

## General Description

The WST3446 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 WST3446 meet the RoHS and Green Product requirement, 100%  $E_{AS}$  guaranteed with full function reliability approved.

## Features

- 100% UIS +  $R_g$  Tested.
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

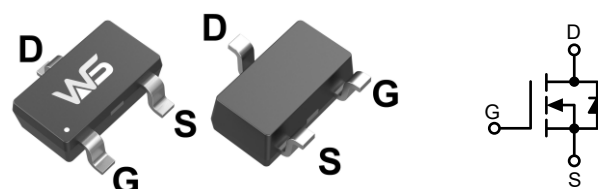
## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|------------|--------------|-------|
| 30V        | 26m $\Omega$ | 6A    |

## Applications

- Power Management for Industrial DC/DC Converters

## SOT-23-3L Pin Configuration



## Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ , Unless Otherwise Noted)

| Symbol    | Parameter                            | Rating                      | Units            |
|-----------|--------------------------------------|-----------------------------|------------------|
| $V_{DS}$  | Drain-Source Voltage                 | 30                          | V                |
| $V_{GS}$  | Gate-Source Voltage                  | $\pm 12$                    |                  |
| $I_D$     | Continuous Drain Current             | $T_J=150^\circ\text{C}$ 6   | A                |
| $I_{DM}$  | Pulse Drain Current                  | 25                          |                  |
| $P_D$     | Maximum Power Dissipation            | $T_A=25^\circ\text{C}$ 1.25 | W                |
|           |                                      | $T_A=70^\circ\text{C}$ 0.8  |                  |
| $T_{STG}$ | Storage Temperature Range            | -55 to 150                  | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature Range | -55 to 150                  |                  |

## Thermal Data

| Symbol          | Parameter                              | Rating | Units              |
|-----------------|--|--------|--------------------|
| $R_{\theta JA}$ | Thermal Resistance-Junction to Ambient | 90     | $^\circ\text{C/W}$ |

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$ , Unless Otherwise Noted)

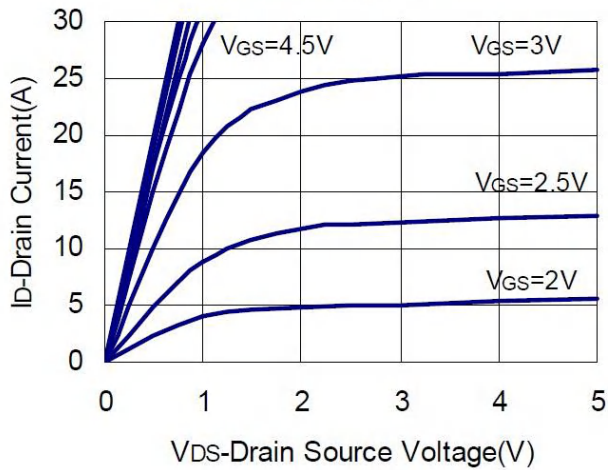
| Symbol       | Parameter                         | Conditions   | Min. | Typ. | Max.      | Units      |
|--------------|-----------------------------------|--|------|------|-----------|------------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V$ , $I_D=250\mu A$   | 30   | ---  | ---       | V          |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=5.7A$  | ---  | 26   | 29        | m $\Omega$ |
|              |                                   | $V_{GS}=4.5V$ , $I_D=5A$   | ---  | 28   | 32        |            |
|              |                                   | $V_{GS}=2.5V$ , $I_D=3.2A$   | ---  | 32   | 36        |            |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$   | 0.4  | 0.5  | 0.8       | V          |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=24V$ , $V_{GS}=0V$   | ---  | ---  | 1.0       | $\mu A$    |
|              |                                   | $T_J=55^{\circ}\text{C}$   | ---  | ---  | 30        |            |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 12V$ , $V_{DS}=0V$   | ---  | ---  | $\pm 100$ | nA         |
| $Q_g$        | Total Gate Charge                 | $V_{DS}=15V$ , $V_{GS}=10V$ , $I_D=5.6A$                                   | ---  | 10   | 19        | nC         |
| $Q_{gs}$     | Gate-Source Charge                |  | ---  | 1.7  | ---       |            |
| $Q_{gd}$     | Gate-Drain Charge                 |  | ---  | 3.2  | ---       |            |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=10V$ , $V_{GS}=15V$ , $R_G=6\Omega$ ,<br>$I_D=1A$ , $R_L=15\Omega$ | ---  | 7    | 15        | ns         |
| $T_r$        | Turn-On Rise Time                 |  | ---  | 10   | 20        |            |
| $T_{d(off)}$ | Turn-Off Delay Time               |  | ---  | 20   | 40        |            |
| $T_f$        | Turn-Off Fall Time                |  | ---  | 11   | 20        |            |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=15V$ , $V_{GS}=0V$ , $f=1.0\text{MHz}$                             | ---  | 416  | ---       | pF         |
| $C_{oss}$    | Output Capacitance                |  | ---  | 62   | ---       |            |
| $C_{rss}$    | Reverse Transfer Capacitance      |  | ---  | 40   | ---       |            |

