

### Features

- $V_{DS} = -20V, I_D = -0.8A$   
 $R_{DS(ON)} < 590m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 900m\Omega @ V_{GS} = -2.5V$
- ESD Protection

### Application

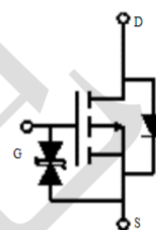
- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

### Package and Pin Configuration



SOT-523

### Circuit diagram



### Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

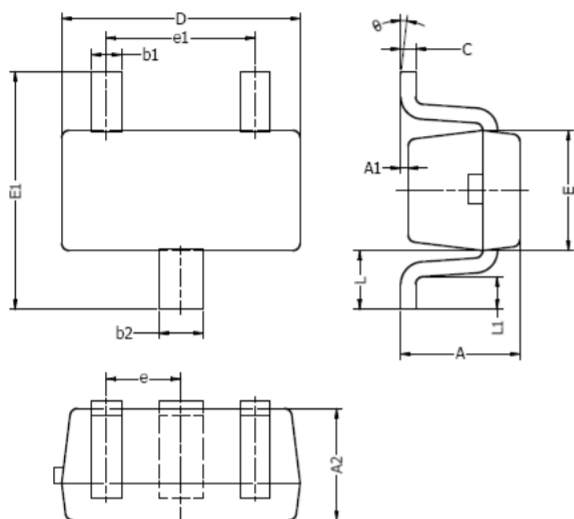
| Parameter                                            | Symbol          | Value     | Unit         |
|------------------------------------------------------|-----------------|-----------|--------------|
| Drain-Source Voltage                                 | $V_{DS}$        | -20       | V            |
| Gate-Source Voltage                                  | $V_{GS}$        | $\pm 12$  | V            |
| Continuous Drain Current                             | $I_D$           | -0.8      | A            |
| Pulsed Drain Current ( $t=300\mu s$ ) <sup>(1)</sup> | $I_{DM}$        | -1.4      | A            |
| Power Dissipation <sup>(2)</sup>                     | $P_D$           | 280       | mW           |
| Thermal Resistance from Junction to Ambient          | $R_{\theta JA}$ | 452       | $^\circ C/W$ |
| Junction Temperature                                 | $T_J$           | 150       | $^\circ C$   |
| Storage Temperature                                  | $T_{STG}$       | -55~ +150 | $^\circ C$   |

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

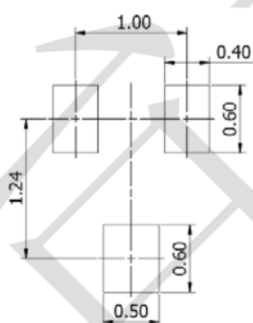
| Parameter                                 | Symbol        | Test Condition                                                | Min  | Type  | Max      | Unit       |
|-------------------------------------------|---------------|---------------------------------------------------------------|------|-------|----------|------------|
| Static Characteristics                    |               |                                                               |      |       |          |            |
| Drain-source breakdown voltage            | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$                                | -20  |       |          | V          |
| Zero gate voltage drain current           | $I_{DSS}$     | $V_{DS} = -20V, V_{GS} = 0V$                                  |      |       | -1       | $\mu A$    |
| Gate-body leakage current                 | $I_{GSS}$     | $V_{GS} = \pm 12V, V_{DS} = 0V$                               |      |       | $\pm 10$ | $\mu A$    |
| Gate threshold voltage <sup>(3)</sup>     | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$                            | -0.5 | -0.75 | -1.1     | V          |
| Drain-source on-resistance <sup>(3)</sup> | $R_{DS(on)}$  | $V_{GS} = -4.5V, I_{DS} = -550mA$                             |      |       | 590      | m $\Omega$ |
|                                           |               | $V_{GS} = -2.5V, I_{DS} = -450mA$                             |      |       | 900      |            |
| Forward tranconductance                   | $g_{FS}$      | $V_{DS} = -5V, I_D = 500mA$                                   |      | 1     |          | S          |
| Dynamic characteristics <sup>(4)</sup>    |               |                                                               |      |       |          |            |
| Input Capacitance                         | $C_{iss}$     | $V_{GS} = 0V, V_{DS} = -10V, Freq. = 1MHz$                    |      |       | 60       | pF         |
| Output Capacitance                        | $C_{oss}$     |                                                               |      |       | 6        |            |
| Reverse Transfer Capacitance              | $C_{rss}$     |                                                               |      |       | 5        |            |
| Switching Characteristics <sup>(4)</sup>  |               |                                                               |      |       |          |            |
| Turn-on delay time                        | $t_{d(on)}$   | $V_{GS} = -4.5V, V_{DS} = -10V, I_D = -1A, R_{GEN} = 3\Omega$ |      | 0.45  |          | $\mu s$    |
| Turn-on rise time                         | $t_r$         |                                                               |      | 0.04  |          |            |
| Turn-off delay time                       | $t_{d(off)}$  |                                                               |      | 0.035 |          |            |
| Turn-off fall time                        | $t_f$         |                                                               |      | 1.1   |          |            |
| Source-Drain Diode characteristics        |               |                                                               |      |       |          |            |
| Diode Forward voltage <sup>(3)</sup>      | $V_{DS}$      | $I_S = 0.15A, V_{GS} = 0V$                                    |      |       | -1.2     | V          |

**SOT523 Package Outline Drawing**

[WWW.TECHPUBLIC.COM](http://WWW.TECHPUBLIC.COM)



**Suggested Land Pattern**



| DIM | MILLIMETERS |      | INCHES     |       |
|-----|-------------|------|------------|-------|
|     | MIN         | MAX  | MIN        | MAX   |
| A   | 0.70        | 0.90 | 0.028      | 0.035 |
| A1  | 0.00        | 0.10 | 0.000      | 0.004 |
| A2  | 0.70        | 0.80 | 0.028      | 0.031 |
| b1  | 0.15        | 0.25 | 0.006      | 0.010 |
| b2  | 0.25        | 0.35 | 0.010      | 0.014 |
| c   | 0.10        | 0.20 | 0.004      | 0.008 |
| D   | 1.50        | 1.70 | 0.059      | 0.067 |
| E   | 0.70        | 0.90 | 0.028      | 0.035 |
| E1  | 1.45        | 1.75 | 0.057      | 0.069 |
| e   | 0.50 TYP.   |      | 0.020 TYP. |       |
| e1  | 0.90        | 1.10 | 0.035      | 0.043 |
| L   | 0.40 REF.   |      | 0.016 REF. |       |
| L1  | 0.10        | 0.30 | 0.004      | 0.012 |
| θ   | 0°          | 8°   | 0°         | 8°    |

**NOTES:**

1. Above package outline conforms to JEITA EIAJ ED-7500A SC-75A.
2. Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.