

### Features

- $V_{DS} = 20V, I_D = 0.8A$   
 $R_{DS(ON)} = 250m\Omega @ V_{GS}=4.5V$  (typ)  
 $R_{DS(ON)} = 300m\Omega @ V_{GS}=2.5V$  (typ)
- ESD Protection

### Application

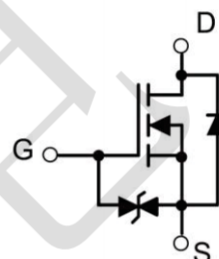
- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

### Package and Pin Configuration



SOT-523

### Circuit diagram



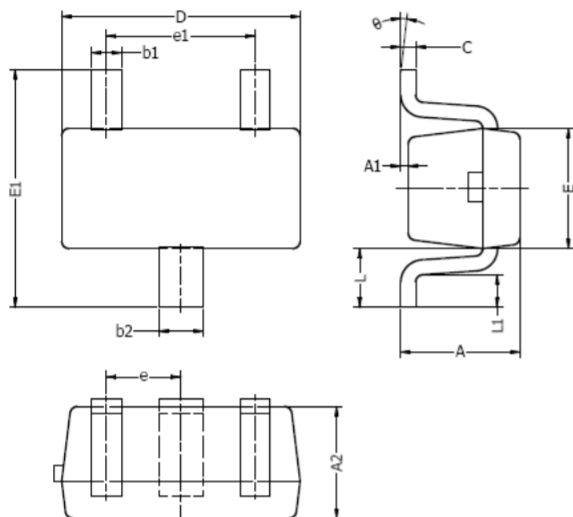
### Absolute Maximum Ratings ( $T_A=25^\circ C$ unless otherwise noted)

| Parameter                                            | Symbol          | Value     | Unit         |
|------------------------------------------------------|-----------------|-----------|--------------|
| Drain-Source Voltage                                 | $V_{DS}$        | 20        | V            |
| Gate-Source Voltage                                  | $V_{GS}$        | $\pm 8$   | V            |
| Continuous Drain Current                             | $I_D$           | 0.8       | A            |
| Pulsed Drain Current ( $t=300\mu s$ ) <sup>(1)</sup> | $I_{DM}$        | 1.8       | 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 )**

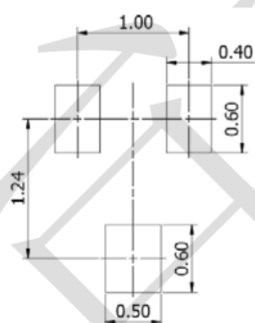
| Parameter                                 | Symbol        | Test Condition                                                  | Min | Type | Max      | Unit    |
|-------------------------------------------|---------------|-----------------------------------------------------------------|-----|------|----------|---------|
| 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                 | $I_{GSS}$     | $V_{GS} = \pm 8V, V_{DS} = 0V$                                  |     |      | $\pm 10$ | $\mu A$ |
| 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> | $R_{DS(on)}$  | $V_{GS} = 4.5V, I_D = 550mA$                                    |     | 250  | 400      | mΩ      |
|                                           |               | $V_{GS} = 2.5V, I_D = 450mA$                                    |     | 300  | 500      |         |
| Forward tranconductance                   | $g_{FS}$      | $V_{DS} = 5V, I_D = 500mA$                                      |     | 1.7  |          | S       |
| Dynamic characteristics <sup>(4)</sup>    |               |                                                                 |     |      |          |         |
| Input Capacitance                         | $C_{iss}$     | $V_{DS} = 16V, V_{GS} = 0V, f = 1MHz$                           |     |      | 120      | pF      |
| Output Capacitance                        | $C_{oss}$     |                                                                 |     |      | 20       |         |
| Reverse Transfer Capacitance              | $C_{rss}$     |                                                                 |     |      | 15       |         |
| Switching Characteristics <sup>(4)</sup>  |               |                                                                 |     |      |          |         |
| Turn-on delay time                        | $t_{d(on)}$   | $V_{DD} = 10V, I_D = 500mA,$<br>$V_{GS} = 4.5V, R_G = 10\Omega$ |     | 6.7  |          | ns      |
| Turn-on rise time                         | $t_r$         |                                                                 |     | 4.8  |          |         |
| Turn-off delay time                       | $t_{d(off)}$  |                                                                 |     | 17.3 |          |         |
| Turn-off fall time                        | $t_f$         |                                                                 |     | 7.4  |          |         |
| 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



| 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 |
| theta | 0°          | 8°   | 0°         | 8°    |

### Suggested Land Pattern



#### NOTES:

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