

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

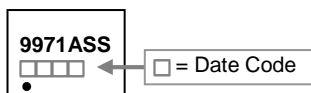
## DESCRIPTION

The SSG9971A provide the designer with the best Combination of fast switching, ruggedized device design, Ultra low on-resistance and cost-effectiveness.

## FEATURES

- Low on-resistance
- Simple Drive Requirement
- Double-N MosFET Package

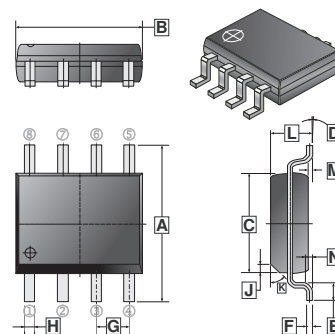
## MARKING CODE



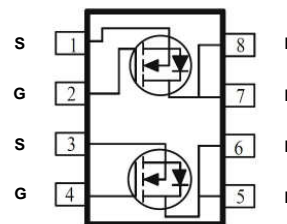
## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	3K	13' inch

## SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current@ $V_{GS} = 10V$ <sup>3</sup>	$I_D$	$T_A = 25^\circ\text{C}$	5
		$T_A = 70^\circ\text{C}$	3.2
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	30	A
Linear Derating Factor	-	0.016	W/ $^\circ\text{C}$
Power Dissipation@ $T_A = 25^\circ\text{C}$	$P_D$	2	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
Thermal Resistance Junction-ambient (Max.) <sup>3</sup>	$R_{\theta JA}$	62.5	$^\circ\text{C} / \text{W}$

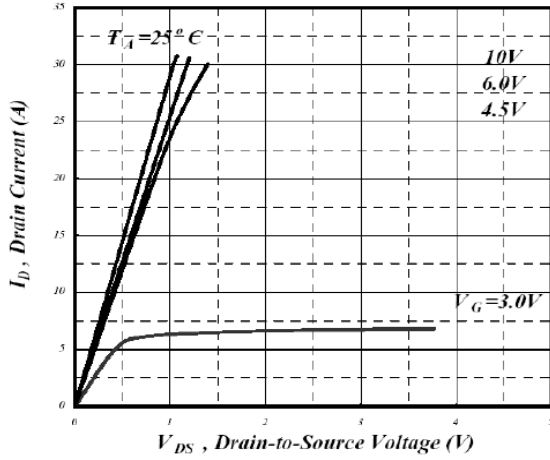
**ELECTRICAL CHARACTERISTICS** (T<sub>j</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
Breakdown Voltage Temp. Coefficient	ΔBV <sub>DS</sub> /ΔT <sub>j</sub>	-	0.06	-	V / °C	Reference to 25°C, I <sub>D</sub> =1mA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	1	-	3	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Forward Transconductance	G <sub>fs</sub>	-	7	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =5A
Gate-Body Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =48V, V <sub>GS</sub> =0, T <sub>J</sub> =25°C
		-	-	25		V <sub>DS</sub> =48V, V <sub>GS</sub> =0, T <sub>J</sub> =70°C
Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	50	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =5A
		-	-	60		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.5A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	32.5	-	nC	I <sub>D</sub> = 5A V <sub>DS</sub> = 48V V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	-	4.9	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	8.8	-		
Turn-On Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	9.6	-	nS	V <sub>DS</sub> = 30V I <sub>D</sub> = 5A V <sub>GS</sub> = 10V R <sub>G</sub> = 3.3Ω R <sub>D</sub> = 6Ω
Rise Time	T <sub>r</sub>	-	10	-		
Turn-Off Delay Time	T <sub>d(off)</sub>	-	30	-		
Fall Time	T <sub>f</sub>	-	5.5	-		
Input Capacitance	C <sub>iss</sub>	-	1658	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	156	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	109	-		
<b>Source-Drain Diode</b>						
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.2	V	I <sub>S</sub> =1.6A, V <sub>GS</sub> =0V
Reverse Recovery Time	T <sub>rr</sub>	-	29.2	-	nS	I <sub>S</sub> =5A, V <sub>GS</sub> =0V
Reverse Recovery Charge	Q <sub>rr</sub>	-	48	-	nC	di/dt=100A/μs

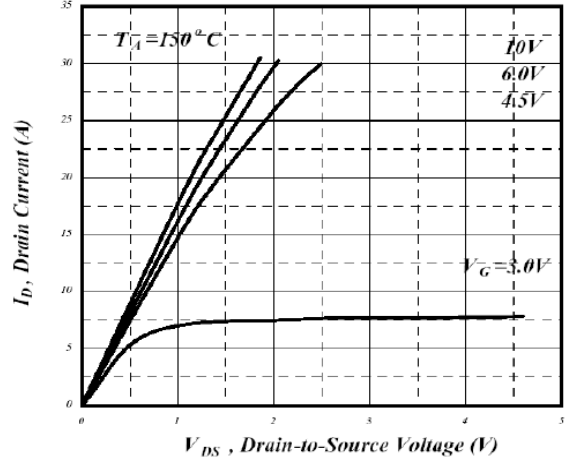
Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounted on a 1 in<sup>2</sup> copper pad of FR-4 board; 135°C/W when mounted on Min. copper pad.

