

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

## DESCRIPTION

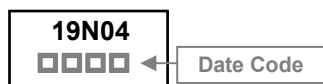
The SSG19N04-C is the highest performance trench N-Ch MOSFETs with extreme high cell density, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

The SSG19N04-C meet the RoHS and Green Product requirement with full function reliability approved.

## FEATURES

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge

## MARKING



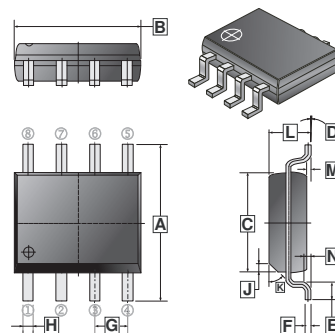
## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch

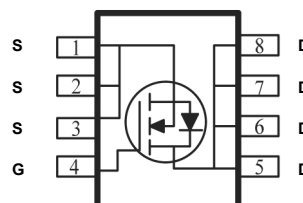
## ORDER INFORMATION

Part Number	Type
SSG19N04-C	Lead (Pb)-free and Halogen-free

## 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.				



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup> , @ $V_{GS}=10V$	$I_D$	$T_C=25^\circ C$	19
		$T_C=100^\circ C$	14
		$T_A=25^\circ C$	10
		$T_A=70^\circ C$	8
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	50	A
Total Power Dissipation	$P_D$	1.5	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ C$
<b>Thermal Resistance Ratings</b>			
Maximum Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	83	$^\circ C/W$
Maximum Thermal Resistance Junction-Ambient <sup>2</sup>		125	
Maximum Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	25	

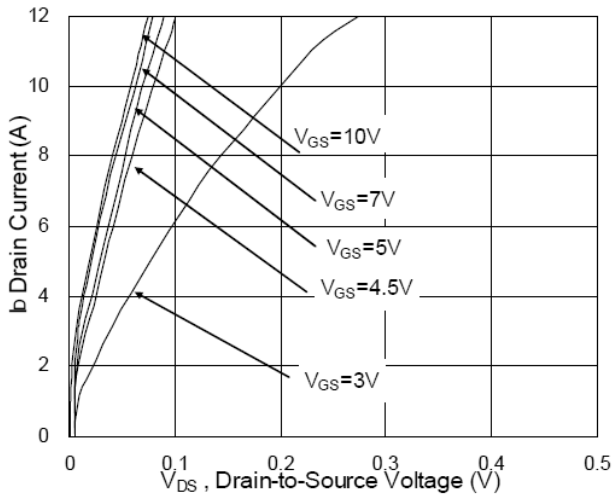
**ELECTRICAL CHARACTERISTICS** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions	
Drain-Source Breakdown Voltage	$BV_{DSS}$	40	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$	
Gate Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	
Forward Transconductance	$g_{fs}$	-	39	-	S	$V_{DS}=5\text{V}, I_D=12\text{A}$	
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}= \pm 20\text{V}$	
Drain-Source Leakage Current	$I_{DSS}$	$T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$	$V_{DS}=32\text{V}, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	5		$V_{DS}=32\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance <sup>4</sup>	$R_{DS(ON)}$	-	-	8.5	m $\Omega$	$V_{GS}=10\text{V}, I_D=12\text{A}$	
		-	-	10		$V_{GS}=4.5\text{V}, I_D=10\text{A}$	
Total Gate Charge	$Q_g$	-	18.8	-	nC	$I_D=12\text{A}$ $V_{DS}=20\text{V}$ $V_{GS}=4.5\text{V}$	
Gate-Source Charge	$Q_{gs}$	-	4.7	-			
Gate-Drain Change	$Q_{gd}$	-	8.2	-			
Turn-on Delay Time	$T_{d(on)}$	-	14.3	-	nS	$V_{DD}=15\text{V}$ $I_D=1\text{A}$ $V_{GS}=10\text{V}$ $R_G=3.3\Omega$	
Rise Time	$T_r$	-	2.6	-			
Turn-off Delay Time	$T_{d(off)}$	-	77	-			
Fall Time	$T_f$	-	4.8	-			
Input Capacitance	$C_{iss}$	-	2332	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1\text{MHz}$	
Output Capacitance	$C_{oss}$	-	193	-			
Reverse Transfer Capacitance	$C_{rss}$	-	138	-			
<b>Source-Drain Diode</b>							
Forward on Voltage <sup>4</sup>	$V_{SD}$	-	-	1.2	V	$I_S=1\text{A}, V_{GS}=0$	
Continuous Source Current <sup>1</sup>	$I_S$	-	-	19	A		
Pulsed Source Current <sup>3</sup>	$I_{SM}$	-	-	50	A		

