

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 30V           | 280mΩ@4.5V      | 1.5A  |
|               | 320mΩ@2.5V      |       |
|               | 500mΩ@1.8V      |       |

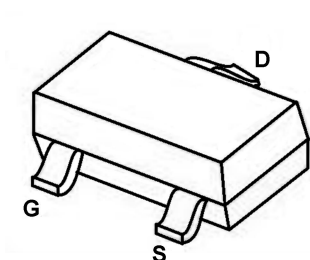
### Feature

- Low input Capacitance
- Fast Switching Speed
- ESD protected

### Application

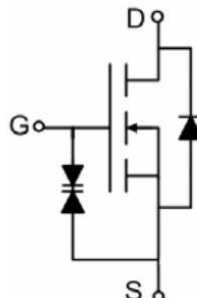
- Load/Power Switching
- Voltage Control

### Package

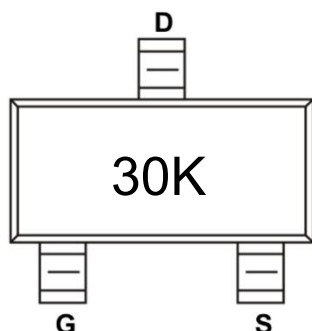


SOT-323

### Circuit diagram



### Marking



**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                    |
| Continuous Drain Current                                  | $I_D$           | 1.5        | A                    |
| Pulsed Drain Current <sup>1)</sup>                        | $I_{DM}$        | 4.2        | A                    |
| Power Dissipation <sup>2)</sup>                           | $P_D$           | 0.2        | W                    |
| Thermal Resistance from Junction to Ambient <sup>2)</sup> | $R_{\theta JA}$ | 336        | $^{\circ}\text{C/W}$ |
| Junction Temperature                                      | $T_J$           | 150        | $^{\circ}\text{C}$   |
| Storage Temperature                                       | $T_{STG}$       | -55 ~ +150 | $^{\circ}\text{C}$   |

**Electrical characteristics ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)**

| Parameter                             | Symbol               | Test Condition                                                                           | Min. | Typ. | Max. | Unit |
|---------------------------------------|----------------------|------------------------------------------------------------------------------------------|------|------|------|------|
| Static Characteristics                |                      |                                                                                          |      |      |      |      |
| 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    | μA   |
| Gate-body leakage current             | I <sub>GSS</sub>     | V <sub>GS</sub> =±12V, V <sub>DS</sub> = 0V                                              |      |      | ±10  | μA   |
| Gate threshold voltage                | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                 | 0.6  | 0.9  | 1.5  | V    |
| Drain-source on-resistance            | R <sub>DS(on)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =1.0A                                              |      | 220  | 280  | mΩ   |
|                                       |                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.8A                                              |      | 245  | 320  |      |
|                                       |                      | V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.6A                                              |      | 290  | 500  |      |
| Forward Transconductance              | g <sub>FS</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =0.8A                                               | 1    |      |      | S    |
| Dynamic characteristics <sup>3)</sup> |                      |                                                                                          |      |      |      |      |
| Input Capacitance                     | C <sub>iss</sub>     | V <sub>DS</sub> =10V,V <sub>GS</sub> =0V,f =1MHz                                         |      | 49   |      | pF   |
| Output Capacitance                    | C <sub>oss</sub>     |                                                                                          |      | 20   |      |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>     |                                                                                          |      | 12   |      |      |
| Total Gate Charge                     | Q <sub>g</sub>       | V <sub>DS</sub> =10V,V <sub>GS</sub> =4.5V,<br>I <sub>D</sub> =0.9A                      |      | 2.1  |      | nC   |
| Gate-Source Charge                    | Q <sub>gs</sub>      |                                                                                          |      | 0.7  |      |      |
| Gate-Drain Charge                     | Q <sub>gd</sub>      |                                                                                          |      | 0.42 |      |      |
| Turn-on delay time                    | t <sub>d(on)</sub>   | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V,<br>I <sub>D</sub> =0.5A R <sub>G</sub> =10Ω |      | 5.7  |      | nS   |
| Turn-on rise time                     | t <sub>r</sub>       |                                                                                          |      | 4.2  |      |      |
| Turn-off delay time                   | t <sub>d(off)</sub>  |                                                                                          |      | 15.3 |      |      |
| Turn-off fall time                    | t <sub>f</sub>       |                                                                                          |      | 6.4  |      |      |
| Source-Drain Diode characteristics    |                      |                                                                                          |      |      |      |      |
| Diode Forward voltage                 | V <sub>DS</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> =0.15A                                               |      |      | 1.2  | V    |
| Reverse Recovery Time                 | t <sub>rr</sub>      | I <sub>F</sub> =1A ,di/dt = 100A/μs                                                      |      | 7.5  |      | nS   |
| Reverse Recovery Charge               | Q <sub>rr</sub>      |                                                                                          |      | 2.5  |      | nC   |

Notes:

- 1) Pulse width  $\leq 100\mu s$ , duty cycle  $\leq 1\%$ , limited by  $T_{jmax}$
- 2) Device mounted on FR-4 substrate PC board, 2ozcopper, with 1-inch square copper plate in still air.
- 3) Guaranteed by design, not subject to production testing.

### Typical Characteristics

Fig. 1 - Output Characteristics

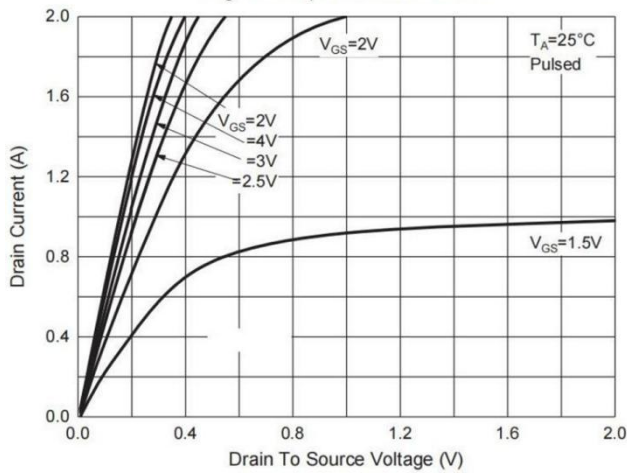


Fig. 2 - Transfer Characteristics

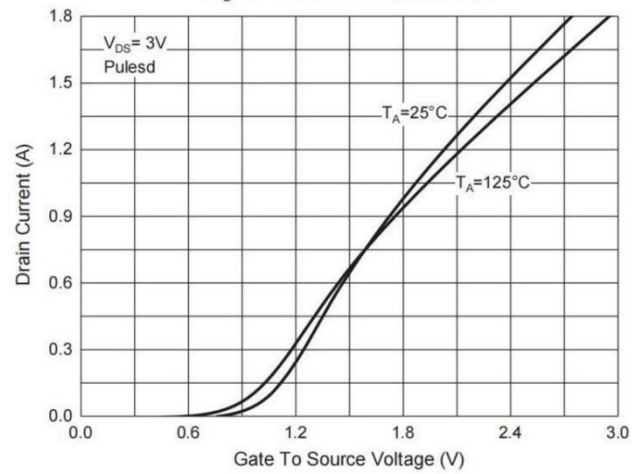


Fig. 3 -  $R_{DS(ON)} - I_D$

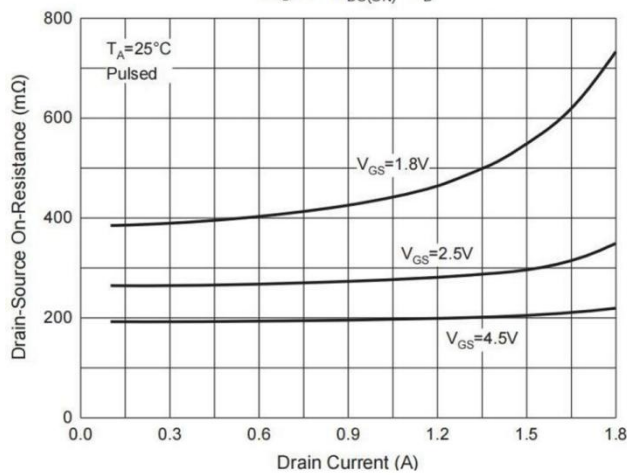


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

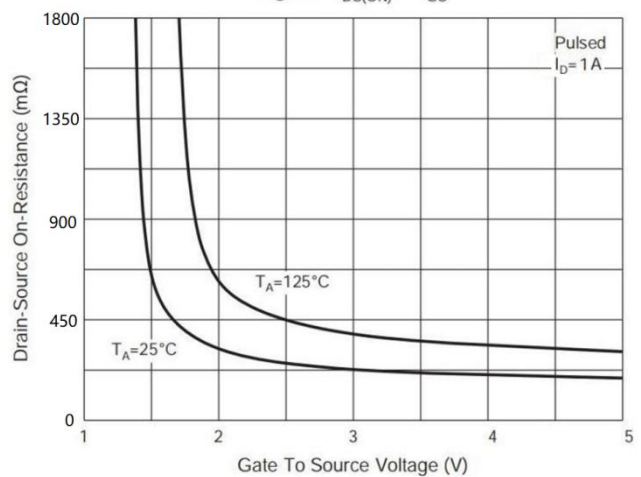


Fig. 5 -  $I_S - V_{SD}$

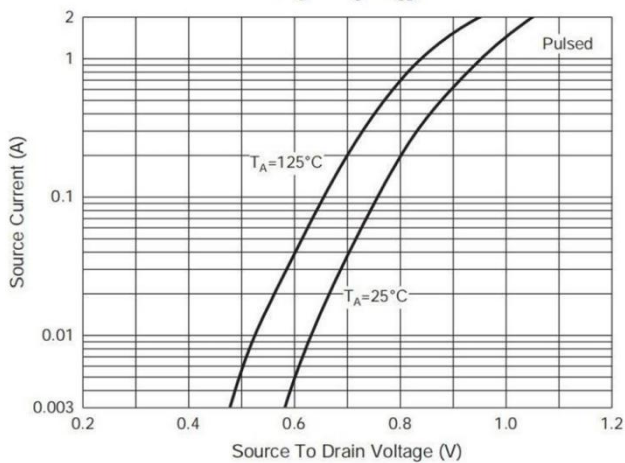
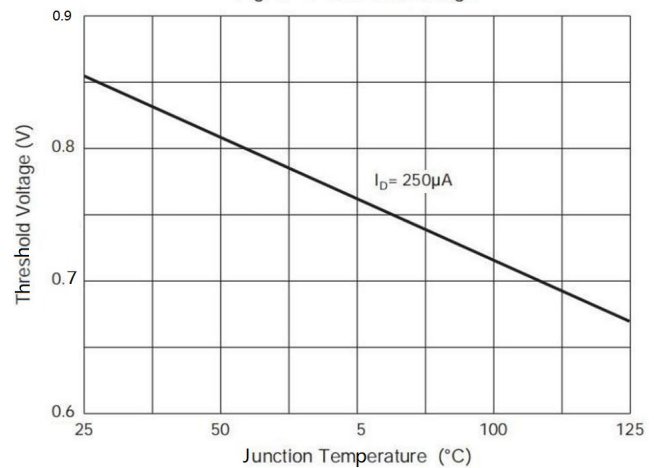
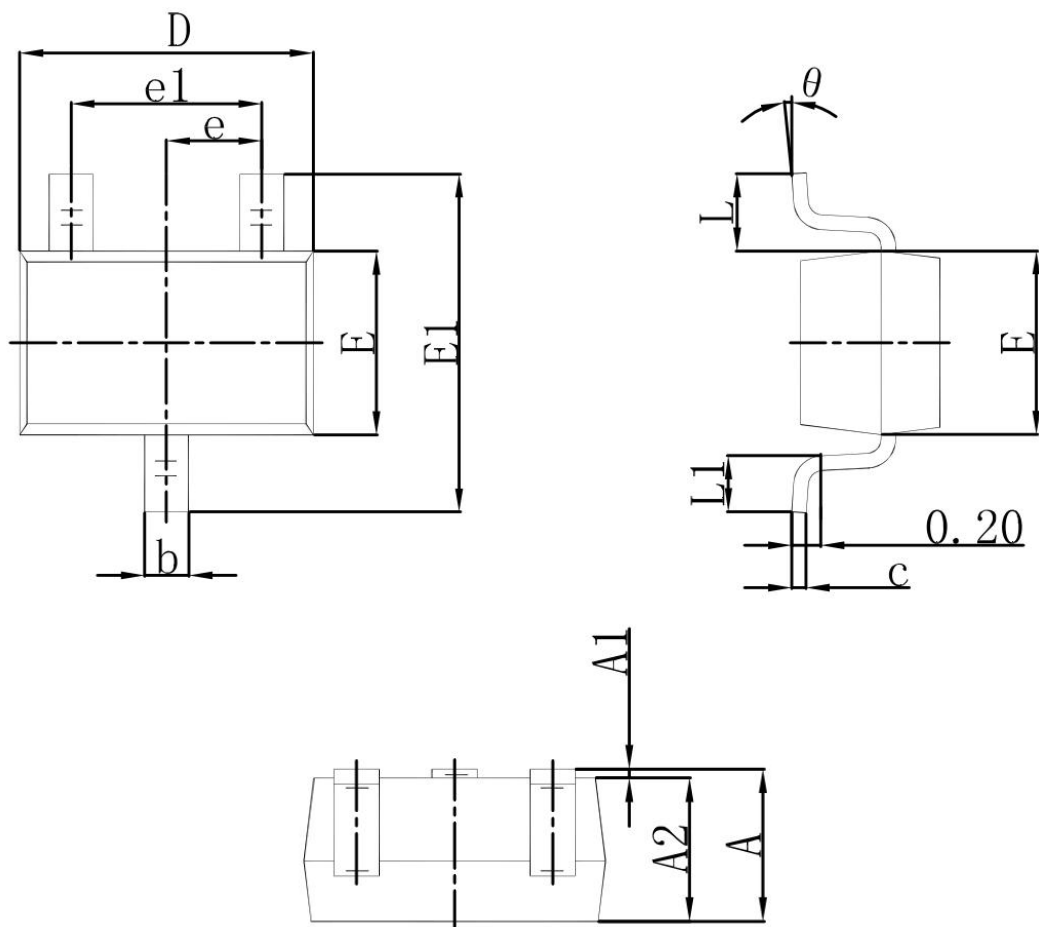


Fig. 6 - Threshold Voltage



## SOT-323 Package Information



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.150                     | 0.400 | 0.006                | 0.016 |
| c      | 0.080                     | 0.250 | 0.003                | 0.016 |
| D      | 1.800                     | 2.200 | 0.071                | 0.087 |
| E      | 1.150                     | 1.350 | 0.045                | 0.053 |
| E1     | 2.150                     | 2.450 | 0.085                | 0.096 |
| e      | 0.650 TYP.                |       | 0.026 TYP.           |       |
| e1     | 1.200                     | 1.400 | 0.047                | 0.055 |
| L      | 0.525 REF.                |       | 0.021 REF.           |       |
| L1     | 0.250                     | 0.460 | 0.010                | 0.018 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |