

## DESCRIPTION

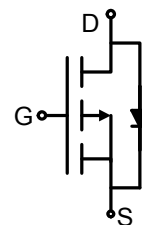
The SSF3365 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

## GENERAL FEATURES

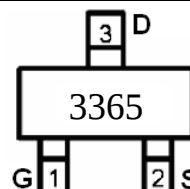
- $V_{DS} = -30V, I_D = -3A$   
 $R_{DS(ON)} < 140m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 80m\Omega @ V_{GS} = -10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

## Application

- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOT-23 top view

## PACKAGE MARKING AND ORDERING INFORMATION

| Device Marking | Device  | Device Package | Reel Size | Tape width | Quantity   |
|----------------|---------|----------------|-----------|------------|------------|
| 3365           | SSF3365 | SOT-23         | Ø180mm    | 8 mm       | 3000 units |

## ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

| Parameter                                         | Symbol             | Limit      | Unit |
|---------------------------------------------------|--------------------|------------|------|
| Drain-Source Voltage                              | $V_{DS}$           | -30        | V    |
| Gate-Source Voltage                               | $V_{GS}$           | ±20        | V    |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | $I_D (25^\circ C)$ | -3         | A    |
|                                                   | $I_D (70^\circ C)$ | -2.5       | A    |
|                                                   | $I_{DM}$           | -12        | A    |
| Maximum Power Dissipation                         | $P_D$              | 1.25       | W    |
| Operating Junction and Storage Temperature Range  | $T_J, T_{STG}$     | -55 To 150 | °C   |

## THERMAL CHARACTERISTICS

|                                                  |                 |     |      |
|--------------------------------------------------|-----------------|-----|------|
| Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 100 | °C/W |
|--------------------------------------------------|-----------------|-----|------|

## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

| Parameter                       | Symbol     | Condition                   | Min | Typ | Max  | Unit |
|---------------------------------|------------|-----------------------------|-----|-----|------|------|
| <b>OFF CHARACTERISTICS</b>      |            |                             |     |     |      |      |
| Drain-Source Breakdown Voltage  | $BV_{DSS}$ | $V_{GS}=0V, I_D=-250\mu A$  | -30 |     |      | V    |
| Zero Gate Voltage Drain Current | $I_{DSS}$  | $V_{DS}=-24V, V_{GS}=0V$    |     |     | -1   | μA   |
| Gate-Body Leakage Current       | $I_{GSS}$  | $V_{GS}=\pm 20V, V_{DS}=0V$ |     |     | ±100 | nA   |

| ON CHARACTERISTICS (Note 3)        |                     |                                                                                           |    |     |      |    |
|------------------------------------|---------------------|-------------------------------------------------------------------------------------------|----|-----|------|----|
| Gate Threshold Voltage             | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA                                 | -1 |     |      | V  |
| Drain-Source On-State Resistance   | R <sub>DS(ON)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-3A                                                |    | 64  | 80   | mΩ |
|                                    |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2.5A                                             |    | 100 | 140  |    |
| Forward Transconductance           | g <sub>FS</sub>     | V <sub>DS</sub> =-10V, I <sub>D</sub> =-3A                                                | 3  |     |      | S  |
| DYNAMIC CHARACTERISTICS (Note4)    |                     |                                                                                           |    |     |      |    |
| Input Capacitance                  | C <sub>ISS</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V,<br>F=1.0MHz                                   |    | 600 |      | PF |
| Output Capacitance                 | C <sub>OSS</sub>    |                                                                                           |    | 150 |      | PF |
| Reverse Transfer Capacitance       | C <sub>RSS</sub>    |                                                                                           |    | 95  |      | PF |
| SWITCHING CHARACTERISTICS (Note 4) |                     |                                                                                           |    |     |      |    |
| Turn-on Delay Time                 | t <sub>d(on)</sub>  | V <sub>DD</sub> =-15V, I <sub>D</sub> =-1A<br>V <sub>GS</sub> =-10V, R <sub>GEN</sub> =6Ω |    | 10  |      | nS |
| Turn-on Rise Time                  | t <sub>r</sub>      |                                                                                           |    | 9   |      | nS |
| Turn-Off Delay Time                | t <sub>d(off)</sub> |                                                                                           |    | 25  |      | nS |
| Turn-Off Fall Time                 | t <sub>f</sub>      |                                                                                           |    | 8   |      | nS |
| Total Gate Charge                  | Q <sub>g</sub>      | V <sub>DS</sub> =-15V, I <sub>D</sub> =-3A, V <sub>GS</sub> =-10V                         |    | 10  |      | nC |
| Gate-Source Charge                 | Q <sub>gs</sub>     |                                                                                           |    | 2   |      | nC |
| Gate-Drain Charge                  | Q <sub>gd</sub>     |                                                                                           |    | 2   |      | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS |                     |                                                                                           |    |     |      |    |
| Diode Forward Voltage (Note 3)     | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>S</sub> =-1.25A                                               |    |     | -1.2 | V  |

## NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in<sup>2</sup> FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

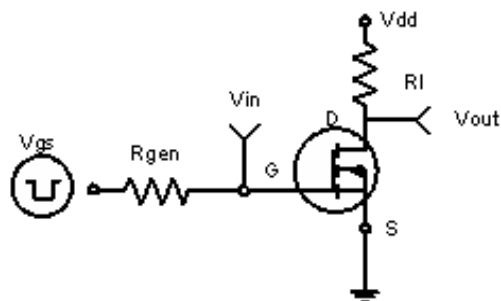


Figure 1: Switching Test Circuit

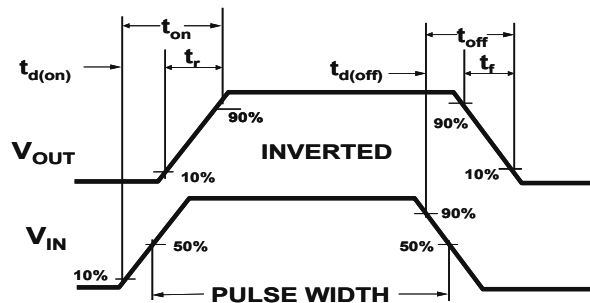


Figure 2: Switching Waveforms

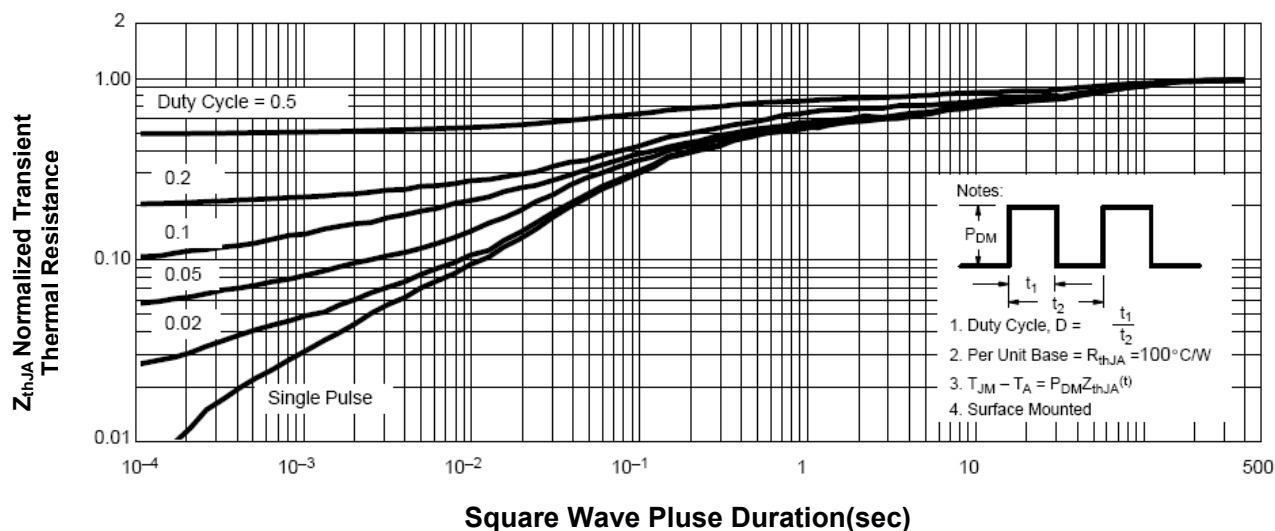
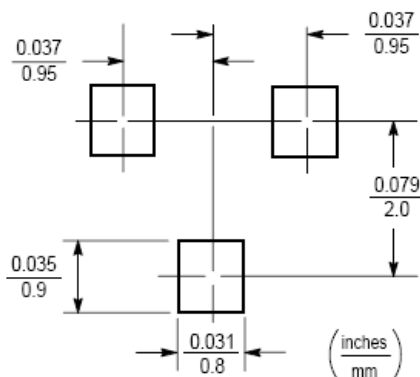
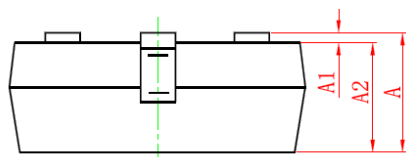
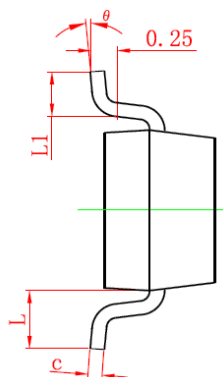
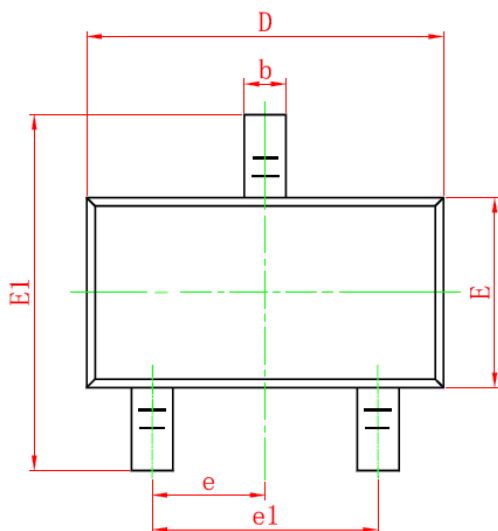


Figure 3 Normalized Maximum Transient Thermal Impedance

## SOT-23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



| Symbol    | Dimensions in Millimeters |              |
|-----------|---------------------------|--------------|
|           | MIN.                      | MAX.         |
| <b>A</b>  | <b>0.900</b>              | <b>1.150</b> |
| <b>A1</b> | <b>0.000</b>              | <b>0.100</b> |
| <b>A2</b> | <b>0.900</b>              | <b>1.050</b> |
| <b>b</b>  | <b>0.300</b>              | <b>0.500</b> |
| <b>c</b>  | <b>0.080</b>              | <b>0.150</b> |
| <b>D</b>  | <b>2.800</b>              | <b>3.000</b> |
| <b>E</b>  | <b>1.200</b>              | <b>1.400</b> |
| <b>E1</b> | <b>2.250</b>              | <b>2.550</b> |
| <b>e</b>  | <b>0.950TYP</b>           |              |
| <b>e1</b> | <b>1.800</b>              | <b>2.000</b> |
| <b>L</b>  | <b>0.550REF</b>           |              |
| <b>L1</b> | <b>0.300</b>              | <b>0.500</b> |
| <b>θ</b>  | <b>0°</b>                 | <b>8°</b>    |

### NOTES

1. All dimensions are in millimeters.
2. Tolerance  $\pm 0.10\text{mm}$  (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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