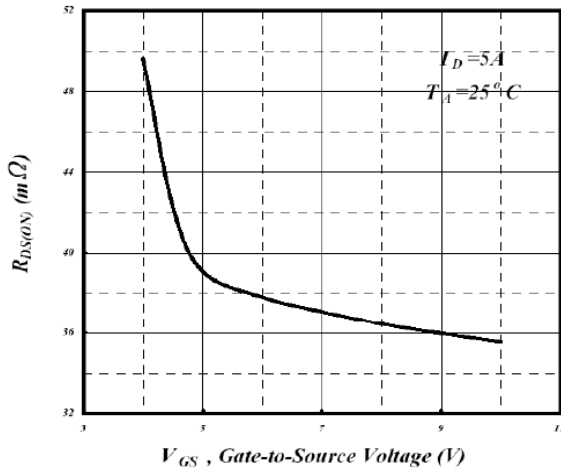
**CHARACTERISTICS CURVE**



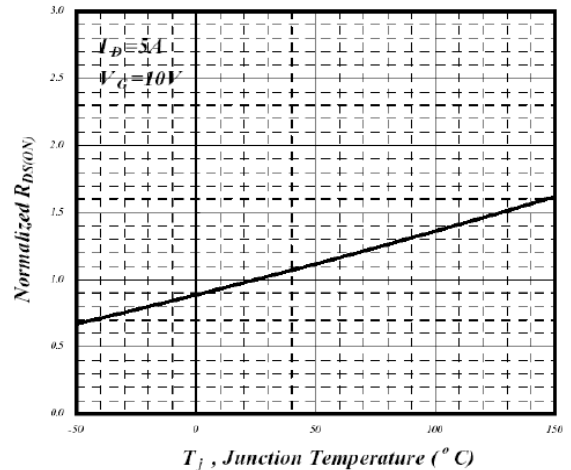
**Fig 1. Typical Output Characteristics**



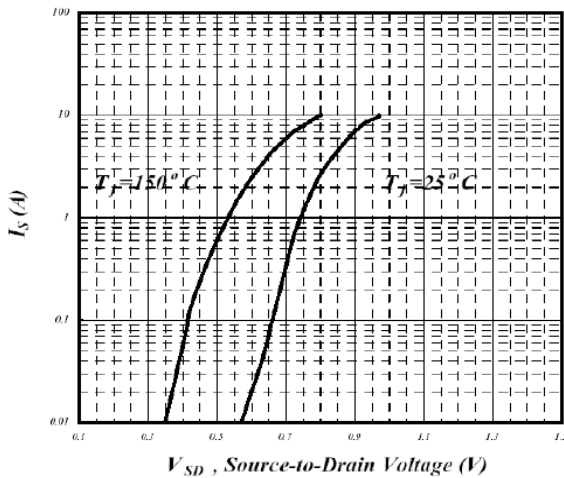
**Fig 2. Typical Output Characteristics**



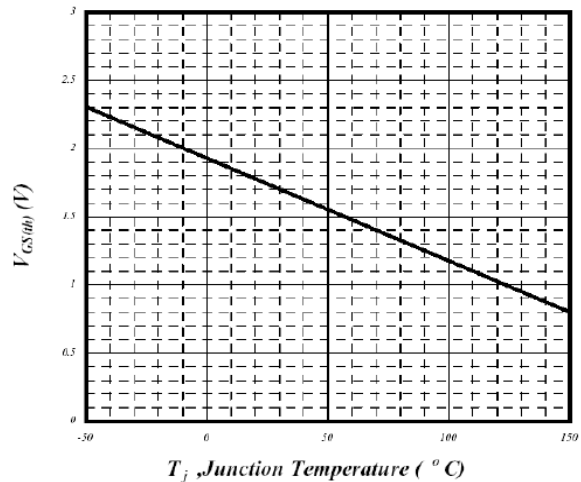
**Fig 3. On-Resistance v.s. Gate Voltage**



