

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

## DESCRIPTION

The SSG23N06S-C is the highest performance trench N-Ch MOSFETs with extreme high cell density, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

The SSG23N06S-C meet the RoHS and Green Product requirement with full function reliability approved.

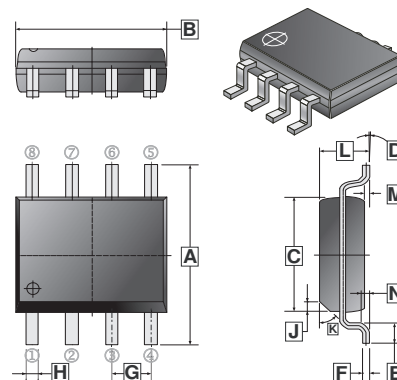
## FEATURES

- High Speed Power Switching
- Super Low Gate Charge
- Green Device Available

## MARKING CODE



## SOP-8



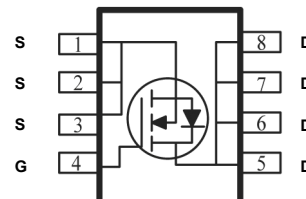
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.79	6.20	H	0.33	0.51
B	4.70	5.11	J	0.375	REF.
C	3.80	4.00	K	45°	REF.
D	0°	8°	L	1.3	1.752
E	0.40	1.27	M	0	0.25
F	0.10	0.25	N	0.25	REF.
G	1.27	TYP.			

## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13' inch

## ORDER INFORMATION

Part Number	Type
SSG23N06S-C	Lead (Pb)-free and Halogen-free



## ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current <sup>1</sup> @V <sub>GS</sub> =10V	T <sub>A</sub> =25°C	23	A
	T <sub>A</sub> =70°C	18	
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	60	A
Power Dissipation <sup>3</sup>	P <sub>D</sub>	3.1	W
Operating Junction & Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
<b>Thermal Resistance Ratings</b>			
Thermal Resistance Junction-ambient <sup>1</sup>	t ≤ 10s	R <sub>θJA</sub>	40
	Steady State		75
Thermal Resistance Junction-Case <sup>1</sup>	R <sub>θJC</sub>		24

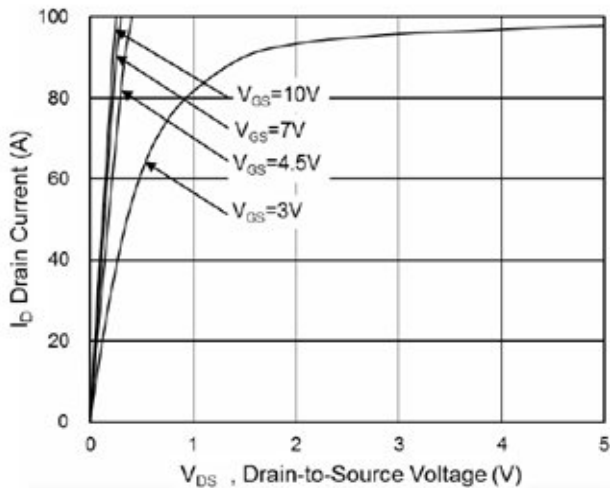
**ELECTRICAL CHARACTERISTICS** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transfer conductance	$g_{fs}$	-	65	-	S	$V_{DS}=5V, I_D=20A$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20V$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ\text{C}$
		-	-	5		$V_{DS}=48V, V_{GS}=0V, T_J=55^\circ\text{C}$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	3.2	3.8	m $\Omega$	$V_{GS}=10V, I_D=10A$
		-	4.6	5.9		$V_{GS}=4.5V, I_D=10A$
Total Gate Charge	$Q_g$	-	58	-	nC	$I_D=10A$ $V_{DS}=30V$ $V_{GS}=10V$
Gate-Source Charge	$Q_{gs}$	-	16	-		
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	4	-		
Turn-On Delay Time	$T_{d(on)}$	-	18	-	nS	$V_{DD}=30V$ $I_D=10A$ $V_{GS}=10V$ $R_G=3\Omega$
Rise Time	$T_r$	-	8	-		
Turn-Off Delay Time	$T_{d(off)}$	-	50	-		
Fall Time	$T_f$	-	10.5	-		
Input Capacitance	$C_{iss}$	-	3458	-	pF	$V_{GS}=0V$ $V_{DS}=30V$ $f=1\text{MHz}$
Output Capacitance	$C_{oss}$	-	1042	-		
Reverse Transfer Capacitance	$C_{rss}$	-	22	-		
<b>Source-Drain Diode</b>						
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$I_S=1A, V_{GS}=0V$
Continuous Source Current <sup>1</sup>	$I_S$	-	-	23	A	$V_G=V_D=0V, \text{Force Current}$
Reverse Recovery Time	$t_{rr}$	-	24	-	nS	$I_F=20A, dI/dt=100A/\mu s,$
Reverse Recovery Charge	$Q_{rr}$	-	85	-	nC	$T_J=25^\circ\text{C}$

