

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

FEATURES

- Low On-Resistance
- Fast Switching Speed
- Drive Circuits can be Simple
- Parallel Use is Easy
- Low Voltage Drive Makes This Device Ideal for Portable Equipment
- Reliable and Rugged
- Green Device Available
- ESD Protection

APPLICATION

- Interfacing
- Switching

MARKING

39K

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-523	3K	7 inch

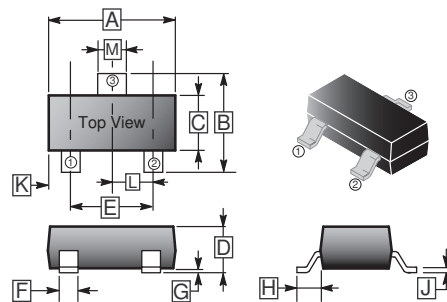
ORDER INFORMATION

Part Number	Type
SCG3139K-C	Lead (Pb)-free and Halogen-free

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

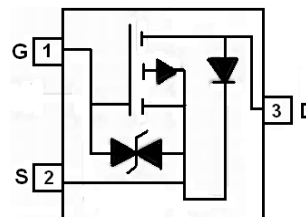
Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ¹ $V_{GS}@ -4.5\text{V}$	I_D	$T_A=25^\circ\text{C}$	-0.5
		$T_A=70^\circ\text{C}$	-0.4
Pulsed Drain Current ³	I_{DM}	-1.5	A
Total Power Dissipation	P_D	280	mW
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-ambient ¹	$R_{\theta JA}$	450	$^\circ\text{C/W}$
Thermal Resistance Junction-ambient ²		735	

SOT-523



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.5	1.7	G	-	0.1
B	1.45	1.75	H	0.55 REF.	
C	0.7	0.9	J	0.1	0.2
D	0.7	0.9	K	-	
E	0.9	1.1	L	0.5 TYP.	
F	0.15	0.35	M	0.25	0.35

Top View



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

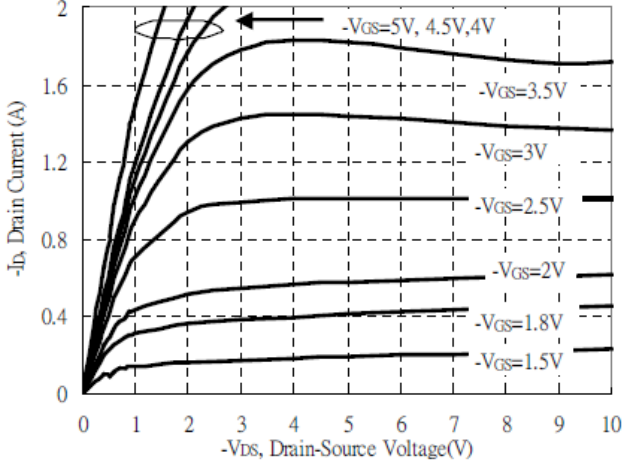
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	-20	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-	-1.2	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 10	μA	$V_{GS} = \pm 8\text{V}$
Drain-Source Leakage Current	$T_J=25^\circ\text{C}$ I_{DSS}	-	-	-1	μA	$V_{DS} = -20\text{V}, V_{GS}=0$
	$T_J=55^\circ\text{C}$ I_{DSS}	-	-	-10		
Static Drain-Source On-Resistance ⁴	$R_{DS(ON)}$	-	-	0.9	Ω	$V_{GS} = -4.5\text{V}, I_D = -500\text{mA}$
		-	-	1.4		$V_{GS} = -2.5\text{V}, I_D = -300\text{mA}$
		-	-	2.7		$V_{GS} = -1.8\text{V}, I_D = -150\text{mA}$
Total Gate Charge	Q_g	-	1.5	-	nC	$I_{DS} = -0.25\text{A}$ $V_{DS} = -10\text{V}$ $V_{GS} = -4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	0.28	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	0.44	-		
Turn-on Delay Time	$T_{d(on)}$	-	30.6	-	nS	$V_{DD} = -10\text{V}$ $I_{DS} = -0.2\text{A}$ $V_{GS} = -4.5\text{V}$ $R_{GEN} = 10\Omega$
Rise Time	T_r	-	48.4	-		
Turn-off Delay Time	$T_{d(off)}$	-	13.5	-		
Fall Time	T_f	-	14.4	-		
Input Capacitance	C_{iss}	-	46	-	pF	$V_{DS} = -10\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	27	-		
Reverse Transfer Capacitance	C_{rss}	-	17	-		
Source-Drain Diode						
Continuous Source Current ¹	I_S	-	-	-0.5	A	
Pulsed Source Current ³	I_{SM}	-	-	-1.5		
Diode Forward Voltage ⁴	V_{SD}	-	-	-1.2	V	$I_S = -150\text{mA}, V_{GS} = 0$

Notes:

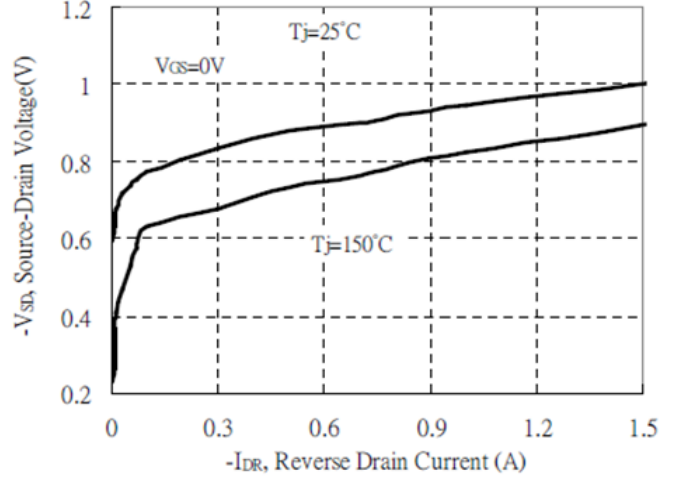
1. Surface mounted on a 1 inch² FR-4 board with 2OZ copper, $t \leq 5$ sec.
2. Surface mounted on FR4 board.
3. Pulse width limited by maximum junction temperature, $P_w \leq 10\mu\text{s}$, Duty cycles $\leq 2\%$.
4. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

CHARACTERISTICS CURVE

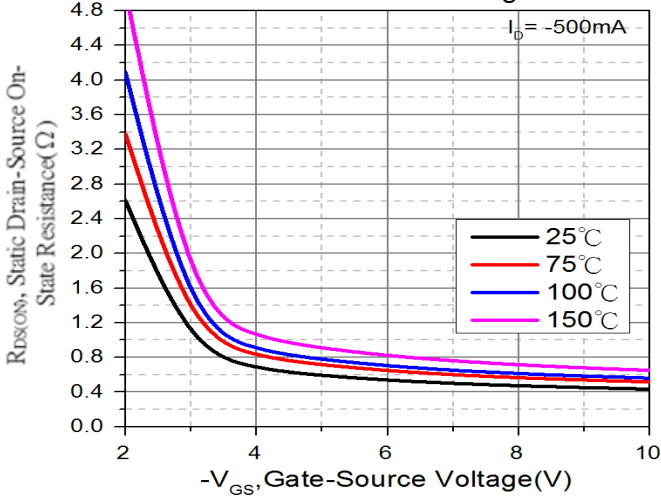
Typical Output Characteristics



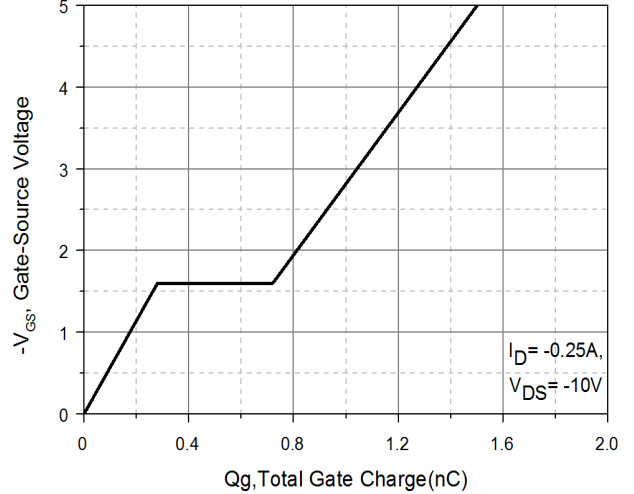
Reverse Drain Current vs Source-Drain Voltage



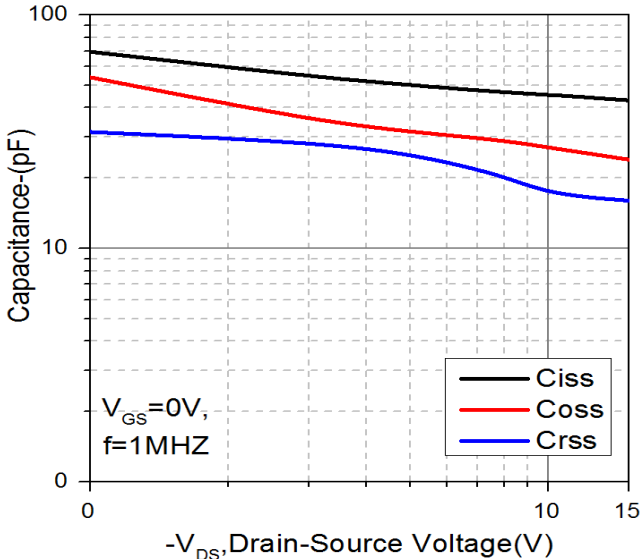
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Gate Charge Characteristics



Capacitance vs Drain-to-Source Voltage



Threshold Voltage vs Junction Temperature

