

### Product Summary

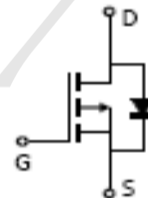
- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-3.0A < 95m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-2.6A < 128m\Omega$

### Application

- Load/Power Switching
- Interfacing Switching
- Logic Level Shift

### Package and Pin Configuration

SOT-23



### Marking:



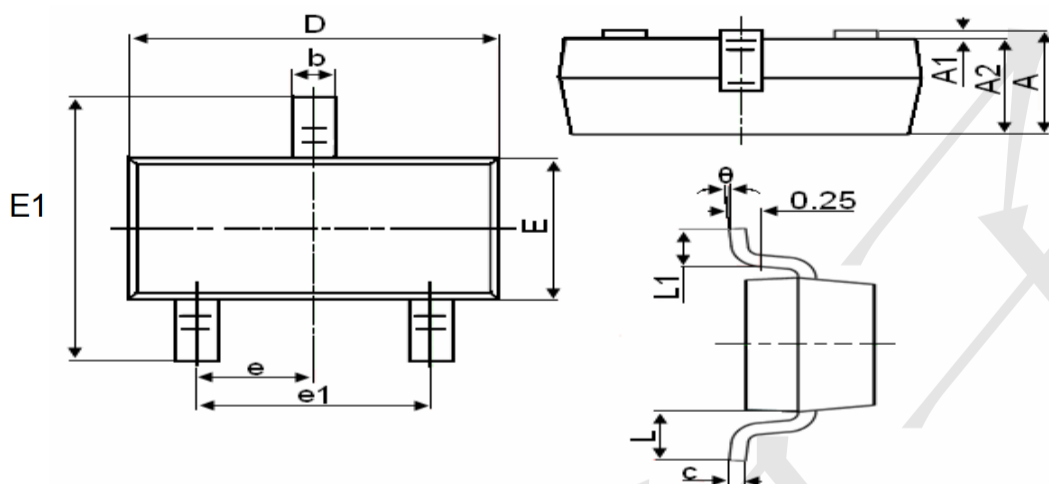
### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER                                        |                      | SYMBOL                            | LIMIT   | UNITS |
|--------------------------------------------------|----------------------|-----------------------------------|---------|-------|
| Drain-Source Voltage                             |                      | V <sub>DS</sub>                   | -40     | V     |
| Gate-Source Voltage                              |                      | V <sub>GS</sub>                   | +20     |       |
| Continuous Drain Current                         |                      | I <sub>D</sub>                    | -3.0    | A     |
| Pulsed Drain Current (Note 4)                    |                      | I <sub>DM</sub>                   | -12.4   |       |
| Power Dissipation                                | T <sub>a</sub> =25°C | P <sub>D</sub>                    | 1.25    | W     |
|                                                  | Derate above 25°C    |                                   | 10      | mW/°C |
| Operating Junction and Storage Temperature Range |                      | T <sub>J</sub> , T <sub>STG</sub> | -55~150 | °C    |
| Typical Thermal Resistance                       |                      | R <sub>θJA</sub>                  | 100     | °C/W  |
| - Junction to Ambient (Note 3)                   |                      |                                   |         |       |

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

| PARAMETER                                             | SYMBOL              | TEST CONDITION                                                                                           | MIN. | TYP.  | MAX. | UNITS |
|-------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------------|------|-------|------|-------|
| Static                                                |                     |                                                                                                          |      |       |      |       |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA                                                              | -40  | -     | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA                                                | -1.0 | -1.5  | -2.5 |       |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-3.1A                                                             | -    |       | 95   | mΩ    |
|                                                       |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1.2A                                                            | -    |       | 128  |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =-40V, V <sub>GS</sub> =0V                                                               | -    | -     | -1   | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                               | -    | -     | ±100 | nA    |
| Dynamic (Note 5)                                      |                     |                                                                                                          |      |       |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =-20V, I <sub>D</sub> =-3.1A,<br>V <sub>GS</sub> =-4.5V (Note 1,2)                       | -    | 6     | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |                                                                                                          | -    | 1.6   | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |                                                                                                          | -    | 2.3   | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V,<br>f=1.0MHZ                                                  | -    | 505   | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |                                                                                                          | -    | 48    | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |                                                                                                          | -    | 33    | -    |       |
| Turn-On Delay Time                                    | td <sub>(on)</sub>  | V <sub>DD</sub> =-20V, I <sub>D</sub> =-2.5A,<br>V <sub>GS</sub> =-10V,<br>R <sub>G</sub> =1Ω (Note 1,2) | -    | 6     | -    | ns    |
| Turn-On Rise Time                                     | tr                  |                                                                                                          | -    | 35    | -    |       |
| Turn-Off Delay Time                                   | td <sub>(off)</sub> |                                                                                                          | -    | 18    | -    |       |
| Turn-Off Fall Time                                    | tf                  |                                                                                                          | -    | 10    | -    |       |
| Drain-Source Diode                                    |                     |                                                                                                          |      |       |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---                                                                                                      | -    | -     | -1.0 | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V                                                               | -    | -0.82 | -1.2 | V     |
| Reverse Recovery Time                                 | trr                 | V <sub>GS</sub> =0V, I <sub>S</sub> =-2.5A<br>dI <sub>F</sub> / dt=100A/us                               | -    | 13    | -    | ns    |
| Reverse Recovery Charge                               | Qrr                 |                                                                                                          | -    | 8.7   | -    | nC    |

**SOT-23 Package Information**



| Symbol | Dimensions in Millimeters |       |
|--------|---------------------------|-------|
|        | MIN.                      | MAX.  |
| A      | 0.900                     | 1.150 |
| A1     | 0.000                     | 0.100 |
| A2     | 0.900                     | 1.050 |
| b      | 0.300                     | 0.500 |
| c      | 0.080                     | 0.150 |
| D      | 2.800                     | 3.000 |
| E      | 1.200                     | 1.400 |
| E1     | 2.250                     | 2.550 |
| e      | 0.950TYP                  |       |
| e1     | 1.800                     | 2.000 |
| L      | 0.550REF                  |       |
| L1     | 0.300                     | 0.500 |
| θ      | 0°                        | 8°    |