## Main Product Characteristics
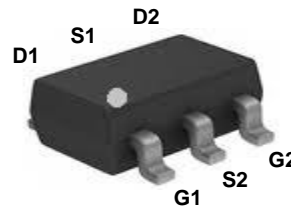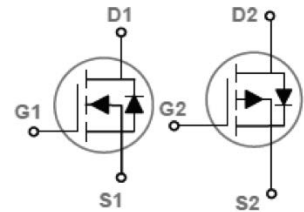
| Channel | N-Channel | P-Channel |
|---|---|---|
| $BV_{DSS}$ | 30V | -30V |
| $R_{DS(on)}$ | 30mΩ | 65mΩ |
| $I_D$ | 4A | -3A |



**SOT-23-6L**



**Schematic Diagram**

## Features and Benefits

■ Advanced MOSFET process technology

■ Ideal for high efficiency switched mode power supplies

■ Low on-resistance with low gate charge

■ Fast switching and reverse body recovery



## Description

The SSF3714 utilizes the latest processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features mae this device extremely efficient and reliable device for use in power switching applications and a wide variety of other applications

## Absolute Maximum Ratings (T$_J$=25°C unless otherwise specified)

| Parameter | Symbol | Rating | | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 30 | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | ±20 | V |
| Drain Current – Continuous (T$_C$=25°C) | $I_D$ | 4 | -3 | A |
| Drain Current – Continuous (T$_C$=70°C) | | 2.5 | -1.8 | A |
| Drain Current – Pulsed[1] | $I_{DM}$ | 16 | -12 | A |
| Power Dissipation (T$_C$=25°C) | $P_D$ | 2 | | W |
| Power Dissipation – Derate above 25°C | | 0.016 | | W/°C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | | °C |
| Operating Junction Temperature Range | $T_J$ | -55 to +150 | | °C |

### Thermal Characteristics

| Parameter | Symbol | Typ. | Max. | Unit |
|---|---|---|---|---|
| Thermal Resistance Junction to Ambient | $R_{θJA}$ | --- | 100 | °C/W |

## N-Channel Electrical Characteristics $(T_J=25°C$ unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}=0V$ , $I_D=250uA$ | 30 | --- | --- | V |
| Drain-Source Leakage Current | $I_{DSS}$ | $V_{DS}=30V$ , $V_{GS}=0V$ , $T_J=25°C$ | --- | --- | 1 | uA |
| | | $V_{DS}=24V$ , $V_{GS}=0V$ , $T_J=125°C$ | --- | --- | 10 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}=±20V$ , $V_{DS}=0V$ | --- | --- | ±100 | nA |
| **On Characteristics** | | | | | | |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V$ , $I_D=4A$ | --- | 22 | 30 | mΩ |
| | | $V_{GS}=4.5V$ , $I_D=2A$ | --- | 35 | 46 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{DS}$ , $I_D=250uA$ | 1.2 | 1.6 | 2.5 | V |
| $V_{GS(th)}$ Temperature Coefficient | $\triangle V_{GS(th)}$ | | --- | -4 | --- | mV/°C |
| Forward Transconductance | gfs | $V_{DS}=10V$ , $I_D=3A$ | --- | 6.5 | --- | S |
| **Dynamic and Switching Characteristics** | | | | | | |
| Total Gate Charge[2,3] | $Q_g$ | $V_{DS}=15V$ , $V_{GS}=4.5V$ , $I_D=6A$ | --- | 4.1 | 8 | nC |
| Gate-Source Charge[2,3] | $Q_{gs}$ | | --- | 1 | 2 | |
| Gate-Drain Charge[2,3] | $Q_{gd}$ | | --- | 2.1 | 4 | |
| Turn-On Delay Time[2,3] | $T_{d(on)}$ | $V_{DD}=15V$ , $V_{GS}=10V$ , $R_G=6Ω$ $I_D=1A$ | --- | 2.8 | 5 | ns |
| Rise Time[2,3] | $T_r$ | | --- | 7.2 | 14 | |
| Turn-Off Delay Time[2,3] | $T_{d(off)}$ | | --- | 15.8 | 30 | |
| Fall Time[2,3] | $T_f$ | | --- | 4.6 | 9 | |
| Input Capacitance | $C_{iss}$ | $V_{DS}=25V$ , $V_{GS}=0V$ , F=1MHz | --- | 345 | 500 | pF |
| Output Capacitance | $C_{oss}$ | | --- | 55 | 80 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | --- | 32 | 45 | |
| Gate Resistance | $R_g$ | $V_{GS}=0V$ , $V_{DS}=0V$ , F=1MHz | --- | 3.2 | 6.4 | Ω |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
| Continuous Source Current | $I_S$ | $V_G=V_D=0V$ , Force Current | --- | --- | 4 | A |
| Pulsed Source Current | $I_{SM}$ | | --- | --- | 8 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}=0V$ , $I_S=1A$ , $T_J=25°C$ | --- | --- | 1 | V |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leqq$ 300us , duty cycle $\leqq$ 2%.
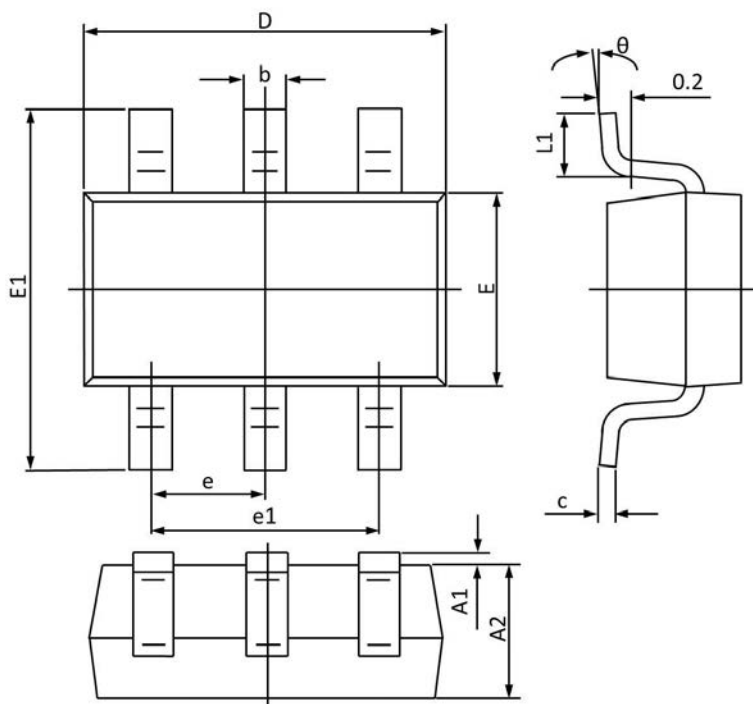3. Essentially independent of operating temperature.

