

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---------------|-----------------|-------|
| -20V          | 87mΩ@-4.5V      | -3.2A |
|               | 119mΩ@-2.5V     |       |

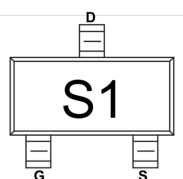
### Feature

- Trench Technology Power MOSFET
- Low  $R_{DS(ON)}$
- Low Gate Charge

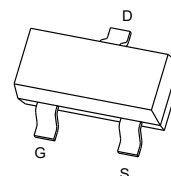
### Application

- Load Switch
- DC/DC Converter

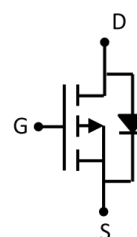
### MARKING:



### SOT-23-3L



### Schematic diagram



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ 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 <sup>1,5</sup>                  | $I_D$           | -3.2      | A                  |
| Pulsed Drain Current <sup>2</sup>                        | $I_{DM}$        | -12.8     | A                  |
| Power Dissipation <sup>4,5</sup>                         | $P_D$           | 1.1       | W                  |
| Thermal Resistance from Junction to Ambient <sup>5</sup> | $R_{\theta JA}$ | 113.6     | $^\circ\text{C/W}$ |
| Junction Temperature                                     | $T_J$           | 150       | $^\circ\text{C}$   |
| Storage Temperature                                      | $T_{STG}$       | -55~ +150 | $^\circ\text{C}$   |

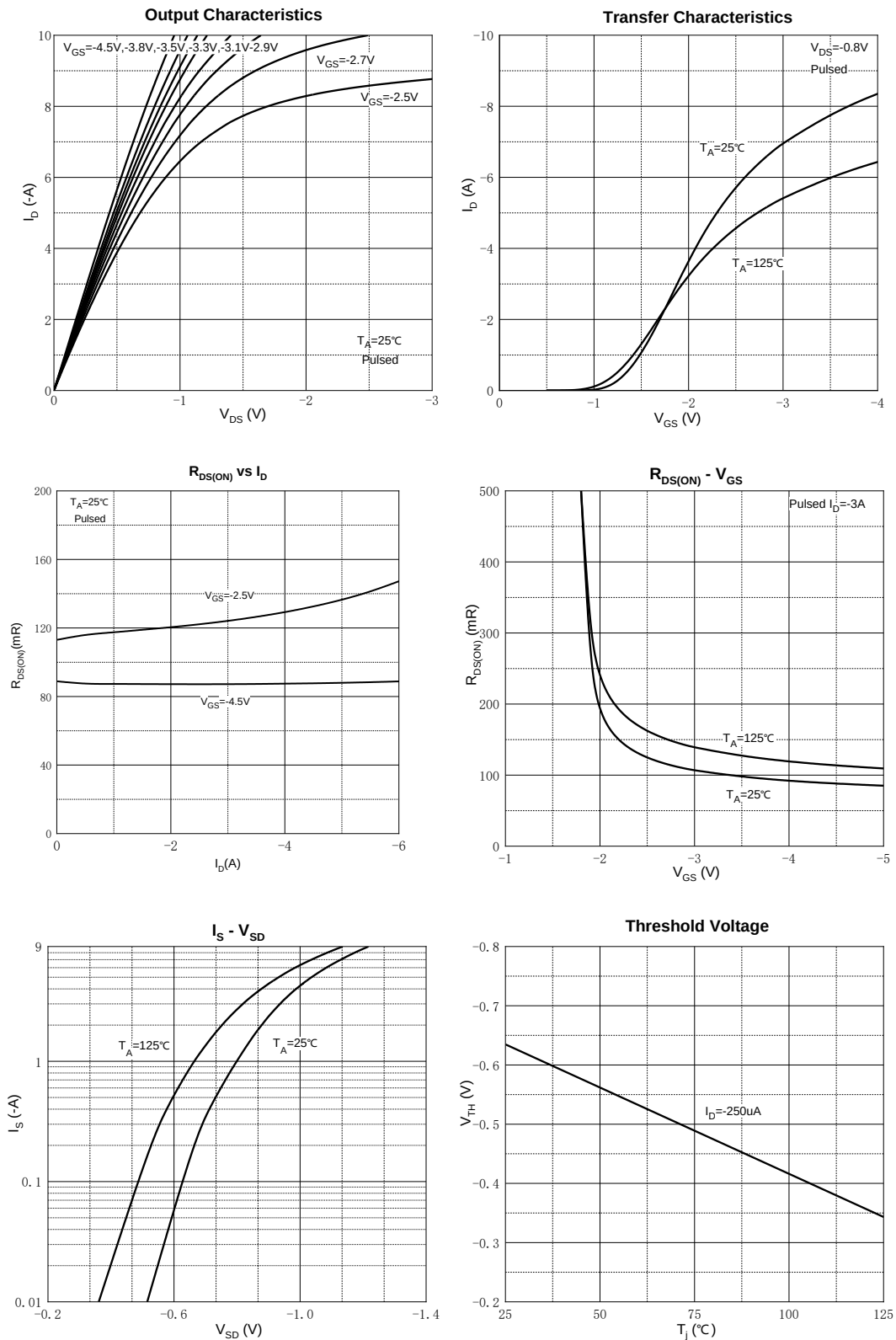
**MOSFET ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$  unless otherwise noted)**

