

## P-Channel -30V (D-S) Power MOSFET

### Features

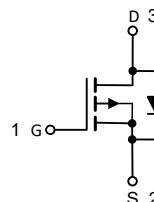
- 100% Avalanche Tested
- Halogen Free, Pb-Free
- RoHS Compliant



SOT-23

### Applications

- Relay driver
- Switching circuits
- High-side load switch
- High-speed line driver



### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter                                     | Symbol          | Value                  | Unit             |
|-----------------------------------------------|-----------------|------------------------|------------------|
| Drain Source Voltage                          | $V_{DS}$        | -30                    | V                |
| Gate Source Voltage                           | $V_{GS}$        | $\pm 12$               | V                |
| Drain Current, Continuous                     | $I_D$           | $T_C=25^\circ\text{C}$ | A                |
|                                               |                 | $T_C=70^\circ\text{C}$ |                  |
| Drain Current, Pulsed (Note 1)                | $I_{DM}$        | -30                    | A                |
| Power Dissipation                             | $P_D$           | $T_C=25^\circ\text{C}$ | W                |
| Operating Junction/ Storage Temperature Range | $T_J / T_{STG}$ | -55 to +150            | $^\circ\text{C}$ |

Note 1: Single pulse;  $t_p \leq 1\mu\text{s}$ .

### Thermal Characteristics

| Parameter                                                               | Symbol     | Max | Unit               |
|-------------------------------------------------------------------------|------------|-----|--------------------|
| Thermal Resistance Junction to Ambient ( $t \leq 10\text{s}$ ) (Note 2) | $R_{thJA}$ | 90  | $^\circ\text{C/W}$ |

Note 2: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a  $25^\circ\text{C}$  still air environment.

## Electrical Characteristics (T<sub>A</sub> =25°C unless otherwise noted)

| Parameter                                 | Symbol               | Test Conditions                                                                        | Min  | Typ | Max  | Unit |
|-------------------------------------------|----------------------|----------------------------------------------------------------------------------------|------|-----|------|------|
| Drain Source Breakdown Voltage            | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA                                            | -30  | --  | --   | V    |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>     | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V                                             | --   | --  | -1   | uA   |
| Gate Threshold Voltage                    | V <sub>GS(TH)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250uA                             | -0.6 | --  | -1.3 | V    |
| Gate Leakage Current                      | I <sub>GSS</sub>     | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V                                             | --   | --  | ±100 | nA   |
| Drain-Source On-state Resistance (Note 3) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =-10V, I <sub>D</sub> =-4A                                             | --   | 44  | 55   | mΩ   |
|                                           |                      | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A                                            | --   | 52  | 75   |      |
| Total Gate Charge                         | Q <sub>g</sub>       | V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A                     | --   | 11  | --   | nC   |
| Gate-Source Charge                        | Q <sub>gs</sub>      |                                                                                        | --   | 2.1 | --   |      |
| Gate-Drain Charge                         | Q <sub>gd</sub>      |                                                                                        | --   | 2.7 | --   |      |
| Turn-on Delay Time                        | t <sub>d(on)</sub>   | V <sub>GS</sub> =-4.5V, V <sub>DD</sub> =-20V, R <sub>G</sub> =3Ω, R <sub>L</sub> =20Ω | --   | 9.8 | --   | ns   |
| Turn-on Rise Time                         | t <sub>r</sub>       |                                                                                        | --   | 11  | --   |      |
| Turn-off Delay Time                       | t <sub>d(off)</sub>  |                                                                                        | --   | 25  | --   |      |
| Turn-off Fall Time                        | t <sub>f</sub>       |                                                                                        | --   | 8   | --   |      |
| Input Capacitance                         | C <sub>iss</sub>     | V <sub>GS</sub> =0V, V <sub>DS</sub> =-20V, f=1MHz                                     | --   | 758 | --   | pF   |
| Output Capacitance                        | C <sub>oss</sub>     |                                                                                        | --   | 64  | --   |      |
| Reverse Transfer Capacitance              | C <sub>rss</sub>     |                                                                                        | --   | 53  | --   |      |