## P-Channel Electrical Characteristics ($T_J$=25°C unless otherwise specified)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V , $I_D$=-250uA | -30 | --- | --- | V |
| $BV_{DSS}$ Tempreture Coefficient | $\triangle BV_{DSS}/\triangle T_J$ | Reference to 25°C, $I_D$=-1mA | --- | -0.03 | --- | V/°C |
| Drain-Source Leakage Current | $I_{DSS}$ | $V_{DS}$=-30V , $V_{GS}$=0V , $T_J$=25°C | --- | --- | -1 | uA |
| | | $V_{DS}$=-24V , $V_{GS}$=0V , $T_J$=125°C | --- | --- | -10 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| **On Characteristics** | | | | | | |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=-10V , $I_D$=-3A | --- | 45 | 65 | mΩ |
| | | $V_{GS}$=-4.5V , $I_D$=-2A | --- | 65 | 90 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$=$V_{DS}$, $I_D$ =-250uA | -1.2 | -1.6 | -2.2 | V |
| $V_{GS(th)}$ Temperature Coefficient | $\triangle V_{GS(th)}$ | | --- | 4 | --- | mV/°C |
| Forward Transconductance | gfs | $V_{DS}$=-10V , $I_D$=-3A | --- | 3.7 | --- | S |
| **Dynamic and Switching Characteristics** | | | | | | |
| Total Gate Charge[2,3] | $Q_g$ | $V_{DS}$=-30V , $V_{GS}$=-4.5V , $I_D$=-2A | --- | 5 | 8 | nC |
| Gate-Source Charge[2,3] | $Q_{gs}$ | | --- | 1.4 | 3 | |
| Gate-Drain Charge[2,3] | $Q_{gd}$ | | --- | 1.7 | 4 | |
| Turn-On Delay Time[2,3] | $T_{d(on)}$ | $V_{DD}$=-30V , $V_{GS}$=-10V , $R_G$=6Ω $I_D$=-1A | --- | 3.4 | 6 | ns |
| Rise Time[2,3] | $T_r$ | | --- | 10.8 | 21 | |
| Turn-Off Delay Time[2,3] | $T_{d(off)}$ | | --- | 26.9 | 51 | |
| Fall Time[2,3] | $T_f$ | | --- | 6.9 | 13 | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-30V , $V_{GS}$=0V , F=1MHz | --- | 420 | 810 | pF |
| Output Capacitance | $C_{oss}$ | | --- | 50 | 80 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | --- | 35 | 60 | |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
| Continuous Source Current | $I_S$ | $V_G$=$V_D$=0V , Force Current | --- | --- | -3 | A |
| Pulsed Source Current | $I_{SM}$ | | --- | --- | -6 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V , $I_S$=1A , $T_J$=25°C | --- | --- | -1 | V |

Note :
4. Repetitive Rating : Pulsed width limited by maximum junction temperature.
5. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
6. Essentially independent of operating temperature.

## Package Outline Dimensions  SOT-23-6L

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|:---:|:---:|:---:|:---:|:---:|
| | **Min** | **Max** | **Min** | **Max** |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.000 | 1.200 | 0.040 | 0.047 |
| b | 0.300 | 0.500 | 0.012 | 0.019 |
| c | 0.047 | 0.207 | 0.002 | 0.008 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.500 | 1.800 | 0.059 | 0.070 |
| E1 | 2.600 | 3.000 | 0.103 | 0.118 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.900 TYP | | 0.075 TYP | |
| L1 | 0.250 | 0.550 | 0.010 | 0.021 |
| θ | 0° | 8° | 0° | 8° |