Elektronische Bauelemente

SSG24N04S-C

24A, 40V, $R_{DS(ON)}$ 3.6mΩ

N-Channel Shielded Gate Trench Power MOSFET

RoHS Compliant Product

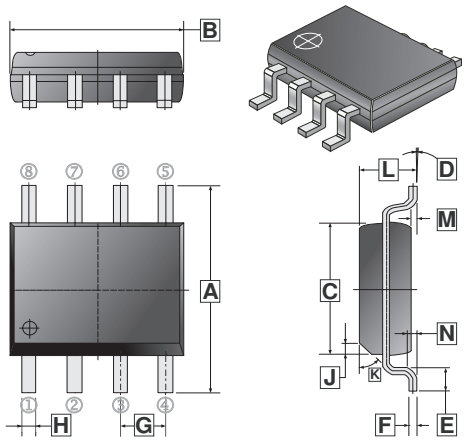
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SSG24N04S-C is the Shielded Gate Technology 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 SSG24N04S-C meet the RoHS and Green Product requirement with full function reliability approved.

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.				

FEATURES

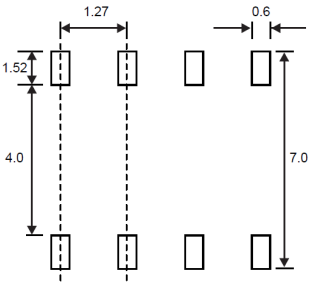
- Shielded Gate Trench Technology
- Super Low Gate Charge
- Green Device Available

MARKING

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch

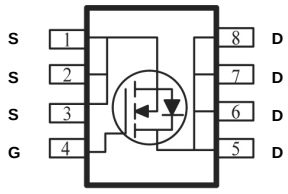
Mounting Pad Layout



*Dimensions in millimeters

ORDER INFORMATION

Part Number	Type
SSG24N04S-C	Lead (Pb)-free and Halogen-free



ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_A=25℃	I_D	24	A
	T_A=70℃		19	
Pulsed Drain Current [2]		I_{DM}	70	A
Power Dissipation [3]	T_A=25℃	P_D	3.1	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]	Steady State	$R_{\theta JA}$	75	℃/W
	t≦10s		40	

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-Source Breakdown Voltage		BV_{DSS}	40	-	-	V	V_{GS}=0V, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transfer Conductance		g_{fs}	-	75	-	S	V_{DS}=5V, I_D=20A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	1	μA	V_{DS}=32V, V_{GS}=0V
	T_J=55℃		-	-	5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	2.5	3.6	mΩ	V_{GS}=10V, I_D=20A
			-	3.8	5.3		V_{GS}=4.5V, I_D=15A
Gate Resistance		R_g	-	1.5	-	Ω	V_{DS}=0V, V_{GS}=0V, f=1MHz
Total Gate Charge		Q_g	-	22.7	-	nC	I_D=20A V_{DS}=20V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	7.5	-		
Gate-Drain (“Miller”) Charge		Q_{gd}	-	5.5	-		
Turn-On Delay Time		$T_{d(on)}$	-	10	-	nS	V_{DD}=20V I_D=20A V_{GS}=10V R_G=3Ω
Rise Time		T_r	-	5	-		
Turn-Off Delay Time		$T_{d(off)}$	-	33	-		
Fall Time		T_f	-	6.5	-		
Input Capacitance		C_{iss}	-	2648	-	pF	V_{GS}=0V V_{DS}=20V f=1MHz
Output Capacitance		C_{oss}	-	899	-		
Reverse Transfer Capacitance		C_{rss}	-	71	-		
Source-Drain Diode							
Diode Forward Voltage [2]		V_{SD}	-	-	1	V	I_S=1A, V_{GS}=0V, T_J=25℃
Continuous Source Current [1,4]		I_S	-	-	24	A	V_G=V_D=0V, Force Current

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width≦300us, duty cycle≦2%.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

