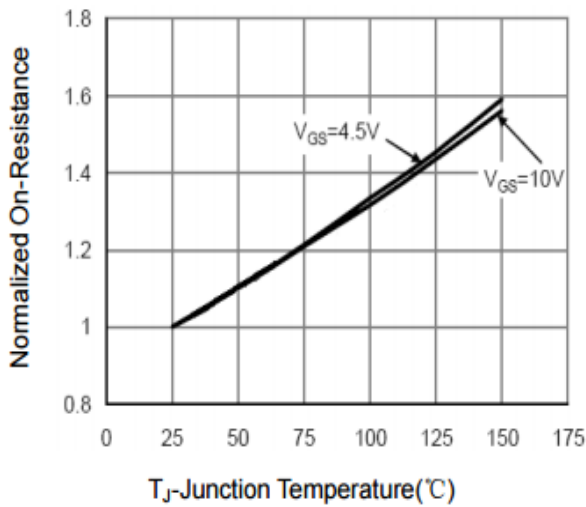
Typical Capacitance Characteristics



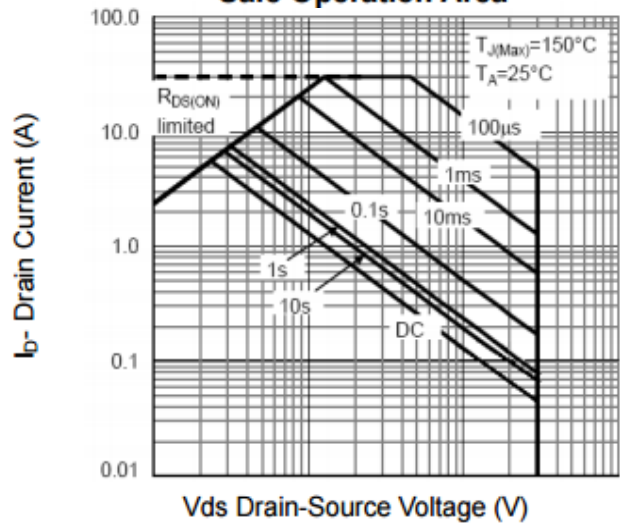
Gate Charge Characteristics



Drain-Source On-Resistance



Safe Operation Area



Normalized Maximum Transient Thermal Impedance