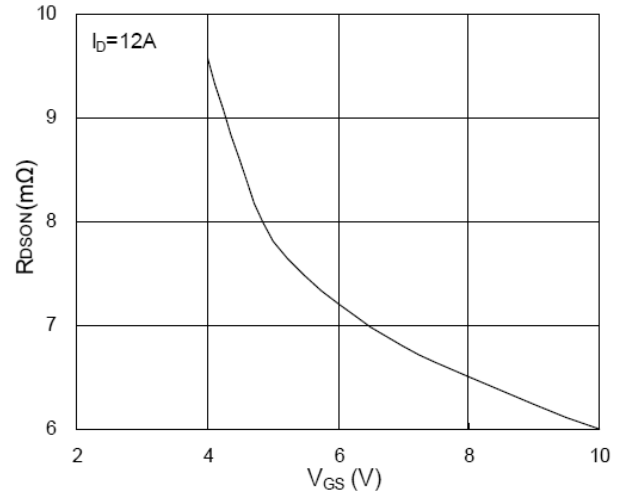
Notes:

- Surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- When mounted on Min. Copper pad.
- Pulse width limited by maximum junction temperature, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- The data tested by pulsed, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

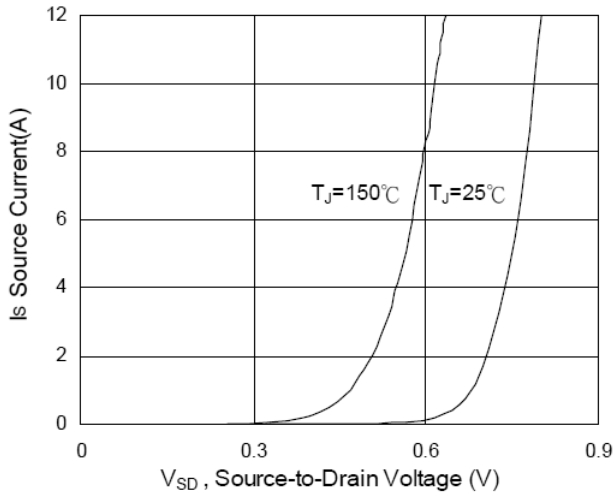
**TYPICAL CHARACTERISTICS CURVE**



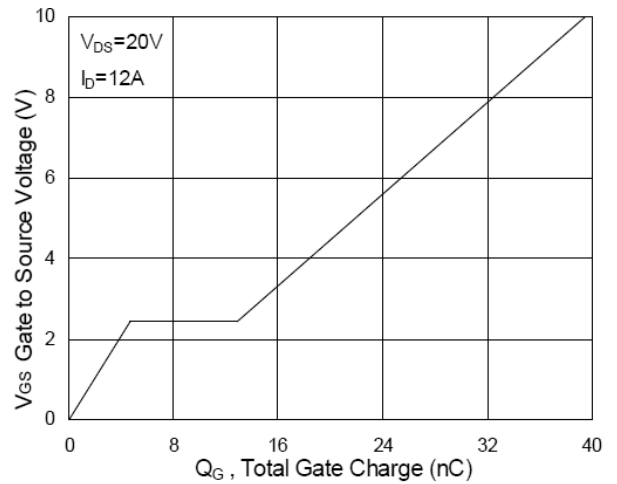
**Fig.1 Typical Output Characteristics**



