## General Description

The WST2SK3018 is the highest performance trench N-Channel MOSFET with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The WST2SK3018 meet the RoHS and Green Product requirement, 100% Final Tested guaranteed with full function reliability approved.

## Product Summery

| $BV_{DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|---|---|---|
| 30V | 1.0Ω | 0.5A |

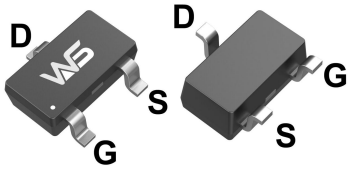
## Applications

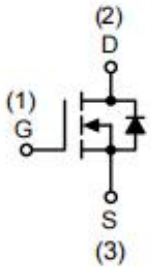
- Load switch
- Battery protection

## Features

- 100% Final Tested.
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

## SOT-23L Pin Configuration




## Absolute Maximum Ratings ($T_A$=25°C, Unless Otherwise Noted)

| Symbol | Parameter | | Rating | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | | 30 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±12 | |
| $I_D$ [7] | Continuous Drain Current | $T_C$=25°C | 0.5 | A |
| | | $T_C$=100°C | 0.3 | |
| $I_{DM}$ [3] | Pulse Drain Current | | 1.6 | |
| $P_D$ [2] | Power Dissipation | $T_C$=25°C | 1 | W |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $T_J$ | Operating Junction Temperature Range | | -55 to 150 | |
| $R_{\theta JA}$ [1,4] | Thermal Resistance-Junction to Ambient | t≤10s | 20 | °C/W |
| | | Steady State | 125 | |

## Electrical Characteristics ($T_J$=25°C, Unless Otherwise Noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250μA | 30 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}$=4.5V , $I_D$=0.5A | --- | 0.8 | 1.0 | Ω |
| | | $V_{GS}$=2.5V , $I_D$=0.5A | --- | 1.2 | 2.0 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$=250μA | 0.5 | 0.8 | 1.2 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=30V , $V_{GS}$=0V | --- | --- | 1 | μA |
| | | $T_J$=55°C | --- | --- | 5 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{DS}$=0V , $V_{GS}$=±12V | --- | --- | ±100 | nA |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=5V , $I_D$=0.5A | --- | 10 | --- | S |
| $R_G$ | Gate Resistance | $f$=1.0MHz | 1.0 | 2.0 | 3.1 | Ω |
| $Q_g$ | Total Gate Charge (4.5V) | $V_{DS}$=10V , $V_{GS}$=4.5V , $I_D$=0.5A | --- | 4.0 | --- | nC |
| $Q_{gs}$ | Gate-Source Charge | | --- | 0.5 | --- | |
| $Q_{gd}$ | Gate-Drain Charge | | --- | 1.0 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}$=10V , $V_{GS}$=4.5V , $I_D$=0.5A , $R_L$=1Ω , $R_{GEN}$=3Ω | --- | 1.5 | --- | ns |
| $T_r$ | Rise Time | | --- | 40 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 13 | --- | |
| $T_f$ | Fall Time | | --- | 5 | --- | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=15V , $V_{GS}$=0V , $f$=1.0MHz | --- | 300 | --- | pF |
| $C_{oss}$ | Output Capacitance | | --- | 20 | --- | |
| $C_{rss}$ | Reverse Transfer Capacitance | | --- | 30 | --- | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $I_S$ [7] | Continuous Source Current | | --- | --- | 0.5 | A |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V , $I_S$=1.5A | --- | --- | 1.35 | V |

Note:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C. The Power dissipation $P_{DSM}$ is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
2. The power dissipation $P_D$ is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.
6. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.
7. The maximum current rating is package limited.
8. These tests are performed with the device mounted on 1 in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C.
9. The maximum current rating is silicon limited

