Elektronische Bauelemente

# SSF3139K-C

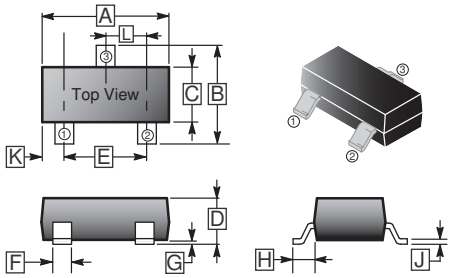
**-0.54A, -20V, $R_{DS(ON)}$ 0.9Ω**
**P-Channel Enhancement Mode Power MOSFET**

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

## FEATURES

- -20V/ -540mA
  $R_{DS(ON)} \leqq 0.9\Omega @ V_{GS}$= -4.5V
  $R_{DS(ON)} \leqq 1.4\Omega @ V_{GS}$= -2.5V
  $R_{DS(ON)} \leqq 2.7\Omega @ V_{GS}$= -1.8V
- Reliable and Rugged
- Green Device Available
- ESD Protection

**SOT-323**




| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 1.80 | 2.20 | G | 0.1 REF. | |
| B | 1.80 | 2.55 | H | 0.525 REF. | |
| C | 1.1 | 1.4 | J | 0.05 | 0.25 |
| D | 0.80 | 1.15 | K | 0.8 TYP. | |
| E | 1.20 | 2.00 | L | 0.65 TYP. | |
| F | 0.15 | 0.50 | | | |

## APPLICATION

- Interfacing
- Switching

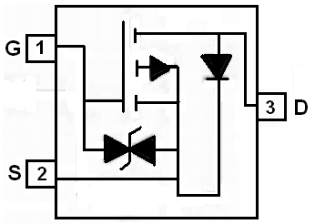
## MARKING

**K5E**

## PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---|---|---|
| SOT-323 | 3K | 7 inch |

**Top View**




## ORDER INFORMATION

| Part Number | Type |
|---|---|
| SSF3139K-C | Lead (Pb)-free and Halogen-free |

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

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | V |
| Continuous Drain Current [1] $V_{GS}$@ -4.5V | $T_A$=25°C | $I_D$ | -0.54 | A |
| | $T_A$=85°C | | -0.38 | |
| Pulsed Drain Current [3] | | $I_{DM}$ | -1.5 | A |
| Maximum Power Dissipation | | $P_D$ | 350 | mW |
| Operating Junction and Storage Temperature | | $T_J$, $T_{STG}$ | -55~150 | °C |
| **Thermal Resistance Ratings** | | | | |
| Thermal Resistance Junction-ambient [1] | | $R_{\theta JA}$ | 357 | °C/W |
| Thermal Resistance Junction-ambient [2] | | | 625 | |

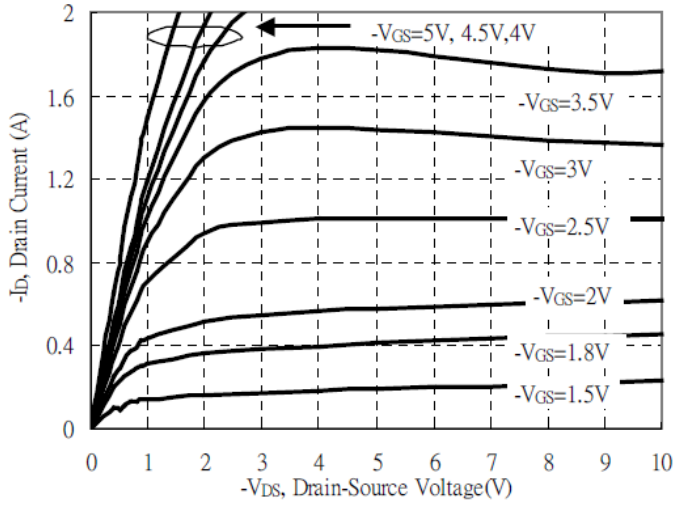
## ELECTRICAL CHARACTERISTICS ($T_J$=25°C unless otherwise specified)