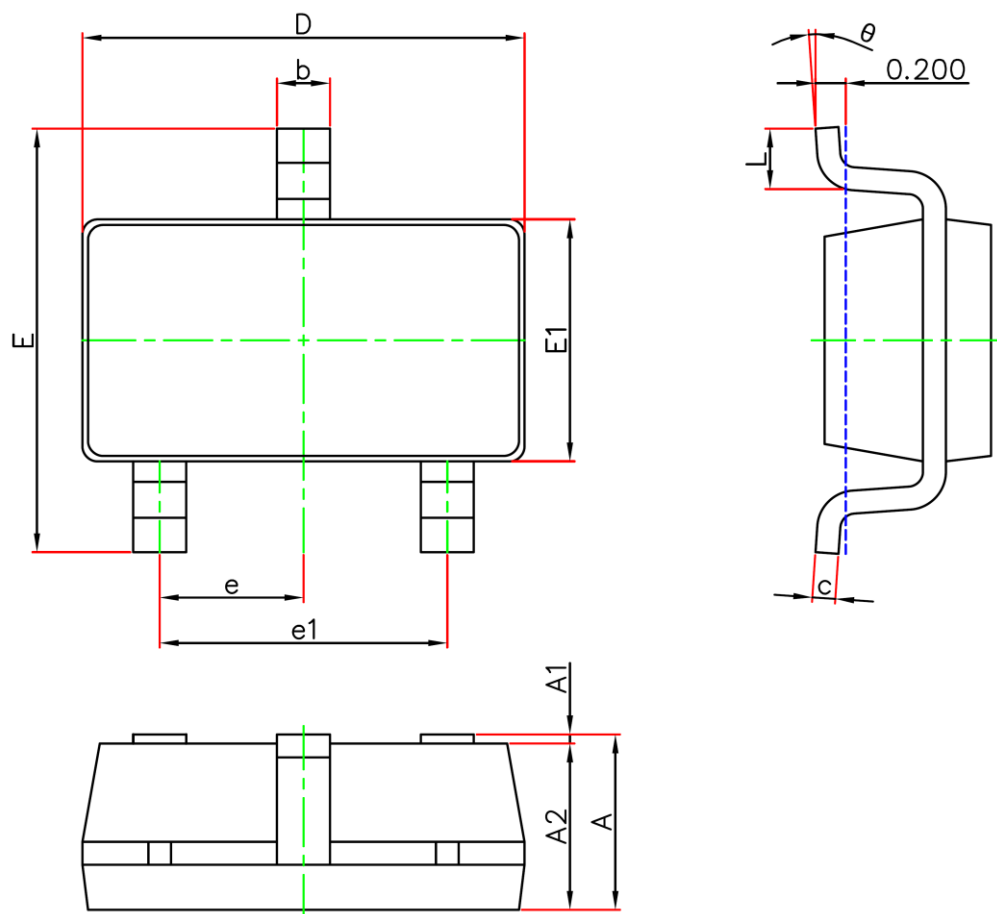
| Parameter                            | Symbol        | Test Condition                                                     | Min  | Type  | Max       | Unit       |
|--------------------------------------|---------------|--------------------------------------------------------------------|------|-------|-----------|------------|
| Off 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          | $I_{GSS}$     | $V_{GS} = \pm 8V, V_{DS} = 0V$                                     |      |       | $\pm 100$ | nA         |
| On Characteristics <sup>3</sup>      |               |                                                                    |      |       |           |            |
| Gate Threshold Voltage               | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$                                 | -0.4 | -0.7  | -1        | V          |
| Drain-source On-resistance           | $R_{DS(on)}$  | $V_{GS} = -4.5V, I_D = -3A$                                        |      | 87    | 107       | m $\Omega$ |
|                                      |               | $V_{GS} = -2.5V, I_D = -2A$                                        |      | 119   | 139       |            |
| Dynamic Characteristics              |               |                                                                    |      |       |           |            |
| Input Capacitance                    | $C_{iss}$     | $V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$                             |      | 403.8 |           | pF         |
| Output Capacitance                   | $C_{oss}$     |                                                                    |      | 50.9  |           |            |
| Reverse Transfer Capacitance         | $C_{rss}$     |                                                                    |      | 41.7  |           |            |
| Gate Resistance                      | $R_g$         | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$                               |      | 26.6  |           | $\Omega$   |
| Switching Characteristics            |               |                                                                    |      |       |           |            |
| Total Gate Charge                    | $Q_g$         | $V_{DS} = -10V, V_{GS} = -4.5V, I_D = -3A$                         |      | 4.8   |           | nC         |