## Typical Characteristics

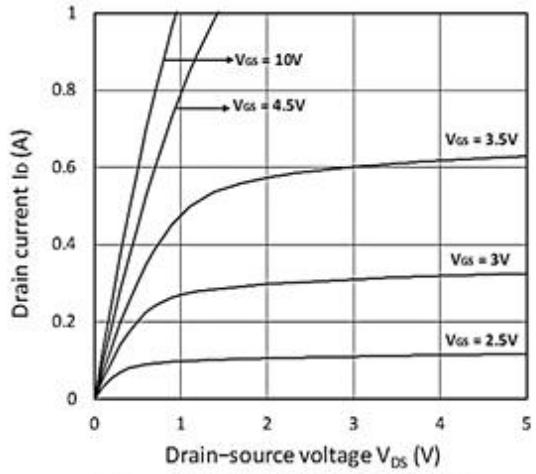



Figure 1. Output Characteristics

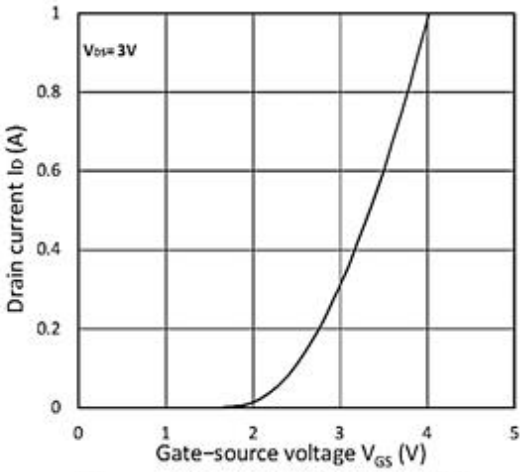



Figure 2. Transfer Characteristics

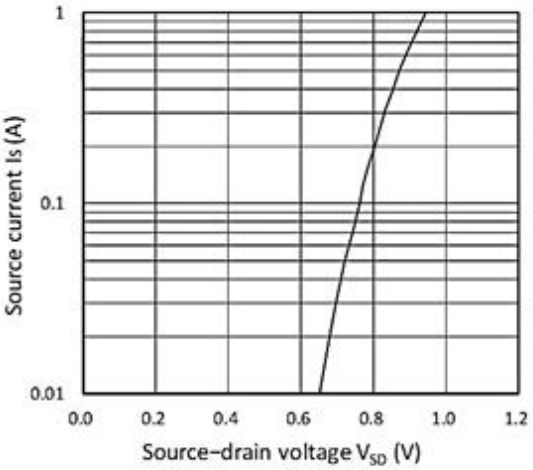



Figure 3. Forward Characteristics of Reverse

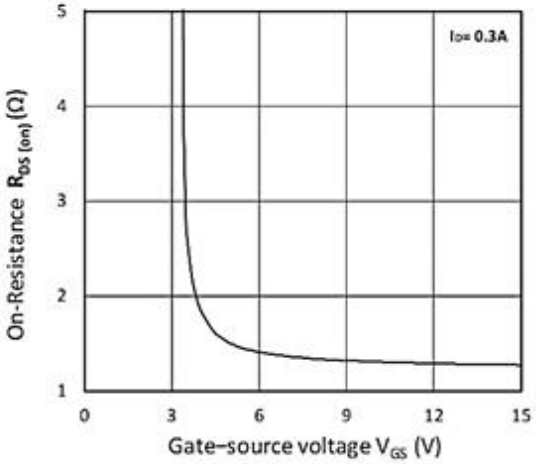



Figure 4. RDS(ON) vs. VGS

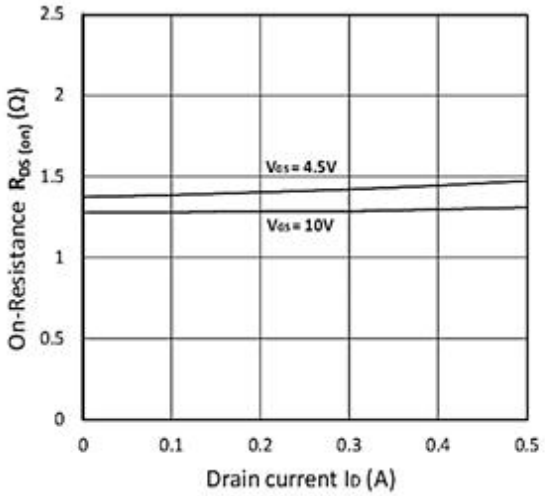



Figure 5. RDS(ON) vs. ID

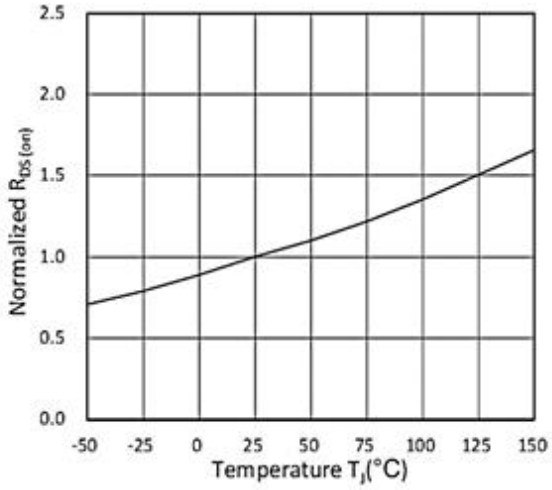



Figure 6. Normalized RDS(on) vs. Temperature

## Typical Characteristics (Cont.)

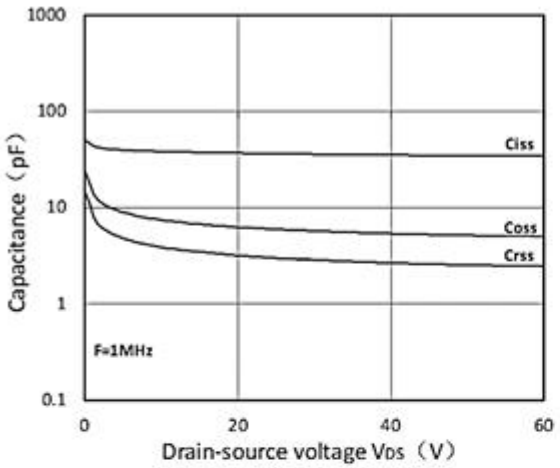



Figure 7. Capacitance Characteristics

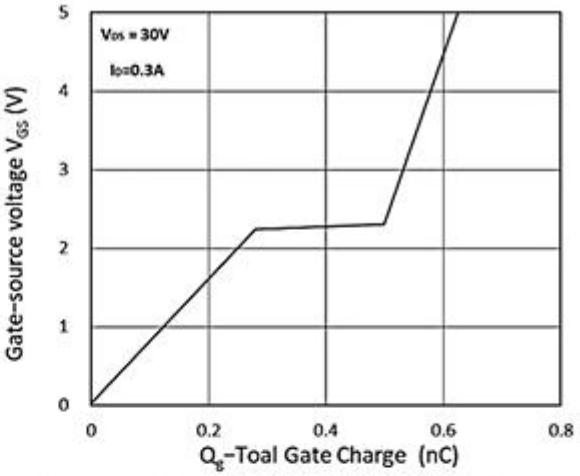



Figure 8. Gate Charge Characteristics

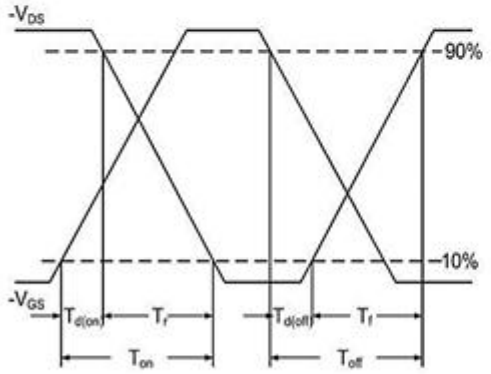



Figure.9 Switching Time Waveform

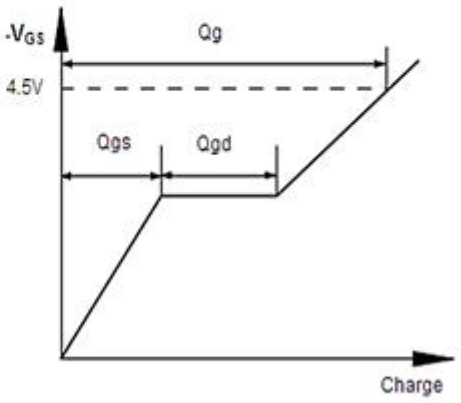
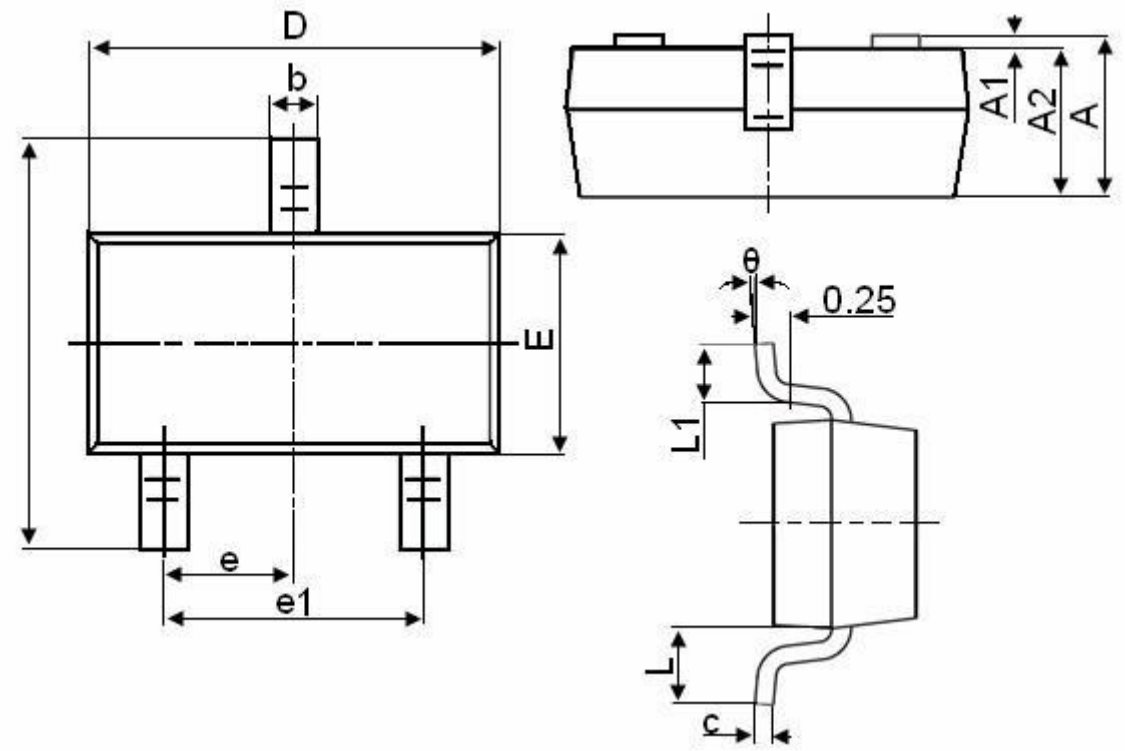



Figure.10 Gate Charge Waveform

## Packaging information




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

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