**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

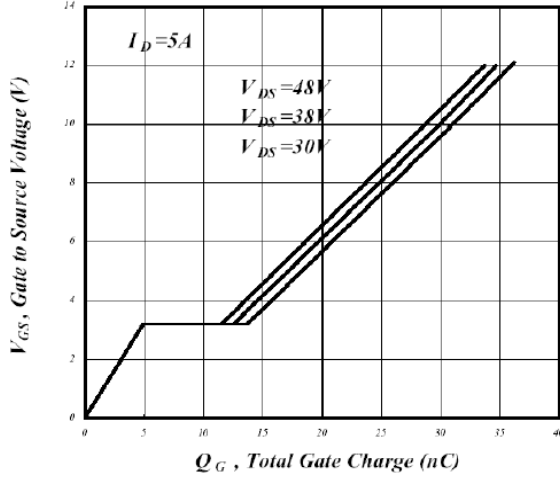


**Fig 5. Forward Characteristics of Reverse Diode**

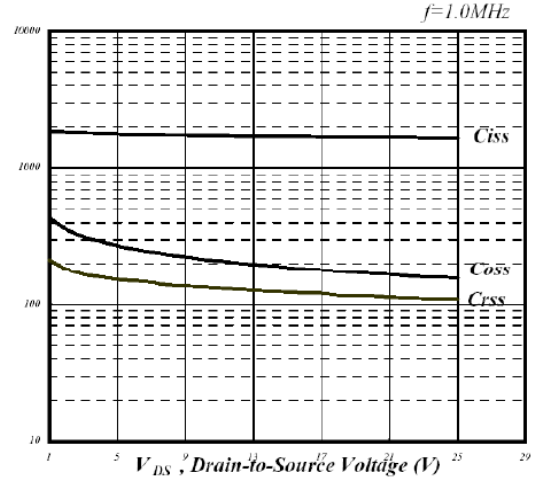


**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**

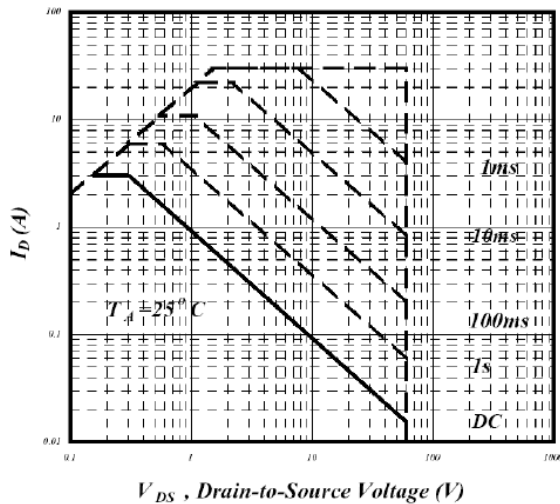
**CHARACTERISTICS CURVE**



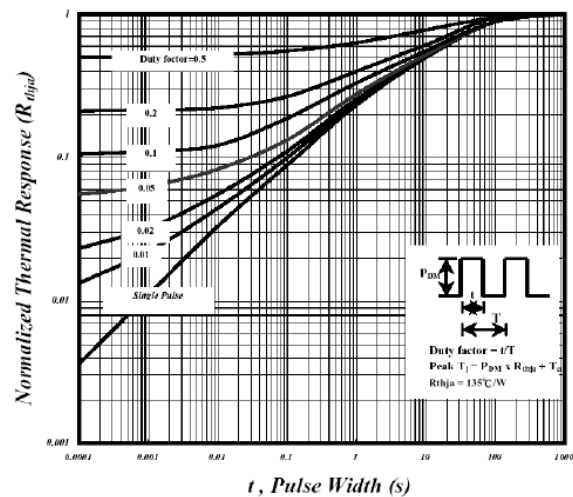
**Fig 7. Gate Charge Characteristics**



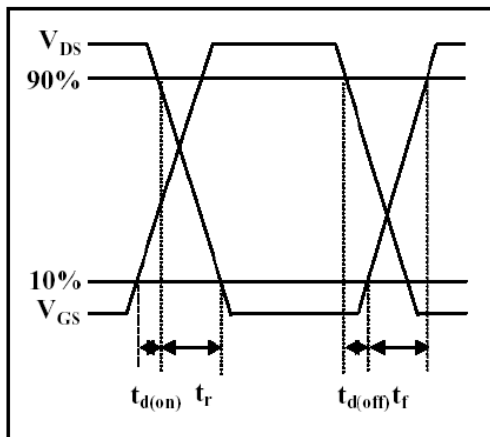
**Fig 8. Typical Capacitance Characteristics**



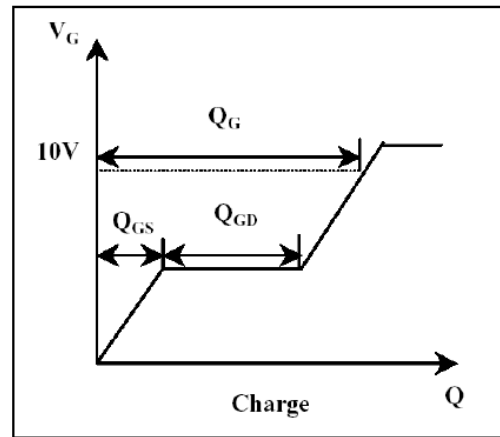
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**