CHARACTERISTICS CURVE

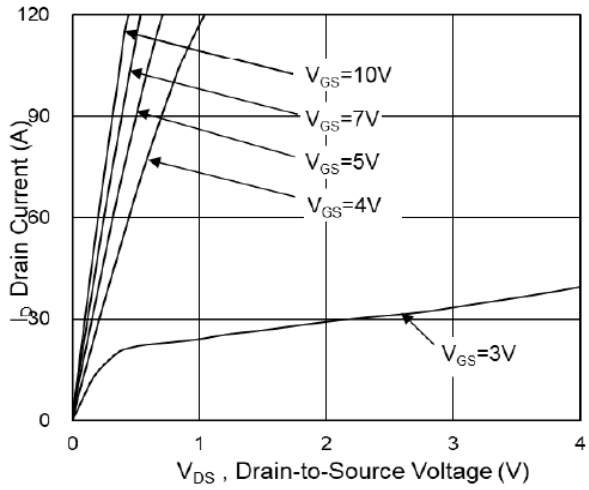


Fig.1 Typical Output Characteristics

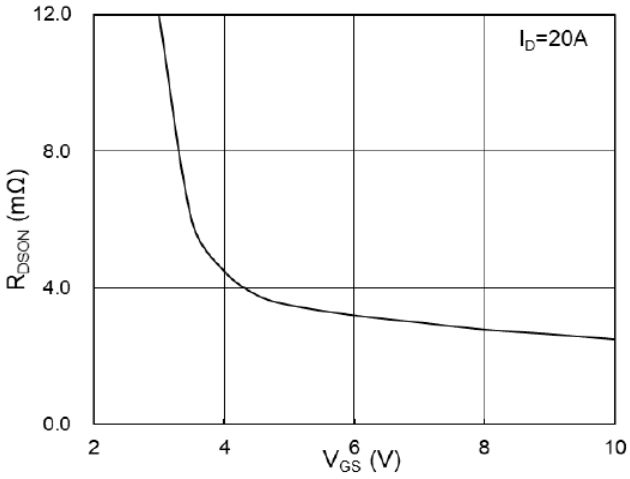


Fig.2 On-Resistance vs G-S Voltage

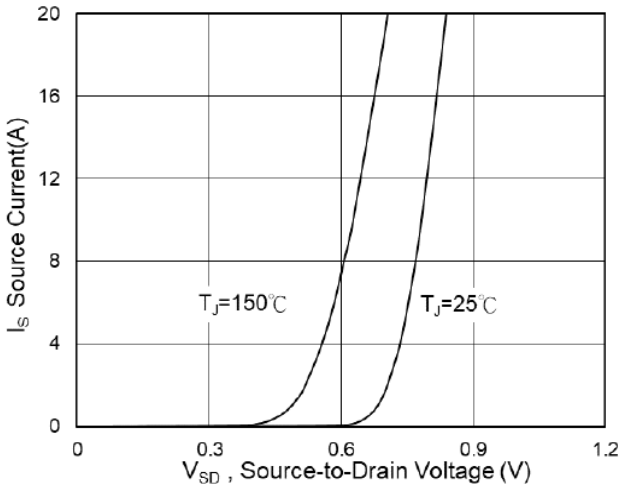


Fig.3 Source Drain Forward Characteristics

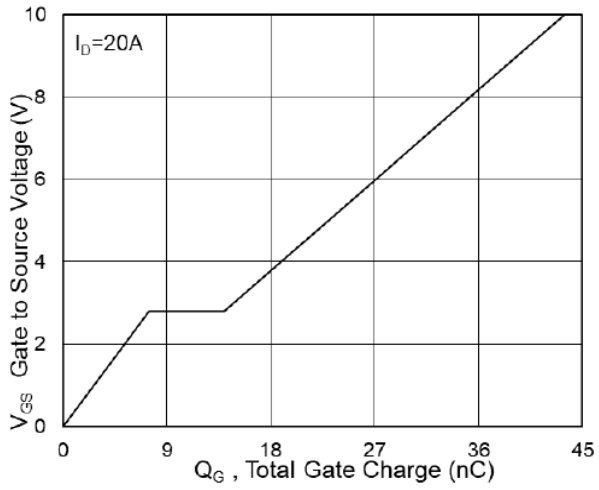


