GOOD-ARK SEMICONDUCTOR

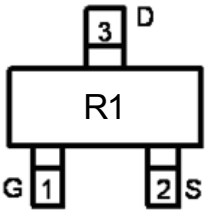
# SSF3401A

**30V P-Channel MOSFET**

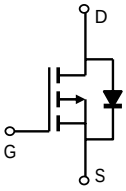
## Main Product Characteristics

| | |
|---|---|
| $V_{(BR)DSS}$ | -30V |
| $R_{DS(on)}$MAX | 60 mΩ@-10V |
| | 70 mΩ@-4.5V |
| | 85 mΩ@-2.5V |
| $I_D$ | -4.2A |

SOT-23




Marking and Pin Assignment




Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for DC-DC converter, power management in portable battery, computer, printer, cellular and general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

## Description

The SSF3401A utilizes the latest processing techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in DC-DC converter, power management in portable battery, computer, printer, cellular and general purpose applications.

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

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | $I_D$ | -4.2 | A |
| Power Dissipation | $P_D$ | 400 | mW |
| Thermal Resistance from Junction to Ambient (t<5s) | $R_{\theta JA}$ | 313 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55 to +150 | ℃ |

## Electrical Characteristics ($T_A$=25°C unless otherwise specified)

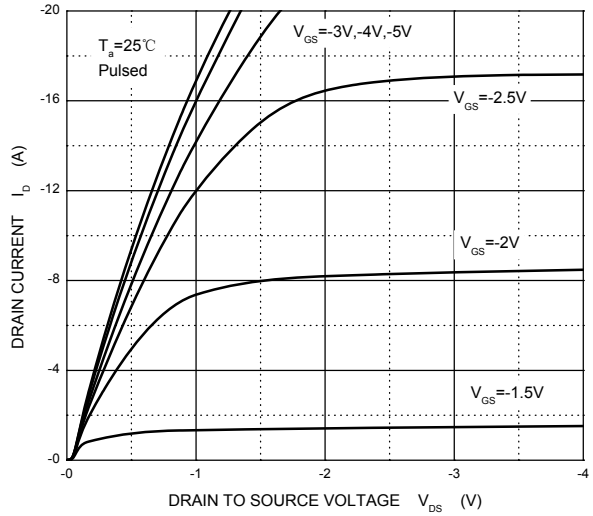
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ =-24V,$V_{GS}$ = 0V | | | -1 | μA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$ =±12V, $V_{DS}$ = 0V | | | ±100 | nA |
| **On Characteristics** | | | | | | |
| Drain-Source On-Resistance (note 1) | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-4.2A | | 41 | 60 | mΩ |
| | | $V_{GS}$ =-4.5V, $I_D$ =-4A | | 47 | 70 | mΩ |
| | | $V_{GS}$ =-2.5V,$I_D$=-1A | | 61 | 85 | mΩ |
| Forward Tranconductance (note 1) | $g_{FS}$ | $V_{DS}$ =-5V, $I_D$ =-5A | 7 | | | S |
| Gate Threshold Coltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | -0.7 | | -1.3 | V |
| **Dynamic Characteristics** (note 2) | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =-15V,$V_{GS}$ =0V,f =1MHz | | 1050 | | pF |
| Output Capacitance | $C_{oss}$ | | | 127 | | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 85 | | pF |
| **Switching Characteristics** (note 2) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{GS}$=-10V,$V_{DS}$=-15V, $R_L$=3.6Ω,$R_{GEN}$=6Ω | | | 6.5 | ns |
| Turn-On Rise Time | $t_r$ | | | | 3.5 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 40 | ns |
| Turn-Off Fall Time | $t_f$ | | | | 13 | ns |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| Diode Forward Voltage (note 1) | $V_{SD}$ | $I_S$=-1A,$V_{GS}$=0V | | | -1 | V |

**Note :**

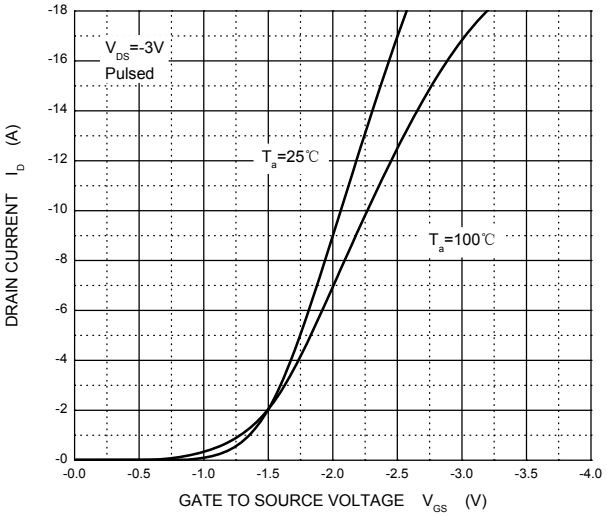
1. Pulse Test : Pulse width≤300μs, duty cycle≤2%.
2. These parameters have no way to verify.

# Typical Electrical and Thermal Characteristics

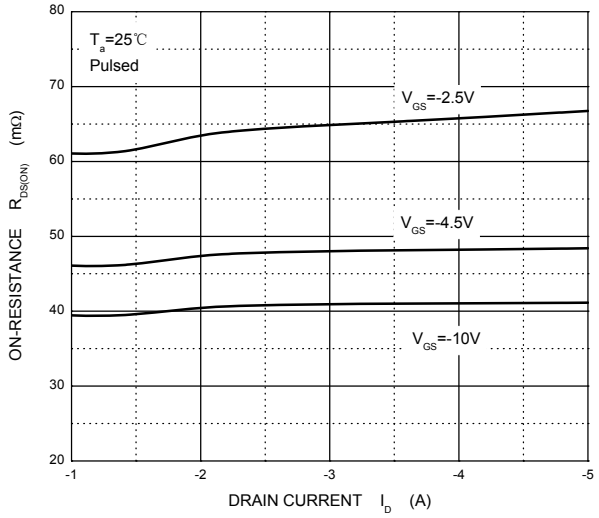
**Output Characteristics**



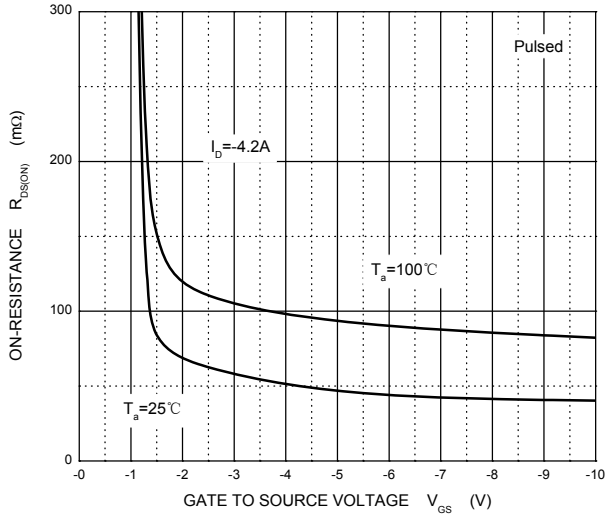

**Transfer Characteristics**



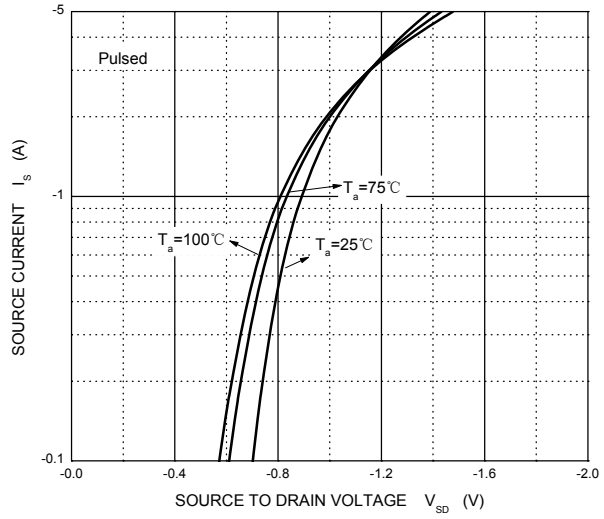

**$R_{DS(ON)}$ —— $I_D$**



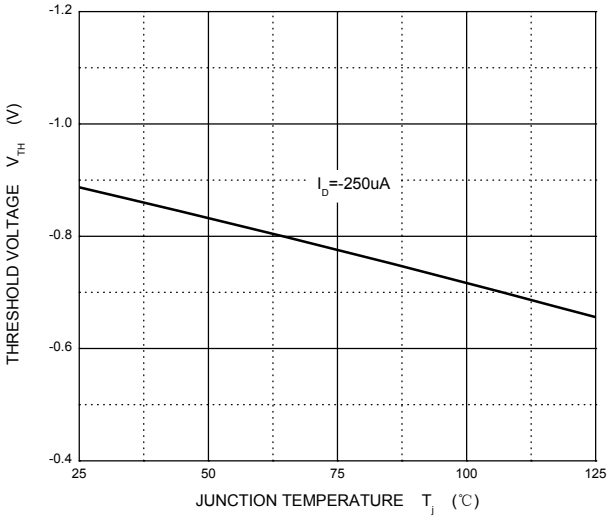

**$R_{DS(ON)}$ —— $V_{GS}$**




**$I_S$ —— $V_{SD}$**




**Threshold Voltage**



## Package Outline Dimensions

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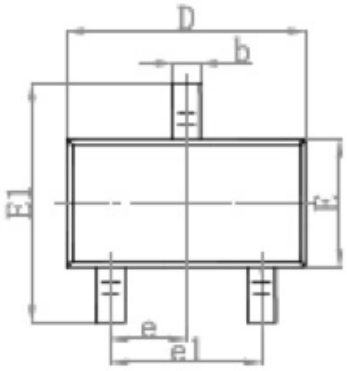
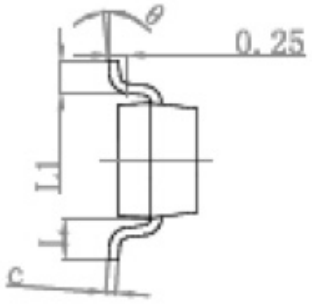
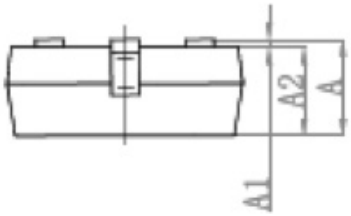
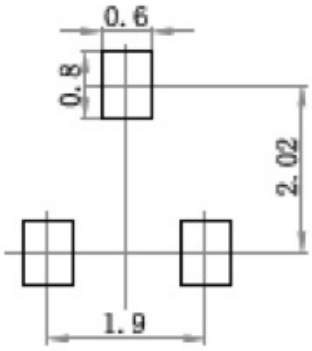



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

## Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.