**Diode Characteristics**

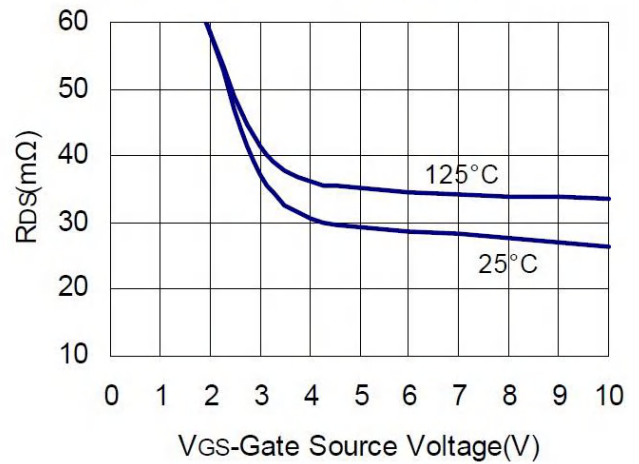
| Symbol   | Parameter                 | Conditions                | Min. | Typ. | Max. | Units |
|----------|---------------------------|---------------------------|------|------|------|-------|
| $I_S$    | Continuous Source Current | $T_C=25^{\circ}\text{C}$  | ---  | ---  | 1.7  | A     |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_{SD}=1A$ | ---  | 0.7  | 1.0  | V     |

