

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

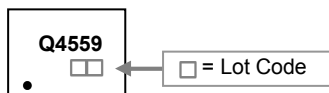
## DESCRIPTION

The SSG4559J-C provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The SOP-8 package is universally preferred for all commercial industrial surface mount application and suited for low voltage applications such as DC/DC converters.

## FEATURES

- Simple Drive Requirement
- Lower On-resistance
- Fast Switching Performance

## MARKING



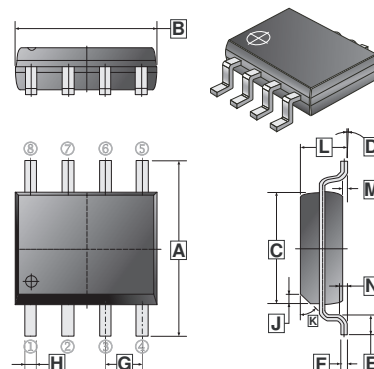
## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOP-8	4K	13 inch

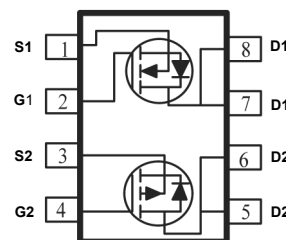
## ORDER INFORMATION

Part Number	Type
SSG4559J-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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings		Unit
		N-Ch	P-Ch	
Drain-Source Voltage	$V_{DS}$	60	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$		V
Continuous Drain Current <sup>1</sup>	$I_D$	4.5	-3.5	A
Pulsed Drain Current ( $t_p=10\mu\text{s}$ )	$I_{DM}$	18	-14	A
Continuous Source Current	$I_S$	4.5	-3.5	A
Total Power Dissipation	$P_D$	2		W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150		$^\circ\text{C}$
Thermal Data				
Thermal Resistance Junction-ambient <sup>1</sup> (Max.)	$R_{\theta JA}$	62.5		$^\circ\text{C} / \text{W}$

**N-CHANNEL ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate Threshold Voltage <sup>2</sup>	$V_{GS(th)}$	1	-	3.5	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Drain-Source Leakage Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=48\text{V}, V_{GS}=0$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	-	58	m $\Omega$	$V_{GS}=10\text{V}, I_D=4.3\text{A}$
		-	-	72		$V_{GS}=4.5\text{V}, I_D=3.9\text{A}$
Forward Transfer conductance <sup>2</sup>	$g_{fs}$	-	15	-	S	$V_{DS}=15\text{V}, I_D=4.3\text{A}$
Total Gate Charge	$Q_g$	-	9	-	nC	$I_D=4.3\text{A}$ $V_{DS}=30\text{V}$ $V_{GS}=4.5\text{V}$
Gate-Source Charge	$Q_{gs}$	-	2.3	-		
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	2.6	-		
Turn-on Delay Time <sup>2</sup>	$T_{d(on)}$	-	25	-	nS	$V_{DD}=30\text{V}$ $V_{GEN}=4.5\text{V}$ $I_D=3.4\text{A}$ $R_G=1\Omega$ $R_L=8.8\Omega$
Rise Time	$T_r$	-	100	-		
Turn-off Delay Time	$T_{d(off)}$	-	25	-		
Fall Time	$T_f$	-	15	-		
Input Capacitance	$C_{iss}$	-	665	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	75	-		
Reverse Transfer Capacitance	$C_{rss}$	-	40	-		
<b>Source-Drain Diode</b>						
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	1.2	V	$I_S=1.7\text{A}, V_{GS}=0, T_J=25^\circ\text{C}$

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

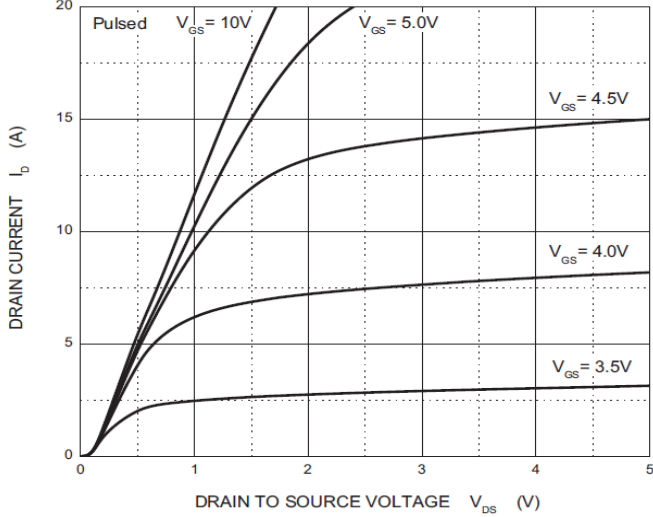
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$BV_{DSS}$	-60	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$
Gate Threshold Voltage <sup>2</sup>	$V_{GS(th)}$	-1	-	-3.5	V	$V_{DS}=V_{GS}, I_D = -250\mu\text{A}$
Drain-Source Leakage Current	$I_{DSS}$	-	-	-1	$\mu\text{A}$	$V_{DS} = -48\text{V}, V_{GS}=0$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20\text{V}$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	-	80	m $\Omega$	$V_{GS} = -10\text{V}, I_D = -3.1\text{A}$
		-	-	150		$V_{GS} = -4.5\text{V}, I_D = -0.2\text{A}$
Forward Transfer conductance <sup>2</sup>	$g_{fs}$	-	8.5	-	S	$V_{DS} = -15\text{V}, I_D = -3.1\text{A}$
Total Gate Charge	$Q_g$	-	12	-	nC	$I_D = -3.1\text{A}$ $V_{DS} = -15\text{V}$ $V_{GS} = -10\text{V}$
Gate-Source Charge	$Q_{gs}$	-	2.2	-		
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	3.7	-		
Turn-on Delay Time	$T_{d(on)}$	-	45	-	nS	$V_D = -30\text{V}$ $V_{GEN} = -4.5\text{V}$ $I_D = -2.4\text{A}$ $R_G = 1\Omega$ $R_D = 12.5\Omega$
Rise Time	$T_r$	-	105	-		
Turn-off Delay Time	$T_{d(off)}$	-	60	-		
Fall Time	$T_f$	-	45	-		
Input Capacitance	$C_{iss}$	-	650	-	pF	$V_{GS}=0$ $V_{DS} = -15\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	95	-		
Reverse Transfer Capacitance	$C_{rss}$	-	60	-		
<b>Source-Drain Diode</b>						
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	-1.2	V	$I_S = -2\text{A}, V_{GS}=0\text{V}, T_J=25^\circ\text{C}$

Notes:

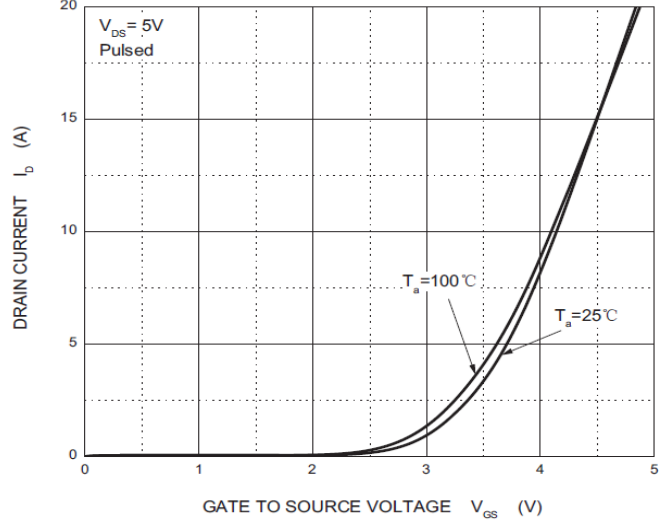
1. Surface mounted on 1 inch<sup>2</sup> copper pad of FR4 board.
2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$