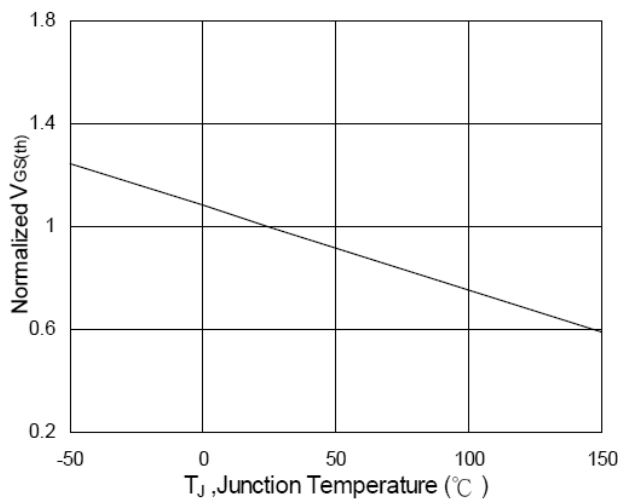
**Fig.2 On-Resistance vs. G-S Voltage**



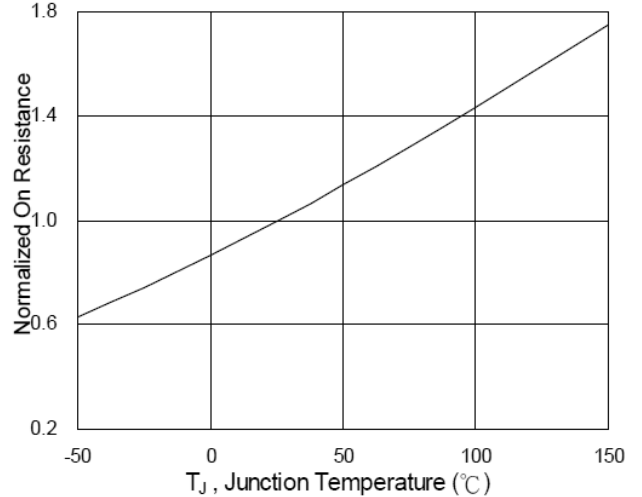
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate-Charge Characteristics**