## Reverse Diode Characteristics (T<sub>A</sub> =25°C unless otherwise noted)

| Parameter                      | Symbol          | Test Conditions                          | Min. | Typ.  | Max. | Unit |
|--------------------------------|-----------------|------------------------------------------|------|-------|------|------|
| Forward Current, Continuous    | I <sub>SD</sub> | T <sub>C</sub> =25°C                     | --   | --    | -4.2 | A    |
| Diode Forward Voltage (Note 3) | V <sub>SD</sub> | I <sub>F</sub> =-1A, V <sub>GS</sub> =0V | --   | -0.78 | -1.0 | V    |

Note 3: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

## Typical Characteristics Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 - Typical Output Characteristics

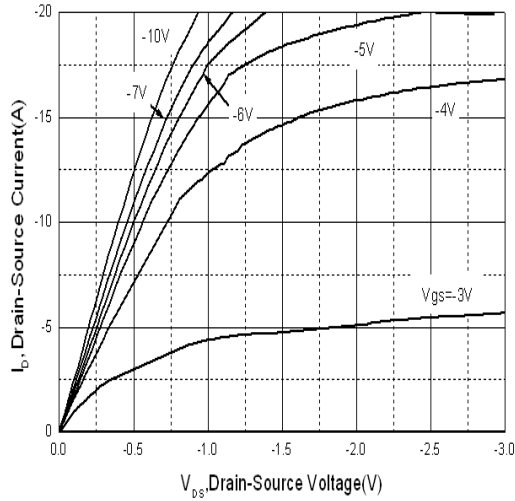


Fig.2 -  $V_{GS(th)}$  vs. Junction Temperature

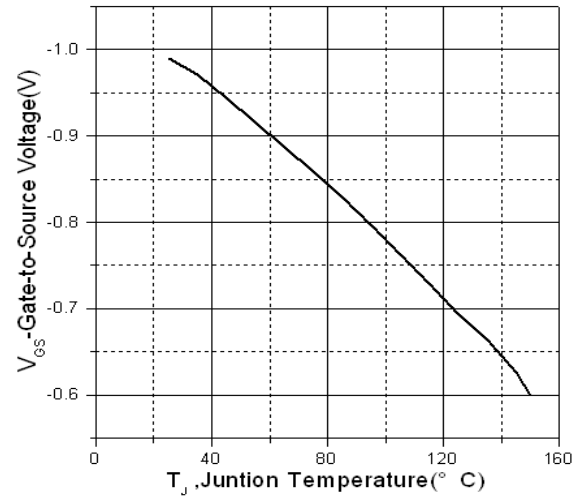


Fig.3 - Drain-to-Source Breakdown Voltage vs. Junction Temperature

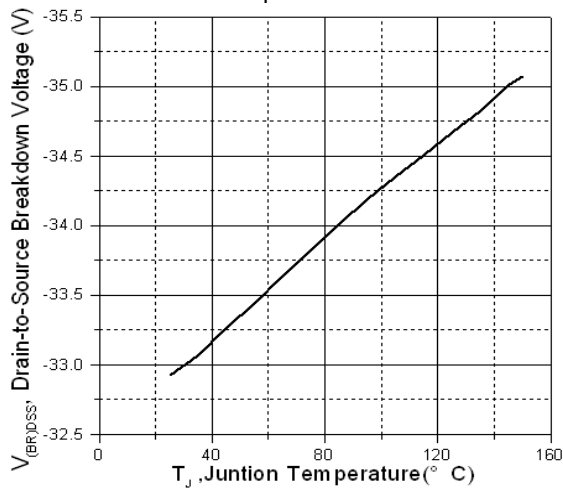


Fig.4 - Normalized On-Resistance vs. Junction Temperature

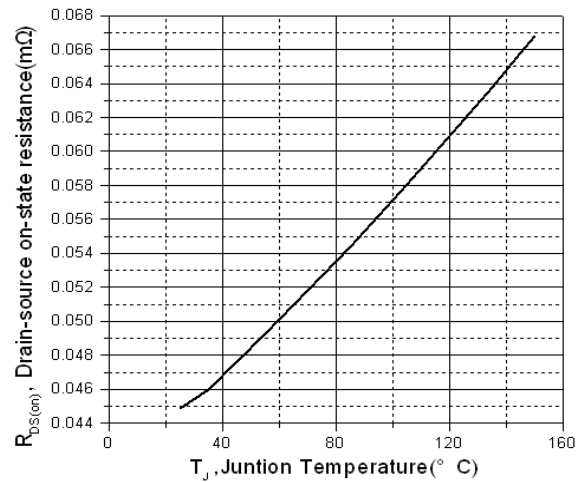


Fig.5 - Maximum Drain Current vs. Case Temperature

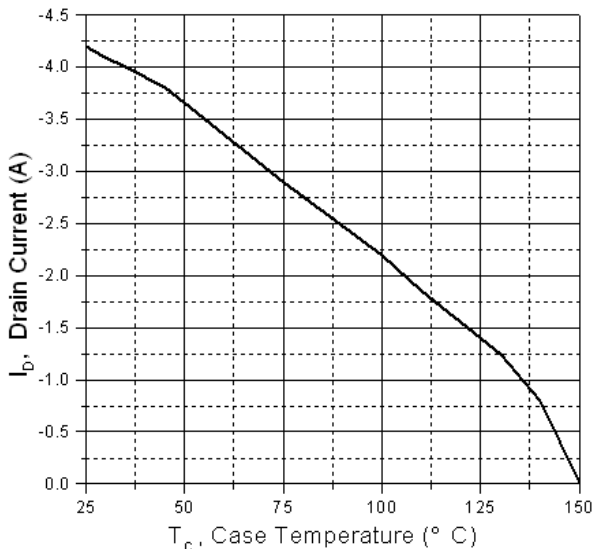
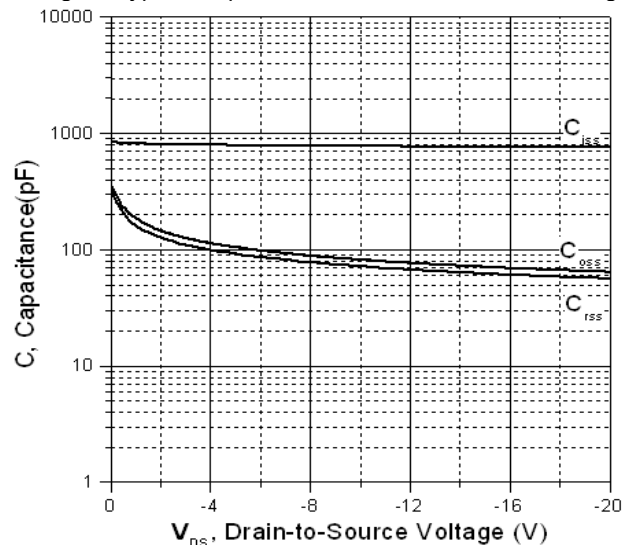
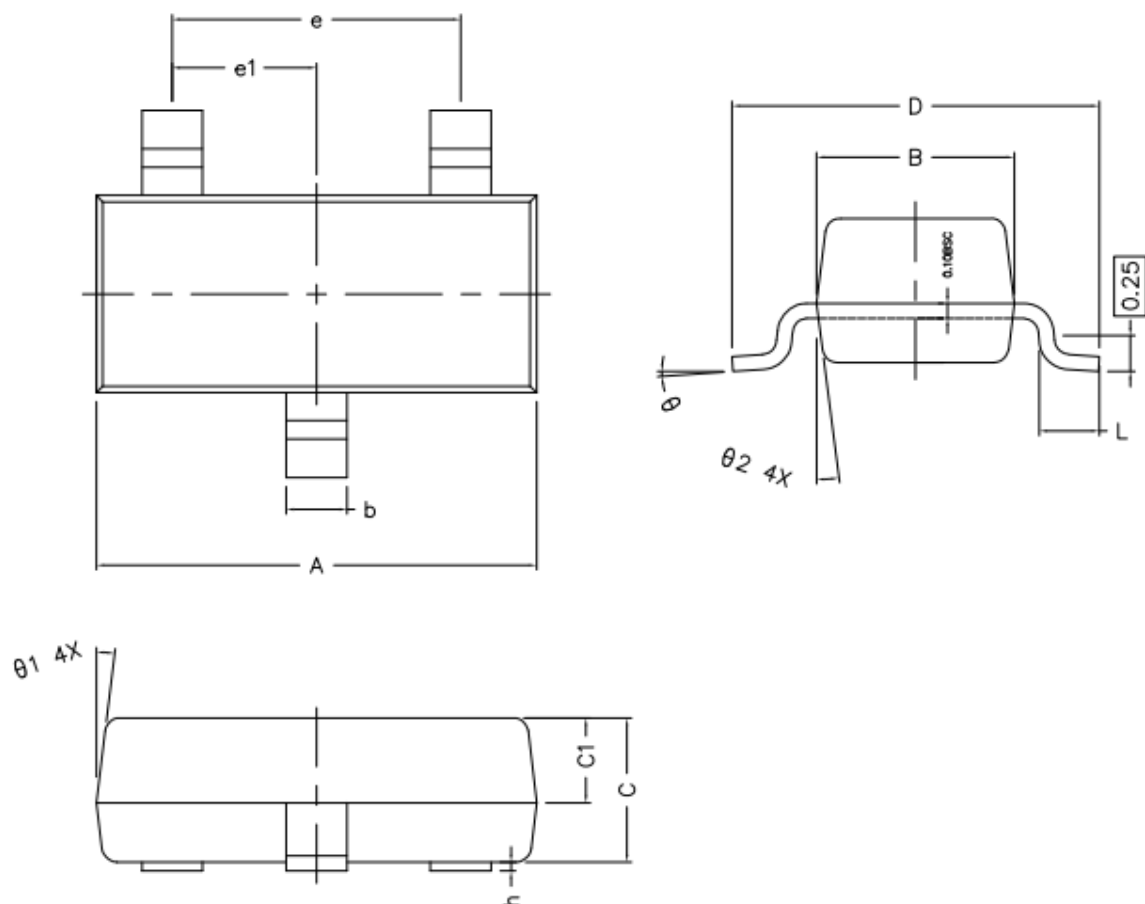


Fig.6 - Typical Capacitance vs. Drain-to-Source Voltage



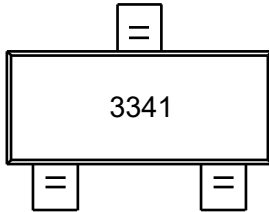
## Package Outline Dimensions (Unit: millimeters)

### SOT-23



| COMMON DIMENSIONS<br>(UNITS OF MEASURE IS mm) |           |        |       |
|-----------------------------------------------|-----------|--------|-------|
|                                               | MIN       | NORMAL | MAX   |
| A                                             | 2.800     | 2.900  | 3.000 |
| B                                             | 1.200     | 1.300  | 1.400 |
| C                                             | 0.900     | 1.000  | 1.100 |
| C1                                            | 0.500     | 0.550  | 0.600 |
| D                                             | 2.300     | 2.400  | 2.500 |
| L                                             | 0.300     | 0.400  | 0.500 |
| h                                             | 0.010     | 0.050  | 0.100 |
| b                                             | 0.350     | 0.400  | 0.450 |
| e                                             | 1.90 TYPE |        |       |
| e1                                            | 0.95 TYPE |        |       |
| θ <sub>1</sub>                                | 7° TYPE   |        |       |
| θ <sub>2</sub>                                | 7° TYPE   |        |       |
| θ                                             | 0° ~ 7°   |        |       |

## Marking Outline



Part Name: SSF3341UP

1. P/N Mark: 3341

## Revision History

| Version | Date       | Major Changes    |
|---------|------------|------------------|
| Rev.A   | 2025.08.04 | Official Release |
|         |            |                  |
|         |            |                  |

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