**CHARACTERISTIC CURVE (N-Ch)**

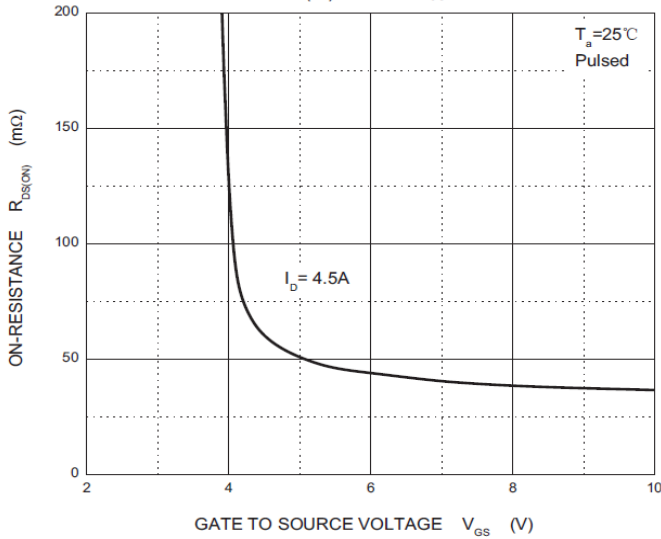
Output Characteristics



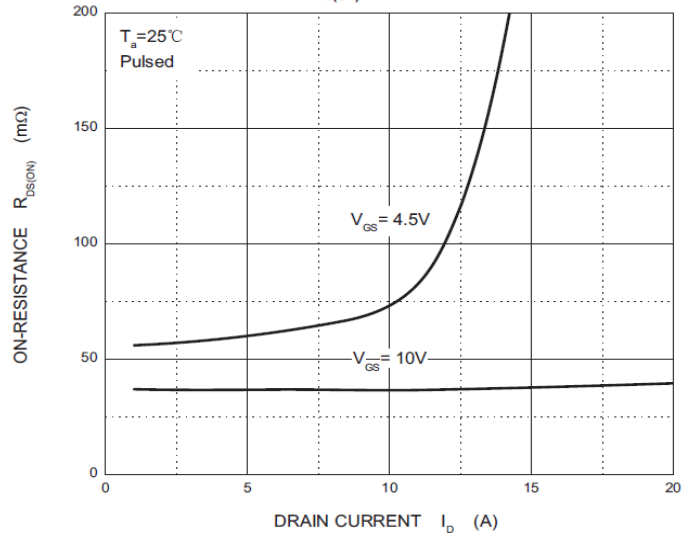
Transfer Characteristics



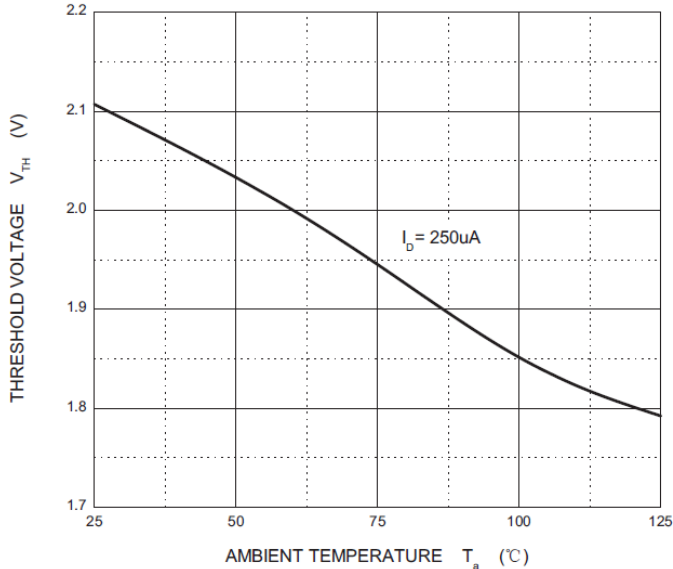
$R_{DS(ON)}$  —  $V_{GS}$