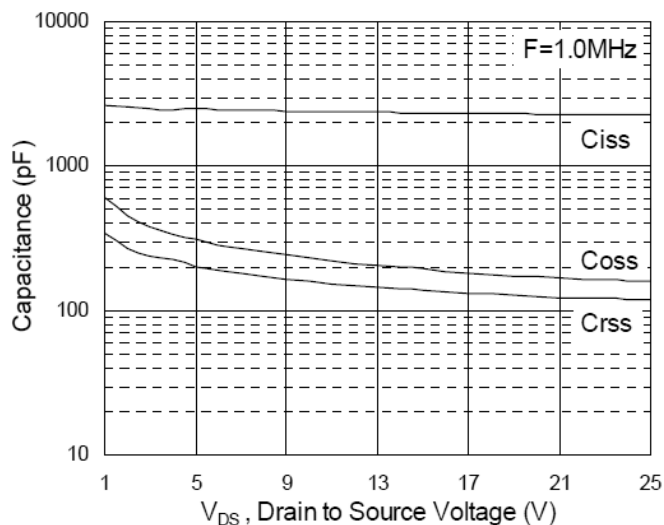


**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**

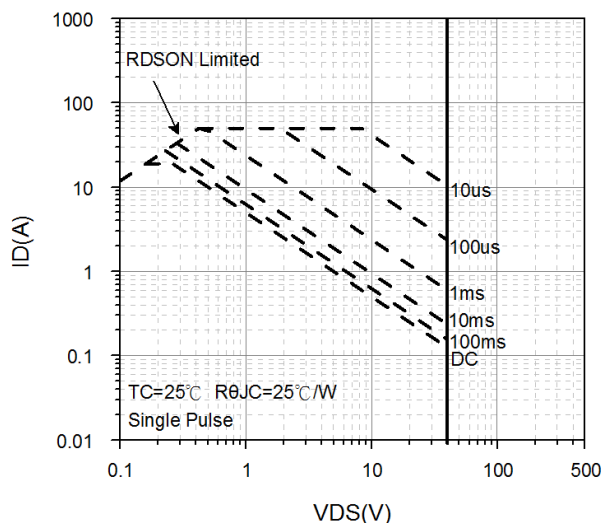


**Fig.6 Normalized  $R_{DS(ON)}$  vs.  $T_J$**

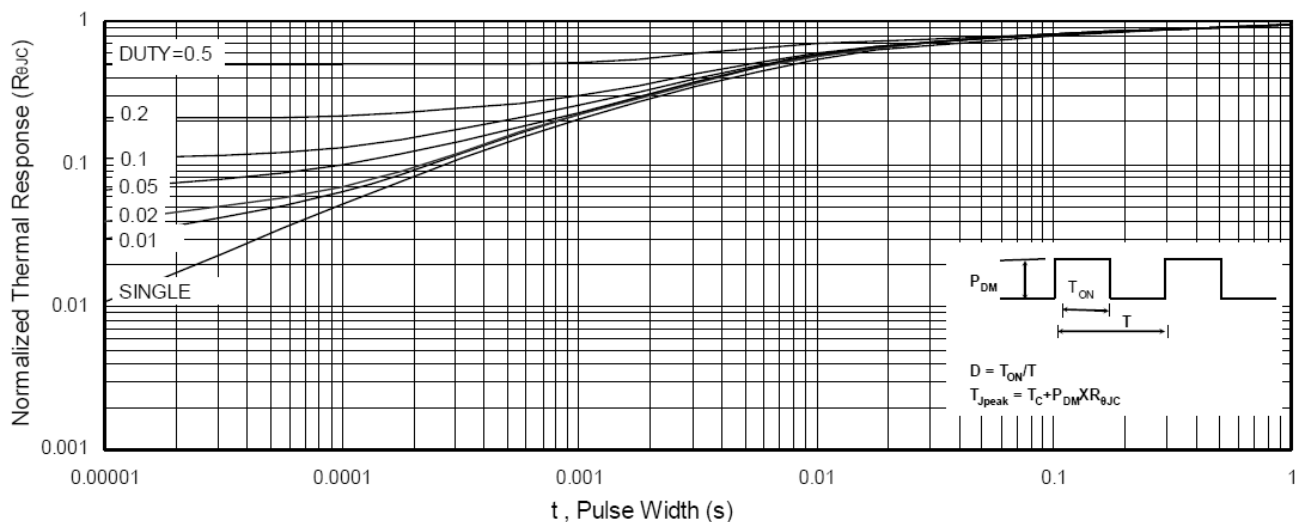
**TYPICAL CHARACTERISTICS CURVE**



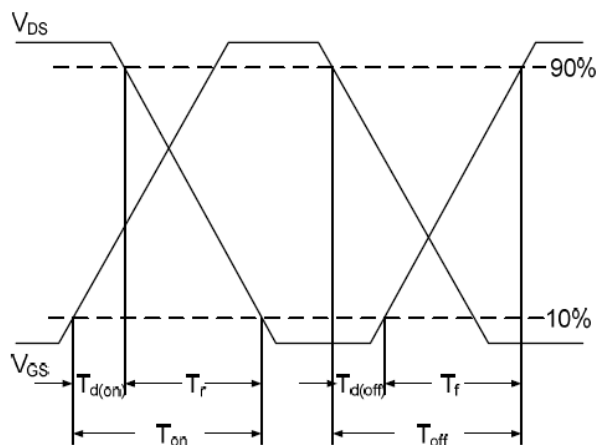
**Fig.7 Capacitance**



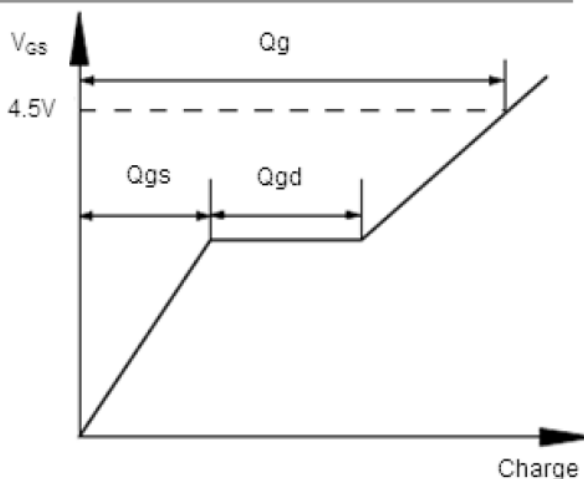
**Fig.8 Safe Operating Area**



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



**Fig.10 Switching Time Waveform**



**Fig.11 Gate Charge Waveform**