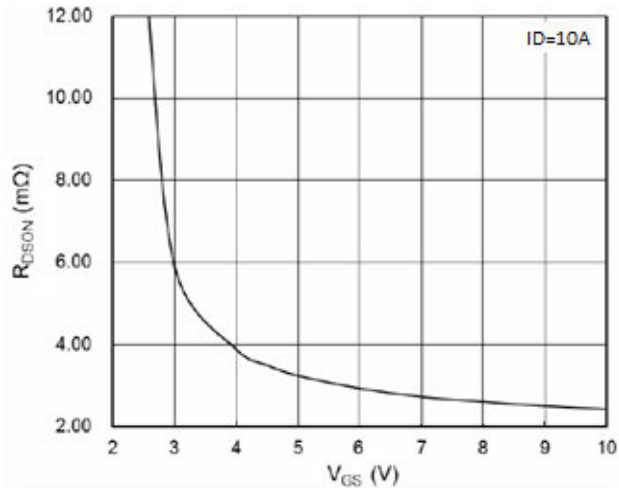
Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.
2. The data tested by pulsed, pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. The power dissipation is limited by 150 $^\circ\text{C}$  junction temperature.

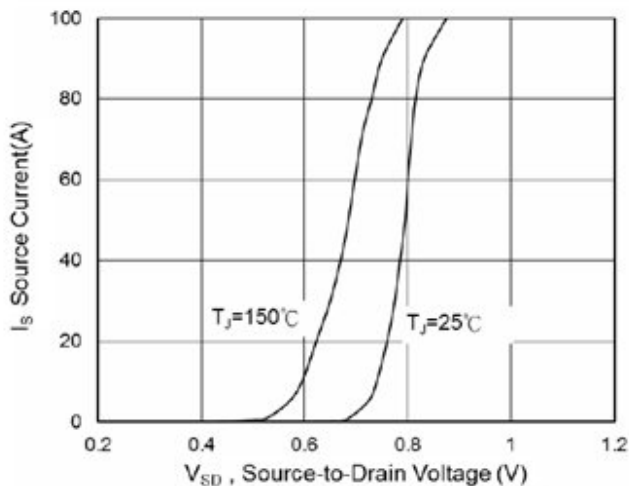
**CHARACTERISTICS CURVE**



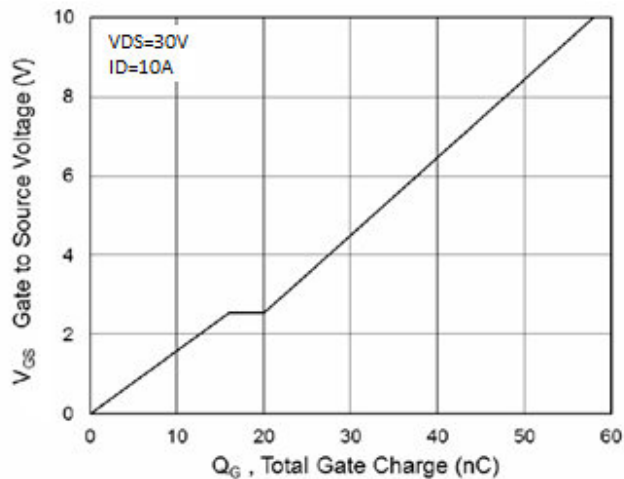
**Fig.1 Typical Output Characteristics**



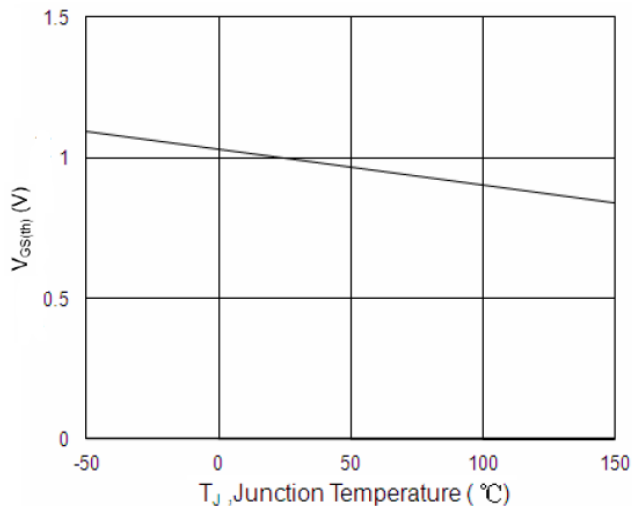
**Fig.2 On-Resistance vs G-S Voltage**



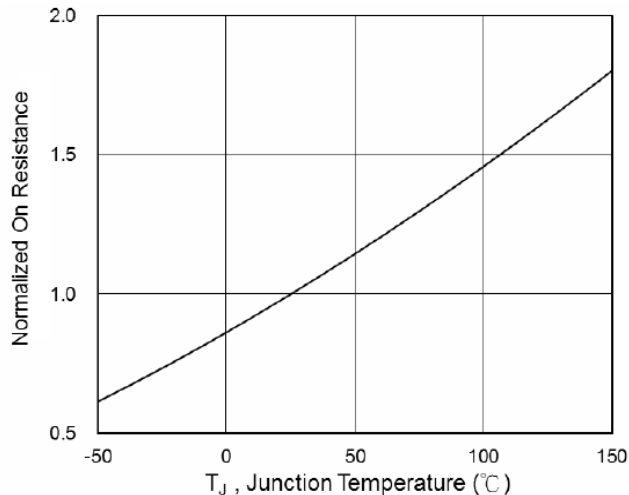
**Fig.3 Diode Forward Voltage vs. Current**