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | | $BV_{DSS}$ | -20 | - | - | V | $V_{GS}$=0, $I_D$= -250μA |
| Gate-Threshold Voltage | | $V_{GS(th)}$ | -0.5 | - | -1.2 | V | $V_{DS}$=$V_{GS}$, $I_D$= -250μA |
| Gate-Source Leakage Current | | $I_{GSS}$ | - | - | ±10 | μA | $V_{GS}$= ±12V |
| Drain-Source Leakage Current | $T_J$=25°C | $I_{DSS}$ | - | - | -1 | μA | $V_{DS}$= -20V, $V_{GS}$=0 |
| | $T_J$=55°C | | - | - | -10 | μA | |
| Static Drain-Source On-Resistance [4] | | $R_{DS(ON)}$ | - | - | 0.9 | Ω | $V_{GS}$= -4.5V, $I_D$= -500mA |
| | | | - | - | 1.4 | | $V_{GS}$= -2.5V, $I_D$= -300mA |
| | | | - | - | 2.7 | | $V_{GS}$= -1.8V, $I_D$= -150mA |
| Total Gate Charge | | $Q_g$ | - | 1.2 | - | nC | $I_{DS}$= -0.25A<br>$V_{DS}$= -5V<br>$V_{GS}$= -4.5V |
| Gate-Source Charge | | $Q_{gs}$ | - | 0.38 | - | | |
| Gate-Drain (“Miller”) Charge | | $Q_{gd}$ | - | 0.23 | - | | |
| Turn-on Delay Time | | $T_{d(on)}$ | - | 5 | - | nS | $V_{DD}$= -6V<br>$I_{DS}$= -0.5A<br>$V_{GS}$= -4.5V<br>$R_{GEN}$=50Ω |
| Rise Time | | $T_r$ | - | 6 | - | | |
| Turn-off Delay Time | | $T_{d(off)}$ | - | 42 | - | | |
| Fall Time | | $T_f$ | - | 14 | - | | |
| Input Capacitance | | $C_{iss}$ | - | 59 | - | pF | $V_{DS}$= -10V<br>$V_{GS}$=0<br>f=1MHz |
| Output Capacitance | | $C_{oss}$ | - | 21 | - | | |
| Reverse Transfer Capacitance | | $C_{rss}$ | - | 15 | - | | |
| **Source-Drain Diode** | | | | | | | |
| Continuous Source Current [1] | | $I_S$ | - | - | -0.54 | A | |
| Pulsed Source Current [3] | | $I_{SM}$ | - | - | -1.5 | | |
| Diode Forward Voltage [4] | | $V_{SD}$ | - | - | -1.2 | V | $I_S$= -100mA, $V_{GS}$=0 |

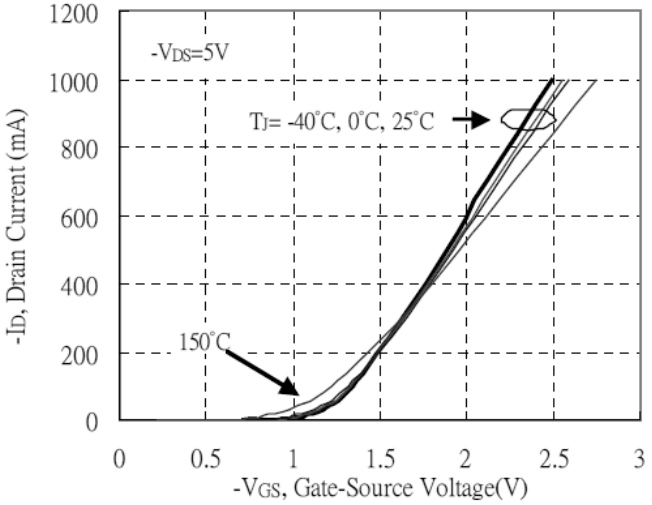
Notes:
1. Surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper, t≦5 sec.
2. Surface mounted on FR4 board.
3. Pulse width limited by maximum junction temperature., Pw≤10μs, Duty cycle≤2%.
4. The data tested by pulsed, pulse width≦300μs, duty cycle≦2%.