Fig.4 Gate-Charge Characteristics

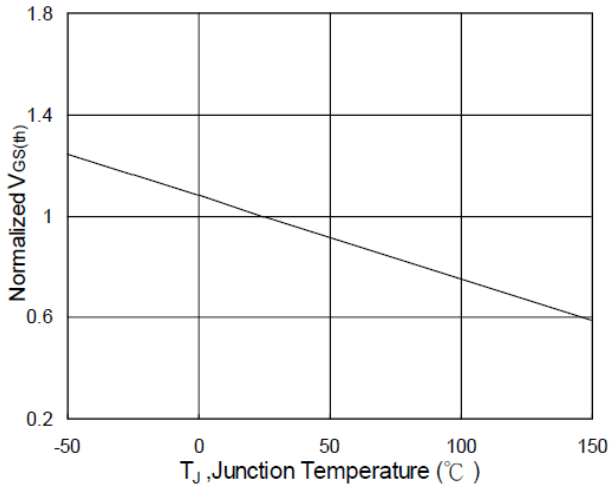


Fig.5 Normalized $V_{GS(th)}$ vs T_J

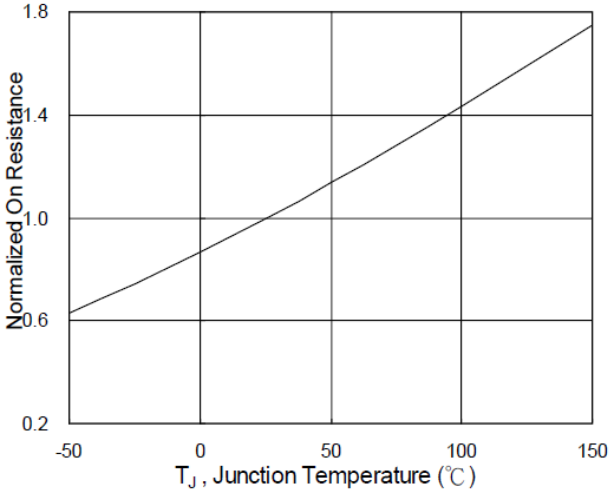


Fig.6 Normalized R_{DSON} vs T_J

CHARACTERISTICS CURVE

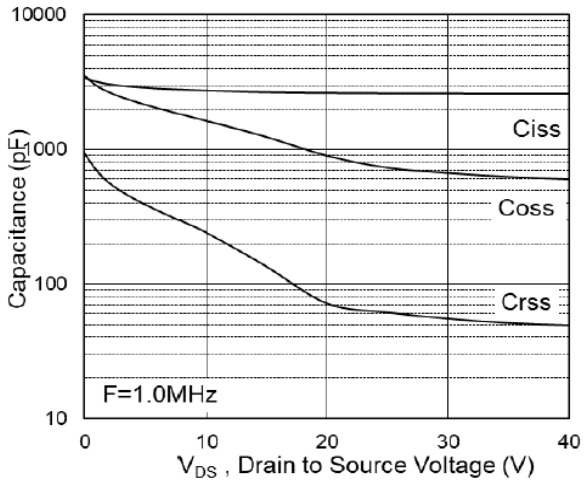


Fig.7 Capacitance

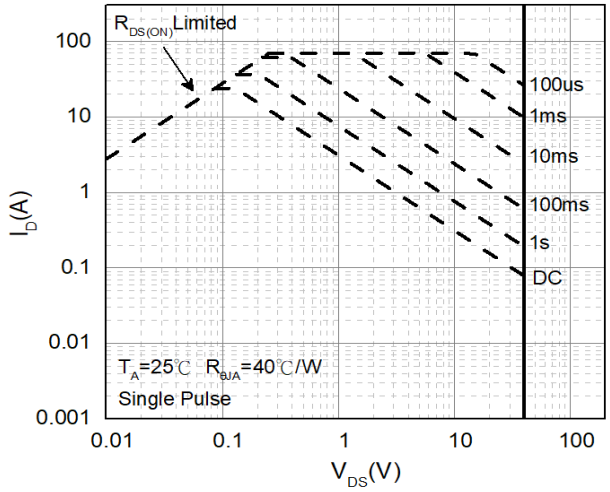


Fig.8 Safe Operating Area

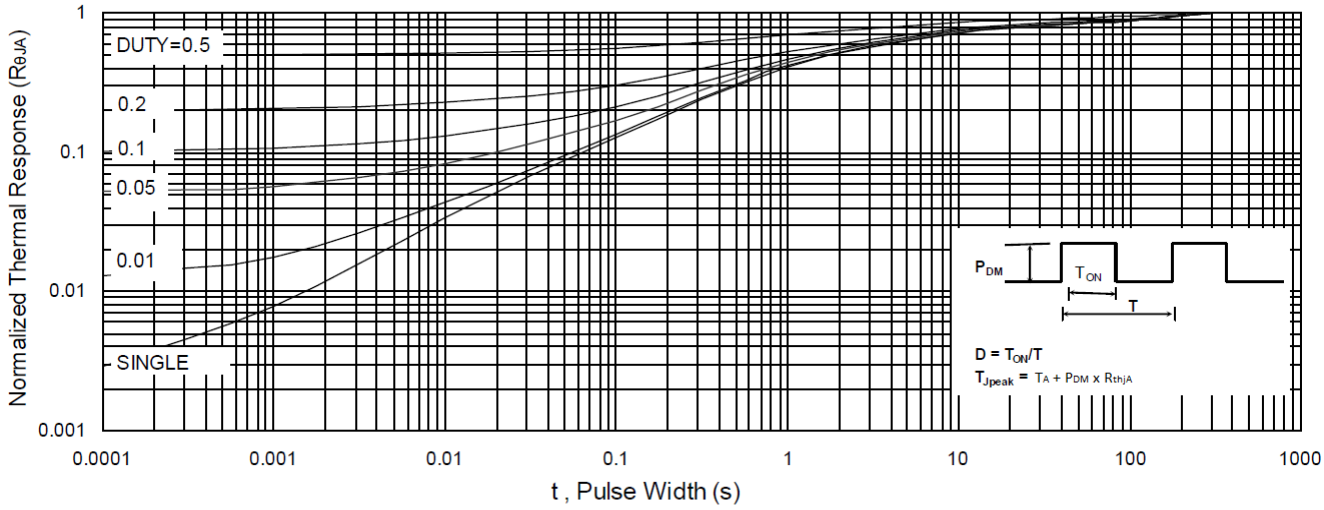


Fig.9 Normalized Maximum Transient Thermal Impedance

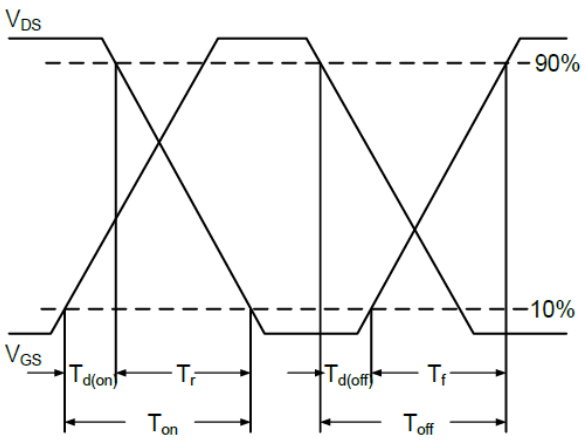


Fig.10 Switching Time Waveform

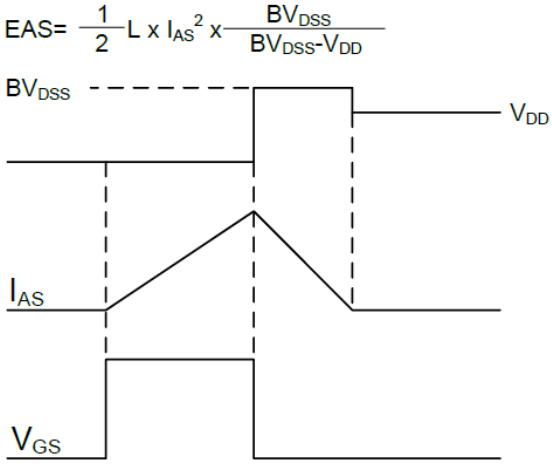


Fig.11 Unclamped Inductive Switching Wave