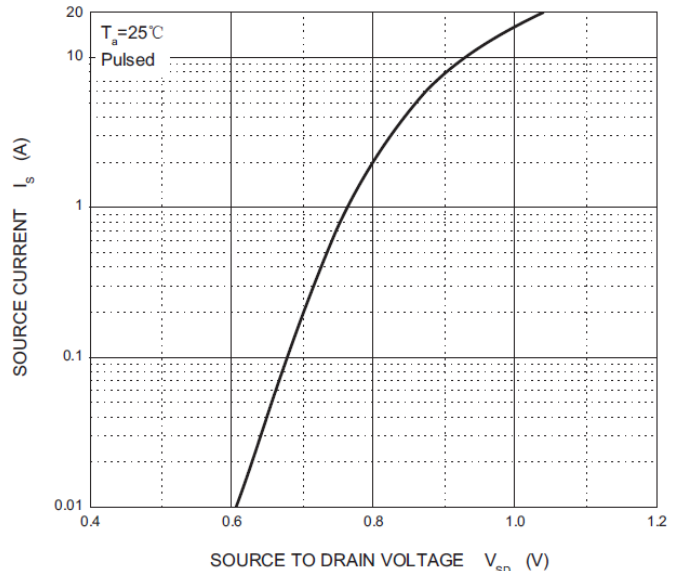
$R_{DS(ON)}$  —  $I_D$



Threshold Voltage

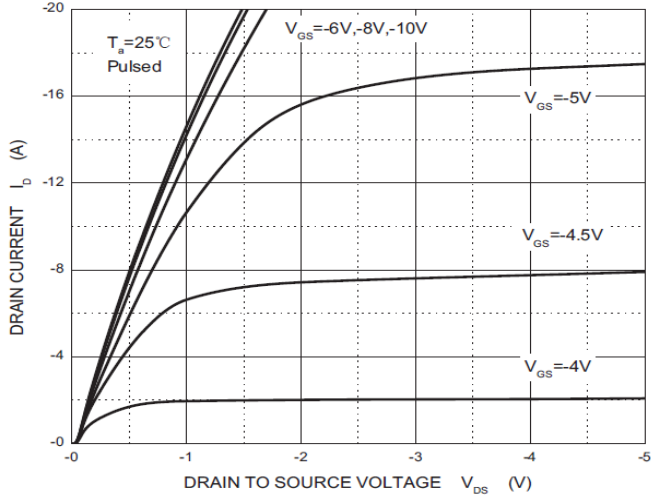


$I_S$  —  $V_{SD}$

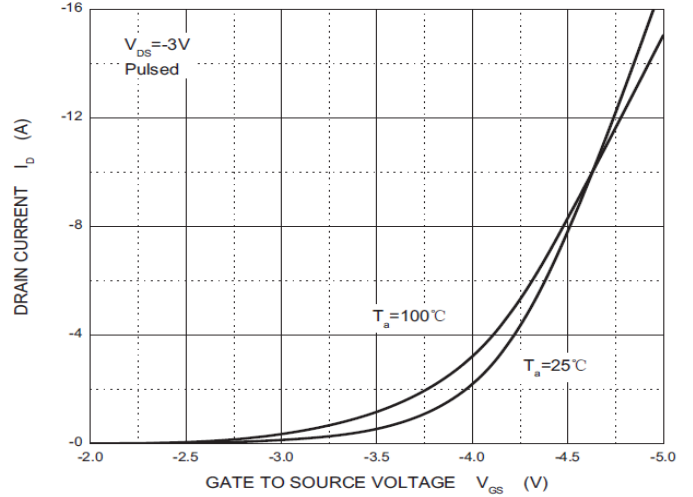


**CHARACTERISTIC CURVE (P-Ch)**

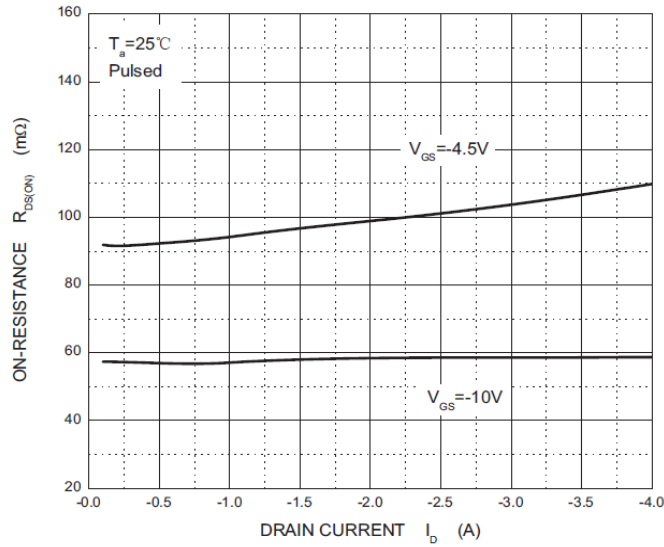
Output Characteristics



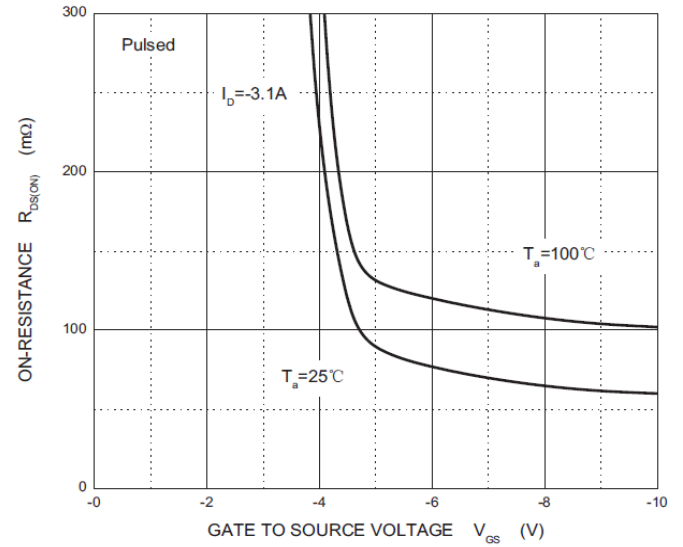
Transfer Characteristics



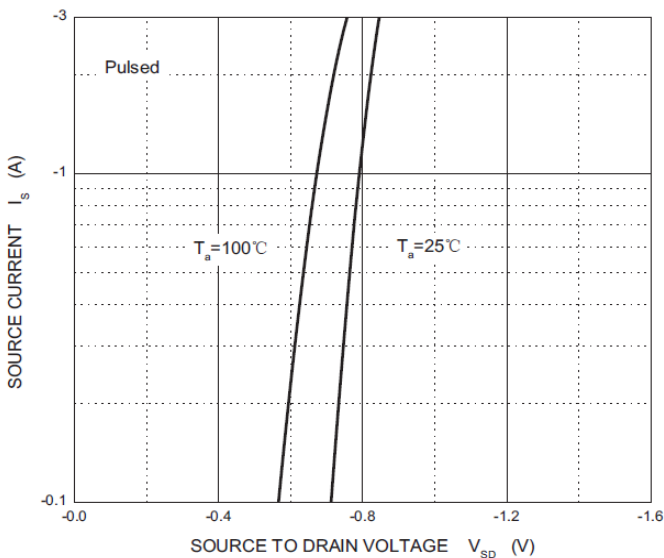
$R_{DS(ON)}$  —  $I_D$



$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$



Threshold Voltage