| Gate-source Charge                   | $Q_{gs}$      |                                                                    |      | 1.2   |           |            |
| Gate-drain Charge                    | $Q_{gd}$      |                                                                    |      | 1.0   |           |            |
| Turn-on Delay Time                   | $t_{d(on)}$   | $V_{DD} = -10V, V_{GS} = -4.5V,$<br>$R_L = 5\Omega, R_G = 3\Omega$ |      | 10    |           | ns         |
| Turn-on Rise Time                    | $t_r$         |                                                                    |      | 5.2   |           |            |
| Turn-off Delay Ttime                 | $t_{d(off)}$  |                                                                    |      | 19    |           |            |
| Turn-off Fall Time                   | $t_f$         |                                                                    |      | 7     |           |            |
| Source - Drain Diode Characteristics |               |                                                                    |      |       |           |            |
| Diode Forward Voltage <sup>3</sup>   | $V_{SD}$      | $V_{GS} = 0V, I_S = -1.3A$                                         |      |       | -1.2      | V          |

Notes :

- 1.The maximum current rating is limited by package.
- 2.Pulse Test : Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
- 3.Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 4.The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ\text{C}$ .
- 5.Device mounted on  $1in^2$  FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

## Typical Characteristics



**SOT-23-3L Package Information**


| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1       | 0                         | 0.150 | 0.000                | 0.006 |
| A2       | 1.050                     | 1.250 | 0.041                | 0.049 |
| 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 |
| E        | 2.650                     | 2.950 | 0.104                | 0.116 |
| E1       | 1.500                     | 1.700 | 0.059                | 0.067 |
| e        | 0.950TYP                  |       | 0.037TYP             |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.300                     | 0.600 | 0.012                | 0.024 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |