Elektronische Bauelemente

SSG9904-C

7.2A, 40V, $R_{DS(ON)}$ 30mΩ

Dual-N Enhancement Mode Power MOSFET

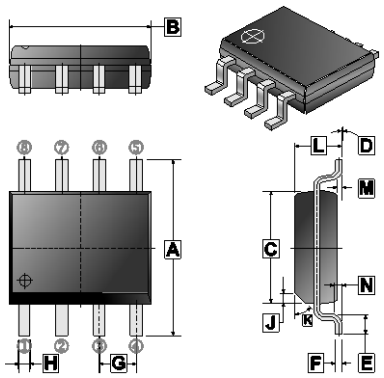
RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SSG9904-C is the highest performance trench dual N-ch MOSFETs with extreme high cell density, which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications.

The SSG9904-C meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

SOP-8

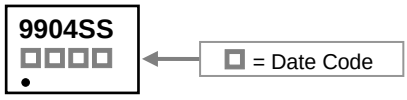


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.79	6.20	H	0.33	0.51
B	4.70	5.11	J	0.375 REF.	
C	3.80	4.00	K	45° REF.	
D	0°	8°	L	1.3	1.752
E	0.40	1.27	M	0	0.25
F	0.10	0.25	N	0.25 REF.	
G	1.27 TYP.				

FEATURES

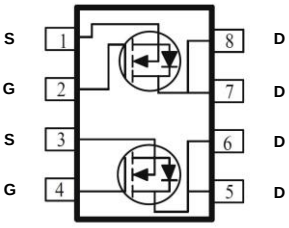
- Advanced high cell density Trench technology
- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available

MARKING

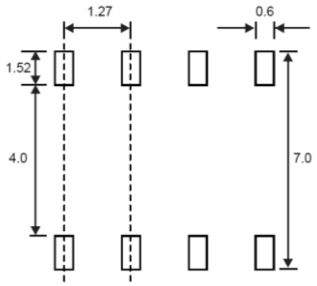


PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	2.5K	13 inch



Mounting Pad Layout



*Dimensions in millimeters

ORDER INFORMATION

Part Number	Type
SSG9904-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 @V_{GS}=10V [1]	T_C=25°C	I_D	7.2	A
	T_C=100°C		5.6	
Pulsed Drain Current [3]		I_{DM}	14.5	A
Single Pulse Avalanche Energy [5]		E_{AS}	28	mJ
Avalanche Current		I_{AS}	7.5	A
Power Dissipation	T_C=25°C	P_D	2.5	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	85	°C/W
Thermal Resistance Junction-Ambient [2]			135	
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	50	

ELECTRICAL CHARACTERISTICS (T_J=25°C 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
Breakdown Voltage Temp. Coefficient		$\triangle BV_{DS}/\triangle T_J$	-	0.034	-	V/°C	Reference to 25°C, I_D=1mA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transfer conductance		g_{fs}	-	14	-	S	V_{DS}=5V, I_D=6A
Gate-Body Leakage		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	μA	V_{DS}=32V,V_{GS}=0
	T_J=55°C		-	-	5		
Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	30	mΩ	V_{GS}=10V, I_D=6A
			-	-	40		V_{GS}=4.5V, I_D=4A
Total Gate Charge		Q_g	-	5.5	-	nC	I_D=6A V_{DS}=20V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	1.25	-		
Gate-Drain (“Miller”) Charge		Q_{gd}	-	2.5	-		
Turn-On Delay Time		$T_{d(on)}$	-	8.9	-	nS	V_{DS}=20V I_D=1A V_{GS}=10V R_G=3.3Ω R_D=20Ω
Rise Time		T_r	-	2.2	-		
Turn-Off Delay Time		$T_{d(off)}$	-	41	-		
Fall Time		T_f	-	2.7	-		
Input Capacitance		C_{iss}	-	593	-	pF	V_{GS}=0V V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	76	-		
Reverse Transfer Capacitance		C_{rss}	-	56	-		
Single Pulse Avalanche Energy [6]		E_{AS}	8	-	-	mJ	V_{DD}=25V, L=1mH, I_{AS}=4A
Source-Drain Diode							
Forward On Voltage [4]		V_{DS}	-	-	1.2	V	I_S=1A, V_{GS}=0V
Continuous Source Current [1]		I_S	-	7.2	-	A	
Pulsed Source Current [3]		I_{SM}	-	14.5	-	A	