## CHARACTERISTIC CURVES

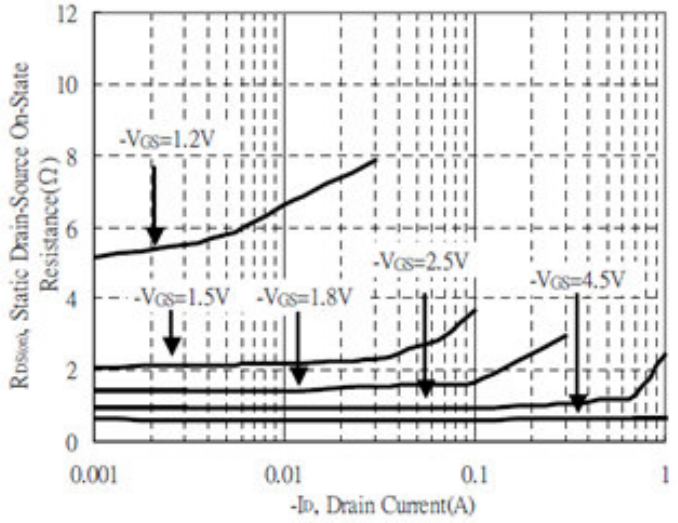
Typical Output Characteristics



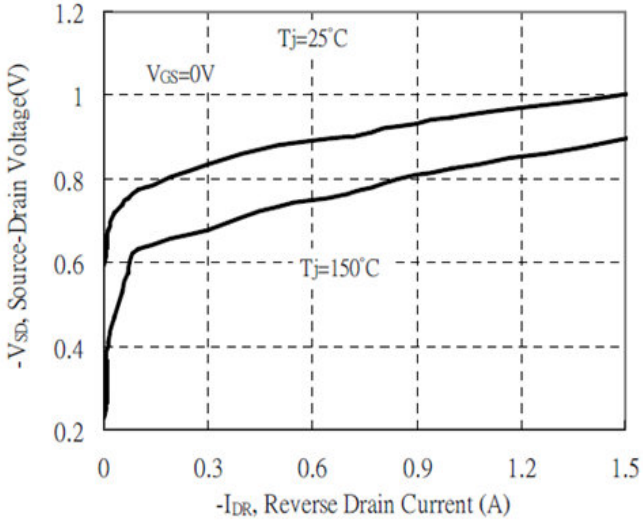

Typical Transfer Characteristics



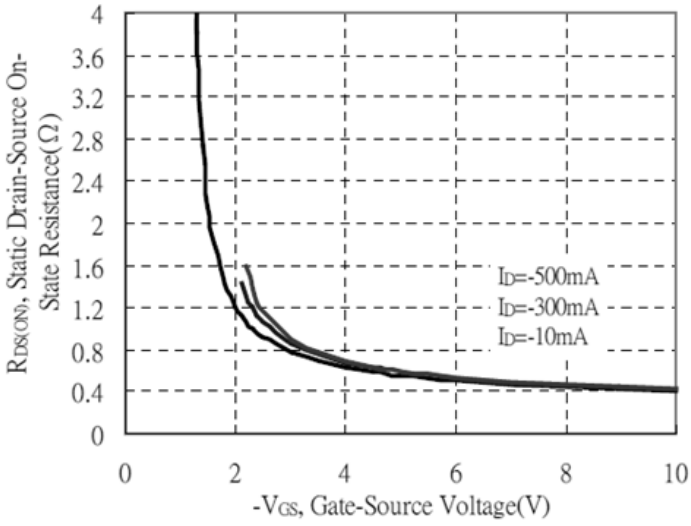

Static Drain-Source On-State resistance vs Drain Current



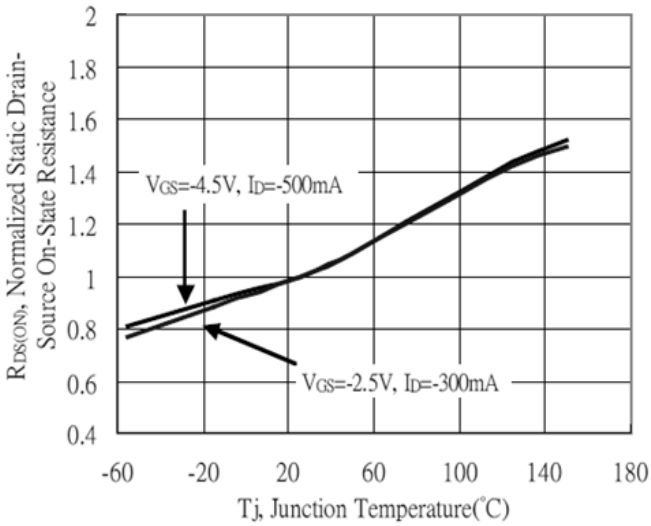

Reverse Drain Current vs Source-Drain Voltage




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

