

## General Description

The WST3392 is the highest performance trench Dual N-Channel MOSFETs with extreme high cell density, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the small power switching and load switch applications.

The WST3392 meet the RoHS and Green Product requirement with full function reliability approved.

## Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

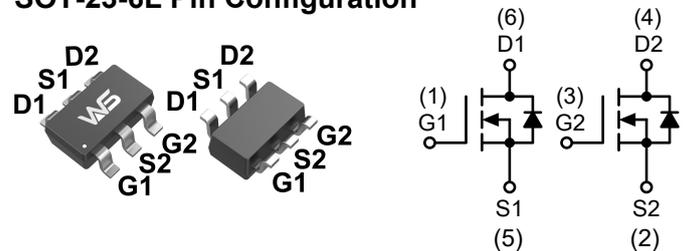
## Product Summary

| $BV_{DSS}$ | $R_{DS(ON)}$ | $I_D$ |
|------------|--------------|-------|
| 30V        | 46m $\Omega$ | 3.7A  |

## Applications

- Power management in portable and battery operated products
- One cell battery pack protection

## SOT-23-6L Pin Configuration



## Absolute Maximum Ratings

| Symbol                   | Parameter  | Rating     | Units      |
|--------------------------|--|------------|------------|
| $V_{DS}$                 | Drain-Source Voltage                                   | 30         | V          |
| $V_{GS}$                 | Gate-Source Voltage                                    | $\pm 20$   |            |
| $I_D @ T_C = 25^\circ C$ | Continuous Drain Current, $V_{GS} @ 4.5V$ <sup>1</sup> | 3.7        | A          |
| $I_D @ T_C = 70^\circ C$ | Continuous Drain Current, $V_{GS} @ 4.5V$ <sup>1</sup> | 3.0        |            |
| $I_{DM}$                 | Pulsed Drain Current <sup>2</sup>                      | 20         |            |
| $P_D @ T_A = 25^\circ C$ | Power Dissipation <sup>3</sup>                         | 1.15       | W          |
| $T_{STG}$                | Storage Temperature Range                              | -55 to 150 | $^\circ C$ |
| $T_J$                    | Operating Junction Temperature Range                   | -55 to 150 |            |

## Thermal Data

| Symbol          | Parameter  | Typ. | Max. | Units        |
|-----------------|--|------|------|--------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient <sup>1</sup> | ---  | 110  | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case <sup>1</sup>    | ---  | 80   |              |

**Electrical Characteristics (T<sub>J</sub>=25°C, Unless Otherwise Noted)**

| Symbol                | Parameter                         | Conditions   | Min. | Typ.     | Max.       | Units |
|-----------------------|-----------------------------------|--|------|----------|------------|-------|
| BV <sub>DSS</sub>     | Drain-Source Breakdown Voltage    | I <sub>D</sub> =250μA, V <sub>GS</sub> =0V   | 30   | ---      | ---        | V     |
| I <sub>DSS</sub>      | Zero Gate Voltage Drain Current   | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V<br>T <sub>J</sub> =55°C                        | ---  | ---      | 1.0<br>5.0 | μA    |
| I <sub>GSS</sub>      | Gate-Body leakage current         | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V   | ---  | ---      | ±100       | nA    |
| V <sub>GS(th)</sub>   | Gate Threshold Voltage            | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA                                 | 0.5  | 1.0      | 1.5        | V     |
| I <sub>D(ON)</sub>    | On state drain current            | V <sub>GS</sub> =10V, V <sub>DS</sub> =5V  | 20   | ---      | ---        | A     |
| R <sub>DS(ON)</sub>   | Static Drain-Source On-Resistance | V <sub>GS</sub> =10V, I <sub>D</sub> =3.4A<br>T <sub>J</sub> =125°C                      | ---  | 46<br>73 | 60<br>88   | mΩ    |
|                       |                                   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A  | ---  | 53       | 70         |       |
|                       |                                   | V <sub>GS</sub> =2.5V, I <sub>D</sub> =2A  | ---  | 65       | 90         |       |
| g <sub>fs</sub>       | Forward Transconductance          | V <sub>DS</sub> =5V, I <sub>D</sub> =3.4A  | ---  | 14       | ---        | S     |
| R <sub>g</sub>        | Gate Resistance                   | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f = 1.0MHz                                     | ---  | 4.3      | ---        | Ω     |
| Q <sub>g</sub> (10V)  | Total Gate Charge                 | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =3.4A                         | ---  | 10       | ---        | nC    |
| Q <sub>g</sub> (4.5V) | Total Gate Charge                 |  | ---  | 4.7      | ---        |       |
| Q <sub>gs</sub>       | Gate-Source Charge                |  | ---  | 0.95     | ---        |       |
| Q <sub>gd</sub>       | Gate-Drain Charge                 |  | ---  | 1.6      | ---        |       |
| T <sub>d(on)</sub>    | Turn-On Delay Time                | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =4.4Ω<br>R <sub>GEN</sub> =3Ω | ---  | 1.5      | ---        | ns    |
| T <sub>r</sub>        | Turn-On Rise Time                 |  | ---  | 3.5      | ---        |       |
| T <sub>d(off)</sub>   | Turn-Off Delay Time               |  | ---  | 2.5      | ---        |       |
| T <sub>f</sub>        | Turn-Off Fall Time                |  | ---  | 17.5     | ---        |       |
| C <sub>iss</sub>      | Input Capacitance                 | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f = 1.0MHz                                    | ---  | 235      | ---        | pF    |
| C <sub>oss</sub>      | Output Capacitance                |  | ---  | 35       | ---        |       |
| C <sub>rss</sub>      | Reverse Transfer Capacitance      |  | ---  | 18       | ---        |       |

