

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

## DESCRIPTION

The SMS2312-C 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

S12

## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

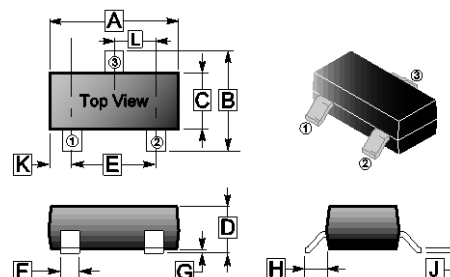
## ORDER INFORMATION

Part Number	Type
SMS2312-C	Lead (Pb)-free and Halogen-free

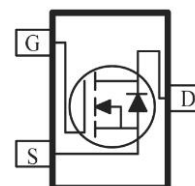
## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	V
Continuous Drain Current <sup>1</sup>	$I_D$	5	A
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	20	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
Operating Junction & Storage Temperature	$T_J, T_{STG}$	150, -55~150	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	$\leq 10s, 89$	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient <sup>2</sup>		357	

## SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.65	3.10	G	0	0.18
B	2.10	3.00	H	0.55	REF.
C	1.10	1.80	J	0.08	0.26
D	0.89	1.40	K	0.60	REF.
E	1.70	2.30	L	0.95	TYP.
F	0.28	0.55			



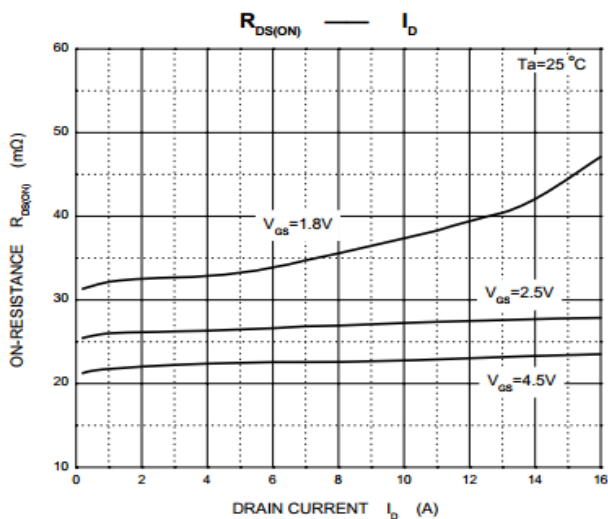
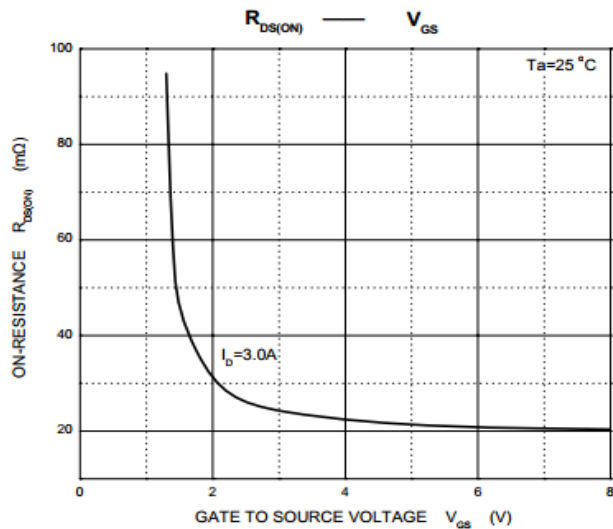
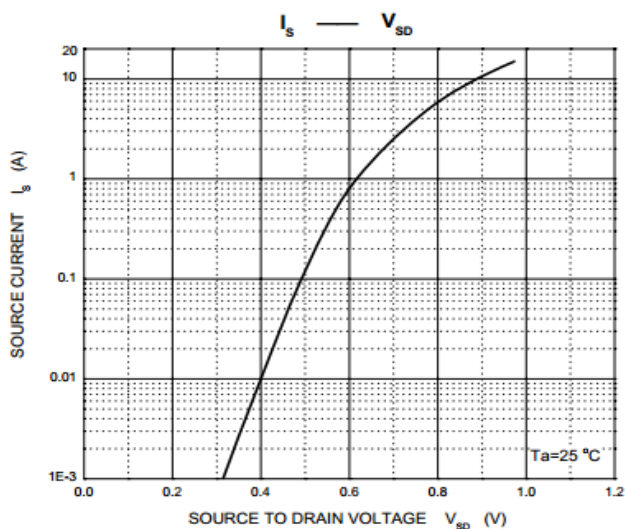
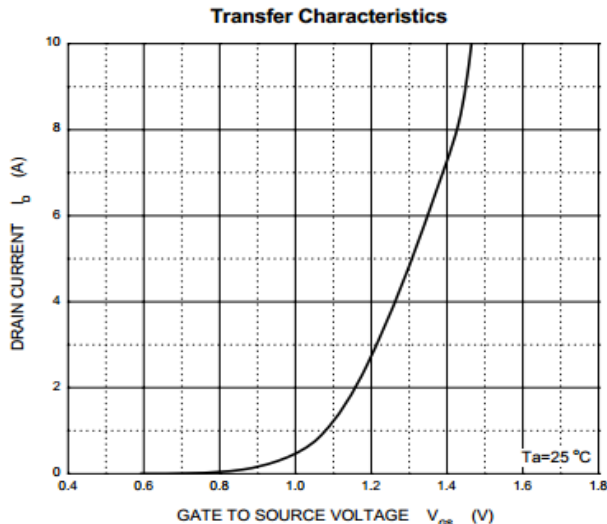
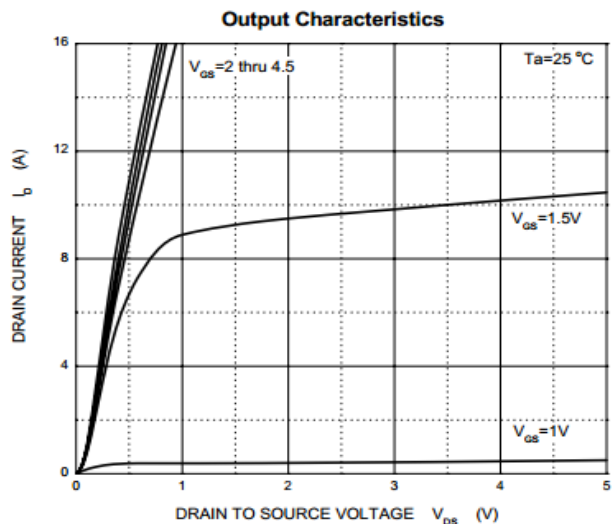
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

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 Transfer conductance	$g_{fs}$	6	-	-	S	$V_{DS}=10\text{V}, I_D=5\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 8\text{V}, V_{DS}=0$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=20\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance <sup>4</sup>	$R_{DS(ON)}$	-	-	32	m $\Omega$	$V_{GS}=4.5\text{V}, I_D=5\text{A}$
		-	-	36		$V_{GS}=2.5\text{V}, I_D=4.7\text{A}$
		-	-	42		$V_{GS}=1.8\text{V}, I_D=4.3\text{A}$
Gate Resistance	$R_g$	0.5	-	4.8	$\Omega$	$f=1\text{MHz}$
Input Capacitance	$C_{iss}$	-	865	-	pF	$V_{GS}=0$ $V_{DS}=10\text{V}$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$	-	105	-		
Reverse Transfer Capacitance	$C_{rss}$	-	55	-		
Turn-on Delay Time	$T_{d(on)}$	-	10	-	nS	$V_{DD}=10\text{V}$ $V_{GEN}=5\text{V}$ $R_G=1\Omega$ $R_L=2.2\Omega$ $I_D=4\text{A}$
Rise Time	$T_r$	-	20	-		
Turn-off Delay Time	$T_{d(off)}$	-	32	-		
Fall Time	$T_f$	-	12	-		
<b>Source-Drain Diode</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	-	0.75	1.2	V	$I_S=4\text{A}, V_{GS}=0$

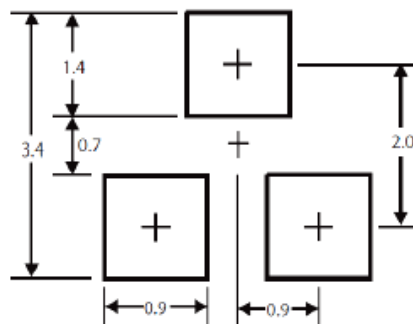
Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2oz copper.
2. Surface mounted on min. copper pad.
3. Pulse width limited by Max. junction temperature.
4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycles $\leq 2\%$ .

**CHARACTERISTIC CURVES**



**Mounting Pad Layout**



\*Dimensions in millimeters