Notes:
1. Surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. When mounted on Min. copper pad.
3. The power dissipation is limited by 150°C junction temperature.
4. The data tested by pulsed, pulse width≦ 300us, duty cycle≦ 2%.
5. The E_{AS} data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=7.5A.
6. The Min. value is 100% E_{AS} tested guarantee.

CHARACTERISTICS CURVE

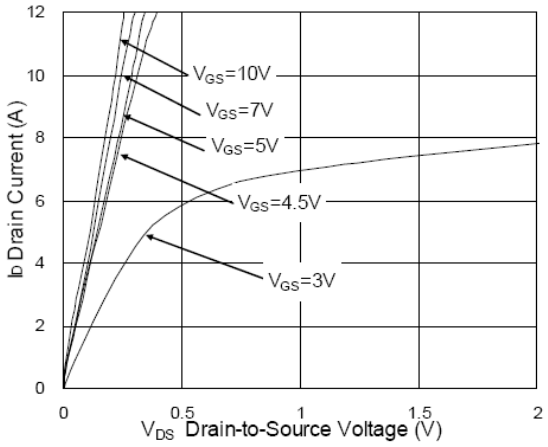


Fig.1 Typical Output Characteristics

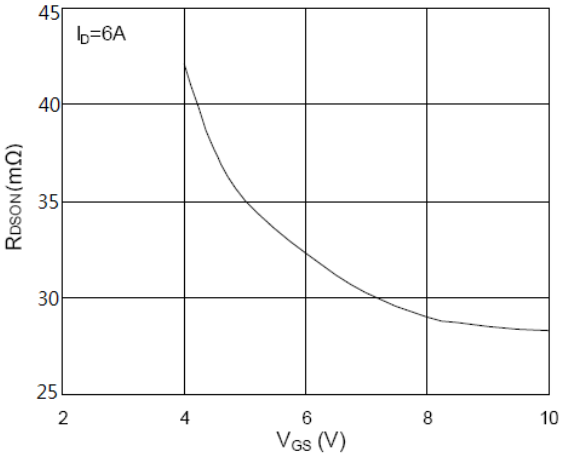


Fig.2 On-Resistance vs. G-S Voltage

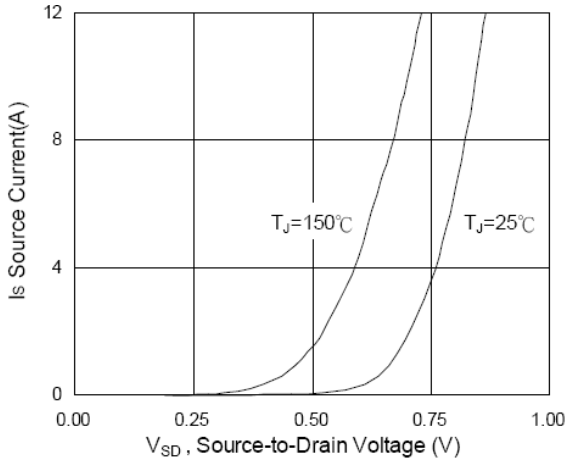


Fig.3 Forward Characteristics of Reverse

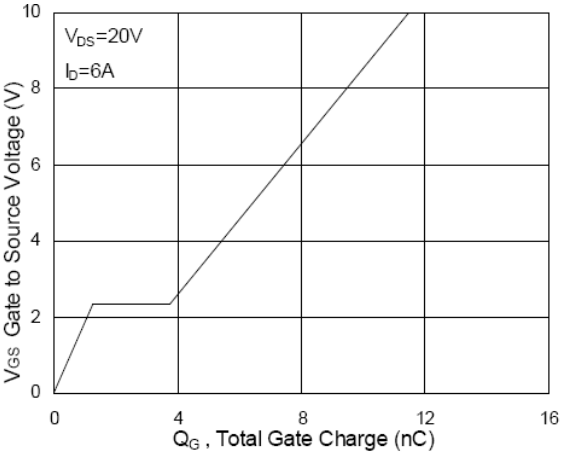


Fig.4 Gate-Charge Characteristics

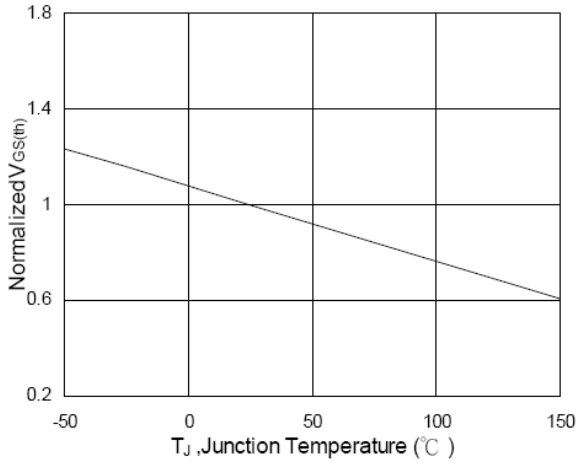


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

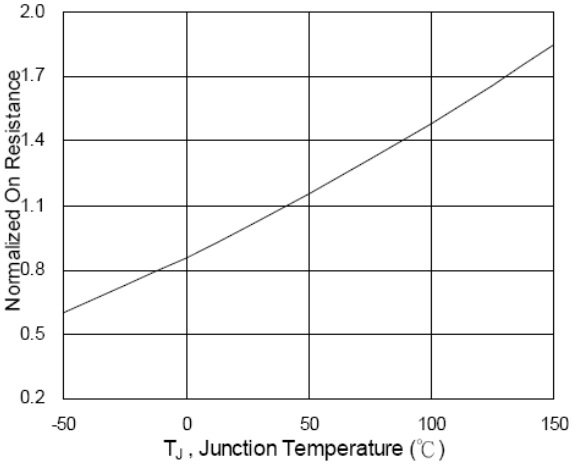