## Typical Characteristics

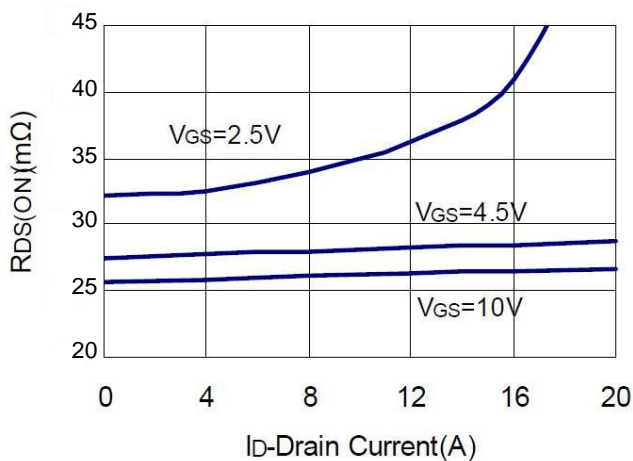
**Output Characteristics**



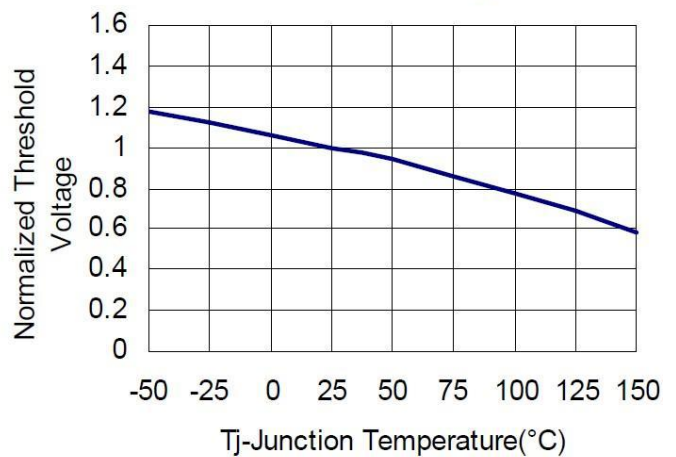
**Drain-Source On Resistance**



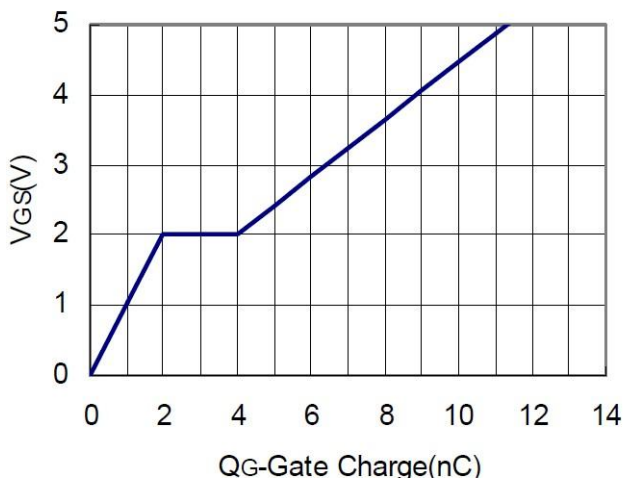
**Drain Source On Resistance**



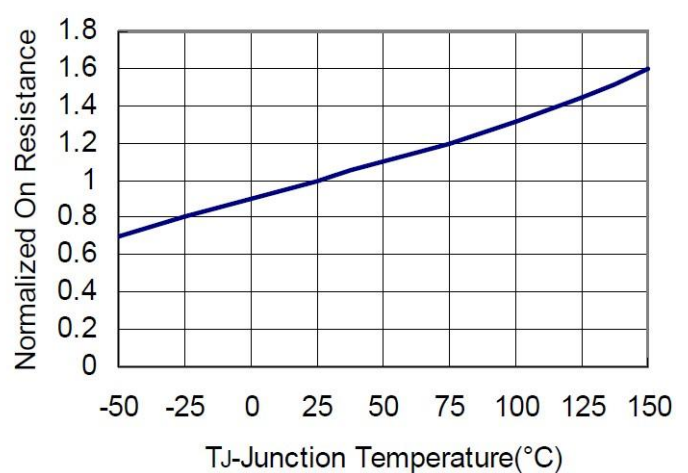
**Gate Threshold Voltage**



**Gate Charge**

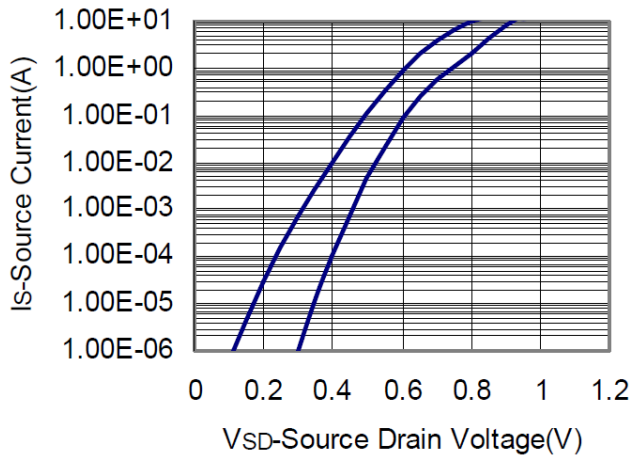