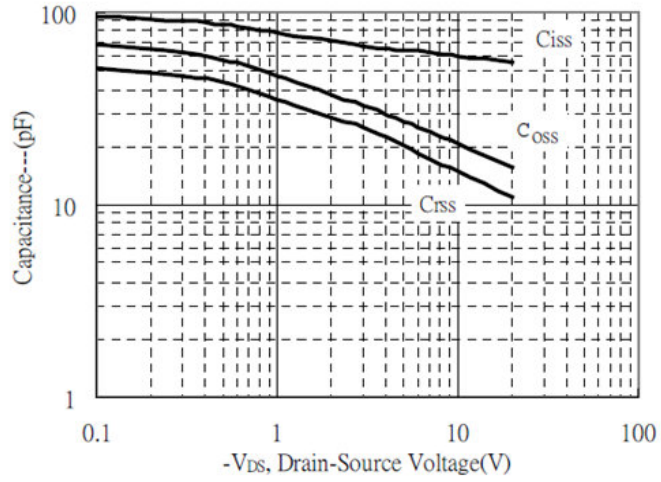



Drain-Source On-State Resistance vs Junction Tempearture

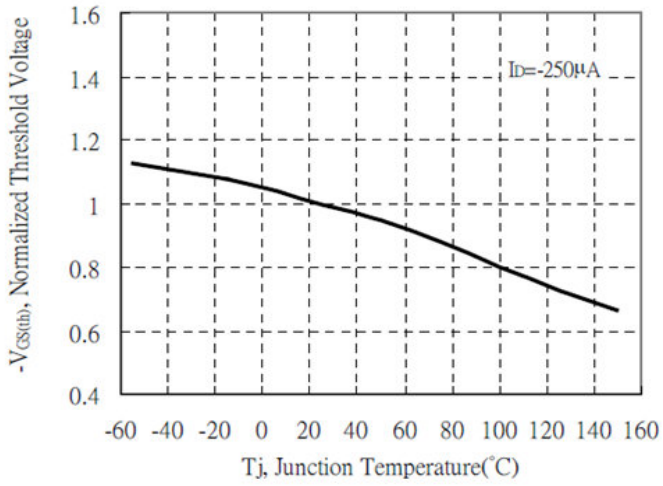


## CHARACTERISTIC CURVES

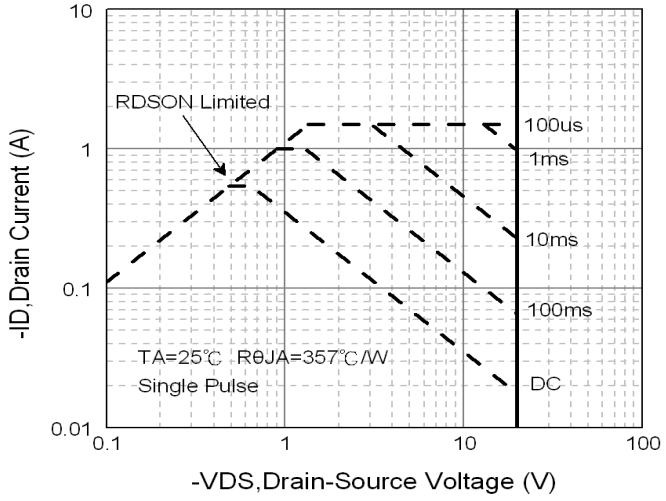
Capacitance vs Drain-to-Source Voltage



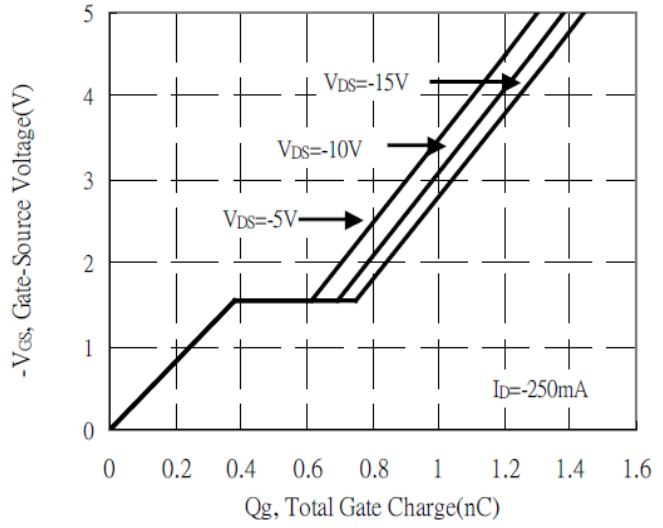

Threshold Voltage vs Junction Tempearture




Maximum Safe Operating Area




Gate Charge Characteristics




Transient Thermal Response Curves