**Diode Characteristics**

| Symbol          | Parameter                             | Conditions                              | Min. | Typ. | Max. | Units |
|-----------------|---------------------------------------|---|------|------|------|-------|
| I <sub>S</sub>  | Maximum Body-Diode Continuous Current |   | ---  | ---  | 1.5  | A     |
| V <sub>SD</sub> | Diode Forward Voltage                 | I <sub>S</sub> =1A, V <sub>GS</sub> =0V | ---  | 0.75 | 1.0  | V     |
| t <sub>rr</sub> | Body Diode Reverse Recovery Time      | I <sub>F</sub> =3.4A, dI/dt=100A/μs     | ---  | 8.5  | ---  | ns    |
| Q <sub>rr</sub> | Body Diode Reverse Recovery Charge    |   | ---  | 2.55 | ---  | nC    |

**Note:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

Typical Characteristics

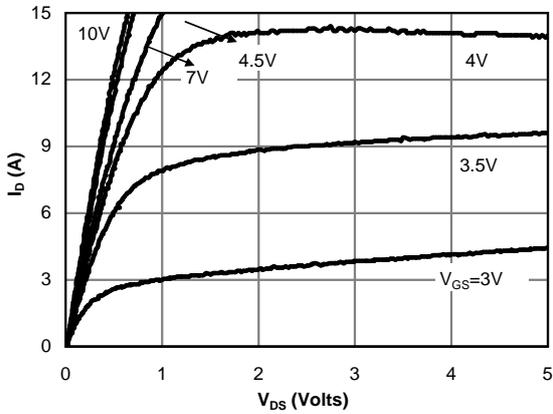


Fig 1: On-Region Characteristics (Note E)

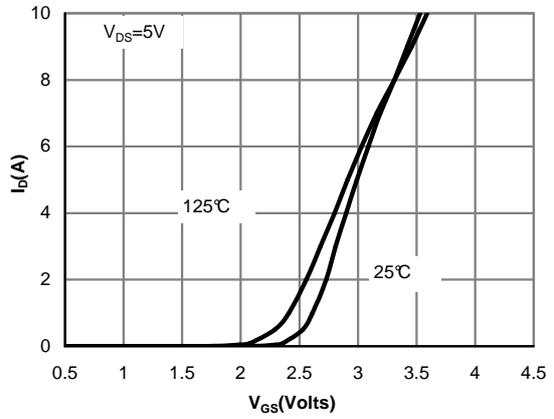


Figure 2: Transfer Characteristics (Note E)

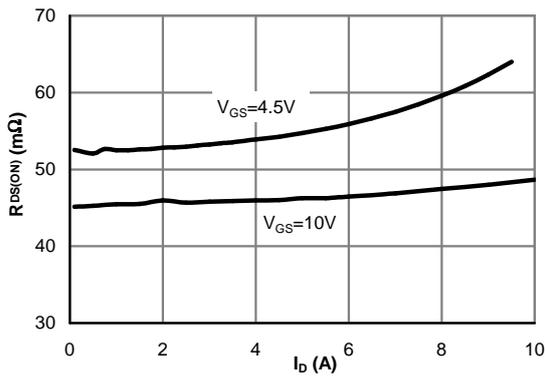


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

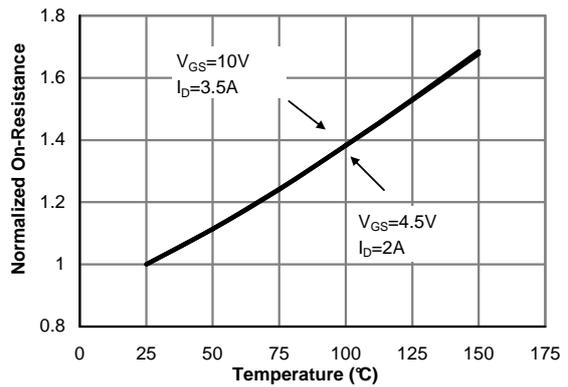


Figure 4: On-Resistance vs. Junction Temperature (Note E)