**Drain Source On Resistance**

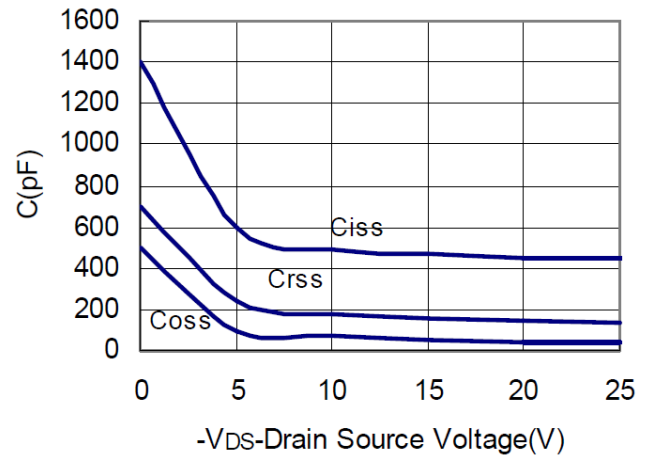


**Typical Characteristics (Cont.)**

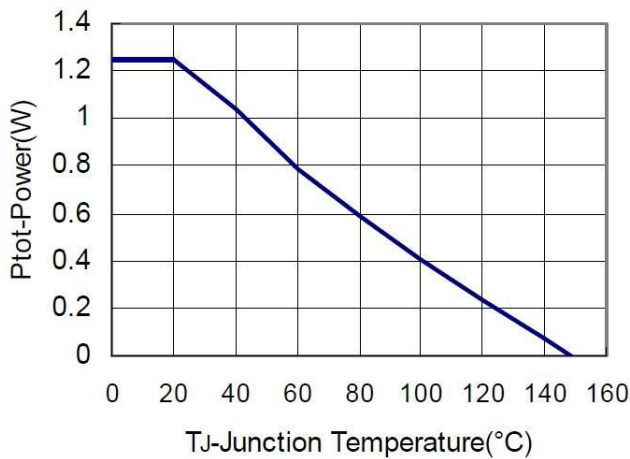
**Source Drain Diode Forward**



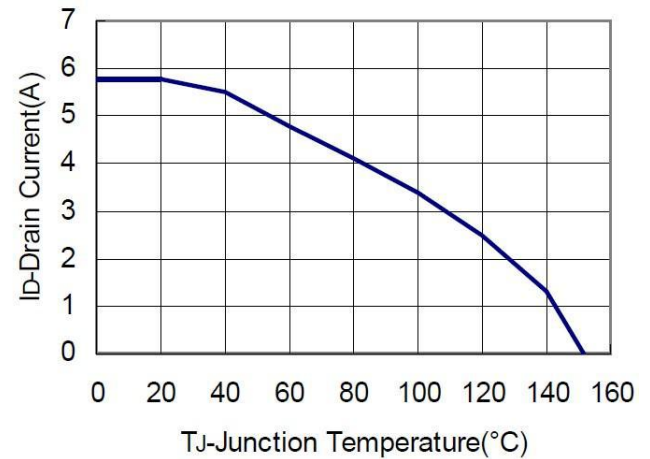
**Capacitance**



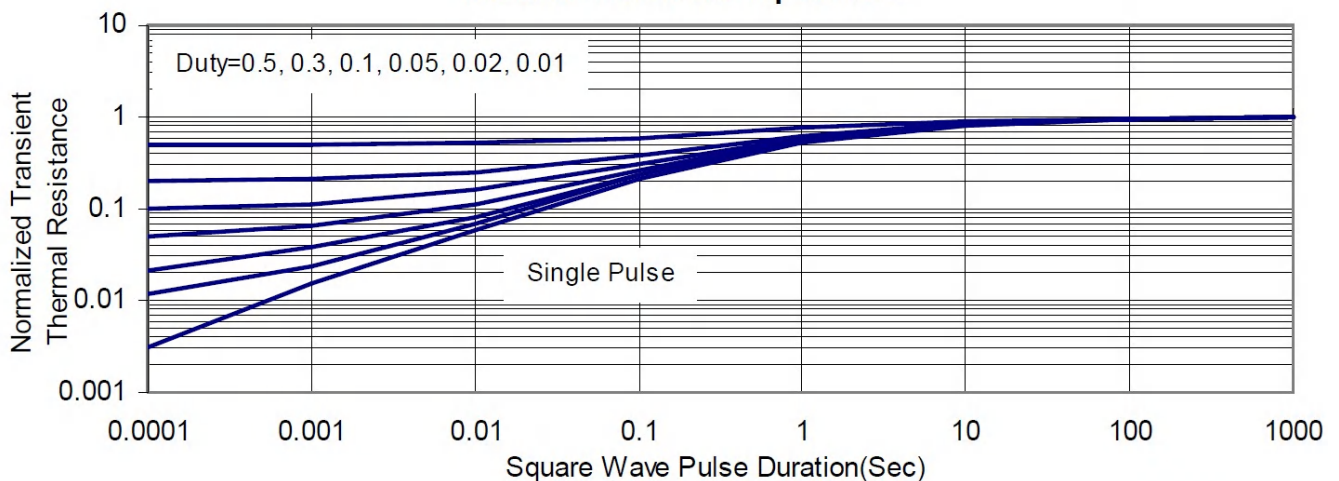
**Power Dissipation**



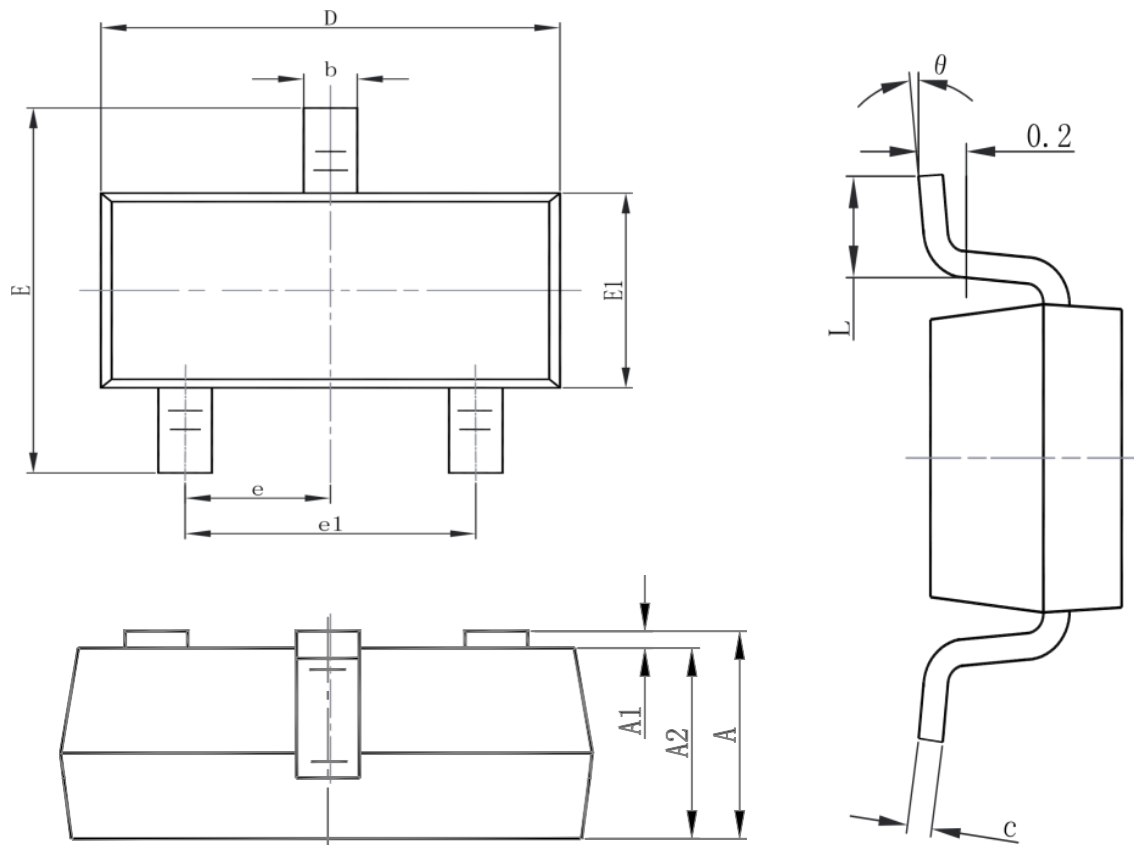
**Drain Current**



**Thermal Transient Impedance**



## Packaging information



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E1     | 1.500                     | 1.700 | 0.059                | 0.067 |
| E      | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

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