**Fig.4 Gate-Charge Characteristics**

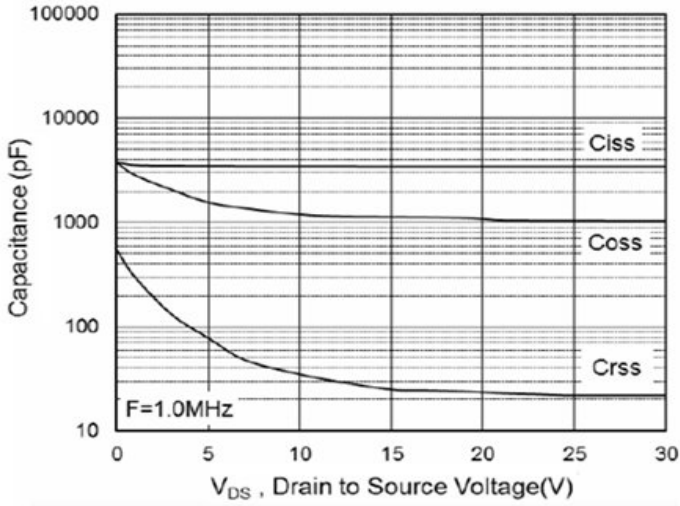


**Fig.5 Normalized  $V_{GS(th)}$  vs  $T_J$**

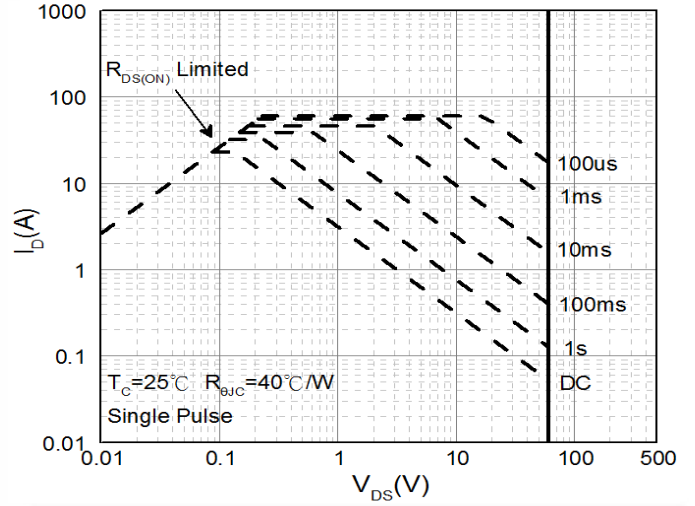


**Fig.6 Normalized  $R_{DS(on)}$  vs  $T_J$**

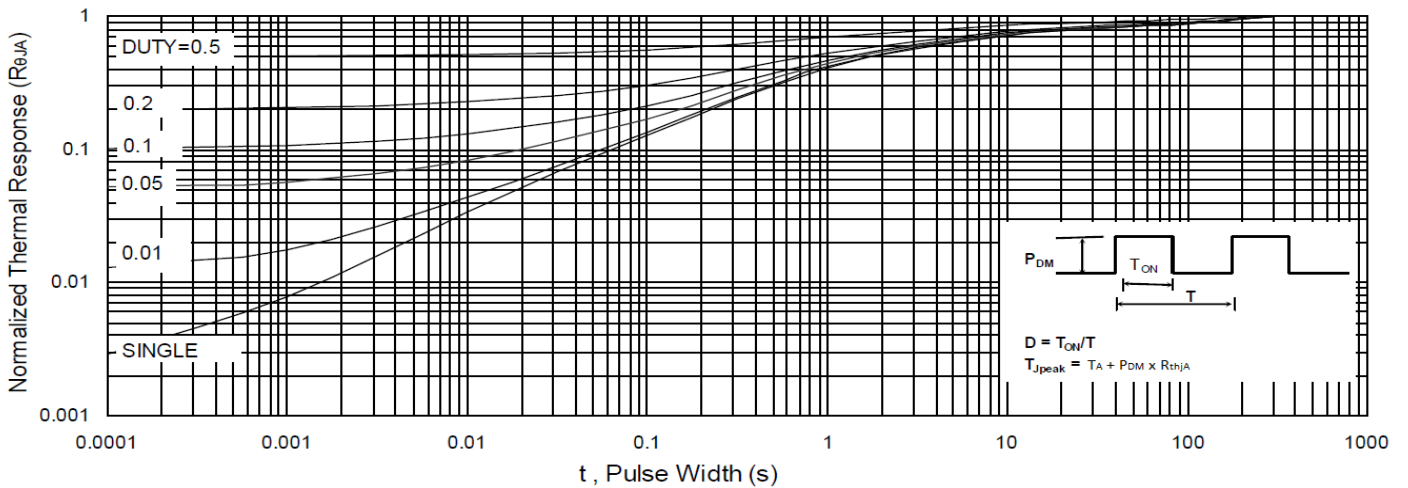
**CHARACTERISTICS CURVE**



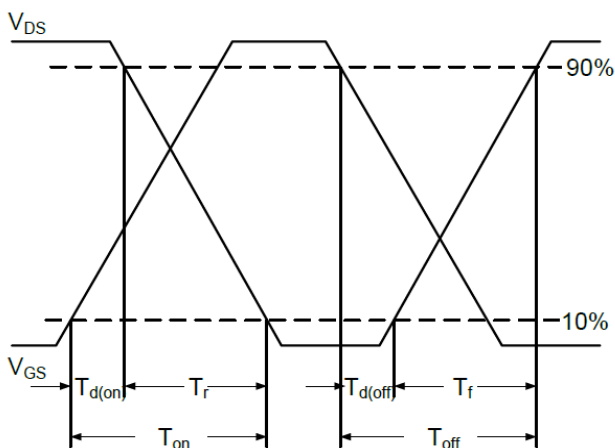
**Fig.7 Capacitance**



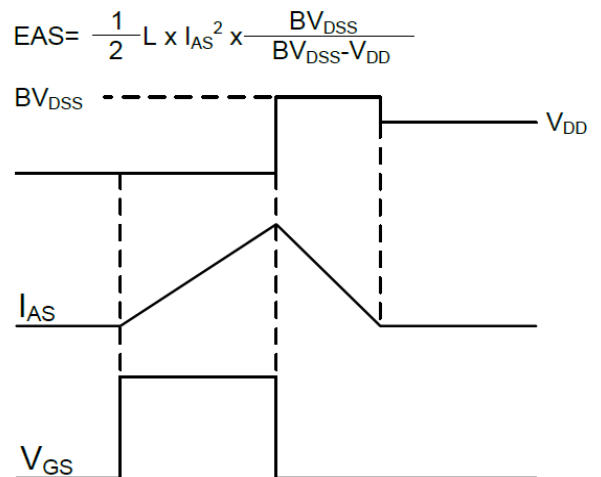
**Fig.8 Safe Operating Area**



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



**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**