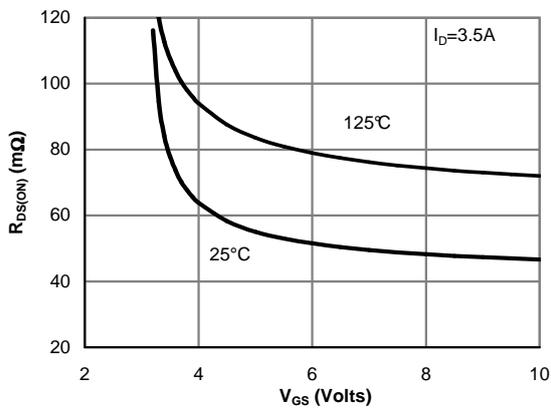


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

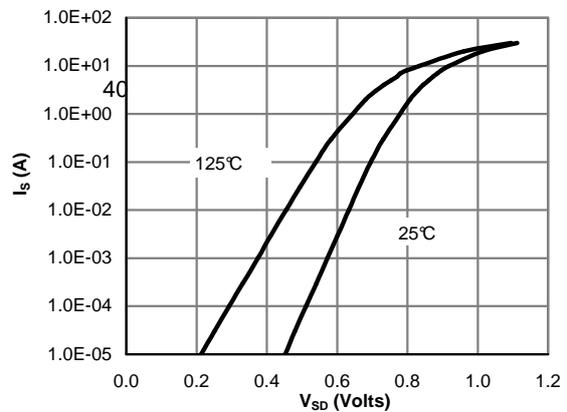


Figure 6: Body-Diode Characteristics (Note E)

Typical Characteristics (Cont.)

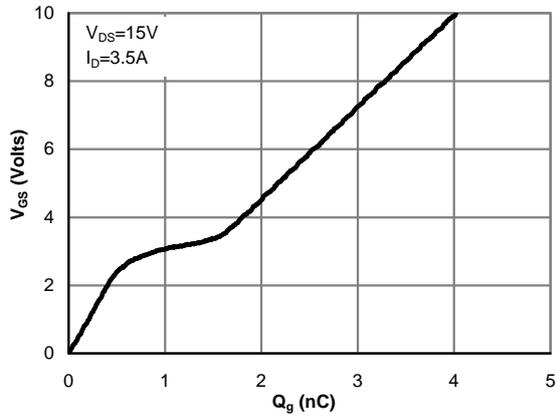


Figure 7: Gate-Charge Characteristics

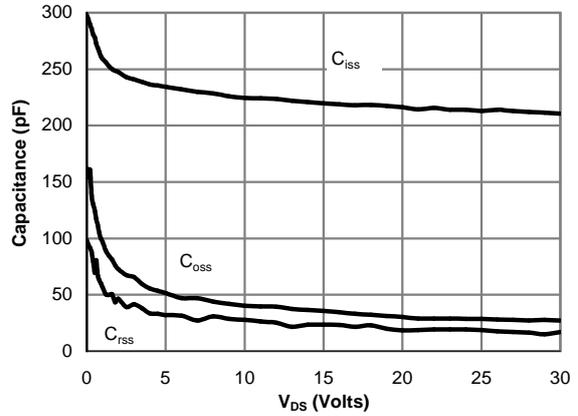


Figure 8: Capacitance Characteristics

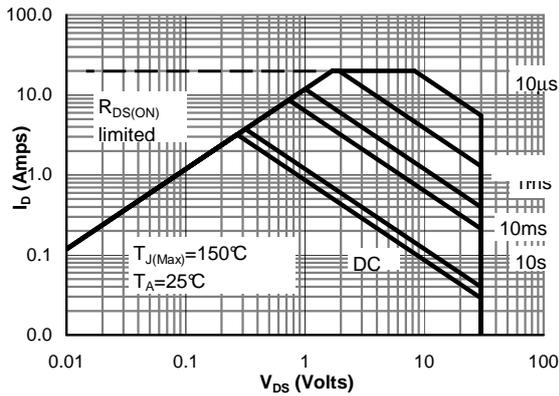


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

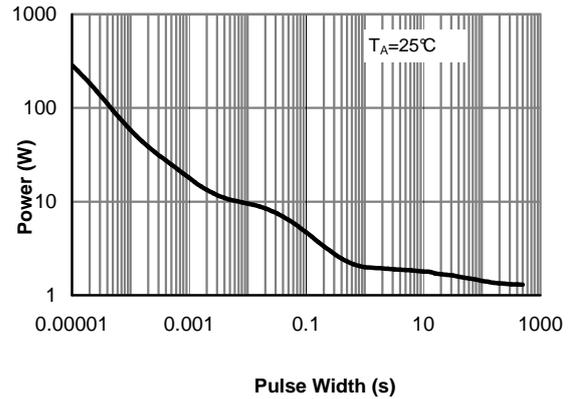


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

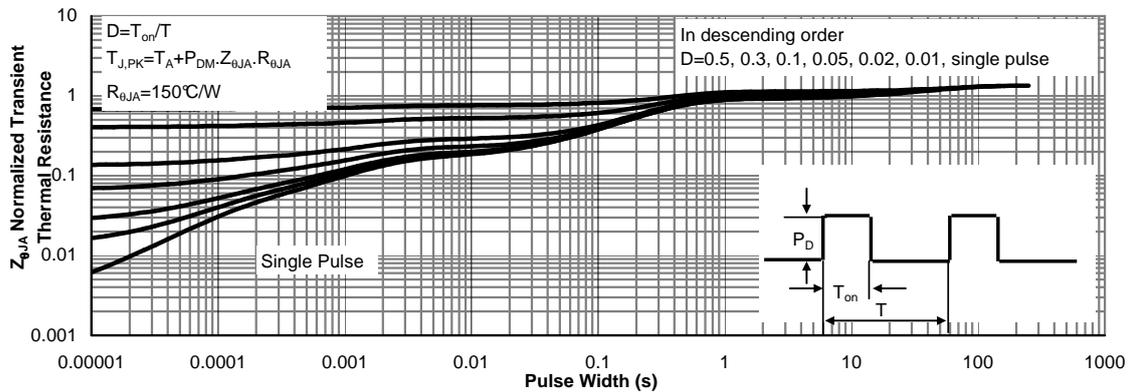
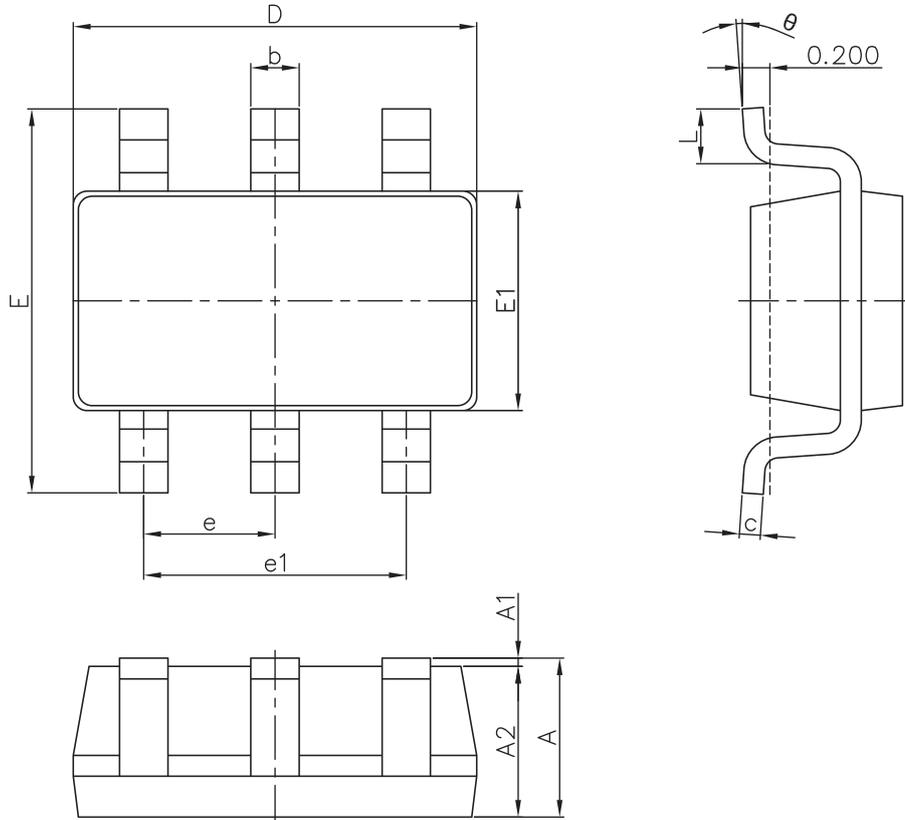


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

**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 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

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