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTICS CURVE

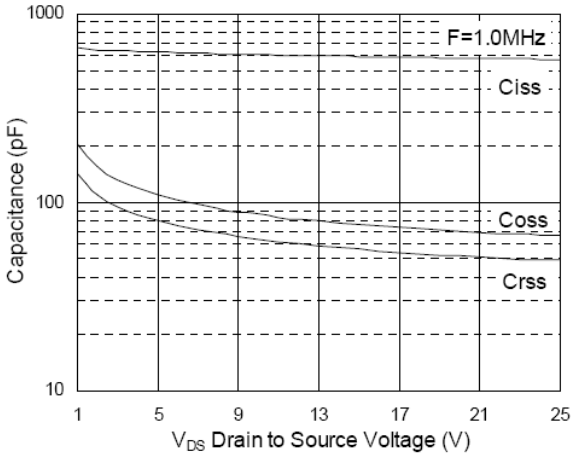


Fig.7 Capacitance

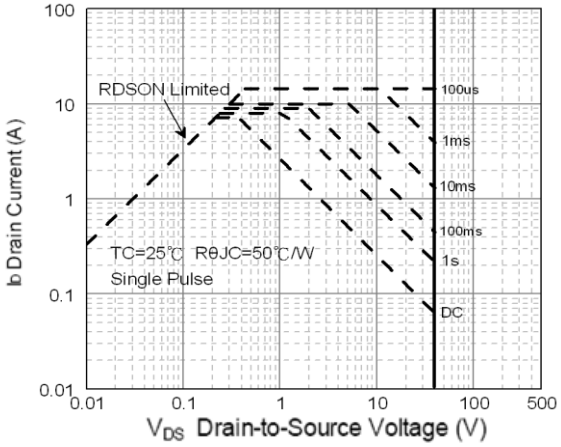


Fig.8 Safe Operating Area

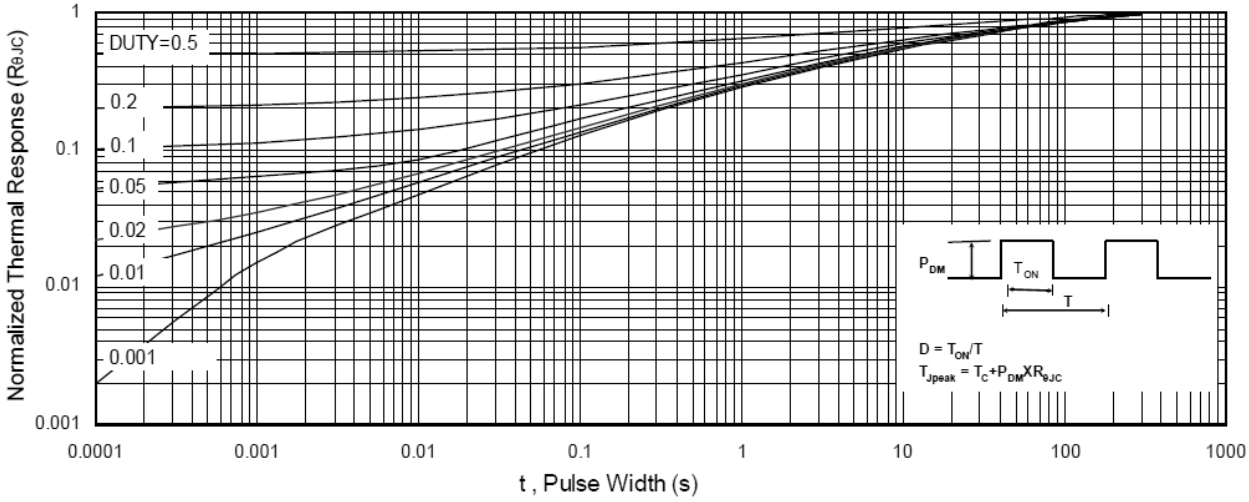


Fig.9 Normalized Maximum Transient Thermal Impedance

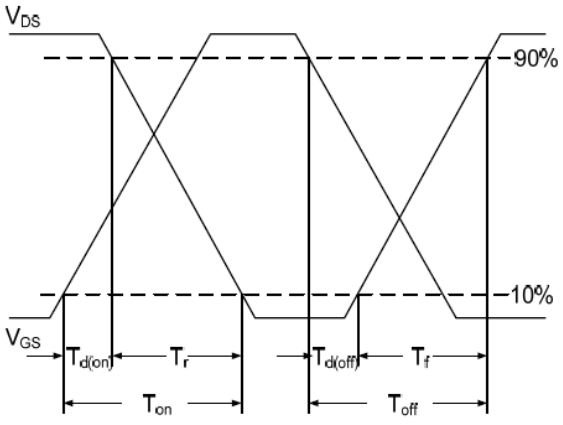


Fig.10 Switching Time Waveform

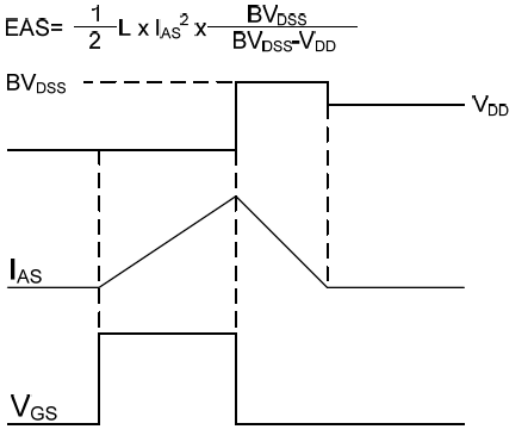


Fig.11 Unclamped Inductive Switching Wave